

DETAILED DISTRICT PHYSICAL PLANS
FOR KICUKIRO & GASABO
KIGALI, RWANDA

KICUKIRO DISTRICT
DETAILED MASTER PLAN REPORT

MAY 2013

TASK ORDER 4: SCHEMATIC PLANS



CITY OF KIGALI

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Preface

PROJECT BACKGROUND

The City of Kigali (CoK), one of the most active and progressive City Councils of Africa, aspires to see Kigali develop as a competitive, safe and modern city. In the recent past, the Government of Rwanda has undertaken the preparation of several urban development plans as well as other studies related to transport, infrastructure, housing and environment for Kigali. Having completed the Kigali Conceptual Master Plan (2008) and Detailed Master Plans for Nyarugenge District (2010) the City now intends to develop Detailed Physical Plans for the other two Districts, namely, Gasabo and Kicukiro, so as to have an integrated detailed plan for the entire City.

PROJECT COMMISSIONING AND SCOPE

In early 2010, Surbana International Consultants, Singapore (Surbana) completed the Detailed Planning of Nyarugenge District, which included Detailed Urban Design for Kigali's CBD. In October 2011, through a public tender, the City of Kigali awarded the 'Design of Detailed District Physical Plans for Kicukiro & Gasabo' to Surbana.

This master planning project, in addition to the detailed planning of the two districts, has the following objectives:

- To review the planning direction and strategies for the entire City of Kigali, while integrating all the past planning and development initiatives undertaken.
- To prepare detailed master plan, urban design (for key areas) and development control guidelines for the two districts of Kigali, namely Gasabo & Kicukiro. This would also include the review and revision of the Detailed Master Plan for Nyarugenge District,
- To establish a GIS database for the entire City which has a coordinated base map, proposed land use plan & development

control information for all areas of the City of Kigali. This GIS system would form a part of the MIS system being put in place by the Government.

- To ensure participation of the various stakeholders in the development of the Master Plan so as to develop a plan that reflects the needs and aspirations of the City's residents.
- To conduct capacity building of the CoK staff through training programmes in Singapore and Kigali.

PROJECT ORGANIZATION & SCHEDULE

The project is spread over one year and comprises of the following 6 task orders, each with a duration of 2-4 months:

- Task Order 1: Inception & Base-mapping**
- Task Order 2: Analysis & Visioning**
- Task Order 3: Concept Planning**
- Task Order 4: Schematic Plans**
- Task Order 5: Urban Design**
- Task Order 6: Implementation Plan**

PROJECT PROCESS

In line with the project scope discussed above, the process to be adopted for this project is as elaborated below:

- Establishment of a proper working base map which incorporates all land use related information for developing the master plan.
- In-depth analysis of various issues facing the City and stock-taking of previous master plans and infrastructure planning initiative in the City in order to develop an integrated Master plan.
- Establishing the strategic Urban Sustainability Framework for Kigali, that will become the overarching framework, guiding the City to address its key economic, social & environmental issues.
- Benchmarking with international best practices in city planning and

management, determining the future growth scenario, and setting the development vision and the strategic growth direction for the city.

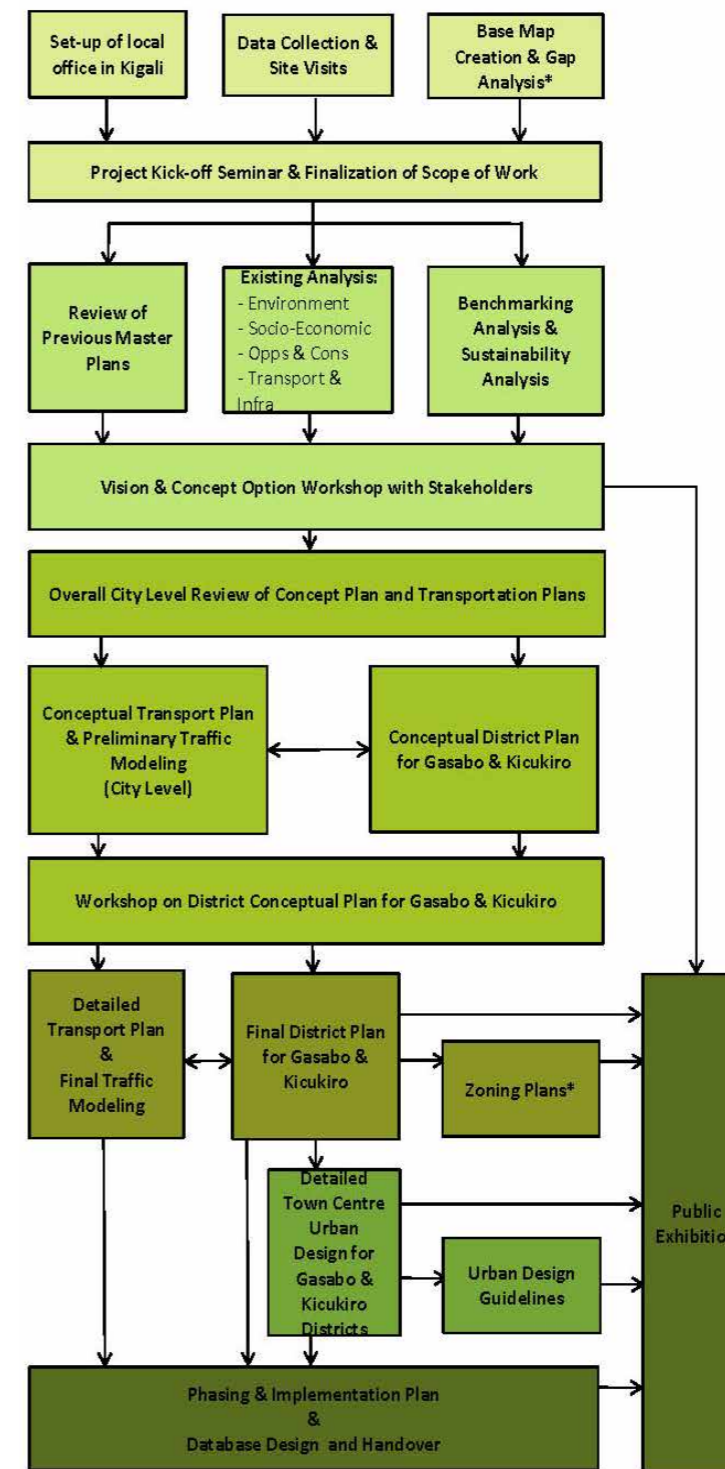
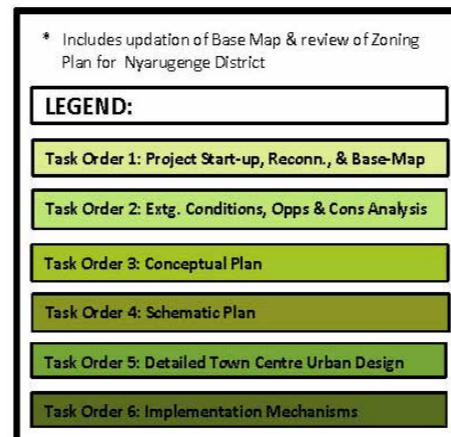
- Development of a conceptual transportation master plan, infrastructure plan & environmental management strategy for the entire city.
- Mapping out implementation process to direct the implementation process.
- Putting in place an integrated landuse data management system which incorporates the base map, the Master plan and planning approval process.

The planning process adopted for this project is further illustrated in the adjacent chart.

PROJECT DELIVERABLES

Various reports, corresponding to the various task orders are to be submitted, which include:

- Task Order 1:
- Inception Report
- Task Order 2:
- Analysis, benchmarking and Visioning Report
- Task Order 3:
- Conceptual Transportation Plan report
 - Conceptual Plan report



Task Order 4:

- Final Transportation Plan report
- Final Gasabo Master Plan report
- Final Kicukiro Master Plan report
- Gasabo Zoning booklet
- Kicukiro Zoning booklet

Task Order 5:

- Gasabo Town Centre Urban Design report
- Kicukiro Town Centre Urban Design report
- Gasabo Town Centre Zoning booklet
- Kicukiro Town Centre Zoning booklet

Task Order 6:

- Implementation report

In addition to the above reports, various marketing and promotional materials to illustrate the master plan would also be prepared for the public exhibition. A Geodatabase, incorporating the existing land use map, the proposed land use plan & the development control information would be submitted at the completion of the project.

STAKEHOLDERS' PARTICIPATION & CAPACITY BUILDING

A key component of the project would be to ensure adequate participation in the planning process from various stakeholders such as decision-makers, focus groups of private sector, community organizations and various public interest groups. Meetings, seminars and workshops are to be undertaken regularly at all stages of the project. A long-term public exhibition of the master planning project is to be undertaken at the end of the project with the objectives of initiation and marketing.

In addition, a communication plan executed through various print, broadcasting & online media would ensure participation and feedbacks from the wider public.

The preparation process of this plan would also be an opportunity for capacity building of CoK staff, which will enable their in-house team to develop into a capable planning office for the country.

This comprehensive city wide plan, incorporating the detailed plans of the two districts as well as all the past planning initiatives, would become the long term development framework for Kigali City guiding it into an era of progressive and holistic city development.

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HE Gen Gatsinzi Marcel-Minister of Disaster Management and Refugee Affairs.
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Mutoni Doreen, Investment Promotion Officer, RDB
Musoni Jordi-Michel, Utilities Delegated Manage, RDB
Thierry Hoza NGOGA, Division Manager, RNRA
Duhuze Remy Nobert , Environmental Regulation and Pollution Control, REMA
Muhayimana Annette Sylvie, Project Coordinator LVEMP 11, REMA
Rugege Denis, Environmental Advisor, REMA/UNDP
Rutabingwa Frank, Director, NAFA
Nzitonda Jacques, Director of Water and Sanitation, RURA
Mark Murenzi Rukata, Director of Electricity Utility, EWSA
Udahemuka Sirius, Director of Airports, CAA
Sagashya Didier G., Deputy Director General, NLC
Dr. Mahabubul Bari, International Expert on Transport Infrastructure, MININFRA
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Rurangwa Raphael, Director General Planning& Programme Coordinator, MINAGRI

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Mupende U. Lilane, OSC Director
Donna Rubinoff PHD, Senior Advisor in Sustainable Urbanism, OSC
Ahimbisibwe Reuben, Infrastructure Department Director
Sugi Félix, Urban Planner and GIS Specialist, OSC
Ashimwe Joshua Senior Urban Planner, OSC
Rangira Bruno, PR & Communication
Rurangwa Claude, Transport & Transport Management Officer
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Muhinda Arthur, Coordinator Infrastructure Gasabo District
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Mukunde Angelique, Vice Mayor FED Kicukiro District
Eng.Kabongo T.Patrick, Urban Planner
Rwakazina Claude, Director Land Bureau
Rwamurangwa Félix, Infrastructure Department

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Executive Summary:

DETAILED MASTER PLAN

KICUKIRO “PROGRESSIVE KNOWLEDGE HUB & GREEN GATEWAY OF KIGALI”

The vision for Kigali is “The Centre of Urban Excellence in Africa”. The Detailed Master Plan (DMP) translates and sharpens this broad planning directive set at the Regional level (Regional Concept Plan) into a detailed guide plan for the Districts. This broad vision for the entire city identifies the focus for each of its three districts.

The distinct roles identified for the three districts are:

NYARUGENGE:

“Green Financial Hub and Vibrant Growth Centre of Kigali”

GASABO:

“Diverse Employment Hub and Cultural Heartland of Kigali”

KICUKIRO:

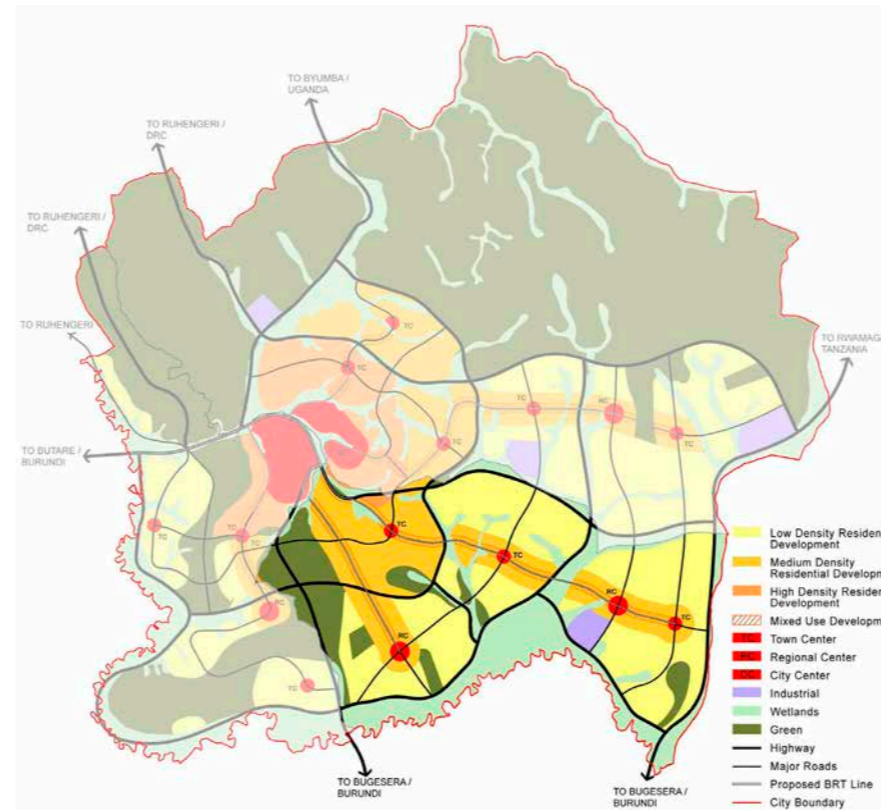
“Progressive Knowledge Hub and Green Gateway of Kigali”

Identified for its many existing institutions and facilities and with the potential to host many more to become not only the City’s but the entire nation’s institutional hub, this unique identity would compliment its development strategy. Guided by the direction set by the concept plan, the DMP for the Districts elaborate on the proposed planning intention for the particular district. It elaborates the district’s Land uses and explains how the various uses such as employment, living areas and facilities are distributed and organized to achieve the distinct identity as a “Vibrant Institutional Centre”. The DMP is an integrated Land use plan which ties in with the overall transportation, transit, open spaces and infrastructure networks.

The Detailed Master Plan (DMP) for Kicukiro looks at how the district could be best planned in relation to the regional Concept Plan of Kigali City. The DMP is a detailed Land use Plan showing all the potential areas and their Land use. As such, it provides the necessary information for the establishment of the gazetted plan, a Zoning Plan and a legal regulatory plan which ensures land reservation for public facilities and infrastructure development. It also regulates how each land parcel could be developed in term of density (FAR), building height, setback, and allowable uses subject to compliance to various planning requirements. The Detail Master Plan is the base for the proposed Zoning Plan.

STRATEGIES FOR TRANSFORMATION...

- To establish a unique Gateway Commercial Hub to Kigali with a wide variety of Mixed Used Developments along growth corridors
- To create distinct identity by developing knowledge, sports and innovation centric growth centres
- To conserve scenic wetlands and nature areas, and promote them through value added recreational uses
- To develop new comprehensive integrated townships and promote regeneration of existing areas with quality living environments
- To integrate all developments with a well planned transport network, and create walkable neighbourhoods by promoting non-motorized transit



Kicukiro in the Proposed Radial City - Conceptual Structure Plan

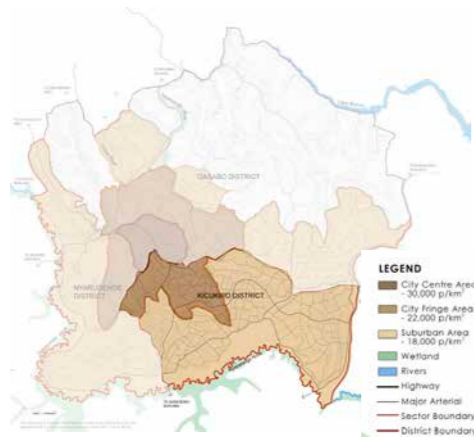
GOALS

To achieve the medium and long term visions for Kigali, a set of goals covering 6 critical development sectors are proposed. These key goals will guide the physical planning for the City as well as Districts.

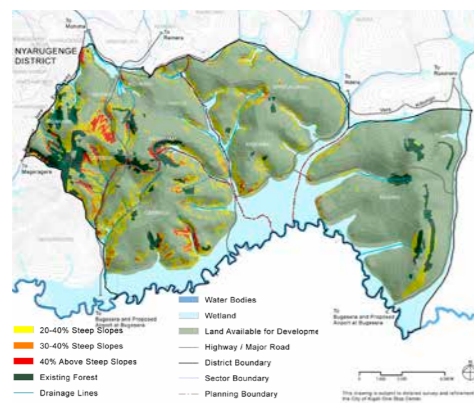
- 1 **CITY OF VIBRANT ECONOMY AND DIVERSITY**
- 2 **CITY OF GREEN TRANSPORT**
- 3 **CITY OF AFFORDABLE HOMES**
- 4 **CITY OF ENCHANTING NATURE & BIODIVERSITY**
- 5 **CITY OF ENDEARING CHARACTER AND UNIQUE LOCAL IDENTITY**
- 6 **CITY OF SUSTAINABLE RESOURCE MANAGEMENT**



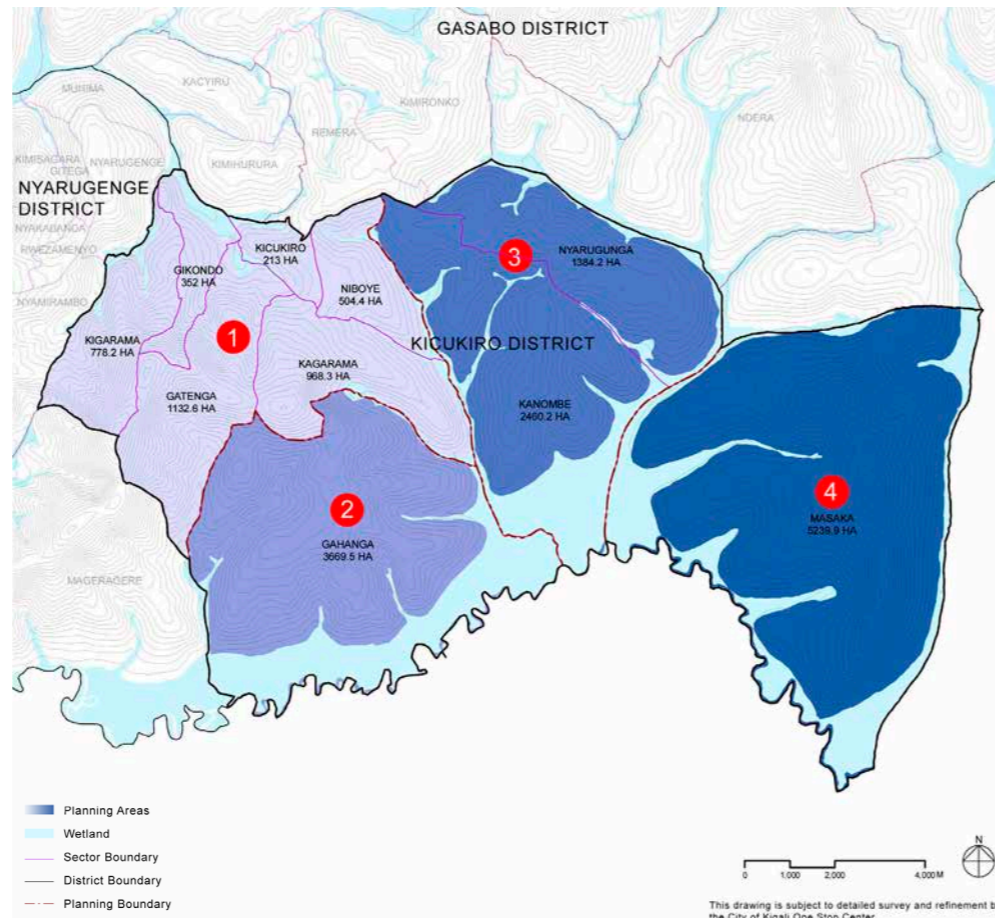
“Progressive Knowledge Hub and Green Gateway of Kigali”



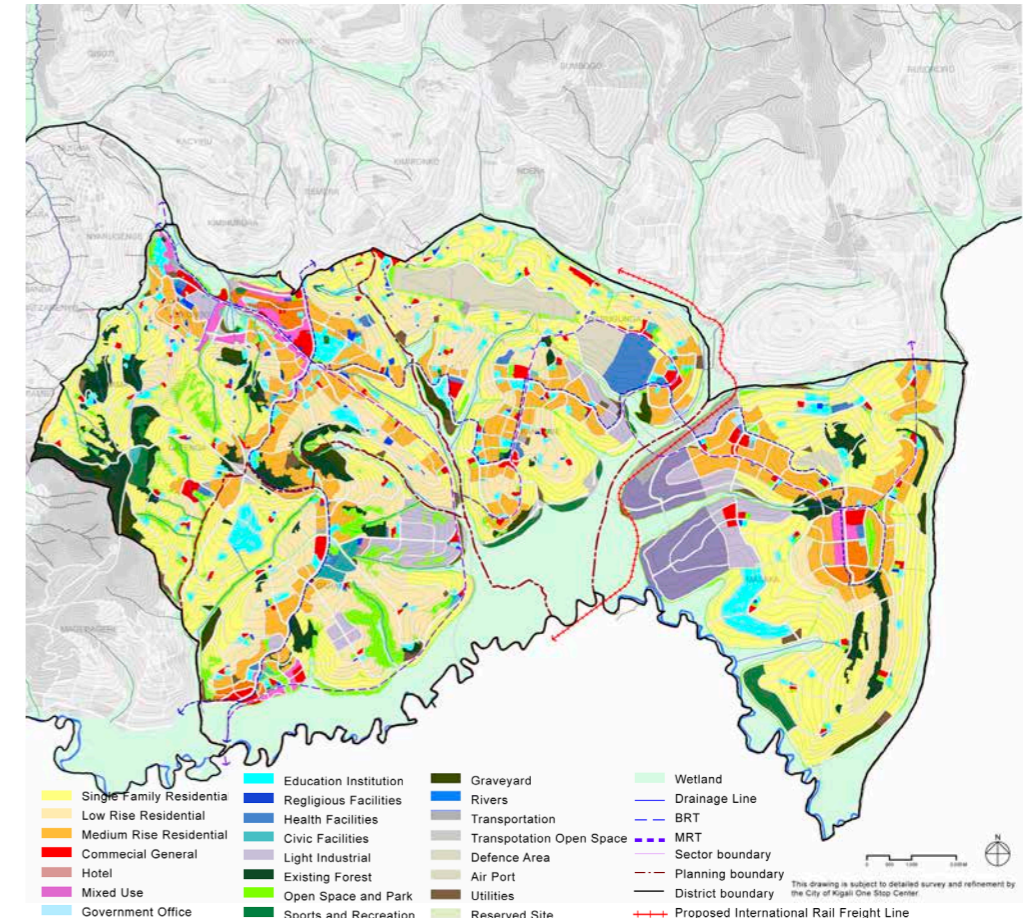
Kigali City - Proposed Density Distribution



