



Urban Plans, Urban Designs, Economic/Finance and Implementation Study for Redevelopment of the Nairobi Central Railway Station and its Surroundings

- Draft Final Report for MCA Workshop -

May. 2019



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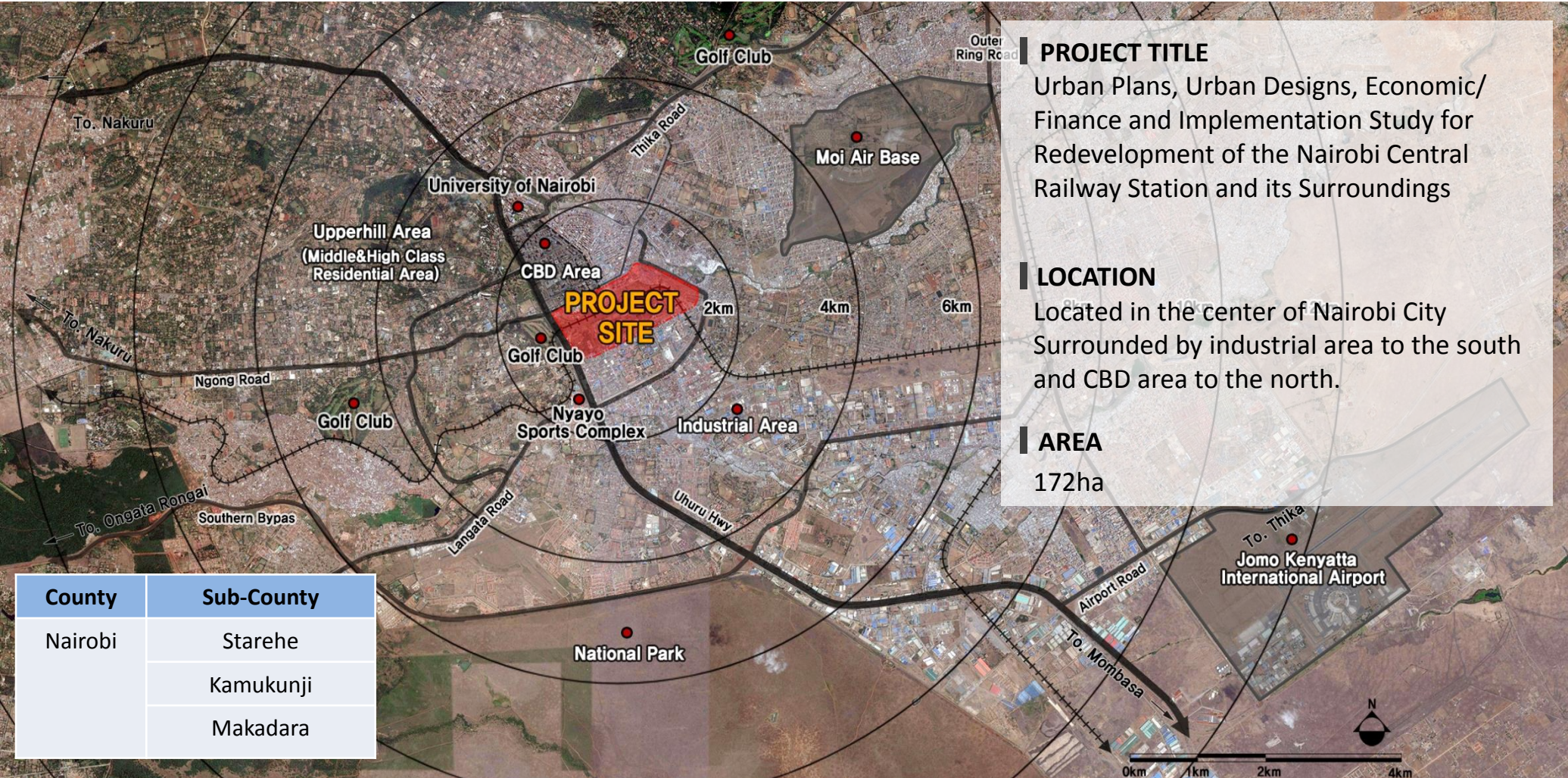
04 Implementation Plan

An aerial photograph of a railway yard at Nairobi Central Station in Kenya. The image shows multiple parallel tracks stretching into the distance. On the left side, a long line of grey freight containers is parked. In the foreground, a worker wearing a blue shirt, green pants, and a white hard hat is walking along one of the tracks. The ground between the tracks is a mix of dirt and sparse grass. In the background, the Nairobi city skyline is visible under a cloudy sky, featuring several tall buildings, including the prominent Kenyatta International Convention Centre. A semi-transparent black banner with white text is overlaid across the middle of the image.

1. Introduction of Project

1. Introduction of the project

Project Location



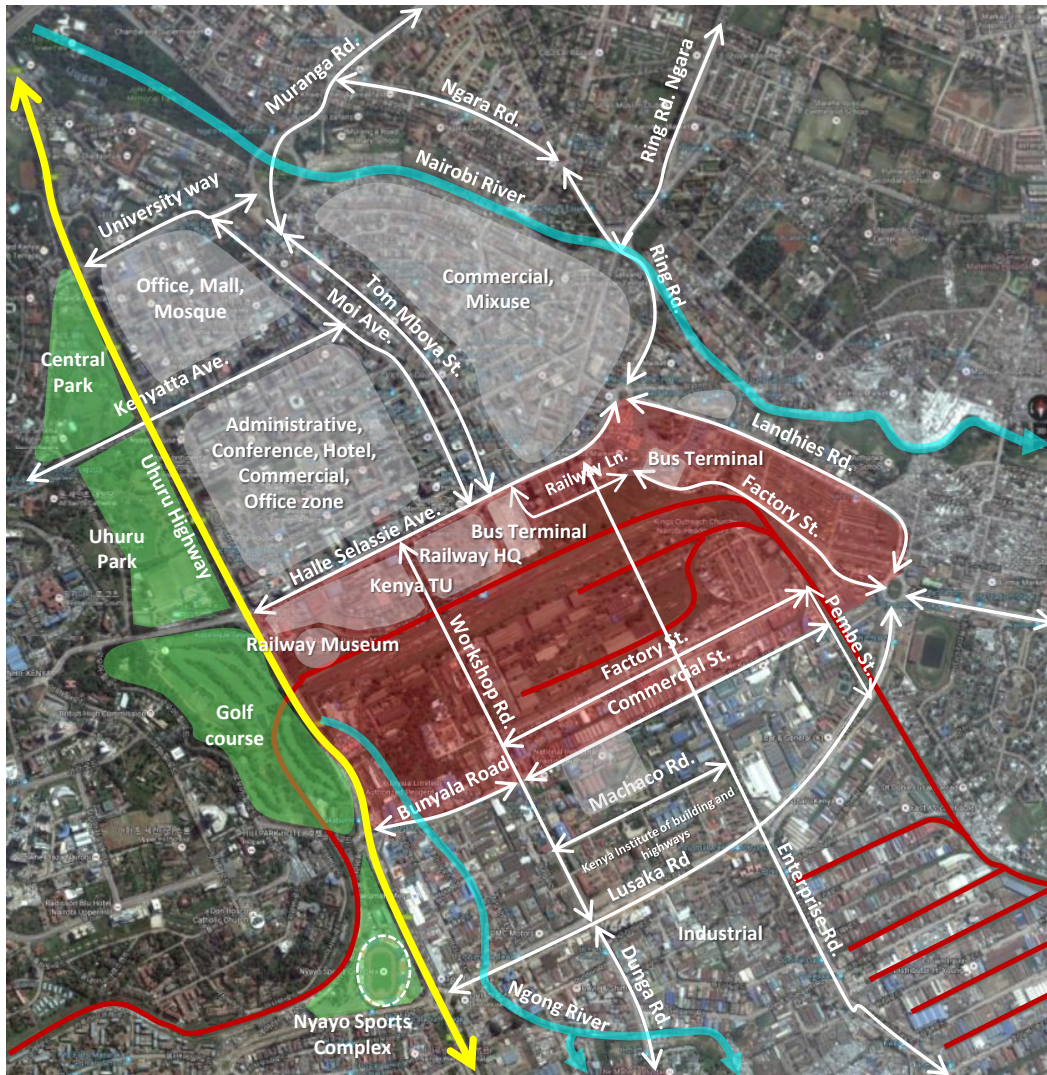
1. Introduction of the project Project Boundary

Project Boundary



1. Introduction of the project

Initial Approach



Economically Sustainable, Integrated Transportation, Iconic Urban space, Inclusive Open city

Prime location

Historically, Nairobi central station represents the origin of Nairobi. Strategically located on the 425 acres of land in the very center of Nairobi next to Current CBD and Upperhill, the city is positioned to act as new CBD area as growth center and transportation hub.

Integrated transportation Hub

New central station is designed to be multi-modal hub in CBD ensure the seamless connection among Commuter rail, 3BRTs, Airport Limousine, City bus, and NMT like Bicycle. Truly urban gateway in Nairobi.

Diverse urban program

The Nairobi Railway city will include multi-modal transit stations, mixed use/ commercial buildings, International offices, SME cluster and high tech industry buildings, residential buildings, community and government buildings, rich open space and plazas, and powerful non-motorized/ pedestrian walkways. Such diverse urban program will generate 24 hour dynamic city.

An aerial night photograph of Seoul Station and the surrounding city. The station's large, illuminated glass and steel structure is the central focus. To its right is the historic Gyeongju Station building. The foreground shows a complex highway interchange with light trails from traffic. The background is a dense urban landscape with numerous lit-up buildings under a twilight sky.

2. Master Plan

2. Master Plan Final option setting

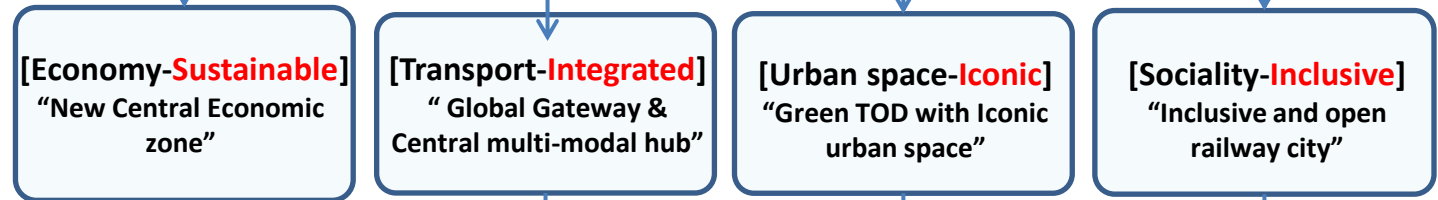
Progress towards Final option

[Vision]

Railway City: Sustainable, Integrated and Iconic city for All

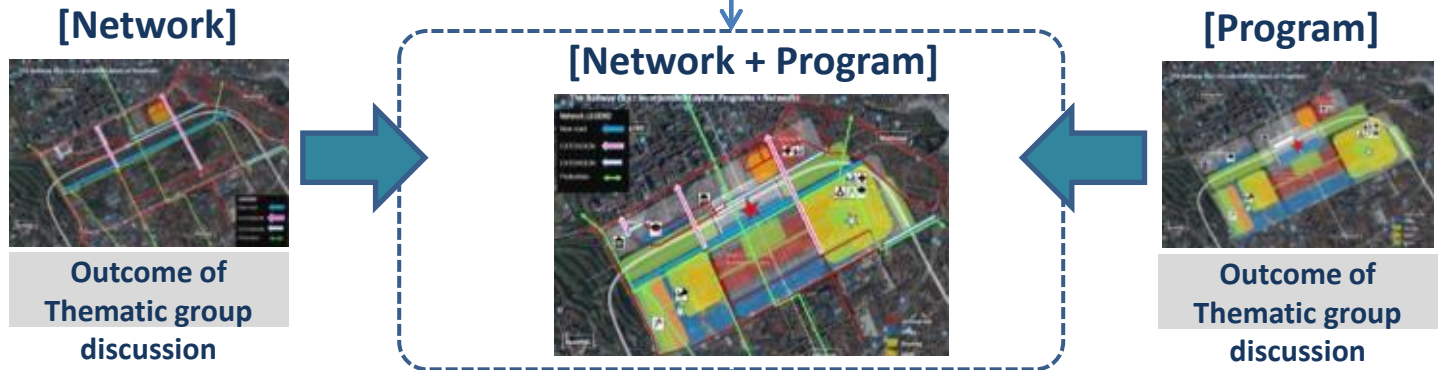
[4 pillars]

