KCCA

KAMPALA CAPITAL CITY AUTHORITY

For a better City

Multi Modal Urban Transport Master Plan for GKMA

'Cities that Work' Workshop on Urban Transport

Eng. Jacob Byamukama

Deputy Director Roads Management

25th April 2018

Together we can transform Kampala city

Presentation Outline

1. The Assignment
2. Base information
3. Multi – Criteria Analysis
4. Optimised option for GKMA
5. Phasing of Planned and Proposed Projects
6. Conclusion

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

The Assignment

Title: Consultancy Services for the development of a Multi-Modal Urban Transport Master Plan for Greater Kampala Metropolitan Area (GKMA)

Client: Kampala Capital City Authority

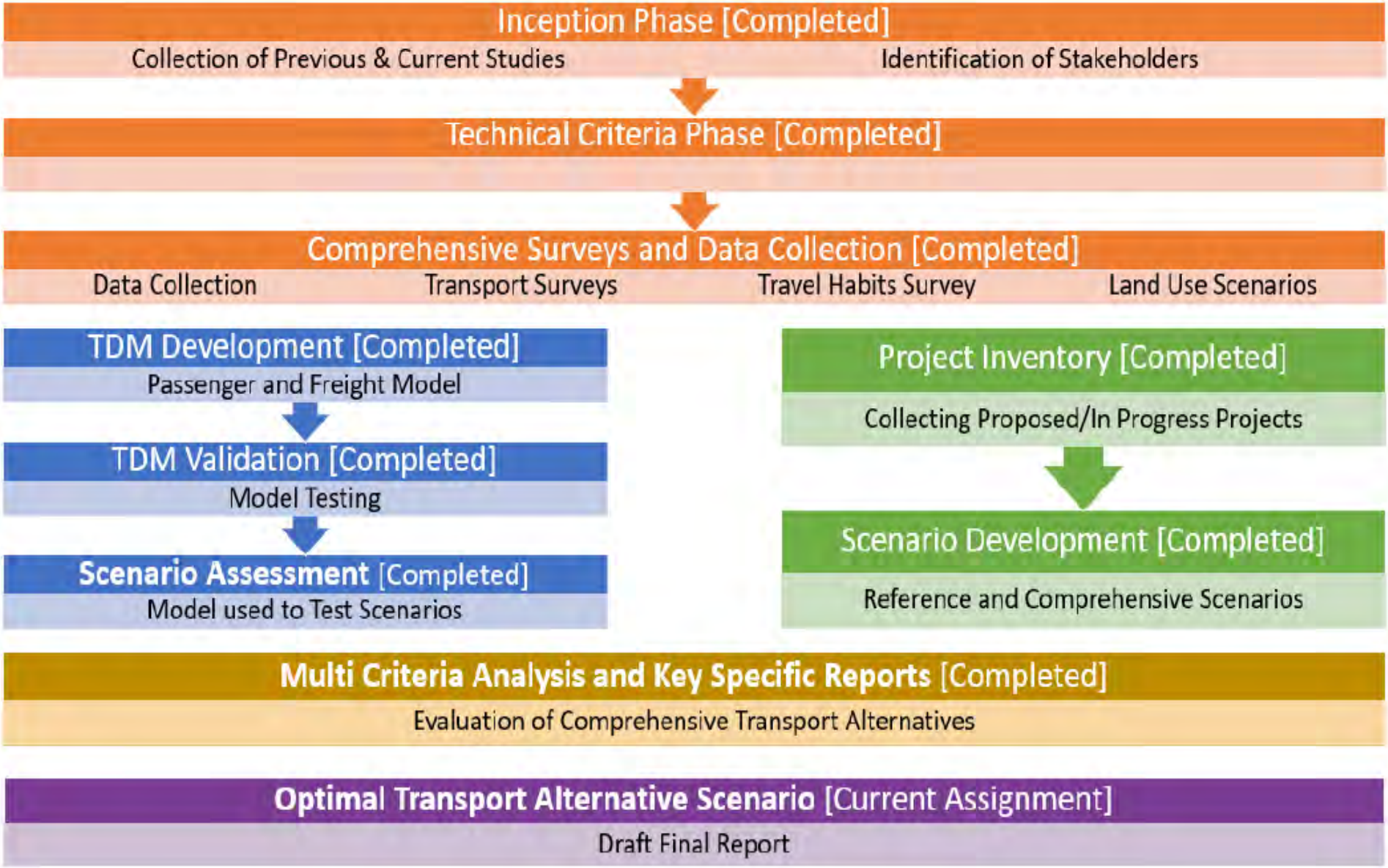
Financing: World Bank

Consultant: ROM Transportation Engineering Ltd, Cambridge Systematics Inc., TNM Ltd in association with AH Consulting