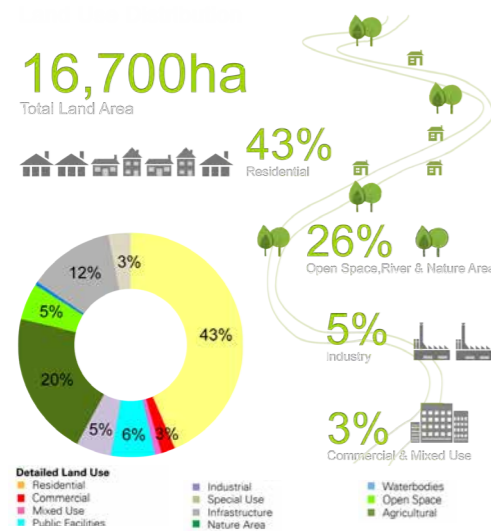
Natural Constraints: Slopes, Forest and Wetlands



Kicukiro District - Proposed Planning Areas Boundaries



Kicukiro District - Proposed Land use Plan - Year X



Kicukiro District - Proposed Land use Distribution

PROPOSED LAND UTILIZATION STRATEGY

The proposed land utilization strategy focuses on the following key aspects:

- Identifying & organizing City Fringe Areas.
- Defining urbanizable new growth areas & organizing these as the Suburban Areas.
- Developing two new 'Regional Centres' to create commercial and employment centres
- Developing New Townships in Sub-urban Areas
- Conserving existing nature areas and develop a variety of Open Spaces inclusive of recreation and tourism areas

PROPOSED PLANNING AREAS

The district is divided into four geographical areas for planning purposes. These four planning areas are developed by the grouping administrative sectors. Sectors in proximity to each other and those that share similar urban and geographic character have been combined to create the planning areas. Distinct role and identity is proposed for each of the planning areas. The 4 planning areas in Kicukiro are:

- Central Planning Area: 'The Vibrant Commercial Centre' - 3941 ha
- South Central Planning Area: 'New Affordable homes amidst scenic wetlands' - 3837 ha

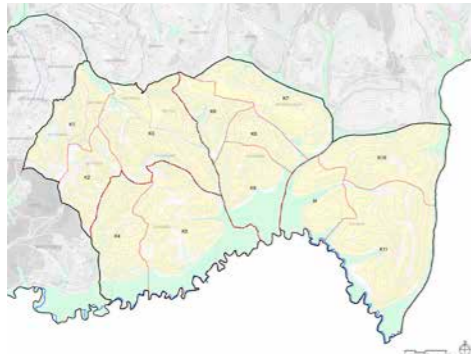
- Southern Planning Area: 'Southern Green Gateway and Sports Hub' - 3662 ha
- Eastern Planning Area: 'Hi-Tech Education and Innovation Hub' - 5231 ha

"PROGRESSIVE KNOWLEDGE HUB AND GREEN GATEWAY OF KIGALI"

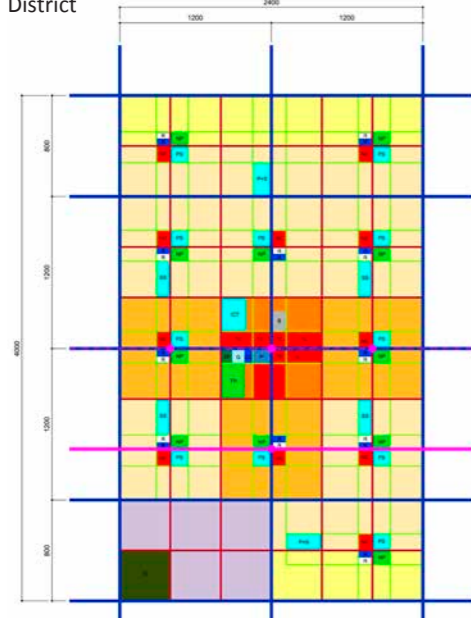
PROPOSED LAND USE PLAN - YEAR X

Kigali City is currently witnessing a growth of 6.2% p.a. SPHD, 2006 Population growth projections were created for three scenarios for the future population. A high growth, medium growth, and low growth scenario are projected by taking EICV3 2011 as the base year. The natural growth as well as migration is factored into the various scenarios. The population of Kigali City is proposed to grow from the current

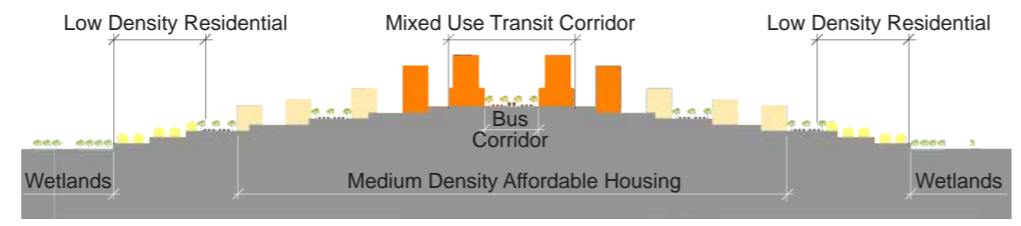
population of 1.3 million to be 5 million as per the high case scenario and 3.6 million as per the low case scenario. Provision of land and reserves for infrastructure, housing and facilities need to be safeguarded for the ultimate population (high case scenario). However, this ultimate population may or may not be reached by 2040. 'Year X' represents the stage where Kigali would have reached its ultimate population of 5 million, based on the current development parameters. The Master Plan should be reviewed every five years in line with the census and development trends.. In line with the projections, Kicukiro District is projected to have a population of 2.3 million by Year X. The key Land use proposals are:



11 Townships and 1 Industrial Estate in Kicukiro District



- To introduce regional level commercial areas in Fringe and suburban areas.
- To safeguard land for consolidated Industrial Estates.
- To establish an efficient highway grid and arterial system ensuring the long-term regional and local connectivity.
- To redevelop existing unplanned settlements into higher density residential developments.
- To develop new integrated suburban



Kigali City -Township Model

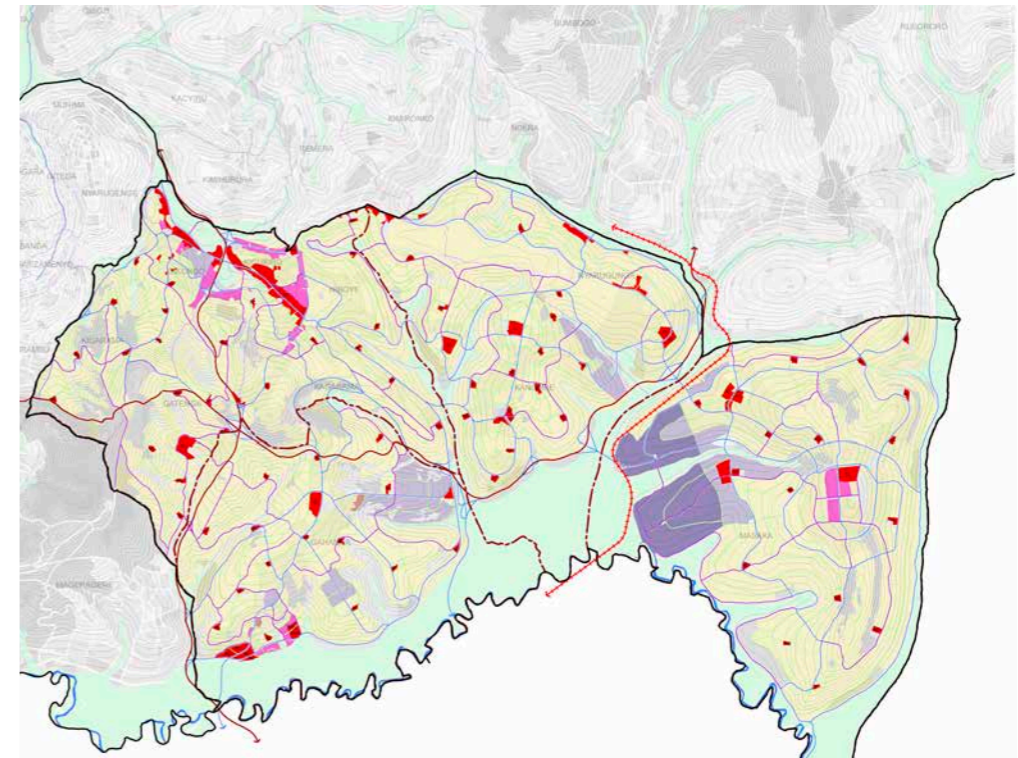
townships with facilities and light industries for local employment opportunities.

- To conserve nature areas such as forests and wetlands, to protect steep slopes, and to develop new town and neighborhood parks for the residents.
- To introduce iconic regional recreation and tourism destinations.
- To develop key infrastructures.

INTEGRATED TOWNSHIPS : PROPOSED TOWNSHIPS IN KICUKIRO

11 self sufficient townships are proposed in Kicukiro. The townships are proposed to be developed as integrated developments along the transit corridor. The features of the township are as follows:

- High density development along the transit corridor; along the flat ridges.
- Town Centre with town parks and public facilities located along the transit corridor.
- Compact neighborhoods of 15000-18000 population with Neighborhood Centre, & Neighborhood Parks
- Light Industries at the periphery, close to the highways.
- Primary Schools located at walking distances from neighborhoods.
- Average size of townships: 900 ha
- Township population ranges from 90,000-200,000
- Future MRT line located at lower slopes, with stations at an average interval of 1km.



- Commercial General
- Regional Center
- Town Center
- Neighbourhood Center
- Mixed Use
- Hotel
- Light Industrial
- Heavy Industrial
- Proposed Development Area
- Expressway
- Semi-Expressway
- Major Arterial
- Minor Arterial
- Collector
- Rural Road
- BRT
- MRT
- Railway Line
- Sector boundary
- Planning boundary
- District boundary

Kicukiro District -Proposed Commercial and Industrial Plan - Year X

CITY OF VIBRANT ECONOMY AND DIVERSITY

PROPOSED COMMERCIAL USE PLAN - YEAR X

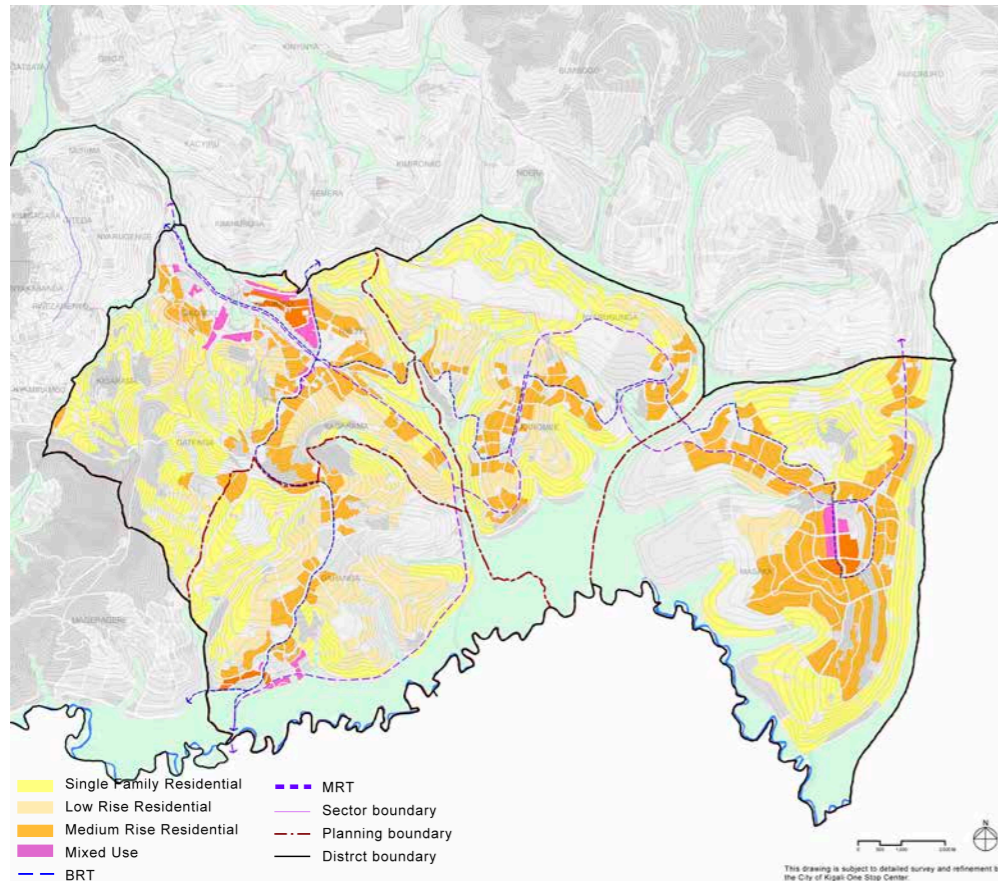
The Commercial Plan for Year X focuses on creating 1 million sq m of commercial space for 0.65 million service sector jobs. It focuses on creating a hierarchy of commercial centres distributed in Kicukiro so as to bring jobs closer to homes. Such centres include:

- 2 new Regional Centres at Gahanga and Masaka Sector
- 1 Fringe Centre at Kicukiro Sector
- 8 Town Centres
- 75 Neighborhood Centres
- Other Commercial Uses

PROPOSED INDUSTRIAL PLAN - YEAR X

The Industrial Plan - Year X, proposes 800 ha of industrial space which will provide working space for 0.2 million people in the industrial sector. The industrial plan proposes:

- 800 ha of land distributed as heavy industrial zone in Masaka capitalizing on the proposed rail alignment.
- 420 ha of Light industries lands within townships.
- Industrial areas are cited away from dense urban settlements.



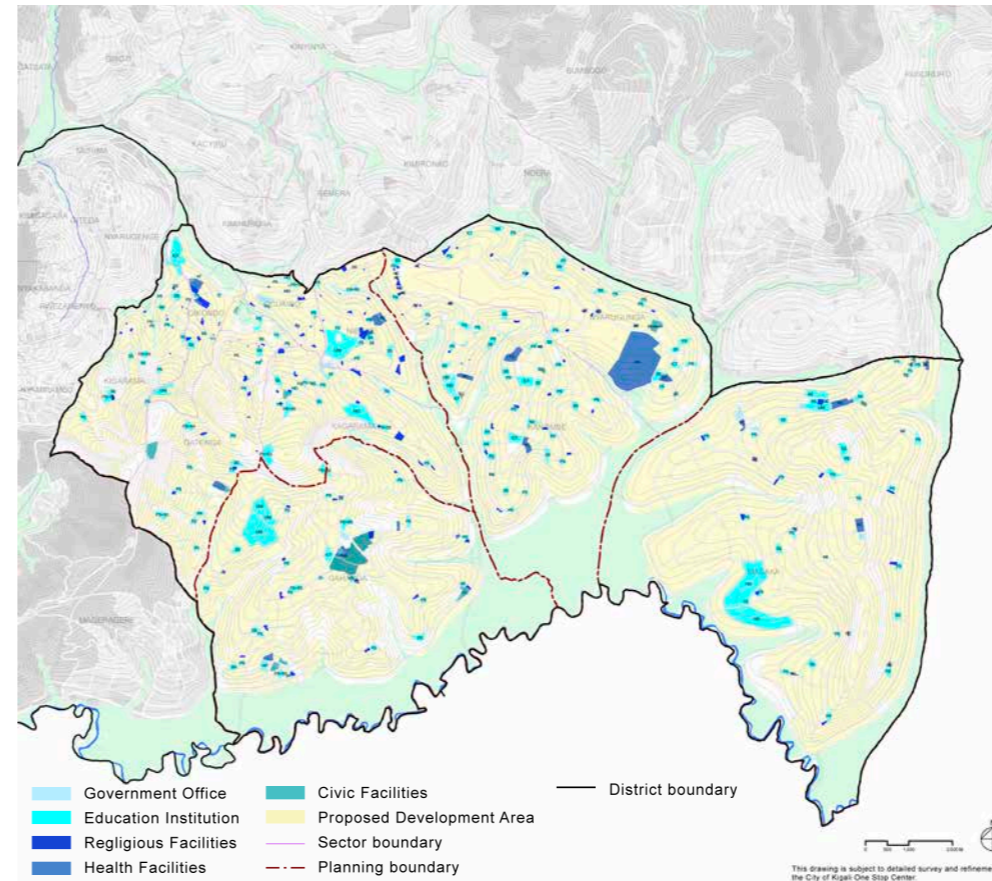
Proposed Residential Plan - Year X

**CITY OF QUALITY AFFORDABLE HOMES:
PROPOSED RESIDENTIAL USE PLAN - YEAR X**

The Residential Plan for Kicukiro - Year X, proposes affordable homes & public facilities for 2.3mi people by Year X and 1.3 mi by 2025. Its focuses on :

- Rehabilitation and regeneration of unplanned areas in the District to create a slum free Kigali by 2040.
- Easy access to quality, affordable facilities within all residential areas
- Develop integrated transit oriented townships.
- Variety of residential choices: Single Family residential, Low Density Residential, Medium Density residential, High Density Residential.

- Higher density residential development along the key transit corridors of Kicukiro district. Recommended density for high density residential areas is 200 Du's/ ha.
- Medium density residential developments around key commercial developments. The recommended density for medium density residential areas is 160 Du's/ ha. This residential Use comprises of 10 % of the land area within Kicukiro district.
- Low density and Single Family residential in areas with steep slopes. Recommended density for Low Residential is 90-35 Du's/ ha.



Proposed Facilities Plan - Year X

PROPOSED FACILITIES PLAN -YEAR X

The Facilities Plan- Year X, proposes various facilities distributed across the district. This provision will make the townships more self sufficient. These facilities are grouped in the following hierarchy.

- District level large scale public facilities such as Hospitals, Education Institutes, Civic Centres, Regional Parks, Sports Facilities, etc to cater to the entire Kicukiro District.
- Township level facilities such as a Town Centre, public parks and technical educational institutions. The Town Centre is the heart of the township housing several commercial and recreational facilities.

- Several neighbourhood level facilities such as shops, parks and day care centers within walkable distances from residential development.

The plan also promotes the sharing of facilities of the government schools such as fields and halls with the local community to use during non-school hours.



Education Facilities at walking distance



Public Plazas



Sports Facilities



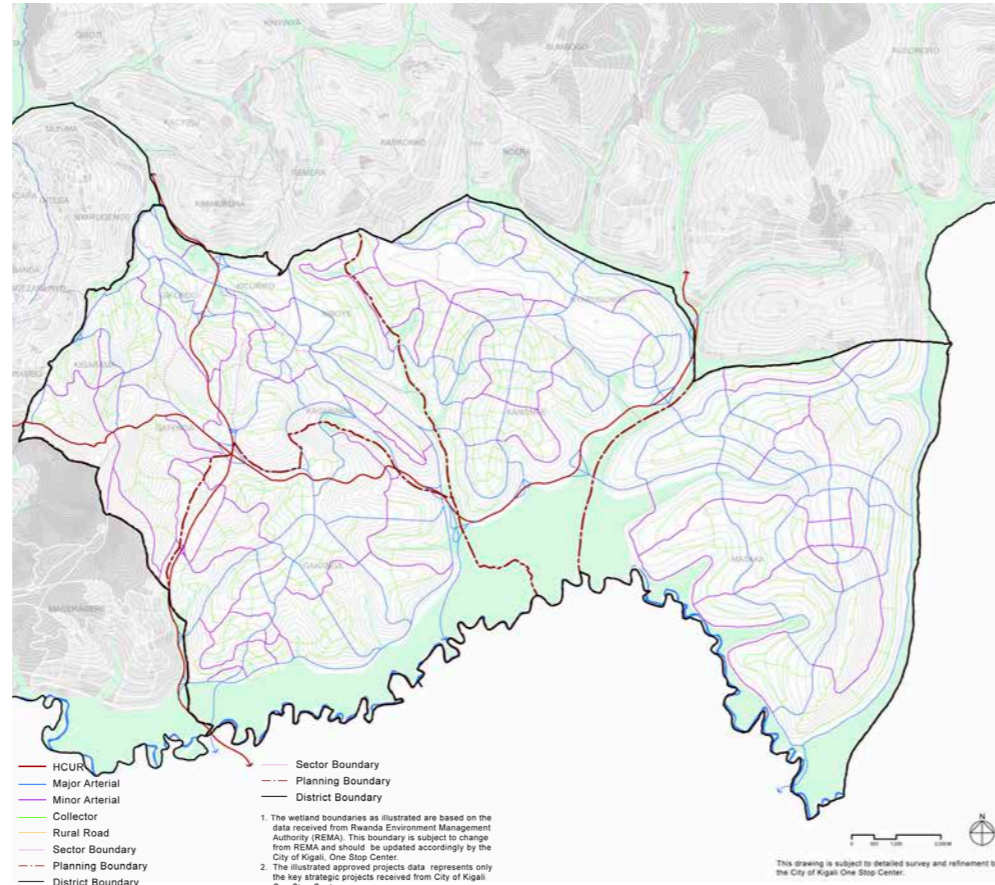
Quality Roads



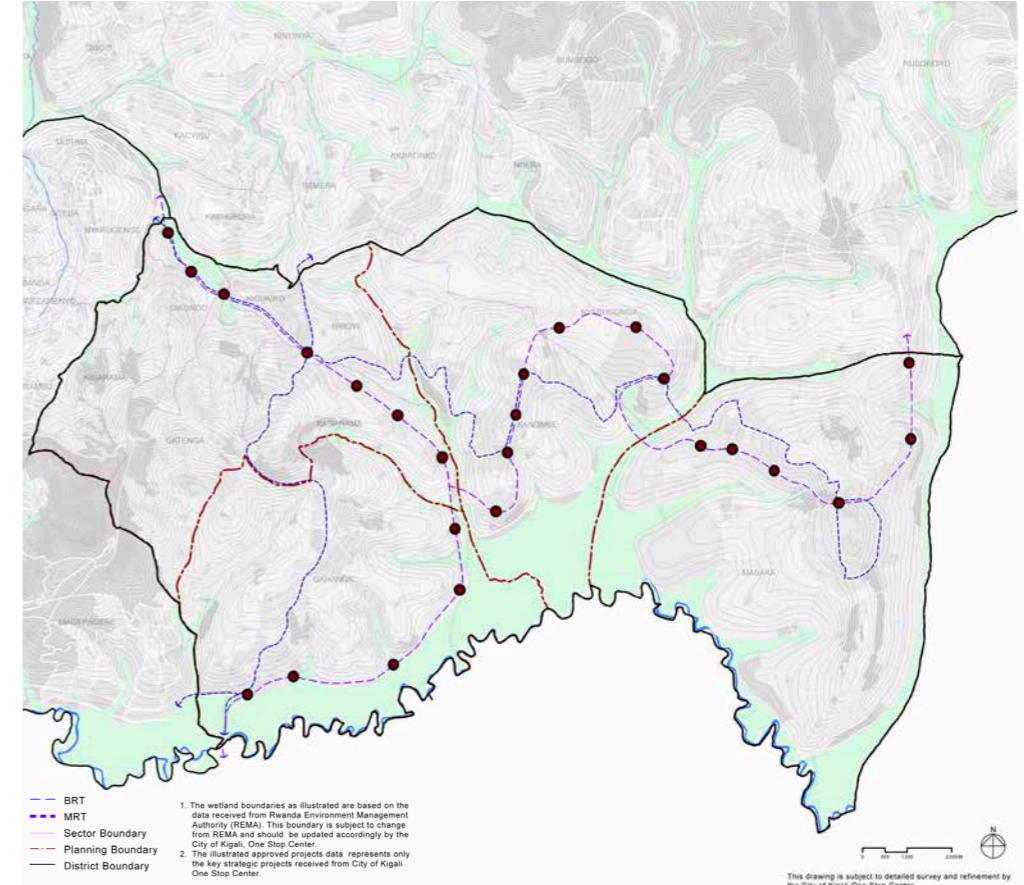
Bus Rapid Transit (BRT)



Mass Rapid Transit (MRT)



Proposed Road Network Plan - Year X



Proposed Public Transportation Plan - Year X

**CITY OF GREEN TRANSPORT:
PROPOSED TRANSPORTATION PLAN - YEAR X**

The Transportation Plan for - Year X, proposes an extensive new road network to cater to the District's 2.3 million residents.