• Visioning workshop

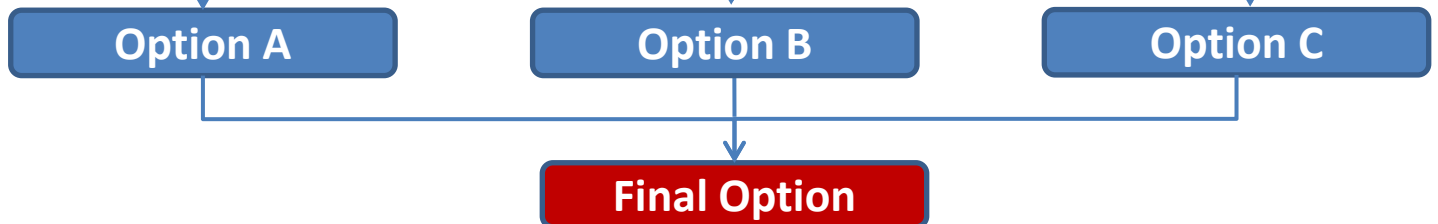


[Schematic layout]

• Thematic group workshop



[Planning Options]



2. Master Plan Final option setting

Progress towards Final option

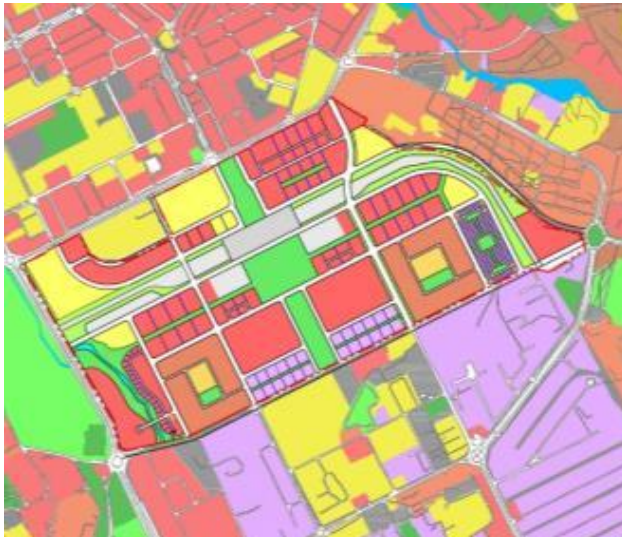
Based on Previous 3 options

Same Goal

- Accept the North South axis
- Link the East and West
- TOD and multi-modal Hub

But, Different Approach

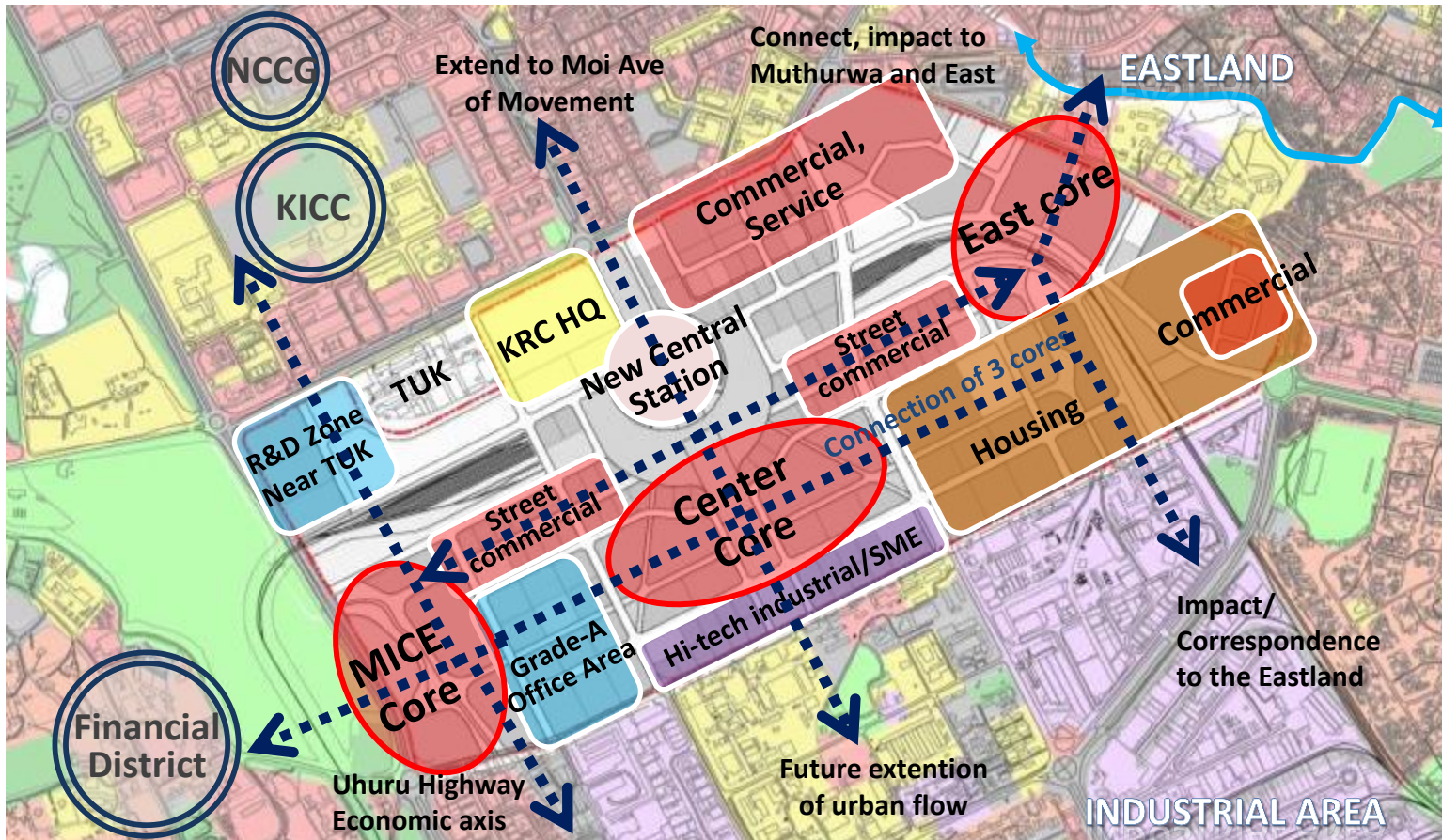
- Option A: Highlighting NS axis
- Option B: Highlighting Central area
- Option C: Highlighting EW linkage



2. Master Plan Spatial layout

Spatial layout : 11 precincts diversify the city

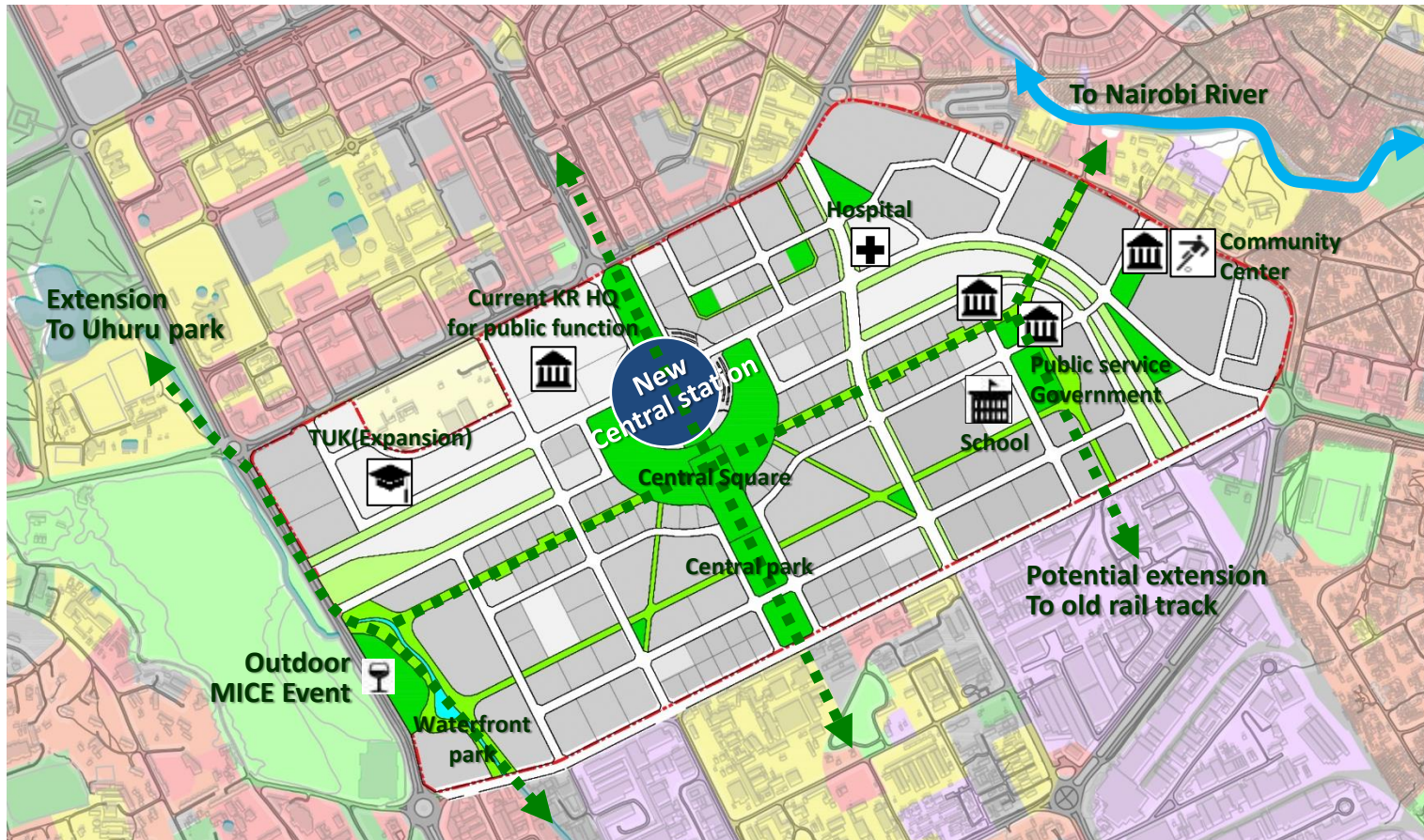
- 3 Cores (MICE, Center and East) and Street commercial is core precinct of the city.
- Office, Housing, Commercial with KRC HQ, R&D, High tech industry geared into the city fabric.