Contract period: 18 months

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

General Project Methodology

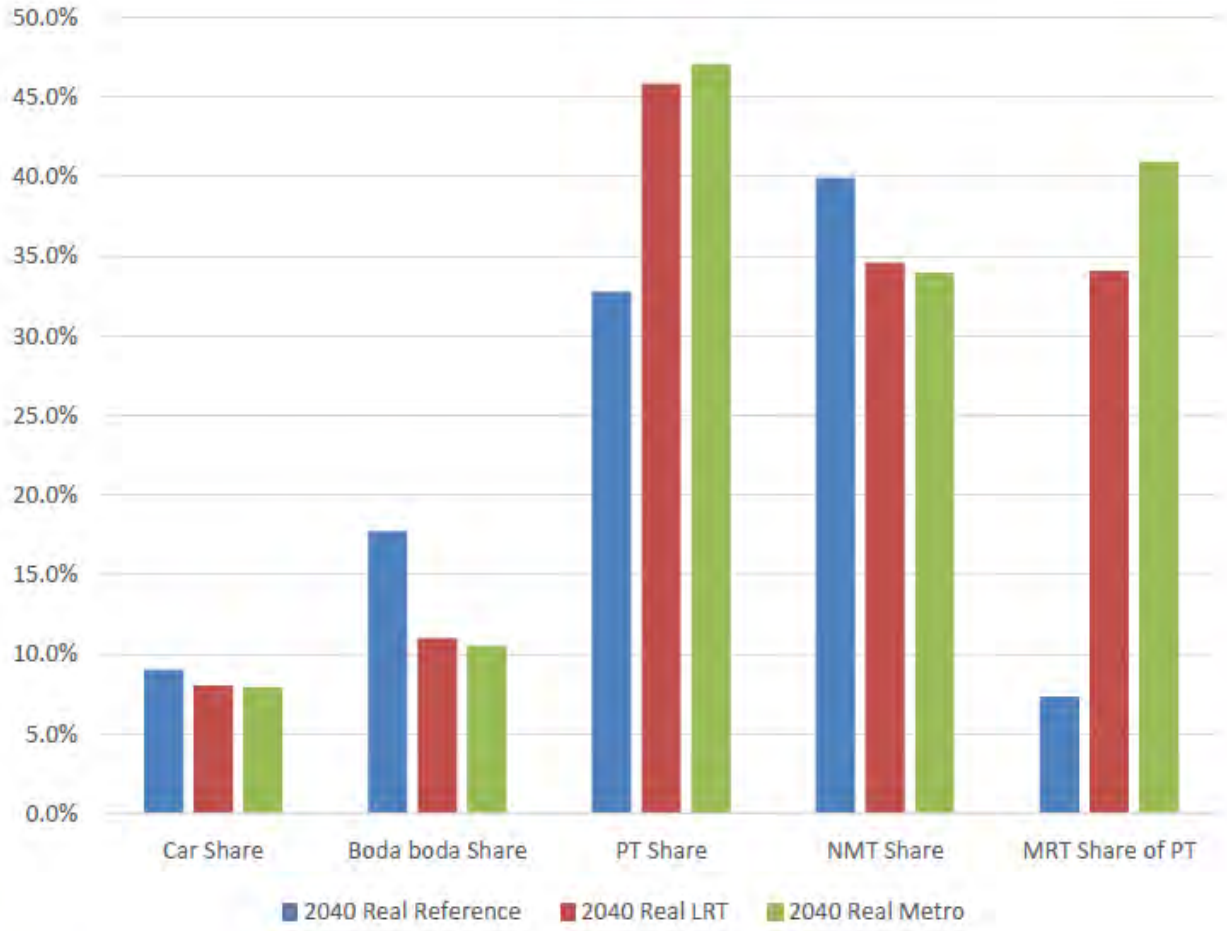


2016 Base Scenario
Existing Situation

Avg. speed (KM/H)	14.4
Avg. Number of Passengers per PT Trip	13.4
Avg. Taxi Fill	84%
Average Transfer Rate	2.2
Average Route Length (Km)	11
Car Share	7.9%
Boda boda Share	10.1%
PT Share	41.0%
NMT Share	39.3%

Impressive sustainable mode share needs to be maintained in future scenarios

Mode Share


50.0%
45.0%
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Car Share
Boda boda Share
PT Share
NMT Share
MRT Share of PT
2040 Real Reference
2040 Real LRT
2040 Real Metro


14.0
12.0
10.0
8.0
6.0
4.0
2.0
-
Avg. speed
2040 Real Reference
2040 Real LRT
2040 Real Metro