The plan proposes to:

- Developing the existing Road Network
- Identify new proposed roads using the existing alignments
- To provide 70:30 modal share of public transit.
- Efficiently manage private transport & Car park.
- Connect to the current & future airport through efficient Public Transport.
- Bypass roads for inter-state goods



Non Motorized Transit (NMT)

vehicles.

- Provide district with 70 km of Expressways, 300 km of Arterial Roads.
- Provide a total 600 km of roads in Kicukiro District

PROPOSED PUBLIC TRANSPORTATION PLAN - YEAR X

The Transit Plan proposes extensive BRT and MRT lines in the district. All townships are oriented along the BRT transit corridor.

The plan proposes :

- Public transit based City organization to connect to employment nodes & regional facilities (Max 1 hr. travel time)
- 2 BRT lines; 43 km length, with stations at

average intervals of 600 m.

- 2 Future MRT lines; 25 km and 19 km long, with stations at average intervals of 1.2 km.
- A system of feeder buses to support BRT and MRT lines.

NON-MOTORIZED TRANSIT

The townships are proposed to be compact and walkable developments. Non motorized travelling within townships for local needs and access to local facilities is enhanced by the provision of pedestrian and park connectors. Cycling is also promoted as a mode of transport through provision of dedicated and shared bike pathways.



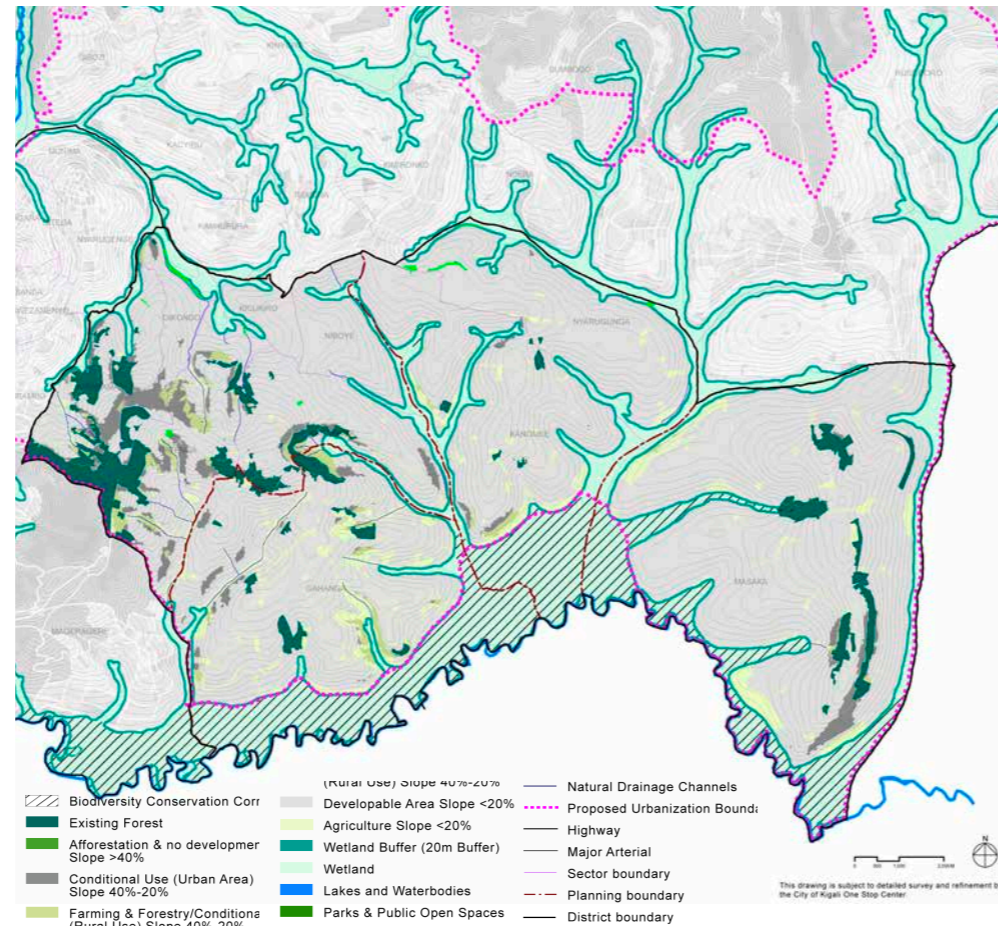
Protecting the wetlands: Our natural assets



Safeguarding the natural drainage



New Open Spaces in the City: Town Parks



Proposed Green and Blue Plan - Year X

CITY OF ENCHANTING NATURE AND BIODIVERSITY:

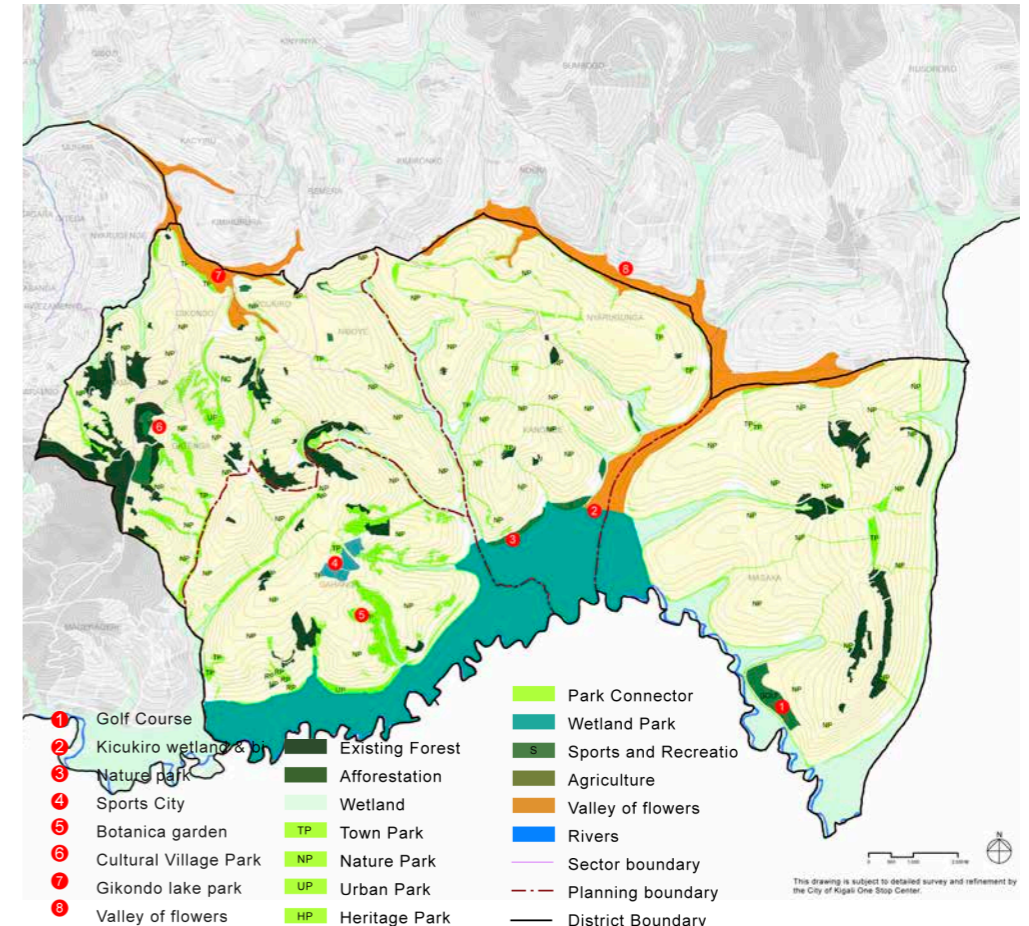
PROPOSED GREEN & BLUE PLAN - YEAR X

The Green & Blue Plan proposes specific environment strategies and a range of open spaces capitalizing on the wetlands and terrain.

The plan proposes to:

- Strengthen existing natural drainage systems and wetland networks to improve the quality of the downstream water.
- Allow agriculture in arable land along wetlands and un-buildable zones.

- Encourage afforestation in steep slopes of more than 40%
- Manage watersheds and slopes.
- Provide a variety of public parks and open spaces, classified as Regional Parks, City Parks, Town Parks, Local Parks and Park Connector Network.
- Develop a variety of attractive parks and recreational features such as theme botanic gardens, bio-diversity parks, eco-bird park, horticulture park, etc.



Proposed Key Features Plan

CITY OF ENDEARING CHARACTER AND UNIQUE LOCAL IDENTITY

PROPOSED KEY FEATURES PLAN -YEAR X

The key features plan proposes a variety of developments in Kicukiro to give it unique destinations, new places to visit and enjoy. These features will help create a distinct identity for Kicukiro and help fulfill its role as the "Progressive Knowledge Hub and Green Gateway of Kigali".

Key features also include attractive tourism destinations for both local and regional

visitors. They constitute nature areas recreational, cultural and commercial developments. These also serve to attract new investments in the region. Some of the key features of Kicukiro are:

1. Lake park at Gikondo
2. Rebero Tourist Resorts
3. Kicukiro Wetland and Bio Diversity Park
4. Sports hub at Gahanga
5. Flower Valley all along central wetlands
6. Botanic gardens in Gahanga
7. Equestrian Park in Kanombe
8. Golf Course resorts at Masaka

1 INTRODUCTION

REPORT BACKGROUND AND PURPOSE

The vision and goals for Kigali City were established and a citywide Broad Land Use Plan was developed in the last three Task Orders

The purpose of the current report, Task Order 4: SCHEMATIC PLANS is to further develop the Broad Land Use by defining the detailed Land Use distribution, key environmental management strategies and transportation and infrastructure systems. Detailed Master Plans and Zoning Plans for both the districts are developed in Task Order 4. The Land Use and Zoning Plan for Nyarugenge District is also updated using the new available cadastral data. This report discusses the Detailed Master Plan of Kicukiro District.

METHODOLOGY

The detailed plans for each district is developed based on the growth projections and planning directions for the District set at Task Order 03 - Conceptual Plan. They are guided by the 'Urban Sustainability Framework', and the Vision and Goals developed at the Conceptual level. The Detailed Master Plan provides a comprehensive development strategy for the District as a whole. It provides development strategies for various sectors through efficient infrastructure, transportation and transit systems; provision of adequate and appropriate housing and employment centre's; extensive environmental management strategies and provision of a range of recreational, cultural and social amenities to ensure good quality of life for all the residents. Plans are prepared for two stages of development. The Ultimate plan is prepared for Year X (2040 and beyond), and an intermediate plan is prepared for Year 2025; this identifies priority development areas.

Various meetings with the district's stakeholders and experts were conducted during the planning stages. The valuable feedback provided during these forums is captured in the development of the plan. For planning purposes, the district is divided into planning areas which consists of several administrative sectors. The Detailed Land Use and Zoning Plans are developed both at District and Planning Area level.

Subsequently, an area in each district is identified for detailed Urban Design. The detailed Urban Design would be developed in Task Order 05. Similarly, priority projects are identified and elaborated in Task Order 06: Implementation Mechanisms.

The process adopted during this Task Order of the project is elaborated below:

- The existing context and the Strengths and Opportunities at a district as well as planning area level are identified.
- The Land Use development strategies for the district are framed.
- For planning purposes, the City is restructured into comprehensive Planning Areas based on their geography and development potential.
- Integrated development plans for various Sectors are proposed. This includes residential, commercial, industrial, public facilities, environmental protection strategies, green and open space, transportation network and various Infrastructure network plans. All these plans combine to form a comprehensive Land Use Plan for the Districts and the City.
- A Zoning Plan corresponding to the Land Use Plan is developed using the available cadastral data. The Zoning Plan and Guidelines play a key role in implementing the proposed Master Plan. It directs the developments, both public and private sector, with a clear set of development objectives, definitions and regulations.

- These development proposals are envisioned in two phases; Year 2025 and Year X.
- Feedback from the district's stakeholder's on Zoning Plan and Land Use development forms an integral part of the planning process.

ORGANIZATION OF THE REPORT

In addition to the Introduction chapter, the report consists of the following chapters:

CHAPTER 2: KICUKIRO DISTRICT - CONTEXT OPPORTUNITIES & CONSTRAINTS

The key objectives of this section are to present an in-depth analysis of the existing Land Use of the district, the socioeconomic and historic context and also identify the major constraints and opportunities that the district has to offer. Detailed planning area boundaries are also explained.

CHAPTER 3: KICUKIRO DISTRICT - PROPOSED MASTER PLAN

The chapter further summarizes the future outlook for the district through projected economic and socio-demographic growth. It focuses on the role for Kicukiro Districts according to the overall city vision. The proposed conceptual structure plan and broad Land Use strategies along with the key features and connectivity are elaborated in detail for this district.

This section highlights the strategies adopted to maximise the development potential on the very limited buildable land in the district. A detailed Land Use Plan for the horizon of 2025 and Year X are presented here. The percentage of land allotted for each development type is shown in a table.

The density distribution plan recommends

different urban densities to address current structural differences in the density distribution. Further to this, proposed organized typical township model with comprehensive facilities are explained in detail in context to the district. These townships aim to not only accommodate the high case projected population but also infuse better quality of life. The total number of townships, area, population and employment distribution in each town is discussed in detail. The Planning areas defined for the purpose of planning is also explained in detail.

The subsequent sections presents the various detailed plans explaining the key sectors:

- **Commercial Plan**
- **Residential Plan**
- **Industrial Plan**
- **Facilities Plan & Education Plan**
- **Green & Blue Plan**
- **Transportation Plan**
- **Infrastructure Plan**

The Chapter explains strategies to develop a vibrant and prosperous district that consolidates business and provides industrial services. It takes a closer look at the existing service sector and the established commercial nodes and upcoming commercial areas. In order to expand the employment and commercial base according to the future economic outlook, a decentralized Commercial Plan is proposed with a hierarchy of commercial centres distributed around the district. The Strategic locations of each commercial centre, the employment scale, supportive facilities like retail, recreation and residential layouts are discussed in detail.

The proposed Commercial plan 2025 illustrates phasing of commercial nodes in order to strengthen existing commercial centres in the district and propose new potential areas for commercial growth as

well as redevelopment.

The chapter also focuses on the industrial sector which is expected to be a major employer in the overall city. In line with the Concept Plan positioning for the district, the proposed Industrial Plan allocates and safeguards land for this sectoral growth. Detailed industrial types and employment generated is discussed in detail.

The proposed Residential Plan Year X, lists the housing typologies, their density distribution and location. For the intermediate 2025 Housing Plan, various upcoming residential developments and new proposed residential developments are highlighted. The Structure Plan presents basic and specialized facilities that are necessary to achieve quality life.

The chapter also examines the existing environmental issues and challenges, natural wetlands and the diminishing forest cover in particular. The Various environment conservation strategies to protect waterways, wetlands, forests and slope management are enunciated in detail. The district's green and blue plan clearly defines the City's ambitious plan to mark itself as tourist and adventure friendly city. It describes the various destinations, attractions and parks as per the structured hierarchy and the phasing of these landscape projects as per the intermediate 2025 green and blue plan.

It further identifies water and energy resources for the city and develops infrastructure facilities for each district. The chapter discusses the existing condition of water supply, sewer, storm water and power supply in detail. It further explains the key issues that arise from expanding the current infrastructure network for the projected population by the year X.

Topography and natural constraints make service distribution and planning unique

to the district. The existing supply and network is inadequate, hence the district has to prepare extensively to cater for the projected population. Different strategies approached for water demand management, distribution and potential water resources are defined clearly within the chapter. Sustainable approaches to sewer treatment and storm water management are also discussed in detail. Due to increasing demand for energy, the chapter explains alternative power supply and ways to reducing demand e.g. through efficient grid systems. The chapter provides a detailed network plans for the various infrastructures to be developed in the district.

In addition to the Transportation Master Plan Report (provided as a separate Report) for the city which provides an in-depth transportation analysis and proposal for the city, a summary of the proposed Transport Plan for the year 2025 and Year X for the district is explained. It underlines the transportation proposal addressing the following:

- Road Network Plan
- Public Transit Plan
- Non Motorized Transit Plan
- Typical Road Sections

CHAPTER 4-7: DETAILED MASTER PLAN FOR THE PLANNING AREAS

This chapter takes a focused look into each planning area consisting of a few administrative sectors for each district. An in-depth analysis of the existing context of each planning area is carried out, and detailed constraints and opportunities for each area are identified.

Development proposals capturing stakeholder's opinions for each Planning Area have been prepared. These approved projects are incorporated in the new

proposed plan. The detailed plan is developed based on the existing cadastral parcels of the city as well as the existing road layout.

Key features for each planning area are identified to create a distinct identity for each area.

This chapter identifies water and energy resources for the city and develops infrastructure facilities for each district. The chapter discusses the existing condition of water supply, sewer, storm water and power supply in detail. It further explains the key issues that arise from expanding the current infrastructure network for the projected population by the year 2040.

Topography and natural constraints make service distribution and planning unique to the district. The existing supply and network is inadequate, hence the district has to prepare extensively to cater for the projected population. Different strategies approached for water demand management, distribution and potential water resources are defined clearly within the chapter. Sustainable approaches to sewer treatment and storm water management are also discussed in detail. Due to increasing demand for energy, the chapter explains alternative power supply and ways to reducing demand e.g. through efficient grid systems. The chapter provides a detailed network plans for the various infrastructures to be developed in the district.

CHAPTER 8: WAY FORWARD

This chapter discusses the upcoming steps and explains subsequent deliverables of the project.

2 Kicukiro District - Context, Opportunities and Constraints

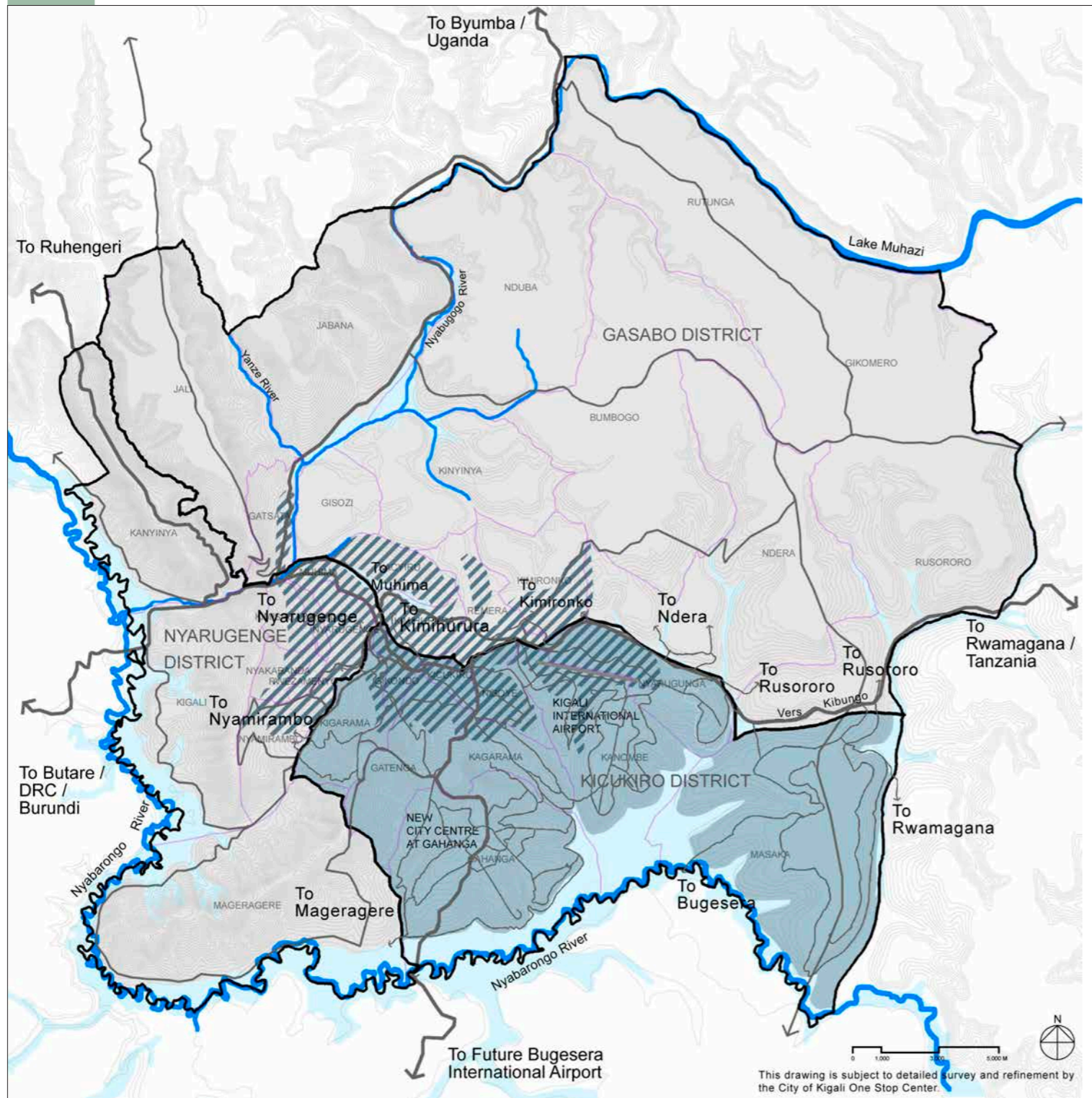


Fig.2.1 Kicukiro District - Location and Connectivity (city map indicating urban areas, water bodies etc)

2.1 Existing Context

This Chapter presents an overview of the current context of the Kicukiro District and the role assigned to the District in the Detailed District Plan. It also presents an analysis of the key physical opportunities and constraints that are critical in the District's planning.

