15.4 Power Supply

15.4.1 Background of Power Supply Sector

(1) Power Generation in Uganda

Uganda is benefitted by hydraulic resources. Table 15.4.1 shows the forecasted power generation mix in Uganda up to 2040. More than 60% of power in respect of energy (GWh) is generated by hydro power plants.

YFAR	2021		2025	5	2030		2035		2040	
TEAN	GWh	%								
Hydro power	13,566	60	24,697	71	24,697	70	30,536	75	33,164	77
Thermal power	784	3	616	2	691	2	434	1	434	1
Geothermal	0	0	0	0	0	0	0	0	0	0
Solar/Wind	7,753	34	9,067	26	9,067	26	9,067	22	9,067	21
Cogeneration, Bagasse	585	3	585	1	585	2	585	2	585	1
Total	22,688	100	34,965	100	35,040	100	40,622	100	43,250	100

Table 15.4.1 Forecast of Power Generation Mix in Uganda

Source: Prepared by JICA Expert Team based on Grid Development Plan 2018-2040 (GDevP)

Table 15.4.2 shows existing and under construction hydro power plants. At present, Kiira Nalubaale (Owen-Falls complex) Hydro Power Plant (HPP) (Installed capacity: 380MW), Bujagali HPP (Eskom) (Generation capacity: 250MW) and Ishimba HPP (183MW) are three large hydro power plants in operation. Other hydro power plants such as Karuma, Oriang, Ayago and Kiba are expected to be commissioned in 2025. As a result, the power generated by hydro power is expected to increase.

Table 15.4.2 Large Hydro Power Plants (HPPs) in Uganda

Plant	Installed capacity (MW)	Status
Kiira-Nalubaale (Eskom)	380	In Operation
Bujagali	250	In Operation
Ishimba	183	In Operation
Karuma	600	To be commissioned in 2022
Oriang	392	To be commissioned in 2025
Ayago	840	To be commissioned in 2025
Kiba	330	To be commissioned in 2025
Uhuru	600	To be commissioned in 2035

Source: JICA Expert Team based on Grid Development Plan 2018-2040 (GDevP)

The power generated is used not only for Uganda's consumption, but also, exported to neighbouring countries through a 132kV international transmission line. The power generated is forecasted to be greater than the load forecast for Uganda and international uses as shown in Table 15.4.3. The power excess is expected to be generated up to 2040.

YEAR	2021	2025	2030	2035	2040
Power Excess (Domestic + Export) (GWh)	12,154	21,954	17,596	18,307	15,329

Source: JICA Expert Team based on Grid Development Plan 2018-2040 (GdevP)

(2) Transmission Network in Uganda

Figure 15.4.1 shows the national grid in Uganda. The national grid is designed to transmit power generated by hydro power plants to the whole of the country. The hydro power plants (HPPs) in operation are namely Kiira-Nalubaale, Bujagali and Ishimba HPPs, which are located to the east of Greater Kampala Metropolitan Area (GKMA) along with the Nile River. The power is evacuated after being stepped-up to either 132kV or 220kV through overhead transmission lines as shown in Figure 15.4.2. Hydro power plants which are expected to be operational in the future, such as Karuma, Orian, Ayago, Kiba, etc., are in the northern part of Uganda as shown in Figure 15.4.1. In 2021, 400kV transmission lines were commissioned and connected from Karuma Substation to Kawanda Substation, which is located in the northern part of GKMA. Evacuated 400kV power to Kawanda Substation will be stepped down to 220kV, and sent to Buloba Substation and New Mukono Substation. In addition, power will be stepped down to 132kV and evacuated to 132/33kV and 132/11kV substations in GKMA, namely, Lugogo, Mutundwe, Kampala North, Queensway, Kawaala and Kapeeka Transmission Substations.



Source: JICA Expert Team based on Grid Development Plan 2018-2040 (GDevP)

Figure 15.4.1 Power System in Uganda



15-66

(3) Organisation Structure of Power Sector in Uganda

The structure of the power sector is shown in Figure 15.4.3. The Ministry of Energy and Mineral Development (MEMD) is the line ministry, and Electricity Regulatory Authority (ERA) is responsible for the overall regulation and supervision of the power sector. At present, generation, transmission and distribution services are managed by three governmental entities, Uganda Electricity Generation Company Ltd. (UEGCL), Uganda Electricity Transmission Company Ltd. (UETCL) and Uganda Electricity Distribution Company Ltd (UEDCL). A major hydroelectric company, ESKOM, concluded a concession agreement with UEGCL in 2002. The transmission sector manages facilities 66kV or above. Facilities are operated and maintained by UETCL.



Blue: governmental entities, white: private entities

Source: JICA Expert Team based on JICA, 2016, Final Report for Preparatory Survey on Greater Kampala Metropolitan Area Transmission Systems Improvement Project in the Republic of Uganda

Figure 15.4.3 Organisation Structure of the Power Sector in Uganda

As for distribution, Umeme Limited (UMEME), a private company, is responsible based on the concession agreement concluded between the Government of Uganda (mainly UEDCL) and UMEME in March 2005. The agreement is in effect until 2025, and extension of the concession period is under negotiation. UMEME is the concessionaire of the distribution network, and it covers 85% of Uganda's distribution network.

UMEME is licensed to distribute and supply electricity to customers, operating 33kV, 11kV and LV facilities. Under the power sector monitoring by Electricity Regulatory Authority (ERA), the mandate of UMEME, a private sector organisation, involves operation, maintenance, and upgrading of the distribution network.

To plan the distribution network, UMEME has formulated two planning periods: a middle-term plan and a long-term plan. The planning period of the middle-term plan is 3-5 years. Under this plan, UMEME also prepared the budget and proposed an upgrading facilities plan. The long-term plan is for the next 10 years. This plan is used to foresee the long-term trends of power demand growth, etc.

(4) Electrification in Uganda

MEMD is the ministry which supervises electricity related policies and activities. MEMD launched the Uganda's Sustainable Energy for All (SE4All) initiative action agenda in June 2015. This initiative aims to provide over 98% of the population with access to electricity by 2030. As of 2012, the rate of electrification access was 26.1%. To achieve the goal, the required number of people gaining new access to electricity per year is 670,000. However, the actual number is less than 100,000 per year. The rate of electricity access¹ reached 28% in 2019².

Figure 15.4.4 shows the map of electrification rate in Uganda. As for neighbouring areas to the Greater Kampala Metropolitan Area, the rate of population with electricity access in Butanbala is 83%, Luwero is 75%, and Buikwe is 91%. The electricity access rate is 100% for all the districts named as Kampala, mainly comprised of KCC, Wakiso District and Mukono District. This means the distribution network has already been extended to nearby consumers in the Greater Kampala Metropolitan Area. However, it differs from the rate of actual connection to consumers, which is represented as connectivity rate.



Source: National Electrification Strategy for Uganda Draft Report (July 2020) Figure 15.4.4 Rate of Population with Electricity Access in Uganda (2020)

¹ Electricity access refers to the connectivity, i.e., the population being directly served by either grid-based electricity services or stand-alone systems (National Electrification Strategy for Uganda Draft Report (July 2020))

² Draft National Energy Policy (October 2019)

According to the Energy for Rural Transformation (ERT) baseline survey conducted based on the Uganda Population and Housing Census 2014, the national level grid access percentage is 24%. 64% of urban residences have access to the national grid, while only 8% of rural residences have that access. This baseline survey targets households, communities, etc. Referring to the result of the ERT baseline survey, the connectivity rate in Greater Kampala Metropolitan Area is less than 64%.

(5) Future Demand for Power in Uganda

According to discussions with the distribution company, the demand forecast in GKUGA is calculated by addition of two different forecasted values: 'load projection' and 'additional load.'

- Load projection: The distribution company records peak loads of incomers, feeders and transformers by SCADA. The distribution company forecasts future demand by applying annual growth rates to respective scenarios: low growth scenario, middle growth scenario, and high growth scenario. Normally, the distribution company applies 3% as the annual growth rate in GKMA.
- Additional load: UMEME obtains the information on any industrial and/or major commercial development. The information is obtained from external sources such as Uganda Investment Authority (UIA).

According to JICA Report (2015)³, the peak demand of UETCL substations located in GKMA in 2013 is 348MW. If the above growth rate is applied, the load projection in 2030 is approximately 600MW, and that in 2040 is approximately 800MW.

15.4.2 Issues on Power Supply Sector

(1) Transmission Substations (T/S) Forecast

The total capacity of transmission substation (T/S) of each district, as shown from Table 15.4.4 to Table 15.4.7, may not correspond to loads forecasted in each area. The total loads will be 800MW in 2040 as shown in 15.4.1(5) Future Demand for Power.

Kampala North Transmission Substation (T/S), Queensway T/S, Lugogo T/S, Mutundwe T/S and existing Kawaala T/S are main power supply sources to Kampala City.

Kawaala T/S currently has one 20MVA power transformer (132/11kV) unit and serves power mainly to Kawempe Division. Kawaala T/S will be upgraded and shall have four transformers (One unit of 20MVA 132/11kV transformer and three units of 40MVA 132/33kV transformer), reaching 140MVA substation capacity in total.

Due to a delay in the project, Luzira T/S has not yet been commissioned. This substation is expected to supply power to the southern part of Nakawa Division (Luzira and surrounding area).

New construction of Gaba T/S is planned in 2026. This substation is expected to supply power to the southern part of Makindye-Ssabagabo and neighbouring areas. These areas are economically important areas since infrastructure such as a water treatment plant and resort hotels exist there. Also, the population growth around this substation is remarkable. In addition, as shown in Figure 15.4.2, Gaba T/S is planned to be interconnected to Luzira T/S by a 132kV transmission line. This will increase the power supply reliability to Namanve South T/S.

Table 15.4.4 shows the transmission substations in KCC.

³ Preparatory survey report on the Project for Improvement of Queensway Substation in the Republic of Uganda (January 2015, JICA)

									Unit: MVA
Substation	Division	Ratio (kV)	2020	2021	2022	2023	2024	2025	2026
Luzira	Nakawa	132/33	40	40	40	40	40	40	40
		132/33	40	40	40	40	40	40	40
		132/33	40	40	40	40	40	40	40
Mutundwe	Rubaga	132/33	40	40	60	60	60	60	60
	_	132/33	40	40	60	60	60	60	60
		132/11	20	20	60	60	60	60	60
		132/11	20	20	60	60	60	60	60
Queensway	Kampala	132/33	40	40	40	40	40	40	40
Cent	Central	132/33	40	40	40	40	40	40	40
		132/33	40	40	40	40	40	40	40
Lugogo	Kampala	132/11	40	40	60	60	60	60	60
00	Central	132/33	40	40	60	60	60	60	60
		132/33	40	40	60	60	60	60	60
		132/11	40	40	60	60	60	60	60
Kampala	Kawempe	132/33	40	40	40	40	40	40	40
North		132/11	40	40	40	40	40	40	40
		132/11	40	40	40	40	40	40	40
		132/33	40	40	40	40	40	40	40
Kawaala	Rubaga	132/11	20	20	20	20	20	20	20
		132/33					40	40	40
		132/33					40	40	40
		132/33					40	40	40
Gaba	Makindye	132/33						40	40
		220/132/33							60
		220/132/33							60
	TOTAL		700	700	900	900	1,020	1,060	1,180

Table 15.4.4 Transmission Substations in Kampala City

Source: GdevP

Table 15.4.5 shows substations located in Wakiso District. Namanve Substation and Namanve South Substation are located in Kira Municipality where development in industrial areas is progressing. Entebbe Substation is expected to supply power to Entebbe Municipality and Busiro South constituency.

									Unit: MVA
Substation	Division	Ratio (kV)	2020	2021	2022	2023	2024	2025	2026
Namanve	Kira	132/33	40	40	40	40	40	40	40
	Municipality	132/33	40	40	40	40	40	40	40
		132/33	40	40	40	40	40	40	40
Namanve	Kira	132/33	63	63	63	63	63	63	63
South Municip	Municipality	132/33	63	63	63	63	63	63	63
		132/33	63	63	63	63	63	63	63
Entebbe	Entebbe	132/33		80	80	80	80	80	80
	Municipality	132/33		80	80	80	80	80	80
Kawanda ^{*1}	Nansana	132/33	20	20	20	20	20	20	20
		132/33	40	40	40	40	40	40	40
Kapeeka	Nansana	132/33	20	20	20	20	20	20	20
	TOTAL		389	549	549	549	549	549	549

Table 15.4.5	Transmission	Substation	Capacities	in Wakiso	District
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Note *1: Transmission transformers (220/132kV, 400/220kV) are omitted from the table. Source: GdevP

Table 15.4.6 shows a substation located in Mukono District. Mukono Substation covers Mbalala and surrounding areas. At present, this area has two factories for manufacturing mattress/steel and paper. This area also has potential to develop as an industrial area.

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									Unit: MVA
Substation	Division	Ratio (kV)	2020	2021	2022	2023	2024	2025	2026
Mukono	Mukono	132/33	63	63	63	63	63	63	63
		132/33	63	63	63	63	63	63	63
		132/33	63	63	63	63	63	63	63
	TOTAL		189	189	189	189	189	189	189

Table 15.4.6	Distribution	Substations i	in Mukono	District
		• • • • • • • • • • • • • • • • • • • •		

Source: GDevP

Table 15.4.7 shows a substation located in Mpigi District. Buloba Substation, which will be located around the boundary of Mpigi District and Wakiso District along Masaka Road, is expected to be completed in 2024. According to the JICA Report (2016)⁴, three 33kV feeders will be extended toward Mityana, Sentema and Masaka. Buloba Substation is expected to supply electricity to Busiro North, Busiro East and Mpigi constituencies.

								U	nıt: MVA
Substation	Division	Ratio (kV)	2020	2021	2022	2023	2024	2025	2026
Buloba *1	Mawokota North	132/33					40	40	40
		132/33					40	40	40
TOTAL				0	0	0	80	80	80

Table 15.4.7 Distribution Substations in Mpigi District

Note *1: Transmission transformers (220/132kV, 400/220kV) are omitted from the table. Source: JICA Expert Team based on GDevP and latest information

(2) Present Distribution Substations

Present distribution substations may not correspond to the loads forecasted in each area. This is the reason why the priority projects described in Section 15.4.6 have been selected.

A distribution substation (D/S), which is also called a 'zone substation,' functions by stepping down the electricity from 33kV to 11kV in the distribution network. Distribution substations are operated and maintained by the distribution company. Table 15.4.8 to Table 15.4.10 list the distribution substations locating in Kampala City, Wakiso District and Mukono District. The total capacity is 455MVA. Distribution substations are not located in Mpigi District at present.

Substation	Division	Ratio (kV)	Rated Capacity (MVA)	Maximum Capacity (MVA)	Year of Implementation
Waligo	Kawampa	33/11	10/14	14	2016
vvaligo	Nawempe	33/11	10/14	14	2016
Nakawa	Nakawa	33/11	15/20	20	2021
Ntindo	Nakawa	33/11	10/14	14	1990
INUITUA	INAKAWA	33/11	10/14	14	2015
Port bell	Nakawa	33/11	10/14	14	2015
	INAKAWA	33/11	5	5	1990
Vitanta	Kampala	33/11	10/14	14	2006
Ritante	Central	33/11	10/14	14	2006
Queensway Old	Kampala	33/11	15/20	20	1992
	Central	33/11	15/20	20	1992
	Kampala	33/11	15/20	20	2013
Queensway New	Central	33/11	15/20	20	2013
Kampala South	Rubaga	33/11	15/20	20	2011
Kisugu	Makindye	33/11	10/14	14	2006
Gaba	Makindyo	33/11	10/14	14	2006
Gaua	I INIAKI I UYE	33/11	10/14	14	2006
	TOTAL	•		265	

Table 15.4.8 Existing Distribution Substations in Kampala City

Source: JICA Expert Team

⁴ Final Report for Preparatory Survey on Greater Kampala Metropolitan Area Transmission Systems Improvement Project in the Republic of Uganda (Sep. 2016)

Substation	Division	Ratio (kV)	Rated Capacity (MVA)	Maximum Capacity (MVA)	Year of Implementation
Kowanda Umama	Nanaana	33/11	10/14	14	2006
Kawanua Umeme	Nansana	33/11	5	5	1972
NI	1/ine	33/11	10/14	14	2015
Namugongo	nia	33/11	10/14	14	2015
Kireka	King	33/11	10/14	14	2008
	inina inina	33/11	10/14	14	2008
Kajjansi	Makindye-Ssabagabo	33/11	5/7	7	1995
Lubawa	Makindua Caabaraha	33/11	10/14	14	2012
Lubowa	Makindye-Ssabagabo	33/11	10/14	14	2012
Kakiri	Busiro South	33/11	10/14	14	2021
Kisubi	Entebbe	33/11	5	5	1990
Entable -	Fatable	33/11	10/14	14	2005
Entebbe	Enteppe	33/11	10/14	14	2005
	TOTAL		•	157	

Table 15.4.9 Ex	cisting Distribution	Substations i	in Wakiso	District
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Source: JICA Expert Team

Substation	Division	Ratio (kV)	Rated Capacity (MVA)	Maximum Capacity (MVA)	Year of Implementation
Nakifuma	Nakifuma	33/11	5	5	2017
Mukono	Mukono	33/11	10/14	14	2015
		33/11	10/14	14	2012
TOTAL				33	

Source: JICA Expert Team

15.4.3 Objectives for Power Supply Sector

The objectives for the Power Supply Sector area are as follows:

- To improve the overall reliability of power supply in GKUGA including KCC
- To expand the areas of power supply in response to future urbanised areas, especially urban centre areas in GKUGA
- To rehabilitate or upgrade the power supply facilities within KCC and its immediate surrounding areas.

15.4.4 Strategies for Power Supply Sector

To improve the reliability of the power supply while satisfying the increasing demand for power supply not only due to urban development within GKUGA outside KCC, but also due to industrial development within GKUGA outside KCC, especially along the JKM Corridor, the following strategies are necessary.

(1) Strengthening of Distribution Network by Upgrading 11kV Facilities to 33kV Facilities

The distribution network applies 33kV and 11kV as Medium Voltage (MV) facilities. MV is used for power distribution (supply) to distribution transformers (33kV/LV or 11kV/LV). 11kVequipment are advantageous in respect of initial installation (equipment) cost, safety and required design criteria such as clearance. 33kV facilities are advantageous in respect of less line loss.

For the criteria of MV class selection, the distribution company sets the reference values of various loads and the corresponding preferred supply voltage as Table 15.4.11 shows. For distribution (MV) lines with loads more than 5MW, it is considered that the application of 33kV is preferable.

		D
Connected load	Supply voltage	Remarks
≤ 1.5kW	1-phase, 240V	Residential low tension (LT)
$2kW \le 50kW$	3-phase, 415V	Secondary distribution LT supply
50kW ≤ 500kW	3-phase, 11/33kV	From dedicated distribution system
500kW ≤ 3MW	3-phase, 11/33kV	From 11/33kV line with an high tension (HT) metering unit
3MW ≤ 5MW	3-phase, 11/33kV	From dedicated loop in loop out 11/33kV line with an HT metering unit
5MW ≤	3-phase, 33kV	From a substation

 Table 15.4.11
 Loads and Corresponding Distribution Supply Characteristics

Source: Prepared based on P.131, Asset Management Plan (2019) (AMP)

In GKMA, major 11kV facilities have been installed based on the design criteria of 33kV facilities. 11kV distribution lines are predominant as feeders. However, as the load increases in the future, these 11kV facilities are expected to be upgraded to 33kV facilities.

(2) Introduction of 15/20MVA Transformer Capacity per Unit for Distribution Substation (Zone Substation)

The distribution company standardises the transformer capacity as 5MVA, 10/14MVA and 15/20MVA (P.54, AMP). According to Table 15.4.4 through Table 15.4.7, the total capacity of transmission substations will be 1,998MVA by 2026, whilst the total capacity of distribution substations at present is 455MVA as the total values of Table 15.4.8 through Table 15.4.10 show. The gap between these substation capacities remains large.

In the master plan study, for the purpose of securing the sufficient 11kV power sources for distribution, the application of 15/20MVA transformers is recommended for newly constructed distribution substations to catch up with the total substation capacity of transmission substations.

(3) Establishment of Two Circuits of Incomers (Interconnection Lines) Connecting to Distribution Substations

AMP (P.124) states that all distribution substations (zone substations) with a load greater than 10MVA have two supply transformers and two incoming 33kV circuits. Under N-1 criteria, even if a fault on either one circuit of a distribution line or one unit of power transformer occurs, the power supply is expected to be maintained or the power outage period will be remarkably minimised.

All the distribution substations in GKUGA will consider this criterion.

(4) Limited Introduction of Underground Cables

Application of overhead line conductors is advantageous with respect to initial cost and maintenance. Also, when a fault occurs, as fault detection on overhead lines is less difficult than underground cables, the time required to repair an overhead line conductor is expected to be greatly shortened compared to that of underground cables. Finally, the installation cost of overhead lines is lower than that of underground cables.

Moreover, the distribution company finds the least cost approach is valuable for distribution network development. For construction of new distribution networks, the application of overhead line conductors will be prioritized, especially for the outskirts of Kampala City.

Under special conditions, the use of underground cables will be considered. Such conditions may include line extension at congested (densely populated) areas, limitation of traffic conditions (i.e., entrance of car parks, road crossings, etc.) and line connections to distribution substations. Figure 15.4.5 shows an example of cable use. This 33kV cable is connected from the overhead line to the Nakawa D/S premises.



Source: JICA Expert Team

Figure 15.4.5 33kV Underground Cable Application to Nakawa D/S

(5) Improvement of the Reliability of the Distribution Network by Securing Two Circuits of Two Different Substations

Figure 15.4.6 shows a typically applied distribution network. Two circuits of 11kV lines are arranged from two different substations. The two circuits are isolated by line switch on this 11kV feeder. Using this alignment, these two circuits are in a form of radial arrangement.

This arrangement is expected to shorten the power outage period in case of fault occurrence in the line by switching this line switch. This arrangement secures relatively high reliability of power supply. Thus, it is mainly applied in GKMA.



Source: Prepared by JICA Expert Team

Figure 15.4.6 Main Line Standby Power Supply System applied in GKMA

(6) Power Supply to Large Customers (Industrial Area)

The distribution company defines customers with a maximum demand greater than 1MVA as large customers.

The following equipment will be required to deliver power to such large customers:

- SF6 or vacuum circuit breakers for the incoming lines sufficient for the fault levels
- Ring type connections (line in line out)

(7) Power Supply to Important Infrastructures

For power supply to important infrastructures, two or more power supply sources should be secured.

In the case of Gaba Water Treatment Plant, power supply to Gaba D/S, which supplies power to the plant, is secured mainly by two 33kV lines: one is from Lugogo T/S and the other is Port bell D/S. The power supply to Port Bell D/S is physically connected to Namanve T/S via Kireka D/S. This means that the power supply to Gaba D/S from two different T/S is established.

In addition to the above two 33kV lines, an 11kV feeder from Queensway D/S (Queensway T/S) is also connected to Gaba D/S as indicated in Figure 15.4.7.

The above shows Gaba Water Treatment Plant receives power from three different transmission substations to secure high redundancy. For important infrastructures, more than two distribution lines from different transmission substations are recommended.



Note: Green line: 33kV line, red line: 11kV line Source: JICA Expert team

Figure 15.4.7 11kV Feeder and 33kV Trunk Lines to Gaba D/S

(8) Transmission Lines and Transmission Substations to Strengthen the Reliability of Power Supply in GKGUA

To prepare for the future population growth and economic development, transmission substations and transmission lines to strengthen not only the capacity but also to strengthen the reliability of power supply to GKUGA is necessary. To increase the reliability of power supply, the redundancy in the transmission network should be considered.

In Grid Development Plan 2018-2040, Mukono 220/132 kV Transmission Substation, Gaba 220/132 Transmission Substation and Buloba 220/132 kV Transmission Substation along with new 220 kV transmission lines are proposed.

15.4.5 Development Plan for Providing New Distribution Substations in GKUGA

The Asset Management Plan (2019) (AMP) prepared by the distribution company states the locations of new distribution substations. Also, the distribution company has a list of planned distribution substations. However, the information and the list provided do not specify any capacities of transformers. Considering the strategies stated in (1) to (7) above, the JICA Expert Team prepared lists of planned development (by 2040) of distribution substations as shown in Table 15.4.12 to Table 15.4.15.

Substation	Division	Ratio (kV)	Rated capacity (MVA)	Maximum capacity (MVA)	Remark
Kawamna	17	33/11	15/20	20	*1
Kawempe	Kawempe	33/11	15/20	20	
Nakawa	Nakawa	33/11	15/20	20	Upgrade
Dugalahi	Nekowa	33/11	15/20	20	*1
Bugolobi	INAKAWA	33/11	15/20	20	
Cir Apollo Kogguo	Kompole Control	33/11	15/20	20	*1
Sii Apolio Kaggwa	Kampala Central	33/11	15/20	20	
Nakasero- Rwenzori	Kampala Central	33/11	15/20	20	*1
		33/11	15/20	20	
Kampala South	Rubaga	33/11	15/20	20	Upgrade
Lunguija	Rubaga	33/11	15/20	20	*2
Lungujja		33/11	15/20	20	
Ndaaha	Rubaga	33/11	15/20	20	*1
INDEEDA		33/11	15/20	20	
Kisugu	Makindye	33/11	10/14	14	Upgrade
Nsambya/	Makindua	33/11	15/20	20	*1
Kansanga	INIAKINDye	33/11	15/20	20	
	Makindua	33/11	15/20	20	*2
	Iviakindye	33/11	15/20	20	
	Total	374			

Table 15.4.12 Planned Zone Substations (33/11kV) in Kampala Capital City

Note *1: Transformer capacity is proposed by the distribution company.

*2: Transformer capacity is proposed by the consultant.

Source: JICA Expert Team

Substation	Division	Ratio (kV)	Rated capacity (MVA)	Maximum capacity (MVA)	Remark
Magigye	Kvadondo East	33/11	10/14	14	*1
Magigye	Ryauonuo Easi	33/11	10/14	14	
Nontohulinwo	Kiro	33/11	15/20	20	*1
INAITIADUIIIWA	INI a	33/11	15/20	20	
Kajianaj	Makindua Saabagaba	33/11	15/20	20	Upgrade
rajjansi	Makindye-Ssabagabo	33/11	15/20	20	
Kino	Makindye-Ssabagabo	33/11	15/20	20	*1
rigo		33/11	15/20	20	
Kakiri	Busiro South	33/11	10/14	14	Upgrade
Sida	Busiro South	33/11	15/20	20	*1
Siua		33/11	15/20	20	
Kisubi	Entebbe	33/11	5	5	Upgrade
Pwohojia	Entebbe	33/11	15/20	20	*1
bwebajja		33/11	15/20	20	
Nakasamba	Entobho	33/11	15/20	20	*1
		33/11	15/20	20	

Note *1: Transformer capacity is proposed by the distribution company.

*2: Transformer capacity is proposed by the consultant.

Source: JICA Expert Team

Table 15.4.14 Planned Zone Substations (33/11kV) in Mukono District

Substation	Division	Ratio (kV)	Rated capacity (MVA)	Maximum capacity (MVA)	Remark
MUKONO DISTRIC	T				
Nakifuma Nakifuma		33/11	15/20	20	Upgrade from 5MVA to 20MVA. Addition of one unit.
	Nakifuma 33/1 ⁻	33/11	15/20	20	
Mukana	Mukopo	33/11	15/20	20	Upgrade from
IVIUKOITO	IVIUKUIIU	33/11	15/20	20	14MVA to 20MVA
Total			80		

Source: JICA Expert Team

Table 15.4.15 Planned Zone Substations (33/11kV) in Mpigi District

Substation	Division	Ratio (kV)	Rated capacity (MVA)	Maximum capacity (MVA)	Remark
Mpigi	Mpigi —	33/11	15/20	20	*1
		33/11	15/20	20	1
Total			40		

Note *1: Transformer capacity is proposed by the consultant based on the strategy. Source: JICA Expert Team

15.4.6 Priority Projects for Power Supply Sector

The proposed priority projects for GKUGA are listed below.

- [PS-01] Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namnve Secondary Urban Centre and Mukono Metropolitan Centre of GKUGA)
- [PS-02] Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of GKUGA)
- [PS-03] Construction of Nakasamba D/S and Connected 33kV Incomers (for Entebbe-Katabi Secondary Urban Centre of GKUGA)

- [PS-04] Construction of Bwebajja D/S and Connected 33kV Incomers for Bwebajja Area (for Kajjansi Metropolitan Centre of GKUGA)
- [PS-05] Construction of Kigo D/S and Connected 33kV Incomers (for Kajjansi Metropolitan Centre of GKUGA)
- [PS-06] Upgrading of Kakiri D/S and New Construction of 33kV Incomer from Kawaala T/S to Kakiri D/S (in Northwest Area of GKUGA)
- [PS-07] Load Shifting from Kampala North T/S & Muutndwe T/S to Upgraded Kawaala T/S (in Central Area of GKUGA)

15.5 Information and Communication Technology (ICT)

15.5.1 Background of ICT Sector

(1) National Infrastructure

Uganda is connected by land cable through 10 different cross-border connections which are connected to the national backbone infrastructure of the country. The map of international internet cable connections are shown in Figure 15.5.1 as red coloured arrow.



Figure 15.5.1 Map of NBI Showing Existing Cross Border Connection Points

NITA-U is setting the National Data Backbone Infrastructure (NBI) across the country and has a plan of setting more than 3,500 kilometre of fibre optics cable. Phase wise plan is shown in Table 15.5.1 and the completed status is showing in Figure 15.5.2. Phase I, II and III of the NBI have been successfully implemented. With 2400kms of fibre laid out and 414 MDA/LG Government sites connected to the NBI.

Phase	Optical Fibre Connections (OFC)
Phase 1	168 km
Phase 2	1,400 km
Phase 3	756 km of
Phase 4	842 km of
Last Mile RCIP (Regional Communications Infrastructure Program)	350 km of
Total	3,516 km

Table 15.5.1	Phasing of NBI	set up Across	Uganda
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Source: NITA-U



Figure 15.5.2 Map of Current Status of the National Backbone Infrastructure



Source: NITA-U

Figure 15.5.3 Existing and Future Plans of the National Backbone Infrastructure in Uganda

(2) Present Status of the ICT Facilities and Users

1) Bandwidth Capacity of NBI

The capacity of the NBI is 100Gbps and the Government has so far procured 10Gbps of internet bandwidth under an IRU. To date 640 Government entities connected to the National Back Bone Infrastructure (NBI) are utilizing Internet Bandwidth through the NBI at USD 70 per Mbps per month compared to FY2012-13 when Government entities would procure internet Bandwidth at USD 1200.

2) Optical Fibre Network

All the major mobile phone operators and broadband operators in Uganda had placed Optical Fibre in all over Kampala as shown in Figure 15.5.4.

Compared to Kampala, the area outside of KCC in GKMA is still not fully covered by these operators (Figure 15.5.5).

The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (GKMA-IUDMP) Final Report



Source: UCC







3) 3G and 4G Coverage

According to the Digital Development Data based on ITU (International Telecommunication Union), country's 74% area has already been covered by 3G and 40% by 4G mobile network. 3G mobile network has been under coverage in almost all over the study area as shown in Figure 15.5.6. However, areas outside Kampala are still far behind the 4G coverage (Figure 15.5.7).



Source: UCC





Figure 15.5.7 4G Coverage Area in GKMA

4) Users of Mobile Phone and Internet

The number of mobile phone subscription is increasing year by year gradually as shown in Table 15.5.2. According to UCC, there are more subscriptions in Kampala compared to the rest of the country. However, as the users feel free to move across the country and can purchase the connection from anywhere, the data of users in KCC, GKUGA, or GKMA is not available.

	2018	2019	2020	Jun-21
(a) Active Mobile Suscriptions (Millions)	24.5	26.7	27.8	29.1
(b) Mobile Internet Suscriptions (Millions)	14.3	17.1	21.4	22
(c) Share of Mobile Internet Users (%) [b/a]	58%	64%	77%	76%
(d) Fixed Internet Subscriptions	-	32307	34596	32889
(e) Internet Subscriptions Fixed & Mobile (Millions) [b+d]	14.3	17.2	21.4	22

Table 15.5.2	Users of Mobile Phone and Internet Across Ugand	la
	U	

Source: UCC

For Uganda there are total 29.1 million subscription of mobile sim card and out of these 22 million also use internet using their mobile phone. The number of fixed internet subscription using broadband optical fibre connection is 32,889 only which is not so high compared to the mobile internet users. Almost 60% of the population has a sim card as shown in Figure 15.5.8. However, it should be noted that many people use more than one sim card, so the actual share is a bit lower.



Note: Some people use more than one mobile connection which is difficult to differentiate Source: Population Data from https://data.worldbank.org; Mobile Subscription Data from UCC

Figure 15.5.8Share of Mobile Phone Subscription against the Total Population

5) No of Mobile Money Users

In Uganda mobile money transaction is quite popular. Especially as many of the people are not covered under the traditional banking sector, people in rural area do prefer to use mobile money for easy, fast and reliable financial transaction. According to UBOS the number of registered mobile money users are 27 million as of 2019 which was almost 62% of the total population.



Figure 15.5.9 Cumulative Number of Registered Mobile Money Customers in Uganda

In 2019, the total mobile money transaction has reached up to 7300 billion UGX (5.2% of the country's current GDP), which was equivalent to about 2 billion USD.



Figure 15.5.10 Value of Transaction using Mobile Money 2009-2019

(3) Cost of Various ICT Sector Products

1) Mobile Phone Call Rate

Mobile phone call rate in Uganda is almost stable from 2017 to till today, which is 4 UGX/ second (240UGX/minute) for both on net and off net (Source: UCC).

2) Mobile Internet Cost

According to the report After-Access-The-State-of-ICT-in-Uganda, a large proportion (89%) of individuals with a maximum income of USD 100 per month, did not use the internet, while about 65 percent of those with a disposable income between USD 101 and USD 1,000 did not use the Internet in 2018. The cost of 1GB of data in Uganda was USD 4.18 (accounting for social media tax) in 2018. According to the website named Techjaja (https://techjaja.com/) the average cost of 1GB internet is 1.56USD in 2021. They also mentioned that, out of the 51 existing data plans, Uganda's cheapest 1GB, data package costs UGX 1,500 (USD 0.45) and can be as expensive as UGX 80,000 (USD 22.71).



Source: After-Access-The-State-of-ICT-in-Uganda (2019), Research ICT Africa

Figure 15.5.11 Cost of 1 GB internet in African Countries in 2018

3) Broadband Internet Cost

Latest broadband internet cost in Uganda is varying from UGX 260,000 (2MBPS)¹ to 650,000 (for 5MPS unlimited) now a days. However, as of Oct 2017, the cost for unlimited broadband internet was around UGX 300,000 with limited speed. As shown in Figure 15.5.12, Uganda stands in the middle of the African countries as the cost of the internet in this region seems expensive compared to the Asian countries.





¹ https://techpointmag.com/broadband-internet-in-uganda-what-providers-offer/

(4) ICT related Stakeholders in Government Sector

1) Overall

The key stakeholders of ICT sectors in National level are the Ministry of Information and Communications Technology, Uganda Communications Commission (UCC) and National Information Technology Authority Uganda (NITA-U). These are the organizations who are in charge of law preparation, policy preparation and promoting ICT related initiatives to the government and non-government sectors.

Uganda Institute of Information and Communications Technology (UICT) founded in 2000 is the only government institution specialising in skills-based middle-level ICT training. It offers practical-oriented ICT training at certificate and diploma levels as an alternative to the theoretically-grounded degrees offered by universities and other tertiary institutions in this same professional area. Apart from these, Research and Education Network for Uganda (RENU) is a not-for-profit National Research and Education Network established in 2006.

In the local government level, KCCA already incorporated an ICT Department in its organisational structure. The ICT Department headed by a Deputy Director who reports to the Deputy Executive Director of Executive Director's Office. The mandate of the ICT Department is to plan the development, implementation and support of all ICT systems and infrastructure of KCCA. Other local authorities, such as Wakiso District, Mukono District, Mpigi District, Entebbe Municipality do not have a separate department for ICT or smart city initiatives. However, they do have an IT officer posted under the Administrative Department.

2) KCCA's Initiative towards Smart City

In GKMA, KCCA is the main local government who is taking some initiatives towards Smart City. Some of its initiatives towards Smart City are described in this part.

- Parish Development Model: According to the Executive Director of KCCA, the new strategy of the Parish Development Model (PDM) is emphasising the agricultural value chain, and everybody needs a gazetted workplace and a licence. As city administrators, it is incumbent upon us to organise all our people to benefit from government programmes. KCCA has set up the Parish Development Committees, completed the enterprise identification and formation of SACCOS, and had the ministerial sensitisation drive to inform people about PDM.
- Decongestion and Organisation: KCCA is taking initiatives to make the city road clear and traffic signals are installed. KCCA team has removed illegal structures and relocated street vendors, creating organised and dignified spaces for trade. The process of organising and having the bodaboda sector regulated is ongoing,
- Economic Empowerment: KCCA has prioritised skilling programmes for the youth and women, offering training in fields such as carpentry, tailoring, and hairdressing, hence fostering entrepreneurship. According to the ED, good numbers of smart young people are now part of the city's workforce, cleaning drainages and sweeping streets.
- Markets: KCCA is also taking initiatives to improve the trading environment and in addition to current 16 markets is working with the central government to open additional trading spaces in all five divisions. The focus on creating working spaces for vendors, for example the Smart City Bazaar in Kisenyi and the vendor's market in Kalerwe, aligns with the country's vision of supporting grassroots businesses. It is understood that, the Smart City Bazaar market in Kisenyi has over 1,000 former street vendors currently operating therein, while Kalerwe Market boasts several hundreds.
- Illumination: Kampala's road network, suffered from a lack of adequate lighting, with only

8% of roads having streetlights. KCCA recognised this challenge and embarked on the Kampala Street Lighting Masterplan project. KCCA sought additional funding from sources such as the French Development Agency and the European Union to install 20,000 lights. These lights will be strategically placed in areas lacking illumination, including asphalt carriageways, pedestrian crossing points, roadside markets and informal settlements.

• Technology: KCCA has launched the Smart Permit online system, through which property developers can submit and get their building plans approved online. One can transact from the comfort of their home. Other services online are Smart Permit, Weyonje, building permits, CAMV, house numbering and travel info, among others.

3) Kampala in Africa Smart Towns Network (ASToN)

ASToN is a flagship programme financed by the French Development Agency (AFD), managed by the French National Urban Renovation Agency (ANRU) and inspired by URBACT² knowledge and tools. ASToN is a network of 12 African cities using digital tools to overcome local and global challenges. The idea is that by creating a cohort of cities and collaborating in this way, ASToN cities can become leading digital actors, faster, and in a way which is appropriate and sustainable for each city's local context.