The need for Mass Rapid Transit – Two case studies

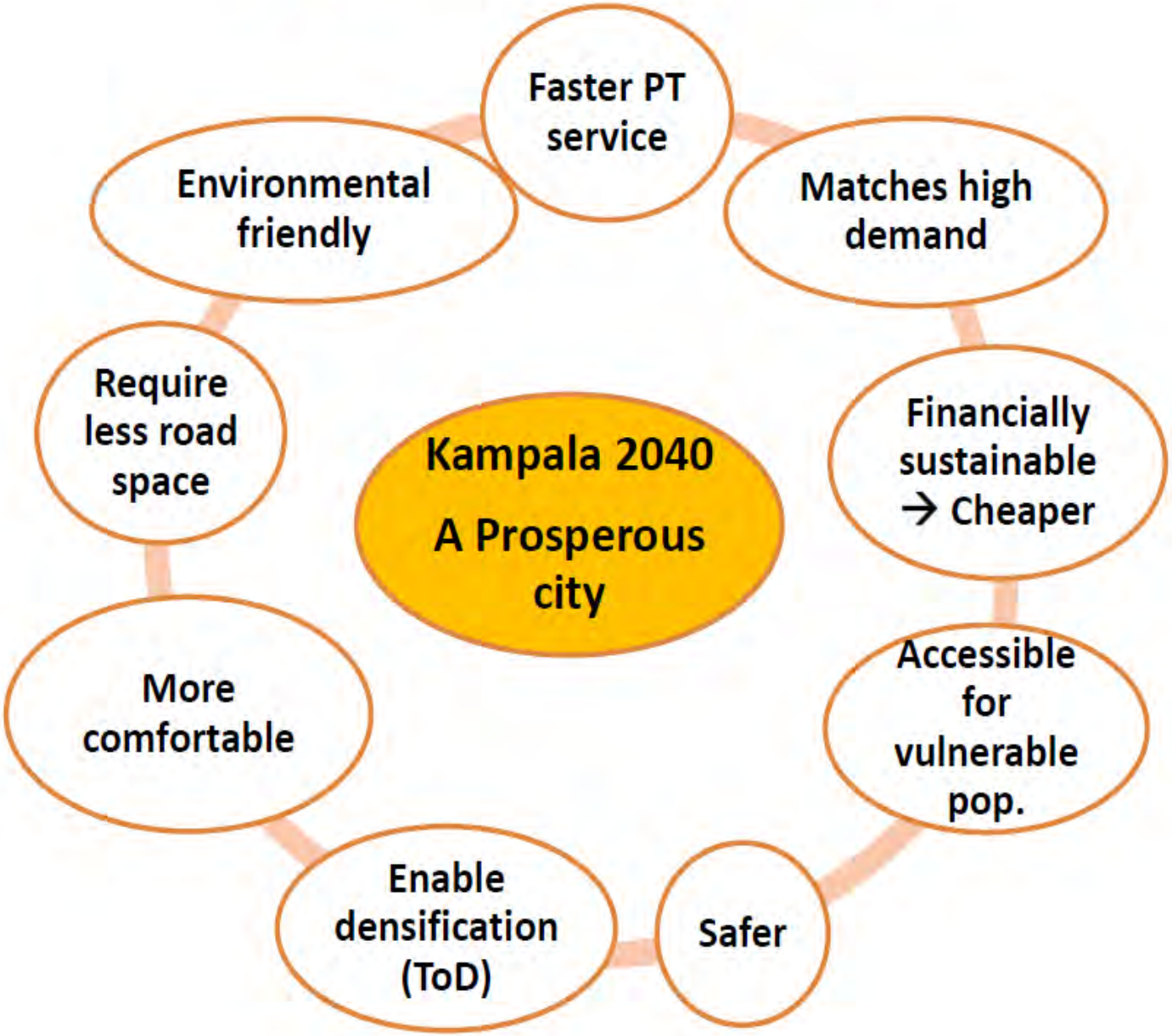
Nairobi

- 6.5 million in metropolitan area
- No MRT. BRT is planned for 2021
- Average daily commute time is 70 minutes
- Considered among the cities with worst traffic in the world