2.1.1 LOCATION AND CONNECTIVITY

Kicukiro District is located south of the Vers Kibungo and comprises of the following 10 sectors - Kigarama, Gikondo, Gatenga, Kicukiro, Kagarama, Niboye, Gahanga, Kanombe, Nyarugunga and Masaka.

It is surrounded by Rusororo, Ndera, Kimironko, Remera, Kimihurura sectors of Gasabo District in the north; Muhima, Nyarugenge, Nyamirambo and Magaregere sectors of Nyarugenge district in the west and north west. It is surrounded by Rwamagana District in the east and river Nyabarongo separates Kicukiro District from Bugesera District in the south.

When compared to Nyarugenge and Gasabo districts, Kicukiro District has relatively more flat land with high potential for new growth areas.

Vers Kibungo and Kigali Nyamata Road are the two prime roads that connect

- Existing Urban Area
- Kicukiro District
- Water Bodies
- Wetland
- National Highway
- Regional Road
- District Boundary
- Sector Boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center

the Kicukiro District with the eastern and southern districts of the country.

In 2005, the City of Kigali expanded its municipal limits by 10 times to 731.24 sq. km leading to the inclusion of large areas of rural and agrarian land. Kicukiro District comprises of 10 administrative sectors, 41 Cells and 333 Imudugudus /administrative villages. Kicukiro District extends over a total area of 166.7 sq. km with 0.35 mi inhabitants and a gross density of 2,095 inhabitants per sq. km¹.

Table 2.1 and Fig.2.2 illustrate the existing size, boundaries and population of each Sector in Kicukiro District.

1 Estimations based on EICV 2006

Table 2.1 Kicukiro District - Sector Size and Population

PLANNING AREA	SECTOR SIZE (HA)	POPULATION
Kigarama	776.58	34,455
Gikondo	351.28	25,186
Gatenga	1130.28	27,431
Kicukiro	212.57	17,966
Kagarama	966.36	16,556
Niboye	503.44	22,663
Gahanga	3661.74	15,164
Kanombe	2455.54	31,185
Nyarugunga	1381.62	31,522
Masaka	5230.57	27,156
Total Area	16669.99	249,284

Source : Kicukiro DDP, Kicukiro population structure in November 2006 per administrative sector

The Five sectors - Kicukiro, Niboye, Gikondo, Kigarama and Nyarugunga Sectors are largely urbanized and comprise of low-density informal housing settlements. The remaining five sectors - Gahanga, Gatenga, Kagarama, Kanombe and Masaka are

largely rural and comprise of scattered rural housing and agricultural land. The biggest of all the sectors in Kicukiro District is Masaka Sector which comprising mostly of farmlands. The smallest and also the most urbanized is Kicukiro sector.

2.1.2 HISTORICAL CONTEXT

Kicukiro District was established by Organic Law n°29/2005, which organized the administrative entities of the Republic of Rwanda, at the start of the second phase of decentralization in January 2006. It resulted from the merger of former Gikondo, Kanombe, Kicukiro Districts and former Municipality of Kabuga.

The administrative office of Kicukiro District is located in the administrative Sector of Kagarama, close to the national road that links Kicukiro District with the Bugesera District in the Eastern Province. As a decentralized entity, Kicukiro District enjoys legal personality and, consequently, both administrative and financial autonomy².

2.1.3 EXISTING SITE CONDITIONS

Only 74% of the land (123.5 sq. km) in the District is available for development due to topographical and natural constraints.

Urban Land Uses such as residential, commercial, industries, social and infrastructure facilities are limited to areas close to the City Centre, Vers Kibungo and the existing International Airport. These developments occupy around 23.8% of the District's land. Major Commercial and Industrial activities are centred in the Kicukiro, Gikondo and Niboye sectors close to the clusters of government institutes, embassies and other non-governmental organizations in Gasabo District. The Nyarugunga and Kanombe sectors support residential clusters and small commercial

development located close to the City's existing International Airport. Most of the area towards the south in Gahanga, Masaka and Kanombe sector remain natural and unplanned rural agrarian land.

Agriculture, stock breeding, co-operatives, commercial trade and Industries constitute the District's economy. The industrial sector is relatively well developed in Kicukiro District. Industries in Gikondo and Kicukiro sector provide additional employment. There is significant presence of commercial and mixed use corridor along the Boulevard de l'OUA which also serves as the logistics corridor for the City.

The recent launch of CBD phase 1 in Muhima has strengthened the existing City Core with new offices and commercial spaces. The upcoming International Airport in Bugesera has revamped the development corridors in the District. This has resulted in growth of the existing local market places and residential development has spread around in both urban and rural areas.

2.1.4 SOCIOECONOMIC CONTEXT

The district as a whole fares decently in terms of living conditions, when compared to the National averages of socio economic indicators³.

Agricultural activity is carried out in rural areas but this is losing ground due to new

3 Source: EICV 2006

- Wetland
- Sector Boundary
- District Boundary
- Planning Boundary

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 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

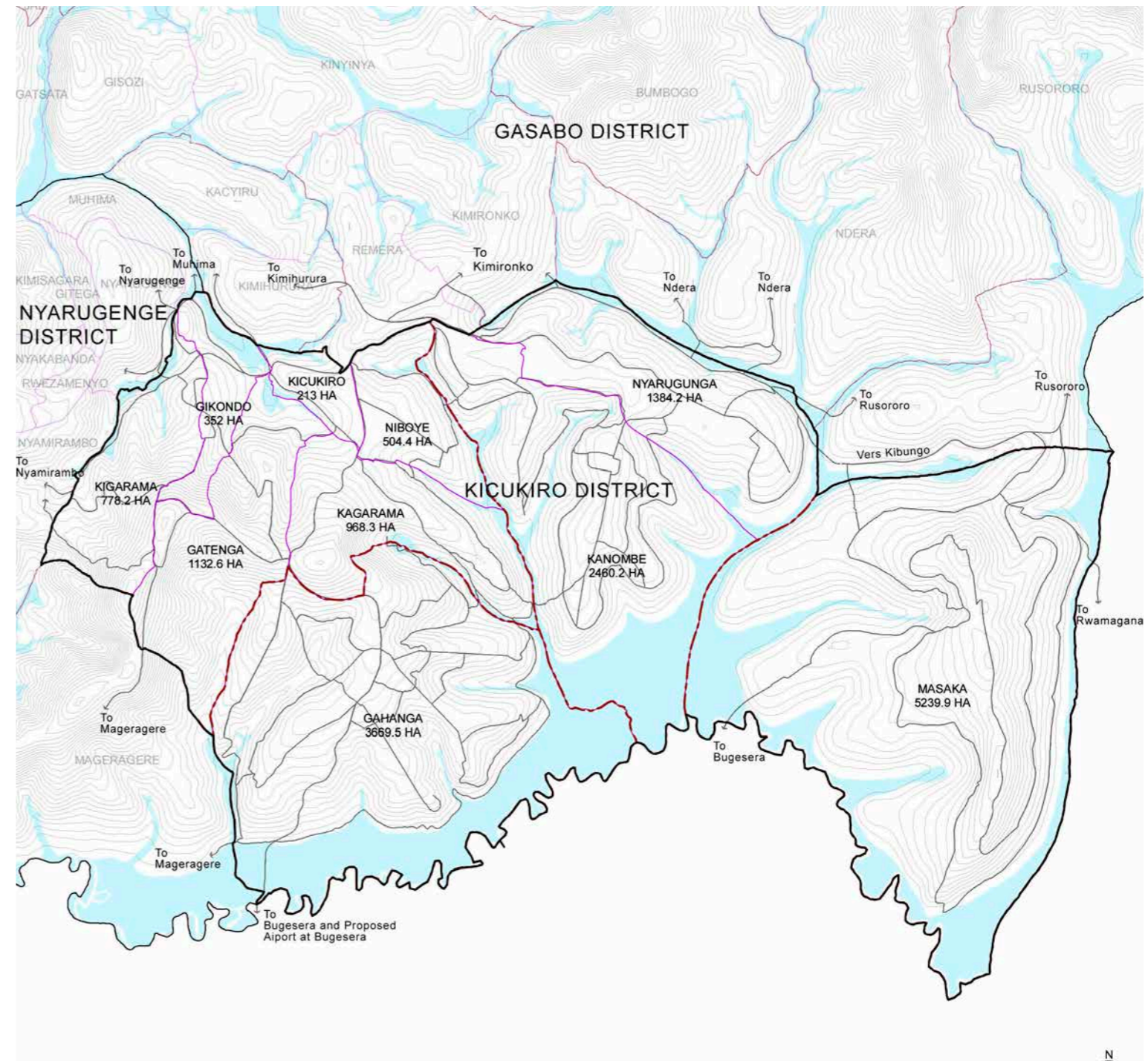


Fig.2.2 Kicukiro District - Existing Sector Boundaries

economic opportunities offered by the expansion of the City. Activities like stock breeding and forestry are less developed and lack promotion from the government. The district has a few cooperatives running that support livelihood on a small scale. A few quarrying and mining activities are still prevalent but mostly random with no environmental standards.

The industrial sector is quite prominent and well developed in Kicukiro District. However competition, lack of financial means and a lack of product outlets are issues that still need to be catered for. The craft industry has been picking up momentum due to the increase in registered artisans. Market infrastructure is poorly developed and many District markets are still unbuilt.

In terms of Education, the District like other administrative districts, faces issues like inadequate infrastructure, high rate of drop outs and lack of motivation. It has very few cultural facilities. In general each sector has a cultural band and dance troupes. There are two genocide memorial centres

- The 1994 Genocide memorial site of Nyanza in Kagarama administrative Sector;
- Memorial site for politicians at Rebero in Gatenga administrative Sector;

which hold cultural importance. Sports activities like football, karate and volleyball have been becoming prominent in the district. However, the District needs to further support them by building sports facilities and complexes. Few health centres and military hospital fail to provide adequate access to health services within the district

2.2 Natural Context

Due to the topographical constraints, almost 26 % of the District remains natural area. These areas offer unique landscape and recreational opportunities.

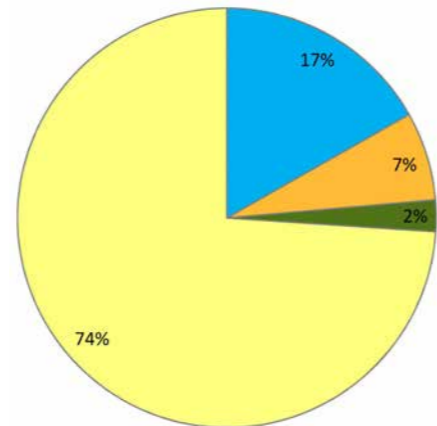


Fig.2.4 Kicukiro District - Land under natural Constraints



1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
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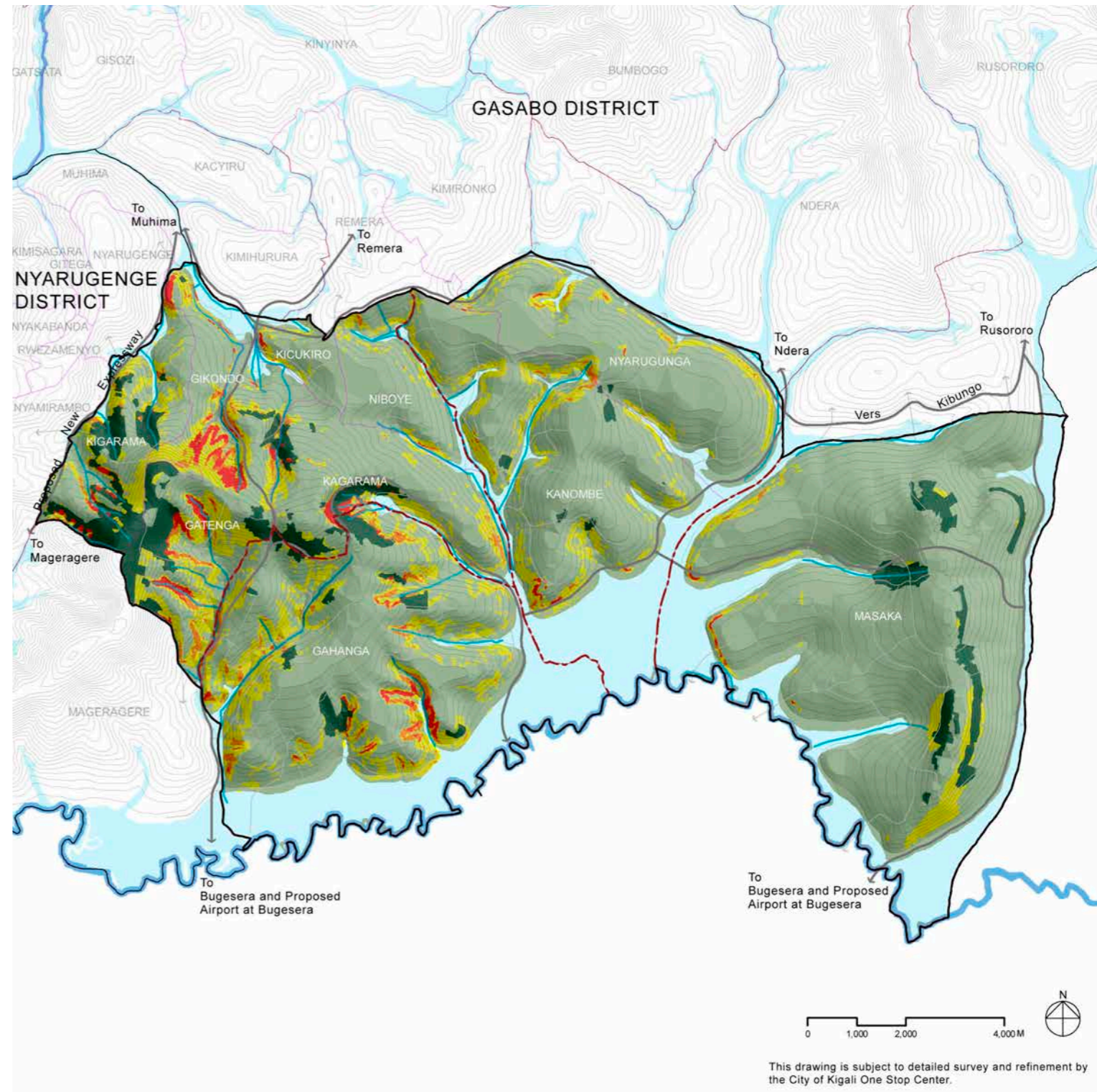


Fig.2.5 Kicukiro District - Land under Natural constraints

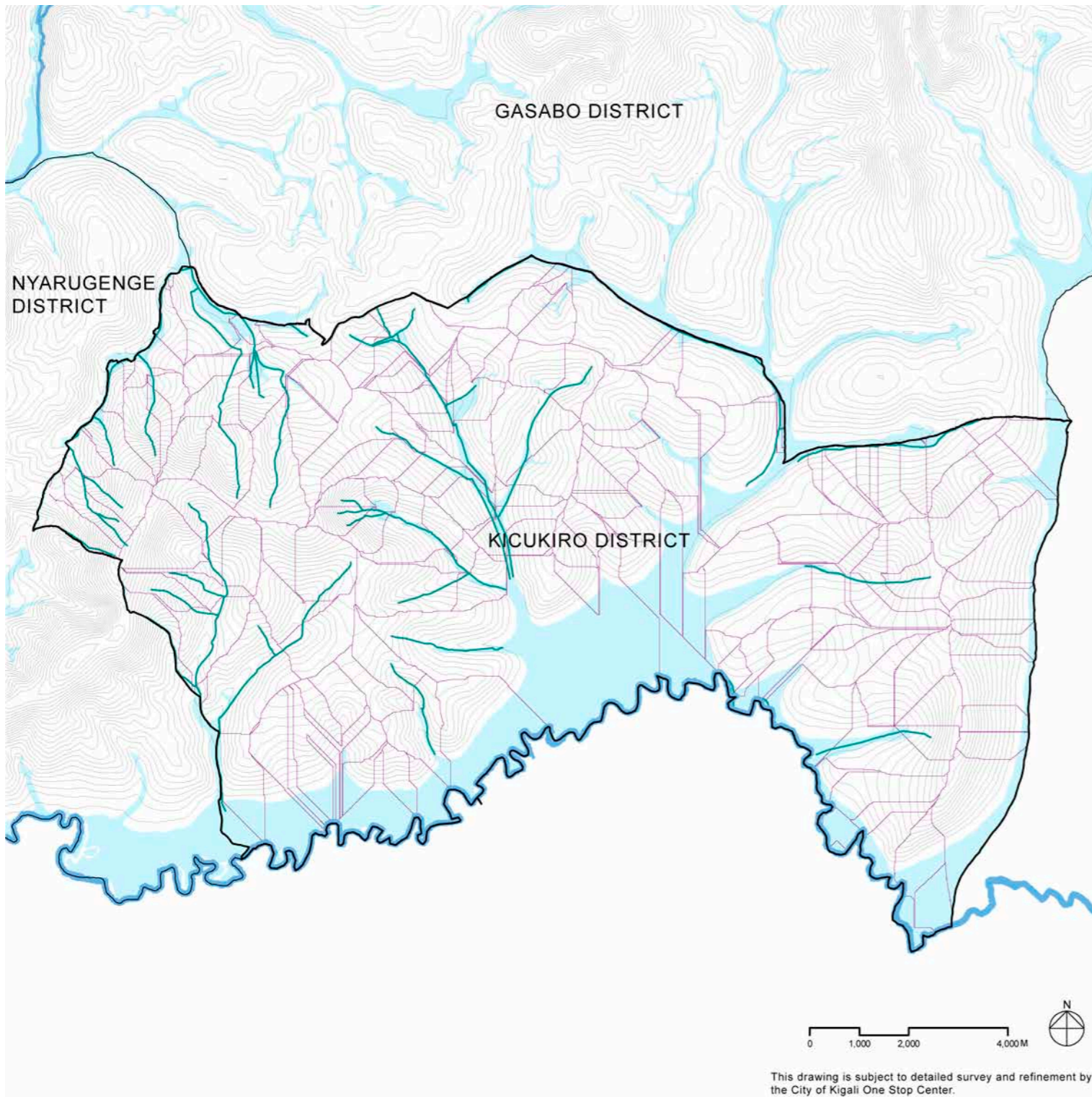


Fig.2.6 Kicukiro District - Water shed and Drainage Map

Of the three districts, Kicukiro District is the least undulating with great potential to host future residential and commercial developments. It comprises of plateaus with gentle slopes of which the highest peak does not exceed 2000 m of altitude. However steep terrain can be found in Kigarama , Gatenga and Gahanga sectors. The KCMP stipulates a slope gradient cut-off value of 20%, beyond which no buildings are allowed to be constructed. Based on this, 6.8% of land within the District lies in areas of steep slope. 16.8% of land within the District falls within the wetland boundary, as delineated by Rwanda Environmental Management Authority (REMA). The river system of Kicukiro District mostly consists of streams and rivers which are part of the Akagera River Basin. The main rivers are Akagera and Nyabugogo. About ten small streams disappear into swamps.

The city has witnessed large-scale deforestation in the last few decades which has led to few pockets of sparse forests. Around 2.5% of land within Kicukiro District is forest area, which needs to be preserved and revitalized.

Fig.2.4 and Fig.2.5 illustrate the quantum and location of land area under natural constraints in Kicukiro District.

- Wetland
- Watersheds
- Drainage Lines
- River
- District Boundary

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2.3 Environmental Context

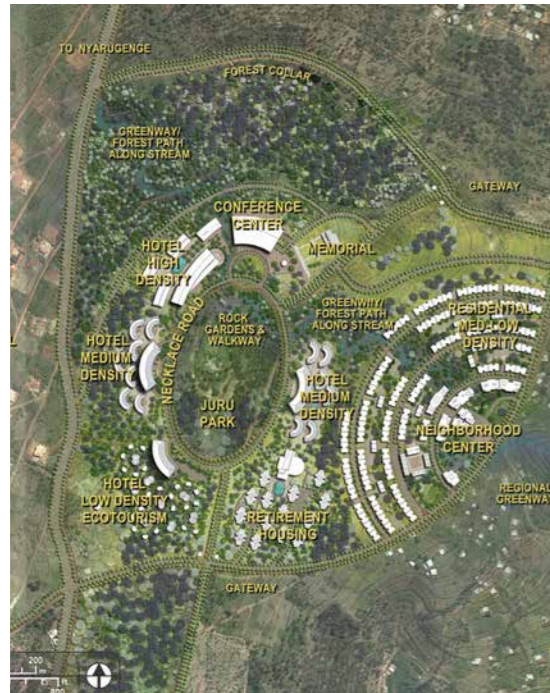
The Districts' fauna includes various species of birds, fish and reptiles. In terms of Flora, natural vegetation is almost extinct. Artificial vegetation like Eucalyptus has replaced the city's landscape.

The City's major concern is soil erosion and wetland encroachment. Many efforts are being taken, like terraces over slopes greater than 12% and protection of swamps. Nonetheless most of the wetlands in the northern part of the District have been encroached or built up for industrial, housing and agricultural uses. The boundary delineated by REMA does not correspond with the on-ground situation where the actual marshland cover is much smaller than the wetland boundary. Hence, it is critical to reclaim the lost wetlands and restore them, as much as possible, to their natural conditions. Due to the undulating topography, there are numerous additional natural drainage channels and adjoining shrubbery which need to be reserved and managed as part of the City's storm water management system.

The district is home to various industries most of them located in wetland areas. The Untreated industrial effluent from industries flows directly into the Nyabarongo river. The river banks are not protected in accordance with the standards set by the Environment Act. All sorts of waste from various areas of the City are deposited in the Kagarama Sector. There is no sustainable waste disposal system in the District⁴.

Fig.2.6 illustrates the existing watersheds and natural drains in Kicukiro District.