2. Master Plan Open space

Open Space and urban Amenities promote health

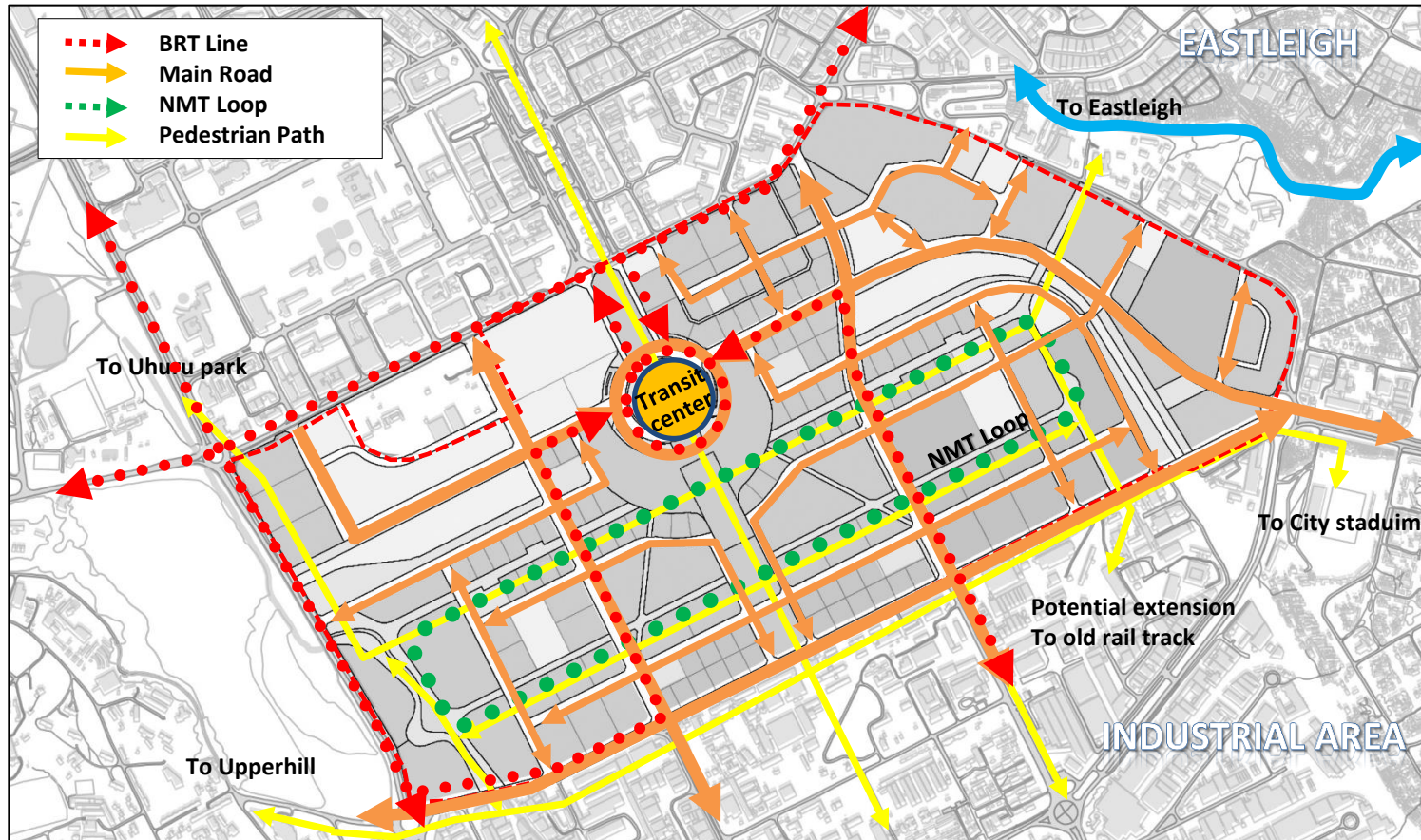
- Central Square and park is backbone of new city green structure.
- Urban amenities with green network promote live and vivid city landscape.



2. Master Plan Seamless, Integrated and Linkage Network enhance the city moving

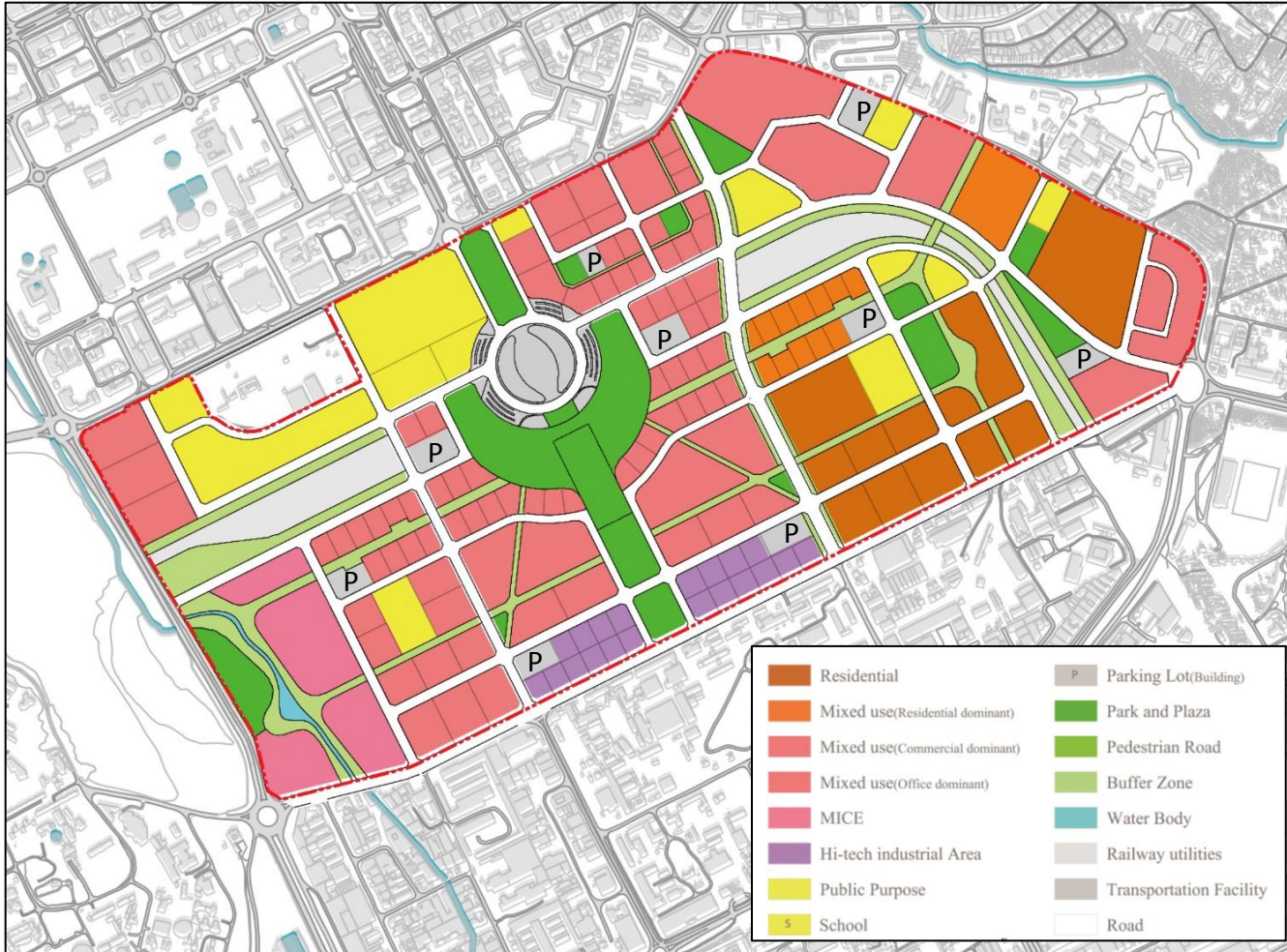
Network layer - Road and pedestrian

- 3 main linkages (Enterprise, workshop and commercial road) connect missing link of Nairobi CBD.
- BRT, Airport Limousine, E-hailed vehicle also integrated in Central station.
- NMT loop is the back bone of pedestrian movement of the city.



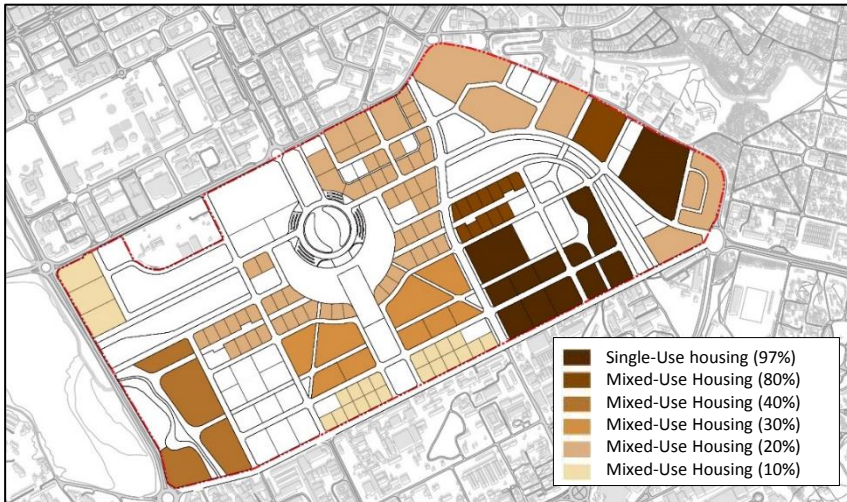
2. Master Plan Land use plan

Land use plan

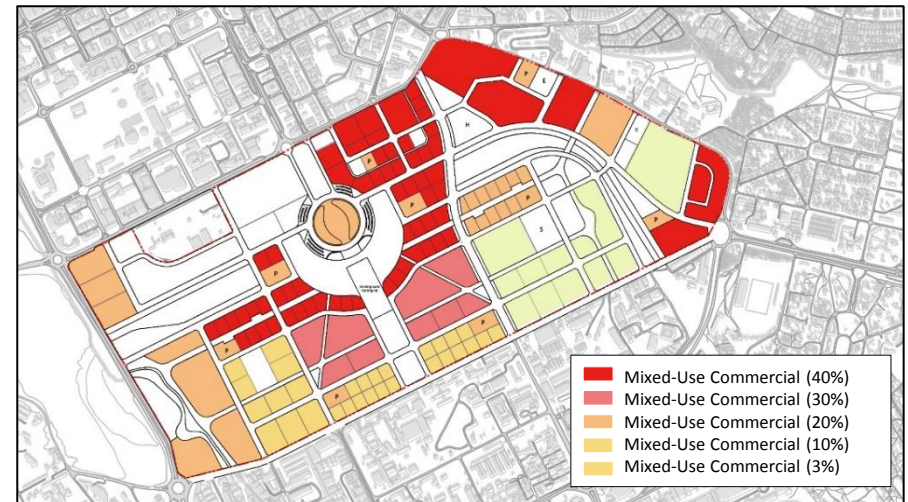


Classification	Option Final	
	Area(m ²)	Rate(%)
Residential	151,300	8.8
Mixed use (Residential)	47,200	2.7
Mixed use (Commercial)	291,500	17.0
Mixed use(Office)	194,300	11.3
MICE	73,900	4.3
High-tech Industrial	42,200	2.5
Public Purpose	109,100	6.3
School	13,900	0.8
TUK(University)	43,700	2.6
Transport	36,500	2.1
Parking lot(Building)	38,600	2.2
Railway Utilities	70,700	4.1
Open Space	331,500	19.3
Park and Plaza	160,300	9.3
Pedestrian Road	88,100	5.1
Buffer Zone	77,100	4.5
Water body (Ngong river)	6,000	0.3
Road	275,400	16.0
Total	1,719,800	100.0