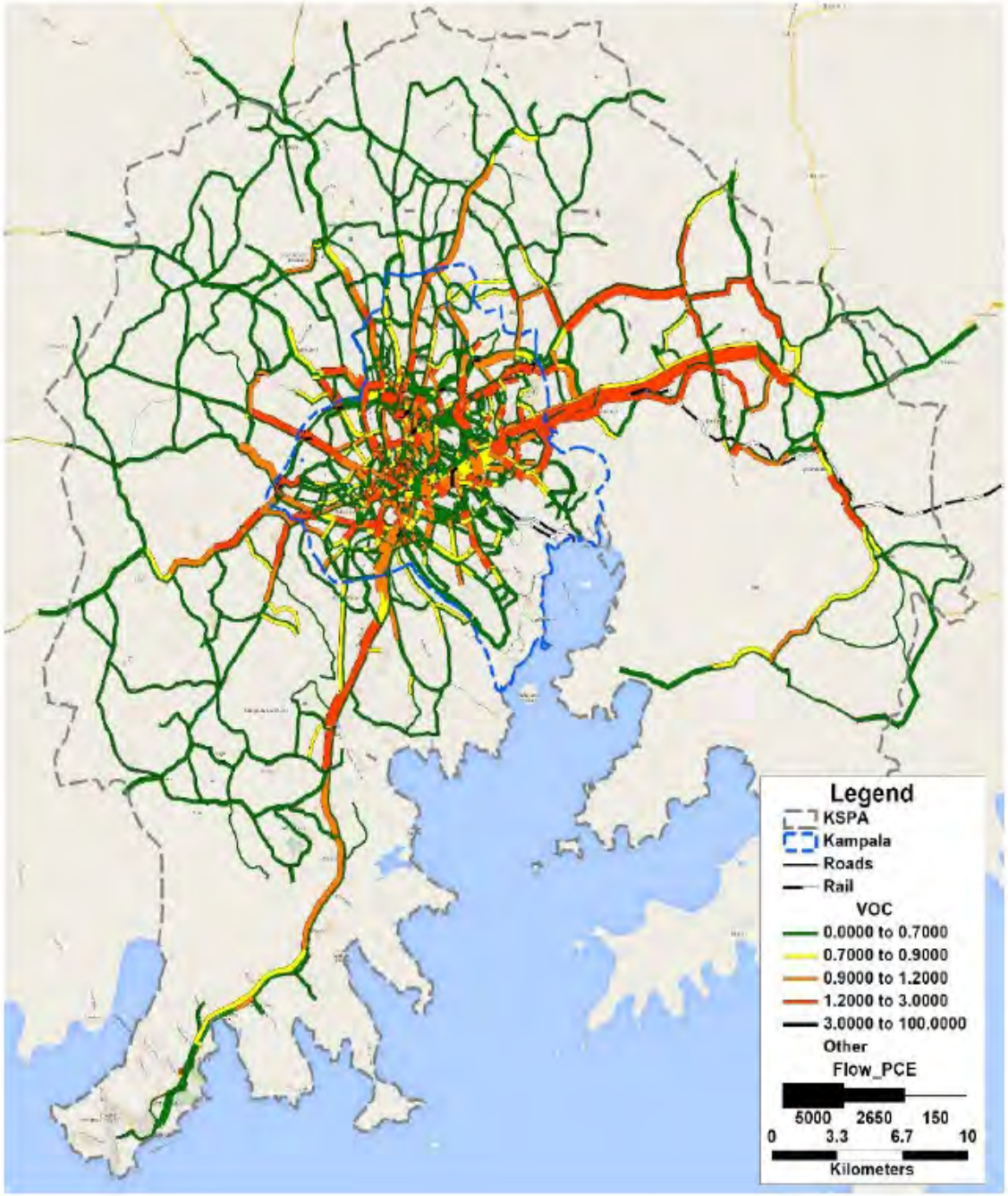
Bogota

- 9.8 million in metropolitan area
- BRT system inaugurated in 2001
- 2.2M Daily riders on MRT
- Average commute time reduced by 20 minutes (32%). Overall congestion decreased dramatically
- Average bus speed increased by 53%

Why Kampala Needs MRT?