4 Source: KICUKIRO DDP 2008



Rebero Sub Area - Rendered Plan and View of the Convention Centre
 Source: Kigali Sub Area Plans, Schematic Planning; Oz architecture.era.edaw.tetrattech.winston associates-December 2010

Mixed Use Zones	Residential Zones	Hotel Zones	Civic
High Density	High Density	High Density/Conference Centre	Educational
Medium Density	Medium Density	Medium Density	Open Space
Neighbourhood Centre	Medium Low Density	Low Density (Eco-Tourism/Retreat)	

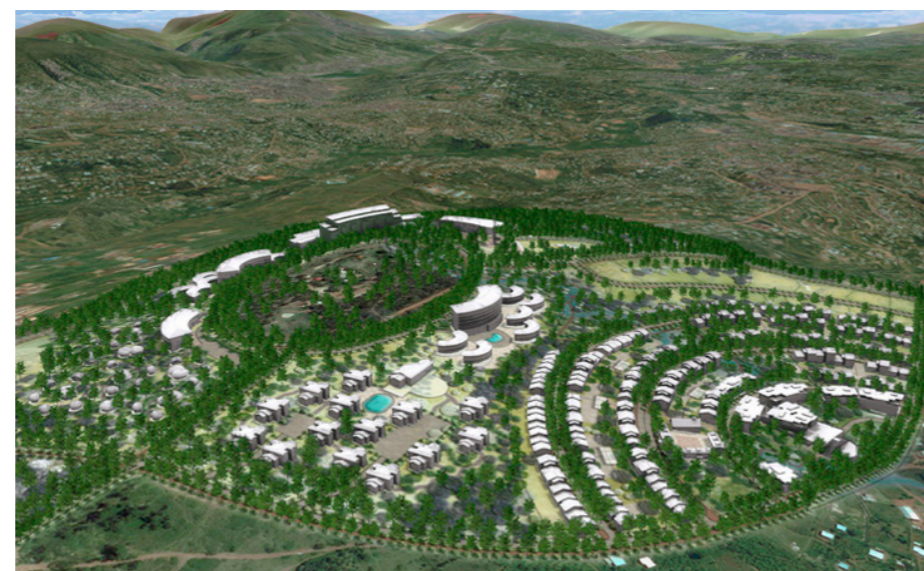
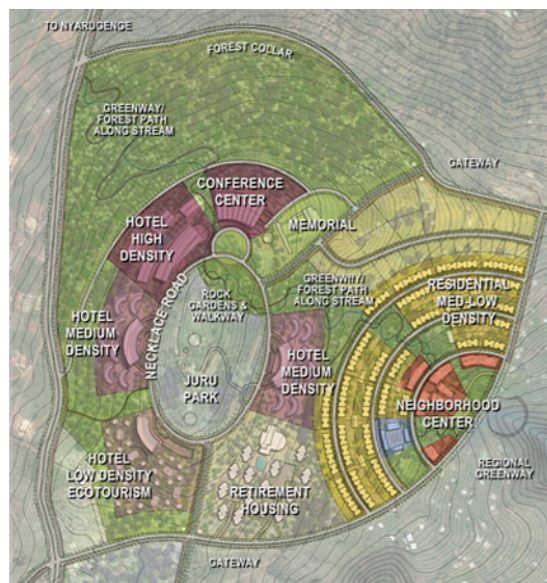


Fig.2.9 Rebero Sub Area - Land Use Plan(81 Ha) and View of the Resort and Neighbourhood from South East
 Source: Kigali Sub Area Plans, Schematic Planning; Oz architecture.era.edaw.tetrattech.winston associates-December 2010

Rebero Sub Area Proposal has the following key aspects:

- **DEVELOPMENT DIRECTION** : The Sub Area is envisioned to reinforce a strong “sense of place” connection with the past, stars and sky attuned to environmental protection.
- **BUILDING ON EXISTING CULTURAL HERITAGE AND SCENIC VIEWS**: Nyenyeri Rock, located at the north end of Juru park; a historically significant landmark is preserved and developed as a cultural attraction.
- **JURO PARK**: Juru Park, located in the center of the proposed Rebero hilltop circle, or “necklace” drive, is developed separately, but serves as the centerpiece around which all of the resort buildings and retreat areas relate.
- **OPEN SPACE AND GREENWAYS** - The natural landscape at the outer perimeter of the site is to be preserved and reforested for a buffer to separate the top of the hill from surrounding urban developments to create a special place in the City.
- **RESIDENTIAL DEVELOPMENT** - The Rebero Neighborhood Center zones includes medium low density residential area and mixed use with a commercial/retail center.

The Rebero development Framework includes the following uses in the Sub Area:

- Open Space/Greenway Zone
- A high density resort village to the north (including a High Density Hotel and Conference Center);
- Medium Density Hotels located in the center of the site on the east and west slopes of the hill (which may also include a Boutique Hotel cluster option in the eastern medium density hotel zone).
- Low Density Hotel/Retreat areas to the south which include an Ecotourism
- Resort and a Senior/Retirement Complex.
- Mixed Use/Neighborhood Center
- Medium Low Density Residential in

Rebero Neighborhood (Low Density Residential not included in scope of project

ISSUES TO BE REVIEWED AND INCORPORATED IN THE NEW CONCEPT PLAN

- **EXISTING CADASTRAL** - There is a need to contextualize the proposal based on existing road and Cadastral alignments.
- **AMENITIES, JOBS, ROAD NETWORK AND INFRASTRUCTURE FOR 5 MILLION POPULATION.**- Considering the projected increase in capacity from 3 million to 5 million, the need for more road and amenities have to be calculated.

These plans will be integrated in the City Master Plan and adjusted to comply with the existing cadastral data, the slopes and other existing constraints. There are also many developments and projects that have been approved for development which will be captured and accommodated in line the new city Master Plan.

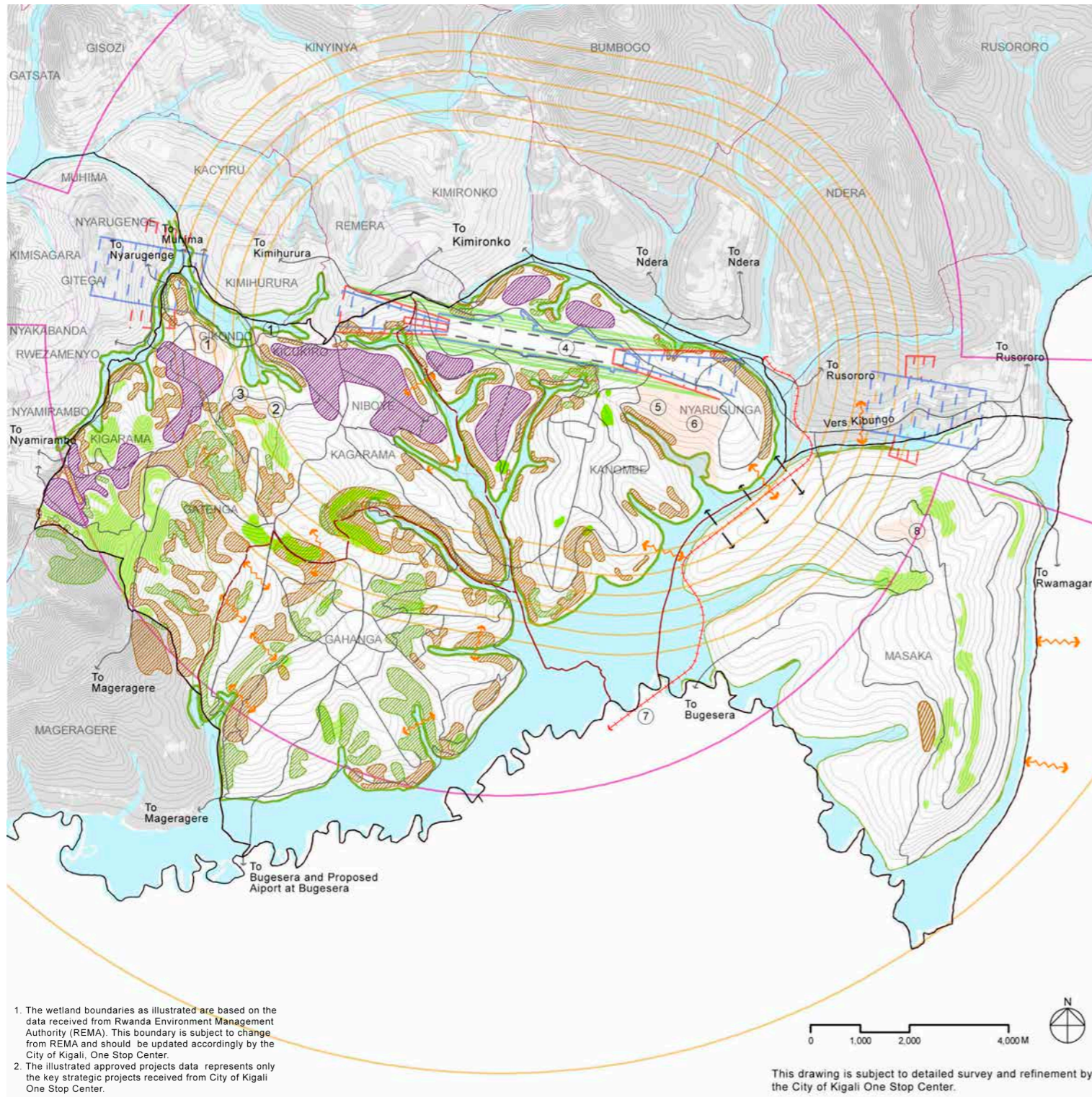


Fig.2.10 Kicukiro District - Constraints Map

2.5 Kicukiro District - Constraints and Opportunities

2.5.1 CONSTRAINTS

About 24% of the land in Kicukiro District is built up. This development is limited to the northern parts of the District. The key constraints for future developments are:

- A large portion of land (26%) is faced with natural constraints comprising of steep slopes (slopes greater than 20%), existing forests and wetland areas. These areas need to be safeguarded to prevent future threats to the environment.
- The existing steep slopes occupy around 7% of the land in the District, mostly towards the west and south west regions. These slope areas need to be protected to prevent the threat of land slides and soil erosion. These steep
- The rapidly growing areas towards Bugesera International Airport in Gahanga and Masaka sectors are largely rural with limited access to urban areas. These developments must be supported with adequate services and infrastructure.
- The low density informal settlements in the urbanized areas around City Centre and Kigali International Airport occupy prime land in the City. These areas could otherwise be developed as high density developments. Redevelopment and infrastructure provision could take longer time than anticipated.
- The projects that are already approved by the City of Kigali are adapted and integrated in the Detailed Master Plan. Although some of them ideal developments in
- The existing hazardous Industrial developments along wetlands in most of the valley areas need to be relocated to reduce the environmental impact.
- The presence of the International Airport in the Nyarugunga Sector poses height

restrictions in the neighbouring areas, thus preventing high rise and density developments.

- Masaka Sector has been experiencing rapid growth in residential developments recently; due to its proximity to the new International Bugesera Airport. However these new developments are faced with long travelling distance to the City Centre for employment purposes.
- If left uncontrolled, the areas close to the CBD and new developments in sub urban areas may develop in a haphazard manner, further constraining redevelopment.

- ▨ Airport Height Restriction Zone
- ▨ Slopes between 20-40% that restrict high density development in areas with good views
- ▨ Steep slopes (above 40%) that need to be protected to prevent soil erosion
- ▨ Largely unplanned built-up areas with very low density development in prime area
- ▨ Fragmented clusters of greens, drain channels and forests need to be connected/integrated
- ▨ Wetland
- ↔ Steep slopes/wetlands restrict connectivity and impose high infrastructure costs
- Physical barrier - the proposed international rail freight line along Masaka sector's edge would make direct connection from Kanombe and Nyarugunga difficult
- Existing rural/mud roads need to be upgraded to accommodate future population
- Sector Boundary
- Planning Boundary
- District Boundary
- ① Existing pollutive industries over wetland stretch
- ② Existing graveyard that needs to be retained
- ③ Existing Magesera dry port needs to be relocated
- ④ Existing Kigali International airport fixates height restrictions and occupies large developable land
- ⑤&⑥ The existing defence area and military hospitals occupy large prime large in the centre of the city
- ⑦ Proposed International Rail freight line will form a physical barrier between Kanombe, Nyarugunga and Masaka Sectors
- ⑧ Military Area is to be retained for strategic purposes

2.5.2 OPPORTUNITIES

Opportunities identified within Kicukiro District are based on existing site analysis. These Opportunities are illustrated in Fig.2.11 and are:

- Relatively flat areas with potential to be developed as high density residential areas
- Potential low density development areas with scenic views along wetlands/slopes
- Opportunity to develop light industrial zone close to international rail freight line for local employment
- Opportunity to develop large parks utilizing existing forests, drain channels and greens
- Opportunity to intensify and rezone the existing developments into low/medium density compact walkable neighbourhoods
- Opportunity to connect open greens and forests to create continuous open green recreational spaces
- Wetland
- Highest elevation in generally flat areas with good scenic views
- Good site views suitable for residential development
- Proposed International Rail freight line
- Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
- Existing Major road
- Sector Boundary
- Planning Boundary
- District Boundary

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- The presence of the existing Kigali International Airport anchors the district as the gateway to the City, located in the cardinal centre of the District. The areas surrounding the Airport will attract Commercial and residential developments.

- Potential to develop a new gateway at the entry of the City from the proposed Bugesera International Airport
- Potential to expand/upgrade the existing market commercial with public amenities
- Opportunity to develop "Sports Hub" by integrating outdoor & indoor stadiums, water sports and sports complexes
- Potential to develop the existing scenic valley as a tourist destination
- Potential to develop urban forest resorts and new housing close to the forest area
- Great potential to develop the existing Juro Park as observatory deck and as a tourist place incorporating OZ's Sub area proposal
- Opportunity to restore the original wetlands and continue wetland park landscape from the CBD
- Opportunity to develop the existing commercial belt into active urban spaces close to the city centre
- Potential to create vibrant public spaces at the Polytechnique Institute node
- The wetland stretch can be redeveloped as an entrance feature at the City's entry from the existing International Kigali Airport
- Potential to develop the large wetland sanctuary / Bio diversity park
- Potential to develop high/medium density housing estates looking into wetlands
- Potential to develop the existing military hospital as regional hospital catering to larger population
- Opportunity to rejuvenate and intensify the existing commercial node at Masaka Town
- Approved Hospital and University project offer potential to develop an Institutional Node
- Potential to develop central employment node in the Eastern Region
- Opportunity to develop recreational facilities looking into the vast wetlands
- Potential to develop Industrial estate close to the International Rail Line in Kicukiro District

- 1) Approved 60,000 capacity stadium project
- 2) Approved Gahanga hotel project

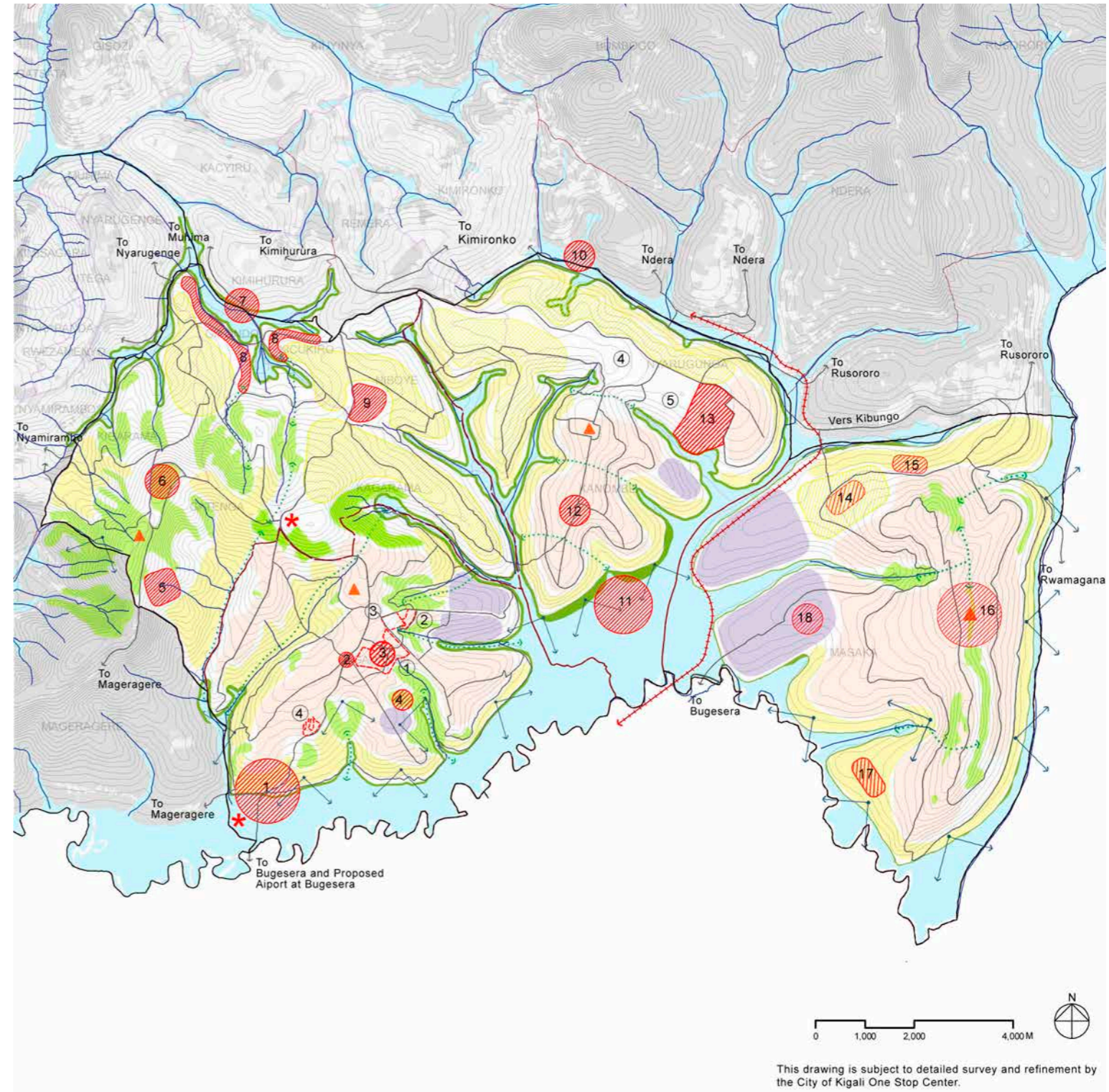


Fig.2.11 Kicukiro District - Opportunities Map

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

- As the new Bugesera International Airport complements the existing airport (located 40 km away) visitor traffic will further boost new commercial, tourism and the logistics industry.
- The current City Centre expansion in Muhima towards the north east side of the District offers large business and employment opportunities. This provides an opportunity to develop affordable residential centres in these parts of the district, hence offering a wide range of housing options for the city dwellers.
- With the existing commercial corridor already established close to the CBD area, Kicukiro sector has huge potential to develop similar supportive commercial centres or a mini CBD.
- The relocation and redevelopment of the industrial area close to CBD areas will help revitalise Gikondo, Kicukiro and Niboye sectors and the surrounding areas.
- The suburban areas in Gahanga, Masaka and parts of Kanombe sector are largely farmland areas offering land for new residential/township developments.
- The existing Juro park and Mount Rebero offer scenic settings with magnificent and protected views over the City of Kigali and neighbouring Districts of Bugesera, Rwamagana, Kamonyi, Rulindo and Gicumbi. The previous Sub Area Proposal for Rebero could be integrated with facilities like observatory decks and resorts, creating a prime destination in the City.
- The existing forests and stretches of wetlands in the South near Gahanga, Kanombe and Masaka sectors offer attractive venues for recreational and tourism related developments like wetland parks, wetland front entertainment hubs etc.
- The mandatory wetland buffer provides an opportunity to develop a continuous green connector linking the entire District. This feature creates recreational facilities and provides for Non motorized transport facilities.
- The meandering river wetlands close to the Nyaborongo River in the South, hold great potential for biodiversity conservation.
- The approved hotel and two large approved stadium projects in the Gahanga Sector, provide a good opportunity to develop Sports hub for the entire City.
- Identified for the concentration of universities and higher education institutes in the District, the District can be further developed as the Education Hub for the City as well as the country; hence encouraging private investments in the field of Education.
- The existing small commercial uses in the District, offer opportunity as development nodes to be built upon.

3 Kicukiro District - Proposed Master Plan

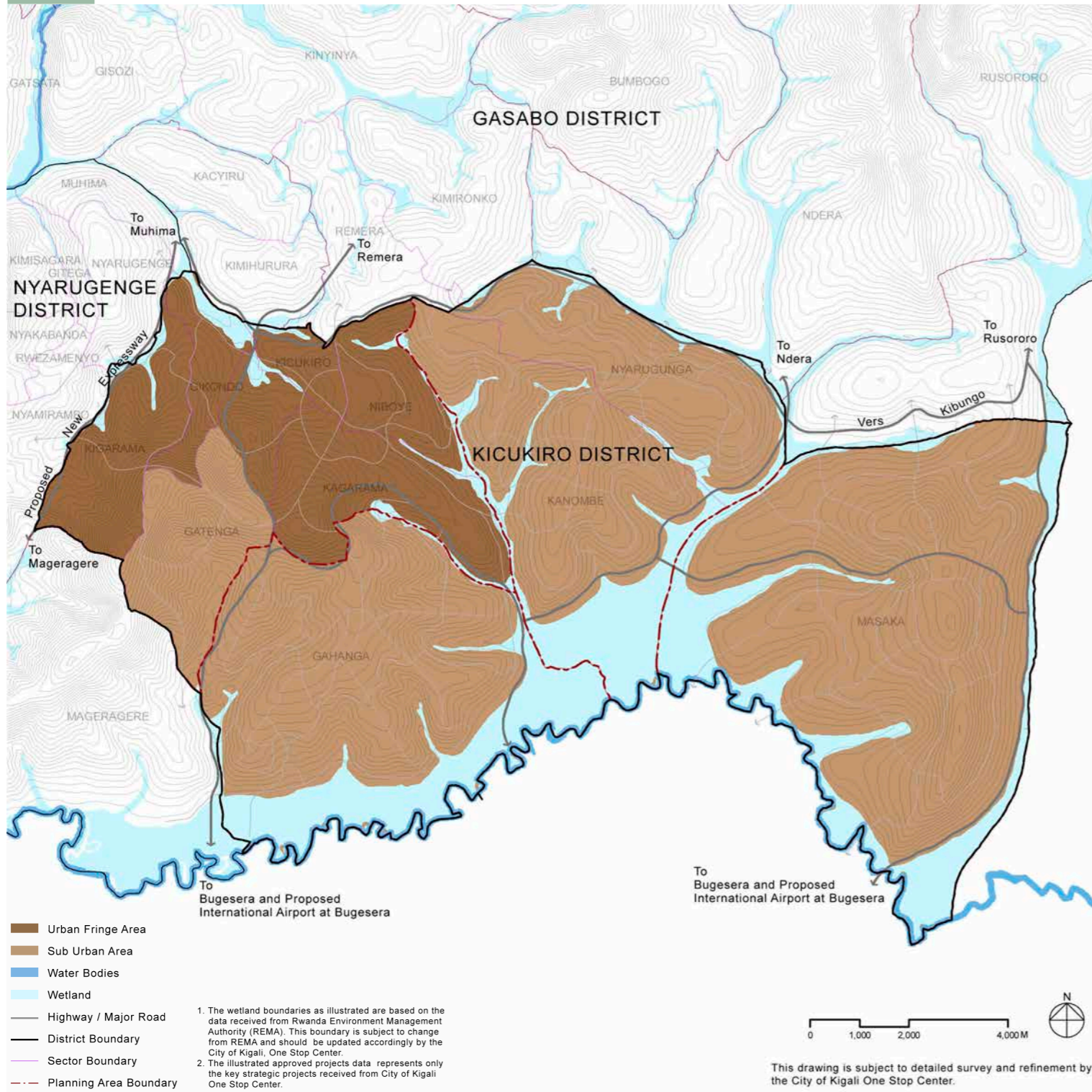


Fig.3.1 Kicukiro District - Proposed Land Utilisation Strategy Plan

Based on the existing site context analyzed in the previous chapters, a land utilisation strategy has been proposed, which determines the broad development directions for different areas in the District. This land utilisation strategy is applied to the physical ground conditions of the District to form the Development Structure Plan. The development structure is refined further to form the Proposed Land Use Plans for Kicukiro District

3.1 Proposed Land Utilisation Strategy

THE ROLE OF KICUKIRO DISTRICT IN KIGALI CONCEPTUAL PLAN

The District is largely known for the presence of the Kigali International Airport. The presence of higher educational Institutes, military hospital (proposed to be developed as district hospital) and large Industrial zone support residential population in the district. Commercial markets in Kicukiro sector and along the airport corridor anchor Kicukiro District as a commercial centre in the future.