Kampala City edged 12 African Cities to claim a lead city role in the ASToN. It was selected as the lead city among the 12 African cities in the ASToN. Each of the cities has its own theme and Kampala chose mobility as its theme.



Source: ASToN, 2021, https://aston-network.org/cities/



² URBACT is a European exchange and learning programme promoting sustainable urban development. For 17 years, URBACT has worked with more than 1000 cities in Europe building city-to-city cooperation networks.

(5) Opportunities of ICT Study in the Universities

1) Makerere University

Makerere University embarked on an ambitious project, with the support of external partners, to integrate information and communication technology (ICT) in all its functions as one of the critical elements of its strategic plan. Within the context of this plan, the vision of ICT is "University wide access to, and utilisation of Information and communication Technology to enhance the position of Makerere University as a centre of academic excellence and its contribution to the sustainable development of society."

2) Ugandan Technology and Management University (UTAMU)

Ugandan Technology and Management University (UTAMU) is a private university that was established by the National Council for Higher Education in March 2013, in accordance with the laws of Uganda. UTAMU is accredited to run academic programmes at all levels of the Higher education system. UTAMU consists of several schools including a School of Computing & Engineering. The school has the mission to provide quality education through relevant academic programmes and research in computing and engineering disciplines for economic and human development.

(6) Initiative for New ICT Hub in Entebbe

Uganda Investment Authority (UIA) is going to establish a Business Process Outsourcing (BPO) Park in Lunyo, Entebbe. The ICT hub is going to be situated on an 18-acre piece of land which is expected to employ about 20,000 people directly with more than 40,000 others employed indirectly. The project has been proposed to be developed under Public Private Partnership (PPP) mode and NITA-U is the authority from Ugandan Government.



Source: https://www.mitconindia.com/development-of-ict-parks-at-entebbe-by-government-of-uganda/Figure Figure 15.5.14 Skeleton Diagram of Planned ICT Parks in Entebbe

(7) Private Sector in ICT Sector

In Uganda there are some start-up initiatives who are trying to prove their capabilities.

One of the companies called 'Buzen Technologies Co., Ltd' who describes themselves as a Uganda based International Technology Company specialising in IT-related services, products and solutions. The company designs and develops quality mobile applications for the android, iOS and windows platforms, in addition to static websites to dynamic websites. According to the IT engineers who started the company, still people in Uganda do not rely on the IT engineers of

Uganda. As a result, many of the customers want to pay more to an international company, rather than procure this from a local IT firm.



Mobile Applications developed by Buzen View of the Workstations at Buzen Technologies

Figure 15.5.15 Initiatives of a Start-up IT Company in Uganda

15.5.2 Issues on ICT Sector

Major issues for ICT sectors in Uganda and GKUGA are identified and described in this section.

(1) Insufficient Infrastructure

To develop an ICT oriented society, one of the prerequisites is to have sufficient ICT infrastructure. It is understood that even if all the organizations are working hard, the ICT infrastructure is still not sufficient in GKUGA. In particular, a good share of the areas outside of Kampala City are not covered by fibreoptics. In addition to the lack of ICT infrastructure, a shortage of electricity supply also affects the service.

(2) High Cost of Internet and ICT Equipment

Like many countries in Africa, the cost of internet in Uganda is still quite high and is not affordable by most of the residents in GKUGA. According to all the stakeholders, the ICT equipment is also costly as most equipment is imported from abroad and is not exempt from tax.

(3) Insufficient ICT Budget

Out of all the districts and municipalities in the GKMA area, except for KCCA, all the districts and municipalities do not have sufficient budget to expand their ICT infrastructure.

(4) Shortage of ICT Manpower

Except for KCCA, all the districts and municipalities have only one ICT officer, who is in charge of all the ICT related matters, including computer set up, LAN connection, ICT procurement, etc. in the office. As ICT is not practised well in Uganda, one ICT officer is not sufficient to deliver the service to the residents.

(5) Lack of Understanding to Recognise the Importance of ICT Sector

Some of the public officials in the public offices and even most of the residents still do not recognise the importance of the ICT sector.

(6) Lack of Confidence in Ugandan IT Engineers' Ability

Most of the people in Uganda do not have enough confidence in the ability of the Ugandan IT Engineers. The private sector also relies on IT engineers from abroad and are ready to pay a higher amount for the same quality work in Uganda.

(7) Lack of Coordination between the Government Agencies

Even if the government agencies are working their best at each level, coordination and information sharing is lacking.

15.5.3 Objectives for ICT Sector

The objectives of the ICT sector in GKUGA are set as:

- To build strong ICT infrastructure at lower administrative levels
- To provide affordable internet and ICT Equipment to stimulate ICT use
- To increase the ICT budget for the LGs to build a strong, knowledgeable productive local government
- To reform institutional setup and to recruit more ICT Manpower in LGs to improve local government service delivery
- To sensitise the citizens and provide proper training for the public officials
- To enhance ICT industries by supporting incubation of start-up companies and coordination with universities
- To improve information sharing between different stakeholders

15.5.4 Strategies for ICT Sector

To achieve the objectives mentioned above, the strategies considered for ICT sector are as follows:

- Infrastructure Development: Expanding ICT Infrastructure (network connectivity, system security, etc.) up to the local level to provide access to the internet
- Tax Exemption for the ICT Products: Exemption of tax for the ICT products to encourage start-up ICT firms and to make ICT products affordable to the citizens
- Support Growth of ICT Sectors: Supporting the growth of ICT sectors by establishing an ICT industrial park and introducing financial assistance/ incentives for start-up companies
- Institutional Development: Strengthening the Institutions (such as, reforming/ restructuring the institutions by introducing ICT departments and recruit skilled ICT Manpower in each LG and allocate a proper budget) for districts and municipalities, especially for those that are still lacking proper infrastructure outside KCC
- Capacity Development of the Public Staff: Enhancing the capacity of the LG staff (in-house training) for use and support of ICT services to the citizens
- Easy Access for the Citizens: Supporting for inclusion and accessibility to public services through digital technology to sensitise the citizens
- Cooperation between the Government Agencies: Developing collaborative activities within the government agencies to realise quality ICT services for the citizens

15.5.5 Priority Projects for ICT Sector

The proposed priority projects for GKUGA are described below. The organisations in charge for the proposed priority projects and costs are listed in a priority project list compiled in Chapter 16.

(1) [IT-01] Expansion of Wi-Fi Hotspots

At present, there are some Wi-Fi hotspots in public spaces; however, they are not sufficient to provide free internet to most of the citizens. Therefore, it is necessary to set up more Wi-Fi hotspots in public spaces and on public transport to improve people's access to the internet.

(2) [IT-02] Smartphone Application for Easy Access of Citizens' Service

Development of a mobile application as a one-stop centre, which citizens can access and use the necessary services linked to the application.

(3) [IT-03] Smartphone Application for Problem Reporting by the Citizens

Development of a mobile application for a participatory problem identification system (such as road problems, service interruption, etc.) to improve the services.

(4) [IT-04] Cashless Payment for Public Transport

Introduction of cashless payments for public transport and expansion to other services (such as road pricing in the city centre, parking payment, etc.) in the future to realise a sustainable public transport system in the long run. The process will also ensure the smooth operation of public transportation and will provide base data for service improvement.

(5) [IT-05] Local Government Revenue Monitoring System

Local government authorities in GKUGA area are collecting revenue from the citizens and in some cases (such as in Kampala), this can be paid using a mobile application. In addition, if a real-time revenue collection monitoring (integrated with cashless payment) system can be developed, the local government can plan the revenue collection monitoring system more accordingly.

(6) [IT-06] Establishment of Start-up Support Centre

As ICT is underdeveloped in Uganda and there are many potential IT engineers who are struggling without proper support, the establishment of a start-up Support Centre is proposed. Facilities such as low-cost office space, free high-speed internet, shared meeting facilities, etc. could be provided.

(7) [IT-07] Strengthening Online Learning Platform

At present, there is an initiative by NITA-U to develop an online learning platform. To strengthen the platform, online education curriculum development for students is proposed.

(8) [IT-08] Establishment of a Resource Centre

A resource centre can be established where young people, especially school children, could be given exposure to research and knowledge of different countries. Use of the internet from a much earlier age could create a high sense of curiosity and passion for sciences, which is necessary for innovation and problem solving, skills which Uganda and Africa as a continent need urgently.

(9) [IT-09] Establishment of Mini/Cottage ICT industry:

Some of the ICT products are in high demand, yet the cost of production as well as the knowledge and skills needed to produce them locally is tenable. These include: laptop batteries, screens, power adaptors, etc. With the right knowledge, training and guidance, these can be assembled in the mini/cottage ICT industry.

15.6 Solid Waste Management

15.6.1 Background of Solid Waste Management Sector

In order to establish proper waste management, the Kampala Physical Development Plan, KPDP, recommends that KCCA and surrounding local governments cooperate and take a wide-area approach as GKUGA. This can be evaluated in terms of reduction of waste disposal costs due to the economy of scale, improvement of resilience of urban functions by joint utilisation of multiple disposal sites, and improvement of waste management capacity through collaboration between local governments.

On the other hand, in such an approach, problems often arise regarding where to construct the waste facility. In particular, it is difficult to form an agreement among the parties concerned on the location of a landfill disposal site. Since final disposal is the basis of proper waste management, delays in the development of a final disposal site affect overall waste management.

KPDP proposes the following projects.

- Integrated Waste Management System Study
- New Landfills and Treatment Plants (Stage I III)
- Kiteezi Rehabilitation Plan
- Kiteezi Rehabilitation
- Waste Vehicle Fleet for KCCA
- Waste Vehicle Fleet for Kampala Metropolitan Towns and Counties (KMTC)
- Waste Handling Infrastructure for KCCA
- Waste Handling Infrastructure for KMTC

Of the above eight projects, only "2. New Landfills and Treatment Plants (Stage I – III)" is in progress. KPDP does not specifically mention the number or location of disposal sites and treatment facilities, but the Ddundu Project seems to follow this proposal. As for Kiteezi, no concrete work such as a closure plan has been started because there is no schedule for moving to a new disposal site. Originally, it was intended that "1. Integrated Waste Management System Study" would formulate a future plan for waste management for the entire GKUGA, and other projects would be consistently developed under the plan. However, no such plan has been developed. In other words, although progress has been made for KCCA, the wide-area approach for GKUGA, which KPDF/KPDP has set as an issue, remains unclear.

KPDP mentioned that a wide-area approach, such as that for GKUGA, is necessary because there is a growing need for waste management due to the rapid progress of urbanisation beyond the boundaries of KCC. Although there has been no major change in the amount of waste collected in KCC¹, the increasing need for waste collection has been raised as an issue in the surrounding local governments².

15.6.2 Issues on Solid Waste Management in GKUGA

Based on the analysis of the current situation 10 years after the creation of KPDF/KPDP, the issues that are foreseen for the future are explained below.

(1) Concerns about Deterioration of Sanitary Environment

In recent years, the population of GKUGA has been increasing at a rate higher than the national average, and this trend is expected to continue in the future. A remarkable increase is expected in the municipalities adjacent to KCC, where provision of waste collection service has recently started. Therefore, the local governments and the private waste collectors have not fully established their capability to properly provide waste collection service like KCCA. For final disposal, many local governments rely on the KCCA Kiteezi disposal site but do not pay the

¹ Source: Kampala City Statistical Abstract, 2019, p. 76

² Source: Interview Survey by JICA Expert Team in December 2021

disposal fee. In this way, if the amount of waste increases rapidly in the surrounding municipalities, there is a concern that uncollected waste may cause environmental and human health damage.

The increase in the amount of waste is caused not only by the increase in population, but also by the increase in the amount of waste generated per capita due to economic development. Taking into account existing information such as the amount of waste disposed of in Kiteezi, the population, and the percentage of households that dispose of waste properly $(88\%)^3$, in this report, amounts of waste generated per person are assumed as follows: 0.85 kg / person / day for KCC and 0.33 kg / person / day for other local governments. In addition, it is presumed that the rate of increase associated with economic growth was set at 1% per year for KCC and 3% per year for others. Under this assumption, the estimated amount of waste generated is shown in the table below.

Area	Unit	2020	2030	2040	2050
Kampala	kg/person/day	0.850	0.939	1.037	1.146
Others total		0.330	0.443	0.596	0.801
Kampala	ton/dov	1,437	1,850	2,261	2,555
Others total	lon/day	1,125	2,412	4,816	8,691
Kampala	ton/voor	524,505	675,250	825,265	932,575
Others total	tonyyear	410,625	880,380	1,757,840	3,172,215

Table 15.6.1 Projection of Waste Amount Generated in GKUGA

Note: Future waste amount generated in this table is projected based on information available in June 2022. A field survey was not carried out for the purpose. It is recommendable to review the projection here based on more reliable information such as data obtained by field surveys and weighbridges.

(2) Impact of the Transition from the Kiteezi Disposal Site to the Ddundu Disposal Site

There are plans to move waste disposal from the current Kiteezi disposal site to the new Ddundu disposal site. The distance from the Kiteezi disposal site to the Ddundu disposal site is about 17 km in a straight line, about 30 km on road, and about 1 hour by vehicle.



Source: JICA Expert Team based on data from KCCA GIS Unit Figure 15.6.1 Distance between Kiteezi and Ddundu

³ Source: Kampala City Statistical Abstract, 2019, p. 27

As mentioned above, the waste management capacity of the surrounding municipalities outside of KCC is still weak; however, collection services are still being developed. If the Kiteezi disposal site is closed, tractors used in some local governments cannot transport the waste to the Ddundu disposal site. Even if waste is transported by truck, it will be time consuming and costly. The current collection service system in those municipalities will collapse. Furthermore, if they use the Ddundu disposal site, they might have to pay the disposal fee.

According to the plan of the Ddundu Project, the disposal site should have been in service in December 2021, while at the same time, the Kiteezi disposal site should have been closed, which may have caused the problems mentioned above. Concerns about the occurrence of such problems were raised by some local governments during the interview survey in October 2021. In addition, they expressed the necessity of transfer stations. Although some donors are working on this issue, no concrete measures have been taken.

In the rapidly urbanising local governments adjacent to KCC, it is hoped that concrete measures for the above-mentioned problems will be formulated and implemented as early as possible.

(3) Lack of Direction in Solid Waste Management for the Entire GKUGA

Although symptomatic measures are necessary to overcome the drastic change from Kiteezi Final Disposal Site to Ddundu, it should be presented with the aim of establishing sustainable solid waste management to maintain the sanitary environment of GKUGA, which is facing a rapid increase of waste generation.

Assuming that the waste of the municipalities on the east side of GKUGA and KCC will be disposed of at the Ddundu disposal site, the realisation of proper disposal of the waste of the municipalities on the west side of GKUGA will be an issue. In addition, it will be necessary to take measures when the amount of waste generated on the east side exceeds the planned amount received at the Ddundu disposal site. Furthermore, it is required that multiple disposal sites function organically so as not to adversely affect the function of GKUGA. Such a long-term and comprehensive plan must be drawn, and laws, policies, facility installation and operation, public awareness, etc. must be considered in the plan.

While looking at the problems that are foreseen in the future as shown in the table below, it is required to formulate a plan which shows the direction of waste management for GKUGA. Such a plan also should take into consideration the current needs of each local government and the differences in waste management capacity.

Area	Description	Predicted problems					
Area A	 KCC that has been already urbanised and is currently using the Kiteezi disposal site. 	 Increased transportation costs due to the transition from Kiteezi to Ddundu. Incurred disposal costs for using the Ddundu disposal site. An increase in the amount of waste that exceeds the capacity of the Ddundu disposal site. 					
Area B	 Local governments located outside Area A and are undergoing rapid urbanization. 	 Deterioration of the environment at the disposal site currently in use due to an increase in the amount of waste. Illegal dumping and environmental pollution due to lack of disposal site. 					
Area C	 Local governments located outside Area B and expected to gradually become urbanised. 	 Deterioration of the environment at the disposal site currently in use due to an increase in the amount of waste. Illegal dumping and environmental pollution due to lack of disposal site. 					

Table 15.6.2 Solid Waste Management Problems foreseen in GKUGA in the Future

Source: JICA Expert Team



Source: JICA Expert Team Figure 15.6.2 Division of Areas from the Viewpoint of Solid Waste Management in GKUGA

15.6.3 Needs on Solid Waste Management Sector in Different Areas

The challenges for avoiding future problems and building sound sustainable waste management are listed below:

(1) Conservation of Sanitary Environment

- Area A: to build a transfer transport system to the Ddundu disposal site, and to improve the collection service
- Area B: to build a transfer transport system to the Entebbe disposal site or the Ddundu disposal site, and to improve the collection service
- Area C: to improve the collection capacity and the sanitary environment

(2) Realisation of Proper Waste Disposal

- Area A: to appropriately dispose of municipal waste that is currently disposed of at the Kiteezi disposal site at the Ddundu disposal site
- Area B: to appropriately dispose of waste at the Entebbe disposal site or at the Ddundu disposal site
- Area C: to improve the disposal site currently being used and reduce the environmental impact
- West side in GKUGA: A new sanitary landfill will be developed to realise proper disposal of waste from local governments on the west side of GKUGA, and to increase the resilience of the entire solid waste management in GKUGA (in case operation of the Ddundu disposal site is interrupted due to an accident, etc.)

(3) Reduction of Final Disposal Amount

- Area A: to carry out waste diversion such as MRF at the Ddundu disposal site and/or at transfer station(s)
- Area B: to carry out waste diversion such as MRF at transfer station(s).
- Area C: to mainly work on the conversion of organic waste, such as by composting, to reduce the disposal amount
- Difficult-to-treat materials (E-waste, construction and demolition waste, hazardous materials, etc.): to take measures for such waste by applying EPR

15.6.4 Objectives for Solid Waste Management Sector

(1) Objectives

- To harmonise the solid waste management sector with the urban development in GKUGA; Metropolitan Core and Six Metropolitan Centres
- To establish a flexible and sustainable waste management system that supports the conservation of the sanitary environment in GKUGA
- To establish a system of mutual support among local governments and the central government through gradual development in consideration of the waste management capacity of each local government in GKUGA
- To aim for establishing a low carbon waste management system

(2) Goals and Targets

1) Increase of Waste Collection Rates

- Metropolitan Core: to achieve 100% by 2030
- Metropolitan Centres: to achieve 60% by 2030 and 80% by 2040

2) Realisation of Proper Waste Disposal

- Metropolitan Core: to achieve 100% of proper waste disposal, disposing of waste in sanitary landfill, by 2030
- Metropolitan Centres: to achieve 60% by 2030 and 80% by 2040

3) Waste Reduction

- Metropolitan Core: to achieve 35% of waste reduction by 2030⁴
- Metropolitan Centres: to achieve 22% by 2030 and 35% by 2040

Note: The numerical targets shown here are proposed by the JICA Expert Team based on the current situation and existing plans. At this time, a plan for the entire GKUGA has not been confirmed.⁵ It is expected that the numerical targets shown here will open a discussion.

15.6.5 Strategies for Solid Waste Management Sector

(1) To Locate Wide-Area Disposal Sites and Transfer Stations in Consideration of Future Urbanisation

Based on future urban centres, road networks, environmental protection areas, etc., disposal sites and transfer stations will be set up in locations taking into consideration efficiency and environment.

By arranging multiple wide-area disposal sites, the resilience of GKUGA's urban functions is to be increased by dealing with risks such as the outage of disposal sites due to fires and accidents

⁴ The Ddundu Project plans at least 35% of waste diversion.

⁵ In June 2022, GGGI is preparing a solid waste management strategy in GKMA. GGGI, Greening Uganda's Urbanization and Industrialization, https://gggi.org/site/assets/uploads/2021/01/Brochure-Greening-Ugandas-Urbanization-and-Industrialization.pdf

on access roads. At the disposal site, methane gas incineration or a power generation facility will be installed to reduce GHG emissions.

The installation of transfer stations will reduce transportation costs and improve the efficiency of collection services, and the buffer function of the transfer stations that separates collection and transportation will reduce the risk of interruption of collection services due to accidents. In addition, the introduction of transfer transport can be expected to reduce CO^2 emissions.

The shorter the transportation distance, the more likely micro enterprises with limited capacity can participate in the collection service. For example, in slums, where residents cannot pay a fee and enjoy sufficient collection services, a community-based organisation (CBO) may be able to function with the support of the government and donors.

The following photos show examples of transfer stations and landfills.



Transfer Station (large scale)



Transfer Station (small scale) Source: JICA Expert Team



Trailer for Transport



Collection Vehicles (small type)



Approach of Transfer Transport Introduction	When considering introduction of g	a /.				
First step to consider introduction of transfer transport is to compare the current cost of direct transportation by your collection vehicle with estimated cost of a transfer transport system as shown on the right.	compare the cost of waste transport to the disposal site directly by collection vehicle with the cost of transfer transport (transport vehicles and transfer stations).	X c Distance (km)				
······································	If a < b + c,	a: Collection cost line				
	there is no need to introduce transfer transport.	b: Transport cost line				
	If $a > b + c$,	c: Transfer cost line				
	the introduction of transfer transport is recommended.	X: Cost breakeven point				
Source: Basics of Municipal Solid Waste Management in Africa, https://africancleancities.org/library/						

Figure 15.6.4 Approach for Introduction of Transfer Transport of Solid Waste

The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (GKMA-IUDMP) Final Report



Landfill Gas Incineration Source: JICA Expert Team

Landfill Gas Power Generation



(2) To Improve Efficiency of the Entire Waste Treatment System by Installing Material Recovery Facilities (MRF) with Transfer Stations, and To Promote Waste Reduction through Various Resource Recovery

Due to the difficulty of securing land and the amount of waste that makes recycling feasible, there are cases where MRFs are installed on the disposal sites. However, this strategy recommends installing MRF with a transfer station. This will improve efficiency of the entire waste management system through the reduction of waste amount transported by recycling and/or treatment.

In selecting resource recovery technology, not only current needs such as plastic waste collection, but also markets that may be cultivated in the future shall be considered. For example, RDF (Refuse Derived Fuel) or RPF (Refuse Paper & Plastic Fuel) can be considered as an alternative fuel in cement manufacturing processes and industrial boilers.

There is a plan to use the site of Kiteezi as a transfer station and MRF. If there is land adjacent to a slum, etc. Where the environment has already deteriorated, it might be an idea to use such land for a transfer station and/or MRF aiming at improving the deteriorated environment and job creation. However, it should be carefully considered by stakeholders because such facilities continuously generate environmental pollution and may cause labour accidents.
The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (GKMA-IUDMP) Final Report





Source: JICA Team

Figure 15.6.6 Example of Material Recovery Facility



Source: https://www.jrpf.gr.jp/rpf-1

Figure 15.6.7 Example of Reuse Paper and Plastic Fuel



Source: JICA Team



Figure 15.6.8 Example of Composting

(3) To Respond to the Needs of Less Urbanised Local Governments

The above-mentioned wide-area disposal sites, transfer stations and material recovery facilities are assumed to be used for local governments located in Area A (within about 10 km from the centre of KCC) which has already become a city, and in Area B (within about 20 km from the centre of KCC) where urbanisation is progressing rapidly.

On the other hand, there are scattered cities in Area C (out of about 20 km from the centre of KCC) where the need for proper waste management is not as high as in Area A and in Area B. In these cities, solid waste management must take their current needs and capacity into consideration. The strategy for local governments in Area C is shown below.

1) Community-Friendly Solid Waste Management Facility

Waste treatment facilities are often shunned as unpleasant facilities. In order to be accepted by the community, these can be developed as places to create employment opportunities, a drop-off facility for resource waste and a meeting / educational facility to raise the environmental awareness of residents.



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Source: JICA Team
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Figure 15.6.9 Example of Community-friendly Solid Waste Management Facilities

2) Home Composting

There are many houses with gardens in Area C, and promotion of home composting can be one of the measures for waste reduction. Plastic containers are often used, but some countries use natural materials. Through composting activities, it is expected that residents will become more aware of the environment.



Source: JICA Expert Team

Figure 15.6.10 Example of Home Composting

3) Open Dump to Controlled Dump

Ideally, a sanitary landfill should be used for waste disposal, but Kiteezi is the only sanitary landfill site in GKUGA, and it is planned that the Kiteezi disposal site will be moved to Ddundu in the near future. In towns located far from these disposal sites, it is not possible to transport waste due to financial restrictions, and some sites use pits and quarry sites as disposal sites. It may be recommended to improve such open dumps to control the disposal sites with gates, fences, etc. in the interim until a sanitary landfill is available. However, such an idea should be discussed among stakeholders as to whether it is compliant with the current regulations.



Source: Basics of Municipal Solid Waste Management in Africa, https://africancleancities.org/library/

Figure 15.6.11 From Open Dump to Controlled Dump

(4) To Manage Waste other than Municipal Solid Waste Applying Polluter Pays Principle

It is desirable to basically apply the polluters pays principle to industrial waste and build a system in which the discharger bears the cost of proper disposal. The application of this principle is also a means of inducing reductions in waste disposal and promotion of recycling.

For hazardous waste, dedicated hazardous waste treatment and establishment / operation of disposal sites must be planned. Measures, such as installing a facility in an industrial complex or using a cement factory around GKUGA, can be considered.

Currently, regardless of whether it is urban waste or hazardous waste (including infectious medical waste), those who are engaged in the transportation, treatment, and disposal of waste must obtain NEMA approval. It is hoped that hazardous waste will be continuously and properly treated and disposed of under this system in the future.

(5) To Establish an Institutional System to Discuss about the Solid Waste Management in GKUGA

Municipal solid waste management is basically left to the local government. It is required to take necessary measures in the collection, transportation, treatment and disposal of urban waste generated in the jurisdiction area.

If municipal solid waste management is completed within the jurisdiction area, it may be possible for the local government to deal with it appropriately. However, in GKUGA, waste is moving beyond the borders of local governments, and the cooperation of related local governments is required. The waste management capacity of local governments other than KCCA is limited, and it is difficult to deal with the waste problem across the borders without the involvement of the central government.

The lack of waste management capacity of local governments has led to environmental pollution of wetlands due to illegal dumping. Wetlands spread out in the lowlands of GKUGA, and they function as flood control and purification of urban wastewater. Downstream of these wetlands is Lake Victoria, which is important not only to Uganda, but also to East African countries. Uncollected slum waste and illegal dumping by collectors pose a risk of contamination of GKUGA's wetlands as well as Lake Victoria.

As mentioned above, the waste problem of one local government related to GKUGA also affects the entire GKUGA and the international water area of Lake Victoria. The central government should take the initiative to build an institutional mechanism for continuous discussion.

15.6.6 Waste Stream

The amount of waste from generation to disposal in GKUGA in the future is estimated as shown in the table below. The amount of waste is estimated for each metropolitan area (see the Figure 10.1.11 Population of Influential Areas (Service Areas) of Metropolitan Centres).

	Unit: tonr	ie per day		
Waste stream	Name	2030	2040	2050
	Metro core	1,850	2,261	2,555
	Mukono Metropolitan Centre	355	1,067	1,979
	Gayaza-Kasangati Metropolitan Centre	177	685	1,169
	Matugga Metropolitan Centre	133	364	593
Amount Generated	Wakiso Metropolitan Centre	195	691	1,314
	Nsangi-Nakirebe Metropolitan Centre	293	995	1,938
	Kaijansi Metropolitan Centre	359	1.013	1,698
	Others	900	0	0
	Total	4.262	7.077	11.246
	Metro core	0	0	0
	Mukono Metropolitan Centre	35	53	99
	Gavaza-Kasangati Metropolitan Centre	18	34	59
	Matugga Metropolitan Centre	13	18	30
Self-disposal	Wakiso Metropolitan Centre	19	35	66
	Nsangi-Nakirebe Metropolitan Centre	29	50	97
	Kaijansi Metropolitan Centre	36	51	85
	Others	90	0	0
	Total	241	241	435
	Metro core	1 850	2 261	2 555
	Mukono Metropolitan Centre	213	2,201	2,555
	Gavaza-Kasangati Metropolitan Centre	106	5/18	1,575
	Maturga Metropolitan Centre	80	201	503
Collection	Wakiso Metropolitan Centre	117	553	1 31/
Collection	Nsangi Nakiraba Metropolitan Centre	176	706	1,014
	Kajiansi Matropolitan Contro	215	7 9 0 911	1,930
	Others	540	011	1,090
		3 207	6 11/	11 2/6
	Notro coro	5,257	701	80/
	Mukono Metropolitan Centre	78	373	603
	Gavaza Kasangati Metropolitan Centre	30	240	409
	Maturga Metropolitan Centre	20	127	207
Waste Diversion	Wakiso Metropolitan Centre	/3	2/2	207
	Nsangi Nakiraba Metropolitan Centre	43	242	678
	Kajiansi Matropolitan Contro	70	355	50/
	Others	108	300	594
		1 1 7 9	2 476	3 036
	Netro poro	1,170	2,470	3,930
	Mukono Metropolitan Centre	1,202	1,470	1,001
	Gavaza Kasangati Metropolitan Centre	67	300	760
	Maturga Matropolitan Centre	51	164	385
Transport	Wakisa Matropolitan Centre	74	211	305 854
Transport	Naangi Nakiraha Matranalitan Cantra	14	311	1 260
	Kajianaj Matranalitan Cantra	111	440	1,200
		242	430	1,104
		342	2 6 2 9	7 210
	Total	2,119	3,030	7,310
	Metro core	1,202	1,470	1,001
	Mukono Metropolitan Centre	100	400	1,200
	Gayaza-Kasangali Metropolitan Centre	51	309	700
Final Dianagal	Wakisa Motranalitan Cantra	5	104	303 054
rinai Disposal	Wakiso Wellopolitan Centre	14	311	004 1 000
	Kalianai Matropolitan Contra	111	440	1,200
		137	400	1,104
		342	U 2 0 0 0	U 7 040
	TOTAL	2,119	3,038	7,310

Table 15.6.3	Estimated Waste Stream in GKUGA in the Future
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Source: JICA Expert Team

15.6.7 Priority Projects for Solid Waste Management Sector

The proposed priority projects for GKUGA are described below. The organisations in charge for the proposed priority projects and costs are listed in a priority project list compiled in Chapter 16.

(1) **Proposed Priority Projects**

Based on the integrated strategies for solid waste management in GKUGA described in Section 15.6.5, a master plan formulation, capacity development and actual establishment of transfer stations and sanitary disposal sites should be implemented as below.

- [SW-01] Formulation of Master Plan for Solid Waste Management System for GKUGA
- [SW-02] Capacity Development of Local Governments in Solid Waste Management System and Implementation of Master Plan for Solid Waste Management System
- [SW-03] Kampala Waste PPP Project: Ddundu landfill + Kiteezi TS and Waste Diversion Facility for KCC
- [SW-04] Establishment of Transfer Station and Waste Diversion Facility for Mukono Metropolitan Centre
- [SW-05] Establishment of Sanitary Landfill for Mukono Metropolitan Centre
- [SW-06] Establishment of Transfer Station and Waste Diversion Facility for Gayaza-Kasangati Metropolitan Centre
- [SW-07] Establishment of Transfer Station and Waste Diversion Facility for Matugga Metropolitan Centre
- [SW-08] Establishment of Transfer Station and Waste Diversion Facility for Wakiso Metropolitan Centre
- [SW-09] Establishment of Sanitary Landfill for Gayaza-Kasangati, Matugga and Wakiso Metropolitan Centres
- [SW-10] Establishment of Transfer Station and Waste Diversion Facility for Nsangi-Nakirebe Metropolitan Centre
- [SW-11] Establishment of Transfer Station and Waste Diversion Facility for Kajjansi Metropolitan Centre
- [SW-12] Establishment of Sanitary Landfill for Nsangi-Nakirebe and Kajjansi Metropolitan Centres



Source: JICA Expert Team

Figure 15.6.12 An Image of Location of Landfills and Transfer Stations in GKUGA and GKMA in the Future

(2) Estimated Project Cost

The table below shows estimated cost for solid waste management projects. Waste management services have a higher ratio of operation and maintenance costs to capital investment costs than other public services. It is recommended that all facilities are gradually expanded as waste volumes increase, rather than building large facilities from the outset. Note that the estimates below do not include land costs.