2016 Base Scenario Assignment – Intensifying Congestion

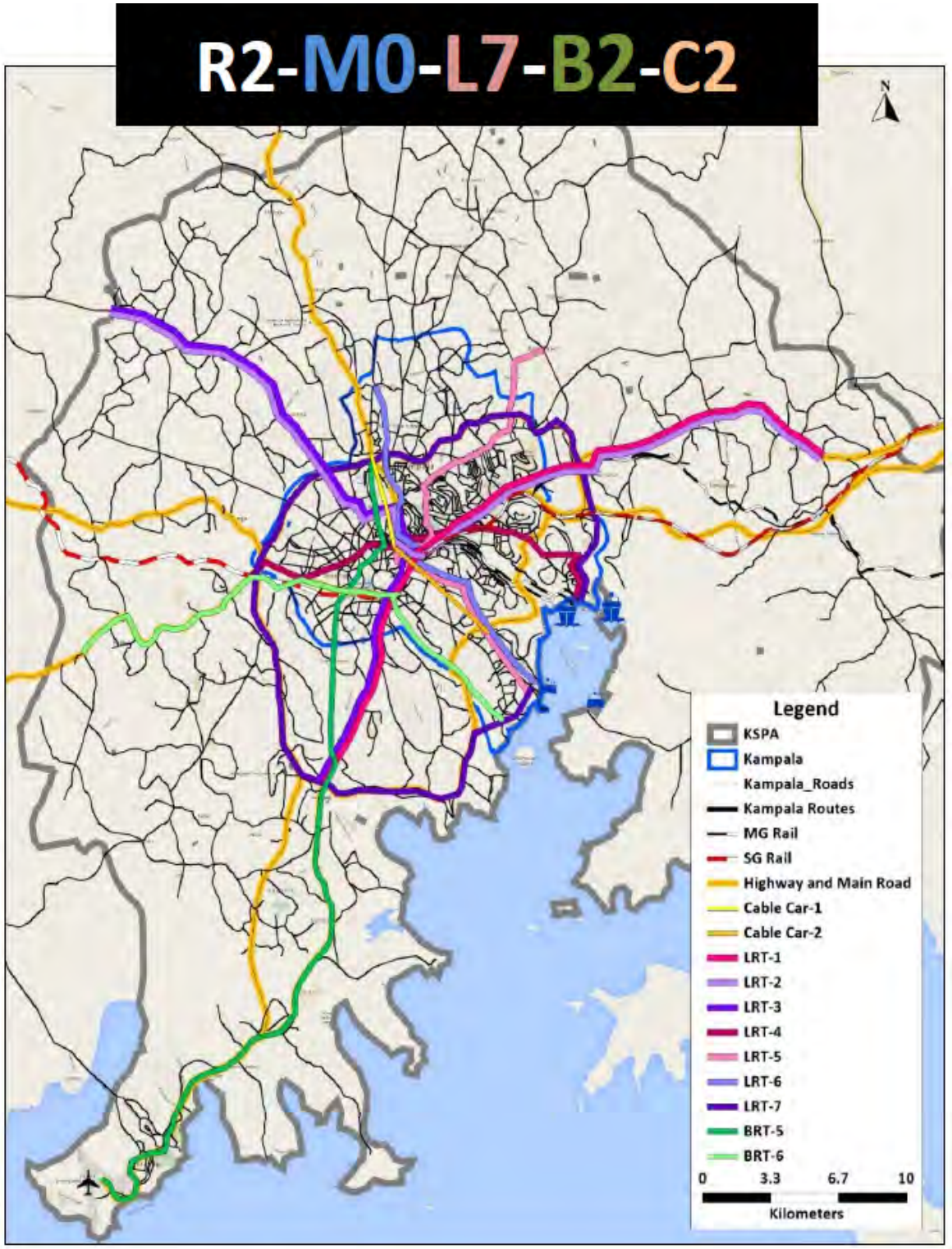


Severe Congestion on many arterial roads throughout the day

2040 Comprehensive Scenarios

LRT Backbone Scenario

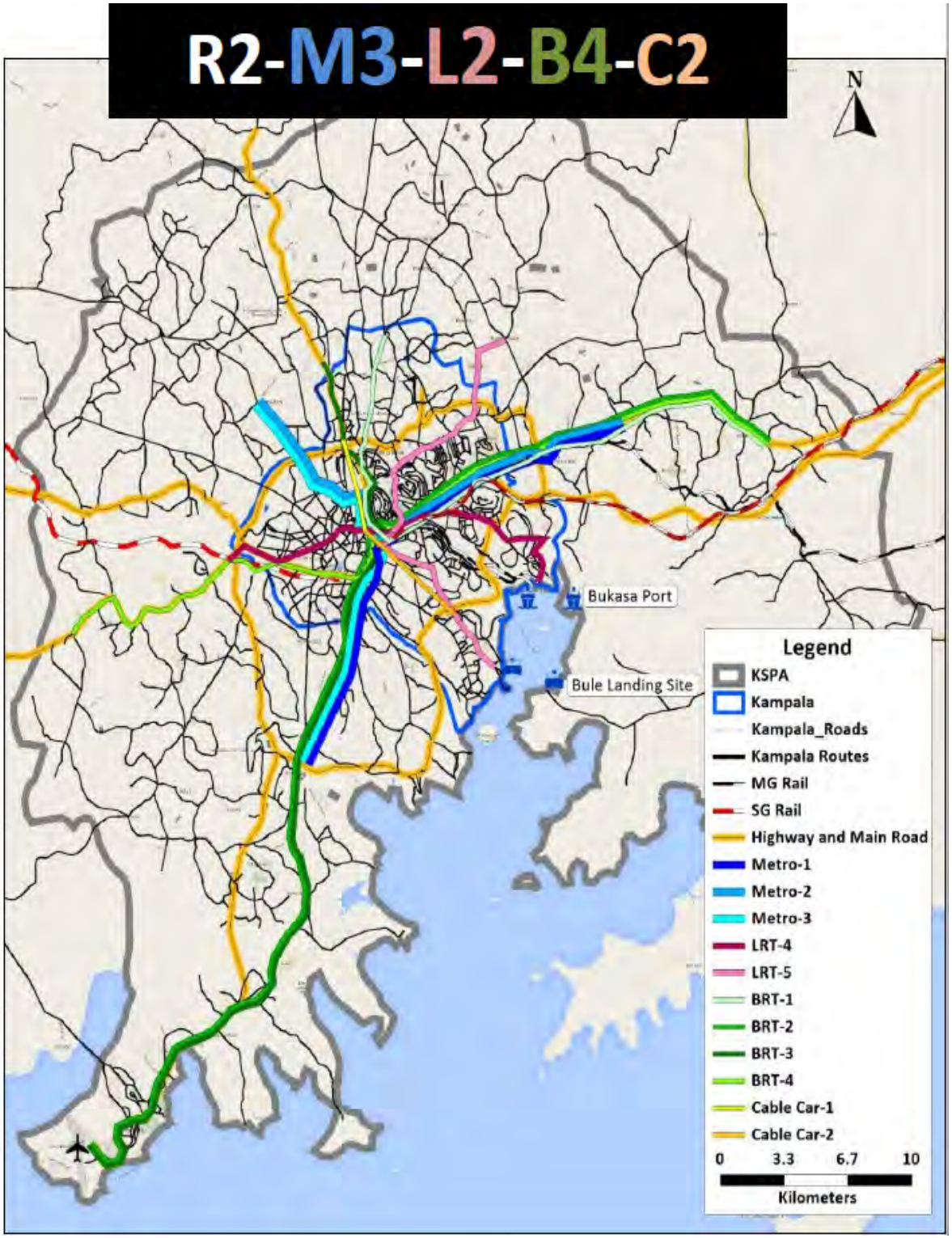
	From	To	Length (Km)
East Rail	Region of Mukono	Kampala	
West Rail	Region of Bujuko/Buloba	Kampala	
LRT-1	Mukono	Kajjansi	35
LRT-2	Mukono	Wakiso	21.2**
LRT-3	Kajjansi	Wakiso	*
LRT-4	Busega	Port Bell	21
LRT-5	Kira	Ggaba	24
LRT-6	Kawempe	Ggaba	5.9**
LRT-7	Ggaba	Port Bell	55
BRT-5	Entebbe (EIA)	Bwaise	43
BRT-6	Busega	Ggaba	27
Cable Car-1	Bwaise (-Makerere)	NTP	4.5
Cable Car-2	Makindye	NTP	6



2040 Comprehensive Scenarios

Metro Backbone Scenario

	From	To	~Length (Km)
East Rail	Region of Mukono	Kampala	
West Rail	Region of Bujuko/Buloba	Kampala	
Metro-1	Namanve	Kajjansi	26
Metro-2	Namanve	Nansana	13*
Metro-3	Kajjansi	Nansana	**
LRT-4	Busega	Port Bell	21
LRT-5	Kira	Ggaba	24
BRT-1 (extended)	Mukono	Kyanja	33
BRT-2 (extended)	Mukono	Entebbe (EIA)	38.5*
BRT-3 (extended)	Kawempe	Entebbe (EIA)	9.8**
BRT-4	Mukono	Maya	19.9**
Cable Car-1	Bwaise (-Makerere)	NTP	4.5
Cable Car-2	Makindye	NTP	6



Multi-Criteria Analysis

Six Criteria were used to prioritize and compare the comprehensive GKMA scenarios:

- Sustainability
- Mobility
- Accessibility
- Safety
- Environmental
- Economic Efficiency

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Sustainability (15%)

Purpose: Reduce the use of non-sustainable modes (car, boda boda) and transfer more people to use sustainable modes (walking, cycling, public transport).