In 2007, the City developed the Kigali Conceptual Master Plan (KCMP) which laid down broad direction for the City's growth. One of the key proposals of the KCMP includes the development of a new City Centre in Gahanga, located between the existing City Centre and the new International Airport in Bugesera. The key thrust of industrial and trade activities is proposed to be eastwards along the east-west corridor connecting the CBD to the existing Kigali International Airport and beyond. As per the KCMP, Kicukiro District is largely designated to be an Education hub with two growth corridors promising new commercial and residential development for the City. Refer to Fig.3.2 for Kigali City - Structure Plan.

LAND USE STRATEGY

The Master Plan acknowledges the broad national vision for City of Kigali as 'Centre of Urban Excellence in Africa'. It further envisions the city to be a leading model of new, economically thriving, democratic, progressive African city that is redeveloped

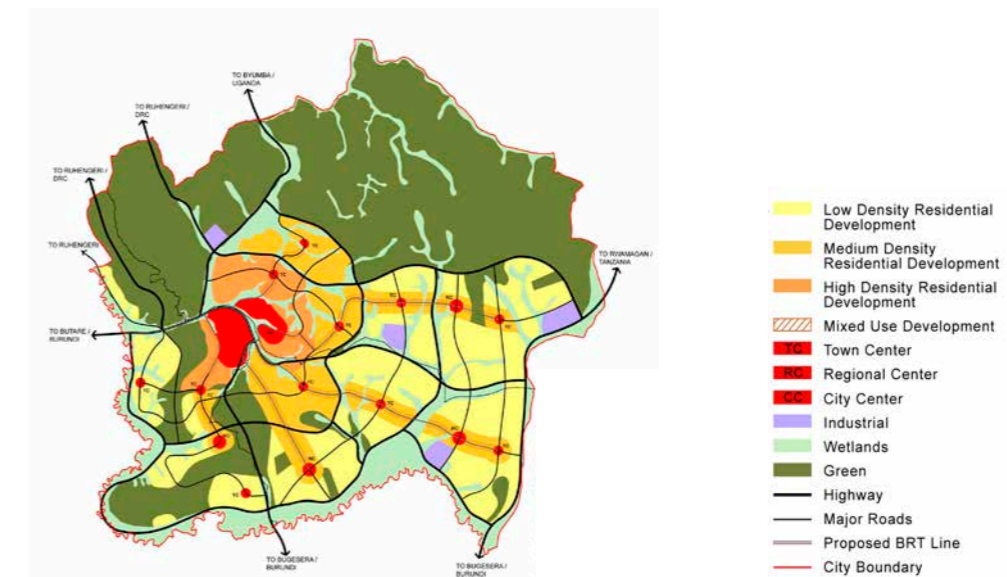


Fig.3.2 Kigali Radial City - Proposed Conceptual Structure Plan

with integrated infrastructure and services; is economically sound; ensures personal safety and security; celebrates the country's rural/agricultural heritage; and becomes a regionally and internationally integrated commercial and administrative hub. In order to achieve the proposed vision and goals, a Land Utilisation strategy is proposed for the City of Kigali. The key features are:

- Identifying an urban boundary for the City Centre Area and, strengthening and organizing the existing City Centre.
- Identifying the existing urban areas that are adjacent to City Centre and organizing these areas as City Fringe Areas.
- Defining the existing urban areas and new growth areas in the urban periphery; and organizing these areas as the Suburban Areas.
- Defining the unbuildable areas in the outskirts as Rural Area and developing relevant strategies for various rural uses.

Refer Appendix 1 for Kigali City-Land Use Strategy plan

As per the Kigali City Land Use Strategy Plan, Kicukiro District is categorized as Urban Fringe Area and Suburban Area. The sectors of Kicukiro, Niboye, Gikondo,

Kigarama, Kagarama and parts of Gatenga are proposed to be developed as the City Fringe Area, due to their close proximity to the City Centre and existing development.

The largely rural sectors of Masaka, Gahanga and Kanombe sectors together with Nyarugunga sector is proposed to be developed as Suburban Area. As per the Interim City's Master Plan for the year 2025¹, the rural areas of Masaka, Gahanga and Kanombe remain largely agricultural land. These areas are developed as Suburban Areas with new developments in the long term plan by Year X.

The large wetland stretches in the District are protected and proposed to be developed as open recreational and tourism sites, such as Wetland Parks and Nature reserves.

3.2 Proposed Planning Area Boundaries for Kicukiro District

Kicukiro District has 10 administrative sectors whose sizes vary from 200 ha to 5000 ha. The smallest of all the sectors is Kicukiro with 212 ha and largest is Masaka with 5240 ha. For physical planning purposes, the sectors have been combined to form four comprehensive Planning Areas

¹ Refer Proposed Land Use Plan for the year 2025 in Appendix 1

Table 3.1 Kicukiro District - Proposed Planning Area Boundaries

	PLANNING AREA	SECTORS	AREA
1	Central Planning Area	Kicukiro, Niboye, Gikondo, Gatenga, Kagarama and Kigarama	3941 ha
2	Southern Planning Area	Gahanga	3662 ha
3	South Central Planning Area	Nyarugunga and Kanombe	3837 ha
4	Eastern Planning Area	Masaka	5231 ha
	Total Kicukiro District		16670 ha

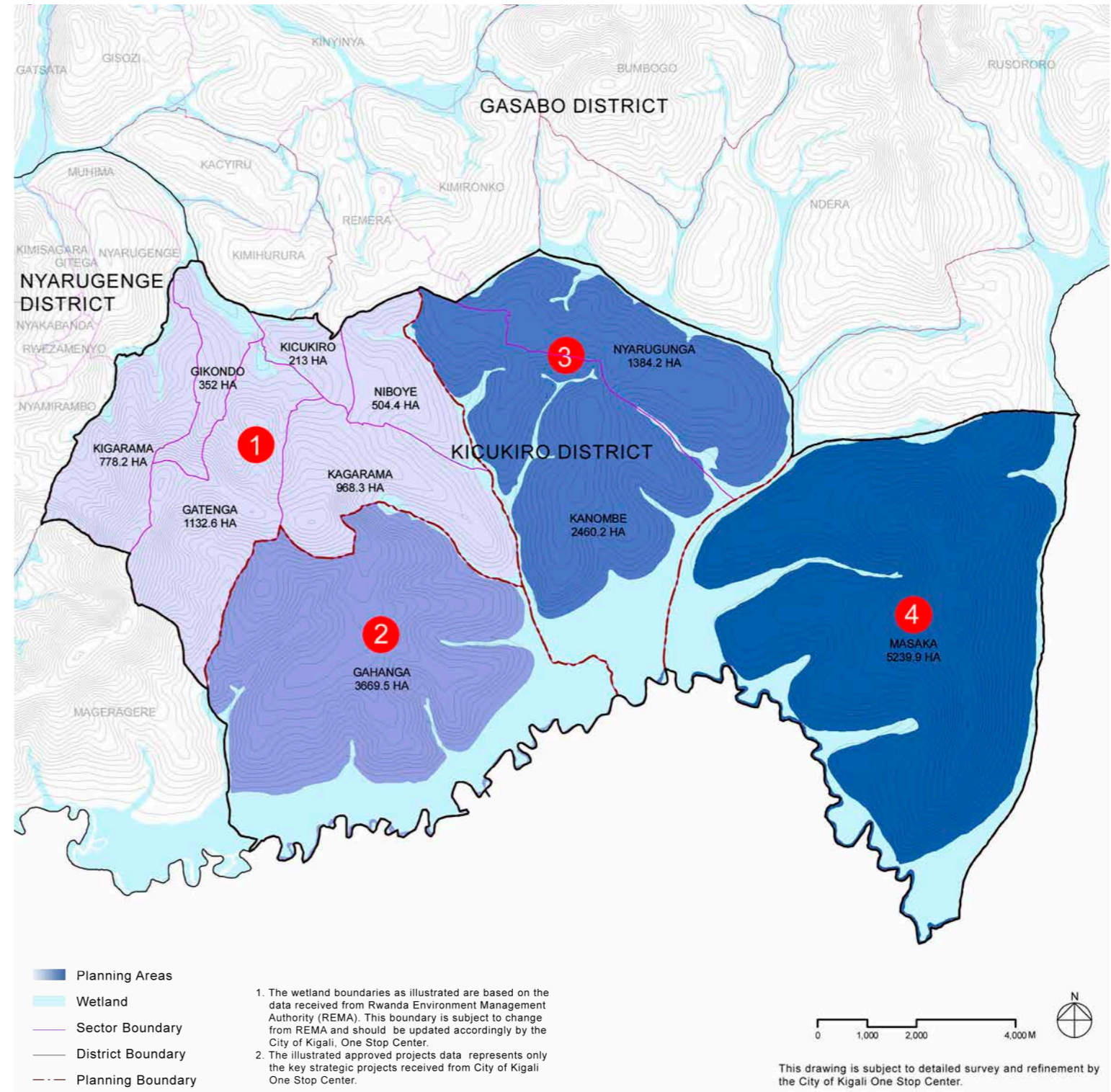


Fig.3.3 Kicukiro District - Proposed Planning Areas

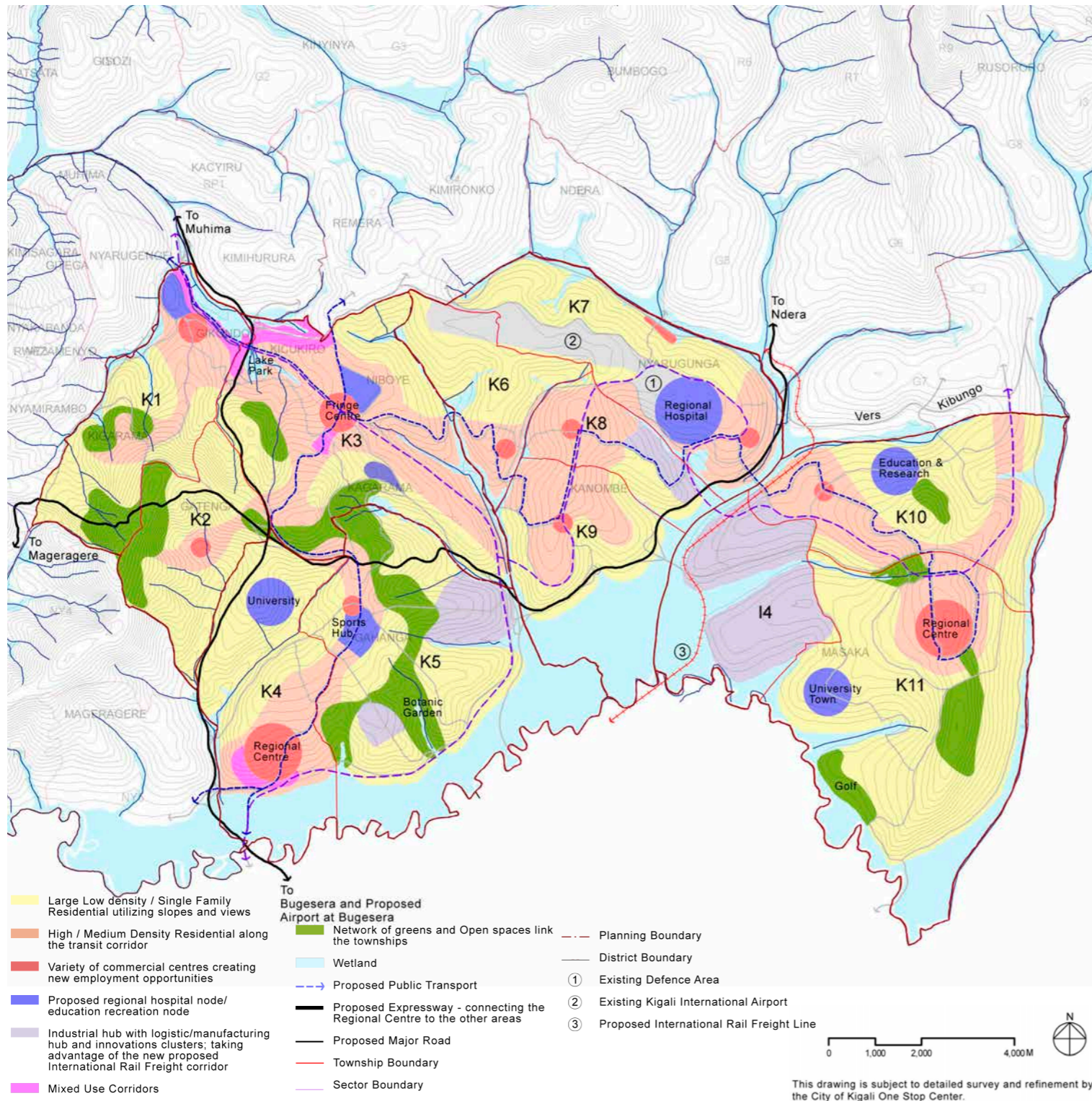


Fig.3.4 Kicukiro District - Proposed Structure Plan

in the District, based on their geographic affinity and by combining smaller sectors together. This will help in shaping definite and well integrated plans for the denoted Planning Areas. The new Planning Area boundaries thus defined, further help in defining distinct and clear strategies for different parts of the district. The sum of all these Planning Areas will provide a holistic Land Use strategy for Kicukiro District. The key strategies for the 4 Planning Areas in Kicukiro District are as follows:

1. CENTRAL PLANNING AREA, comprises of six urban sectors close to the existing City Centre; Kicukiro, Gatenga, Gikondo, Niboye, Kigarama and Kagarama. This Planning Area plays the role of 'Urban Fringe Centre' in Kicukiro District. The existing commercial and residential developments are redeveloped to accommodate the increasing population and employment requirements.

2. SOUTH PLANNING AREA, comprises of the Gahanga Sector. The Planning Area includes the new urban growth corridor² and the proposed new Regional Centre at the entry point of the city from the new proposed Bugesera International Airport. It is surrounded by new residential townships, large recreation, sports and education facilities for Kicukiro District.

3. SOUTH CENTRAL PLANNING AREA, comprises of Kanombe and Nyarugunga sectors. Of the two sectors, Nyarugunga is comparatively urbanized and Kanombe is largely rural. The Planning Area plays the role of 'Recreational Gateway' of the Kicukiro District due of the presence of the existing Kigali International Airport. New residential areas that closely interact with the wetland network are proposed.

² Refer Proposed Development Concept for Kigali City, In Conceptual Plan Report

4. EASTERN PLANNING AREA, comprises of the Masaka sector. The Planning Area comprises new growth areas along with a Regional Centre. Industrial, Recreation, Research, Innovation clusters and educational facilities are proposed as part of the new developments. The Eastern Planning Area is envisioned as the 'Educational Hub' in the City. Ref. Fig.3.3 for Planning Area Boundaries.

3.3 Proposed Structure Plan

The structure plan for the City has the following key considerations:

- Establishing a range of employment centers in Kigali.
- Creating affordable and quality living environments in Kigali.
- Improving connectivity and transit in Kigali.
- Managing and improving the environment and infrastructure.

3.3.1 KICUKIRO DISTRICT STRUCTURE PLAN

Guided by the broad principles, that were set by the Conceptual Plan³ for Kigali city, the following are the strategies for the transformation of Kicukiro District:

- **TO ESTABLISH A UNIQUE GATEWAY COMMERCIAL HUB TO KIGALI WITH A WIDE VARIETY OF MIXED USED DEVELOPMENTS ALONG GROWTH CORRIDORS** - The proposal focuses on new developments in the green field areas, whilst intensifying the inner city area surrounding the CBD. The development corridor will connect existing key features of the city with the new commercial and industrial employment nodes. This includes two new 'Regional Centres' at Gahanga and Masaka sector respectively and a 'Fringe Centre' at Kicukiro sector. These Regional Centres will cater to a larger catchment area providing regional

³ Refer Appendix 1 - Kigali City- Concept Plan

level facilities. They will also be key employment destinations in the city offsetting the development pressure from the CBD area.

- TO CREATE DISTINCT IDENTITY BY DEVELOPING KNOWLEDGE, SPORTS AND INNOVATION CENTRIC GROWTH CENTRES** - The relatively higher number of Educational Institutes in Kicukiro District gives it an ideal platform to promote the district as the City's knowledge hub with additional facilities like Regional level Sports stadium and Research cum Innovation centres. Two new University Towns are proposed in Gahanga and Masaka sector respectively. The approved Indoor and Outdoor Stadium projects are integrated in the District's Master Plan.
- TO CONSERVE SCENIC WETLANDS AND NATURE AREAS, AND PROMOTE THEM THROUGH VALUE ADDED RECREATIONAL USES** - The proposed Environmental Green and Blue Plan connects the various existing nature areas through a continuous pedestrian and bicycling network along the wetland buffer zone. Numerous parks in different hierarchy providing both active and passive recreational spaces for residents are proposed within each township. These parks are planned as nature parks, wetland parks and edge parks depending of their location, environmental condition and topography. Regional Level parks like the flower valley, Botanical garden and Biodiversity park are proposed in key areas.
- TO DEVELOP NEW COMPREHENSIVE INTEGRATED TOWNSHIPS AND PROMOTE REGENERATION OF EXISTING AREAS WITH QUALITY LIVING ENVIRONMENTS** - The Detailed Master Plan proposes restructuring the District into eleven self sufficient townships. Unplanned areas within the district are rehabilitated and regenerated to create

a 'Slum Free' Kigali by 2040. The existing residential developments are reorganized to provide access to adequate public facilities and infrastructure. Masaka town and parts of Kanombe sector are rehabilitated to medium residential developments. New medium and high density residential neighbourhoods are proposed along the key transit corridors.

- TO INTEGRATE ALL DEVELOPMENTS WITH A WELL PLANNED TRANSPORT NETWORK, AND CREATE WALKABLE NEIGHBOURHOODS BY PROMOTING NON-MOTORIZED TRANSIT** - A radial road network with well spaced highways caters to smooth city travel and fast connections within the district and better linkage to the new airport at Bugesera. The proposed trans-national rail line through the District will further strengthen the District's Industrial and logistics sector. The proposed transit corridor forms an integral component of the transportation and Land Use Plan. It links the various townships in Kicukiro and high density development is proposed along these corridors. The transit corridors will have Bus Rapid Transit with transit stops distributed at regular intervals. However in the future once enough population catchment is achieved, high capacity MRT corridor is proposed. Fig.3.4 presents the Structure Plan for Kicukiro District.

The structure Plan is further developed as District Concept Plan. Refer to Appendix 3 for Kicukiro District- Concept Plan

3.4 Proposed Integrated Townships in Kicukiro District

Kigali City is restructured into twenty four self-sufficient townships. The District of Kicukiro encompasses eleven of these residential townships (K1-K11) and one (I4) Industrial estate. All of these townships are proposed to be served by the public

transit corridor. Generally the townships are organized according to topography and 1-2 hills constitute one township entity. The BRT and the MRT corridor forms the main central spine of each township. In most cases the MRT corridor runs parallel to the wetland edges extending towards the commercial centres. The central spine holds commercial uses and major facilities with high density developments.

PROPOSED POPULATION DISTRIBUTION

Kigali City is currently witnessing a growth of 6.2% p.a. SPHD, 2006. Population growth projections were created for three scenarios for the future population. A high growth, medium growth, and low growth scenario are projected by taking EICV3 2011 as the base year. The natural growth as well as migration is factored into the various scenarios. The population of Kigali City is proposed to grow from the current population of 1.3 million to 5 million as per the high case scenario and 3.6 million as per the low case scenario. Provision of land and reserves for infrastructure, housing and facilities need to be safeguarded for the ultimate population (high case scenario). However, this ultimate population may or may not be reached by 2040. 'Year X' represents the stage where Kigali would have reached its ultimate population of 5 million, based on the current development parameters. The Master Plan should be reviewed every five years in line with the census and development trends. In line with these projections, Kicukiro District is projected to have an ultimate population of 2.3 million by Year X.

The fringe areas with three townships will house a population of 0.6 mi. Masaka Sector with rapid development and relatively flat land has huge potential for high density residential development.

The proposed township population distribution is shown in Fig.3.5 & Table 3.2

PROPOSED EMPLOYMENT DISTRIBUTION

The projected Employment opportunity for Kigali City is 2.3 mi, of which Kicukiro District will have an employment share of 37% with 0.86 mi jobs provided. The projected job requirements are catered to through new well distributed employment nodes around the city, in close proximity to townships. The two Regional Centres in Kicukiro District cater to 44% of the service based jobs in the City.

New townships in the suburban areas are proposed to provide 32% of the District's jobs, through local Industrial zones and various commercial centres. The proposed Industrial estate in Masaka is expected to cater to 77,000 jobs in manufacturing and logistic industries. This would support a decentralized job distribution and ensure significant local employment. Additional employment is also provided by upgrading

key existing commercial developments. The proposed Employment Distribution in each Township is shown in Table 3.4.