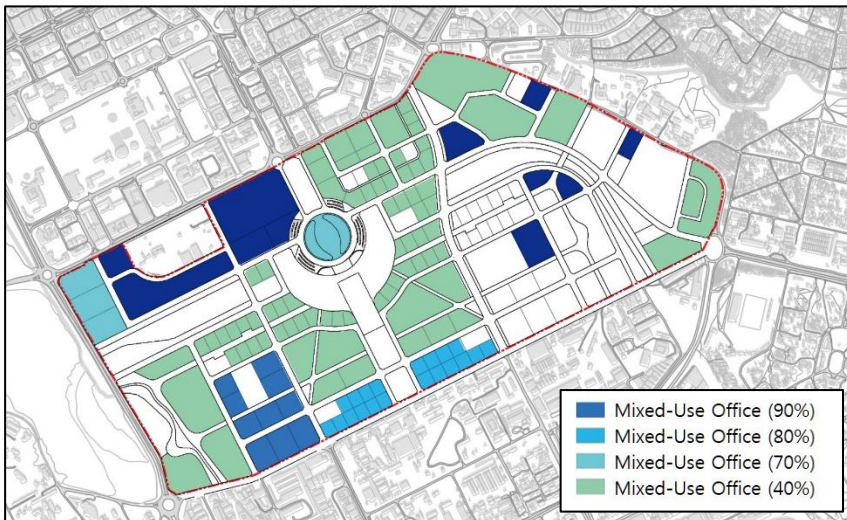
2. Master Plan Land use plan



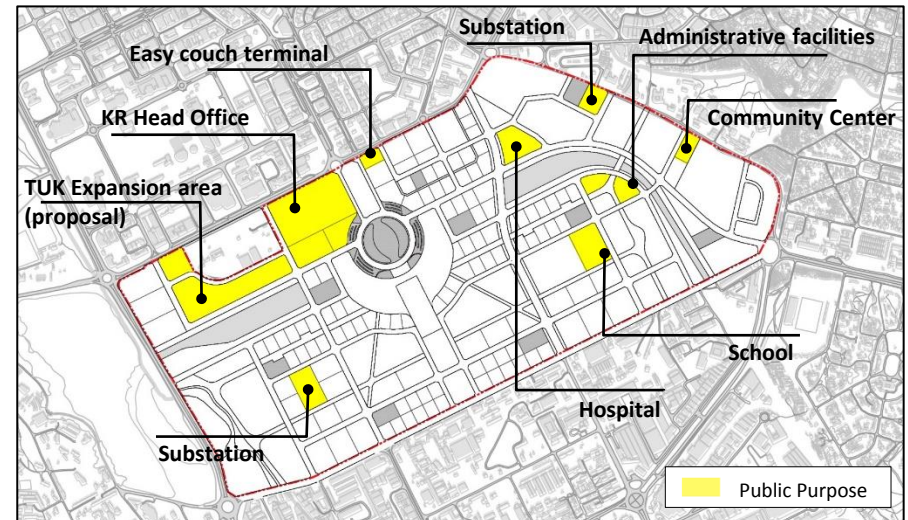
Housing plan



Commercial plan



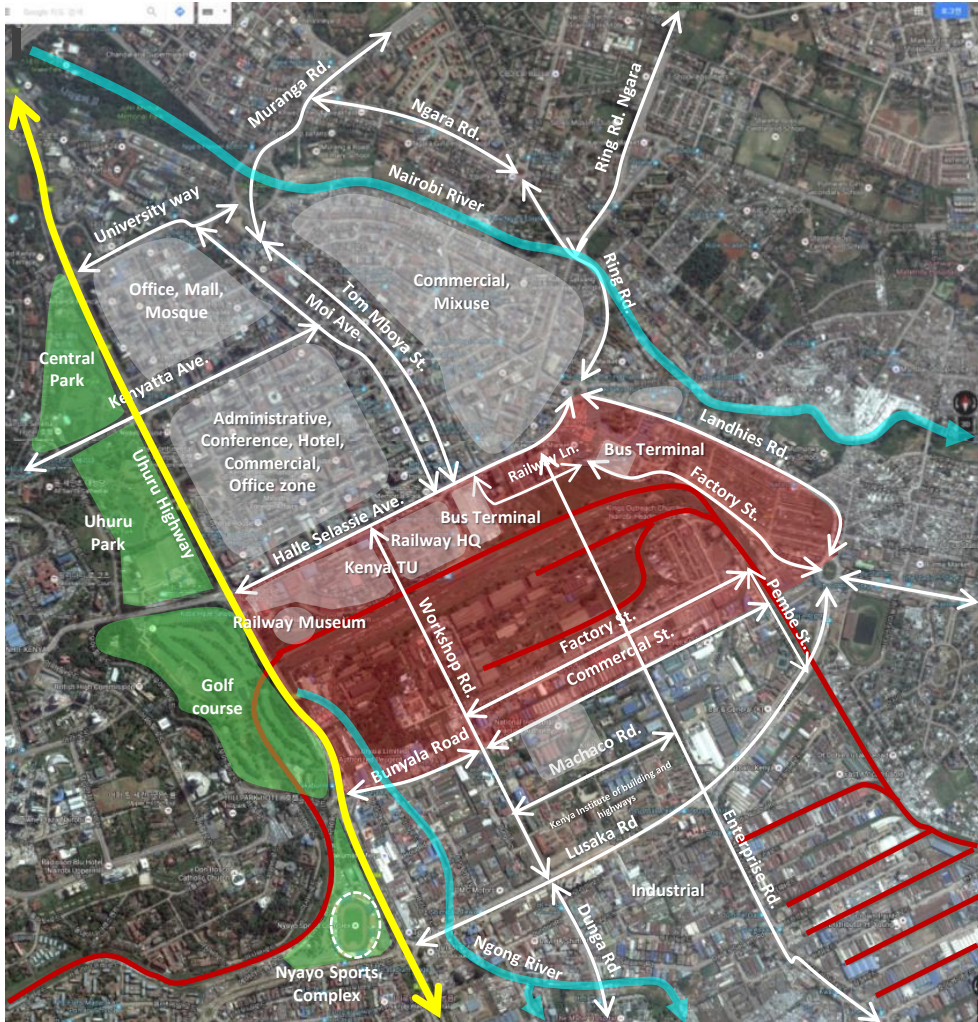
Office plan



Public purpose

2. Master Plan Transportation Plan

Directions



Railway as a TOD has the transport system as its back bone

• Key Transport functions

- **Missing Links** - improving accessibility and connectivity between the CBD and other areas
- **Public Transport** Links and Facilities
- Integrated Facilities – provision of **multimodal hub**.
- **Mode Interaction** and Facilities - improve interaction of motorized transport, NMT, public transport
- **Ease congestion** – on links around the Railway City, especially Uhuru Highway, Haile Selassie Avenue, Landhies Road
- Provide Sustainable Transit Oriented Development