Description	Weight	Target	LRT	Metro
Share of trips using sustainable modes - walk, cycle, PT (%)	5%	80%	79.6%	80.3%
Share of KM using sustainable modes - walk, cycle, PT (%)	10%	75%	63.1%	65.5%

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Mobility (20%)

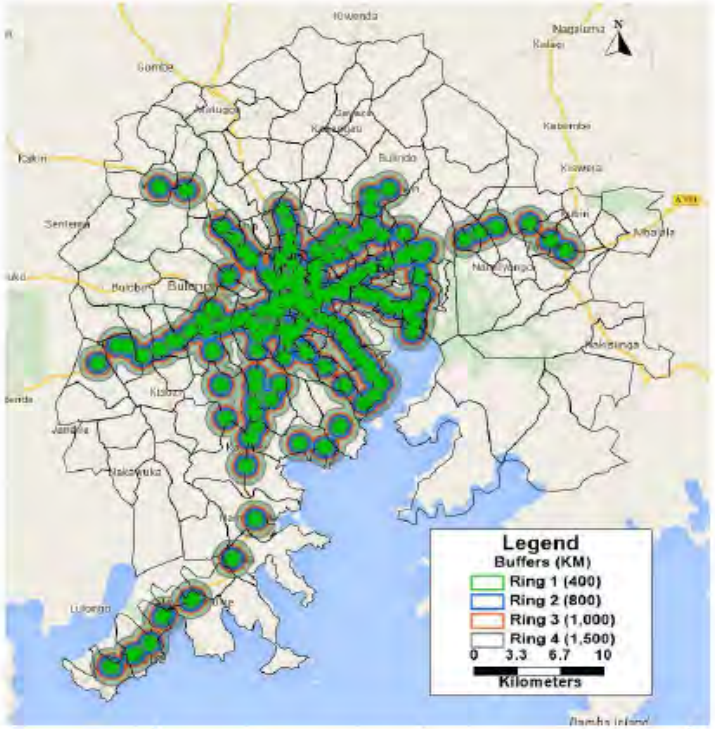
- **Purpose:** Ensure all citizens can reach their destination in a quick and efficient way under the target time.

Description	Weight	Target	LRT	Metro
Average weighted PT travel time during AM Peak within the CBD	2%	20	18.2	17.9
Average weighted PT travel time during AM Peak to CBD from KCCA	8%	40	36.4	36.7
Average weighted PT travel time during AM Peak to CBD from GKMA	8%	60	54.0	52.5
Average weighted PT travel time during AM Peak from GKMA including KSPA	2%	80	56.0	54.4

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Accessibility (20%)

- **Purpose:** Ensure all citizens are offered affordable transport options that enable access to key destinations and services.



Description	Weight	Target	LRT	Metro
Percent population with 400 meter radius of MRT within Ring 1	2%	65%	61%	65%
Percent population with 800 meter radius of MRT within ring 2	8%	60%	60%	51%
Percent population with 1,000 meter radius of MRT within ring 3	8%	50%	47%	38%
Percent population with 1,000 meter radius of MRT within ring 4	2%	40%	40%	32%

Safety (10%)

- **Purpose:** Improve safety and security for all transport users through reduction in expected fatalities and injuries (relative to reference scenario).

Description	Weight	Target	LRT	Metro
Reduction in annual pedestrian fatalities/injuries	5%	30%	22.8%	25.3%
Reduction in annual vehicle passenger fatalities/injuries	5%	30%	22.5%	26.9%

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Environmental (15%)

- **Purpose:** Reduce air and noise pollution, greenhouse gas emissions, and energy consumption.

Description	Weight	Target	LRT	Metro
GHG emission (Thousand Tons)	15%	15%	10.1%	14.3%

Economic Efficiency (20%)

Purpose: Improve the efficiency and cost-effectiveness of the transportation of persons and goods.

Description	Weight	LRT	Metro
Net Present Value (Millions $)	10%	5,159	6,868
Internal Rate of Return (%)	5%	19%	20%
Benefit to Cost Ratio	5%	2	2.1