Table 3.2 Kicukiro District : Township Population Distribution by Year X

PLANNING AREA	TOWNSHIP	POPULATION
CENTRAL	KT1	128,000
	KT2	79,000
	KT3	480,000
SOUTHERN	KT4	184,000
	KT5	253,000
SOUTH CENTRAL	KT6	83,000
	KT7	133,000
	KT8	110,000
	KT9	158,000
EASTERN	KT10	280,000
	KT11	386,000
	I4	18,000
TOTAL		2,292,000

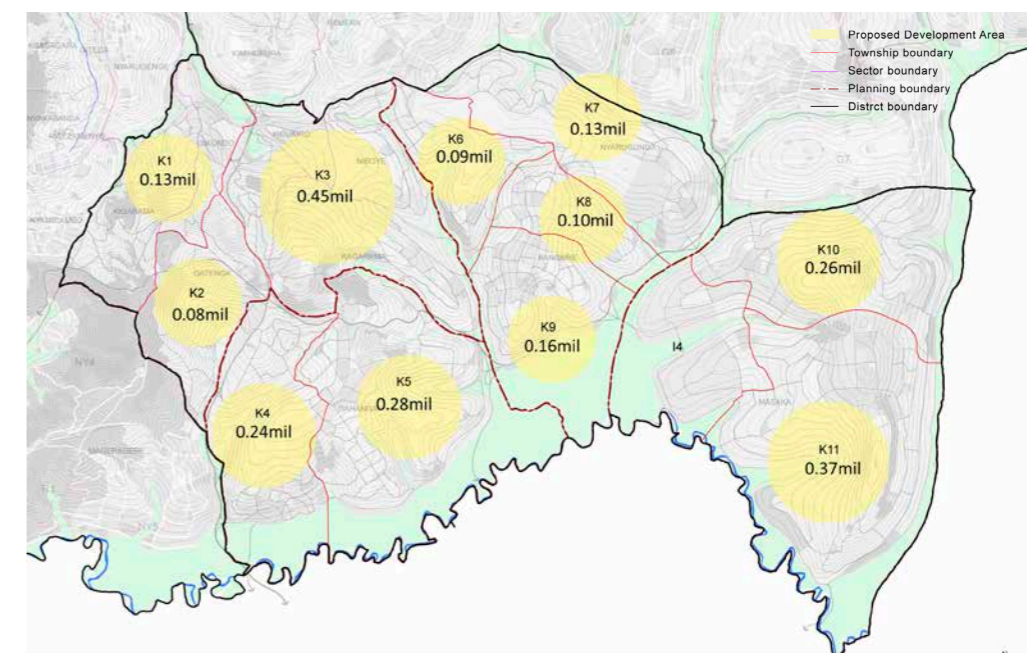


Fig.3.5 Township Boundaries and Population Distribution in Kicukiro District

3.5 Proposed Land Use plan

The proposed Land Use Plan for Kicukiro District provides the development strategy

for the intermediate term of 2025 and long term plan for Year X. These plans are developed based on extensive analysis of the existing site and also capture the ongoing

approved projects and development trends. A detailed Transportation Master Plan and it's modelling is done concurrently to ensure that the proposed Land Use is well integrated with the Transportation Plan and public transit. The proposed Land Use Plan is a guide plan charting the development direction for the City.

Table 3.3 Kicukiro District Proposed Land Use Distribution Data - Year X

Broad Land Use	Detail Land Use	Area (Ha)	
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	4,097	7203
	LOW RISE RESIDENTIAL	1,389	
	MEDIUM RISE RESIDENTIAL	1,606	
	HIGH RISE RESIDENTIAL	112	
COMMERCIAL	COMMERCIAL GENERAL	304	312
	HOTEL	8	
MIXED USE	MIXED USE	177	177
PUBLIC FACILITIES	GOVERNMENT OFFICE	26	1116
	EDUCATIONAL	611	
	RELIGIOUS FACILITIES	65	
	HEALTH FACILITIES	185	
	CIVIC FACILITIES	39	
	SPORTS AND RECREATION FACILITIES	190	
INDUSTRIES	LIGHT INDUSTRIAL	453	832
	HEAVY INDUSTRIAL	380	
NATURE AREA	EXISTING FOREST	654	3564
	AFFORESTATION	4	
	WETLAND	2,906	
AGRICULTURE	FARMLAND	0	0
OPEN SPACE	OPEN SPACE AND PARK	1,038	1038
WATER BODIES	RIVERS	88	88
INFRASTRUCTURE	ROADS	1,461	1772
	TRANSPORTATION	97	
	TRANSPORTATION (OPEN SPACE)	95	
	UTILITIES	119	
SPECIAL USE/RESTRICTED AREA/UNCLASSIFIED	DEFENCE AREA	127	524
	AIRPORT	243	
	GRAVEYARD	154	
RESERVE SITE	RESERVE SITE	43	43
TOTAL		16,670	16,670

3.5.1 PROPOSED LAND USE PLAN FOR KICUKIRO DISTRICT YEAR X

The Land Use plan for Year X shows the development envisioned for the district. The key proposals are as follows:

- The new Regional Centre in Gahanga will act as a major employment hub in the service sector. Vibrant mixed use developments around this Commercial Centre, will infuse new residential population. This development will serve as the new southern gateway, introducing visitors to the new progressive Kigali City.
- The third Regional Centre of the City, proposed in Masaka sector will be developed subsequently in the long term beyond Year 2025.
- A second level of City level Commercial in the form of 'Fringe Centre' is proposed in Kicukiro sector. This will strengthen the existing commercial in and around Kicukiro, Niboye and Gikondo sectors;

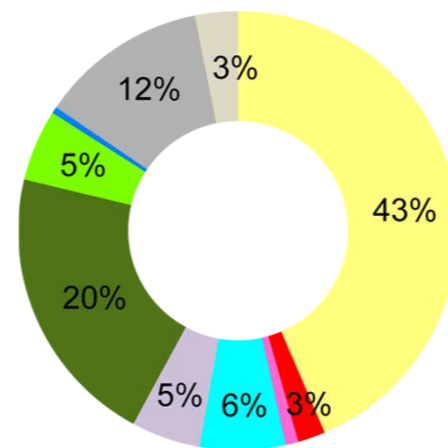


Fig.3.6 Proposed Land Use Distribution - Year X

- Eight new town Centres with commercial use and varied public amenities are proposed to serve the various townships.
- An industrial estate is proposed in Masaka Sector, close to the new proposed International rail Freight line running across the country.
- Light industries in the range of 80-100 ha are proposed in each Planning Area to provide localized employment opportunities for the residents.
- An efficient grid of highways and arterial roads system has been established to ensure long term regional and local connectivity.
- Eleven new suburban townships are proposed in the District. Each township is integrated with adequate public facilities such as schools, health care Centres, Civic institutions, parks and recreation facilities and are distributed as per catchment and residential population density.
- The proposed new transit corridors link all the townships and make travelling from one part of the City to the other; a seamless experience. High density development of approximately 220 Du's/Ha is proposed along these corridors.
- Existing unplanned settlements in Fringe and Sub urban areas are rezoned into low-rise (90 Du's/Ha) and Medium rise-residential (160 Du's/Ha) based on the slope conditions.
- Nature areas such as forests, wetlands and steep slopes above 20% (conditional use is proposed in urban areas) are protected through afforestation, zoning and buffer areas.
- Regional level recreational facilities like urban parks and Cultural Centres, and tourist attractions like the Botanic gardens, Bio Diversity park, Wetland parks, Golf Course and Flower Valley are proposed in different parts of the District.
- The Land Use Plan proposes sustainable integrated power, water and waste management systems to support the growing needs. It further promotes

alternative energy sources to reduce dependency on non-renewable energy. Refer to Appendix 2 for Broad Land Use Composition for Kigali -Year X. The Proposed Land Use Distribution in Kicukiro District for the Year X, is presented in Table 3.3, Fig.3.6 and Fig.3.7

3.5.2 PROPOSED LAND USE PLAN FOR KICUKIRO DISTRICT - YEAR 2025

The proposed Land Use Plan 2025 is an intermediate plan for Kicukiro District, for a projected population of 1.2 mi by the year 2025. The key features of the proposed Land Use Plan for 2025 are:

- Growth is focused around the existing urban developments near the City Fringe area at Kicukiro, Niboye, Gikondo and along the airport road towards Masaka.
- The initial focus is on developing key transportation corridors, upgrading the existing roads as well as acquiring land for new growth areas.
- Six key new town ships are proposed to be developed as catalyst projects in all Planning Areas. K1, K3 (Central Planning Area), K5 (Southern Planning Area), K6 and K7 (South Central Planning Area)and K10 (Eastern Planning Area) townships.
- Unplanned development in fringe areas are proposed to be upgraded with public facilities and infrastructure.
- Industrial areas in these townships will be fully developed enabling local employment.
- In suburban areas, the existing Imudugudus shall be retained and provided with necessary public facilities.
- The Flower Valley and the Heritage Memorial at Nyanza, Lake Park in Gikondo and sports facilities in Gahanga will be developed.

The Proposed Land Use Distribution in Kicukiro District for the Year 2025, is presented in Fig.3.8. Refer to Appendix 3 for Zoning Plans of Kicukiro District and the Planning Areas.

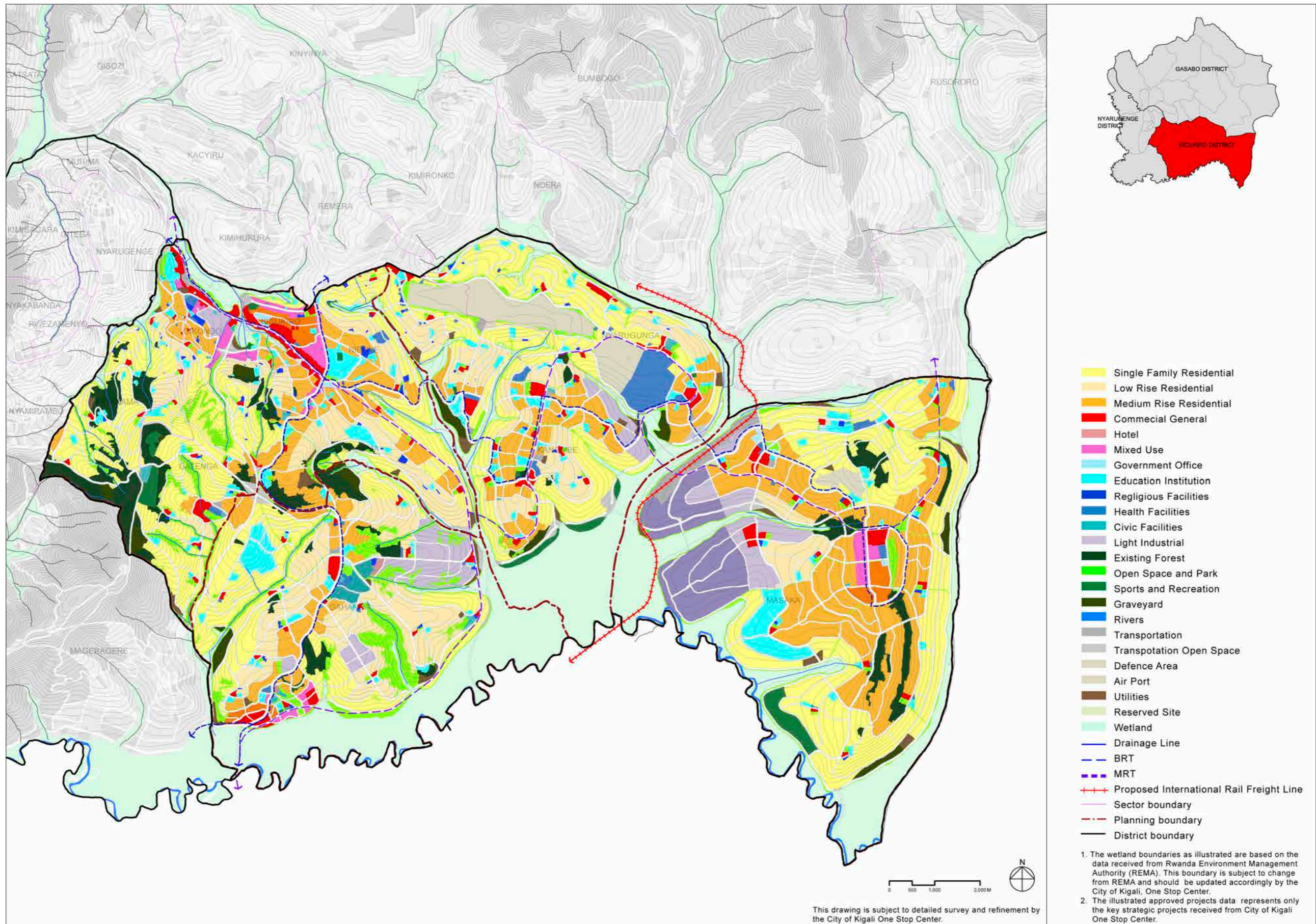


Fig.3.7 Kicukiro District - Proposed Land Use Plan- Year X

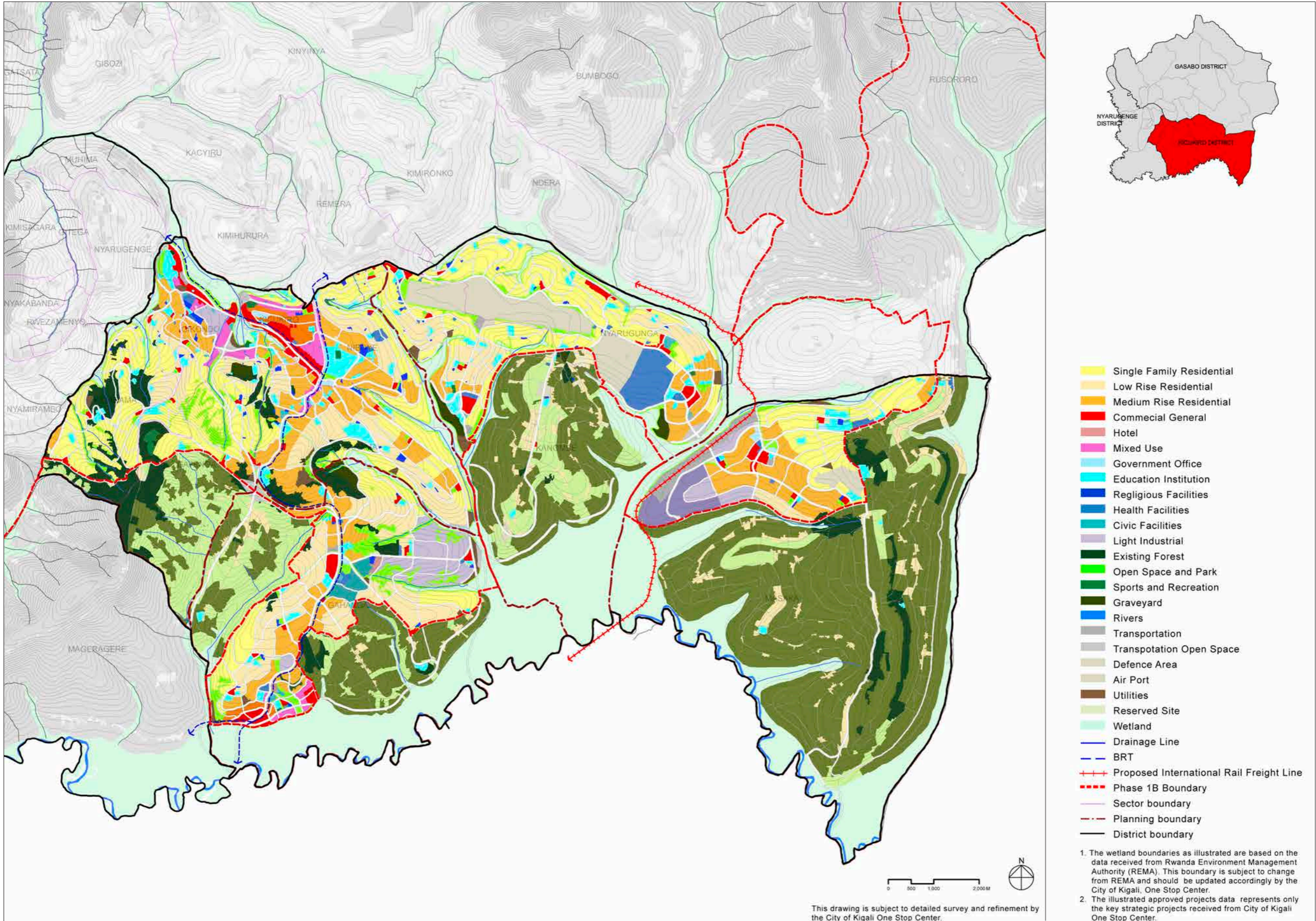


Fig.3.8 Kicukiro District - Proposed Land Use Plan 2025

3.6 Proposed Commercial Use Plan

The services sector accounts for 62% of Kigali's GDP and has witnessed growth of 5.1%¹ p.a in the last five years. The sector employed approximately 304,000 people in Kigali, indicating strong skill set increase in the City.

The urban sectors of Kicukiro District hold key commercial markets along L'Umuganda and Boulevard de l'OUA leading towards the City Centre. The existing rural sectors of Kanombe, Masaka and Gahanga each have one central commercial market.

The key strategies for allocation of different commercial Centres are:

- The existing commercial areas are redeveloped into neighbourhood/town Centres wherever possible.
- In new growth areas, new commercial Centres are proposed along the proposed new roads.
- Most of these commercial centres are developed together with residential developments along the Public transit routes. These commercial developments surrounded by high/ medium density residential developments (160-220 Du's/ Ha) function as urban nodes that are easily accessible through Public Transit.
- These Commercial Centres are further surrounded by religious, cultural, health and civic facilities including Open space parks to form active Urban Nodes.

3.6.1 PROPOSED COMMERCIAL PLAN - YEAR X

The service sector is projected to have 0.6 mi jobs by Year X in Kicukiro District alone. The proposed Commercial Plan addresses the strategic distribution of these Job

¹ Source - National Institute of Statistics, GDP Estimates 2010/11, 2005 prices

Centres across Kicukiro so as to promote a more decentralized distribution and create local employment opportunities. These employment nodes fall inclose proximity to townships.

The proposed hierarchy of commercial Centres in Kicukiro District is as follows :

REGIONAL CENTRE COMMERCIAL - Regional Centres are the largest commercial outside the central CBD area of the city. The main purpose of a Regional Centre is to decentralize the commercial activity within the district and bring jobs and facilities closer to the suburban areas of the district.

- Two Regional Centres are proposed in Kicukiro District; in Gahanga and Masaka sector respectively.
- These Regional Centres offer commercial space for offices , retail and entertainment and help reduce the need for people to travel to the City Centre for basic facilities.
- Each Regional Centre caters to a population catchment of about 1 mi and is spread over 50 ha.
- Each Regional Centre offers approximately 0.57 mi sq. m of commercial space with 200,000 employment opportunities in the service sector.

FRINGE CENTRE COMMERCIAL - Fringe Centres are distinctive commercial Centres developed around major transit nodes at close proximity to the City Centre; typically about three to five kilometers away from Downtown and well integrated with Public Transit.

- One such Fringe Centre is proposed in Kicukiro District, in the Kicukiro sector. The main role of this Fringe Centre is to provide commercial spaces for business that do not need their offices in the CBD.
- This provides employment centres closer to homes and also serves the suburban areas of the District.
- The Fringe Centre is spread over 12 Ha. It is developed next to the existing kimironko

market and Ecole Technique de Kicukiro and is surrounded by existing commercial zone around Boulevard de IOUA and Avenue des Communications. Most of these existing commercial developments are upgraded to Mixed Use developments to add in residential population for a vibrant 24 hour Commercial Centre.

- The Fringe Centre offers approximately 0.09 mi sq. m of commercial space with 50,000 employment opportunities in the service sector.

TOWN CENTRE COMMERCIAL - Each township is proposed with a Town Centre which accommodates the commercial needs of the self sustaining township.

- Out of 11 comprehensive townships proposed in Kicukiro District, the two Regional Centres and the Fringe Centre accommodate Town Centre commercial quantum within these three townships; the remaining eight townships are served by one Town Centre each.
- The Town Centres are well integrated with Public Transit and surrounded by medium density housing (160 Du's/Ha).
- Each Town Centre offers 0.09 mi sq. m of commercial space with approximately 10,000 employment opportunities in the service sector.

The Town Centres contribute to approximately 10% of the total retail space proposed in the District.

NEIGHBOURHOOD CENTRE COMMERCIAL- The existing commercial uses in the entire District are retained and in most cases rejuvenated to form compact Neighbourhood Centres.

- Neighbourhood Centres are proposed within each neighbourhood of approximately 15,000-20,000 residents.
- These Centres cater to everyday requirements and smaller scale retail like grocery, stationery, super markets, food vendors, cloth stores etc.

- Civic, Religious and Health facilities proposed at these Neighbourhood Centres would flourish with the neighbourhood catchment population.

- Each Neighbourhood Centre is well connected with Non motorized Transport facility linking the surrounding residential areas to these commercial/public nodes.

Around 75 such Neighbourhood Centres are proposed in the District with a total floor space of 0.2 million sq. m. Each Neighbourhood Centre will have approximately 3000 sq. m of Gross Floor Area. This contributes to approximately 10% of the total retail space proposed in the district.

MIXED USED COMMERCIAL - Mixed Use areas are proposed in Kicukiro District to create vibrant and well utilized places.

- These developments are well integrated with public transit network facilitating high density population with good and easy access to the rest of the City. Mixed Use Developments include various types of uses promoting live, work and play environments.
- These developments are generally a mix of 80% residential and 20% commercial quantum.
- They are proposed along the prime commercial corridors in the Fringe sectors of Kicukiro, Niboye, and Gikondo; and the Nyarugunga sector.
- Other than these key corridors, 75% of the Regional Centre is proposed to house integrated mixed use development; this arrangement gives the residential population an opportunity to enjoy regional level facilities within walking distances.
- Approximately 170 ha of land within the district is dedicated to Mixed-Use developments. With good urban design, these developments, create commercial centres with a sense of place.

OTHER COMMERCIAL USES - The other

commercial uses comprise of theme based commercial infrastructure within the District. The airport Boulevard in Nyarugunga is one such existing thriving commercial Centre.

- All these commercial uses will be revitalized with proper access and infrastructure.
- Special warehouse commercial is proposed in Masaka's Industrial Estate promoting factory outlets and Industrial showrooms.
- Specialized commercial like the M.I.C.E (Meetings, Incentives, Conventions and Exhibitions) district in Gahanga, close to the International Airport in Bugesera; will boost the City's Commerce.