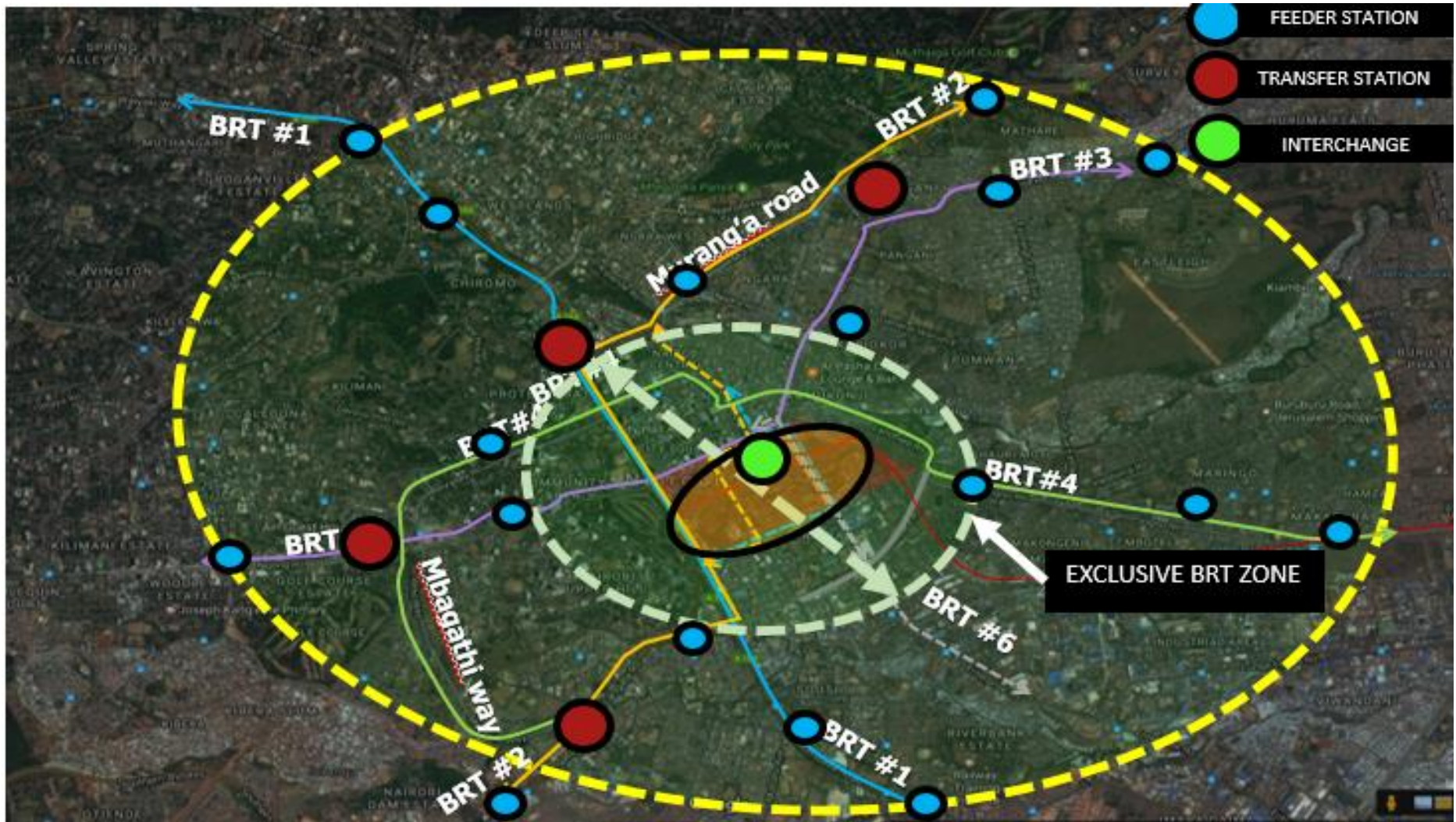
2. Master Plan Transportation Plan

Public Transport Network: BRT proposals



2. Master Plan Transportation Plan

Proposed Trunk and Feeder system for Railway city



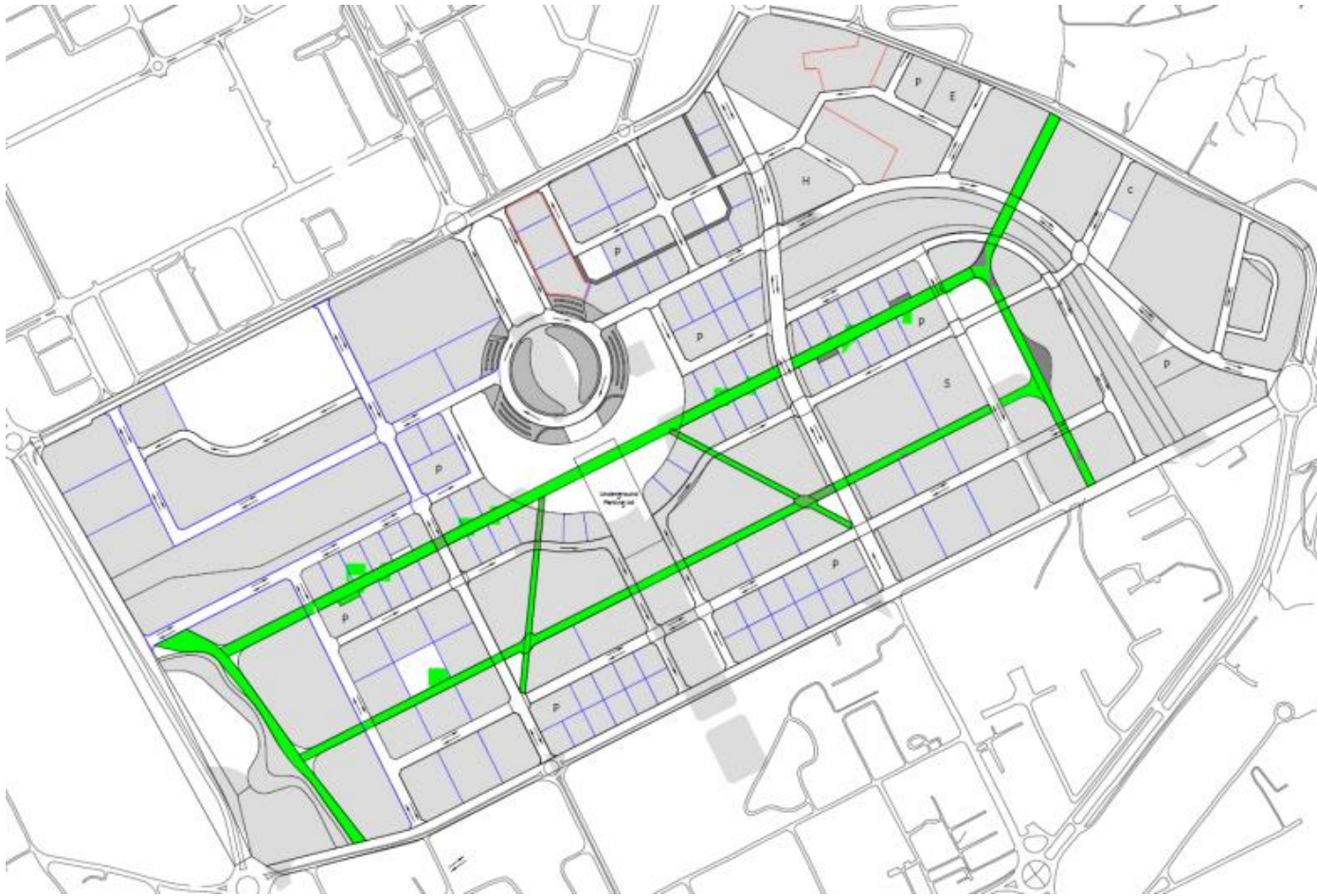
2. Master Plan Transportation Plan

Transport Network: NMT Corridors



2. Master Plan Transportation Plan

Transport Network: NMT Corridors

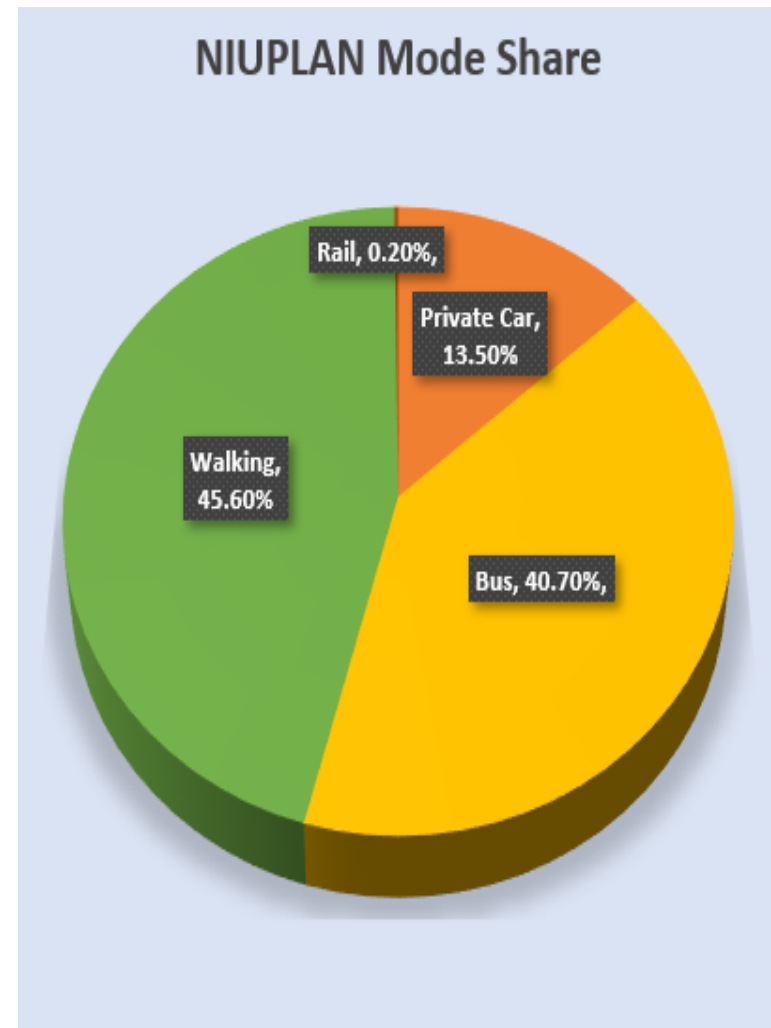


2. Master Plan Transportation Plan

Mode interaction and Facilities : Proportion of Facilities provided

Mode	Mode Share
Private Car	6.4%
Bus	32.0%
Walking	45.8%
Rail	16.0%
Total	100.0%

Dedicated Corridor Section	Proportion	Transit Type
Carriageway (Mixed Traffic)	25%	MT
Bus Lanes	3%	MT
Pedestrian Walkways (Roadside)	21%	NMT
Pedestrian Corridor	28%	NMT
Cycle Lanes	14%	NMT
Streetlights, Kerbs, Benches etc.	9%	



2. Master Plan Transportation Plan

Mode interaction and Facilities : proposals

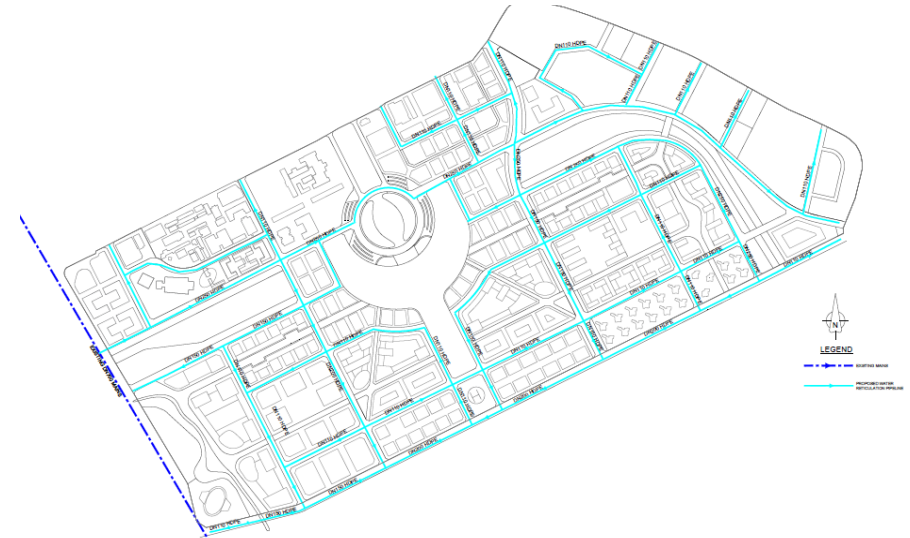


- **Inter-modal Facility/Hub**
- **NMT Facilities** – separate and adequate lanes along highways for cycles and pedestrians
- Wider NMT lane widths within commercial areas
- **Dedicated NMT corridor** within the Railway City
- Provision of wider NMT lanes around market areas for hand carts
- **Exclusive Bus and PSV (Taxi) corridors in Station Vicinity;** Drop off only for motor vehicles
- **BRT Priority Signalling**
- Traffic calming measures on all roads

2. Master Plan Infrastructure Plan

Water supply

- **Water Demand for the City is projected as 7,480 m³/day upon full development;**
- Water recycling for flushing of the toilets is proposed at the **MICE Core, Centre Core and Housing**. The recycled water will also be used to irrigate the green areas;
- Rain water will be collected and stored in the underground tank below the proposed railway station.



Sewerage

- **The wastewater generation was estimated as 5,984 m³/day;**
- This flow will be conveyed to two existing trunk sewers namely DN 1200mm Nairobi River Trunk Sewer and DN 600mm Uhuru Highway Trunk sewer.



2. Master Plan Infrastructure Plan

Power Supply

- Power demand for the New city is estimated at 133 MVA;
- Due to rapid growth of Nairobi City, the utility power provider is coming up with a City Centre power substation of 2 x 200.0MVA, 220 / 66kV within the project area near the Kenya Railway footbridge;
- Comparing the power demand for new development of 133.00MVA, the **city centre substation is adequate to support the new development.**
- Mitigation measures:
 - Enhance power reliability through use of integrated solar lighting and use of power saving appliances;
 - Use of smart grid system technology – a self healing technology.

Communication and Security services

- Communication infrastructures shall employ the use of fibre optic for connectivity.
- For the new city surveillance services CCTV shall be employed



Power Substation



CCTV surveillance

State of Art infrastructure – Smart designs

- Several smart alternatives can be considered in the design of the New city including the following:
 - **Utility tunnel system**
 - Services are accommodated in one accessible utility tunnel;
 - New services are installed easily without requiring new excavations and cutting;
 - Enables easier tracing in case of faults and breakages.
 - **Grey water system**
 - Water efficient fixture (shower heads, taps);
 - Water recycling for flushing of the toilets;
 - It is easier and cheaper to treat and recycle grey water
 - **Sustainable energy solutions**
 - Use of integrated solar lighting system;
 - Use of power saving appliances
 - Use daylight natural lighting technology;
 - Employing green building technology as a way of minimizing 100% dependability on grid power supply.



2. Master Plan Infrastructure Plan

I Storm Water Drainage

- Propose to **retain these two rivers** as the main outlets for storm water originating from railway city;
- Storm water drainage facilities **provided on both sides of all the roads**;
- Side drains to be covered concrete u-shaped drains, allowing utilisation of the full width of the transit corridors and to reduce cases of blockage common with open channels;
- **U-shape provide adequate capacity** while taking up less space than trapezoidal channels;
- Pipe and box culverts to be provided at crossing points as determined by the hydraulic requirements;
- **Underground WATER TANK** located at strategic location to allow for rain water harvesting.



2. Master Plan Social Plan

Essential social facilities list on the Railway city

Facility	Population threshold	Demand	existing	Deficit	Land size	Suggestion
Primary school	3,500	7	7	-	2.0ha	Starehe consti. Oversupply . But, 1 school (in Housing zone,1.39ha) to supplement.
Secondary School	8,000	3	3	-	3.5ha	Starehe consti. Oversupply .
Health center	10,000	2	3		2.0ha	Area already served by 3 health centers in the site.
Hospital	330,000	0	-	-	var	1 Hospital (level III, 0ha)
Park	10,000	2	-	2	1.5ha x 2	Multiple parks (in sum, 16.6ha)
Community center	20,000	1	1*		0.5ha	1 community center (0.5ha)
Library	20,000	1	-	1	0.4ha	1 Library (in KR zone or public office)
Fire station	75,000	0	-	-	0.4ha	Already served with 2 fire stations

Desirable social facility list in the Railway city

Facility	Land Area(ha)	location	For the purpose of
Police station with fire fighting/ Disaster response center	2ha	East core area	For the security of the Railway city
Kenya Railway Cultural center	6.15ha	Kenya Railway zone	Old headquarter building for new KR cultural center, open to the public
TUK expansion area as University	4.37ha	R&D zone near TUK	Reflecting the idea of TUK expansion master plan
Kenya Railway Museum	-	Existing Railway station	Sensitizing historical essence

Railway city company as the master developer will be responsible for ensuring an appropriate spread of essential social facilities across the city. In accordance with **physical planning handbook (2008)**, required **space and threshold by population will be secured** as much. In case of inconsistency, the developer shall discuss with master developer with City Council. **The residential population is estimated to be 27,534**, and it shall require the following essential facilities.

Proposed Interventions arising from the Environmental and Social Assessment for Railway City

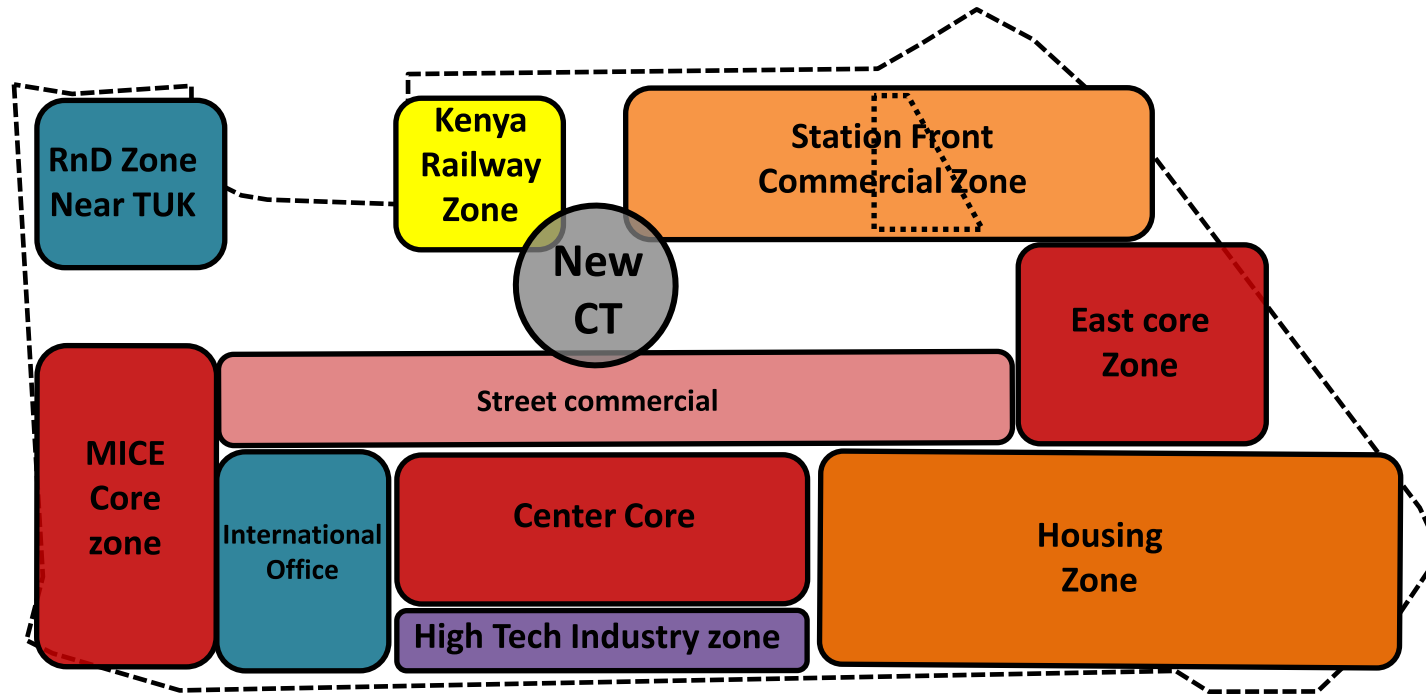
Aspect	Strategic Considerations for further study
Ecosystem Services	Rehabilitation / restoration of polluted natural resources within the planning area Measures to enhance ecosystem services within and around the project areas
Green Spaces	Integration of green spaces in the planning area as well as specific measures to influence an increase of green spaces in the larger eastern area and the CBD.
Surface Water Resources	Determination of the causes of pollution as well as development of mechanisms / programs for clean-up of the river for the long term
Education facilities	To avoid a strain on the existing primary school facilities therefore, provision of public primary schools is important to serve the low-income primary school level population that may be introduced in the planning area.
Child Safety	Considerations for safe spaces, related child safety / protection services and facilities as well as child friendly walkways for children who walk to school should also be integrated to promote child safety within the planning area.
Inclusive Planning	Integration of the needs of vulnerable groups including low income households, the urban poor, children as well as persons with disability in City Planning.
Economy and Informal Businesses	Measures for formalisation of informal business and integration of this group into mainstream economic activities in the proposed railway city
Housing	Provision of affordable housing for low income households and students
Physical cultural resources	Show case existing physical cultural resources and further enhance them with spaces and monuments that demonstrate the identity of Nairobi and unique aspects of Kenyan Culture, for the benefit of future generations and visitors from foreign countries.
Public Participation	Meaningful and responsive public participation for the Railway City Planning Process.