Project Teality/Service Item 2023-30 2031-40 2041-50 Total SW-1 Master Plan - 10 - - 10 SW-2 Capacity Dev. - 2.0 - - 2.0 SW-3 Callection O&M 109.4 20.6 2.37.3 549.3 SW-4 Capital 7.9 14.6 17.1 13.4 40.0 92.6 Waste diversion Capital 7.1 13.1 15.4 356.6 66.1 Q&M 14.2 26.3 30.8 71.1 13.2 2.4.4 2.8.6 66.1 Landfill Capital 0.3.7 16.5 41.13 60.6 62.5 139.6 2.04.7 SW-4 Transfer O&M 2.07 7.66 22.56 32.5 14.7 0.8.1 14.7 0.2.2.6 32.5 14.7 0.2.2.6 32.5 32.5 32.5 32.5 32.54 6.8.4 14.3						Unit: m	illion USD
SW-1 Master Plan - 1.0 - - 1.0 SW-2 Capacity Dev. - - 2.0 - - 2.0 SW-3 Collection Capital 32.4 60.0 70.3 142.7 SW-3 Transfer Capital 7.9 14.6 17.1 39.7 SW-3 Waste diversion Capital 7.1 13.1 15.4 35.6 Waste diversion Capital 7.1 13.1 15.4 35.6 Collection Capital 3.7 16.6 41.3 13.6 15.6 SW-4 Transfer Capital 0.8 3.37 9.67 13.9 SW-4 Transfer Capital 0.89 3.37 9.67 13.9 SW-5 Landfill O&M 2.05 7.86 2.246 2.32.5 SW-6 Capital 1.48 0.561 16.12 2.32.5 SW-6 Transfer Capital 0.	Project	Facility/Service	Item	2025-30	2031-40	2041-50	Total
SW-2 Capacity Dev. - 2.0 - - - 2.0 SW-3 Collection Capital 32.4 60.00 7.03 162.7 SW-3 Transfer Capital 7.9 14.6 17.1 39.7 SW-3 Capital 7.9 14.6 17.1 39.7 39.7 Waste diversion Capital 7.1 13.1 15.4 30.8 71.2 Landfill Capital 7.3 162.7 13.2 24.4 28.6 66.1 SW-4 Collection O&M 26.3 48.8 57.1 132.2 SW-4 Transfer Capital 0.7 86 22.56 32.5 Waste diversion Capital 0.84 12 9.73 14.7 O&M 2.09 11.23 32.23 46.4 SW-5 Landfil Capital 1.48 5.61 16.12 23.2 SW-6 Transfer O&M 0.29 <td>SW-1</td> <td>Master Plan</td> <td>-</td> <td>1.0</td> <td>-</td> <td>-</td> <td>1.0</td>	SW-1	Master Plan	-	1.0	-	-	1.0
SW-3 Collection Capital (Capital) 72.4 (Capital) 70.3 (Capital) 70.3 (Capital) <th70.3 (Capital) 70.3 (Capital)</th70.3 	SW-2	Capacity Dev.	-	2.0	-	-	2.0
SW-3 Default Odd 1094 2026 237.3 S49.3 SW-3 Transfer Capital 7.9 14.6 17.1 39.7 Waste diversion Capital 7.1 13.1 15.4 30.6 7.1 Landfill Capital 13.2 24.4 28.6 66.1 13.2 SW-4 Collection Capital 3.7 15.6 4.1.3 606.6 O&M 12.6 52.5 139.6 204.7 13.9 SW-4 Transfer Capital 0.88 3.37 9.67 13.9 SW-5 Landfill Capital 0.88 3.27 9.76 13.9 SW-5 Landfill Capital 1.48 5.61 16.12 2.32.5 SW-6 Landfill Capital 1.48 5.61 16.12 2.32.2 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 SW-7 Transfer Capital		Collection	Capital	32.4	60.0	70.3	162.7
SW-3 Transfer Capital 7.9 14.6 17.1 13.1 14.00 92.6 Waste diversion Capital 7.1 13.1 15.4 35.6 Landfill Capital 7.1 13.1 15.4 35.6 SW-4 Collection Capital 3.7 15.6 41.3 60.6 SW-4 Transfer Capital 0.8M 26.3 48.8 57.1 132.2 SW-4 Transfer Capital 0.89 33.3 9.67 13.9 SW-5 Landfill Capital 0.86 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 9.56 25.06 32.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.44 2.06 5.85 8.4 SW-7 Transfer Capit			O&M	109.4	202.6	237.3	549.3
SW-3 Number of Capital 7.1		Transfer	Capital	7.9	14.6	17.1	39.7
Waste diversion Capital 7.1 13.1 15.4 33.6 Landfill Capital 13.2 24.4 28.6 66.1 QM 26.3 48.8 57.1 132.2 SW-4 Collection Capital 3.7 9.6 133.6 SW-4 Transfer Capital 0.89 3.37 9.6 139.6 SW-4 Transfer Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-6 Capital 1.48 5.61 16.12 23.2 SW-6 Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Transfer Capital	SW-3		O&M	18.4	34.1	40.0	92.6
Interview O&M 14.2 26.3 30.8 71.2 Landfill Capital 13.2 24.4 28.6 66.1 08M 26.3 48.8 57.1 132.2 SW-4 Collection Capital 3.7 15.6 41.3 60.6 SW-4 Transfer Capital 0.89 3.37 9.67 13.9 Waste diversion Capital 0.89 3.37 9.67 13.9 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-6 Capital 0.84 2.97 7.86 22.56 36.5 SW-6 Landfill Capital 0.48 5.61 16.12 23.2 SW-6 Collection Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.44 2.06 5.50 11.85 17.8 SW-7 Transfer Capital 0.44 2.54 5.92 8.9 <td>011 0</td> <td>Waste diversion</td> <td>Capital</td> <td>7.1</td> <td>13.1</td> <td>15.4</td> <td>35.6</td>	011 0	Waste diversion	Capital	7.1	13.1	15.4	35.6
Landfill Capital 13.2 24.4 28.6 66.6 ORM 26.3 48.8 57.1 132.2 SW-4 Collection Capital 0.7 15.6 41.3 60.6 SW-4 Transfer Capital 0.89 3.37 19.67 13.9 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 5.61 16.12 2.32 SW-6 Transfer Capital 1.48 9.56 25.08 3.65 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.44 2.06 5.85 8.4 SW-7 Transfer Capital 0.44 2.06 5.85 8.4 SW-7 Transfer Capital 0.43 13.05 4.88			O&M	14.2	26.3	30.8	71.2
SW-4 Collection Capital Capital 3.7 15.6 41.3 60.6 SW-4 Transfer Capital 0.89 3.37 9.67 13.9 SW-4 Transfer Capital 0.89 3.37 9.67 13.9 Waste diversion Capital 0.85 4.12 9.73 14.7 Waste diversion Capital 1.48 5.41 16.22.52 13.9.45 2.94 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-6 Collection Capital 1.48 5.61 16.12 2.23 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.44 2.06 5.85 8.4 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 SW-7 Transfer Capital 0.43 2.54 5.92 8.9 SW-7 Transfer Capital <td></td> <td>Landfill</td> <td>Capital</td> <td>13.2</td> <td>24.4</td> <td>28.6</td> <td>66.1</td>		Landfill	Capital	13.2	24.4	28.6	66.1
Collection Capital O&M 3.7 15.6 41.3 60.6 SW-4 Transfer Capital 0.89 3.37 9.67 13.9 Waste diversion O&M 2.07 7.86 22.56 32.5 Waste diversion O&M 1.71 8.23 19.45 29.4 SW-5 Landfill Capital 1.48 5.61 116.12 23.2 SW-6 Collection Capital 1.48 5.61 116.12 23.2 SW-6 Transfer Capital 1.48 5.61 116.12 23.2 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 </td <td></td> <td>Lanam</td> <td>O&M</td> <td>26.3</td> <td>48.8</td> <td>57.1</td> <td>132.2</td>		Lanam	O&M	26.3	48.8	57.1	132.2
SW-4 Transfer O&M 12.6 52.5 139.6 2047 Waste diversion Capital 0.89 3.37 9.67 13.9 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 1.86 9.56 28.08 36.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.43 2.54 5.92 8.9 Waste diversion O&M 0.84 0.63 5.99 11.85 17.8 SW-7 Transfer Capital 0.32 1.43 3.05 4.8 9.0 SW-7 Transfer Capital 0.32		Collection	Capital	3.7	15.6	41.3	60.6
SW-4 Transfer Capital 0&M 0.89 3.37 9.67 13.9 Waste diversion Capital 0.84 2.07 7.86 22.56 32.5 SW-5 Landfill Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 1.48 5.61 16.12 23.2 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 SW-7 Transfer Capital 0.32 1.43 3.05 4.8 SW-7 Transfer Capital			O&M	12.6	52.5	139.6	204.7
Off P Industry O&M 2.07 7.86 22.56 32.5 Waste diversion Capital 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 0.48 2.95 11.23 32.23 46.4 SW-6 Callection Capital 0.44 2.06 5.85 8.4 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 1.43 3.05 18.5 17.8 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Transfer Capital 0.32 1.43 3.05 4.8 SW-7 Transfer Capital 0.32 1.43	SW-4	Transfer	Capital	0.89	3.37	9.67	13.9
Waste diversion Capital O&M 0.85 4.12 9.73 14.7 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 1.86 9.56 25.08 36.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 SW-6 Transfer Capital 0.44 2.06 5.85 19.5 Waste diversion Capital 0.44 2.06 5.85 8.9 Waste diversion Capital 0.44 2.06 5.85 8.9 SW-7 Collection Capital 0.43 2.54 5.92 8.9 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 SW-7 Transfer Capital 0.32 1.43 3.05 4.8 SW-7 Transfer Capital 0.32 <td>011 4</td> <td></td> <td>O&M</td> <td>2.07</td> <td>7.86</td> <td>22.56</td> <td>32.5</td>	011 4		O&M	2.07	7.86	22.56	32.5
SW-5 Landfill Capital 1.71 8.23 19.45 29.4 SW-5 Landfill Capital 1.48 5.61 16.12 23.2 SW-6 Collection Capital 1.86 9.56 25.08 36.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.40 0.85 5.09 11.85 17.8 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 SW-8 Collection Capital 0.32 1.43 3.05 4.8 SW-9 Landfill Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.49 <td></td> <td>Waste diversion</td> <td>Capital</td> <td>0.85</td> <td>4.12</td> <td>9.73</td> <td>14.7</td>		Waste diversion	Capital	0.85	4.12	9.73	14.7
SW-5 Landfill Capital O&M 1.48 5.61 16.12 23.2 (2.32) SW-6 Collection Capital 1.86 9.56 25.08 36.5 SW-6 Transfer Capital 0.40 2.95 32.26 84.65 123.2 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.44 2.06 5.85 8.4 SW-7 Collection Capital 0.43 2.54 5.52 8.9 SW-7 Transfer Capital 0.43 2.54 5.52 8.9 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.25 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital			O&M	1.71	8.23	19.45	29.4
Off O Collection O&M 2.95 11.23 32.23 46.4 SW-6 Collection Capital 1.86 9.56 25.08 36.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.43 2.54 5.92 8.9 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.32 1.43 3.05 4.8 W-8 Transfer Capital 0.47 2.60 6.40 9.5 SW-8 Transfer Capital 0.47 2.60	SW-5	Landfill	Capital	1.48	5.61	16.12	23.2
SW-6 Collection Capital O&M 1.86 9.56 25.08 36.5 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 WW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-10 Transfer Capital 0.210 8	000-0	Landin	O&M	2.95	11.23	32.23	46.4
SW-6 Transfer O&M 6.29 32.26 84.65 123.2 SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 1.40 5.41 12.90 19.7 SW-7 Collection Capital 1.40 5.41 12.90 19.7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.32 1.43 3.05 4.8 SW-8 Collection Capital 2.02 9.72.6 39.1 SW-8 Collection Capital 0.49 2.11 6.38 9.0 Maste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0		Collection	Capital	1.86	9.56	25.08	36.5
SW-6 Transfer Capital 0.44 2.06 5.85 8.4 Waste diversion Capital 0.43 2.54 5.92 8.9 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.43 2.74 43.54 66.5 Transfer O&M 0.72 18.27 43.54 66.5 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 SW-8 Collection O&M 0.64 2.85 6.11 9.6 SW-8 Collection O&M 6.92 33.02 91.99 131.9 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.47 2.60 6.40 <td< td=""><td></td><td>Collection</td><td>O&M</td><td>6.29</td><td>32.26</td><td>84.65</td><td>123.2</td></td<>		Collection	O&M	6.29	32.26	84.65	123.2
SW-0 Italiser O&M 1.03 4.80 13.65 19.5 Waste diversion Capital 0.43 2.54 5.92 8.9 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion O&M 0.62 2.74 7.01 10.5 Waste diversion O&M 0.64 2.85 6.11 9.6 Waste diversion Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 2.05 9.78 27.26 39.1 SW-9 Landfill Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 <t< td=""><td>SW 6</td><td>Transfor</td><td>Capital</td><td>0.44</td><td>2.06</td><td>5.85</td><td>8.4</td></t<>	SW 6	Transfor	Capital	0.44	2.06	5.85	8.4
Waste diversion Capital Q&M 0.43 2.54 5.92 8.9 Waste diversion Q&M 0.85 5.09 11.85 17.8 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Transfer Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.32 1.43 3.05 4.8 SW-8 Collection Capital 0.32 1.43 3.05 4.8 SW-8 Collection Capital 0.32 1.43 3.05 4.8 SW-9 Collection Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill O&M 0.94 5.20 12.81 18.9 SW-10 Transfer Capital 0.73 3.06	300-0		O&M	1.03	4.80	13.65	19.5
Waste diversion O&M 0.85 5.09 11.85 17.8 SW-7 Collection Capital 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.55 Transfer O&M 0.78 2.74 7.01 10.5 Waste diversion Capital 0.32 1.43 3.05 4.8 O&M 0.64 2.85 6.11 9.6 Waste diversion Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill O&M 0.94 5.20 12.81 18.9 SW-9 Landfill O&M 1.41 4.92 14.88 20.9 SW-10 Tra		Wests diversion	Capital	0.43	2.54	5.92	8.9
SW-7 Collection Capital O&M 1.40 5.41 12.90 19.7 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion O&M 0.44 5.20 12.81 18.9 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 O&M 0.94 5.20 12.81 18.9 SW-9 Landfill Capital 3.08 14.19 39.33 57.2			O&M	0.85	5.09	11.85	17.8
SW-7 Collection O&M 4.72 18.27 43.54 66.5 SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.32 1.43 3.05 4.8 SW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 3.06 9.35 1.31 SW-10 Transfer Capital 0.73		Collection	Capital	1.40	5.41	12.90	19.7
SW-7 Transfer Capital 0.33 1.17 3.01 4.5 Waste diversion Capital 0.32 1.43 3.05 4.8 Waste diversion Capital 0.32 1.43 3.05 4.8 O&M 0.64 2.85 6.11 9.6 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 SW-9 Transfer Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.17 1.619 3.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1		Collection	O&M	4.72	18.27	43.54	66.5
SW-7 Infinitier O&M 0.78 2.74 7.01 10.5 Waste diversion Capital 0.32 1.43 3.05 4.8 0&M 0.64 2.85 6.11 9.6 0.8M 0.64 2.85 6.11 9.6 SW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 O&M 0.94 5.20 12.81 18.9 0.8M 14.19 39.93 57.2 SW-9 Landfill Capital 3.08 14.19 39.93 57.2 <t< td=""><td></td><td rowspan="2">Transfer</td><td>Capital</td><td>0.33</td><td>1.17</td><td>3.01</td><td>4.5</td></t<>		Transfer	Capital	0.33	1.17	3.01	4.5
Waste diversion Capital 0.32 1.43 3.05 4.8 0&M 0.64 2.85 6.11 9.6 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.210 8.90 25.39 36.4 SW-10 Transfer Capital 2.10 8.90 25.39 36.4 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 Waste diversion Capital 0.73 3.06 9.37 13.8 O&M 1.71<	500-7		O&M	0.78	2.74	7.01	10.5
Waste diversion O&M 0.64 2.85 6.11 9.6 SW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 O&M 0.94 5.20 12.81 18.9 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 O&M 0.421 17.81 50.79 72.8 2.11 17.81 50.79 72.8 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 Waste diversion Capital 0.70 3.76 <td< td=""><td></td><td>Maste diversion</td><td>Capital</td><td>0.32</td><td>1.43</td><td>3.05</td><td>4.8</td></td<>		Maste diversion	Capital	0.32	1.43	3.05	4.8
SW-8 Collection Capital 2.05 9.78 27.26 39.1 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Landfill Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 SW-11 Transfer Capital		waste diversion	O&M	0.64	2.85	6.11	9.6
SW-8 Collection O&M 6.92 33.02 91.99 131.9 SW-8 Transfer Capital 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Callection Capital 2.10 8.90 25.39 36.4 SW-10 Collection Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 SW-11 Transfer Capital			Capital	2.05	9.78	27.26	39.1
SW-8 Transfer Capital O&M 0.49 2.11 6.38 9.0 Waste diversion Capital 0.47 2.60 6.40 9.5 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Collection Capital 2.10 8.90 25.39 36.4 SW-10 Collection Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 SW-11 Transfer Capital 0.70 3.76 13.7 14.98 36.63 55.4 SW-11		Collection	O&M	6.92	33.02	91.99	131.9
SW-8 Iranster O&M 1.14 4.92 14.88 20.9 Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 O&M 4.21 17.81 50.79 72.8 7	014/0	T (Capital	0.49	2.11	6.38	9.0
Waste diversion Capital 0.47 2.60 6.40 9.5 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Landfill Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 Waste diversion Capital 0.70 3.76 9.37 13.8 SW-11 Transfer Capital 0.70 3.76 123.62 186.9 SW-11 Transfer O&M 12.74 50.56 123.62 186.9 SW-11 Transfer O&M	577-8	Transfer	O&M	1.14	4.92	14.88	20.9
Waste diversion O&M 0.94 5.20 12.81 18.9 SW-9 Landfill Capital 2.10 8.90 25.39 36.4 SW-9 Landfill O&M 4.21 17.81 50.79 72.8 SW-10 Collection Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 SW-10 Transfer Capital 0.70 3.76 9.37 13.8 Waste diversion Capital 0.70 3.76 9.37 13.8 Waste diversion Capital 0.70 3.76 9.37 13.8 SW-11 Transfer Capital 0.70 3.76 14.98 36.63 55.4 SW-11 Transfer Capital 0.90 3.25 8.54 12.7 SW-12 Landfill Capital </td <td></td> <td></td> <td>Capital</td> <td>0.47</td> <td>2.60</td> <td>6.40</td> <td>9.5</td>			Capital	0.47	2.60	6.40	9.5
SW-9 Landfill Capital O&M 2.10 8.90 25.39 36.4 SW-9 Landfill O&M 4.21 17.81 50.79 72.8 Collection Capital 3.08 14.19 39.93 57.2 O&M 10.38 47.89 134.76 193.0 Transfer Capital 0.73 3.06 9.35 13.1 O&M 1.71 7.15 21.82 30.7 Waste diversion Capital 0.70 3.76 9.37 13.8 O&M 1.41 7.53 18.74 27.7 Collection Capital 3.77 14.98 36.63 55.4 O&M 12.74 50.56 123.62 186.9 SW-11 Transfer Capital 0.90 3.25 8.54 12.7 SW-11 Transfer Capital 0.90 3.25 8.54 12.7 Waste diversion Capital 0.86 3.95 8.66 13.		waste diversion	O&M	0.94	5.20	12.81	18.9
SW-9 Landfill O&M 4.21 17.81 50.79 72.8 SW-10 Collection Capital 3.08 14.19 39.93 57.2 SW-10 Transfer Capital 0.308 14.19 39.93 57.2 SW-10 Transfer Capital 0.73 3.06 9.35 13.1 O&M 1.71 7.15 21.82 30.7 Waste diversion Capital 0.70 3.76 9.37 13.8 O&M 1.41 7.53 18.74 27.7 Waste diversion Capital 3.77 14.98 36.63 55.4 O&M 12.74 50.56 123.62 186.9 SW-11 Transfer Capital 0.90 3.25 8.54 12.7 SW-12 Landfill Capital 0.86 3.95 8.66 13.5 SW-12 Landfill Capital 0.86 3.95 8.66 13.5 O&M 1.73 <td>014/0</td> <td>1 101</td> <td>Capital</td> <td>2.10</td> <td>8.90</td> <td>25.39</td> <td>36.4</td>	014/0	1 101	Capital	2.10	8.90	25.39	36.4
SW-10 Collection Capital 3.08 14.19 39.93 57.2 SW-10 Transfer O&M 10.38 47.89 134.76 193.0 Transfer Capital 0.73 3.06 9.35 13.1 O&M 1.71 7.15 21.82 30.7 Waste diversion Capital 0.70 3.76 9.37 13.8 O&M 1.41 7.53 18.74 27.7 Collection Capital 3.77 14.98 36.63 55.4 O&M 12.74 50.56 123.62 186.9 SW-11 Transfer Capital 0.90 3.25 8.54 12.7 SW-11 Transfer Capital 0.90 3.25 8.66 13.5 SW-12 Landfill Capital 0.86 3.95 8.66 13.5 SW-12 Landfill Capital 2.71 10.51 29.82 43.0 O&M 5.43 21.03	500-9	Landfill	O&M	4.21	17.81	50.79	72.8
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			Capital	3.08	14.19	39.93	57.2
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Collection	O&M	10.38	47.89	134.76	193.0
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	0.04 40	- /	Capital	0.73	3.06	9.35	13.1
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	SW-10	Iranster	O&M	1.71	7.15	21.82	30.7
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			Capital	0.70	3.76	9.37	13.8
SW-11 Collection Capital 3.77 14.98 36.63 55.4 SW-11 Transfer Capital 0.77 14.98 36.63 55.4 Waste diversion Capital 0.90 3.25 8.54 12.7 SW-12 Landfill Capital 0.90 3.25 8.66 13.5 SW-12 Landfill Capital 0.86 3.95 8.66 13.5 SW-12 Landfill Capital 2.71 10.51 29.82 43.0 Total 343.8 908.30 1783.90 3035.9		Waste diversion	O&M	1 41	7 53	18 74	27.7
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			Canital	3 77	14 98	36.63	55.4
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Collection	O&M	12 74	50.56	123.62	186 Q
SW-11 Transfer Odeptide 0.00 <th0.00< th=""> 0.00</th0.00<>			Capital	0.90	3 25	8.54	12 7
Waste diversion Capital 0.86 3.95 8.66 13.5 SW-12 Landfill Capital 2.71 10.51 29.82 43.0 Total 343.8 908.30 1783.90 3035.9	SW-11	Transfer	O&M	2 09	7.57	19 93	29.6
Waste diversion Ode/Lat 0.00 0.00 0.00 10.00 SW-12 Landfill Capital 2.71 10.51 29.82 43.0 Total 343.8 908.30 1783.90 3035.9			Capital	0.86	3 95	8 66	13.5
SW-12 Landfill Capital 2.71 10.51 29.82 43.0 Total 343.8 908.30 1783.90 3035.9		Waste diversion	O&M	1 73	7 Q1	17 32	27 0
SW-12 Landfill Capital 2.71 10.31 23.02 43.0 O&M 5.43 21.03 59.64 86.1 Total 343.8 908.30 1783.90 3035.9			Canital	2 71	10.51	20.82	/13.0
Total 3/3.8 908.30 1783.00 3035.0	SW-12	Landfill	O&M	5/3	21 03	50 6/	9.0 26 1
		Total		3/12 8	008 30	1783 00	3035.0

Source: JICA Expert Team

(3) Unit Cost

It is crucial if the society can bear the cost of the solid waste management services. The table below shows estimated total cost and unit cost per ton of waste to be collected for the entire GKUGA. The unit cost falls in approximately 50 USD/ton of waste to be collected. This would be beard by the society of GKUGA considering the typical cost well known in the solid waste management sector. (See Table 15.6.6)

lte	em	Unit	2025-30	2031-40	2041-50
Waste collecti	on amount	Ton per day	3,297	6,114	11,246
		Ton per period	7,220,430	22,316,1000	41,047,900
Total cost	Capital	million USD	90.17	240.11	471.81
	O&M	million USD	250.64	668.19	1,312.09
	Total	million USD	340.81	908.30	1,783.90
Unit cost	Capital	USD/collection ton	12.49	13.98	14.89
	O&M	USD/collection ton	34.71	38.90	41.41
	Total	USD/collection ton	47.20	52.88	56.31

Table 15.6.5 Estimated Unit Cost for Solid Waste Management in GKUGA

Source: JICA Expert Team

Table 15.6.6	Typical Solid Waste Management (Cost

	Low- income countries	Lower- middle- income countries	Upper- middle- income countries	High- income countries
Collection and transfer	20–50	30–75	50-100	90–200
Controlled landfill to sanitary landfill	10–20	15-40	20-65	40-100
Open dumping	28	3–10	-	-
Recycling	0-25	5-30	5-50	30-80
Composting	5-30	10-40	20-75	35-90

Source: World Bank Solid Waste Community of Practice and Climate and Clean Air Coalition. Note: - = not available.

Note: - = not available.

Source: Word Bank, 2018, What a Waste

Chapter 16 Priority Projects and Phased Development Plan in Greater Kampala Urban Growth Area (GKUGA) including Kampala Capital City (KCC)

16.1 Introduction

Section 16.2 shows a Phased Development Plan (Scenario) of Urban Centres, Expressways, Public Transportation and Other Infrastructure in an integrated manner.

Furthermore, Sections 16.2, 16.3, and 16.4 compile the lists of priority projects by sector which are included in Chapter 11 "Urban Development", Chapter 14 "Transport", Chapter 15 "Other Infrastructures", and Chapter 23 "Institutional Development" containing priority projects for GKUGA.

16.2 Phased Development Plan of Urban Centres, Expressways, Public Transportation and Other Infrastructure Sectors

16.2.1 Phased Development Scenario of Urban Centre Development in Accordance with Expressway Development

Paying attention to the present severely congested road traffic situation, urban development outside Kampala Capital City (KCC) should be promoted together with urban centre development for seeking a poly-centric and widely distributed spatial structure.

Urban centre development could be promoted by developing strong connectivity through transportation modes. Currently the major transportation modes are private cars and public transportations on arterial roads, as well as on expressways. In the future, possible transportation modes would be expressways, BRT routes (on arterial roads and expressways), heavy railways, and LRT/MRT routes.

Such strong connectivity can be attained by constructing a good and wide coverage of expressway network and operation of BRT on the expressways, as well as the upgrading of heavy railways and new establishment of LRT/MRT routes for promoting the development of polycentric urban spatial structure.

Therefore, a phased scenario of formation of spatial structure is composed considering the combination of urban centre development (especially Metropolitan Centres) and expressway network development, as well as operation of BRT routes, upgrading of heavy railways and development of LRT/MRT routes.

Figure 16.2.1 shows the present situation of GKUGA's spatial structure.

Figure 16.2.2, Figure 16.2.3, Figure 16.2.4, Figure 16.2.5, and Figure 16.2.6 show the phased development pattern of Metropolitan Centres, expressways and BRT, heavy railway, LRT/MRT of Phases 1, 2, 3, 4 and 5.



Source: JICA Expert Team

Figure 16.2.1 Present Situation of Metropolitan Centres and Expressways



Source: JICA Expert Team

Figure 16.2.2 Phase 1 (2024-2030): Phased Development Scenario of Metropolitan Centres and Expressways



Source: JICA Expert Team

Figure 16.2.3 Phase 2 (2030-2035): Phased Development Scenario of Metropolitan Centres and Expressways

Source: JICA Expert Team

Figure 16.2.4 Phase 3 (2035-2040): Phased Development Scenario of Metropolitan Centres and Expressways

Source: JICA Expert Team

Figure 16.2.5 Phase 4 (2040-2045): Phased Development Scenario of Metropolitan Centres and Expressways

Source JICA Expert Team

Figure 16.2.6 Phase 5 (2045-2050): Phased Development Scenario of Metropolitan Centres and Expressways

16.3 Criteria for Identifying High and Medium Priority Projects in GKUGA

Sector development strategies were formulated not only based on the relatively high needs for improvement of infrastructures and services in individual sectors, but also in accordance with the overall directions of spatial development and economic sectors development in GKUGA.

Priority projects were selected for implementing sector development strategies by each sector.

High and medium priority projects were selected to pursue the following development and management goals of GKUGA:

- To seek prosperous, stable and green "Urban Economies" by attracting investment in business, manufacturing, international tourism, higher education, and advanced health
- To accommodate high urban functions by developing decentralised urban centres, securing urban mobility and utilising Smart Technology
- To seek inclusive society by developing public transportation
- To manage a liveable urban environment with green and open space
- To enhance resilience against climate change and disasters

16.4 List of Priority Projects for Urban Development Sector

The urban development sector has the following programmes:

- GKMA Master Plan Implementation Programme
- Metropolitan Centre Development Programme
- Secondary Urban Centre Development Programme
- Primary Urban Centre (CBD) Expansion Programme
- Programme for Prevention of Growth of Emerging Slums
- Programme for Development and Management of Wetland Urban Parks
- Programme for Land Use Management of Victoria Lakeshores

		list on Development Octor		Organizations in		Sc	hed	ule		Cost
No	Priority	GKMA MP Implementation Programme	Status	Private Sector Fund (PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	(million USD)
UD- 01	High	Project for Capacity Development for Implementation of GKMA Integrated Urban Development Master Plan	Proposed	MKCC&MC, MoLHUD, KCCA, Wakiso District, Mukono District, Mpigi District						3.0
No	Priority	Urban Development Sector Metropolitan Centre Development Programme	Status	Organizations in Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)
UD- 02	High	Project for Kajjansi Metropolitan Centre Development including Buwebajja Government Campus (Stage 1)	Proposed	MKCC&MA, Wakiso District						15.0
UD- 03	High	Project for Mukono Metropolitan Centre Development (Stage 1)	Proposed	MKCC&MA Mukono District						15.0
UD- 04	High	Project for Nsangi Metropolitan Centre Development (Stage 1)	Proposed	MKCC&MA Wakiso District						10.0
UD- 05	High	Project for Wakiso Metropolitan Centre Development (Stage 1)	Proposed	MKCC&MA Wakiso District						15.0
UD- 06	High	Project for Matugga Metropolitan Centre Development (Stage 1)	Proposed	MKCC&MA Wakiso District						10.0
UD- 17	High	Project for Gayaza-Kasangati Metropolitan Centre Development (Stage 1)	Proposed	MKCC&MA Wakiso District						10.0
UD- 18	Middle	Project for Kajjansi Metropolitan Centre Development including Buwebajja Government Campus (Stage 2)	Proposed	MKCC&MA, Wakiso District						15.0
UD- 19	Middle	Project for Mukono Metropolitan Centre Development (Stage 2)	Proposed	MKCC&MA Mukono District						15.0
UD- 20	Middle	Project for Nsangi Metropolitan Centre Development (Stage 2)	Proposed	MKCC&MA Wakiso District						10.0
UD- 21	Middle	Project for Wakiso Metropolitan Centre Development (Stage 2)	Proposed	MKCC&MA Wakiso District						15.0
UD- 22	Middle	Project for Matugga Metropolitan Centre Development (Stage 2)	Proposed	MKCC&MA Wakiso District						10.0

 Table 16.4.1
 List of Priority Projects for Urban Development

UD-		Project for Gavaza-Kasangati Metropolitan		MKCC&MA						
23	Middle	Centre Development (Stage 2)	Proposed	Wakiso District						10.0
		Urban Development Sector		Organizations in		Schedule		Cost		
No	Priority	Secondary Urban Centre Development Programme	Status	Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	(million USD)
UD- 07	High	Project for Busega-Kyengera Secondary Urban Centre Development	Proposed	MKCC&MA, Wakiso District, KCCA						15.0
UD- 08	High	Project for Luzira-Port Bell Secondary Urban Centre Development	Proposed	MKCC&MA, KCCA						10.0
UD- 09	High	Project for Namanve Secondary Urban Centre Development	Proposed	MKCC&MA, UIA, Mukono District						10.0
UD- 10	Middle	Project for Entebbe-Katabi Secondary Urban Centre Development	Proposed	MKCC&MA, Wakiso District, KCCA						10.0
No	Priority	Urban Development Sector Primary Urban Centre (CBD) Expansion Programme	Status	Organizations in Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2 S	bed: Lhase3	Phase4 aln	Phase5	Cost (million USD)
UD- 11	High	Project for CBD Expansion (Stage 1)	Proposed	KCCA, MoLHUD PPP						150.0
UD- 22	Middle	Project for CBD Expansion (Stage 2)	Proposed	KCCA, MoLHUD PPP						150.0
No	Priority	Urban Development Sector Programme for Prevention of Growth of Emerging Slums	Status	Organizations in Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2	bhase3	Phase4 an	Phase5	Cost (million USD)
UD- 12	High	Project for Preventing the Growth of Emerging Slums near Kajjansi Metropolitan Centre	Proposed	Wakiso District MoLHUD						2.0
UD- 13	High	Project for Preventing the Growth of Emerging Slums near Mukono Metropolitan Centre	Proposed	Mukono District MoLHUD						2.0
UD- 14	High	Project for Preventing the Growth of Emerging Slums near Nsangi Metropolitan Centre	Proposed	Wakiso District MoLHUD						2.0
UD- 15	High	Project for Preventing the Growth of Emerging Slums near Wakiso Metropolitan Centre	Proposed	Wakiso District MoLHUD						2.0
UD- 16	High	Project for Preventing the Growth of Emerging Slums near Matugga Metropolitan Centre	Proposed	Wakiso District MoLHUD						2.0
No	Priority	Urban Development Sector Programme for Development and Management of Wetland	Status	Organizations in Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2 60	Phase3	Phase4 an	Phase5	Cost (million USD)
OS- 01	High	Project for Development and Management of Nakivubo Wetland Urban Park	Proposed	KCC MWE PPP						3.2
OS- 02	High	Project for Development and Management of Lubigi Wetland Urban Park	Proposed	Wakiso District MWE PPP						5.5
OS- 03	High	Project for Strengthening of Enforcement Effort at Development Control for Wetlands	Proposed	MoLHUD, MWE, KCCA, Wakiso District, Mukono District, Mpigi District						-
No	Priority	Urban Development Sector Programme for Land Use Management of Victoria Lakeshores	Status	Organizations in Charge/ Involvement of Private Sector Fund (PPP)	Phase1	Phase2 o	ped Phase3	Phase4 aln	Phase5	Cost (million USD)
LS- 01	High	Project for Land Use Suitability Study of Victoria Lakeshores and Formulation of Land Use Management System for Victoria Lakeshores in GKMA	Proposed	MWE, MoLHUD, KCC, Mpigi, Mukono, Wakiso						-
LS- 02	Middle	Project for Project for Land Use Management of Victoria Lakeshores in KCC	Proposed	KCCA, MWE, MoLHUD						-

LS- 03	Middle	Project for Land Use Management of Victoria Lakeshores in Mpigi	Proposed	Mpigi District, MWE, MoLHUD			-
LS- 04	Middle	Project for Land Use Management of Victoria Lakeshores in Mukono	Proposed	Mukono District, MWE, MoLHUD			-
LS- 05	Middle	Project for Land Use Management of Victoria Lakeshores in Wakiso District	Proposed	Wakiso District, MWE, MoLHUD			-

Source: JICA Expert Team

16.5 List of Priority Projects for Transport Sector

The transport sector contains the following three subsectors of priority projects:

- Road Subsector
- Traffic Management Subsector
- Public Transportation Subsector

This section shows three lists for short-term, middle-term and long-term projects. Each list includes priority projects of the above three subsectors.

				Organizations in		Schedule				Cost
No	Priority	Road Subsector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	(million USD)
RD- S1	High	Project for Capacity Improvement and Signalisation of Kampala – Gayaza Road	On-going	UNRA						18.0
RD- S2	High	Project for Capacity Improvement and Signalisation of Kampala – Buloba Road	On-going	UNRA						15.0
RD- S3	Middle	Project for Capacity Improvement and Signalisation of Namungona – Kakiri Road	On-going	UNRA						25.0
RD- S4	High	Project for Kampala Flyover	On-going	UNRA						153.7
RD- S5	High	Project for Kampala City Road Rehabilitation Project (including drainage works, 2 big drainage works)	On-going	КССА						246.0
RD- S6	High	GKMA Urban Development Programme (Road Development Component)	On-going	MKCC&MA						-
RD- S7	High	Project for Upgrading of Northern Bypass Expressway	On-going	UNRA						141.1
RD- S8	High	Kampala Southern Bypass Expressway Construction Project	On-going	UNRA						200.0
RD- S9	High	Kibuye – Busega Expressway Construction Project	On-going	UNRA						229.0
RD- S10	High	Busega – Mpigi Expressway Construction Project	On-going	UNRA						196.8
RD- S11	High	Kampala – Jinja Expressway Construction Project	On-going	UNRA						800.0
RD- S12	High	Nakasero Bypass Expressway (Nakasero – Northern Bypass) Construction Project	On-going	UNRA						200.0
RD- S13	Middle	Project for Upgrading of Kyaliwajala – Kira – Matugga Road Road (including junctions along the road)	On-going	UNRA						54.3
RD- S14	Middle	Project for Upgrading of Najjanankumbi – Busabala Road (including junction signalisation)	On-going	UNRA						70.1
RD- S15	Middle	Project for Upgrading of Matugga – Wakiso – Buloba Road	On-going	UNRA						30.4
RD- S16	High	Project for Upgrading of Jokas – Namanve – Mukono Road	On-going	UNRA						13.0
RD- S17	Middle	Project for Upgrading of Natete – Nakawuka – Kisubi – Maya – Nakiwuogo Road	On-going	UNRA						91.9

Table 16.5.1	List of Priority Projects for 1	Transport Sector

-										
RD- S18	High	Project for Railway Station Access Roads Development	Proposed	Local Governments						111.0
RD- M1	High	Kampala-Bombo Expressway Construction Project	On-going	unra PPP						559.9
RD- M2	High	Kampala Outer Beltway Phase 1 (Kajjansi- Nsangi) Construction Project	On-going	UNRA PPP						246.4
RD- M3	High	Expressway R4 (Kampala – Wakiso – Kakiri) Construction Project	Proposed	UNRA PPP						256.9
RD- M4	High	Kampala – Mukono Expressway Construction Project (Bypass of Jinja Road and Kampala - Jinja Expressway)	Proposed	UNRA PPP						191.2
RD- M5	High	Urban Expressway (Nakasero Bypass – Southern Bypass Expressway) Construction Project	Proposed	UNRA PPP						110.9
RD- L1	High	Kampala Outer Beltway Phase 2 (Nsangi – Wakiso – Gayaza – Mukono – Muknyonyo) Construction Project	On-going	UNRA PPP						951.9
RD- L2	High	Expressway R6 (Kira – Kasaayi – Ngalama – Kigogola) Construction Project	Proposed	UNRA PPP						260.0
No	Priority	Traffic Management Subsector	Status	Organizations in Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2 6	Phase3 pad	Phase4 क	Phase5	Cost (million USD)
TM- S1	High	Project for Central Traffic Control Centre (Junction)	On-going	KCCA						18.8
TM- S2	High	Project for Parking Restrictions and Tax in CBD	On-going	KCCA						0.5
TM- M1	Middle	Boda-Boda Restriction Project	On-going	КССА						2.0
No	Priority	Public Transport Subsector	Status	Organizations in Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2 S	hedi Lhase3	Phase4	Phase5	Cost (million USD)
PT- S1	High	Uganda Railway Corporation Capacity Building Project	On-going	URC						366.3
PT- S2	High	BRT Pilot1 (CBD-Kajjansi) Development and Operation Project	On-going	MoWT KCCA						172.4
PT- S3	High	BRT Pilot2 (CBD-Mukono) Development and Operation Project	On-going	MoWT KCCA						270.9
PT- S4	High	BRT Pilot3 (CBD-Kasangati) Development and Operation Project	On-going	MoWT KCCA						184.7
PT- S5	High	BRT Kampala-Entebbe (along Expressway) Mixed Lane Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP						7.0
PT- S6	High	BRT Busega – Mpigi (along Busega – Mpigi Expressway) Mixed Lane Development and Operation Project	Proposed	MKCC&MA、MoWT PPP						6.2
PT- S7	High	BRT Inner-Beltway – Ring Road (Along Northern Bypass – Kampala Entebbe Expressway – Southern Bypass) Mixed Lane Development and Operation Project	Proposed	MKCC&MA、MoWT PPP						9.6
PT- S8	High	Bus and Taxi Service Improvement (Introduction of New Large or Middle size Buses)	Proposed	КССА						20.0
PT- S9	High	Project for Development of Multi-modal Transport Hubs	Proposed	URC, KCCA						400.0
PT- S10	Middle	Project for Development of Platform for Mobility-as-a-Service (MaaS)	Proposed	МКСС&МА						20.0

-	1				1	1	1	
PT- M1	High	Project for Upgrading of Existing Metre Gauge Railway Service	Proposed	URC				1,908.0
PT- M2	Middle	Dualisation of BRT Corridor Development and Operation Project	Proposed	MoWT				270.9
PT- M3	Middle	BRT Kampala – Entebbe (along Expressway) Dedicated Lane Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP				317.6
PT- M4	Middle	BRT Masaka Extension (CBD – Mpigi) Dedicated Lane Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				374.3
PT- M5	Middle	BRT CBD – Portbell Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				149.0
PT- M6	Middle	BRT Gayaza Extension (CBD – Kalagi) Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				395.2
PT- M7	Middle	BRT Jinja Extension (CBD – Mukono) Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				161.3
PT- M8	Middle	BRT Nansana – Wakiso – Kakiri Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				249.9
PT- M9	Middle	BRT Busega – Mpigi (along Busega – Mpigi Expressway) Dedicated Lane Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP				330.0
РТ- M10	Middle	BRT Nansana – Wakiso – Kakiri (along Expressway R4, Namungoona – Bujuko – Kakiri) Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP				246.2
РТ- M11	Middle	BRT CBD-Bombo (Along Bombo Expressway) Mixed Lane Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP				10.8
PT- M12	Middle	BRT Inner-Beltway – Ring Road (Along Northern BP – Kampala Entebbe Expressway – Southern BP) Dedicated Lane Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				776.9
PT- M13	Middle	BRT Kampala – Kasanje (along Nakawuka Road) Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				307.8
РТ- M14	Middle	BRT Masooli-Kagoma-Matugga (along Bombo Road) Development and Operation Project	Proposed	MKCC&MA、 MoWT PPP				251.2
РТ- M15	Middle	BRT Namboole – Namugongo – Seeta Development and Operation Project	Proposed	MKCC&MA、MoWT PPP				176.1
РТ- M16	Middle	Water Transport Development Project, Port Bell – Ggaba – Kigungu (Entebbe), Katosi - Port Bell	Proposed	MoWT PPP				270.0
РТ- M17	High	MRT Development Project (Kyengera – Namungoona – Bujuko – Kakiri) (along Expressway R4)	Proposed	MoWT PPP				1,861.9
PT- M18	High	LRT Development Project (Kampala – Kajjansi Metropolitan Centre)	Proposed	MoWT PPP				552.0
PT- L1	Middle	LRT Development Project (Kajjansi Metropolitan Centre – Entebbe Airport)	Proposed	MoWT PPP				900.0
PT- L2	Middle	Heavy Railway Development Project – Outer Beltway Ring Road, Along 1st Outer Belt Expressway (Kampala Freight Rail Bypass)	Proposed	MoWT				841.5
PT- L3	Middle	BRT Busega – Buloba (along Fort Portal Road) Development and Operation Project	Proposed	MoWT PPP				395.2
PT- L4	Middle	BRT CBD – Bombo (Along Bombo Expressway) Dedicated Lane Development and Operation Project	Proposed	MoWT PPP				582.3

				Organizations in		Sc	hedu	ıle		Cost
No	Priority	Non-motorised transport Subsector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	(million USD)
NM- S1	High	NMT Corridor Project	On-going	КССА						366.3

Source: JICA Expert Team

16.6 List of Priority Projects for Infrastructure Sectors

The Infrastructure Sectors include water supply, sewerage, drainage, power supply, ICT and solid waste management. Table 16.6.1 contains priority projects identified by sector.