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

MCA Initial Results

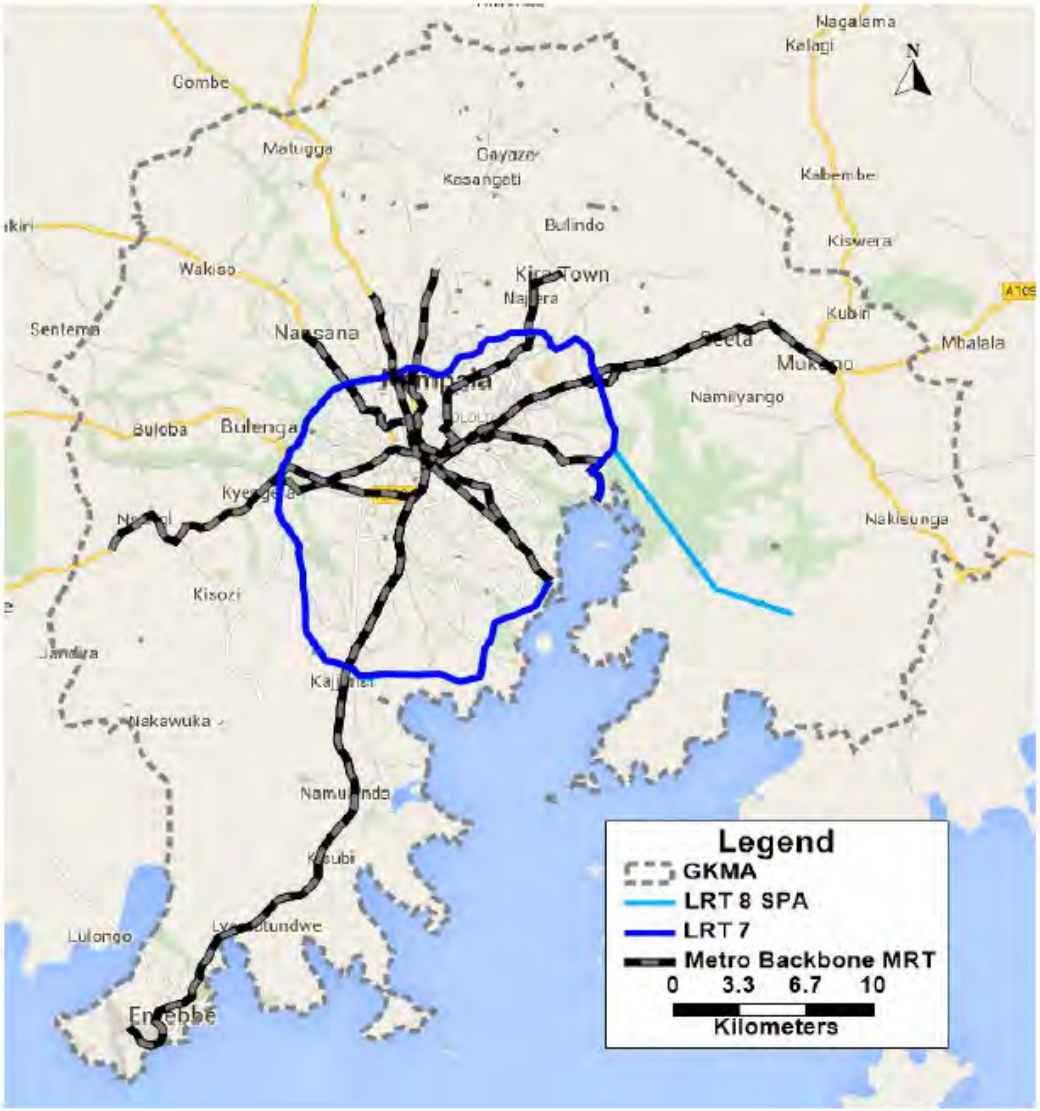
Criteria	Indicator	LRT			Metro		
		Value	Point	Rank	Value	Point	Rank
Sustainability	SUS_Passenger	79.6%	4.43		80.3%	5.00	
	SUS_Passenger_KM	63.1%	8.64		65.5%	10.00	
Mobility	MOB_Ring1	13.2	1.8		12.9	2.0	
	MOB_Ring2	36.4	8.0		36.7	7.9	
	MOB_Ring3	54.0	7.7		52.5	8.0	
	MOB_Ring4	56.0	1.93		54.4	2.0	
Accessibility	ACC_Ring1	61%	1.67		65%	2.00	
	ACC_Ring2	60%	8.00		51%	6.40	
	ACC_Ring3	47%	8.00		38%	6.18	
	ACC_Ring4	55%	2.00		47%	1.59	
Safety	SAFE_FAT_NMT	834.6	2.3		807.3	2.5	
	SAFE_ACC_NMT	7,388.6	2.3		7,147.4	2.5	
	SAFE_FAT_VEH	1,771.7	2.1		1,670.5	2.5	
	SAFE_ACC_VEH	29,761.4	2.1		28,062.5	2.5	
Environmental	ENV_GHG	2,760.1	10.2		2,630.5	15.0	
Economic Efficiency	NPV	5,159.0	7.5		6,868.0	10.0	
	IRR	0.2	4.8		0.2	5.0	
	C/B	2.0	4.8		2.1	5.0	
Total			88.0			96.1	

Metro Scenario provides overall better service. LRT provides improved accessibility and coverage