3. Urban Design



3. Urban Design Urban design Guideline setting

11 precinct

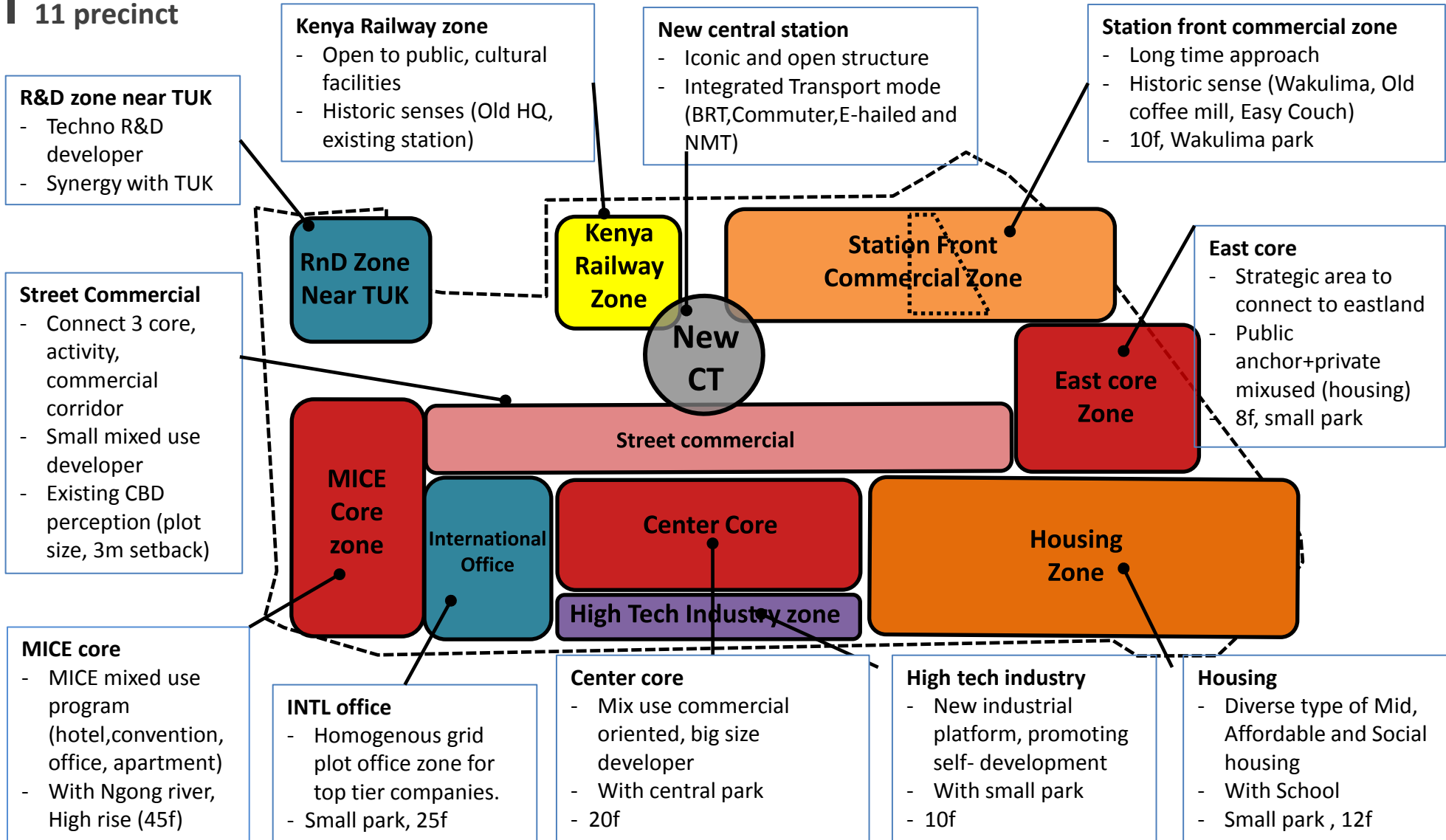


Meaning of the Precinct in Railway city

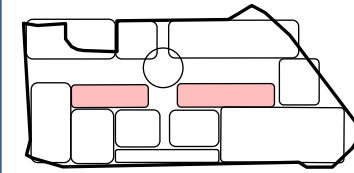
1. **Precinct identity:** Every precinct should ensure the “precinct identity” by specific urban program package, landscape and urban atmosphere. It shall be controlled by Urban design Guideline.
2. **Mixed use approach:** Every precinct indicates a dominant function with other program. Especially, Commercial as daytime, Housing as night time keeper.
3. **Precinct developer:** Every precinct could be developed by one “sub-master developer” as precinct developer. (e.g, Master developer - Precinct developer – individual plot developer)

3. Urban Design Urban design Guideline setting

11 precinct

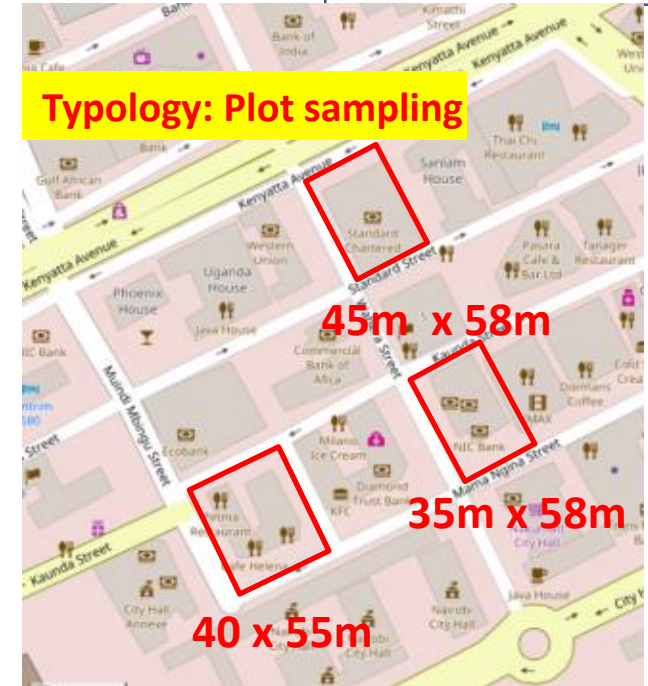
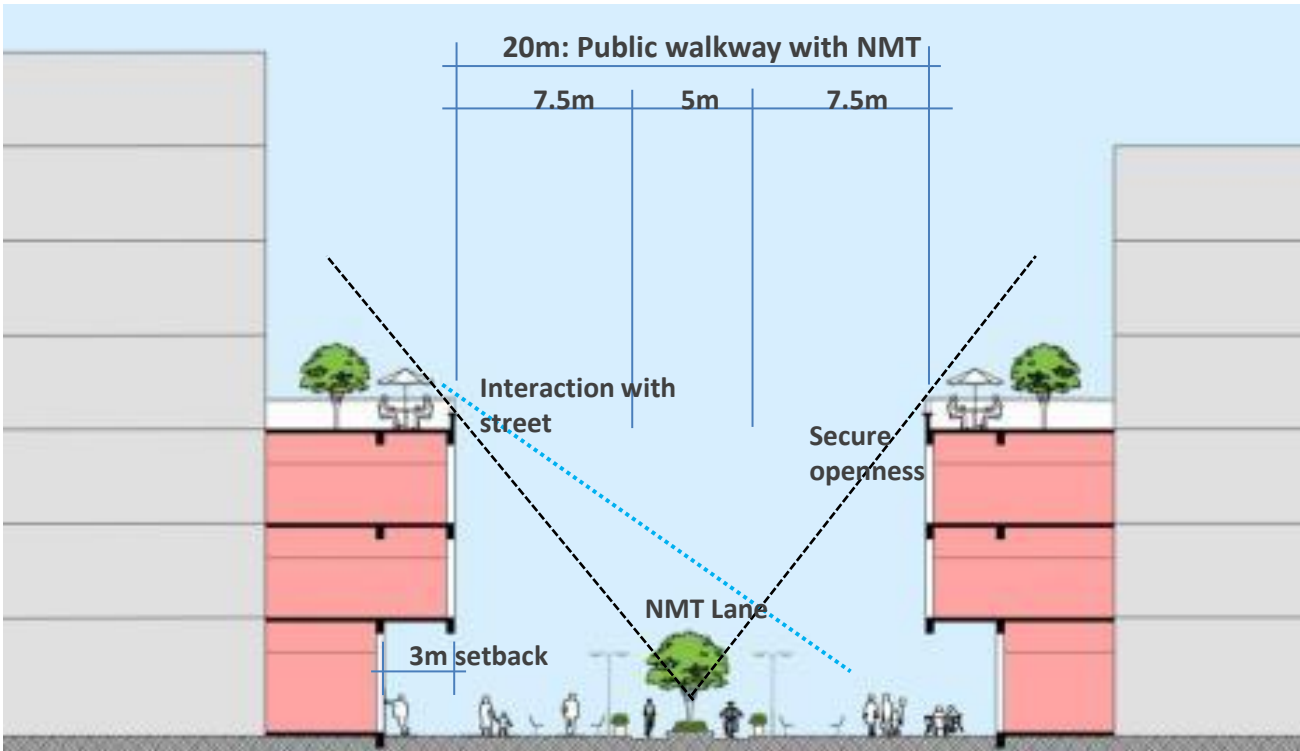


3. Urban Design Urban design Guideline



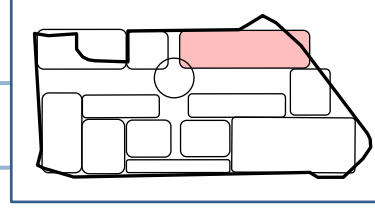
Street commercial

Safe pedestrian area with diverse activity



▲ Street set back in Ground floor for Commercial-friendly environment

3. Urban Design
Urban design Guideline setting



Station Front commercial area
Active commercial area with historical asset

Image of “Wakulima Park”
Early modern style structure could provide monumental structure of sun shading for the small park.