				Organizations in		Sc	Schedule				
No	Priority	Water Supply Sector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)	
WS- 01	High	Lake Victoria Water and Sanitation Project	On-going	NWSC						225	
WS- 02	High	Wakiso West Water and Sanitation Project	On-going	NWSC						195	
WS- 03	High	Development of Water Supply System Piped from Deep Groundwater and Surface Water in Short and Medium-Term	Proposed	NWSC						85	
WS- 04	High	Establishment of Water Supply System Piped from WTP in Mukono, North-East Wakiso and North KCC	Proposed	MWE						136	
WS- 05	High	Establishment of Water Supply System Piped from WTP in West Wakiso and Mpigi	Proposed	NWSC						390	
WS- 06	Middle	Establishment of Water Supply System Piped from WTP in other than target areas of WS-04 and WS-05	Proposed	NWSC						228	
WS- 07	High	Connecting Primary Pipelines with Secondary and Tertiary Pipelines by NWSC Branch	Proposed	NWSC						-	
				Organizations in		Sc	hed	ule			
No	Priority	Sewerage Sector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)	
WW- 01	High	Project for Rehabilitation of Existing Sewer Network in Kampala Capital City	Proposed	NWSC KCCA						7	
WW- 02	High	Project for Implementation of Nalukolongo Wastewater Treatment Plant and Faecal Sludge Treatment Plan	On-going	NWSC KCCA						41	
WW- 03	High	Project for Sewer Network Densification in Kampala Capital City	Proposed	NWSC KCCA						209	
WW- 04	High	Project for Implementation of Ssumbwe Wastewater Treatment Plant and Ssumbwe Faecal Sludge Treatment Plant	Proposed	NWSC Wakiso District Kyengera Town						70	
WW- 05	High	Project for Implementation of Namanve Wastewater Treatment Plant	Proposed	UIA NWSC						70	
WW- 07	High	Project for Implementation of Mukono Faecal Sludge Treatment Plant	On-going	NWSC Mukono District Mukono Municipality						20	
WW- 10	Middle	Project for Implementation of Kira Faecal Sludge Treatment Plant	On-going	MWE Wakiso District Kira Municipality						20	
WW- 11	Middle	Project for Formulation of Sanitation Implementation Plans for Metropolitan Centres in GKUGA (Including review and Update of sanitation plan prepared by Support	Proposed	MWE MKCC&MA NWSC Wakiso District						2	

Table 16.6.1 List of Priority Projects of Infrastructure Sectors

		to Rural Towns Water and Sanitation Project		Mukono District						
WW-	Middle	Project for Upgrading Lubigi Wastewater	Proposed	NWSC						120
WW-	Middle	Project for Implementation of Entebbe	Proposed	NWSC						70
15 WW-		Wastewater Treatment Plant Project for Implementation of Mukono	-	Entebbe Municipality NWSC						10
16	Middle	Wastewater Treatment Plant	Proposed	Mukono Municipality						120
vvvv- 17	Middle	Project for Implementation of Kajjansi Wastewater Treatment Plant	Proposed	NWSC Kajjansi Town						70
WW- 19	Middle	Project for Implementation of Wakiso Wastewater Treatment Plant	Proposed	NWSC Wakiso Town						100
WW- 20	Middle	Project for Implementation of Makindye Wastewater Treatment Plant	Proposed	NWSC Makindye-Ssabagabo Municipality KCCA						200
WW- 23	Middle	Project for Upgrade of Nakivubo Wastewater	Proposed	NWSC						70
20		Troution () func		Organizations in		Sc	hed	ule		
No	Priority	Drainage Sector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)
DR- 01	High	Capacity Development for Collecting and Measuring Drainage-Related Data and Formulation of Drainage Master Plan for GKUGA	Proposed	MWE MKCC&MA						3.0
DR- 02	High	Improvement of Basic Drainage Facilities in GKUGA outside KCC	Proposed	District Local Governments						10.0-
DR- 03	High	Strengthening of Institutional Capacity for Drainage Sector for GKUGA outside KCC	Proposed	MoPS						3.0-
DR- 04	High	Continued Implementation of Projects Identified by Kampala Drainage Master Plan for Kampala Capital City	On-going	KCCA						-
				Organizations in		Sc	hed	ule		
No	Priority	Power Supply Subsector	Status	Private Sector Fund	hase1	hase2	ase3	ase4	se5	Cost (million USD)
				(including FFF)	Ъ	d	Чd	Ph	Pha	
PS- 01	High	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA)	Proposed	The Uganda Electricity Distribution Company Limited (UEDCL) PPP	Ъ	4	Чd	Ph	Pha	3.0
PS- 01 PS- 02	High Middle	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA) Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of GKUGA)	Proposed Proposed	The Uganda Electricity Distribution Company Limited (UEDCL) PPP UEDCL PPP	d.	d	Чd	³ 4d	Бна	3.0
PS- 01 PS- 02 PS- 03	High Middle Middle	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA) Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of <u>GKUGA)</u> Construction of Nakasamba D/S and Connected 33kV Incomers for Entebbe Area (for Entebbe Secondary Urban Centre of GKUGA)	Proposed Proposed Proposed	UEDCL PPP		d	44	ud d	eud	3.0 3.0 3.0
PS- 01 PS- 02 PS- 03 PW- 04	High Middle Middle High	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA) Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of GKUGA) Construction of Nakasamba D/S and Connected 33kV Incomers for Entebbe Area (for Entebbe Secondary Urban Centre of GKUGA) Construction of Bwebajja D/S and Connected 33kV Incomers for Bwebajja Area (for Kajjansi Metropolitan Centre of GKUGA)	Proposed Proposed Proposed	UEDCL PPP UEDCL PPP			P	Ph	Pha	3.0 3.0 3.0 2.0
PS- 01 PS- 02 PS- 03 PW- 04 PS- 05	High Middle Middle High	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA) Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of GKUGA) Construction of Nakasamba D/S and Connected 33kV Incomers for Entebbe Area (for Entebbe Secondary Urban Centre of GKUGA) Construction of Bwebajja D/S and Connected 33kV Incomers for Bwebajja Area (for Kajjansi Metropolitan Centre of GKUGA) Construction of Kigo D/S and Connected 33kV Incomers (for Kajjansi Metropolitan Centre of GKUGA)	Proposed Proposed Proposed Proposed	UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP				Ph	Pha	3.0 3.0 3.0 2.0 5.0
PS- 01 PS- 02 PS- 03 PW- 04 PS- 05 PS- 06	High Middle Middle High High	Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre of GKUGA) Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of <u>GKUGA)</u> Construction of Nakasamba D/S and Connected 33kV Incomers for Entebbe Area (for Entebbe Secondary Urban Centre of <u>GKUGA)</u> Construction of Bwebajja D/S and Connected 33kV Incomers for Bwebajja Area (for Kajjansi <u>Metropolitan Centre of GKUGA)</u> Construction of Kigo D/S and Connected 33kV Incomers (for Kajjansi Metropolitan Centre of <u>GKUGA)</u> Upgrading of Kakiri D/S and New Construction of 33kV Incomer from Kawaala T/S to Kakiri D/S (in Northwest Area of GKUGA)	Proposed Proposed Proposed Proposed Proposed	UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP UEDCL PPP			4	Ph	- Dha	3.0 3.0 3.0 2.0 5.0 3.0

				Organizations in		Schedule				
No	Priority	ICT Sector	Status	Charge/ Involvement of Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)
IT-01	High	Expansion of Wi-Fi Hotspots	On-going	Wi-Fi Service Providers						3.0
IT-02	High	Smartphone Application Easy Access of Citizens' Service	On-going (only KCCA)	MDAs, Local Governments						0.2
IT-03	High	Smartphone Application for Problem Reporting by the Citizens	Proposed	MDAs, Local Governments						0.2
IT-04	High	Cashless Payment for Public Transport	Proposed	Public Transport Companies						3.0
IT-05	Middle	Revenue Monitoring System	On-going (only KCCA)	Local Governments						0.3
IT-06	Middle	Establishment of Start-up Support Centre	Proposed	Ministry of Trade, Industry and Cooperatives						1.2
IT-07	High	Strengthening Online Learning Platform	On-going	National Information Technology (NITA-U) Ministry of Education						1.2
IT-08	Middle	Establishment of a Resource Centre	Proposed	NITA-U						1.2
IT-09	High	Establishment of Mini/Cottage ICT industry	Proposed	Ministry of Trade, Industry and Cooperatives						0.6
				Organizations in		Sc	hed	ule		
No	Priority	Solid Waste Sector	Status	Private Sector Fund (including PPP)	Phase1	Phase2	Phase3	Phase4	Phase5	Cost (million USD)
SW- 01	High	Formulation of Master Plan for Solid Waste Management System for GKUGA	Proposed	MKCC&MA, NPA, MoLG, MWE, KCCA, Wakiso District, Mukono District, Mpigi District						1.0
SW- 02	High	Capacity Development of Local Governments in Solid Waste Management System and Implementation of Master Plan for Solid Waste Management System	Proposed	MKCC&MA, NPA,MoLG, MWE, KCCA, Wakiso District, Mukono District, Mpigi District						2.0
SW- 03	High	Kampala Waste PPP Project: Ddundu landfill + Kiteezi Transfer Station and Waste Diversion Facility for KCC	On-going	KCCA, Wakiso District, Mukono District PPP						2025-2030: 60.6 2031-2040: 112.1 2041-2050: 131.4
SW- 04	Middle	Establishment of Transfer Station and Waste Diversion Facility for Mukono Metropolitan Centre	Proposed	MKCC&MA, Mukono District, Mukono Municipality PPP						2025-2030: 5.44 2031-2040:23.09 2041-2050:60.7
SW- 05	High	Establishment of Sanitary Landfill for East GKUGA	Proposed	MKCC&MA, Mukono District, Mukono Municipality PPP						2025-2030: 1.48 2031-2040: 5.61 2041-2050: 16.12
SW- 06	Middle	Establishment of Transfer Station and Waste Diversion Facility for Gayaza-Kasangati Metropolitan Centre	Proposed	MKCC&MA, Wakiso District, Kasangati Town PPP						2025-2030: 2.73 2031-2040:14.16 2041-2050: 36.85
SW- 07	Middle	Establishment of Transfer Station and Waste Diversion Facility for Matugga Metropolitan Centre	Proposed	MKCC&MA, Wakiso District, Nansana Municipality PPP						2025-2030: 2.05 2031-2040:8.01 2041-2050:18.96
SW- 08	Middle	Establishment of Transfer Station and Waste Diversion Facility for Wakiso Metropolitan Centre	Proposed	MKCC&MA, Wakiso District, Wakiso Town PPP						2025-2030: 3.01 2031-2040: 14.39 2041-2050: 40.04

SW-		Establishment of New Senitory Londfill		MKCC&MA, Wakiso		2025-2030: 2.10
	High	Disposal Site for Northwest GKUGA	Proposed	District		2031-2040: 8.90
09				PPP		2041-2050: 25.39
C/M/		Establishment of Transfer Station and Waste		MKCC&MA, Wakiso		2025-2030:4.51
3VV- 10	Middle	Middle Diversion Facility for Nsangi-Nakirebe F	Proposed	District, Kyengera Town		2031-2040:21.80
10		Metropolitan Centre		PPP		2041-2050:58.65
C/M/		Establishment of Transfer Station and Waste ddle Diversion Facility for Kajjansi Metropolitan	Proposed	MKCC&MA, Wakiso		2025-2030: 5.53
300-	Middle			District, Kajjansi Town		2031-2040:22.18
11		Centre		PPP		2041-2050:53.83
C/M/		Establishment of New Conitory Londfill		MKCCRMA Waking		2025-2030: 2.71
3VV-	High	Establishment of New Sanitary Landin	Proposed	NINGCAINA, WAKISO		2031-2040: 10.51
12	-	Disposal Site for Southwest GKUGA		District, wipigi District		2041-2050: 59.64

Note: The cost for SW-03 to SW-12 are capital costs and O&M cost are not included. Source: JICA Expert Team

Chapter 17 Profiles of Priority Projects in Greater Kampala Urban Growth Area (GKUGA) including Kampala Capital City (KCC)

17.1 Introduction

Priority projects were identified in each sector for implementing sector development strategies. High and medium priority projects were also selected out of the identified priority projects for achieving the development and management goas of GKUGA. See Section 16.3. In this chapter, profiles of high priority projects are presented.

17.2 Profiles of Priority Projects for Urban Development

17.2.1 Project for Capacity Development in Implementation of GKMA Integrated Urban Development Master Plan [UD-01]

(1) Rational

By the middle of year 2024, the Integrated Urban Development Master Plan for GKMA will be finaliesd and hopefully approved by appropriate government authorities. After the approval, it is time for a variety of local governments and MDAs to utilise the master plan and monitor the results of using the master plan.

In order to use the master plan, certain types of knowledges and skills are required. The master plan is a multi-sectoral one, containing new initiatives. It is necessary for concerned local government officers and MDA officers to learn the knowledge and skills and at the same time, to try to use such knowledge and skills for actual improvement of the urban situations in GKUGA. Therefore, training for concerned government officers need to be conducted through lectures and exercises, but also by conducting pilot projects in real settings.

(2) **Objectives**

- To enhance the capacity of local government officers, as well as MDA officers in understanding and utilising the master plan for sustainable urban development
- To enhance the capacity of local government officers in GKMA in formulating local-level detailed physical development plans (PDPs) in urban centres proposed by the master plan for promoting polycentric urban spatial structure of GKUGA
- To acquire the capacity of concerned government officers in improving public transportation situations by implementing experimental operation in selected areas
- To strengthen the capacity of local government officers and concerned MDA officers in implementing the enforcement activities against encroachment into wetlands by using the detailed PDPs and other available regulations on wetlands
- To improve the capacity of local government officers and concerned MDA officers in preventing the growth of emerging slums in suburban areas outside Kampala Capital City

(3) **Project Description**

Project for Capacity Development in Implementation of GKMA Integrated Urban Development Master Plan is to have the following components:

• Component 1: Enhancement of the Capacity for Coordination and Collaboration (through Activities of Technical Coordination Committee)

- Component 2: Enhancement of the Capacity for Formulation of Detailed Physical Development Plans (PDPs) for Metropolitan Centres (Kajjansi Metropolitan Centre, Mukono Metropolitan Centre, and Wakiso Metropolitan Centre), as well as Secondary Urban Centres (Luzira-Port Bell Secondary Urban Centre, Namanve Secondary Urban Centre and Entebbe-Katabi Secondary Urban Centre)
- Component 3: Enhancement of the Capacity for Introducing BRT Operation on Expressways (including Pilot Projects) including Coordination with ongoing BRT Pilot Project
- Component 4: Enhancement of the Capacity for Identification of Areas of Emerging Slums and Action Planning for Prevention of Growth of Emerging Slums (including Pilot Projects)
- Component 5: Enhancement of the Capacity for Enforcement of Development Control for Wetlands (District Office, Sub County Office in Wakiso, Mukono and Mpigi)

Capacity development activities will be organised by providing lectures to trainees but also by conducting hands-on pilot activities in real settings.

The formulated local-level detailed PDPs for urban centres will be used for implementing various infrastructure and service development.

The BRT operation on expressways will be experimented on Busega-Mpigi Expressway under the coordination of Ministry of Works and Transport and Mpigi District, Wakiso District and KCCA.

(4) Expected Benefits

- The project will attract more investment and technical support to the effort of promoting the implementation of various priority projects in the master plan.
- The project will increase the number of job opportunities, commercial facilities and service providers in targeted urban centres, so that local residents could rely not only on nearby urban centres for getting commercial facilities and service providers, but also on getting job opportunities.
- The project will promote the betterment of the quality of life in terms of less dependence on the urban core of Kampala, utilisation of convenient and comfortable public transportation (BRT) in GKUGA.
- The project will reduce the risk of growing slums near urban centres outside the Kampala Capital City within GKUGA.
- The project will reduce the risk of encroachment of people and businesses into wetlands near urban centres near urban centres outside Kampala Capital City.

(5) Executing Agency and Related Organisations

- Ministry of Kampala Capital City & Metropolitan Affairs (Leader)
- Ministry of Lands, Housing and Urban Development (Co-Leader)
- Ministry of Works and Transport
- Ministry of Water and Environment
- Kampala Capital City Authority (KCCA)
- Mukono District Local Government
- Wakiso District Local Government
- Mpigi District Local Government
- Other Related Municipalities

(6) Estimated Project Cost

3.0 million USD

(7) Implementation Schedule

2025-2030 Short Term

(8) Necessary Actions for Implementation / Critical Factor

- Approval of the GKMA-IUDMP by National Physical Planning Board
- Approval of the GKMA-IUDMP by the Cabinet of Ugandan Government
- Continued activities of Technical Coordination Committee for promoting the implementation of the GKMA-IUDMP

(9) Related Plans and Projects

• World Bank Supported "GKMA Urban Development Programme"

(10) Social and Environmental Impacts

The following social impacts could arise:

• Potential impacts on affected communities by promotion of urban centre development

The following environmental impacts could arise:

• Potential impacts on nearby water sources by urban centre development

17.2.2 Project for Urban Centre Development in Greater Kampala Urban Growth Area (GKUGA) : Combining [UD-02][UD-03][UD-04][UD-07][UD-15]

(1) Rational

In accordance with a road map shown by the Integrated Urban Development Master Plan for GKMA, concerned government officers (local governments and MDA officers) related to GKMA need obtain necessary knowledge and skills for implementing various actions and projects proposed by the master plan. At the same time, to increase the impact of using the master plan, it is necessary to implement relatively larger scale of projects including capital investment. This programme is composed of different types of projects to realise the development of urban centres and eventually leading to the formation of polycentric urban spatial structure.

By 2040, the GKUGA will reach 10 million population. Then it would become very difficult for the GKUGA to maintain comfortable social life activities and efficient economic activities without proper intervention in the formation of urban centres outside the KCC.

It is necessary to implement effective and substantial interventions in promotion of urban centre development outside the KCC for the formulation of polycentric urban spatial structure in the GKUGA.

(2) **Objectives**

• To embark on the development of urban centres, especially metropolitan centres and secondary urban centres, and CBD expansion in GKUGA

(3) **Project Description**

This Urban Centre Development Programme has target urban centres and target components of intervention. This project aims to integrate and implement the priority projects [UD-02], [UD-03], [UD-04], [UD-07] and [UD-15].

1) Target Urban Centres

The target urban centres of this programme are two kinds. The ones are Secondary Urban Centres. The others are Metropolitan Centres. In the first phase of this programme, the following Secondary Urban Centres and Metropolitan Centres are targeted:

- Secondary Urban Centre: Busega-Kyengera Secondary Urban Centre
- Metropolitan Centres: Kajjansi Metropolitan Centre, Mukono Metropolitan Centre, and Wakiso Metropolitan Centre

2) Target Components

This programme has the following seven target components of interventions:

- Component 1: Formulation of a Detailed PDP for Urban Centre Areas
- Component 2: Local Roads and Drainage Facilities Development for Urban Centre Areas
- Component 3: Multi-Modal Terminal Development Integrating Taxi Park, BRT Station and Other Modes' Stations in Urban Centre Areas
- Component 4: Commercial Centre Development in combination with the Multi-Modal Terminal (PPP)P) in Urban Centre Areas
- Component 5: Development of Open Space and Pedestrian Ways in Urban Centre Areas
- Component 6: Provision of Basic Infrastructure for Preventing the Growth of Emerging Slums in and around Urba Centre Areas
- Component 7: Other Environmental Management Matters

(4) Expected Benefits

The project will increase the number of job opportunities, commercial facilities and service providers in targeted urban centres, so that local residents could rely not only on nearby urban centres for getting commercial facilities and service providers, but also on getting job opportunities.

The project will promote the betterment of the quality of life in terms of less dependence on the urban core of Kampala, utilisation of convenient and comfortable public transportation (BRT) in GKUGA.

(5) Executing Agency and Related Organisations

- Ministry of Kampala Capital City & Metropolitan Affairs (Leader)
- Ministry of Works and Transport (Co-Leader)
- Ministry of Lands, Housing and Urban Development (Co-Leader)
- Ministry of Water and Environment
- Kampala Capital City Authority (KCCA)
- Mukono District Local Government
- Wakiso District Local Government
- Mpigi District Local Government
- Other Related Municipalities

(6) Estimated Project Cost

36.0-50.0 million USD

(7) Implementation Schedule

2026-2031 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Design and plan local road betterment and new construction
- Acquire necessary land and relocate affected utilities

(9) Related Plans and Projects

• World Bank Supported "GKMA Urban Development Programme"

(10) Social and Environmental Impacts

The following social impacts could arise:

• Potential impacts on affected communities by promotion of urban centre development

The following environmental impacts could arise:

• Potential impacts on nearby water sources by urban centre development

17.3 **Profiles of Priority Projects for Transport Sector**

17.3.1 Project for Capacity Improvement and Signalisation of Kampala – Gayaza Road [RD-S1]

(1) Rational

The Project for capacity improvement and signalisation of Kampala-Gayaza Road aims to enhance the road's infrastructure and traffic management systems, addressing increased traffic volume, capacity enhancement, improved safety, efficient traffic management, economic benefits, environmental considerations, and social benefits. By widening the road, adding lanes, and installing a signalization system, the project will reduce congestion and travel times, minimize accidents, and prioritize pedestrian and public transport movements. The project will also promote economic growth, mitigate environmental impacts, and improve access to social services, education, and employment opportunities, ultimately creating a safer, more efficient, and sustainable transportation system that supports the region's development.

(2) **Objectives**

- To enhance the road's capacity to accommodate the growing traffic volume, reducing congestion and travel times.
- To enhance safety features to minimize accidents, ensuring a safer environment for all road users, including pedestrians, cyclists, and motorists.
- To implement an intelligent signalization system to regulate traffic flow, prioritize pedestrian and public transport movements, and reduce conflicts between different road users.
- To reduce travel times and improve journey reliability, making the road more attractive for commuters, public transport, and freight operators.
- To facilitate economic development by improving connectivity, enhancing trade, and promoting business growth in the region.
- To incorporate environmental mitigation measures to minimize the impact on surrounding ecosystems and communities.
- To improve access to social services, education, and employment opportunities, enhancing the overall quality of life for residents and commuters.
- To enhance pedestrian and cyclist facilities, promoting a more inclusive and sustainable transportation system.

(3) **Project Description**

The project for Capacity Improvement and Signalisation of Kampala-Gayaza Road aims to upgrade and enhance the existing road infrastructure to address growing traffic demands, improve safety, and promote economic growth.

The target road is as shown in Figure 17.3.1 with a total length of 15km.

The project involves: Widening the road from 2 to 4 lanes, installing an intelligent signalization system, constructing pedestrian and cyclist infrastructure, enhancing safety features implementing environmental mitigation measures and Improving drainage and utility services.

Source: JICA Expert Team

Figure 17.3.1 Project Location of the Project for Capacity Improvement and Signalisation of Kampala – Gayaza Road [RD-S1]

(4) Expected Benefits

The project will reduce congestion, travel times, and accidents while increasing capacity, the safety of both car users and NMT users, and economic opportunities, ultimately enhancing the overall quality of life for commuters and residents.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

18.0 million USD

(7) Implementation Schedule

2024-2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Design and plan the road widening and signalization system.
- Acquire necessary land and relocate affected utilities.
- Construct new lanes, pedestrian, and cyclist infrastructure.
- Install intelligent signalization systems and safety features.
- Implement environmental mitigation measures.
- Coordinate with stakeholders, including local communities and businesses.
- Ensure adequate funding and resource allocation.
- Establish a robust project management and monitoring system.
- Conduct regular maintenance and evaluation.
- Ensuring synergy with existing infrastructure and future development plans.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Potential impacts on affected communities with displacement.
- Increased traffic noise.
- Potential increase in air pollution.

The following environmental impacts could arise:

- Potential increase in air pollution.
- Increased traffic noise.
- Potential impacts on nearby water sources.
- Acquisition of land and potential displacement of natural habitats.
- Potential increase in greenhouse gas emissions.

17.3.2 Project for Capacity Improvement and Signalisation of Kampala – Buloba Road [RD-S2]

(1) Rational

The Project for Capacity Improvement and Signalisation of Kampala-Buloba Road is a crucial transportation infrastructure development that aims to address the growing traffic demands, safety concerns, and economic importance of the route. With a significant increase in traffic volume, poor road design, and inadequate safety features, the road has become a concern for the users. The project will widen the road, improve safety features, and install an intelligent signalization system, reducing travel times, congestion, and accidents, while enhancing mobility and accessibility for all road users. By incorporating green technologies and sustainable practices, the project will mitigate environmental impacts, ensuring a safer, more efficient and sustainable transportation system that supports urbanization, economic development, and long-term sustainability.

(2) Objectives

- To increase the road's capacity to accommodate growing traffic demands, reducing congestion and travel times.
- To improve road safety by enhancing safety features, reducing accident rates, and minimizing risks to all road users.
- To enhance mobility and accessibility for all road users, including pedestrians, cyclists, and public transport users.
- To reduce travel times and delays, making the road more efficient and attractive for commuters and businesses.
- To support economic growth and development in the region by improving connectivity and facilitating trade.
- To mitigate environmental impacts by incorporating green technologies and sustainable practices.

(3) **Project Description**

The Project for Capacity Improvement and Signalisation of Kampala-Buloba Road is a vital transportation infrastructure upgrade aimed at enhancing the safety, efficiency, and sustainability of the critical Kampala-Buloba route. The target road section is as shown in Figure 17.3.2 with a length of 12km.

The project includes widening the road, installing an intelligent signalisation system, and constructing pedestrian and cyclist infrastructure.

Source: JICA Expert Team

(4) Expected Benefits

The project will significantly reduce congestion and travel times, minimize accidents, and promote economic growth and development in the region. There will be an increase in business and employment opportunities. With a focus on environmental sustainability, the project incorporates green technologies and pollution reduction measures, ensuring a safer and more efficient transportation system for users. Upon completion, the project will support the country's rapid urbanization and economic development while improving the overall quality of life for citizens.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

15.0 million USD

(7) Implementation Schedule

2024-2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Design and plan the road widening and signalisation system.
- Acquire necessary land and relocate affected utilities.
- Construct new lanes, pedestrian, and cyclist infrastructure.
- Install intelligent signalisation systems and safety features.
- Implement environmental mitigation measures.
- Coordinate with stakeholders, including local communities and businesses.
- Ensure adequate funding and resource allocation.
- Establish a robust project management and monitoring system.
- Ensuring synergy with existing infrastructure and future development plans.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Potential impacts on affected communities.
- Increased traffic noise.
- Potential increase in air pollution.

The following environmental impacts could arise:

- Potential increase in air pollution.
- Increased traffic noise.
- Potential impacts on nearby water sources.
- Acquisition of land and potential displacement of natural habitats.

17.3.3 Project for Implementation of Kibuye-Busega Expressway [RD-S9]

(1) Rational

The construction of the Kibuye-Busega Expressway is a crucial infrastructure project that will revolutionize the connectivity and development of the primary urban centres/CBD of Kampala, as well as the secondary urban centre of Busega-Kyengera, Nsangi Metropolitan Centre, Kiringente Suburban Centre, Mpigi Suburban Centre, Buwama Service Centre, Bujuko Suburban Centre and Zana Urban Sub-Centre. By providing a high-speed transportation link between these urban centres, the expressway will enhance economic opportunities, reduce travel time, and improve the quality of life for residents. The project will also support urbanization, promote regional integration, and create jobs while incorporating safety features and environmental considerations. The expressway will also improve access to the primary urban centre/CBD, making it easier for people to access amenities, services, and opportunities, and strengthening its position as the economic and commercial hub of the region.

(2) **Objectives**

- To ease the flow of traffic in the metropolitan areas by connecting the CBD to the expressways of Busega Mpigi, Kampala Entebbe and Kampala Northern Bypass hence reducing traffic congestion.
- To facilitate trade and commerce by providing a faster and more efficient route for goods and services.
- To reduce travel time allowing people to spend more time on productive activities.
- To contribute to economic growth by providing a modern and efficient transportation infrastructure.

(3) **Project Description**

The Kibuye-Busega Expressway is a project that will connect KCC and the surrounding suburbs to a network of expressways at Busega Roundabout. (See Figure 17.3.3.) The length of the expressway is 8km along Masaka Road and is designed with a dual carriageway.

The implementing institutions are still soliciting a funder.

Source: JICA Expert Team

Figure 17.3.3 Project Location of Kibuye-Busega Expressway [RD-S9]

(4) Expected Benefit

The project is intended to ease traffic flow and reduce the usually heavy traffic through the metropolitan areas along the Kampala - Masaka routes.

The following benefits are also expected:

- The project may create jobs and stimulate local economic growth.
- The expressway will enhance connectivity and accessibility for residents, businesses, and services.
- Property values may increase due to improved infrastructure and connectivity.
- The expressway may reduce travel time, improving the quality of life for commuters.
- The expressway may reduce congestion and emissions from vehicles, improving air quality.
- Proper waste management and disposal practices may be implemented during construction and operation.
- The project may lead to increased environmental monitoring and awareness.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

229.0 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Government commitment and support are crucial for the project's success.
- Thorough planning and design are necessary to ensure a safe, efficient, and sustainable expressway.
- Fair and transparent land acquisition and resettlement processes are critical for affected communities.

- Securing sufficient funding from government, private investors, or international agencies is vital.
- Identifying and addressing potential environmental impacts is essential.
- Open communication and engagement with affected communities and stakeholders are crucial.
- Ensuring high-quality construction and materials is vital for the expressway's durability and safety.
- Implementing effective traffic management and safety measures is critical during construction and operation.
- Regular monitoring and evaluation are necessary to assess the project's progress, impact, and performance.
- Effective collaboration among government agencies, contractors, and stakeholders is essential.
- Leveraging modern technologies, such as intelligent transportation systems, can enhance the expressway's efficiency and safety.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Affected communities may be displaced, requiring fair resettlement and compensation.
- Noise pollution from the expressway may affect nearby residents' health and quality of life.
- Construction may disrupt community activities and social structures.

The following environmental impacts could arise:

- The project may disrupt natural habitats and lead to biodiversity loss.
- Construction and traffic may generate air and noise pollution.
- Construction and runoff may contaminate nearby water sources.
- The project may contribute to greenhouse gas emissions and climate change.

17.3.4 Project for Implementation of VVIP Expressway (Nakasero-Northern Bypass Expressway) [RD-S12]

(1) Rational

The project's rationale is to alleviate congestion in Kampala city towards the North. The Nakasero-Northern Bypass Expressway, also known as the VVIP Expressway, is a planned road project that aims to connect the primary urban centres in Kampala to the Nansana Urban Sub-Centre, Kawempe Urban Sub-Centre, Wakiso Metropolitan Centre, Matugga Metropolitan Centre, Gayaza Metropolitan Centre, Kakiri Suburban Centre and Migadde Suburban Centre. The expressway also can be utilized for the bus on expressway which strategically serves the north-south passenger movement of the CBD.

(2) **Objectives**

- To reduce traffic congestion in Kampala by providing an alternative route to the city centre.
- To reduce travel time for commuters travelling from the northern parts of the city to the city centre.
- To stimulate trade and economic development by providing a faster and more efficient route for goods and services.
- To enhance regional integration by providing a faster and more efficient route for goods and services between Kampala and other regional cities.

(3) **Project Description**

The VVIP Expressway in Kampala, also known as the Nakasero-Northern Bypass Express Route, is a planned expressway that will start at Garden City Roundabout along Yusuf Lule Road and connect through Fairway junction to Mulago then Northern Bypass at Bwaise. (See Figure 17.3.4.) The expressway is a four-lane road with a total length of 5km.

Figure 17.3.4 Project Location of VVIP Expressway (Nakasero-Northern Bypass Expressway) [RD-S12]

The project's design is completed, and it is awaiting funding.

(4) Expected Benefits

The following benefits are expected:

- Improved connectivity and accessibility to key destinations.
- Enhanced economic growth and development through increased mobility and trade.
- Creation of jobs and stimulation of local businesses.
- Reduced travel times and increased productivity.
- Improved safety and reduced congestion on existing roads.
- Elevated structures to reduce environmental negative impacts.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

200.0 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Secure funding and financing arrangements.
- Acquire necessary land and properties.
- Obtain necessary permits and approvals.
- Install intelligent transportation systems (ITS) for monitoring and management.
- Conduct public awareness and stakeholder engagement campaigns.
- Political will and government support.
- Environmental and social impact considerations.
- Long-term maintenance and sustainability plans.

(9) Related Plans and Projects

• BRT CBD Port Bell [PT-M5]

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of communities and businesses due to land acquisition.
- Increased air and noise pollution from vehicle emissions.
- Impact on traditional livelihoods and cultural heritage through relocations and displacement.

The following environmental impacts could arise:

- Loss of natural habitats and biodiversity due to land acquisition.
- Increased greenhouse gas emissions and contribution to climate change.
- Impact on local ecosystems and wildlife.

17.3.5 Project for Upgrading of Jokas-Namanve-Mukono Road [RD-S16]

(1) Rational

The upgraded Jokas-Namanve Road will serve as a strategic alternative route to the existing Jinja-Kampala Highway, from Bweyogerere through Namanve to Mukono Town offering a reliable and efficient option for commuters, freight transporters, and tourists. By alleviating traffic pressure on the main highway, the new route will reduce congestion and travel times, while also enhancing regional accessibility and promoting economic development. As a vital transportation artery, the upgraded road will ensure the region remains connected during road maintenance or disruptions, unlocking economic potential and supporting the growth of industries, agriculture, and tourism. This route will enhance connectivity of Primary Urban Centres to Namanve Secondary Urban Centre, Mukono Metropolitan Centre and Namataba Suburban Centre.

(2) **Objectives**

- To provide a strategic alternative route to the existing Jinja-Kampala highway.
- To offer a reliable and efficient transportation option for commuters, freight transporters, and tourists.
- To alleviate traffic pressure on the main highway and reduce congestion and travel times.
- To enhance regional accessibility and connectivity.
- To promote economic development and unlock economic potential.
- To support the growth of industries, especially in Namanve Industrial Park.
- To ensure the region remains connected during road maintenance or disruptions.
- To improve the overall quality of life for residents and users.

(3) **Project Description**

The Project for Upgrading of Jokas-Namanve Road aims to transform the existing road into a modern, efficient, and safe transportation artery, providing a strategic alternative route to the Mukono/Jinja-Kampala Highway. (See Figure 17.3.5.) The total length of the target road is 14km.

Source: JICA Expert Team

Figure 17.3.5 Project Location of Project for Upgrading of Jokas-Namanve-Mukono Road [RD-S16]

(4) Expected Benefits

The project will enhance regional connectivity, reduce travel times, and promote economic development, supporting the growth of industries, agriculture, and tourism in the region.

The following benefits are expected:

- The project will generate employment opportunities for residents.
- The upgraded road will enhance connectivity and access to social services, markets, and employment opportunities.
- Improved road conditions and reduced travel time will reduce the fuel cost of vehicles which leads to a reduction of CO₂ emissions from vehicles.

(5) **Executing Agency and Related Organisations**

Uganda National Roads Authority and Ministry of Works and Transport

Estimated Project Cost (6)

13.0 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) **Necessary Actions for Implementation / Critical Factor**

- Have a detailed design and engineering study.
- Secure funding and financing arrangements.
- Acquire necessary land and properties.
- Upgrade existing infrastructure.
- Install safety features and traffic management systems.
- Implement efficient drainage and erosion control measures.
- Implement environmental and social impact mitigation measures.
- Political will and government support.
- Effective project management and coordination.
- Public engagement and stakeholder participation.

• Long-term maintenance and upkeep plans.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Residents and businesses in the project area will be displaced or affected by the construction process.
- Construction and increased traffic may lead to higher noise levels along this road.

The following environmental impacts could arise:

• The project may affect the Namanve Wetland, potentially leading to habitat loss, biodiversity reduction, and water pollution.

17.3.6 Project for Railway Station Access Roads Development [RD-S18]

(1) Rational

The Project for Railway Station Access Roads Development along the Mukono-Kampala, Kampala-Port Bell, and Kampala-Kyengera Railway lines is to improve access to railway stations and halts enhancing the overall passenger experience and promoting the use of rail transport. The development of access roads will provide safe and efficient entry and exit points to stations and halts, reduce congestion and enhance the overall connectivity of the railway network, making it easier for people and goods to reach their destinations.

(2) **Objectives**

- To improve safety and accessibility to railway stations and halts.
- To enhance passenger experience and convenience.
- To reduce congestion and improve traffic flow.
- To increase connectivity and mobility.
- To promote the use of rail transport.
- To support economic growth and development.
- To enhance the overall efficiency of the railway network.

(3) **Project Description**

Railway Station Access Roads Development is a transportation infrastructure upgrade aimed at enhancing the safety, accessibility, and efficiency of roads leading to railway stations, thereby improving the overall passenger experience, reducing congestion, and promoting the use of rail transport, ultimately supporting economic growth and development in surrounding areas.

(4) Expected Benefits

The Railway Station Access Roads Development is expected to bring numerous benefits, including improved safety and accessibility, enhanced passenger experience, reduced congestion, and increased connectivity and mobility. This development will also boost local economic growth, increase the use of rail transport, reduce travel times, and improve air quality. Additionally, it will enhance integration with other transportation modes, support urban growth, increase property values, and create job opportunities, ultimately having a positive impact on the environment, economy, and quality of life for users and local communities.

(5) Executing Agency and Related Organisations

• Local Governments
(6) Estimated Project Cost

111.0 million USD

(7) Implementation Schedule

2024-2030 Short-Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and impact assessments.
- Secure funding and resources.
- Obtain necessary permits and approvals.
- Engage with stakeholders and local communities.
- Design and plan access roads and infrastructure.
- Acquire land and relocate project-affected persons and utilities if necessary.
- Construct and upgrade access roads and infrastructure.
- Implement traffic management and safety measures.
- Monitor and evaluate progress and impact.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Improved accessibility and mobility for passengers.
- Increased economic opportunities and job creation
- Potential displacement of residents and businesses (if relocation is necessary)
- Potential increase in noise and air pollution.

The following environmental impacts could arise:

- Air pollution reduction through increased use of rail transport
- Noise pollution reduction through improved road design
- Increased energy efficiency through improved infrastructure
- Potential for increased greenhouse gas emissions during construction
- Impact on local wildlife and ecosystems with potential habitat destruction

17.3.7 Project for Uganda Railways Corporation Capacity Building [PT-S1]

(1) Rational

The Project for Uganda Railways Corporation Capacity Building is a strategic initiative aimed at enhancing the capacity and efficiency of the national railway network, thereby boosting economic growth, regional integration, and sustainable development. By upgrading infrastructure, improving safety standards, and developing staff skills, the project will increase cargo volume, reduce transportation costs, and enhance Uganda's competitiveness in the regional rail transport market.

This project will improve rail transport while linking the primary urban centres to Namanve Secondary Urban Centres Mukono Metropolitan Centre in the east direction Luzira-Port Bell Secondary Urban Centre in the southeast direction and Busega-Kyengera Secondary Urban Centre in the west direction. It is expected that this improved rail transport will provide reliable urban transport connecting these urban centres. This project will also create new employment opportunities, generate government revenue, and contribute to environmental sustainability by reducing reliance on road transport. The project is set to revolutionize the country's rail transport sector, positioning Uganda as a regional hub for trade and commerce. Ultimately, the project will play a vital role in supporting Uganda's economic development and regional integration, aligning with the East African Community's (EAC) goals and promoting sustainable development.

(2) **Objectives**

- To increase the capacity of Uganda Railways Corporation (URC) to handle cargo and passenger traffic.
- To improve the efficiency and effectiveness of URC's operations.
- To enhance the safety standards of URC's operations.
- To develop the skills and competencies of URC staff.
- To upgrade and modernize URC's infrastructure and equipment.
- To reduce transportation costs and increase competitiveness.
- To increase government revenue through increased cargo volumes and improved operational efficiency.
- To promote regional integration and trade through improved rail connectivity.