Metro + Accessibility Improvements to Metro Scenario

	From	To	Length (Km)
LRT-7	Ggaba	Port Bell	55
LRT-8	Nambole	Ntengeru	12.9

Providing accessibility for over 700,000 passengers daily



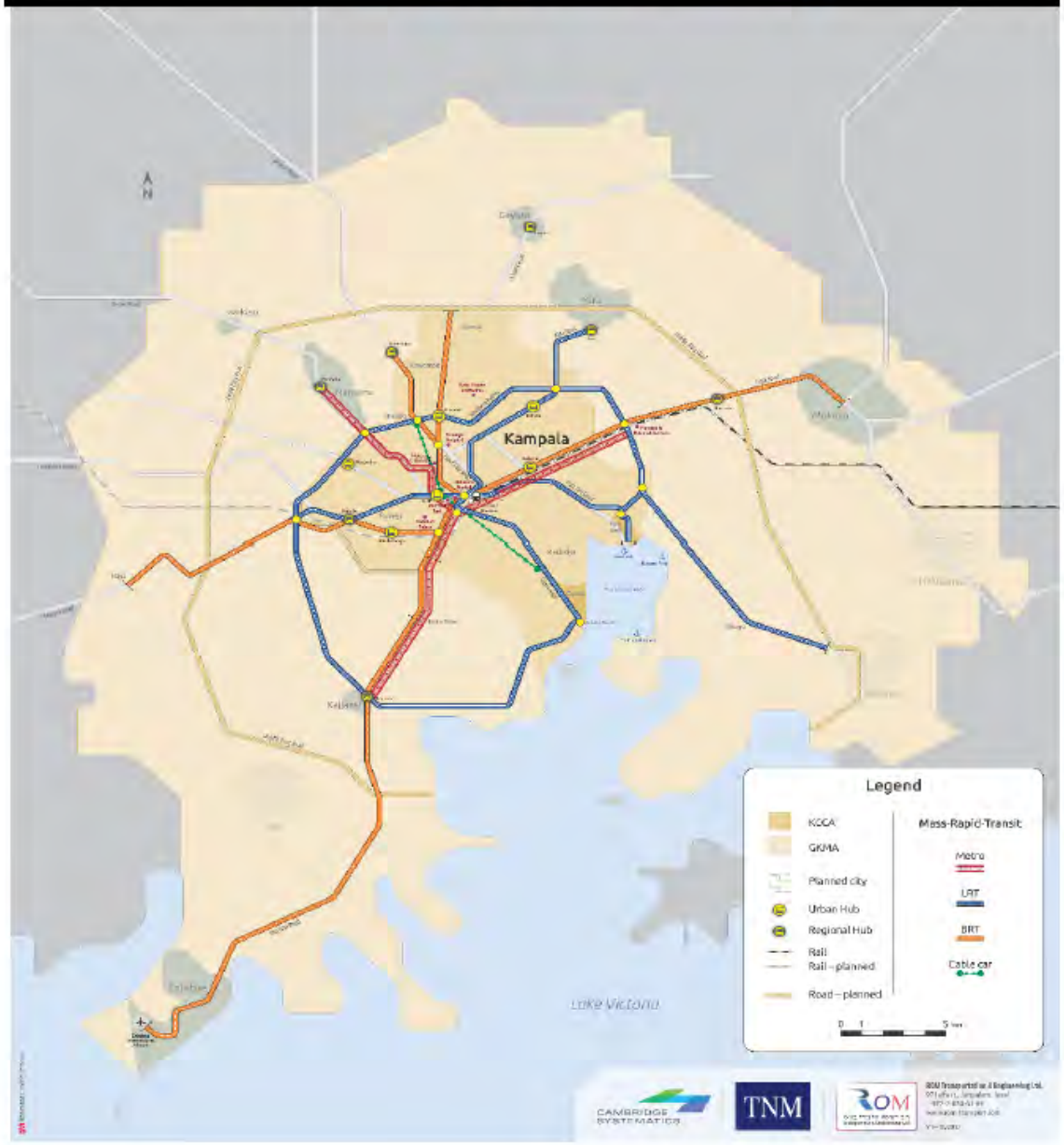
KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

2040 Comprehensive Scenarios

Metro + Scenario

	Routes	KM
Metro	3	39
LRT	4	113
BRT	5	101
Cable Car	2	10.5
Suburban rail	2	107

R2-M3-L4-B4-C2



Phasing of Planned and Proposed Projects

5 investment periods (Frameworks)

Pilot (2018-2021)	• Only projects that can be implemented quickly • Highly cost-effective
SHORT (2022-2025)	• First significant part of the MRT system • BRT Extensions and LRT and Metro Initial
Medium (2026-2030)	• BRT Finalization • LRT Implementation • Metro Initialization
LONG (2030-2035)	• LRT Finalization and Extension • Final Metro Design
HORIZON (2036-2040)	• Finalization of Metro • Operational Costs

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

As GOU, What we must do now

Institutional Framework

- Strategic Planning Committee and MRT round table
- Project Implementation Unit for PILOT framework

Planning capacity

- Planning team with up-to-date tools
- Transport impact assessment
- Execute feasibility study for each project including preliminary design and cost estimation

Financial challenge

- "Road show"
- Full governmental attention and support
- Seek Global Opportunities

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Next year TOP 10 Immediate actions (2018)

- Publish BRT tender
- Design NMT Highways
- Implement Parking plan
- Build up Project implementation Unit
- PT Re-Organization
- Bus and Taxi Park Re-organization
- Control Center Operation
- Roundabout removal and Signalization
- Detailed Workplan for Street Signage and Marking
- East SGR Detailed Design

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

Conclusion

- KCCA has developed a Multi-Modal Urban Transport Master Plan for GKMA with an investment plan. In the Master Plan, several transport infrastructure related projects have been identified and ranked.

- GoU through KCCA values all the support of the World Bank and looks forward to more targeted support that shall keep Kampala moving and vibrant.

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City