Image of “Korean example”
Terrarosa Yangpyoung

Old coffee mill rehabilitated
“Kenyan coffee center”



3. Urban Design Urban design Guideline setting

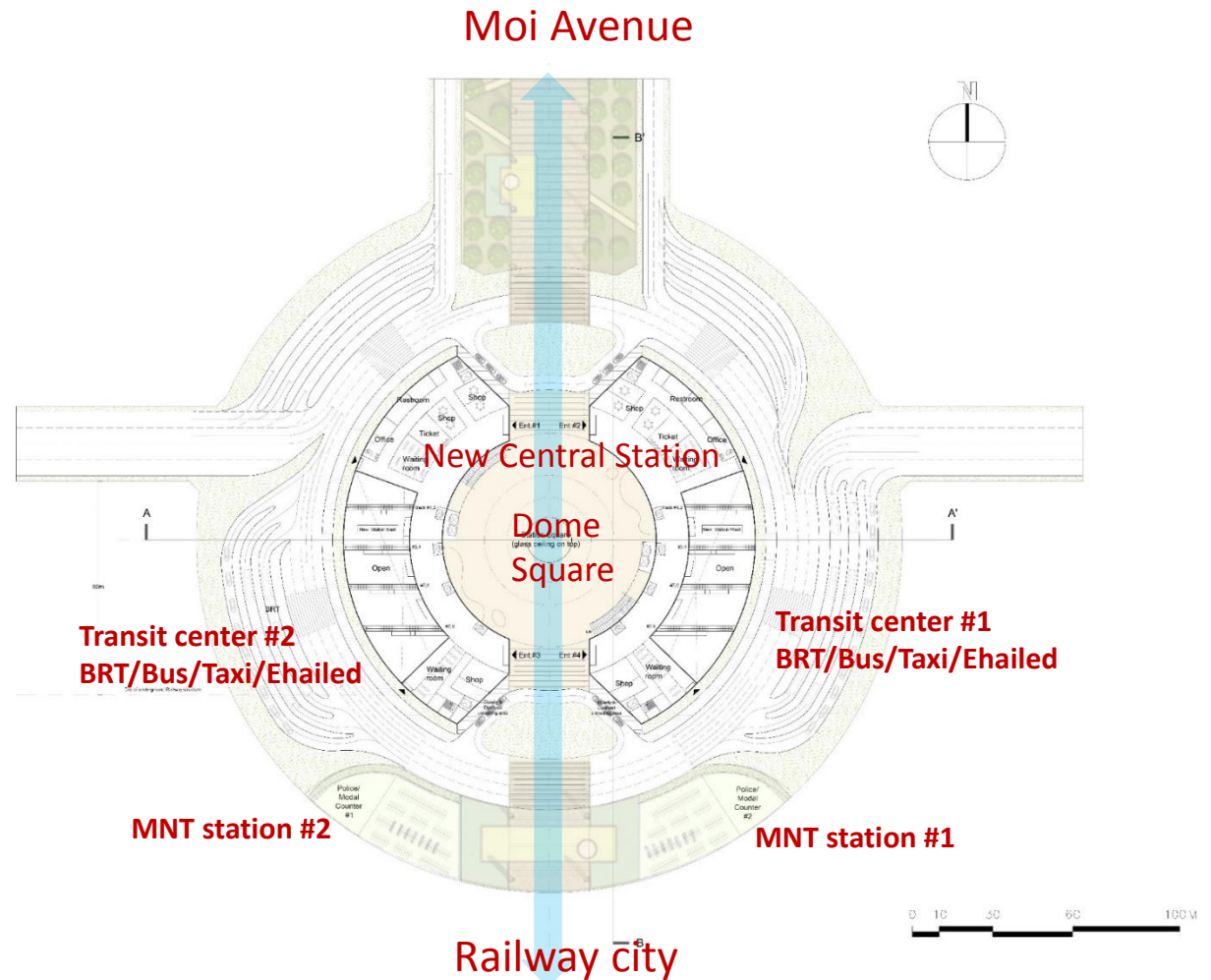
New Central Railway Station “Truly African Gateway”

Location Character

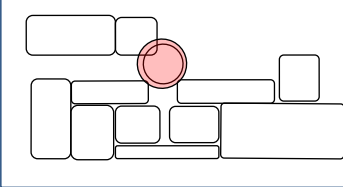
- Locates the center of the city and existing station area.
- Transit center for integration of BRT, to airport limusine, Bus, Taxi and E-hailed, and NMT station.
- Private vehicle also needs to be considered for the elderly and disabled, heavy luggage people.

Spatial scheme

- Open building for the spatial continuity from Moi avenue, perceived as “gate way” to the new city.
- Dome Square is in the middle by Glass loop ceiling.
- NMT station is also connected to the transit center area.

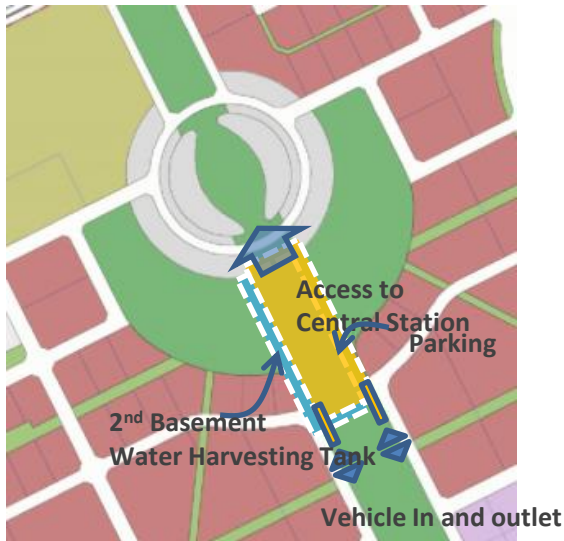
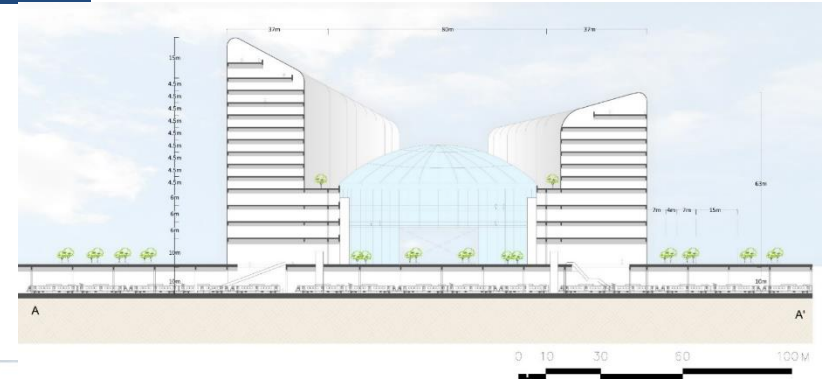


3. Urban Design Urban design Guideline setting

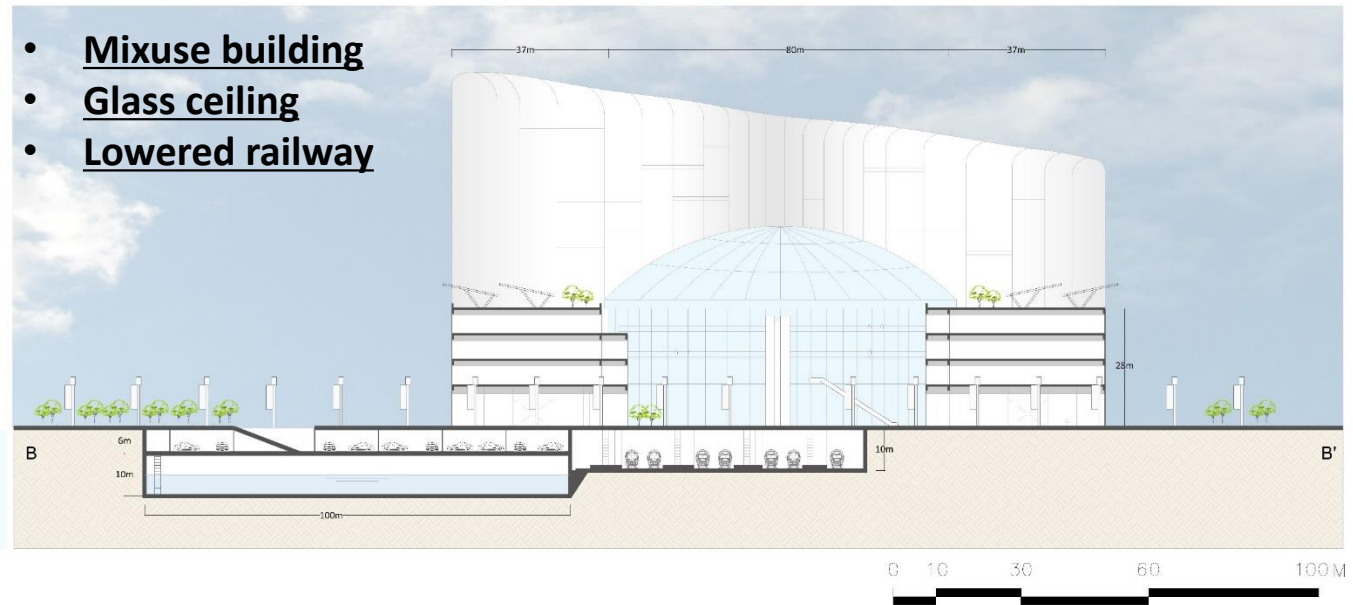


Spatial scheme: Section Study

1. **1st basement secures the transit parking of the railway station**, In and outlet is separated from the main access road of the station.
2. **2nd Basement for water reservoir (Rain harvesting)** which could be used for grey water reuse, and secured the aqua quantity from the inflow from lowered tracks.



- **Mixuse building**
- **Glass ceiling**
- **Lowered railway**



3. Urban Design Urban design Guideline setting

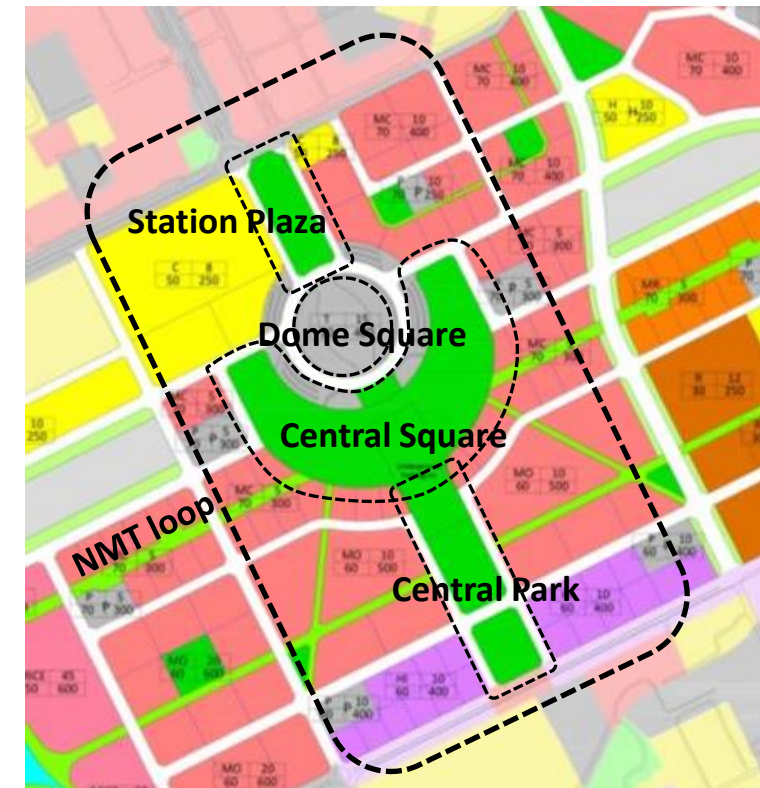
Central Square and Park Nairobi's New Central Square

Location Character

- Central station accompany with sizable open space with greeneries for station user convenience and be functioned as one of the symbolic public space in the host city.
- According to the location, central Square and park is the core structure of public space in Railway city, which is also for the future Nairobi Metropolitan spatial perspective.