(3) **Project Description**

The Project for Uganda Railways Corporation Capacity Building is a comprehensive initiative aimed at transforming the national railway network into a modern, efficient, and safe transportation system.

The project entails the refurbishment of the Namanve - Kampala, Namanve - Tororo, Kampala - Port Bell and Kampala - Kyengera Railway line. The total length is 92km. (See Figure 17.3.6.)

The project will upgrade and modernize infrastructure, equipment, and human resources, increasing cargo handling capacity, improving safety standards, and reducing transportation costs.



Source: JICA Expert Team

Figure 17.3.6 Project Location of Railway Lines to be Uganda in the Project for Railways Corporation Capacity Building

(4) Expected Benefits

By providing a sufficient and efficient urban public transport system, the transportation services and accessibility within GKUGA will be improved contributing to enhanced economic growth and development which can create employment opportunities.

By enhancing regional integration and trade, the project will promote economic growth, competitiveness, and customer satisfaction, ultimately contributing to Uganda's sustainable development.

(5) Executing Agency and Related Organisations

- Uganda Railways Corporation
- Ministry of Works and Transport

(6) Estimated Project Cost

366.3 million US dollars

(7) Implementation Schedule

2024-2030 Short-Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct a thorough needs assessment and feasibility study.
- Develop a comprehensive project plan and timeline.
- Establish a dedicated project management team.
- Secure funding and resources.
- Upgrade and modernize infrastructure (tracks, signals, bridges).
- Procure new rolling stock and equipment.
- Develop and implement a staff training and development program.
- Enhance safety standards and protocols.
- Implement efficient operating procedures and systems.
- Monitor and evaluate project progress and impact.
- Strong political will and support.
- Effective project management and coordination.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• Potential displacement of small-scale farmers and artisans

The following environmental impacts could arise:

- Disruption of natural water sources and drainage systems
- Potential destruction of natural habitats and ecosystems

17.3.8 Project for BRT-Pilots (CBD-Kajjansi, CBD-Mukono and CBD-Kasangati) [PT-S2], [PT-S3] and [PT-S4]

(1) Rational

The Bus Rapid Transit (BRT) system aims to provide efficient public transportation and reduce congestion in the GKMA with the BRT – Pilot 1, (CBD-Kajjansi) linking the Primary urban centres to the direction of Kajjansi Metropolitan Centre, Zana Urban Sub Centre and Munyonyo Urban Sub-centre, the BRT-Pilot 2 (CBD-Mukono) linking the Primary Urban Centres to

Namanve Secondary Urban Centre, Kira Urban Sub centres and Mukono Metropolitan Centre, the BRT-Pilot 3 (CBD-Kasangati) linking the Primary Urban Centres to Kawempe Urban Sub-Centre and Matugga Metropolitan Centre.

(2) Objectives

- To reduce carbon emissions and promote sustainable transportation in Kampala.
- To reduce traffic congestion in Kampala by providing an efficient and reliable public transportation system.
- To provide mass transportation to de-congest the city, at lower transport fares.
- To implement a pilot project to test the feasibility and effectiveness of the BRT system in Kampala.

(3) **Project Description**

The BRT system for Kampala City aims to alleviate congestion in the Greater Kampala Metropolitan Area (GKMA) by providing efficient public transportation and reducing congestion. The system will be designed to reflect current and expected travel needs in GKMA, with a detailed design update previously prepared in 2014. The government of Uganda has invited consultants to express interest in updating the detailed design of the BRT system, which will feature dedicated bus lanes, modern buses, and efficient payment systems.

The main objective of the BRT system is to provide a reliable, safe, and comfortable transportation service, reducing travel times while also promoting economic growth and development in the GKMA. 14km of the BRT only within the jurisdiction area of KCCA will be implemented during the pilot phase (Phase 1) with the phase considering the routes of Pilot 1 (CBD-Kajjansi), Pilot 2 (CBD-Mukono) and Pilot 3 (CBD-Kasangati). 42km of dedicated BRT is foreseen after the implementation of all four phases are implemented. (See Figure 17.3.7.)



Source: JICA Expert Team

Figure 17.3.7 Project Location for BRT-Pilots (CBD-Kajjansi, CBD-Mukono and CBD-Kasangati) [PT-S2], [PT-S3] and [PT-S4]

(4) Expected Benefits

The following benefits are expected:

- The BRT system will create new job opportunities and stimulate local economic growth.
- The BRT system will provide efficient public transportation, improving mobility and accessibility for residents, especially those with disabilities.
- The BRT system will reduce travel times and congestion, improving the overall quality of life for commuters.
- The BRT system will reduce noise pollution by promoting the use of modern and efficient buses.
- The BRT system will reduce greenhouse gas emissions by promoting the use of modern and efficient buses.

(5) Executing Agency and Related Organisations

- Kampala Capital City Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

- BRT Pilot (CBD-Kajjansi) 172.4 million US dollars
 - BRT Pilot (CBD-Mukono) 270.9 million US dollars
- BRT Pilot (CBD-Kasangati) 184.7 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Update the detailed design and planning of the BRT system to reflect current and expected travel needs in Kampala.
- Engage with stakeholders, including residents, businesses, and transport operators, to ensure a smooth implementation process.
- Establish a clear institutional framework for the management and operation of the BRT system.
- Secure sufficient funding and financing for the implementation and operation of the BRT system.
- Acquire the necessary land and relocate affected residents and businesses.
- Develop the necessary infrastructure, including bus lanes, stations, and depots.
- Procure modern and efficient buses for the BRT system.
- Implement an efficient payment system for the BRT system.
- Conduct public awareness and education campaigns to inform residents and transport operators about the BRT system.
- Regularly monitor and evaluate the implementation and operation of the BRT system to ensure its effectiveness.
- Build the capacity of the implementing agency and other stakeholders to manage and operate the BRT system effectively.
- Leverage technology and innovation to improve the efficiency and effectiveness of the BRT system.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• The BRT system may require the relocation of residents and businesses, potentially leading to displacement and social disruption.

17.3.9 Project for Implementation of Mixed Lane for BRT Kampala-Entebbe (along Expressway) [PT-S5]

(1) Rational

The Bus Rapid Transit (BRT) system aims to provide efficient public transportation with reduced travel time and reduce congestion along Kampala-Entebbe direction with the BRT – linking Busega – Kyengera Secondary Urban Centre and the Primary urban centres to Zana Urban Sub centre, Kajjansi Metropolitan Centre and Entebbe Secondary Urban Centre.

(2) Objectives

- To reduce the travel time of public transport between Kampala and Entebbe.
- To provide scheduled public transport services between Kampala and Entebbe.
- To reduce traffic congestion along Kampala Entebbe roads by providing an efficient and reliable public transportation system.
- To provide high-capacity transport that can carry more people and is cheaper on a large scale.
- To reduce carbon emissions and promote sustainable transportation between Kampala and Entebbe.

(3) **Project Description**

The Project for the Implementation of Mixed Lane BRT Kampala-Entebbe aims to develop an efficient and sustainable public transportation system along the Kampala-Entebbe Expressway. (See Figure 17.3.8.) The total length of this BRT route is 26km. The project will integrate BRT lanes with existing traffic lanes, enhancing mobility and reducing congestion.

The design of the expressway will be slightly modified to incorporate bus stops along the expressway for passenger boarding and alighting.



Source: JICA Expert Team

Figure 17.3.8 Project Location of Mixed Lane for BRT Kampala-Entebbe (along Expressway) [PT-S5]

(4) Expected Benefits

The following benefits are expected:

- Improved mobility for residents and commuters
- Reduced travel times and increased reliability
- Enhanced quality of life and economic opportunities
- Increased safety and security features
- Reduced greenhouse gas emissions and air pollution

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

7.0 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Develop a comprehensive BRT plan and design.
- Secure funding and financing arrangements.

- Acquire necessary land and properties for BRT bus stations.
- Construct bus stations.
- Procure BRT-compatible buses and equipment.
- Implement intelligent transportation systems (ITS) and fare collection systems.
- Develop and implement operational plans and schedules.
- Provide public education and awareness campaigns.
- Ensure effective maintenance and upkeep arrangements.
- Political will and government support.
- Effective project management and coordination.
- Technical expertise and capacity building.
- Safety and security considerations.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of informal settlements and businesses at station locations along the expressway
- Potential job losses among informal transport operators like taxi drivers

17.3.10 Project for Implementation of Mixed Lane for BRT Busega-Mpigi (along Busega-Mpigi Expressway) [PT-S6]

(1) Rational

The implementation of a mixed-lane BRT system along the Busega-Mpigi Expressway offers a cost-effective and efficient solution to enhance public transportation along the Kampala Mpigi direction. By allowing buses and other vehicles to share lanes, the capacity of the road is increased, reducing congestion and travel times. This approach also promotes flexibility in traffic management, accommodates changing traffic patterns, and enhances connectivity between Busega Kyengera Secondary Urban Centre and Primary Urban Centres to Nsangi Metropolitan Centre, Kiringente Suburban Centre and Mpigi Suburban Centre with connection to Kammengo Strategic Centre and Buwama Service Centre.

(2) Objectives

- To reduce travel times for commuters along the Kampala, Busega to Mpigi directions.
- To ensure reliable and consistent bus services with regular frequencies.
- To increase the capacity of the expressway to accommodate at least 10,000 passengers per hour.
- To decrease congestion in the Busega-Kyengera area.
- To reduce greenhouse gas emissions and air pollution by promoting public transportation.
- To maintain affordable fares to ensure public transportation remains accessible to all.
- To ensure seamless integration with existing transportation modes, such as taxis and ridehailing services.
- To design the system to be sustainable, with plans for future expansion and upgrades.

(3) **Project Description**

The Project for Mixed Lane BRT Busega-Mpigi aims to develop an efficient and sustainable public transportation system along the Busega-Mpigi Expressway. (See Figure 17.3.9.) The project will integrate Bus BRT lanes with existing traffic lanes, enhancing mobility and reducing congestion.

The design of the expressway will be slightly modified to incorporate bus stops along the expressway for passenger boarding and alighting.



Source: JICA Expert Team

Figure 17.3.9 Project Location of Mixed Lane for BRT Busega-Mpigi (along Busega-Mpigi Expressway) [PT-S6]

(4) Expected Benefits

The following benefits are expected:

- Improved mobility for residents and commuters
- Reduced travel times and increased reliability
- Enhanced quality of life and economic opportunities
- Increased safety and security features
- Reduced greenhouse gas emissions and air pollution

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

6.2 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct a feasibility study and transport demand analysis.
- Develop a comprehensive BRT plan and design.
- Secure funding and financing arrangements.
- Acquire necessary land and properties for BRT bus stations.
- Construct bus stations.
- Procure BRT-compatible buses and equipment.
- Implement intelligent transportation systems (ITS) and fare collection systems.
- Develop and implement operational plans and schedules.

- Provide public education and awareness campaigns.
- Ensure effective maintenance and upkeep arrangements.
- Political will and government support.
- Safety and security considerations.

(9) Related Plans and Projects

• Busega-Mpigi Expressway [RD-S10]

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of informal settlements and businesses at station locations along the expressway
- Potential job losses among informal transport operators like taxi drivers

17.3.11 Project for Implementation of Mixed Lane for BRT Inner-Ring Road (Along Northern BP – Kampala Entebbe Expressway – Southern BP) [PT-S7]

(1) Rational

A mixed-lane BRT system along the Inner-Ring Road offers a rational solution for efficient public transportation in Kampala. The system integrates buses into the existing road infrastructure, leveraging the comprehensive network connecting key urban areas and suburbs This BRT provides direct connectivity from the Primary Urban Centres to the Busega-Kyengera Secondary Urban Centre, Zana Urban Sub-Centre, Munyonyo Urban Sub-Centre and Luzira-Port Bell Secondary Urban Centre to the other urban centres outward. By operating buses in mixed traffic, the system maximizes resource utilization and minimizes additional construction costs. This approach provides flexible operations, accommodating various bus types and capacities, and enables adjustments to meet changing demands.

(2) **Objectives**

- To improve public transportation efficiency in Kampala by providing a reliable and faster bus service.
- To increase passenger capacity along the route, reducing the demand for private vehicles and alleviating congestion.
- To enhance mobility for citizens, providing a reliable, efficient, and affordable transportation option.
- To reduce travel times for passengers, making public transportation a more attractive option.
- To improve air quality by reducing the number of private vehicles on the road.
- To support economic growth and productivity by providing a reliable transportation system.
- To integrate the BRT system with existing road infrastructure, maximizing resource utilization.
- To allow for flexible operations and adjustments to meet changing demand and evolving transportation needs.
- To enhance the overall quality of life for citizens by reducing congestion, air pollution, and travel times.

(3) **Project Description**

This BRT system utilises modern buses and intelligent transportation systems to provide reliable and efficient services, prioritizing buses at intersections and junctions, and offering an enhanced passenger experience.

The design of the expressway will be slightly modified to incorporate bus stops along the expressway for passenger boarding and alighting.



Source: JICA Expert Team

Figure 17.3.10 Project Location of Mixed Lane for BRT Inner-Beltway-Ring Road (Along Northern BP – Kampala Entebbe Expressway – Southern BP) [PT-S7]

(4) Expected Benefits

By combining buses and private vehicles on the same lanes, the system maximizes resource utilization and minimizes additional infrastructure costs, making it a cost-effective solution for sustainable public transportation in GKUGA.

The BRT system will also improve air quality by reducing private vehicles, enhancing mobility, and supporting economic growth.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

9.6 million US dollars

(7) Implementation Schedule

2024 - 2030 Short Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct a thorough study to assess demand, infrastructure, and potential impacts.
- Optimize the route to cover high-demand areas, minimize conflicts with private vehicles, and ensure efficient operations.
- Improve road conditions and construct bus stops and terminals.
- Purchase modern, high-capacity buses with efficient emission standards.
- Install ITS infrastructure for real-time monitoring, scheduling, and passenger information.
- Educate the public about the benefits and changes associated with the BRT system.
- Establish clear policies, laws, and regulations to govern BRT operations.
- Train drivers and staff on BRT operations, customer service, and safety procedures.

- Implement an efficient fare collection system, such as a cashless payment system.
- Continuously monitor and evaluate the system's performance, making adjustments as needed.
- Support from government and stakeholders is crucial for successful implementation.
- Secure reliable funding sources for operations, maintenance, and upgrades.
- Effective coordination among government agencies, operators, and stakeholders.
- Ensure the safety and security of passengers, staff, and infrastructure.

(9) Related Plans and Projects

• N/A

(10) Social and Environmental Impacts

The following impacts could arise:

- The construction of BRT infrastructure may lead to the destruction of wetland habitats, disrupting ecosystems and biodiversity since the expressways are built along or on the wetlands. Especially during the implementation of bus stations.
- The project may require the relocation of residents and businesses

17.3.12 Project for Bus and Taxi Service Improvement (Introduction of New Large or Middle Size Buses) [PT-S8]

(1) Rational

The Project for Bus and Taxi Service Improvement for GKMA is aimed at modernizing and upgrading the public transportation system, addressing the growing demand for efficient and reliable transport. The introduction of new large or middle-size buses will significantly enhance the capacity, safety, and comfort of public transportation, reducing traffic congestion, air pollution, and greenhouse gas emissions. By providing a reliable and comfortable service, the project will improve the overall passenger experience, stimulate economic growth and provide safety to passengers while connecting the primary urban centres to secondary urban centres, urban subcentres and metropolitan centres within the GKMA.

(2) **Objectives**

- To improve the efficiency and reliability of public transportation in the Greater Kampala Metropolitan Area.
- To increase the capacity of public transportation, reducing congestion and travel times.
- To enhance the safety and comfort of passengers, introducing modern and well-maintained buses.
- To reduce air pollution and greenhouse gas emissions, promoting a more environmentally friendly transportation system.
- To promote sustainable transportation, encouraging the use of public transportation over private vehicles.
- To support economic growth, creating jobs and stimulating local economic development.
- To improve the overall passenger experience, providing a comfortable, reliable, and affordable transportation service.
- To integrate the bus system with other transportation modes, promoting a more efficient and sustainable transportation network.
- To reduce the number of accidents and incidents, improving road safety.
- To increase government revenue through taxes, fees, and advertising.

(3) **Project Description**

The Project for Bus and Taxi Service Improvement is a transformative initiative aimed at revolutionizing the public transportation system by introducing modern, safe, and comfortable large and middle-size buses. This project will not only replace outdated and inefficient vehicles

but also increase vehicle size, optimize route planning, and enhance safety features and passenger amenities.

(4) Expected Benefits

The following benefits are expected:

- Job creation and employment opportunities for drivers, maintenance staff, and administrators.
- Enhanced mobility and connectivity for passengers.
- Reduced travel times and increased productivity.
- Increased safety and security for passengers.
- Reduced greenhouse gas emissions and air pollution from newer, more efficient buses.
- Decreased noise pollution from newer buses.
- Increased use of sustainable transportation options.

By promoting sustainable transportation and reducing environmental impact, the project will contribute to the region's economic growth and provide a reliable and efficient travel experience for commuters, ultimately improving the overall quality of life in the GKUGA.

(5) Executing Agency and Related Organisations

- Kampala Capital City Authority
- Wakiso District Local Government
- Mukono District Local Government
- Mpigi District Local Government
- Ministry of Works and Transport

(6) Estimated Project Cost

20.0 million US dollars

(7) Implementation Schedule

2024-2030 Short-Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct a thorough feasibility study and needs assessment.
- Develop a comprehensive project plan and timeline.
- Establish a dedicated project management team.
- Secure funding and resources.
- Procure new buses and equipment.
- Upgrade and modernize existing infrastructure (terminals, stations).
- Develop and implement new route plans and schedules.
- Train and capacitate bus drivers and staff.
- Implement safety and security measures.
- Launch a public awareness and education campaign.
- Strong political will and support.

(9) Related Plans and Projects

• Multi-Modal Urban Transport Master Plan

(10) Social and Environmental Impacts

The following social impact could arise:

• Potential displacement of existing taxi and bus operators.

17.3.13 Project for Development of Kampala Multi-Modal Transport Hub [PT-S9]

(1) Rational

The development of a multi-modal transport hub by Uganda Railways Corporation at Kampala Station is a strategic move to revolutionize the city's transportation landscape. By integrating rail, bus, taxi, and private vehicle transportation under one roof, the hub will offer a seamless travel experience, reducing congestion and providing a one-stop transfer location for passengers while promoting economic growth and urban development. The modern facility will provide comfortable waiting areas, amenities like shopping points and restaurants and advanced safety features, making it an attractive option for passengers. Additionally, the hub will stimulate local economic development, create jobs, and connect Primary Urban Centres in Kampala to other urban centres in GKMA and other regions, fostering regional integration and sustainability. By future-proofing the transportation system, the multi-modal transport hub will be a game-changer for Kampala's transportation needs, enhancing the overall quality of life for citizens and supporting the city's growth and development.

(2) Objectives

- To create an integrated transportation system, combining rail, bus, taxi, and private vehicle transportation, for a seamless passenger experience.
- To reduce congestion and pollution in Kampala by promoting public transportation and reducing private vehicle usage.
- To enhance passenger comfort and convenience by providing modern amenities and facilities.
- To increase efficiency and reduce travel times by streamlining transportation modes and transfers.
- To stimulate economic growth and development in Kampala by attracting businesses, creating jobs, and increasing accessibility.
- To improve safety and security for passengers through advanced safety features and robust security measures.
- To promote sustainable transportation and reduce environmental impact.
- To increase accessibility and inclusivity for people with disabilities and low-income communities.
- To revitalize the surrounding area through urban regeneration and development.
- To create a transportation hub that can adapt to emerging transportation technologies and modes, ensuring a resilient and future-proof transportation system.
- To reduce the transportation cost and increase the efficiency of goods transportation.

(3) **Project Description**

The Uganda Railways Corporation's Multi-Modal Transport Hub at Kampala Station is a cuttingedge transportation facility that seamlessly integrates rail, bus, taxi, and private vehicle transportation, offering a modern and efficient travel experience. This hub features a spacious terminal building with amenities like restaurants, retail, and entertainment options, as well as comfortable waiting areas and lounges. With efficient passenger information and ticketing systems, secure and accessible facilities for people with disabilities, and advanced safety and security measures, the hub streamlines transportation, reduces congestion and pollution, and enhances passenger experience, making it a convenient and comfortable one-stop transfer location.

In addition to the terminal building, the station plaza is necessary for smooth transfer among the various transport modes.

For the development of Kampala Station's multi-modal transport hub, the land owned by URC will be utilised to develop its surrounding area into a commercial activity centre including residential development. (See Figure 17.3.11.)



COLOUR	TYPE	
	RESIDENTIAL	
	COMMERCIAL	_
	INSTITUTIONAL	_
	INDUSTRIAL	_

Source: Final Report, Preliminary Design of the Kampala Multi-Modal Hub, URC, 2022

Figure 17.3.11 Project Plan of Kampala Multi-Modal Transport Hub

(4) Expected Benefits

The following benefits are expected:

- Job creation and employment opportunities for residents through increased economic activity and local investment, and improved access to education, employment, and healthcare for surrounding communities.
- Enhanced mobility and connectivity for people with disabilities.
- Reduced travel times and increased productivity.
- Improved safety and security for passengers and locals.
- Reduced air pollution and greenhouse gas emissions from decreased private vehicle usage.
- Increased use of sustainable transportation options.

(5) Executing Agency and Related Organisations

- Uganda Railways Corporation
- Kampala Capital City Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

400.0 million US dollars

(7) Implementation Schedule

2024-2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and needs assessments.
- Develop a comprehensive project plan and timeline.
- Secure funding and resources.
- Acquire land and relocate existing facilities.
- Design and construct the hub's infrastructure (terminal building, platforms, rails, roads, etc.).
- Install modern passenger information and ticketing systems.
- Implement efficient transportation management systems.

- Integrate different transportation modes (rail, bus, taxi and private vehicles).
- Develop and implement safety and security protocols.
- Train staff and conduct public awareness campaigns.
- Strong political will and support.

(9) Related Plans and Projects

• Kampala Central (KACE) passenger multi-modal hub proposed by National Integrated Transport Master Plan (2021-2040) to be implemented by KCCA

(10) Social and Environmental Impacts

The following social impacts could arise:

• Potential displacement of existing businesses and residents.

The following environmental impacts could arise:

• Potential impact on natural habitats and ecosystems from infrastructure development.

17.3.14 Project for Implementation of Parking Restriction and Tax in CBD [TM-S2]

(1) Rational

The implementation of parking restrictions and taxes in Kampala's Central Business District (CBD) is a strategic move to reduce traffic congestion, encourage public transport, and increase revenue for the city. By limiting parking spaces and making them more expensive, the city aims to decrease reliance on personal vehicles, promote alternative modes of transportation, and manage demand. This approach also seeks to enhance air quality, improve pedestrian safety, and support urban planning goals, ultimately contributing to a more sustainable, compact, and pedestrian-friendly city. By managing parking, Kampala can reduce urban sprawl, promote cycling and walking, and enhance the overall quality of life for its residents and visitors, making the CBD a more attractive and liveable space.

(2) Objectives

- To reduce traffic congestion and improve traffic flow.
- To encourage the use of public transportation, walking, and cycling.
- To generate revenue for the city to fund infrastructure and public services.
- To manage parking demand and prevent overcrowding.
- To enhance air quality and reduce pollution.
- To improve pedestrian safety and accessibility.
- To encourage alternative modes of transportation.

(3) **Project Description**

The planned implementation of parking restrictions and tax in Kampala CBD will involve a multistep process, starting with traffic studies and analysis to identify designated parking areas and zones, followed by setting time limits and fees, installing parking meters and signage, and deploying enforcement personnel and technology. The process will also include establishing payment systems and revenue collection processes, raising public awareness and educating motorists, and continuously monitoring and evaluating the system's effectiveness, all of which are yet to be rolled out and implemented in the city's central business district.



Source: JICA Expert Team

Figure 17.3.12 Project Location of Parking Restriction and Tax in CBD [TM-S2]

(4) Expected Benefit

The following benefits are also expected:

- Reduced traffic congestion.
- Increased use of public transportation.
- Enhanced air quality.
- Improved pedestrian safety.
- Increased revenue for city development.
- Encouragement of alternative modes of transportation (cycling, walking).
- Better traffic flow and management.
- Reduced parking-related chaos and disorder.

(5) Executing Agency and Related Organisations

• Kampala Capital City Authority

(6) Estimated Project Cost

0.5 million US dollars

(7) Implementation Schedule

2024 2030 Short Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct traffic studies and analysis
- Identify designated parking areas and zones
- Set time limits and fees for parking
- Install parking meters and signage
- Deploy enforcement personnel and technology
- Establish payment systems and revenue collection processes
- Raise public awareness and educate motorists
- Develop and implement an enforcement plan
- Install CCTV cameras for monitoring

• Provide exemptions for special cases (e.g. disabled parking)

(9) Related Plans and Projects

• Multi-Modal Urban Transport Master Plan

(10) Social and Environmental Impacts

The following social impacts could arise:

- Reduced congestion and travel times
- Increased access to public transportation
- Improved air quality and reduced pollution
- Enhanced pedestrian safety and walkability
- Increased revenue for city development and social services
- Potential job creation in parking management and enforcement
- Improved overall quality of life for residents and visitors

The following environmental impacts could arise:

- Reduced greenhouse gas emissions from decreased congestion
- Increased use of alternative modes of transportation (cycling, walking)
- Reduced urban heat island effect from decreased parking lots
- Increased green spaces and urban gardens
- Reduced noise pollution from decreased traffic congestion
- Improved overall environmental sustainability

17.3.15 Project for Implementation of Non-Motorized Transport (NMT) Corridor [NM-S1]

(1) Rational

The Non-Motorized Transport (NMT) Corridor Project in Kampala aims to address traffic congestion, improve air quality, and enhance safety for pedestrians and cyclists by providing dedicated infrastructure for walking, cycling, and other non-motorized transport modes. By promoting sustainable transportation options, reducing reliance on personal motor vehicles, and increasing mobility and accessibility, the project supports economic growth, improves quality of life, and contributes to Kampala's vision of becoming a modern and sustainable city.

(2) Objectives

- To provide safe and convenient pedestrian and cycling infrastructure.
- To reduce traffic congestion and travel times.
- To improve air quality and reduce pollution.
- To promote physical activity and healthy lifestyles.
- To increase mobility and accessibility for all users.
- To reduce pedestrian and cyclist fatalities.
- To integrate NMT modes with public transportation systems.
- To create a sustainable and modern transportation system in Kampala.

(3) **Project Description**

The Non-Motorized Transport (NMT) Corridor Project in Kampala is an urban transport initiative aimed at creating dedicated infrastructure for walking, cycling, and other non-motorized transport modes. The project involves designing and constructing pedestrian and cycling paths, footbridges, and bike lanes along key roads within the CBD and railway corridor from Kampala station to Namanve, improving road safety, reducing traffic congestion, and promoting sustainable transportation options. By providing a safe and convenient environment for NMT users, the project enhances mobility, accessibility, and quality of life for Kampala's residents and visitors.



Figure 17.3.13 Project Location of Non-Motorized Transport (NMT) Corridor [NM-S1]

(4) Expected Benefit

The following benefits are also expected:

- Improved road safety for pedestrians and cyclists.
- Enhanced air quality and reduced pollution.
- Increased physical activity and healthy lifestyles.
- Improved accessibility and mobility for all users.
- Reduced pedestrian and cyclist fatalities.
- Enhanced quality of life and urban livability.
- Increased use of sustainable transportation modes.
- Reduced carbon footprint and contribution to climate change mitigation.
- Improved social interaction and community engagement.
- Enhanced aesthetic appeal of the city.

(5) Executing Agency and Related Organisations

• Kampala Capital City Authority

(6) Estimated Project Cost

N/A

(7) Implementation Schedule

2024 – 2030 Short-Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Engage stakeholders and communities in planning.
- Review detailed designs and engineering plans.
- Secure funding and resources.
- Acquire land and obtain necessary permits.
- Construct NMT infrastructure (paths, lanes, footbridges).
- Install safety features and signage.
- Implement traffic management and calming measures.

• Integrate NMT corridors with public transportation systems.

(9) Related Plans and Projects

- Multi-Modal Urban Transport Master Plan
- National Integrated Transport Master Plan
- Kampala Physical Development Plan

(10) Social and Environmental Impacts

The following social impacts could arise:

- Improved safety for pedestrians and cyclists.
- Enhanced mobility and accessibility for all users.
- Increased physical activity and healthy lifestyles.
- Improved social interaction and community engagement.
- Enhanced quality of life and urban livability.

The following environmental impacts could arise:

- Reduced air pollution and greenhouse gas emissions.
- Decreased traffic congestion and noise pollution.
- Increased green spaces and urban aesthetics.
- Conservation of natural resources and energy.
- Reduced carbon footprint and contribution to climate change mitigation.
- Improved overall environmental sustainability.

17.3.16 Project for Implementation of Kampala-Bombo Expressway [RD-M1]

(1) Rational

The implementation of the Kampala-Bombo Expressway is justified by its potential to transform the region's transportation landscape, reducing travel time from 2-3 hours to 30 minutes, improving safety, and boosting economic growth by enhancing trade, commerce, and tourism. The expressway will also create jobs, and stimulate urban development of Migadde Suburban Centre, Matugga Metropolitan Centre and Gayaza Metropolitan Centre. This Expressway will also link these urban centres to the primary urban centres within Kampala and promote sustainable transportation while reducing traffic congestion, air pollution, and noise pollution. By connecting Kampala to surrounding areas and neighbouring districts, the expressway will foster regional connectivity, drive long-term sustainability, and improve the overall quality of life for citizens, making it a vital infrastructure project for Uganda's development.

(2) **Objectives**

- To reduce travel time and improve journey quality between Kampala and Bombo.
- To enhance road safety and reduce accidents.
- To increase economic growth and development in the region.
- To improve connectivity and accessibility to social services, markets, and employment opportunities.
- To reduce traffic congestion and alleviate pressure on existing roads.
- To stimulate urban development and growth along the expressway corridor.
- To create jobs and stimulate local economies during construction and maintenance.
- To improve emergency response times and access to essential services.

(3) **Project Description**

The Kampala-Bombo Expressway Implementation Project involves the design, construction, and maintenance of a 50km, 4-lane expressway connecting Kampala, the capital city of Uganda through Bombo, a key urban centre in Luweero District to Katikamu. The project aims to reduce

travel time, improve road safety, enhance economic growth, and promote sustainable transportation. The expressway will feature modern infrastructure, including interchanges, bridges, and pedestrian facilities, designed to accommodate high-speed traffic and minimize environmental impact. The project will be implemented with a projected completion period of 3-5 years.



Figure 17.3.14 Project Location of the Kampala-Bombo Expressway [RD-M1]

(4) Expected Benefits

The Kampala-Bombo Expressway is expected to bring numerous benefits, including reduced travel time to just 30 minutes, improved road safety, and boosted economic growth through enhanced trade, commerce, and tourism. The expressway will also increase connectivity, create jobs, stimulate urban development, and reduce environmental pollution while improving emergency response times and regional connectivity. Additionally, it will lead to increased property values, reduced traffic congestion, and an overall improvement in the quality of life for citizens and communities along the expressway, making it a transformative infrastructure project for the region.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

559.9 million USD

(7) Implementation Schedule

2031-2035 Mid Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Secure funding and resources.
- Obtain necessary permits and approvals.
- Engage with stakeholders and local communities.
- Review the detailed design and plan of the expressway and infrastructure.
- Acquire land and relocate utilities if necessary.
- Construct and upgrade infrastructure.
- Implement traffic management and safety measures.
- Monitor and evaluate progress and impact.

(9) Related Plans and Projects

- National Development Plan III
- Expressway Development Master Plan
- Multi-Modal Urban Transport Master Plan
- National Integrated Transport Master Plan

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of communities and businesses.
- Job creation and income opportunities.
- Improved access to services and markets.
- Potential for increased noise and air pollution.
- Potential for increased cost of living and gentrification.

The following environmental impacts could arise:

- Habitat destruction and fragmentation.
- Noise and air pollution from construction and traffic.
- Water pollution from construction and runoff.
- Potential for increased greenhouse gas emissions

17.3.17 Project for Implementation of Kampala Outer Beltway Phase 1 (Kajjansi-Nsangi) (2nd Ring (Middle Ring)) [RD-M2]

(1) Rational

The implementation of the Kampala Outer Beltway Expressway (Phase 1: Kajjansi-Nsangi) (2nd Ring (Middle Ring)) is a strategic move to address Kampala's transportation challenges, reduce traffic congestion, and boost economic growth of Kajjansi Metropolitan Centre and Nsangi Metropolitan Centre. By enhancing connectivity between Kampala and surrounding districts, the expressway will facilitate trade, commerce, and tourism, while improving safety and reducing travel times. Additionally, it will support the urbanization of the two metropolitan centres, accommodate the city's growing population, and contribute to environmental sustainability by reducing air and noise pollution by reducing travel times. As a critical infrastructure project, the Kampala Outer Beltway Expressway (2nd Ring (Middle Ring)) aligns with Uganda's national development goals and Vision 2040, demonstrating the government's commitment to driving economic growth and improving the quality of life for its citizens.

(2) Objectives

- To improve travel time between Kajjansi and Nsangi.
- To enhance road safety and reduce accidents.
- To increase economic growth and development in the region.
- To improve connectivity and accessibility to social services, markets, and employment opportunities.

- To support urbanization and accommodate Kampala's growing population.
- To improve regional connectivity and links to neighbouring districts, towns, and countries.
- To create jobs and stimulate local economies during construction and maintenance.
- To contribute to Uganda's national development goals and Vision 2040.

(3) **Project Description**

The Kampala Outer Beltway Expressway (Phase 1: Kajjansi-Nsangi) (2nd Ring (Middle Ring)) is a 22km, 4-lane expressway that will bypass Kampala city, reducing traffic congestion and improving connectivity between Kajjansi and Nsangi. The project aims to enhance road safety, reduce travel times, and stimulate economic growth in the region. It will feature modern infrastructure, including interchanges, bridges, and pedestrian facilities, designed to accommodate high-speed traffic and minimize environmental impact. The project will be implemented in phases, with Phase 1 focusing on the Kajjansi-Nsangi section.



Figure 17.3.15 Project Location of Kampala Outer Beltway Phase 1 (Kajjansi-Nsangi) (2nd Ring (Middle Ring)) [RD-M2]

(4) Expected Benefit

The following benefits are expected:

- Reduced traffic congestion in the Greater Kampala Metropolitan Area.
- Improved travel times and reduced journey hours.
- Enhanced road safety and reduced accidents.
- Increased economic growth and development in the region.
- Improved connectivity and accessibility to social services, markets, and employment opportunities.
- Support for urbanization and accommodation of Kampala's growing population.
- Improved regional connectivity and links to neighbouring districts, towns, and countries.
- Creation of jobs and stimulation of local economies during construction and maintenance.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

246.4 million US dollars

(7) Implementation Schedule

2036 - 2040 Mid Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Secure funding and resources
- Obtain necessary permits and approvals
- Engage with stakeholders and local communities
- Design and plan the expressway and infrastructure
- Acquire land and relocate utilities if necessary
- Construct and upgrade infrastructure
- Implement traffic management and safety measures
- Monitor and evaluate progress and impact

(9) Related Plans and Projects

- Expressway Development Master Plan.
- Multi-Modal Urban Transport Master Plan.
- National Integrated Transport Master Plan.
- Kampala Physical Development Framework.

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of communities and businesses
- Job creation and income opportunities
- Improved access to services and markets
- Impact on local culture and heritage sites
- Potential for increased noise and air pollution

The following environmental impacts could arise:

- Habitat destruction and fragmentation
- Air and noise pollution from construction and traffic
- Water pollution from construction and runoff
- Potential for increased greenhouse gas emissions

17.3.18 Project for Implementation of Expressway R4 (Kampala-Wakiso-Kakiri) [RD-M3]

(1) Rational

The implementation of Expressway R4 (Kampala-Wakiso-Kakiri) is a strategic move to enhance transportation efficiency, economic growth, and regional integration in the direction of Mityana Road and Hoima Road by linking the Primary Urban Centres and Busega-Kyengera Secondary Urban Centre to Nansana Urban Sub Centre, Wakiso Metropolitan Centre, Kakiri Suburban centre and Bujjuko Suburban Centre. By reducing travel time and congestion, the expressway will improve access along the Kampala-Wakiso-Kakiri corridor to work, markets, industries, and agricultural areas, boosting economic development and minimizing accidents. Overall, the expressway will have a transformative impact on Uganda's transportation infrastructure, driving growth and development in the region.

(2) Objectives

• To improve public transportation efficiency in Kampala by providing a reliable and faster

bus service

- To decongest traffic in the Kampala-Wakiso-Kakiri corridor
- To improve connectivity between Kampala and neighbouring districts
- To boost economic development and trade in the region
- To reduce travel time between the Kampala-Wakiso-Kakiri corridor
- To enhance safety features and reduce accidents
- To contribute to the improvement of the Northern Corridor, a vital route connecting East African countries

(3) **Project Description**

The Expressway R4 (Kampala-Wakiso-Kakiri) project involves the construction of a 4-lane, 20km dual carriageway connecting Kampala to Wakiso and Kakiri. The project aims to improve road infrastructure, enhance transportation efficiency, and promote economic growth in the region. The expressway will feature interchanges, service roads, pedestrian and cyclist facilities, and intelligent transportation systems.

(4) Expected Benefits

The project will reduce travel time, improve road safety, and increase connectivity between Kampala and neighbouring districts beyond Wakiso, fostering economic development and regional integration.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

256.9 million US dollars

(7) Implementation Schedule

2031 – 2040 Mid-Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and finalize expressway design.
- Acquire necessary land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Construct the expressway, interchanges, and service roads.
- Install Intelligent Transportation Systems (ITS) for traffic management and safety.
- Implement environmental mitigation measures and monitoring.
- Coordinate with utility providers for relocation of services.
- Strong political will and government support.
- Effective public engagement and stakeholder involvement.

(9) Related Plans and Projects

N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• Displacement and resettlement of affected communities

The following environmental impacts could arise:

• Habitat disruption hence impacting biodiversity and ecosystems



(11) Project Location Map

Figure 17.3.16 Project Location of Expressway R4 (Kampala-Wakiso-Kakiri) [RD-M3]

17.3.19 Project for Implementation of Kampala - Mukono Expressway (Bypass of Jinja Road and Kampala - Jinja Expressway) [RD-M4]

(1) Rational

The Kampala-Mukono Expressway (Bypass of Jinja Road and Kampala-Jinja Expressway) project aims to enhance transportation links within the Kampala-Jinja corridor. The Kampala-Jinja route experiences high traffic that won't fully be accommodated by the existing Jinja Highway, the proposed Kampala–Jinja Expressway and the existing Metre Gauge Railway. This expressway that will start from the Northern Bypass in Kira Municipality to Mukono will reduce congestion and travel times, boosting economic growth, and improving livelihoods for residents along the corridor. The project also considers environmental safeguards and supports the growth of Mukono Metropolitan Centre and Namanve Secondary Urban Centre, accommodating the increasing demand for transportation infrastructure. By implementing this project, the government seeks to promote regional integration, increase trade, and improve the quality of life for citizens, making it a vital investment in Uganda's transportation infrastructure and economic future.

(2) Objectives

- To improve road safety and reduce accidents.
- To enhance transportation efficiency and decrease travel times.
- To promote economic growth and development in the region.
- To increase regional integration and facilitate cross-border trade.
- To reduce traffic congestion and improve air quality.
- To enhance environmental sustainability and minimize the project's ecological footprint.
- To improve livelihoods and provide better access to social services, employment

opportunities, and markets.

• To support urbanization and development in Mukono and surrounding areas.

(3) **Project Description**

The Kampala-Mukono Expressway (Bypass of Jinja Road and Kampala-Jinja Expressway) project involves the construction of a 4-lane, 14km dual carriageway starting from Kampala Northern Bypass to Mukono. The expressway aims to alleviate road congestion above the current considerations for the Kampala-Jinja corridor, improve safety, reduce travel times, and promote economic growth in the region.

(4) Expected Benefits

The expressway will enhance connectivity between Kampala and Mukono, support urbanization and development and facilitate regional trade and integration. The expressway will provide increased access to employment opportunities and markets, improved road safety reduced accidents, and reduced traffic congestion which will lead to a reduction of greenhouse gas emissions.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

191.2 million US dollars

(7) Implementation Schedule

2031 - 2040 Mid Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and environmental impact assessments.
- Design and plan the expressway alignment and interchanges.
- Acquire land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Construct the expressway, interchanges, and service roads.
- Install intelligent transportation systems and safety features.
- Implement traffic management and maintenance plans.
- Political will and government support.
- Effective public engagement and stakeholder involvement.

(9) Related Plans and Projects

N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• Displacement and resettlement of affected communities.

The following environmental impacts could arise:

- Habitat disruption impacting biodiversity and ecosystems.
- Water pollution and drainage effects.



(11) Project Location Map

Figure 17.3.17 Project Location of Kampala - Mukono Expressway (Bypass of Jinja Road and Kampala - Jinja Expressway) [RD-M4]

17.3.20 Project for Implementation of Urban Expressway (VVIP-Southern Bypass) [RD-M5]

(1) Rational

The Urban Expressway project, connecting the VVIP (Nakasero-Kampala Northern Bypass) Expressway to the Southern Bypass through Bugolobi to Luzira, aims to enhance transportation links and economic growth in Kampala's urban areas by reducing congestion, improving safety, and increasing accessibility to social services, employment opportunities, and markets. The project will also support the urbanization of Luzira-Port Bell Secondary Urban Centre through connection to the Primary Urban Centres, reduce travel times, and incorporate environmental safeguards, ultimately improving the quality of life for citizens and promoting sustainable development in the region. By implementing this critical transportation infrastructure, the government seeks to address the growing demands of Kampala's urban population, foster economic development, and create a more efficient and sustainable transportation network.

(2) Objectives

- To improve transportation efficiency and reduce travel times.
- To enhance connectivity between key urban areas, promoting economic growth and development.
- To reduce traffic congestion and improve air quality in the city.
- To increase accessibility to social services, employment opportunities, and markets.
- To support urbanization and accommodate the growing demand for transportation infrastructure.
- To improve road safety and reduce accidents.
- To enhance the quality of life for citizens and promote sustainable development.

- To encourage economic development and growth in the region.
- To provide an alternative route to reduce reliance on existing roads.
- To integrate with existing transportation systems to create a seamless travel experience.

(3) **Project Description**

The Urban Expressway project involves the construction of a 6km dual carriageway connecting the VVIP Expressway to the Southern Bypass through Bugolobi to Luzira. The expressway will have 4 lanes, service roads and interchanges. The project aims to improve transportation efficiency, reduce congestion, enhance connectivity, and promote economic growth of Primary Urban Centres and the Luzira-Port Bell Secondary Urban Centre.

(4) Expected Benefits

The Urban Expressway will provide a safe, efficient, and sustainable transportation infrastructure, supporting the development of Kampala's urban areas and connecting the CBD to the Southern Bypass hence creating reduced travel times outside the CBD.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

110.9 million US dollars

(7) Implementation Schedule

2031 - 2040 Mid Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and environmental impact assessments.
- Design and plan the expressway alignment and interchanges.
- Acquire land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Construct the expressway, service roads, and interchanges.
- Install intelligent transportation systems and safety features.
- Implement traffic management and maintenance plans.
- Political will and government support.
- Effective public engagement and stakeholder involvement.

(9) Related Plans and Projects

N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• Displacement and resettlement of affected communities

The following environmental impacts could arise:

• Habitat disruption impacting biodiversity and ecosystems



(11) Project Location Map

Figure 17.3.18 Project Location of Urban Expressway (VVIP-Southern Bypass) [RD-M5]

17.3.21 Project for Upgrading of Existing Metre Gauge Railway Service [PT-M1]

(1) Rational

The project requires an upgrade of the existing metre gauge railway service from Mukono to Kampala and extensions to Portbell, Kyengera, and Buloba to standard gauge with double tracking, modern signalling and safety systems and new rolling stock. By increasing capacity, improving efficiency, and enhancing safety, this project will reduce travel times, congestion, and carbon emissions, while boosting economic growth, urbanization, and sustainable development. With double tracking, trains can operate in both directions on separate tracks, minimizing delays and head-on collisions, while also enabling easier maintenance and upgrading of the infrastructure. This transformation will not only improve passenger services but also facilitate trade and commerce, cementing the region's position as a vital economic hub.

(2) Objectives

- To improve transportation efficiency and reduce travel times.
- To increase transportation capacity and reduce congestion.
- To enhance safety features and reduce accidents.
- To promote economic growth and development in the region.
- To support urbanization and improve access to social services.
- To facilitate trade and commerce by connecting key economic hubs.
- To reduce carbon emissions and promote sustainable transportation.
- To improve passenger services and overall customer experience.
- To enhance regional connectivity and integration.
- To comply with international railway standards by upgrading to standard gauge.
- To increase freight capacity and reduce transportation costs.
- To create jobs and stimulate economic activity during construction and operation.

(3) **Project Description**

The existing metre gauge railway service from Mukono to Kampala is set to undergo a transformative upgrade, with extensions to Port Bell, Kyengera, and Buloba. The project will involve upgrading the track to a standard gauge, double-tracking the entire route, constructing new stations and upgrading existing ones, installing modern signalling and safety systems, and acquiring new rolling stock.

(4) Expected Benefits

The project will increase the passenger capacity of current railway lines, enhance safety, and reduce travel times. It will position the railway as a vital transportation artery that supports economic growth, urbanization and sustainable development in the region.

(5) Executing Agency and Related Organisations

- Uganda Railways Corporation
- Ministry of Works and Transport

(6) Estimated Project Cost

1,908.0 million US dollars

(7) Implementation Schedule

2031 - 2040 Mid Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and environmental impact assessments.
- Design and plan the upgrade, including track alignment, stations, and signalling systems.
- Acquire land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Upgrade the track, signals, and safety systems.
- Construct new stations and upgrade existing ones.
- Acquire new rolling stock.
- Train personnel and implement new operating procedures.
- Monitor and evaluate project progress and performance.
- Political will and government support.
- Effective public engagement and stakeholder involvement.

(9) Related Plans and Projects

N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

• Displacement and resettlement of affected communities

The following environmental impacts could arise:

• Habitat disruption impacting biodiversity and ecosystems

(11) **Project Location Map**



Source: JICA Expert Team

Figure 17.3.19 Project Location of Upgrading of existing metre gauge Railway Service [PT-M1]

17.3.22 Project for MRT (Kyengera-Namungoona-Bujuko-Kakiri) (along Expressway R4) [PT-M17]

(1) Rational

The MRT (Kyengera-Namungoona-Bujuko-Kakiri) (along Expressway R4) starting at Kyengera and running along Kampala Northern Bypass to Namugoona and turn to Expressway R4 is a crucial transportation project that aims to reduce traffic congestion and promote sustainable transportation in the Kampala-Wakiso direction (Between Hoima Road and Mityana Road) linking Busenga Kyengera Secondary Urban Centre and the Primary Urban Centres to Nansana Urban Sub-Centre, Wakiso Metropolitan Centre, Kakiri Suburban Centre and Bujuko Suburban Centre. By providing an efficient and reliable mass transit system, the MRT will improve connectivity and accessibility to commercial, workplaces and industrial areas, enhance quality of life, and support the growing population and urbanization in the area. Additionally, the MRT will reduce greenhouse gas emissions, improve air quality, and provide equal access to transportation opportunities for all members of society, making it a sustainable and socially equitable transportation solution for the long-term benefit of the GKMA.

(2) Objectives

- To improve transportation efficiency and reduce travel times.
- To enhance connectivity and accessibility to commercial, industrial, and residential areas.
- To reduce traffic congestion and alleviate traffic bottlenecks.
- To promote sustainable transportation and reduce carbon footprint.
- To support economic growth and development in the region.
- To improve air quality and reduce negative environmental impacts.
- To enhance the quality of life for residents and commuters.

- To provide safe, reliable, and comfortable transportation options.
- To increase mobility and accessibility for all members of society.
- To support urbanization and population growth in the region.
- To encourage transit-oriented development (TOD) and mixed-use development.
- To reduce traffic accidents and improve road safety.

(3) **Project Description**

The MRT (Kyengera-Namungoona-Bujuko-Kakiri) project is a transformative transportation initiative that will support mass public transport between Kampala and Wakiso-Kakiri direction. Spanning 20km, the MRT will connect Kyengera to Kakiri through the Kampala Northern Bypass and Expressway R4.

(4) Expected Benefits

The MRT will reduce travel times, alleviate congestion, and promote sustainable development and economic growth, while also prioritizing environmental sustainability and social responsibility, with a capacity to transport high numbers of passengers per hour per direction. It will also enhance job creation and economic opportunities along the corridor and will lead to change in the land use and development of Wakiso Metropolitan Centre and Nansana Urban Centre.

(5) Executing Agency and Related Organisations

- Uganda Railways Corporation
- Ministry of Works and Transport

(6) Estimated Project Cost

1,861.9 million US dollars

(7) Implementation Schedule

2031 - 2040 Mid Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and environmental impact assessments.
- Design and plan the MRT alignment, stations, and depots.
- Acquire land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Construct the elevated viaduct, at-grade sections, and tunnels.
- Install tracks, signalling, and electrification systems.
- Acquire and test rolling stock (trains).
- Implement safety and security measures.
- Train personnel and conduct trial runs.
- Launch commercial operations.
- Political will and government support.
- Effective public engagement and stakeholder involvement.
- Environmental compliance and mitigation measures.

(9) Related Plans and Projects

• Project of Upgrading of existing metre gauge railway service [PT-M1]

(10) Social and Environmental Impacts

The following social impacts could arise:

- High implementation costs especially for high interest on borrowed funds
- Displacement and resettlement of affected communities

The following environmental impacts could arise:

• Habitat disruption impacting biodiversity and ecosystems



(11) **Project Location Map**

Figure 17.3.20 Project Location of MRT (Kyengera-Namungoona-Bujuko-Kakiri) (along Expressway R4) [PT-M17]

17.3.23 Project for LRT (Kampala-Kajjansi Metropolitan Centre) [PT-M18]

(1) Rational

The implementation of a Light Rail Transit (LRT) from Kampala to Kajjansi Metropolitan Centre is a rational response to the region's rapid urbanization and transportation demands that will exceed the earlier proposal of the BRT system in this direction. BRT has a maximum capacity considered as 10,000 passengers/hour/direction. By providing an efficient, sustainable, and comfortable transportation solution, the LRT will reduce traffic congestion, stimulate economic growth, and promote environmental sustainability. With the potential to reduce travel times, increase property values and create jobs, the LRT is a long-term solution that will improve the overall quality of life for residents, workers and students, while also integrating with existing transportation modes to create a seamless and efficient transportation network.

(2) Objectives

- To improve transportation efficiency and reduce travel times.
- To enhance connectivity and accessibility between Kampala and Kajjansi.
- To reduce traffic congestion and alleviate traffic bottlenecks.
- To promote sustainable transportation and reduce carbon footprint.
- To support economic growth and development in the region.
- To improve air quality and reduce negative environmental impacts.
- To enhance the quality of life for residents, workers, and students.
- To provide a safe, reliable, and comfortable transportation option.
- To increase mobility and accessibility for all members of society.

- To support urbanization and population growth in the region.
- To encourage transit-oriented development (TOD) and mixed-use development.
- To reduce traffic accidents and improve road safety.

(3) **Project Description**

The Kampala Kajjansi LRT project involves the construction of an 18 km long light rail transit system connecting Kampala city to the Kajjansi Metropolitan Centre. The LRT will operate at scheduled departure and arrival times to improve efficiency, reduce traffic congestion and promote sustainable transportation. The LRT is planned to curb the high transport demand in this corridor that exceeds BRT capacity in 2050.

(4) Expected Benefits

The project is expected to reduce the travel time between Kampala and Kajjansi Metropolitan Centre, which will enhance job creation and economic opportunities, and improve access to education, health care and social services.

(5) Executing Agency and Related Organisations

- Uganda Railways Corporation
- Ministry of Works and Transport

(6) Estimated Project Cost

552 million US dollars

(7) Implementation Schedule

2031 -2040 Mid Term Projects

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and environmental impact assessments.
- Design and plan the MRT alignment, stations, and depots.
- Acquire land and relocate affected communities.
- Engage contractors and suppliers through transparent procurement.
- Construct the elevated viaduct, at-grade sections, and tunnels.
- Install tracks, signalling, and electrification systems.
- Acquire and test rolling stock (trains).
- Implement safety and security measures.
- Train personnel and conduct trial runs.
- Launch commercial operations.
- Political will and government support.
- Effective public engagement and stakeholder involvement.
- Environmental compliance and mitigation measures.

(9) Related Plans and Projects

N/A

(10) Social and Environmental Impacts

The following social impacts could arise:

- High implementation cost probably characterised by high interest rates on loan repayment
- Displacement and resettlement of affected communities

The following environmental impacts could arise:

• Habitat disruption impacting biodiversity and ecosystems



(11) Project Location Map

Figure 17.3.21 Project Location of LRT (Kampala-Kajjansi Metropolitan Centre) [PT-M18]

17.3.24 Project for Implementation of Boda-Boda Restriction [TM-M1]

(1) Rational

The restriction of boda-bodas in Kampala is driven by a range of concerns, including safety risks, traffic congestion, lawlessness, security threats, environmental degradation, and the need for more organized urban planning. With a high accident rate, disregard for traffic rules, and involvement in criminal activities, boda-bodas pose a significant risk to road users and the general public. By limiting their operations, authorities aim to reduce reckless behaviour, protect pedestrians and other road users, and promote a more sustainable and planned transport system, ultimately creating a safer and more liveable city.

(2) Objectives

- To improve road safety and reduce accidents.
- To reduce traffic congestion and chaos.
- To enhance law and order on the roads.
- To prevent criminal activities using boda-bodas.
- To promote an organized and planned urban transport system.
- To reduce environmental pollution and noise.
- To encourage the use of alternative and safer transport modes.

(3) **Project Description**

Implementing boda-boda restrictions in Kampala involves a comprehensive approach to regulating the operation of motorcycle taxis, addressing safety, traffic, and security concerns through measures such as limiting numbers and operations, designating specific routes and boda-boda free zones, enforcing safety gear use, conducting regular inspections and licensing, and increasing enforcement and penalties for non-compliance, ultimately aiming to reduce accidents,
congestion, and crime, while promoting a more organized and safe transportation system in the city.

With efficient and robust public transport implemented in Kampala and GKMA, the boda-boda free zone is to be considered for the CBD and limiting numbers and operations of boda-boda are to be considered for the remaining Kampala area and GKMA as a whole.



Figure 17.3.22 Project Location of Boda-Boda Restriction [TM-M1]

(4) Expected Benefit

The following benefits are also expected:

- Improved road safety and reduced accidents.
- Reduced traffic congestion and chaos.
- Enhanced law and order on the roads.
- Prevention of criminal activities using boda-bodas.
- Promotion of an organized and planned urban transport system.
- Increased use of alternative and safer transport modes.

(5) Executing Agency and Related Organisations

- Kampala Capital City Authority
- (6) Estimated Project Cost

2.0 million US dollars

(7) Implementation Schedule

2031-2040 Mid Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct public awareness campaigns.
- Establish clear regulations and guidelines.
- Designate specific boda-boda routes and zones.
- Set up registration and licensing systems.
- Install surveillance cameras and monitoring systems.

- Deploy enforcement personnel and equipment.
- Establish penalties for non-compliance.
- Provide alternative transportation options.
- Engage with boda-boda associations and stakeholders.

(9) Related Plans and Projects

• Multi-Modal Urban Transport Master Plan.

(10) Social and Environmental Impacts

The following social impacts could arise:

- Job losses for some boda-boda riders.
- Potential impact on livelihoods of dependent families.
- Potential increase in crime rates (if alternative livelihoods are not provided)
- Increased travel times.

The following environmental impacts could arise:

- Reduction in air pollution.
- Decrease in noise pollution.
- Less traffic congestion and reduced fuel consumption.
- Potential increase in the use of alternative, eco-friendly transport modes.

17.3.25 Improved Overall Environmental Sustainability Project for Implementation of Kampala Outer Beltway Phase 2 (Nsangi-Wakiso-Gayaza-Mukono-Munyonyo) (2nd Ring (Middle Ring)) [RD-L1]

(1) Rational

The Kampala Outer Beltway Phase 2 (Nsangi-Wakiso-Gayaza-Mukono-Munyonyo) (2nd Ring (Middle Ring)) is a strategic extension of the outer beltway loop, aimed at enhancing connectivity, reducing congestion, and supporting economic growth in the surrounding districts. By improving access to key economic centres, markets, and industrial areas, the project will reduce travel times, enhance road safety, and promote sustainable development of Nsangi, Wakiso, Matugga, Gayaza and Mukono Metropolitan Centres. This phase will also foster social cohesion, connect communities, and promote social interaction, aligning with Uganda's national development goals and Vision 2040. By completing the outer beltway loop, Phase 2 will further transform the transportation landscape, driving economic growth, social development, and environmental sustainability in the region.

(2) Objectives

- To complete the outer beltway loop, enhancing connectivity and reducing congestion in Kampala.
- To improve access to key economic centres, markets, and industrial areas.
- To reduce travel times and improve road safety.
- To support economic growth and development in the surrounding districts.
- To enhance regional connectivity, linking to neighbouring districts and countries.
- To promote sustainable development and reduce environmental impact.
- To foster social cohesion and connect communities.
- To increase economic opportunities and job creation.
- To align with Uganda's national development goals and Vision 2040.

(3) **Project Description**

The Kampala Outer Beltway Phase 2 (2nd Ring (Middle Ring)) is an 85km, 4-lane expressway that completes the outer beltway loop around Kampala. Starting from Nsangi, the expressway

passes through Wakiso, Gayaza, and Mukono, and ends at Munyonyo. The project aims to reduce congestion, improve connectivity, and enhance economic growth in the surrounding districts. It features modern infrastructure, including interchanges, bridges, and pedestrian facilities, designed to accommodate high-speed traffic and minimize environmental impact. The project will be implemented in phases, with Phase 2 focusing on the Nsangi-Wakiso-Matugga-Gayaza-Mukono-Munyonyo section.

Within the long-term (2041-2050) implementation phase, the Nsangi-Wakiso and Matugga through Gayaza to Mukono are to be implemented in the period of 2041-2045. The completion of the Kampala Outer Beltway (2nd Ring (Middle Ring)) will be achieved by implementing the Wakiso-Matugga and Mukono-Munyonyo sections in 2046-2050.



Source: JICA Expert Team



(4) Expected Benefit

The following benefits are also expected:

- Reduced traffic congestion in the Greater Kampala Metropolitan Area.
- Improved travel times and reduced journey hours.
- Enhanced road safety and reduced accidents.
- Increased economic growth and development in the surrounding districts.
- Improved connectivity and accessibility to social services, markets, and employment opportunities.
- Support for urbanization and accommodation of Kampala's growing population.
- Improved regional connectivity and links to neighbouring districts, towns, and countries.
- Creation of jobs and stimulation of local economies during construction and maintenance.
- Contribution to Uganda's national development goals and Vision 2040.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

951.9 million US dollars

(7) Implementation Schedule

2041 – 2050 Long Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Secure funding and resources
- Obtain necessary permits and approvals
- Engage with stakeholders and local communities
- Design and plan the expressway and infrastructure
- Acquire land and relocate utilities if necessary
- Construct and upgrade infrastructure
- Implement traffic management and safety measures
- Monitor and evaluate progress and impact
- Develop and implement an environmental management plan
- Develop and implement a social management plan
- Establish a project management team and coordination structure
- Procure materials and services
- Implement quality control and assurance measures
- Develop and implement a maintenance and repair plan

(9) Related Plans and Projects

- Expressway Development Master Plan
- Multi-Modal Urban Transport Master Plan
- National Integrated Transport Master Plan
- Kampala Physical Development Framework

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of communities and businesses.
- Job creation and income opportunities.
- Improved access to services and markets.
- Impact on local culture and heritage sites.
- Potential for increased noise and air pollution.

The following environmental impacts could arise:

- Loss of biodiversity by habitat destruction and fragmentation.
- Air and noise pollution from construction and traffic.
- Water pollution from construction and runoff.
- Potential for increased greenhouse gas emissions.
- Impact on local water sources and drainage systems.

17.3.26 Project for Implementation of Expressway R6 (Kira-Kasaayi-Kigogola) [RD-L2]

(1) Rational

The implementation of Expressway R6 (Kira-Kasaayi-Nagalama-Kigogola) is a vital transportation infrastructure project that aims to reduce traffic congestion, enhance connectivity, and promote economic growth in the region. By providing a high-speed, efficient, and safe transportation corridor, the expressway will improve travel times, reduce environmental pollution, and support the urbanization of Kira Urban Sub Centre and the development of surrounding areas. Additionally, it will enhance regional connectivity of the Primary Urban Centres to Kira Urban Sub Centre, Kalagi Service Centre and Nakifuma-Naggalama Strategic Centre, increase economic opportunities, and stimulate local economies. The project is a strategic investment in the country's

future, expected to have a positive impact on the quality of life for citizens and communities along the expressway.

(2) **Objectives**

- To improve road safety and reduce accidents.
- To reduce traffic congestion and travel times.
- To enhance connectivity between Kampala and surrounding districts.
- To promote economic growth and development in the region.
- To support urbanization and accommodate Kampala's growing population.
- To improve access to key economic centres, markets, and industrial areas.
- To increase economic opportunities and job creation.

(3) **Project Description**

The Expressway R6 project involves the construction of a high-speed, 4-lane expressway spanning 20km, connecting Kira, Kasaayi, Nagalama, and Kigogola. The project aims to improve road safety, reduce traffic congestion, and enhance connectivity between Kampala and surrounding districts. It will also promote economic growth, support urbanization, and reduce environmental pollution. The expressway will feature modern infrastructure, including interchanges, bridges, and pedestrian facilities, designed to accommodate high-speed traffic and minimize environmental impact. Upon completion, Expressway R6 will transform the transportation landscape, drive economic growth, and improve the quality of life for citizens in the region.

The R6 Expressway extends from Kira through Kasaayi to Kalagi with 20km within the Greater Kampala Urban Growth Area and the Kalagi, Nagalama to Kigogola is 15km within the Greater Kampala Metropolitan Area.



Figure 17.3.24 Project Location of Expressway R6 (Kira-Kasaayi-Nagalama-Kigogola) [RD-L2]

(4) Expected Benefit

The following benefits are also expected:

- Improved road safety and reduced accidents.
- Reduced traffic congestion and travel times.
- Enhanced connectivity between Kampala and surrounding districts.
- Boosted economic growth and development in the region.
- Increased access to key economic centres, markets, and industrial areas.
- Improved emergency response times and access to services.
- Reduced vehicle operating costs and travel times.
- Increased competitiveness and attractiveness of the region for investment and business.

(5) Executing Agency and Related Organisations

- Uganda National Roads Authority
- Ministry of Works and Transport

(6) Estimated Project Cost

260.0 million US dollars

(7) Implementation Schedule

2046 - 2050 Long Term Project

(8) Necessary Actions for Implementation / Critical Factor

- Conduct feasibility studies and impact assessments.
- Secure funding and resources.
- Obtain necessary permits and approvals.
- Engage with stakeholders and local communities.
- Design and plan the expressway and infrastructure.
- Acquire land and relocate utilities if necessary.
- Construct and upgrade infrastructure.
- Implement traffic management and safety measures.
- Monitor and evaluate progress and impact.

(9) Related Plans and Projects

• Expressway Development Master Plan.

(10) Social and Environmental Impacts

The following social impacts could arise:

- Displacement of communities and businesses.
- Job creation and income opportunities.
- Improved access to services and markets.
- Enhanced quality of life for nearby residents.
- Potential for increased noise and air pollution.

The following environmental impacts could arise:

- Habitat destruction and fragmentation.
- Air and noise pollution from construction and traffic.
- Water pollution from construction and runoff.
- Loss of biodiversity and ecosystem disruption.
- Impact on local water sources and drainage systems.

17.4 Profiles of Priority Projects for Infrastructure Sectors

17.4.1 Project for Development of Water Supply System Piped from Deep Groundwater in North GKUGA (Short and Medium-Term) [WS-03]

(1) Rational

As of 2020, in north of Wakiso District and Mpigi District which are part of the suburban area in GKUGA, only 107,030 people out of a total population of 400,000 is covered by water supply facilities. In addition, only 791m³/day is supplied from water supply facilities.

Therefore, the water supply coverage rate in this part of GKUGA is 27%, and the amount of water supply is 7.4 litters/capita/day. Furthermore, the population of this area is projected to be 1,054,000 in 2050, and water shortages is an urgent issue since there are no future projects planned for this area as of now.

By establishing the water supply facility in this Project, it will be possible to secure a water supply volume of 26,247 m³/day, and secure 20 litters/capita/day as minimum design water supply of rural area targeted by NWSC.

(2) Objectives

To provide a safe and stable water supply of the minimum amount of water necessary for the population of 1,054,000 as the projected population in 2050 in the suburban area of north GKUGA.

(3) **Project Description**

The project target area is shown in Figure 17.4.1.



Figure 17.4.1 Project Location for Development of Deep Groundwater Supply System for Suburban Areas in North GKUGA [WS-03]

The following facilities will be implemented:

- Deep wells: 20 units, Elevated water tanks: 11,000 m³
- Water transmission main and distribution pipeline (DI and uPVC φ 100mm-1,000mm): 304 km
- Booster pump: 10 units
- Chlorine injection equipment: 1 set
- Public stand post: 175 units

(4) Expected Benefits

In the suburban area of GKUGA, it will be possible to supply 20 litres/capita/day, which is the minimum design water supply of rural area targeted by NWSC, to the 1,054,000 as the projected population in 2050. In addition, since it is a deep ground water supply system, it is possible to handover and operate facilities one by one upon completion of construction, and it is possible to supply water from high-priority areas.

(5) Executing Agency and Related Organisations

• National Water and Sanitation Corporation, Ministry of Water and Environment

(6) Estimated Project Cost

Estimated project cost is shown in Table 17.4.1.

Table 17.4.1 Estimated Project Cost for the Project for Development of Deep Groundwater Supply System for Suburban Areas in North GKUGA [WS-01]

Items	Quantity	Unit	Unit Cost	Total Cost
	-		(USD)	(thousand USD)
Bowling	20	no.	79,276	1,586
Elevated Water Tank	11.000	m ³	73	799
Water Transmission Main DI ND≧400 mm	40,000	m	522	20,876
Water Distribution Pipeline DI uPVC ND <400 mm	263,699	m	126	33,100
Booster Pump	10	no.	264,253	2,643
Chlorine Injection Equipment	1	set	872,035	872
Public Stand Posts	175	no.	6,606	1,156
Administration, Overhead Cost	40	%	-	24,412
			Total Cost	85,444

Note: JICA rate on April 2024 is applied for the estimation. Source: JICA Expert Team

(7) Implementation Schedule

Implementation schedule is considered as shown in Figure 17.4.5.

Work Items	20	24	2	02	5	20	26	2	02	7_	2	028	2	202	9	20	30	4	203	31	2	032	2	20	33	20	034	ł	203	35	2	036	5 2	2037
Site Survey and Design stage]	Wa Fac	ter ility	Supp y-1	ly		l l	V F	Vate acili	er S ity-i	սթր 2	ly		11	V F		r Su ity-3	pply	_		*		Wat	ter S	uppl	ly
Work Preparation																														Γ	Faci	ility-	4	
Bowling Work																																		
Piping Work																																		
Pump and PSPs Installation																																		
Handover																																		

Note: Four deep ground water facilities in total are planned to construct in target area Source: JICA Expert Team

Table 17.4.2 Implementation Schedule of the Project for Development of Deep Groundwater Supply System for Suburban Areas in North GKUGA [WS-03]

(8) Necessary Actions for Implementation / Critical Factor

Prior to the boring work, it is necessary to conduct pumping tests and thoroughly and investigate the surrounding environment to confirm for variation of future pumped water amount due to climate change, etc. In addition, since the target area is under the jurisdiction area of the CUO, coordination will be required for NWSC to implement the project.

(9) Related Plans and Projects

Currently, there are no medium and long-term projects planned in the target area, but if a new project is formulated in the future, clear demarcation will be necessary.

(10) Social and Environmental Impacts

It is necessary to secure the land for the installation of water supply facilities (elevated water tanks, water transmission main and distribution pipeline, public stand posts, etc.). In addition, in order to reduce the labour burden of water collection for women and children, location of installation of public stand posts should be considered and in order to secure water supply to low-income household, set of water rates should be considered.

17.4.2 Project for Establishment of Water Supply System Piped from WTP in Northeast GKUGA (Mukono, Northeast Wakiso and North KCC) [WS-04]

(1) Rational

KW LV WatSan Project and Wakiso West WatSan Project are currently ongoing in GKUGA, but it is limited to the NWSC jurisdictional area. Considering the target of 50 L/capita/day which is the projected design capita water supply for 2050, the whole GKUGA faces a water shortage of 217,197 m³/day.

By expanding the existing Katosi WTP, it will be possible to meet the targeted design water supply of 50 L/capita/day by 2050, especially in the northeast GKUGA, where water supply is insufficient.

(2) **Objectives**

To provide a safe and stable water supply of 50 L/capita/day as targeted design water supply to 2,606,000 as the projected population in 2050 in the northeast GKUGA, where water supply is insufficient specially.

(3) **Project Description**

The project target area is shown in Figure 17.4.2.

The following facilities will be implemented:

- Water Treatment Plant: 1 unit (Design capacity: 105,000 m³/day)
- Reservoir: 34,700 m³
- Water transmission main and distribution pipeline (DI and uPVC ϕ 100 mm-1,000 mm): 235km
- Booster pump: 2 units
- SCADA system (remote monitoring system): 5 units



Source: JICA Expert Team

Figure 17.4.2 Project Location for Establishment of Water Supply System Piped from WTP in Northeast GKUGA [WS-04]

(4) Expected Benefits

In northeast GKUGA, it will be possible to supply 50 L/capita/day, which is the projected design water supply targeted by NWSC, to the 2,598,000 as the projected population in 2050. In addition, since piped water supply from water treatment plant, it is possible to supply safe and stable water.

(5) Executing Agency and Related Organisations

National Water and Sanitation Corporation, Ministry of Water and Environment

(6) Estimated Project Cost

Estimated project cost is shown in Table 17.4.2.

Table 17.4.3 Estimated Project Cost for the Project for Establishment of Water Supply System Piped from WTP in Northeast GKUGA [WS-04]

Items	Quantity	Unit	Unit Cost (USD)	Total Cost (thousand USD)
Water Treatment Plant	105,000	m ³ /day.	73	7,630
Reservoir	34,700	m ³	258	8,940
Water Transmission Main DI ND≧400 mm	54,029	m	522	28,198
Water Distribution Pipeline DI uPVC ND <400 mm	181,465	m	126	22,777
Booster Pump	2	no.	264,253	529
SCADA system	5	unit	9,909	50
Administration, Overhead Cost	40	%	-	68,124
			Total Cost	136,248

Source: JICA Expert Team

(7) Implementation Schedule

Medium Term (2025-2040)

(8) Necessary Actions for Implementation / Critical Factor

As for location of expansion of Katosi WTP, it is considered that contamination of the water source in order to determine location.

(9) Related Plans and Projects

As for implementation plan, it is necessary to consider the progress of the KW LV WatSan Project. Specially, if construction of pipeline interferes with major roads, coordination will be necessary.

(10) Social and Environmental Impacts

It is necessary to secure the land for the installation of water supply facilities (Water treatment plant, reservoirs, water transmission main and distribution pipeline, etc.). During the construction of water treatment plants, it is concerned that construction site wastewater combines with rainwater runoff and its discharge into Lake Victoria.

17.4.3 Project for Establishment of Water Supply System Piped from WTP for Suburban Areas in West Wakiso and Mpigi [WS-05]

(1) Rational

KW LV WatSan Project and Wakiso West WatSan Project are currently ongoing in GKUGA, but it is limited to the NWSC jurisdictional area. Considering the target of 50 L/capita/day which is the projected design capita water supply for 2050, the whole GKUGA faces a water shortage of 289,596 m³/day.

By planning new water treatment plant located at Kasanje, it will be possible to meet the targeted design water supply of 50 L/capita/day by 2050, especially in the west GKUGA, where water supply is insufficient.

(2) **Objectives**

To provide a safe and stable water supply of 50 L/capita/day as targeted design water supply for the projected population of 4,852,000 in 2050 in the western area of GKUGA, where water supply is especially insufficient.

(3) **Project Description**

The project target area is shown in Figure 17.4.3.



Source: JICA Expert Team

Figure 17.4.3 Project Location for Establishment of Water Supply System Piped from WTP in Western Area of GKUGA [WS-05]

The following facilities will be implemented:

- Water Treatment Plant: 1 unit (Design capacity: 141,000 m³/day)
- Reservoir: 46,900 m³
- Water transmission main and distribution pipeline (DI and uPVC ϕ 100 mm-1,000 mm): 935km
- Booster pump: 24 units
- SCADA system (remote monitoring system): 48 units

(4) Expected Benefits

In West GKUGA, it will be possible to supply 50 L/capita/day, which is the projected design water supply targeted by NWSC, to the 4,952,000 as the projected population in 2050. In addition, since piped water supply from water treatment plant, it is possible to supply safe and stable water.

(5) Executing Agency and Related Organisations

National Water and Sanitation Corporation, Ministry of Water and Environment

(6) Estimated Project Cost

Estimated project cost is shown in Table 17.4.4.

Table 17.4.4 Estimated Project Cost for the Project for Establishment of Water Supply System Piped from WTP in West GKUGA [WS-05]

Items	Quantity	Unit	Unit Cost (USD)	Total Cost (thousand USD)
Water Treatment Plant	141,000	m ³ /day.	73	10,256
Reservoir	46,900	m ³	258	12,084
Water Transmission Main DI ND≧400 mm	122,000	m	522	63,672
Water Distribution Pipeline DI uPVC ND <400 mm	813,173	m	126	102,070
Booster Pump	24	no.	264,253	6,342
SCADA system	48	unit	9,909	476
Administration, Overhead Cost	40	%	-	194,889
			Total Cost	389,779

Source: JICA Expert Team

(7) Implementation Schedule

Medium Term (2025-2040)

(8) Necessary Actions for Implementation / Critical Factor

As for location of establishment of Kasanje WTP, contamination of the water source should be considered in order to determine location.

(9) Related Plans and Projects

As for implementation plan, it is necessary to consider the progress of the Wakiso West WatSan Project. Especially, if construction of pipeline interferes with major roads, coordination will be necessary.

(10) Social and Environmental Impacts

It is necessary to secure the land for the installation of water supply facilities (Water treatment plant, reservoirs, water transmission main and distribution pipeline, etc.). During the construction of water treatment plants, there are concerns that the wastewater at the construction site combines with rainwater runoff and being discharged into Lake Victoria.

17.4.4 Project for Establishment of Water Supply System Piped from WTP in Other Areas Not Targeted in [WS-04] and [WS-05] [WS-06]

(1) Rational

The WS-04 and WS-05 projects target areas where the service coverage rate in 2050 is less than 70% as shown in Table 15.1.14. Therefore, by expanding each water treatment plant, Katosi WTP and Kasanje WTP, and targeting areas other than WS-04 and WS-05 where the service coverage rate is less than 100%, it will be possible to meet the targeted design water supply of 50 L/capita/day in 2050 for whole GKUGA.

(2) **Objectives**

To provide a safe and stable water supply of 50 L/capita/day as targeted design water supply to 4,949,000 as the projected population in 2050 in the other than target areas of WS-04 and WS-05 projects in whole GKUGA.

(3) **Project Description**

The project target area is shown in Figure 17.4.4.



Source: JICA Expert Team

Figure 17.4.4 Project Location for Establishment of Water Supply System Piped from WTP in Areas Not Targeted in [WS-04] and [WS-05] [WS-06]

The following facilities will be implemented:

- Water Treatment Plant: 2 units (Design capacity: 89,000 m³/day)
- Reservoir: $29,500 \text{ m}^3$
- Water transmission main and distribution pipeline (DI and uPVC ϕ 100 mm-1,000 mm): 459km
- Booster pump: 2 units
- SCADA system (remote monitoring system): 4 units

(4) Expected Benefits

In the areas other than the target areas of [WS-04] and [WS-05] projects, it will be possible to supply 50 L/capita/day, which is the projected design water supply targeted by NWSC, to the projected population of 4,949,000 in 2050. In addition, since piped water supply from water treatment plant, it is possible to supply safe and stable water.

(5) Executing Agency and Related Organisations

National Water and Sanitation Corporation, Ministry of Water and Environment

(6) Estimated Project Cost

Estimated project cost is shown in Table 17.4.5.