Spatial scheme

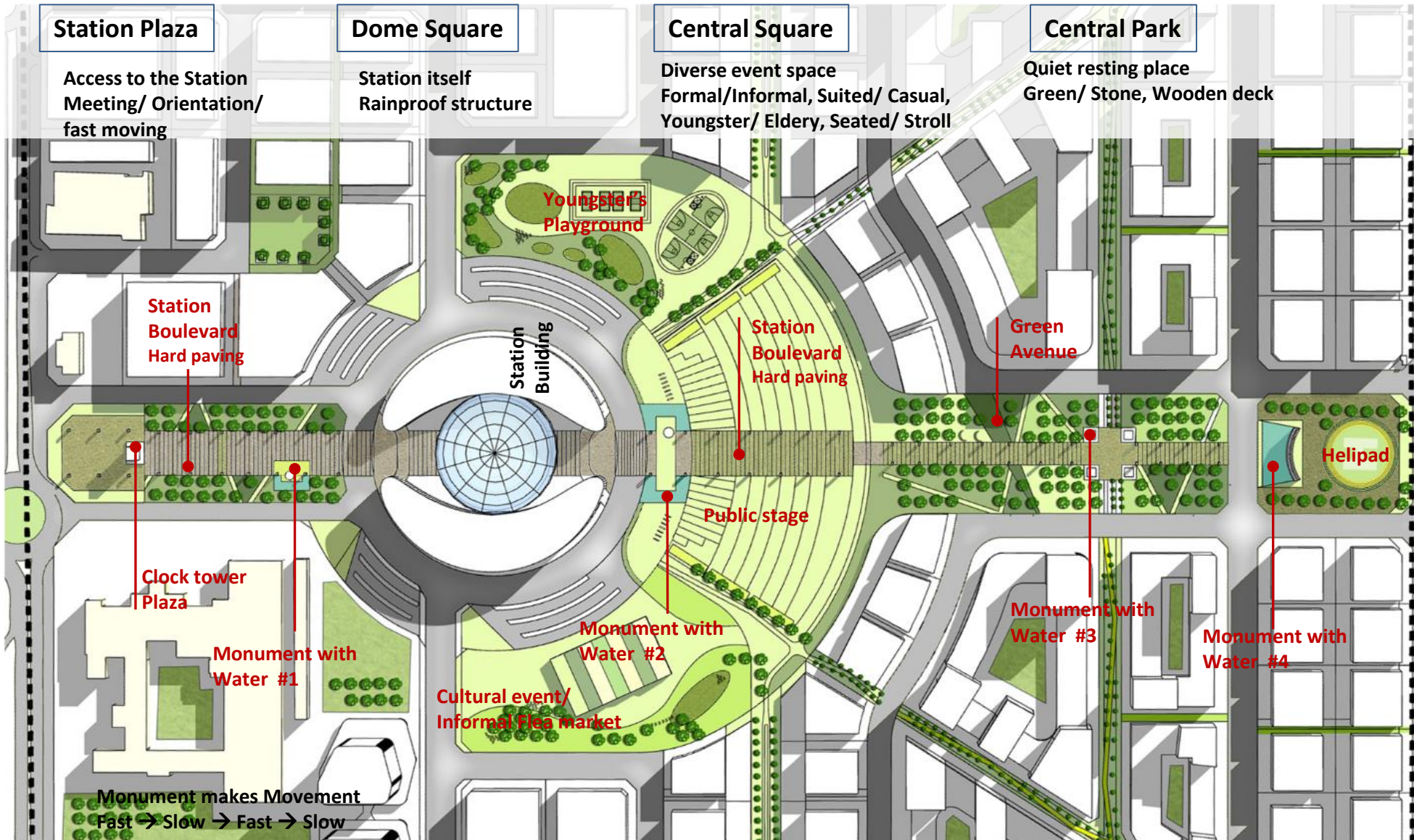
- It comprises some series of different spaces which is adapted for the future urban programs of surroundings.
- “Station Plaza”, “Dome Square”, “Central Square”, “Central Park” and “NMT loop”.



3.

Urban Design

Urban design Guideline setting

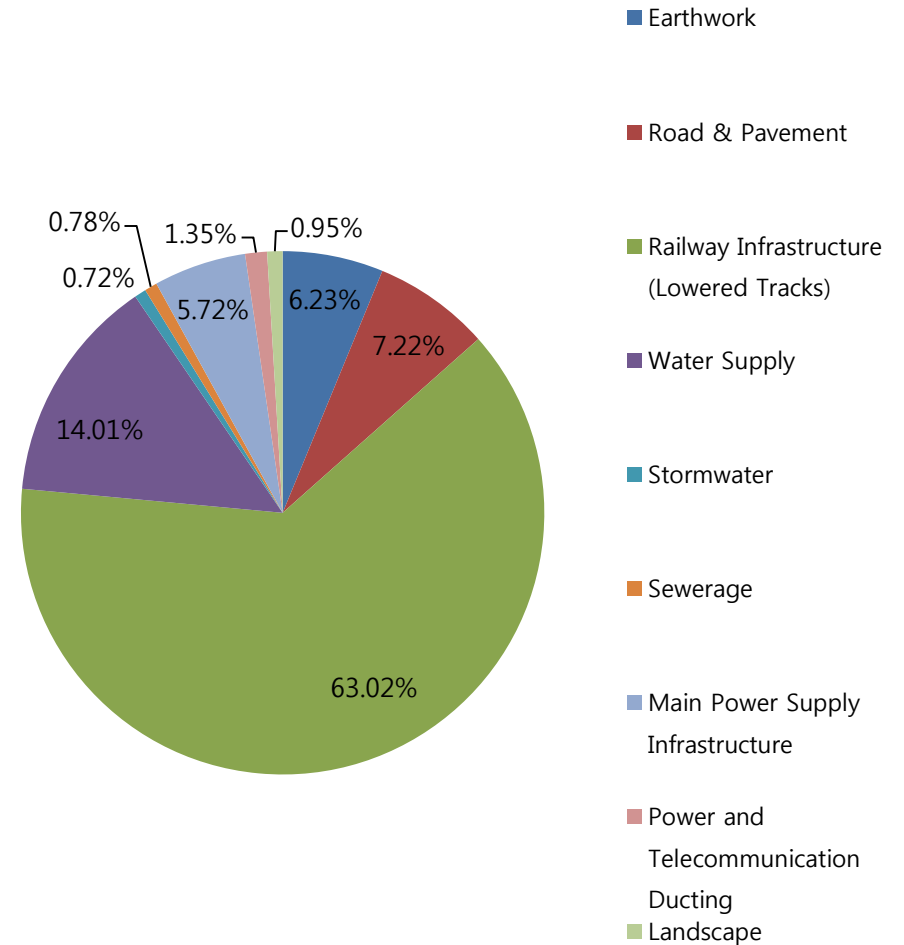




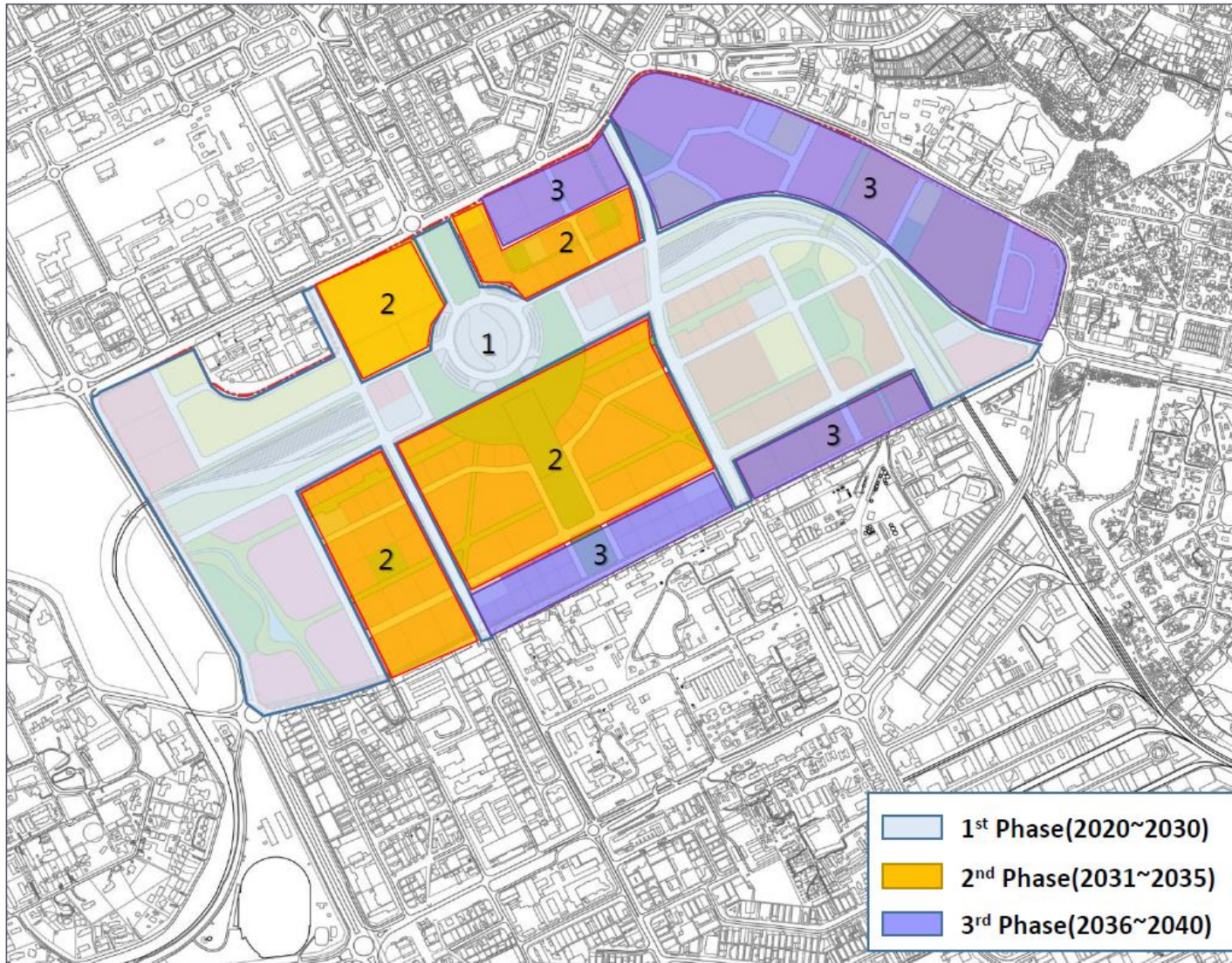
4. Implementation Plan

4. Implementation Plan Phasing and Cost

Item	Cost (Ksh)	percentage
Earthwork	1,737,913,000	6.23%
Road & Pavement	2,015,715,000	7.22%
Railway Infrastructure	17,593,729,550	63.02%
Water Supply	3,912,327,095	14.01%
Stormwater	201,571,500	0.72%
Sewerage	218,718,135	0.78%
Main Power Supply Infrastructure	1,596,250,000	5.72%
Power and Telecommunication Ducting	377,000,000	1.35%
Landscape	264,800,000	0.95%
total	27,918,024,280	100.00%



4. Implementation Plan Phasing and Cost



The project period is 20 years. Implementation plans are simplified to three phase as follows,

1. Development Area

- 1st Phase(2020~2030):

Basic Infrastructure Development

- 1) Arterial Road
- 2) Lowering track and Railway station
- 3) Public purpose

Selling Program

- 1) TU-Kenya expansion area
- 2) R&D area
- 3) MICE area
- 4) Residential area with some commercial area

- 2nd Phase(2031~2035) :

Activation of Economy

- 1) International business area
- 2) Center core with Street commercial
- 3) Kenya railway head office
- 4) Commercial area

2. Planning Area

- 3rd Phase(2036~2040): Spontaneous development by development guide lines

Institution plan

- The governance and institutional framework section of the report **covers the legal context of key project components** derived from **the laws governing planning; the laws governing registration of land interests; and the law governing transport.**
- The Consultant also addresses the **financing models for infrastructure projects** from a legal view. Particular focus is given to project finance and the most common modes of financing projects. The options covered include **debt and equity financing, bonds, PPP financing and public financing.** The advantages and disadvantages of the different modes of financing have been outlined for ease of comparison.
- Finally, the project governance and institutional framework options available for administration of the project are drafted. The segment covers **inter-ministerial committees and joint committees** pursuant to the National Government Coordination Act and under the Inter-governmental Relations Act. The segment also covers the option of **creating a special purpose vehicle under the State Corporations Act and under the Companies Act.** The advantages and disadvantages of the various options have been outlined. In the next stage, the Consultant shall **elaborate more on the financing models and framework, with Business plan development.**

THE NAIROBI RAILWAY CITY

– Sustainable, Integrated and Iconic city for All



Nairobi Railway city is the future of Nairobi.

For preparing the great CBD of Nairobi, the city is designed to be as New central economic zone, Integrated multimodal hub, Green TOD with iconic urban space and Inclusive and open Railway city.

Bird's Eye View



Central station



MICE core



Housing area



**Asante Sana
(railwaycity@googlegroups.com)**