Table 17.4.5	Estimated Project Cost for the Project for Establishment of Water Supply System Piped from WTP in
	Areas Not Targeted in [WS-04] and [WS-05] [WS-06]

Items	Quantity	Unit	Unit Cost (USD)	Total Cost (thousand USD)
Water Treatment Plant	89,000	m ³ /day.	73	6,468
Reservoir	29,500	m ³	258	7,601
Water Transmission Main DI ND≧400 mm	105.321	m	522	54,967
Water Distribution Pipeline DI uPVC ND <400 mm	353,738	m	126	44,401
Booster Pump	2	no.	264,253	529
SCADA system	4	unit	9,909	40
Administration, Overhead Cost	40	%	-	114,004
			Total Cost	228,009

Source: JICA Expert Team

(7) Implementation Schedule

Long Term (2040-2050)

(8) Necessary Actions for Implementation / Critical Factor

It is necessary to reconsider or adjust the target area, taking into account actual performance of water supply volume, population census results, and actual non-revenue water rate before implementation.

(9) Related Plans and Projects

Currently, there is no planned project for water supply after 2040.

(10) Social and Environmental Impacts

It is necessary to secure the land for the installation of water supply facilities (Water treatment plant, reservoirs, water transmission main and distribution pipeline, etc.). During the construction of water treatment plants, there are concerns that wastewater combined with rainwater runoff could be discharged to Lake Victoria from the construction site.

17.4.5 Project for Connecting Primary Pipelines with Secondary and Tertiary Pipelines by NWSC Branch [WS-07]

(1) Rational

The pipes planned in the KW LV WatSan Project and Wakiso West WatSan Project are only water transmission pipelines, therefore, it is necessary to install primary and secondary pipelines by NWSC branch, in order to supply water to each household.

However, each NWSC branch has a limited budget for installation of secondary and tertiary pipelines. Therefore, by installing secondary and tertiary pipelines in the above project, it will be possible to supply water to each household.

(2) **Objectives**

It will be possible to supply water to each household in the target areas of KW LV WatSan Project and Wakiso West WatSan Project.

(3) **Project Description**

Target areas planned for KW LV WatSan Project and Wakiso West WatSan Project

(4) Expected Benefits

It will be possible to supply water to each household in the KW LV WatSan Project and Wakiso West WatSan Project. The water supply and served population will be 44 L/capita/day as the design per capita water supply for the target population of 8,340,332 in the KW LV WatSan

Project, and 47.5 L/capita/day as the design per capita water supply for the target population of 1,448,293 in the target area of Wakiso West WatSan Project.

(5) Executing Agency and Related Organisations

National Water and Sanitation Corporation, Ministry of Water and Environment

(6) Estimated Project Cost

To be considered.

(7) Implementation Schedule

Medium Term (2025-2040)

(8) Necessary Actions for Implementation / Critical Factor

It is necessary to confirm the installed location of the service pipes and consider the connection point with the tertiary pipelines. In addition, it is necessary to consider layout plan of the secondary pipelines and tertiary for each NWSC branch.

(9) Related Plans and Projects

Kampala Water Lake Victoria WatSan Project and Wakiso West WatSan Project

(10) Social and Environmental Impacts

17.4.6 Project for Construction of 33/11kV Nantabulirwa D/S with Connected 33kV Incomers (for Namanve Secondary Urban Centre and Mukono Metropolitan Centre of GKUGA) [PS-01]

(1) Rational

Mukono Municipality has high potentiality to develop urban centres for GKUGA and within Mukono Municipality, part of Namanve Secondary Urban Centra and Mukono Metropolitan Centre are designated which will attract business and commercial activities. To prepare for the future demand it is necessary to provide sufficient basic infrastructure including power supply in this area.

(2) **Objectives**

For supplying 11kV power to large power users, new distribution substation is necessary. The purpose of Nantabulirwa D/S is to secure the capacity of 11kV power supply to these potential customers.

(3) **Project Description**

Figure 17.4.5 shows the potential location for the distribution substation at Nantabulirwa. Nantabulirwa is in Goma Division of Mukono Municipality.

Figure 17.4.6 shows new 33kV lines connecting from Namanve T/S to Namanve South T/S. Since two 33kV power evacuation lines are secured, power reliability is expected to increase.

The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (GKMA-IUDMP) Final Report



Source: JICA Expert Team





Source: JICA Expert Team

Figure 17.4.6 Preliminary System Diagram of Nantabulirwa D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

(5) Executing Agency and Related Organisations

- UMEME Limited.
- Uganda Electricity Distribution Company Limited (UEDCL)
- Electricity Regulatory Authority (ERA)

(6) Estimated Project Cost

3 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME's master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.7 Project for Construction of 33/11kV Mpigi Substation and 33kV Incomers (for Mpigi Suburban Centre of GKUGA) [PS-02]

(1) Rational

According to Asset Management Plan (2019), 33kV line from Mutundwe T/S to Masaka Central D/S (total length is 180.04km), the System Average Interruption Duration Index (SAIDI) is 5.00 and the System Average Interruption Frequency Index (SAIFI) is 3.91, showing high unreliable power supply situation.

(2) **Objectives**

This line was designed as the interconnection line between Mutundwe T/S and Masaka Central D/S. However, due to the increase of power demand in area along this line, this line serves power. Electricity power is distributed to Mpigi area through this 33kV line by stepping down 33kV to 11kV by quite a few numbers of distribution transformers. Under this situation, the distribution line faults could extend and the fault of isolation of fault area will lead to the power outage of this area as well as main 33kV line.

This project will improve this situation and upgrade the existing distribution networks and increase the reliability of power supply in Mpigi.

(3) **Project Description**

This project will establish the new distribution substation, new construction of 11kV feeders for power supply, and upgrading existing 33kV distribution networks.

Figure 17.4.7 shows the potential location of distribution substation in Mpigi. The red colour line shows the existing 11kV feeder from Kiriri D/S (Butambala District).



Note: Solid lines: Existing 33kV incomers. Dotted line: existing 11kV feeder Source: JICA Expert Team

Figure 17.4.7 Proposed Location of Mpigi D/S

Figure 17.4.8 shows the system diagram for Mpigi D/S. This substation will be interconnected to Masaka Central D/S and Buloba T/S, which will be commissioned in 2024.



Source: JICA Expert Team

Figure 17.4.8 System Diagram of Mpigi D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

(5) Executing Agency and Related Organisations

- UMEME Limited
- UEDCL
- ERA

(6) Estimated Project Cost

3 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.8 Project for Construction of Nakasamba D/S and Connected 33kV Incomers (for Entebbe-Katabi Secondary Urban Centre of GKUGA) [PS-03]

(1) Rational

Entebbe area is designated as a secondary urban centre for GKUGA. Entebbe is connected with Kampala by expressway and has the international airport and some ministry offices It has the potentiality to grow to become an urban centre which supports the urban function of Kampala.

(2) **Objectives**

A new distribution substation will support the reliable power supply in Entebbe-Katabi Secondary Urban Centre.

(3) **Project Description**

The scope of this project is the construction of distribution substation in Nakasamba with connected 33kV incomers.

Figure 17.4.9 shows proposed location of distribution substation at Nakasamba. Figure 17.4.10 shows preliminary system diagram. 33kV incomers will be connected from two power substations, namely Entebbe T/S and Entebbe D/S. From the view of reliability, improvement of line loss, and securing the sufficient supply capacity of existing 33kV lines to Entebbe D/S from Lubowa D/S, the line from Entebbe T/S is recommended to be used as main line and the other line is used as backup.



Note: Green line: Existing 33kV incomers. Source: JICA Expert Team





Figure 17.4.10 System Diagram of Nakasamba D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

(5) Executing Agency and Related Organisations

- UMEME Limited
- UEDCL
- ERA

(6) Estimated Project Cost

3 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.9 Project for Construction of Bwebajja D/S and Connected 33kV Incomers for Bwebajja Area (for Kajjansi Metropolitan Centre of GKUGA) [PS-04]

(1) Rational

A new government campus is planned in Bwebajja in Kajjansi. The offices of the ministries are expected to move to Bwebajja from Kmapala city centre. Furthermore, the development of the Outer Beltway 1 will accelerate the urbanisation in this area transforming Kajjansi into a metropolitan centre providing job for the surrounding residents.

(2) Objectives

To provide sufficient and reliable power supply to Kajjansi Metropolitan Centre.

(3) **Project Description**

The scope of this project is the new construction of distribution substation in Nakasamba with connected 33kV incomers.

Figure 17.4.11 shows proposed location of distribution substation at Bwebajja. Figure 17.4.12 shows the preliminary system diagram.

There are three options for the 33kV incomer connection: Entebbe-Lubowa (Line-in Line-out), Kisubi-Kajjansi (Line-in Line-out), or a T-branch from the existing two lines as shown in Figure 17.4.12. This will be determined in the outline design stage considering factors such as the distribution company's operation method, line capacity, etc.



Note: Green line: Existing 33kV incomers Source: JICA Expert Team





Source: Prepared by JICA Expert team

Options for Connecting Distribution Lines to Bwebajja D/S Figure 17.4.12

(4) **Expected Benefits**

Power supply capacity will be obtained considering the new load.

(5) **Executing Agency and Related Organisations**

- **UMEME** Limited
- UEDCL
- **ERA**

Estimated Project Cost (6)

2 million USD

Implementation Schedule (7)

As soon as practicable.

(8) **Necessary Actions for Implementation / Critical Factor**

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.10 Project for Construction of Kigo D/S and Connected 33kV Incomers (for Kajjansi Metropolitan Area of GKUGA) [PS-05]

(1) Rationale

Kajjansi D/S has one unit of 33/11kV transformer (5/7.5MVA). Also, Kajjansi D/S is connected by T branch from Kampala South – Kisubi line. These two conditions may imply two bottlenecks of present Kajjansi D/S as below:

- There is only one transformer, and it does not satisfy N-1 criteria. Also, the capacity is 5/7.5MVA which is smaller than other substations around Kajjansi. It is a high risk of supplying sufficient power to loads in the future.
- The line connected to Kajjansi D/S is only one from Kampala South Kisubi line. When the fault occurs in this range (Kampala South Kajjansi Kisubi), Kajjansi D/S shall undergo the power outage.

The construction of Kigo D/S and connected 33kV incomes is expected to provide sustainable power supply to Kajjansi Metropolitan Area.

(2) **Objectives**

To provide sustainable power supply to Kajjansi Metropolitan Area.

(3) **Project Description**

The scope of this project is the new construction of distribution substation at Kigo with connected 33kV incomers. Figure 17.4.13 shows preliminary location. and Figure 17.3.14 shows system diagram. Figure 17.3.14 shows the system diagram in case of upgrading Kajjansi D/S for preliminary study purpose. The optimized design shall require further study (upgrading, decommissioning etc.).



Note: Green line: Existing 33kV incomers. Source: Prepared by JICA Expert Team

Figure 17.4.13 Proposed Location of Kigo D/S



Note: Line arrangement shall need further study. Source: JICA Expert Team

Figure 17.4.14 Preliminary System Diagram of Kigo D/S and Kajjansi D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

(5) Executing Agency and Related Organisations

- UMEME Limited
- Electricity Regulatory Authority (ERA)

(6) Estimated Project Cost

5 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement

17.4.11 Project for Upgrading of Kakiri D/S and Construction of 33kV incomer from Kawaala T/S to Kakiri D/S (Northwest Area of GKUGA) [PS-06]

(1) Rational

According to the JICA Report (2016)¹, a 33kV feeder will be extended to Kakiri, Busiro North constituency, approx. 20km away toward north-west direction from this substation. Therefore, upgraded Kawaala Substation is expected to supply electricity to Nansana, Busiro North, and Busiro East constituency.

¹ Final Report for Preparatory Survey on Greater Kampala Metropolitan Area Transmission Systems Improvement Project in the Republic of Uganda (Sep. 2016)

(2) Objectives

To supply electricity to Nansana, Busiro North, and Busiro East constituency.

(3) **Project Description**

The scope of this project is to construct new 33kV line from Kawaala T/S to Kakiri D/S will be constructed. For the purpose of decreasing the utilization rate of 132/33kV transformers in Kawanda T/S, this new incomer will be used as main line whilst the existing line from Kawanda T/S to Kakiri D/S will be used as backup line.

Figure 17.3.15 shows preliminary route of 33kV line. In addition, since Kakiri D/S has only one unit of transformer, additional transformer will be installed for redundancy. Figure 17.3.16 shows preliminary system diagram.



Note: Solid lines: Existing 33kV incomers. Dotted lines: New 33kV incomer route. Source: Prepared by JICA Expert team

Figure 17.4.15 Proposed Location of Kakiri D/S and Connected lines



Source: Prepared by JICA Expert Team Figure 17.4.16 System Diagram of Kakiri D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

(5) Executing Agency and Related Organisations

- UMEME Limited
- UEDCL
- ERA

(6) Estimated Project Cost

3 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.12 Project for Load Shifting from Kampala North T/S & Muutndwe T/S to upgraded Kawaala T/S (Central Area) [PS-07]

(1) Rational

33kV feeders from upgraded Kawaala T/S will be also connected to Mutundwe T/S and Kampala North T/S.

(2) **Objectives**

To ensure a stable supply of electricity to central areas of Kampala.

(3) **Project Description**

The scope of this project will include the new construction of 33kV incomers from upgraded Kawaala T/S to existing Mutundwe T/S and Kampala North T/S in line with new construction of distribution substations in and around Kampala Central Division. These new distribution substations will be Sir Appolo Kaggwa D/S (Kampala Central Division), Nakasero-Rwenzori D/S (Kampala Central Division) and Lungujja D/S (Lugaba Division).

Figure 17.3.17 shows proposed location of new distribution substations. As same as the other projects, 33kV route survey will be necessary. Figure 17.3.18 shows basic system diagram applied to substations in common.

The Project for Integrated Urban Development Master Plan for Kampala Special Planning Area (GKMA-IUDMP) Final Report



Source: JICA Expert team

Figure 17.4.17 Proposed location of Lungujja D/S, Sir Apollo Kagwa D/S and Nakasero-Rwenzori D/S



Source: JICA Expert Team

Figure 17.4.18 System diagram of Lungujja D/S, Sir Apollo Kagwa D/S and Nakasero-Rwenzori D/S

(4) Expected Benefits

Power supply capacity will be obtained considering the new load.

- (5) Executing Agency and Related Organisations UMEME Limited. UEDCL and ERA
- (6) Estimated Project Cost

3 million USD

(7) Implementation Schedule

As soon as practicable.

(8) Necessary Actions for Implementation / Critical Factor

Land acquisition

(9) Related Plans and Projects

UMEME master plan

(10) Social and Environmental Impacts

Noise from substation shall fulfil environment requirement.

17.4.13 Project for Expansion of Wi-Fi Hotspots [IT-01]

(1) Rational

The project will provide easy internet access service to the public at an affordable cost or free of cost by Wi-Fi hotspots in GKMA area, specially at different key locations such as, educational institutions, hospitals, public offices, public spaces and contribute to development.

(2) **Objectives**

- To densify communication networks to the public by providing easy access to the internet
- To increase penetration rate for the internet and the ICT facilities
- To enhance popularization of ICTs by accessibility to the internet in places most frequently visited by the inhabitants

(3) **Project Description**

- Install necessary equipment to create Wi-Fi hotspot at different key locations such as, educational institutions, hospitals, public offices, public spaces (park, shopping mall etc.)
- Provide secure and stable Wi-Fi internet access to the public
- Controlling the data use by registration and restricting the irrelevant websites in order to ensure the fair and efficient internet data use
- Maintenance budget

(4) Expected Benefits

- More inhabitants can access the internet.
- Access to the services through IT systems like telemedicine, e-learning, e-government, etc. will be enhanced.

(5) Executing Agency and Related Organisations

- NITA-U: Responsible for overall infrastructure development
- Kampala Capital City Authority (KCCA) and each municipality: Responsible for local connectivity

(6) Estimated Project Cost

- US\$ 3 million for 10 locations
- About 0.3 million per location which can serve about 10,000 people simultaneously

(7) Implementation Schedule

• 24 months

(8) Necessary Actions for Implementation / Critical Factor

• Needs to have proper coordination between the LGs and NITA-U

(9) Related Plans and Projects

- E-Government Master Plan by the central government
- NITA U's National Data Backbone Infrastructure (NBI) and last mile extension project
- KCCA's Information Systems Strategic Plan (ISSP) 2020-2026 also known as the Smart City Strategic Plan (2020-2026)

(10) Social and Environmental Impacts

• Wifi hot-spot equipment need to be set up carefully, so that it would not create any social or environmental hazards.

17.4.14 Establishment of a Resource Centre [IT-08]

(1) Rational

The project will provide opportunity for the young people, especially school children, could be given exposure to research and knowledge of different countries.

(2) **Objectives**

- To create opportunity for the young school children to use internet
- To enhance the opportunity of exposure to research and knowledge of different countries
- To create a knowledge sharing resource center for the younger generation which can be a center of excellence for the rest of the Africa

(3) **Project Description**

- Building/ Structure, Utilities installation & Production equipment with free high-speed internet
- Computers with necessary equipment for serving 100 persons
- Online meeting facilities
- E-library and collaboration with foreign cities to share the technical publications and ongoing projects
- Local Government IT and administrative personal for management
- Maintenance budget

(4) Expected Benefits

- The young generation's knowledge related to ICT will enhance
- Young generation will attract to ICT sector and

(5) Executing Agency and Related Organisations

- Ministry of ICT: Policy Support
- NITA-U: IT Infrastructure Development
- Uganda Investment Authority: Overall Infrastructure Development

(6) Estimated Project Cost

• US\$ 1.2 million

(7) Implementation Schedule

• 36 months

(8) Necessary Actions for Implementation / Critical Factor

• Needs to have proper coordination between the organizations

(9) Related Plans and Projects

- E-Government Master Plan by the national government (Education Sector)
- NITA U's National Data Backbone Infrastructure (NBI) and last mile extension project
- KCCA's Information Systems Strategic Plan (ISSP) 2020-2026 also known as the Smart City Strategic Plan (2020-2026)

(10) Social and Environmental Impacts

• The location needs to be selected which will be create any social or environmental impact

17.4.15 Profile of Project for Solid Waste Management [SW-01] and [SW-02]

It is recommended to carry out the project SW-01 (Formulation of Master Plan for Solid Waste Management System for GKUGA) and the project SW-02 (Capacity Development of Local Governments in Solid Waste Management System and Implementation of Master Plan for Solid Waste Management System) as one project.

(1) Rational

There is no solid waste management plan for GKUGA, and the solid waste management capacity of local governments, especially other than KCC, is weak.

(2) **Objectives**

- To formulate a master plan which will make clear the future direction of the solid waste management system for GKUGA.
- To develop the solid waste management capacity of the local governments through formulation process and implementation of pilot project(s).
- To build consensus on the future direction among stakeholders through the formulation process.

(3) **Project Description**

The project will formulate the master plan through joint work between a Ugandan competent authority(ies) and a team of solid waste management experts sent by a donor agency.

(4) Expected Benefits

A solid waste management master plan will be formulated for GKUGA. The formulation process aims to develop solid waste management capacity of people and institutions, and to build consensus among stakeholders for the implementation of the master plan.

(5) Executing Agency and Related Organisations

- Ministry of Kampala Capital City, MKCC
- Ministry of Lands, Housing and Urban Development
- National Planning Authority
- Kampala Capital City Authority
- Mukono District Government
- Wakiso District Government
- Mpigi District Government
- Others as necessary

(6) Estimated Project Cost

[SW-01] 1.0 million USD + [SW-02] 2.0 million USD = 3.0 million USD

(7) Implementation Schedule

• Three years during 2025 - 2030

(8) Necessary Actions for Implementation / Critical Factor

• There is no authority dealing with solid waste management for the whole GKUGA. An organization of solid waste management experts should be established under MKCC for implementation.

(9) Related Plans and Projects

• Kampala Waste PPP Project

(10) Social and Environmental Impacts

There will be no social or environmental impacts, as the projects consist only of surveys, planning and capacity development.

17.4.16 Kampala Waste PPP Project [SW-03]

This project [SW-03] Kampala Waste PPP Project includes the necessary actions for Ddundu Landfil, Kiteezi TS and Waste Diversion Facility for KCC.

(1) Rational

Kiteezi landfill which receives waste from the Metro Core, i.e., KCC and neighbouring local authorities, is almost full and it is said that this landfill should be replaced in the next few years. KCC prepared a concept for a project called as "Kampala Waste PPP Project" and secured a land for the future landfill called as Ddundu. However, the project has not been realised so for. This project shall be implemented to ensure the solid waste management of the Metro Core.

(2) **Objectives**

• To improve and secure the entire solid waste management system, from collection to final disposal, of the Metro Core currently using the Kiteezi landfill, with private sector participation.

(3) **Project Description**

The project consists of improving collection, converting the Kiteezi landfill into a transfer station with waste minimisation facilities, and constructing and operating a new Ddundu landfill. The project can be implemented on a component basis.

(4) Expected Benefits

The project will increase collection rates, promote waste minimisation, mitigate the environmental impact of the Kiteezi landfill and provide appropriate final disposal.

(5) Executing Agency and Related Organisations

Kampala Capital City Authority and neighbouring local authorities.

(6) Estimated Project Cost

The table below shows estimated project cost.

					U	nit: million USD
Project	Facility / Service	Item	2025-30	2031-40	2041-50	Total
	Collection	Capital	32.4	60.0	70.3	162.7
	Collection	O&M	109.4	202.6	237.3	549.3
	Transfor	Capital	7.9	14.6	17.1	39.7
C/M/ 0.2	Tansier	O&M	18.4	34.1	40.0	92.6
500-05	Maste diversion	Capital	7.1	13.1	15.4	35.6
		O&M	14.2	26.3	30.8	71.2
	Londfill	Capital	13.2	24.4	28.6	66.1
		O&M	26.3	48.8	57.1	132.2

Table 17.4.6 Component Costs for Implementing the Priority Project [SW-03]

(7) Implementation Schedule

• See the table above.

(8) Necessary Actions for Implementation / Critical Factor

• The project expects private sector participation. Funding shall be secured to make it financially viable for the private sector.

(9) Related Plans and Projects

• Kampala Waste PPP Project

(10) Social and Environmental Impacts

- Strengthening the collection system will improve sanitation in the city.
- The closure of the Kiteezi landfill will reduce the environmental impact on the surrounding area.
- Conversion of the landfill to a transfer station with minimisation facilities at Kiteezi may result in new environmental impacts.
- Construction and operation of the new Ddundu landfill will require mitigation measures for the expected environmental impacts.

17.4.17 Project for Solid Waste Management in the Metropolitan Centres [SW-04], [SW-05], [SW-06], [SW-07], [SW-08], [SW-09], [SW-10], [SW-11] and [SW-12]

The following are the projects that correspond to the development of the Metropolitan Centres.

- [SW-04] Establishment of Transfer Station and Waste Diversion Facility for Mukono Metropolitan Centre
- [SW-05] Establishment of Sanitary Landfill for Mukono Metropolitan Centre
- [SW-06] Establishment of Transfer Station and Waste Diversion Facility for Gayaza-Kasangati Metropolitan Centre
- [SW-07] Establishment of Transfer Station and Waste Diversion Facility for Matugga Metropolitan Centre
- [SW-08] Establishment of Transfer Station and Waste Diversion Facility for Wakiso Metropolitan Centre
- [SW-09] Establishment of Sanitary Landfill for Gayaza-Kasangati, Matugga and Wakiso Metropolitan Centres
- [SW-10] Establishment of Transfer Station and Waste Diversion Facility for Nsangi-Nakirebe Metropolitan Centre
- [SW-11] Establishment of Transfer Station and Waste Diversion Facility for Kajjansi Metropolitan Centre
- [SW-12] Establishment of Sanitary Landfill for Nsangi-Nakirebe and Kajjansi Metropolitan Centres

(1) Rational

The Greater Kampala Urban Growth Area Physical Development Plan, GKUGA-PDP, recommends a balanced urban development with dispersed Metropolitan Centres. The above solid waste management projects shall be in line with this urban development.

(2) Objectives

• To establish the entire solid waste management system, from collection to final disposal, in the Metropolitan Centres.

(3) **Project Description**

The project consists of establishment of collection system, construction and operation of transfer stations with waste minimisation facilities and constructing and operating new landfills. The project can be implemented on a component basis.

(4) Expected Benefits

The project will improve sanitation, promote waste minimisation, and provide appropriate final disposal in the Metropolitan Centres.

(5) Executing Agency and Related Organisations

- Ministry of Kampala Capital City, MKCC
- Ministry of Lands, Housing and Urban Development
- National Planning Authority
- Kampala Capital City Authority and other local authorities

(6) Estimated Project Cost

The table below shows estimated costs of the projects.

Table 17.4.7Component Costs for Implementing Priority Projects [SW-04], [SW-05], [SW-06], [SW-07], [SW-08],
[SW-09], [SW-10], [SW-11] and [SW-12]

					Unit	million USD
Project	Facility/Service	Item	2025-30	2031-40	2041-50	Total
	Collection	Capital	3.7	15.6	41.3	60.6
	Collection	O&M	12.6	52.5	139.6	204.7
	Transfor	Capital	0.89	3.37	9.67	13.9
500-4	Tansier	O&M	2.07	7.86	22.56	32.5
	Maata divaraian	Capital	0.85	4.12	9.73	14.7
	waste diversion	O&M	1.71	8.23	19.45	29.4
SW-5	Londfill	Capital	1.48	5.61	16.12	23.2
	Landfill	O&M	2.95	11.23	32.23	46.4
	Collection	Capital	1.86	9.56	25.08	36.5
	Collection	O&M	6.29	32.26	84.65	123.2
SW 6	Transfer	Capital	0.44	2.06	5.85	8.4
300-0		O&M	1.03	4.80	13.65	19.5
	Wasta divarsian	Capital	0.43	2.54	5.92	8.9
		O&M	0.85	5.09	11.85	17.8
	Collection	Capital	1.40	5.41	12.90	19.7
	Collection	O&M	4.72	18.27	43.54	66.5
SW/ 7	Transfer	Capital	0.33	1.17	3.01	4.5
300-1		O&M	0.78	2.74	7.01	10.5
	Waste diversion	Capital	0.32	1.43	3.05	4.8
	vvaste diversion	O&M	0.64	2.85	6.11	9.6

Project	Facility/Service	Item	2025-30	2031-40	2041-50	Total
	Collection	Capital	2.05	9.78	27.26	39.1
	Collection	O&M	6.92	33.02	91.99	131.9
C/M/ 9	Transfor	Capital	0.49	2.11	6.38	9.0
300-0	Transier	O&M	1.14	4.92	14.88	20.9
	Wasta diversion	Capital	0.47	2.60	6.40	9.5
	Waste diversion	O&M	0.94	5.20	12.81	18.9
S/W/ 0	Londfill	Capital	2.10	8.90	25.39	36.4
311-9	Lanunn	O&M	4.21	17.81	50.79	72.8
	Collection	Capital	3.08	14.19	39.93	57.2
	Collection	O&M	10.38	47.89	134.76	193.0
SW/ 10	Transfer	Capital	0.73	3.06	9.35	13.1
300-10	Tansier	O&M	1.71	7.15	21.82	30.7
	Maata divaraian	Capital	0.70	3.76	9.37	13.8
		O&M	1.41	7.53	18.74	27.7
	Collection	Capital	3.77	14.98	36.63	55.4
	Collection	O&M	12.74	50.56	123.62	186.9
SW/ 11	Transfor	Capital	0.90	3.25	8.54	12.7
300-11	Tansier	O&M	2.09	7.57	19.93	29.6
	Maata divaraian	Capital	0.86	3.95	8.66	13.5
		O&M	1.73	7.91	17.32	27.0
CW/ 10	Londfill	Capital	2.71	10.51	29.82	43.0
SW-12	Lanum	O&M	5.43	21.03	59.64	86.1

Source: JICA Expert Team

(7) Implementation Schedule

• See the table above.

(8) Necessary Actions for Implementation / Critical Factor

• Coordination among local authorities is a key to the successful development of a solid waste management system across the GKUGA. Strong leadership is expected from MKCC and/or other authorities at national level.

(9) Related Plans and Projects

• Kampala Waste PPP Project

(10) Social and Environmental Impacts

- Strengthening the collection system will improve sanitation in the Metropolitan Centres.
- Transfer stations with minimisation facilities may result in new environmental impacts.
- Construction and operation of new landfills will require mitigation measures for the expected environmental impacts.

17.5 Project Profile for Open Space Development and Wetland Management

17.5.1 Project for Development and Management of Nakivubo Wetland Park [OS-01]

(1) Rational

The Nakivubo Wetland plays a crucial role in maintaining the water quality of the Murchison Bay section of Lake Victoria. However, it is losing its functionality due to the increasing drainage and

the conversion of its natural vegetation. Proactive interventions are necessary to improve the situation. With the planned development of Luzira into a suburban centre, the creation of an urban green park in the Nakivubo area presents a significant opportunity to make it as a landmark naturebased recreational space for KCC, help prevent encroachment into the functioning wetland, and assist in the restoration of the wetland system.

(2) Objectives

- Develop a green urban park along Nakivubo Wetland and provide open and recreational space for the urban residents.
- Integrate slum improvement with drainage and waste management to minimise the pollution of the wetland
- Clarify physical boundary by walkway to prevent land use change and encroachment within the wetland.

(3) **Project Description**

Develop an urban green park surrounding Nakivubo Wetland with the application of linear park concept (approximately 10km). As shown in Figure 17.5.1, the wetland and drainage channel will be maintained, and the park will be in strip defined by the pathways along the wetland. Some dedicated open spaces can be created at the Luzira side. The slum areas in Namuwongo need basic infrastructure improvement such as sewage piping and waste management. Phase based development approach may be considered where eastern side to be developed first and western informal dwelling area in the second phase.

The conceptual plan from the previous study is shown in Figure 17.5.2. The plan includes a visitor centre, landscaping, boardwalks, picnic facilities, toilet facilities, etc. For reference, Figure 17.5.3 shows the infrastructure intervention for the seasonal flood and wetland park presented in the similar project.



Source: JICA Project Team

Figure 17.5.1 Proposed Location of Linear Green Urban Park



Source: Promoting Green Urban Development in Africa, WB, 2016

Figure 17.5.2 Nakivubo Wetland Park Conceptual Plan (Reference)



Source: Addis Ababa "Beautifying Sheger" River Development Project, AfDB Figure 17.5.3 Example of Wetland Park Concept (Reference)

(4) Expected Benefits

- Preserve functioning wetland and prevent further encroachment within wetland.
- Provide accessible open and recreational space for urban residents and international tourists.
- Raise awareness of wetland conservation.
- Allowing for tourism and business opportunities along the park.

(5) Executing Agency and Related Organisations

- KCCA: Engage development partners to prepare urban green park plan and feasibility study.
- MWE: Evaluate impact of the project and regulate activities inside the wetland.
- NEMA: Evaluate impact of the project and determine approval.
- MoLHUD: Plan and integrate slum upgrading projects in the urban green park plan.
- NGO: Plan and implement slum upgrading activities, including waste management.
- NWSC: Plan and coordinate sewage connections

(6) Estimated Project Cost

The project cost will be estimated based on the feasibility study. The tentative budget is approximately UGX 12 billion.
(7) Implementation Schedule

- Feasibility Study: 2026
- Implementation: 2027-2031

(8) Necessary Actions for Implementation / Critical Factor

- Securing the wetland by cancellation of private land titles.
- Seek funding and development partners for the feasibility study and implementation.
- Improvement of sewage infrastructure and waste management in the informal settlement.
- Improvement of wastewater treatment before entering wetland.

(9) Related Plans and Projects

- Sanitation and wastewater treatment works
- Slum upgrading initiatives

(10) Social and Environmental Impacts

EIA will be required. Hydrological and ecological surveys must be conducted at the feasibility study stage to identify the extent of the park, location of the facilities and design of the landscape. The project is anticipated to have a positive impact on wetland conservation. Additionally, the creation of a nature-based recreational space will enhance the mental and physical health of urban residents. Improving sewage and wastewater treatment will also benefit public health, particularly in informal settlements.

17.5.2 Project for Development and Management of Lubigi Wetland Urban Park [OS-02]

(1) Rational

Wetland degradation is one of the critical issues in GKUGA especially in and around KCC. One of the wetland management strategies is the development of an urban green park at the edge of the wetland, which is expected to improve the physical boundary of the wetland and at the same time prevent further encroachment into the wetland. Considering that there is already an eco-park concept in Lubigi Wetland, it can be considered as a pilot project for the implementation of this strategy.

(2) **Objective**

- To develop a wetland eco-park in the urbanized area as a green urban park pilot project.
- To establish standards/guidelines for green urban park development using part of the wetland in the planning and design of this pilot project.

(3) **Project Description**

The proposed location of the eco-park in the Lubuji wetland is shown in Figure 17.5.4. It is locat4ed between Hoima Road on the eastern side and around Busega Roundabout on the western end. The target area is approximately 828 ha.



Source: Wetland Management Department of MWE

Figure 17.5.4 Proposed Eco Park Site in Lubigi

Within the wetland, vegetation and water flow will be maintained. The design will be consistent with the topography of the land and sustainable landscaping. Amenities such as walking trails, seating area, picnic and playground area will be developed at the edge of the wetland. Figure 17.5.5 shows the example of eco-park concept plan drafted by the Wakiso District Local Government.



Source: Wakiso District

Figure 17.5.5 Eco Park Concept Plan (Example)

(4) Expected Benefits

- Provide open and recreational space for urban residents.
- Prevent encroachment within functioning wetland.
- Used as a model case for the eco-park development in other potential sites in GKUGA.

(5) Executing Agency and Related Organisations

- Local governments (Wakiso District and KCCA): Engage development partners to prepare feasibility study. Monitor and supervise the development in case of private development.
- MWE: Evaluate impact of the project and regulate activities inside the wetland
- NEMA: Evaluate impact of the project and determine approval
- MoLHUD: Prepare guidelines for an urban green park with a wetland wise use concept.

(6) Estimated Project Cost

The project cost will be estimated based on the feasibility study. The tentative budget is approximately UGX 20 billion.

(7) Implementation Schedule

- Feasibility Study: Consultant selection stage (as of May 2024)
- Development in 2025-2026

(8) Necessary Actions for Implementation / Critical Factor

- Seek funding for feasibility study and development partners for eco-park development.
- Based on the feasibility study, prepare guidelines for an urban green park with a wetland wise use concept.
- Monitoring and supervision of the development by the responsible authorities, i.e. Wakiso District and KCC government, to ensure compliance with the standards and regulations.

(9) Related Plans and Projects

Lubigi is one of the eco-park development sites. The feasibility study is supported by the Global Green Growth Institute (GGGI).

(10) Social and Environmental Impacts

EIA will be required. Hydrological and ecological surveys must be conducted at the feasibility study stage to identify and minimize negative impacts. The project is expected to have a positive impact on wetland conservation. The provision of a nature-based recreational space will improve the mental and physical health of urban residents. To maximize user benefits, accessibility, safety, and usability for different ages and genders should be considered.



KAMPALA CAPITAL CITY PHYSICAL DEVELOPMENT PLAN (KCC-PDP)

Chapter 18 Present Urban Characteristics of Kampala Capital City (KCC)

18.1 Land Use in Kampala Capital City

18.1.1 Land Use Changes in Kampala Capital City

This section shows how land uses have changed in Kampala Capital City (KCC).

In 1996, approximately 45% of the surface area in KCC was built-up area, followed by approximately 38% of the land use being subsistence farmland, and 7% wetland. Most of these farmlands were transformed into residential areas by 2021 with less than 2% of the land still used for agricultural purposes. Some of the wetland has also been encroached on including for residential areas for low-income households. (See Figure 18.1.1.)



Note: White area within Kampala City is the built-up area in 1996. Source: KCCA GIS Unit

Figure 18.1.1 Farmlands, Forests and Wetland Transformed into Residential Areas in Kampala Capital City in 1996

The change in population density between 2002 and 2014 also shows how these subsistence farmlands have been transformed from a very low-population density area (0–10 persons/ha) into a relatively populated area with 26–50 persons/ha in the northern part of Kawempe Division, the northern and southern part of Nakawa Division, the southern part of Makindye Division, and a high density area with 101–200 persons/ha in the western area of Rubaga Division. (See Figure 18.1.2)



Figure 18.1.2 Changes in Population Density of Kampala Capital City (2002 and 2014)

While farmlands have become residential areas, some residential areas in KCC have changed into commercial areas. A decrease in population was observed between 2002 and 2014, especially in the Kampala Central Division where the commercial and administration centre of Kampala is located. (See Figure 18.1.3.)



Source: JICA Expert Team based on Population and Housing Census data 2002 and 2014 from UBOS Figure 18.1.3 Average Population Growth Rage in Kampala City (2002-2014)

18.1.2 Present Land Use in Kampala Capital City

(1) Present Land Use at the City Level

This part of the report gives an account of the current land use situation in the city. In line with the previous assertion of rapid urbanisation in the city, the land uses in the KCC are dominated by residential and mixed use. Residential land uses take about 43% of the total surface area of the city while mixed-use occupies about 17%. This mixed-use mainly comprises intertwined residential-commercial activities which are mainly made up of small businesses at the frontages of residential buildings along major arterial roads in the city. They are supplemented by purely commercial activities which equally takes advantage of the road network in the city. For this purpose, commercial land use represents about 5% of the total land area of the city. The total land area for the city's road network is approximately 6% of KCC's surface area.

As the seat of government and the centre for many formal administrative processes of the country, KCC has several schools, offices, churches, hospitals, museums and other places of gathering. These are reflected in its institutional land use (7%), civic (0.5%), government or special area (1.5%), and public open space (0.9%). Scrap yards, garages, workshops and other industries take about 4% of the total surface area of the city. Wetlands, on the other hand, occupy about 9%, representing the third largest land use area in the city. There are some areas in the city which are yet to be developed. This has a total of 6 square kilometres and represents approximately 3% of the total surface area of the city. All these are illustrated in Figure 18.1.4, while the summary of the land use categories and their areas is shown in the land use map in Figure 18.1.5.

The present distribution of slum areas is overlaid on the present land use map, as shown in Figure 18.1.6. This overlay reveals that, nearly 6% are in the Central Division, 24% in Kawempe Division, 18% in Makindye Division, 17% in Nakawa Division and 35% in Rubaga Division. Furthermore, about 40% are within mixed used areas, while 60% are in residential areas.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.





Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.





Note: Initial slum boundaries were prepared by the KCCA GIS Unit in 2012, but monidified in 2024 by the JICA Expert Team with the results from density analysis of building footprints smaller than 50 m2 using data from JICA's Preparatory Study on Urban Environment Improvement against COVID-19 2022, and Google Earth Pro 2024. Source: JICA Expert Team

Figure 18.1.6 Distribution of Slum Areas on Present Land Use of Kampala Capital City, 2022

(2) Present Land Use at Division Level

In this section, land uses at the division levels are discussed.

1) Present Land Use in Central Division

In general, all land uses in the Central Division represent 8% of the total land use coverage of the whole of KCC. Known for its centrality in the country's capital, the division can best be described as having four unique identities when it comes to its land use distribution as shown in Figure 18.1.7. There is the northeast, southeast, central and southwest. The Central Division is made up of a dominant 23% residential use which constitutes about 2% of the total land area of KCC. This is uniquely placed in the northeastern portion of the division with few areas in the southwest. Commercial land use is the second largest in the Central Division and is mostly found in the central portion which also embodies the CBD. Together with mixed commercial use, they occupy 33% of the division's total surface area and represent 3% of the entire KCC land use coverage. These commercial areas, particularly in the central area are supported by other land uses such as schools, healthcare facilities and offices. Therefore, institutional and civic land uses take up 8% and 4% of the division's land area respectively. Significantly, the southeastern enclave of the division is dedicated to industrial use, and it constitutes 10% area within the division. Together with other small industrial sites in other parts of the division, it is composed of nearly 1% of the total land area of the Capital City and about 20% of all industrial land use in the city. Despite vibrant activities in the division, there are areas dedicated to recreational activities which include the Ugandan Golf Course, and the Independence Park among others. They are composed of open spaces which are 7% of the division's area but constitute 58% of all open space allocations in the city. Table 18.1.1 gives additional information on the land uses in relation to others.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.



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Land Use Category	Land Use Coverage (Ha)	% of Land Use within Division	% per City's Land Use Category Allocation	% of Total City's Surface Area				
Civic	61	4.2%	62.9%	0.3%				
Special Area	15	1.1%	5.7%	0.09%				
Cemetery	6	0.4%	66.4%	0.03%				
Institutional	111	7.7%	8.6%	0.6%				
Residential	331	23.1%	4.3%	1.9%				
Undeveloped/Vacant Land	6	0.4%	1.0%	0.03%				
Commercial	291	20.3%	32.5%	1.6%				
Mixed use	182	12.7%	5.9%	1.0%				
Industrial	141	9.8%	18.6%	0.8%				
Infrastructure and Utilities	50	3.5%	36.7%	0.3%				
Road Network	128	8.9%	11.3%	0.7%				
Open Space	94	6.5%	57.8%	0.5%				
Wetlands	19	1.3%	1.2%	0.1%				
Open Water	-	0.0%	0.0%	0.0%				
Total	1,648.81	100%		8.0%				

Table 18.1.1 Present Land Use Categories in Central Division

Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

2) Present Land Use in Kawempe Division

Land use in Kawempe Division constitutes about 31 km² which is 17% of the total land use coverage in KCC, and more than half (55%) of this is residential, which is nearly 22% of all residential land use in the city and about 10% of all residential land use in the capital combined. Mixed land use constitutes 14% of the area in the division but together with other commercial uses represent almost 17%, which is about 3% of KCC's surface area. However, they are mostly found along the Ntinda - Kasaasi Road and the Gayaza - Kampala Road. Furthermore, its industrial uses are spread along Bombo Road and in Bwaise Parish but the entire industrial area in the division is made up of 14% of all industrial zones in KCC. Makerere University, Mulago Hospital and other areas contribute to the division's institutional land use which is nearly 10% area but denotes 23% of all institutional land uses for the Capital City. Figure 18.1.8 shows the land use map of the division while Table 18.1.2 shows the land use areas in comparison to others.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.



		-		
Land Use Category	Land Use Coverage (Ha)	% of Land Use within Division	% per City's Land Use Category Allocation	% of Total City's Surface Area
Civic	0.3	0.01%	0.3%	0.002%
Special Area	1	0.03%	0.4%	0.01%
Cemetery	0	0.00%	0.0%	0.0%
Institutional	291	9.5%	22.6%	1.6%
Residential	1,687	55.2%	21.9%	9.5%
Undeveloped/Vacant Land	86	2.8%	2.8%	0.5%
Commercial	103	3.4%	13.6%	0.6%
Mixed use	412	13.5%	2.9%	2.3%
Industrial	108	3.5%	14.2%	0.6%
Extractive	0	0.0%	0.03%	0.0%
Infrastructure and Utilities	0.3	0.01%	0.2%	0.002%
Forest	3	0.1%	5.7%	0.02%
Road Network	236	7.7%	20.9%	1.3%
Open Space	9	0.3%	5.5%	0.05%
Wetlands	121	4%	7.7%	0.7%
Total	3,058	100%		17.14%

Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

3) Present Land Use in Makindye Division

The present land use in Makindye Division is uniquely identified by the distribution of mixed uses along its major arterial roads such as Lukuli Road, Salaama Road and Ggaba Road. The mixed uses represents 22% area of the division but takes 31% of all mixed uses allocations in the city, as well as 5% of the city's land area. Residential however occupies approximately 43% of the division but 11% of the total surface area of KCC. This is a further 25% of KCC's 77 km² of residential land use allocations. Wetlands, on the other hand, take 13% of the division's land area and this is the third largest of the division and forms nearly 37% of all wetlands in the Capital City. Notably, along the roads are the location of commercial land use which is about an area of 2 km². Table 18.1.3 shows the land use categories in Makindye Division while its spatial distribution is depicted in Figure 18.1.9.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

Figure 18.1.9 Present Land Use in Makindye Division

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Land Use Category	Land Use Coverage (Ha)	% of Land Use within Division	% per City's Land Use Category Allocation	% of Total City's Surface Area
Civic	5	0.1%	5.4%	0.03%
Special Area	47	1.1%	17.3%	0.3%
Cemetery	0	0.0%	0.0%	0.0%
Institutional	184	4.1%	14.3%	1.0%
Residential	1,914	43.1%	24.9%	10.7%
Undeveloped/Vacant Land	102	2.3%	18.5%	0.6%
Commercial	197	4.4%	22.0%	1.1%
Mixed use	967	21.8%	31.2%	5.4%
Industrial	42	0.9%	5.6%	0.2%
Extractive	9	0.2%	48.7%	0.05%
Infrastructure and Utilities	28	0.6%	20.6%	0.2%
Forest	37	0.8%	76.0%	0.2%
Agriculture	36	0.8%	34.4%	0.2%
Commercial Agriculture	0	0.0%	0.0%	0.0%
Road Network	276	6.2%	24.4%	1.5%
Open Space	30	0.7%	18.5%	0.2%
Wetlands	570	12.8%	36.4%	3.2%
Open Water	0	0.0%	0.00%	0.0%
Total	4,443	100%		24.9%

Table 18.1.3 Present Land Use Categories in Makindye Division

Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

4) Present Land Use in Nakawa Division

Nakawa Division shows a variety of land uses but is dominated by residential with an area of 23 km², representing approximately 13% of the total land area of KCC and 45% of the surface area of the division. This is about 30% of all residential land use within the city. The division also has significant areas dedicated to industrial activities with about 3 km², representing 43% of all industrial land use in the city. Parts of the division are composed of special areas, and they consist of the Naguru Police Barracks, the Luzira Prisons and other security defence enclaves. Together, they form 76% of all lands allocated for such purposes in the whole of the city, and within the division, they represent about 4% of the total land use coverage. Furthermore, Kyambogo University, together with the Butabika National Referral Mental Hospital and others, contribute to the institutional land use. This is about 8% of the land use in the division. The representation of all the land uses in the division is depicted in Figure 18.1.10 and Table 18.1.4.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.



Land Use Category	Land Use Coverage (Ha)	% of Land Use within Division	% per City's Land Use Category Allocation	% of Total City's Surface Area
Civic	25	0.5%	26.0%	0.1%
Special Area	206	4.0%	75.6%	1.2%
Institutional	412	8.0%	31.9%	2.3%
Residential	2286	44.7%	29.7%	12.8%
Undeveloped/Vacant Land	273	5.3%	49.4%	1.5%
Commercial	140	2.7%	15.6%	0.8%
Mixed use	443	8.7%	14.3%	2.5%
Industrial	328	6.4%	43.3%	1.8%
Extractive	9	0.2%	50.6%	0.05%
Infrastructure and Utilities	12	0.2%	8.8%	0.1%
Forest	9	0.2%	17.6%	0.05%
Agriculture	67	1.3%	64.7%	0.4%
Commercial Agriculture	0	0.0%	0.0%	0.0%
Road Network	313	6.1%	27.7%	1.8%
Open Space	16	0.3%	9.6%	0.1%
Wetlands	576	11.3%	36.7%	3.2%
Total	5,114	100%		28.7%

Table 18.1.4 Present Land Use in Nakawa Division

Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

5) Present Land Use in Rubaga Division

Six land use categories are prominent in Rubaga Division. They are residential, which is nearly 40% of the division's land area, mixed uses (29%), institutional (7%), wetlands (7%), commercial (4%), and undeveloped or vacant areas (2%). Rubaga Division has the highest proportion of all mixed-use allocations in the whole of KCC with a percentage of 34%. This represents about 6% of the entire surface of the city. This is notably spread along all arterial roads in the city as shown in Figure 18.1.11. Additional descriptions of the land use categories and their areas are shown in Table 18.1.5.



Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

Figure 18.1.11 Present Land Use in Rubaga Division

Land Use Category	Land Use Coverage (Ha)	% of Land Use within Division	% per City's Land Use Category Allocation	% of Total City's Surface Area					
Civic	2	0.05%	1.9%	0.01%					
Cemetery	3	0.07%	29.9%	0.01%					
Institutional	277	7.4%	21.5%	1.6%					
Residential	1,397	37.5%	18.2%	7.8%					
Undeveloped/Vacant Land	83	2.2%	15.0%	0.5%					
Commercial	145	3.9%	16.2%	0.8%					
Mixed use	1,063	28.5%	34.3%	6.0%					
Industrial	127	3.4%	16.8%	0.7%					
Infrastructure and Utilities	43	1.1%	31.4%	0.2%					
Commercial Agriculture	0	0.01%	99.2%	0.00%					
Road Network	298	8.0%	26.3%	1.7%					
Open Space	9	0.2%	5.4%	0.05%					
Wetlands	267	7.2%	17.0%	1.5%					
Open Water	9	0.2%	100%	0.05%					
Total	3,723	100%		20.8%					

Table 18.1.5	Present Land	Use Cate	egories in	Rubaga	Division
			goines in	nusugu	DIVISION

Source: JICA Expert Team based on the interpretation of an Orthophoto prepared by World Bank supported Project "Three-Dimensional Oblique Aerial Imagery" done by AAM Geomatics Pty Ltd. in 2019 and ground truthing by the JICA Expert Team in 2022.

18.2 Review of Former and Existing Land Use Plans in Kampala

18.2.1 Kampala Structure Plan 1994

The Kampala Structure Plan which was formulated in 1994 guided the urban development in KCC until KPDP 2012 was formulated.

The overall objective of the Kampala District Plan was to provide for a conceptual planning framework for a combination of green fields expansion and intensification in a form which reinforces the existing resistance council system, and the corresponding pattern of community relations this system currently supports.

The plan includes the following land use categories:

- Environmental Land Use The plan provides for the protection of critical ecological system and drainage pattern.
- Industrial Land Use The plan identifies all undeveloped/agriculture lands with low-slope as "Potential Industrial Land" to reinforce the priority given to accommodating a full range of new formal and informal industrial activity.
- Commercial Land Use The plan designates the existing CBD as well as a series of subcentres and local centres for commercial activity in line with what currently exists.
- Residential Land Use: The plan designates as "residential" all existing residential areas as well as all other underdeveloped/agricultural lands not designated for primary commercial or industrial use.
- Social Facilities The plan identifies the general distribution of facilities to be required both during and beyond the planning period in order that land can begin to be identified. The plan emphasises the development of multi-purpose facilities to make best use or limited resources.
- Transportation The plan emphasises the upgrading of Kampala's existing road network, the primary road network in particular, during the planning period as opposed to construction of new roads.



The proposed land use plan of Kampala Structure Plan 1994 is shown in Figure 18.2.1.

Source: Kampala District Plan 1994 in KPDP 2012

Figure 18.2.1 Land Use Plan in Kampala District Plan 1994

Most of KCC is designated as residential area with concentration of commercial areas and industrial areas in the city centre. Also, many of the commercial areas are designated along the major arterial roads. Most of the potential industrial areas are designated in Kawempe Division and Nakawa Division. However, the industrial area in current land use in KCC is more or less same

as the industrial areas which existed in 1994, and the potential industrial areas were not developed to become industrial areas.

18.2.2 KPDP 2012

KPDP 2012 has been guiding the urban development in KCC since its approval.

The spatial goals of KPDP 2012 are as follows:

- To create a multifocal and multifunctional city centre composed of special components of metropolitan importance.
- To enlarge and extend the CBD.
- To construct an urban freeway for better accessibility to employment and businesses.
- To develop Kampala as a lakefront city and to connect the lake to the inner city.
- To change the attitude towards wetlands within the city and protect them as lively, healthy and functional parks accessible to Kampala's residents and visitors.
- To create a new hierarchy of service centres and sub-centres and to control and direct linear sprawl of shops and public services.
- To crystallise a new spatial system, as part of the city centre, for cultural activities, recreation and tourism.
- To develop the hilltops for public use, recreation and tourism.
- To define and designate new urban quarters and precincts as planning entities for better control, management and development.
- To encourage new housing models, including affordable housing, in future development of quarters and precincts.
- To create a hierarchical road network system consisting of urban freeway and major arterial road.
- To create a mass rapid transit (MRT) system that includes BRT and/or LRT.
- To provide safe and attractive infrastructure for non-motorised trips.
- To integrate land use and transport planning.

The plan includes the following land use categories:

- City Centre Main and central functions of the city and metropolitan area including the existing CBD and new development and re-development in adjacent areas
- Major Employment Centres & Business Parks Major business centres located along the inner ring road. Each Major Business Centre covers a minimum of 25 ha.
- Tourism and Recreation Tourism and Recreation areas within the KCCA located at potential (e.g., hilltops, lakefront, etc.) or at existing sites (e.g., Kibuli Mosque, Kasubi Tombs, etc.) to meet the different the needs of local, regional and international tourism.
- Lakefront The Lakefront consists of the Lake Victoria shoreline in the KCCA area. The Lakefront is a mixed use area which includes functions of employment, commerce, tourism and recreation together with the protection and preservation of the coastline itself.
- Secondary Centres Business, Community Services and Commerce Small scale Business, Community Services and Commerce centres within the built urban tissues. The local centres are to supply services for the residents of adjacent neighbourhoods.
- Major Hospital New or existing major hospitals within the KCCA area. On average, a major hospital will hold 2,000 beds serving a catchment population of some 500,000 people.
- Major University New or existing major universities within the KCCA area.
- Major Government Facilities Areas which house major government facilities (e.g., KCCA offices, Parliament, Kampala State House, etc.).
- Cultural and Historical Reserve Areas of historic and cultural significance within the KCCA area (Kasubi, Lubiri Salaama Island) including World Heritage Sites.
- Urban Park Green open space for public use within the KCCA area including recreation, sport and culture. The urban parks vary from city and metropolitan scale parks to small-scale local parks. The urban parks are located either in currently vacant areas or in existing wetland within the KCCA area.

- Sport Centre Sport facilities for public use within the KCCA area. The sport facilities vary from city scale centres to small-scale local centres.
- Natural Wetland Reserve Natural wetland surrounding the KCCA area. The wetlands have an important role in the Kampala ecologic system and constitute the most significant land reserves in the KCCA area.
- Natural Forest Reserve Forests within the KCCA area which form part of the Natural Resources and Open Spaces System.
- Central Residential Zone Inner city residential areas included in the city centre and areas adjacent to the city centre (e.g., Kololo, Old Kampala, Nsambya, Kibili, Bogolobi, etc.) The central residence zone provides support functions for the city centre and includes public functions to a certain extent in addition to residence.
- Inner City Residential Zone Inner city established, relatively dense residential areas which are not adjacent to the city centre (e.g., Busega, Lubia, Mutungo, Buziga, etc.) These residential zones are mostly residential with more non-residential functions.
- Peripheral Residential Zone Peripheral less established, less dense city residential areas in the extended KCCA area (e.g., Kawempe, Kyanja, Mutundwe, Busabala, etc.) These residential zones are primarily residential, often lacking non-residential functions.
- New Residential Zone Areas for development of new residential areas. These new residential areas will be planned and built according to modern standards. The areas area located either in the Inner-City Residential Zones or the Peripheral Residence Zones.
- Slum Redevelopment and Upgrade Existing slums which are to be redeveloped or upgraded. The areas for slum redevelopment and upgrade are located either in the Central Residential Zone, the Inner-City Residential Zones or the Peripheral Residence Zones.
- Road Network New road networks to serve both KCCA and GKMA. The minimum reserve width of each newer road is 60 m and should include cross section travelling lanes, separation area between the two travelling directions, walkway pavement on each travelling side with minimum width of 2.5 m, cycling lane on each side with minimum width of 2.5 m, and a possibility for MRT system with a minimum width of 8m for the MRT sections and 15 m at stations and platforms. No parking will be allowed along the arterial roads, there will be no at-grade intersection between the urban freeway and the urban roads but only interchanges.
- MRT Network (BRT/LRT) New mass rapid transit network for KCCA area. The alignments are either along existing urban roads or within the new arterial system. The MRT may be operated as BRT or LRT. All stations and platforms should be accessible to mobility impaired people. The MRT is planned to cover the majority of the KCCA area with a radius of 2 km.

The land use plan based on the spatial goals using the land use categories above are shown in Figure 18.2.2.



Source: KCCA, 2012, Updating Kampala Structure Plan and Upgrading the Kampala GIS Unit Final Report

Figure 18.2.2 Integrated Land Use Plan in KPDP 2012

The land use plan also includes the existing industrial areas, existing commercial areas, and existing community facilities.

Functions permitted on each land use category are determined in KPDP 2012. In addition, density targets (gross built area capacity and indicative nett development rights) are set for each land use category. Building coverage ratio, floor area ratio, building heights etc. are not determined in the plan document. Therefore, the KCCA staff follows the National Physical Planning Standards and Guidelines 2011 is used alongside the KPDP 2012 for development control.

Unfortunately, many of the goals such as enlarging the CBD, implementing MRT, etc., were not realised in the past 10 years. In addition, despite the goal of controlling the linear sprawl of shops and public services along the major roads, most of the areas along the major arterial roads has shifted to mixed use area of commercial and residential.

There are eight major employment centres and business parks proposed in the plan, which includes Nakawa, Kyambogo, Butabika, Munyonyo, Busega, Makerere and Bukoto in KCC and Nangabo in Kasangati Town, Wakiso District. Out of these eight, Butabika, Munyonyo and Busega are wetlands, while Kyambogo and Makerere are undeveloped land next to universities. Nakawa already has a business park established, and Bukoto is now being developed to become a multifunction complex. Nangabo, which was vacant land in 2011, is being developed as an industrial area. (See Figure 18.2.3.)

The secondary centres proposed are areas which still had some vacant land mostly with some sort of existing commercial activities or service centres. However, there are three new centres proposed, which are at Kyanja, Butabika and Kyebando. The situation of these designated secondary centres is shown in Figure 18.2.4.



 Makerere University
 Ntinda and Mbuya

 Source: JICA Expert Team utilising data from KCCA GIS Unit and Orthophoto data 2019
 Figure 18.2.3

 Figure 18.2.3
 Present Situation (2019) of the Lands Proposed for Employment Centres and Business Parks in KPDP



CA Expert Team utilising data from KCCA GIS Unit and Orthophoto data 2019 Figure 18.2.4 Present Situation (2019) of the Lands Proposed for Secondary Centres in KPDP

Chapter 19 Land Use Policies for Kampala Capital City (KCC)

19.1 Future Spatial Structure for Kampala Capital City (KCC)

The present spatial structure of Kampala Capital City (KCC) is a monocentric structure with a small CBD area and low-density commercial function or mixed use of commercial and residential along the major arterial roads.

The future spatial structure for Kampala Capital City considers the development of centres other than the existing CBD with Transit-Oriented development (TOD) along selected expressways and arterial roads, and railway line that will be rehabilitated. (See Figure 19.1.1.)



Figure 19.1.1 Future Spatial Structure of Kampala Capital City (KCC), 2040

The urban spatial structure for KCC is composed of the following transport infrastructures and urban centres:

Expressways are the main components of the spatial structure, with the Kampala-Jinja Expressway and the Southern Bypass Expressway, for which project plans already exist, in addition to the existing Northern Bypass Expressway and Entebbe Expressway. In the future, in addition to those expressways, it is proposed to develop the Nakasero bypass motorway linking the city centre to the northern bypass motorway and the intra-urban express link linking the city centre to the southern bypass motorway. These expressways will be served by BRT, thereby enhancing the public transport network.

- Primary Urban Centres
- Secondary Urban Centres
- Urban Sub-Centres
- TOD Transit Centres

The Primary Urban Centres are the following three areas:

- Nakasero: Current CBD
- Old Kampala: Current CBD
- Naguru-Nakawa: New CBD to be Extended

The Secondary Urban Centres are the following two areas:

- Busega: near the exit/entrance of Kampala-Mpigi Expressway
- Luzira-Port Bell: near the Exit of Southern Bypass to be developed with existing business and industrial park

The Urban Sub-Centres are the following two areas:

- Kawempe: Current urban centre of Kawempe Division with industrial areas changing into commercial area along Bombo Road
- Munyonyo: Lakefront area along the Southern Bypass to be developed

The TOD corridors are designated along the major roads where BRT or LRT are planned to be implemented, and the existing railway line that will be rehabilitated to be utilised for urban railway. These corridors are expected to have higher daytime population density and active economic activities.

The TOD Transit Centres are at the exits of the expressways and railway stations where it has potential to develop as a commercial centre.

19.2 Land Use Policies for Kampala Capital City

(1) Objectives of the Formulation of the Physical Development Plan including General Land Use Plan for Kampala Capital City

The objectives of the formulation of the physical development plan including the general land use plan for Kampala Capital City are as follows:

- To promote not only the transformation of functional formation of orderly and liveable urban space, but also the transformation for efficient economic activities in KCC
- To promote transit-oriented development (TOD) along heavy railways, BRT routes (on both arterial roads and expressways), and LRT/MRT routes in KCC
- To indicate infrastructure needs and locations in KCC

(2) Land Use Policies for Kampala Capital City

By considering the present condition including urbanisation issues of KCC and future directions for KCC, the following land use policies are proposed:

- To expand the areas for CBDs for accommodating commercial and business activities with high productivity, high-skilled industry, headquarters function as primary centres not only for Uganda but also for East African Region
- To create Secondary Urban Centre Areas in selected areas with good accessibility to expressways and arterial roads, as well as railways and future rail-based transits, to support the CBD functions
- To allow the development of commercial and mixed use areas along arterial roads while promoting the expansion of CBDs and Secondary Urban Centre areas.
- To promote Medium-Rise Mixed Use (Commercial and Residential) along major expressways and arterial roads, by which transit-oriented development (TOD) could be promoted
- To promote the expansion of Medium-Rise Mixed Use areas (Commercial and Residential) where multi-story buildings can be built to accommodate an increasing number of populations
- To promote the development of Low Density Mixed Use areas (Commercial and Residential) on selected areas in areas with relatively large plot size and low-rise buildings close to the CBD where business opportunities are emerging closer to arterial roads.
- To control developments on wetlands that function as waterway and natural ecosystem
- To secure land for future infrastructure and urban parks by utilising deteriorated wetlands

(3) General Land Use Plan for the KCC

In order to realise the above-mentioned land use policies, a general land use plan for the Kampala Capital City was formulated.

The general land use plan is a tool to realise the proposed spatial structure and land use policies for Kampala Capital City and GKUGA. Such general land use plans are used as reference for formulating detailed land use plans (land use zoning plans, as part of the detailed PDP). Then the detailed PDPs are used for controlling actual land development and construction and uses of buildings.

If the existing land use does not match the designated land use categories in the general land use plan, it does not mean that building uses should be changed, or existing people should relocate. Existing facilities can stay.

However, once the detailed PDPs are formulated by referring to the general land use plan, and in case, existing buildings are to be extended or rebuilt, those development should comply with the detailed land use zoning plan.

(4) Land Use Categories Used by the General Land Use Plan for the KCC

The land use types for urban plans in the Draft National Physical Planning Standards and Guidelines Second Edition 2023 (NPPS&G 2)¹ are adopted for land use categories to be used for the general land use plan for the KCC.

However, the following adjustment or changes are proposed:

- Medium High Density Residential Zone is proposed in the residential zone since the majority of good residential areas in Kampala do not have such a large lot size as 1,000m² which is the minimum lot size for medium density residential area specified by the NPPS&G 2, while the lot size of good residential areas also has a larger lot size than 300m² which is the maximum lot size for high density residential areas regulated in the Draft Version of NPPS&G 2.
- In addition, the minimum lot size of 200m² is relatively large for high density residential areas in a city where the land price is high like KCC. There are quite a few residential houses with a lot size less than 200m² but still should maintain the characteristics of residential area.

¹ The National Physical Planning Standards and Guidelines (NPPS&G) 2011 was prepared by the Ministry of Lands, Housing and Urban Development (MoLHUD) in order to supplement the Physical Planning Act 2010 in promoting the orderly development. The Second Edition for the NPPS&G has been prepared in the last three years. NPPS&G 2011 was used as an official guideline and regulation for preparation of physical development plans.

Therefore, Low Density Mixed Use (Commercial and Residential) Zone and Medium Density Mixed Use (Commercial and Residential) Zone are also applied in the general land use plan for Kampala Capital City, where the lot size do not satisfy the minimum lot size regulated in the guidelines but is considered to maintain the low-rise structures.

Table 19.3.2 shows the detailed adjustment and changes made for the land use categories adopted in the general land use plan for KCC in comparison with the land use categories for urban plans stipulated in Draft NPPS&G2.

Land Use Categories for Urban Plans Stipulated in Draft NPPS&G 2	Land Use Categories Used Adopted in General Land Use Plan for KCC			
	Low Density Residential			
Low Density Residential	Mixed Use Low Density (Commercial and Residential)			
Madium Dangity Degidential	Medium Density Residential			
Medium Density Residential	Mixed Use Medium Density (Commercial and Residential)			
	High Density Residential			
High Density Residential	Mixed Use High Density (Commercial and Residential)			
	Medium Rise Residential			
	Mixed Use Medium Rise (Commercial and Residential)			
Commercial	Commercial			
	CBD			
Light Industry	Minud Has (Communication d Industrial)			
Heavy Industry	Mixed Use (Commercial and Industrial)			
Institutional	Institutional			
Civic	Civic			
	Road Network			
Utilities/transport	Railway Network			
	Other Infrastructure			
Agriculture	Agriculture-			
Cemetery				
Open Space	Open Space			
Forest	Forest			
	Wetland			
Reservoirs/lakes/rivers	Protected Waterfront Zone			
	Open Water			

Table 19.2.1 Comparison of Land Use Categories in Draft NPPS&G2 and General Land Use Plan for KCC

Source: JICA Expert Team based on Draft NPPS&G2

(5) Description of Land Use Categories for General Land Use Plan for the KCC

In the NPPS&G 2 (Draft Version), the land use categories used in the general land use plan for cities and districts are described. The land use categories in the general land use plan for KCC is described in accordance with the NPPS&G 2 (Draft Version).

1) Commercial Area

There are three types of commercial areas used in the general land use plan for KCC, which are, CBD, Commercial and Mixed Use. Mixed Use is further divided into five sub-categories, namely Mixed Use-Medium Rise (Commercial and Residential), Mixed Use – Low Density (Commercial and Residential), Mixed Use – Medium Density (Commercial and Residential), Mixed Use – High Density (Commercial and Residential) and Mixed Use (Commercial and Industrial) to guide the formulation of detailed physical development plans and also help the development control process until the detailed physical development plans are formulated covering the whole city area. The policy for each land use categories are described below.

• CBD: The areas under this category will be the most attractive business and commercial areas of Uganda. High-rise buildings for business, commercial and residential uses should be promoted to support economic activities. CBD should be set for the Primary Urban Centres for GKUGA. Large-scale offices and shopping centres should be promoted. Good

road network and public transport should also be developed to support the function of the CBD. Furthermore, residential usage should also be permitted to allow the existing residents to live and also to promote residents to return to the centre of Kampala Capital City.

- Commercial: The areas under this category should support the economic activities of the CBD by creating urban centres. Commercial area are set for the Secondary Urban Centres and Urban Sub-Centres for GKUGA. Large-scale and medium-scale offices and shopping centres should be promoted. Good road network and public transport should be developed to support such functions.
- Mixed Use Medium Rise (Commercial and Residential): In this area, commercial and residential usage should be promoted. This area is set along major roads and for TOD Transit Centres in Kampala Capital City, allowing high-rise building promoting mixed urban development to promote TOD. Large-scale and medium-scale offices and shopping centres should be promoted. Small-scale retail shops are not preferable in this area.
- Mixed Use Low Density (Commercial and Residential): In this area, the existing low-rise residential areas with relatively larger plot sizes should be maintained. Medium-scale and small-scale offices and shopping centres should be promoted, but high-rise and medium-rise buildings should not be permitted.
- Mixed Use Medium Density (Commercial and Residential): This area should be set in major part of existing residential areas of KCC where medium and small-scale offices and shopping centres should be promoted. In this area, while high rise buildings are not recommended, medium rise buildings could also be considered if good road network exists.
- Mixed Use High Density (Commercial and Residential): This area should be set in relatively dense residential and commercial mixed-use area. Informal settlements that are mixed use area in the present land use is designated with this category to promote the formalisation of the area.
- Mixed Use (Commercial and Industrial): This land use category is designated on existing industrial areas in KCC. It does not require the existing industries to relocate, but it promotes commercial and business usages in the existing industrial areas in case there is vacant land if industries relocate to areas outside KCC where land prices are lower and more spacious. Large-scale and medium-scale offices should be promoted if the existing industries should not be permitted. High-rise buildings should also be promoted. However, residential uses are not recommended.

2) Residential

There are four types of residential areas used in the general land use plan for KCC, which are, Medium Rise, High Density, Medium Density and Low Density to guide the formulation of detailed physical development plans and also help the development control process until the detailed physical development plans are formulated covering the whole city area. The policies for different land use categories are described below:

- Low Density Residential: The area which has existing residential areas with extremely large plot size in a city centre maintaining the buildings and street scape from the colonial era will be designated as Low-Density Residential area to protect the environment in such residential area.
- Medium Density Residential: Good and luxury residential areas with relatively large plot sizes are designated as Medium Density Residential area to provide luxury residential area in KCC.
- High Density Residential: Pure residential areas including some residential areas which are classified as informal settlement with basic road infrastructure and existing buildings in relatively good condition are designated as High Density Residential area to provide residential area with good living environment in KCC.
- Medium Rise Residential: Flats and apartments should be promoted in the Medium-Rise Residential area to provide sufficient affordable housing in KCC.

3) Institutional

The Institutional Land Use should be set for large scale educational and healthcare facilities on adequate parcels of land. In addition, primary and secondary schools within the CBD area should be designated as institutional to protect such facilities from land encroachment.

4) Open Space

The Public Open Space should be set for lands which should be secured as public parks and sport facilities. In addition, deteriorated wetlands that can become urban parks and land for large-scale infrastructure should be set as public open space to reserve the land. Green infrastructure should be promoted in this area.

5) Forest

Forest designated as Forest Reserve should use this land use category.

6) Wetland

Wetlands that should be preserved falls under this land use category. No development should be permitted on this zone.

(6) Other Layers included in the General Land Use Plan

1) Conservation Layer

For the purposes of conservation of areas with special interest such as environmental and cultural conservation, another layer is overlayed on the land use category.

The following categories are included in the general land use plan for KCC:

- Historic, Traditional and Cultural Zone is for the area of Kasubi Royal Tombs and Kabaka's Palace its surrounding area.
- Protected Waterfront Zone should be designated on the lakefront of Victoria Lake.

2) Transport Layer

The following roads and railways are included in the general land use plan:

- Planned Expressways
- Existing Expressways
- National Roads
- Other Roads
- Existing Railways
- Proposed Standard Guage Railway

19.3 General Land Use Plan for Kampala Capital City

(1) Major Changes from the Current General Land Use Plan (KPDP 2012)

The land use plan for KCC should be changed from the land use plan in KPDP 2012 taking in consideration of the land use planning policies and the Draft National Physical Planning Standards and Guidelines 2024 (Second Edition). To achieve the objectives of the general land use plan, the following changes have been applied to the land use plan in KPDP 2012.

- Expanded CBD proposed in KPDP 2012 remains as CBD. In addition, Old Kampala and Nakawa proposed as Primary Urban Centres are designated as CBD.
- Areas designated as Secondary Urban Centre and Urban Sub-Centres in spatial structure plan are designated as Commercial area.
- Areas designated as Major Employment Centres & Business Parks, and Secondary Centres: Business, Community Services and Commerce in KPDP 2012 are changed to Commercial

area. However, Major Employment Centres & Business Parks and Secondary Centres which were on wetland in KPDP 2012 and are still wetland as of now, are changed to Wetland.

- Existing Industrial Area in KPDP 2012 are changed to Mixed Use (Commercial and Industrial) area.
- The roadside areas along Northern Bypass, Masaka Road, Jinja Road, Bombo Road, Hoima Road, Gayaza Road, Ggaba Road and Port Belle Road are designated as Mixed Use Medium Rise (Commercial and Residential) area.
- Areas with exits of expressways are designated as Mixed Use Medium Rise (Commercial and Residential) area.
- Central Residential Zone is changed to Mixed Use Low Density (Commercial and Residential) area. If there are residential area with lot size larger than 2,000m², Low Density Residential Area is applied.
- Inner City Residential Zone and Peripheral Residential Zone are changed to Mixed Use Medium Density (Commercial and Residential) area. If there are residential areas with lot size larger than 1,000m², Medium Density Residential Area is applied.
- Areas designated as Urban Park in KPDP 2012's land use plan which still function as wetland are changed to Wetland.
- Areas designated as Urban Park in KPDP 2012's land use plan which is neither part of Central Urban Park nor wetland are changed to Public Open Space.
- Areas designated as Lakefront in KPDP 2012's land use plan are changed to Protected Waterfront Zone.
- Sport Centres are changed to Public Open Space.
- Areas designated as Existing Community Facilities in KPDP 2012's land use plan are changed to Institutional area.
- Major universities and major hospitals in KPDP 2012's land use plan are changed to Institutional area.

(2) General Land Use Plan for the KCC

The general land use plan (draft version) prepared at the scale of 1:20,000 for the target year 2040 is shown in Figure 19.3.1.

The total surface area of the land use under the category CBD, Commercial and Mixed Use (Commercial and Industrial) is 3,620 ha. The existing commercial area in the present land use is 895 ha. Therefore, approximately 2,725 ha of land will increase which can be used for commercial and business purposes. In KPDP 2012, approximately 618 ha of land was proposed as new areas for commercial and business purposes. However, most of the areas which were designated as new commercial areas by KPDP did not change to commercial usage by 2022.

The surface area by land use category in the draft general land use plan is shown in Table 19.3.1. Largest land use is Mixed Use Medium Density (Commercial and Residential) with 3,012 ha which is approximately 17% of the surface area in KCC. The next large land use is High Density Residential Area with 2,961 ha.

The comparison of the land surface area for each land use category in the general land use plan are compared with the present land use and KPDP 2012. The result is shown in Table 19.3.2.

In KPDP 2012, approximately 70% of the area in KCC was designated as residential area. In the KCC-PDP, residential area is approximately 27% of the surface area in KCC while mixed use area covers approximately 35% of that.

Land Use Category	Surface Area	Share
(IDD	(na)	Z 40/
CBD	954	5.4%
Commercial Zone	921	5.2%
Mixed Use - Medium Rise (Comm and Residential)	1,747	7.4%
Mixed Use - Low Density (Comm and Residential)	137	0.8%
Mixed Use - Medium Density (Comm and	3,012	16.9%
Residential)		
Mixed Use - High Density (Comm and Residential)	1,321	7.4%
Mixed Use (Commercial and Industrial)	410	2.3%
Low Density Residential	300	1.7%
Medium Density Residential	1,542	8.7%
High Density Residential Area	2,961	16.6%
Medium Rise Residential	90	0.5%
Forest	44	0.3%
Institutional	1,019	5.7%
Open Space	302	1.7%
Open Water	10	0.1%
Protected Waterfront Zone	486	2.7%
Road Network	1,260	7.1%
Wetlands	1,311	7.4%
Total	17,836	100.0%

 Table 19.3.1
 Surface Area in General Land Use Plan for KCC (2040) by Land Use Category

Source: JICA Expert Team

Tahla 19 3 2	Comparison	of Surface Area h	v I and Ilsa	Category: F	Procent I and I lea	KPDP and KCC-PDP
Table 19.3.2	Comparison	OI SUITACE Alea D	y Lanu Use	Calegory. r	Fresent Lanu Use	, KEDE allu KGG-EDE

Land Use Category	Present Land Use 2022		KPDP 2012 Target Year: 2030		General Land Use Plan for KCC Target Year: 2040	
	Total (Ha)	%	Total (Ha)	%	Total (Ha)	%
Residential	7,688	43.1%	12,649	70.9%	4,889	27.4%
Mixed Use (Commercial and Residential)	3,099	17.4%	0	0.0%	6,214	38.9%
Institutional	1,290	7.2%	1,106	6.2%	1,018	5.7%
Commercial	895	5.0%	1,782	10.0%	1,873	10.5%
Industrial	758	4.3%	287	1.6%	0	0.0%
Mixed Use (Commercial and Industrial)	0	0.0%	0	0.0%	409	2.3%
Open Space	716	4.0%	1,086	6.1%	301	1.7%
Agriculture	104	0.6%	0	0.0%	0	0.0%
Wetlands	1,567	8.8%	137	0.8%	1,310	7.4%
Forest	49	0.3%	52	0.3%	43	0.3%
Open Water	9	0.1%	9	0.1%	9	0.1%
Other Land Use	1,703	9.3%	724	4.1%	2,672	7.2%
Total	17,836	100.0%	17,836	100.0%	17,836	100.0%

Source: JICA Expert Team



Source: JICA Expert Team

Figure 19.3.1 General Land Use Plan for Kamala Capital City, 2040

19.4 Priority Areas for Detailed PDPs in Kampala Capital City

It is important that detailed PDP are formulated in the Kampala Capital City to guide control urban development in KCC, since it is only the detailed PDPs that could directly regulate the usage of each land. At the moment, three precinct PDPs have been prepared in KCC and are waiting for approval, while a detailed PDP has been formulated covering Nateete and Busega Wards in Rubaga Division, as part of Busega-Kyengera Secondary Urban Centre in GKMA-IUDMP. However, the expansion of the CBD requires an urgent formulation of detailed PDP to utilise the prime land in the capital city strategically. This urgency must also be extended to Luzira-Port Bell Secondary Urban Centre, which is expected to place a major role in the overall functioning and support of the Primary Urban Centre. Figure 19.4.1 shows the status of PDP formulation in Kampala Capital City and the priority areas for new PDPs.



Source: JICA Expert Team

Figure 19.4.1 Priority Areas for Detailed PDPs in Kampala Capital City