In summary, the proposed commercial hierarchy allocates 44 % of the district's office space in the Regional Centres at Gahanga and Masaka; 24% in the Fringe Centre in Kicukiro sector and the remaining 32% of Commercial space in the 8 Town Centres and smaller Neighbourhood Centres. The District offers 0.65 mi jobs in the service sector and 0.2 mi jobs in Industrial sector that are well distributed. The proposed Commercial Use Plan for the Year X for Kicukiro District is shown in Fig.3.9. Table 3.4 shows the Employment distribution within each township.

3.6.2 PROPOSED COMMERCIAL PLAN - YEAR 2025

As per the proposed Commercial Use Plan- Year 2025; approximately 0.3 mi employment is needed in service and retail sectors. The main focus is to fully develop the commercial sector within the Fringe Centre areas of Kicukiro, Gikondo and Niboye. By Year 2025 it is anticipated that the commercial sector within the suburban area of Gahanga will be fully developed. Town Centres and neighbourhood Centres will be developed within the new townships.

Table 3.4 Proposed Commercial and Industrial Employment Distribution in Kicukiro District - Year X

PLANNING AREA	TOWNSHIP	EMPLOYMENT				TOTAL EMPLOYMENT
		SERVICE	LIGHT INDUSTRY	MANUFACTURING	LOGISTICS	
CENTRAL	KT1	12,400	7,600	-	-	20,000
	KT2	7,500	4,600	-	-	12,100
	KT3	58,900	25,900	-	-	84,800
SOUTHERN	KT4	286,400	13,700	-	-	300,100
	KT5	26,000	16,000	-	-	42,000
SOUTH CENTRAL	KT6	8,100	5,000	-	-	13,100
	KT7	11,900	7,300	-	-	19,200
	KT8	9,500	5,900	-	-	15,400
EASTERN	KT9	14,700	9,100	-	-	23,800
	KT10	25,000	14,850	-	-	39,850
	KT11	198,400	21,100	-	-	219,500
	I4	-	-	50,250	26,800	77,050
KICUKIRO	TOTAL	657,900	131,050	50,250	26,800	866,900

Table 3.5 Proposed Industrial Areas in Kicukiro District

PLANNING AREA	TOWNSHIP	HEAVY INDUSTRIAL AREA(HA)	LIGHT INDUSTRIAL AREA (HA)	TOTAL AREA (HA)
CENTRAL	K1 , K3	-	25	25
SOUTHERN	K5	-	162	162
SOUTH CENTRAL	K8	-	63	63
EASTERN	I4	378	169	547
TOTAL		378	419	797

3.7 Proposed Industrial Use Plan

The industrial sector accounts for 33% of Kigali's GDP and has witnessed growth of 9.7% p.a. in the last five years. The sector currently employs approximately 70,000¹ people in Kigali. The sector consists largely of quarrying, manufacturing, utilities, and construction industries. Within this sector, the construction industry is still the major employer, and will continue to be so as the country develops.

The main industrial zone today, lies in Kicukiro District in the sectors of Kicukiro, Gikondo and small parts of Gatenga. This entire Industrial belt sits in the City's central prime area over the central wetland stretch. Pollutive industries and dry port in prime location mars both the wetlands and decreases the land value. The area has higher development potential. In order to optimize the land value, it is proposed to relocate these Industries to nearby suitable areas in the District.

The development is proposed to focus on labor and skill intensive jobs in the short term and capital & technology intensive jobs in the long term. Focus would be to

¹ Source: National Institute of Statistics, GDP Estimates 2010/11, 2005 prices

encourage the development of identified SME clusters in the immediate term.

As per the Industrial Policy, the phasing of industrial development is as follows:

- Short Term: Agro-processing (including pyrethrum, dairy, vegetable oil, soaps and detergents); ICT; high-end tourism; textiles (including silk& leather goods); minerals processing;
- Medium Term: Construction materials (including cement); Pharmaceuticals; chemical products (including fertilizers);
- Long Term: Building materials (metal parts and structures); bio plastics; other high-tech Industries.

3.7.1 PROPOSED INDUSTRIAL USE PLAN- YEAR X

The Industrial sector is projected to provide 0.2 mi jobs by Year X in Kicukiro District. The proposed Industrial Plan addresses the strategic distribution of these Industrial zones across Kicukiro so as to promote a more decentralized distribution. Light Industrial estates are proposed within each Planning Area to create local employment. The key strategies are:

- About 800 ha of land has been proposed for Industrial use in Kicukiro District. This includes both Heavy and light industries .
- The heavy industrial belt in Kicukiro and Gikondo is redeveloped as Light Industrial Zone allowing only clean industries. This reduces the pollution levels and redevelopment of the City's prime area.
- An Industrial estate is proposed close to the cross-country trans national Rail line. This freight line runs along Masaka sector. Major logistics operations are cited at Masaka Industrial estate due to it's location and connection with the neighboring areas.
- All the light industrial areas are proposed along highway and logistic corridors for

ease of accessibility.

The proposed Industrial Use Plan Year X is shown in Fig.3.11. Table 3.5 illustrates the total area allocated for Industrial Use in Kicukiro District.

The industrial zones proposed in Kicukiro District are:

HEAVY INDUSTRIAL ZONE - Approximately 380 ha of land has been safeguarded in Masaka Sector for heavy industries. Adequate buffer is proposed around this industrial development. These industries provide space for large industrial clusters like Agro-processing, electronics, construction materials, plastics & pharmaceuticals timber & metals products and textile garments. They also provide space for other potential heavy industries such as petroleum depot and chemical industries as well as smaller SME clusters.

LIGHT INDUSTRIAL ZONES WITHIN TOWNSHIPS-

Light Industries typically have less environmental impact than those associated with heavy industries and hence are located closer to residential areas. Industries serving the surrounding population such as motor workshops, printing companies, light building services and warehouses, and other small SME clusters are located in all townships. About 480 ha of land is proposed to be safeguarded for light industries within townships which will provide employment for approximately 0.13 mi people.

3.7.2 PROPOSED INDUSTRIAL USE PLAN- YEAR 2025

The proposed Industrial Plan - 2025 focuses on developing Industrial Zone in Gahanga, Kagarama and Kigarama sectors and Heavy Industrial Zone in Masaka Sector. The plan proposes the development of several light industrial estates and SME clusters in line with the industrial policy.

Fig.3.12 presents the Industrial Use Plan for the Year 2025.

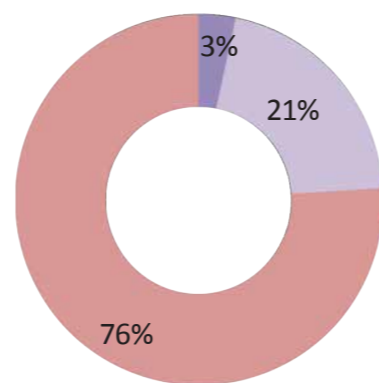
866,000
Total Jobs Created by year X



657,900
Jobs in Service Sector by year X



50,250
Jobs in Light and Heavy Industries



76%
Jobs in Service Sector

21%
Jobs in Light Industry

3%
Jobs in Logistic Sector

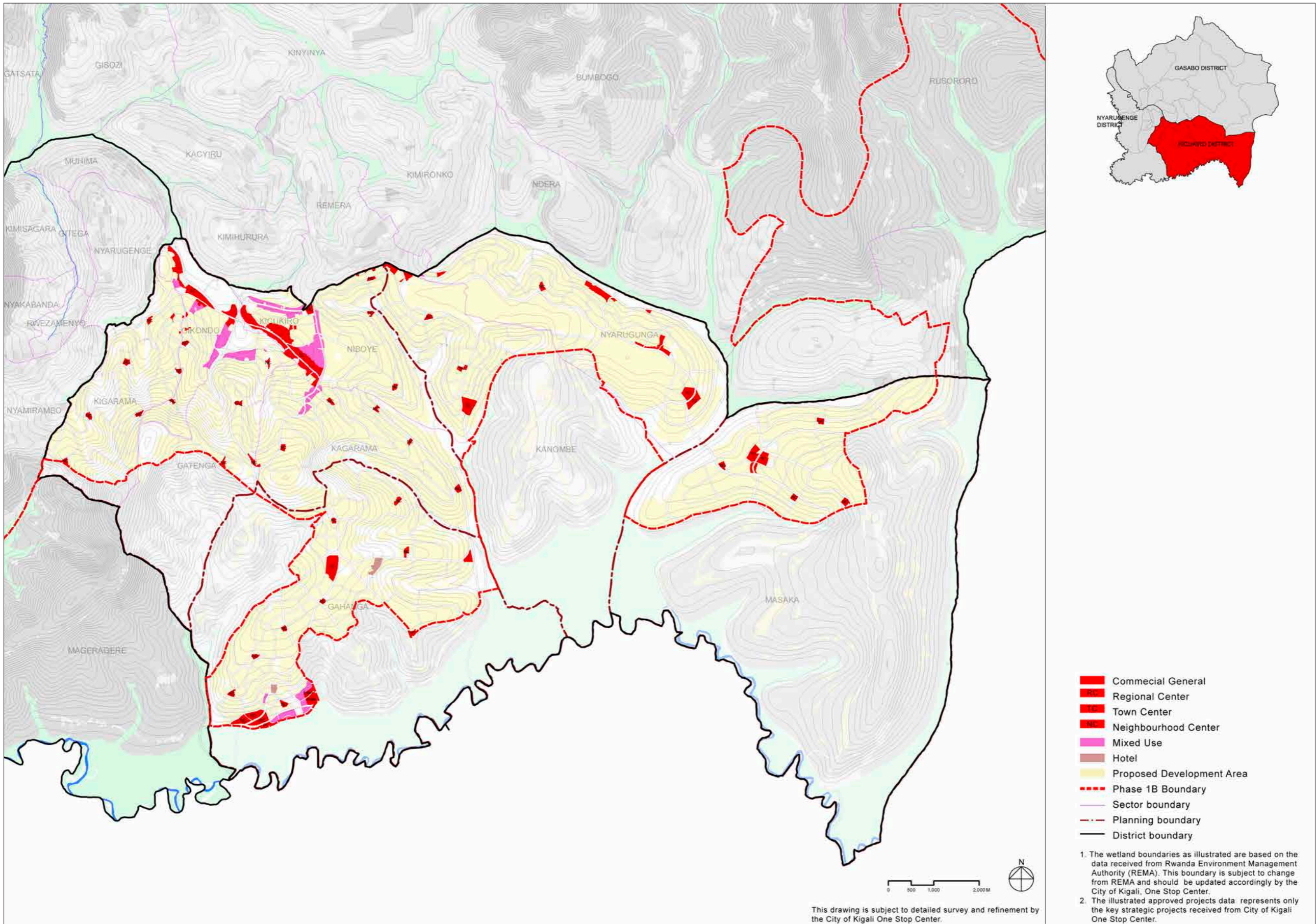


Fig.3.10 Kicukiro District - Proposed Commercial Use Plan - 2025

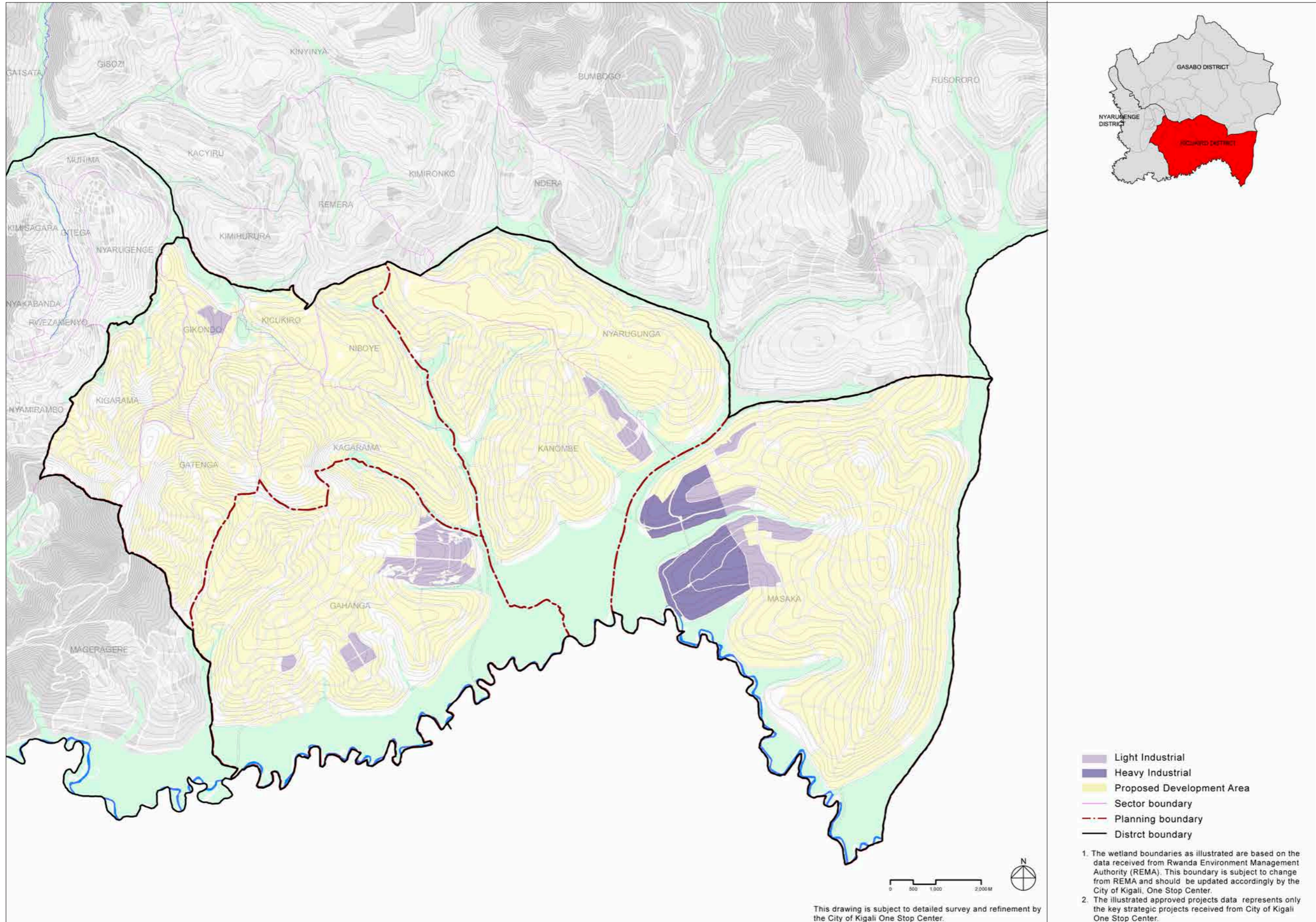


Fig.3.11 Kicukiro District - Proposed Industrial Use Plan - Year X

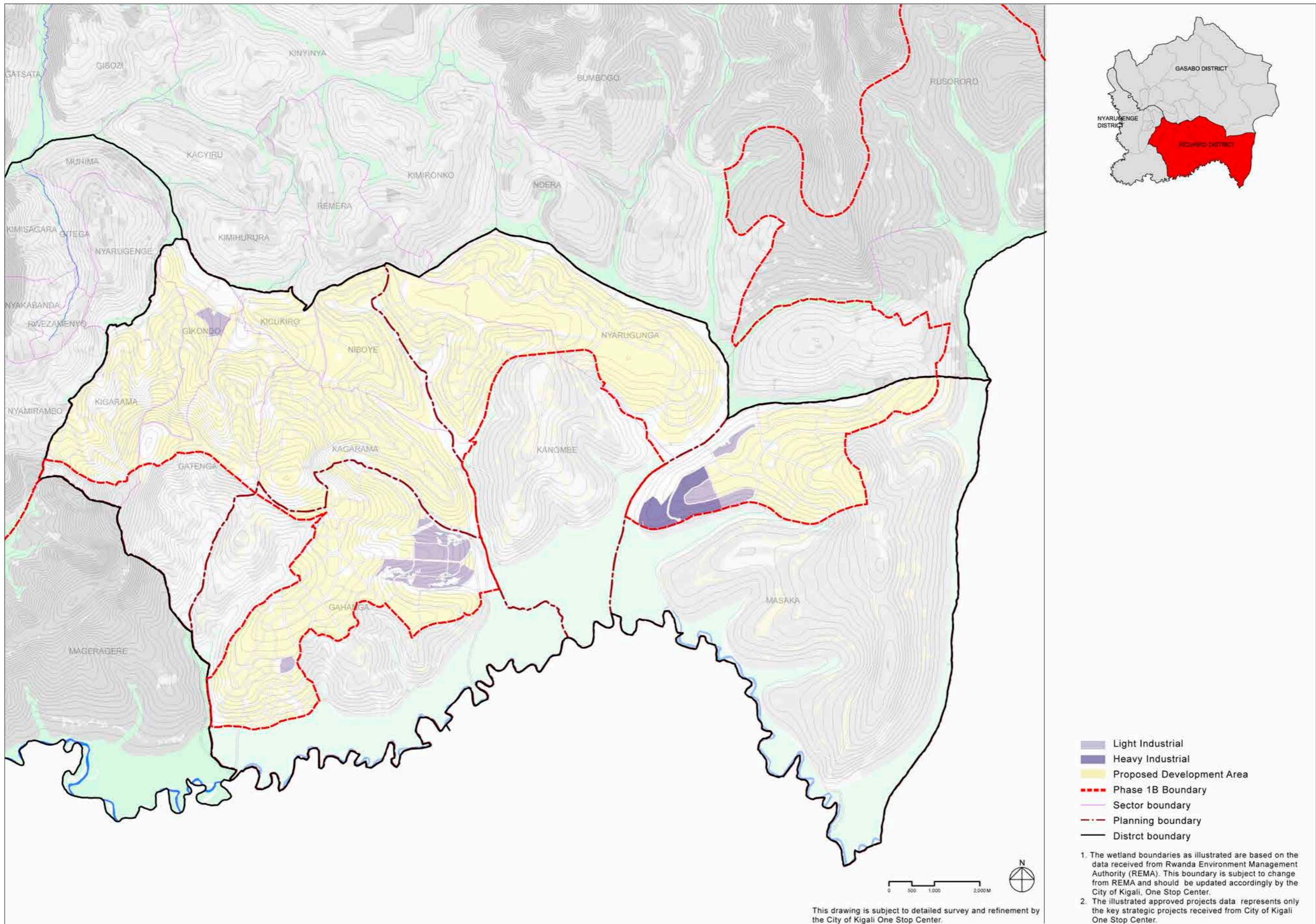


Fig.3.12 Kicukiro District - Proposed Industrial Use Plan - 2025

3.8 Proposed Residential Use Plan

With a current population of 0.35 mi, the average household size in the city is estimated to be 4.7 P/Du's (persons/ dwelling unit). The District has the following three residential typologies:

- The high density packed unplanned housing;
- Planned housing which is usually in the form of low density or single family homes;
- And, government sponsored Imudugudus.

Refer to Table 3.8 for existing housing types and distribution in Kicukiro District.

As such, with respect to the housing sector, the key issues evident in the entire city are:

- Acute shortage of affordable formal housing in the market has generated large unplanned settlements.
- There is a need to check the growing, unmanaged low density urban sprawl in the urban sectors close to the Industrial zone and upcoming Masaka sector.
- Developments are piecemeal, fragmented and not integrated with infrastructure development.
- There is a necessity for clear development policies, direction and guidelines to manage and foster growth.
- There is a need to provide for housing types offering choice of homes for all the income brackets.

3.8.1 PROPOSED RESIDENTIAL USE PLAN-YEAR X

Kicukiro District's Population is estimated to be 2.3 million, with a 7% annual growth rate till Year X. The household size in the city is estimated to decrease to 3.85 P/ Du's (persons/ dwelling unit). The key principles and strategies adopted in planning residential uses are:

- Restructure Kicukiro District into 11 integrated townships with jobs, social infrastructure, recreational spaces and amenities
- New developments to respect topography and site context by allowing higher density developments along ridges which gradually become less dense as they approach the low lying wetlands. Refer Appendix 2 for Township Model Layout.
- Comprehensive approach to unplanned area rehabilitation, especially in Central and South Central Planning Areas to propose an appropriate strategy for rehabilitation.
- Removal of hazardous unplanned developments and Industries from Steep slopes and wetlands that are prone to landslides in Kicukiro, Gikondo and Niboye sectors
- Strategic land acquisition for the new proposed township facilities along key transit corridors.
- Identifying key government land suitable to catalyze affordable housing projects which can be further emulated.

The proposed Residential Use Plan for Year X as shown in Fig.3.13 presents the development of higher density residential developments along the key transit corridors of the City. Residential Use comprises of 47 % of the Land Use in Kicukiro District. The Residential Use Plan consists of 4 types of residential developments, which cater to the various housing needs of the estimated population. The mentioned residential types are listed as follows :

SINGLE FAMILY RESIDENTIAL

Single family residential development is the most prevalent Land Use type. It is classified as good quality landed housing with detached, semi detached, terrace houses within lush greenery. It occupies 27% of the District Land and has a share of

57% of the residential population. The key features of this development are :

- Single family residential is characterized by a dwelling unit density of 35 Du's/Ha with minimum plot sizes varying from 400-600 sq. m
- Existing high class Single Family residences in the core areas of the District are retained.
- Areas with Steep slopes are allowed to be developed as single family residential developments on conditional use permits by the city.
- Prime areas with good views of wetlands and nature areas, that are located at a considerable distance from the urban commercial Centre are proposed to be developed as single family residential developments. Areas where the population catchment is less is also cited as Single Family Residential.

Other than good quality landed housing, a few key areas with unique scenic views and prime locations in the district are proposed to be developed as premium single family residential houses. Zoning guidelines for these developments are described in the Zoning report. (Refer to Zone R1 and R1A) Table 3.6 and Table 3.7 illustrates the housing density and development character.

LOW RISE RESIDENTIAL

Such housing developments are similar to single family residential developments, but are more compact in nature with a mix of low rise apartments. The current residential development in the District in Kagarama, Niboye, parts of Gatenga and Nyarugunga resemble this type of housing. It occupies about 18% of the total Residential land area with a population share of 24%. The existing residential developments close to the proposed Fringe Centre in Kicukiro, are

Table 3.8 Existing Housing Development in Kicukiro District

Indicators	PERCENTAGE
Inhabitants in Villages (Imudugudus)	8.7%
Isolated housing	30.4%
Spontaneous housing	47.3%
Developed areas	7%

Source : Kicukiro District Development Plan 2008-2012

Table 3.7 Kicukiro District - Proposed Housing Typology Distribution, with average household size 3.85

HOUSING TYPE	HOUSING AREA (HA)	PERCENTAGE OF LAND WITHIN RESIDENTIAL DEVELOPMENT	RESIDENT POPULATION (MI)	PERCENTAGE SHARE OF POPULATION WITHIN RESIDENTIAL DEVELOPMENT
Single Family	4,096	56%	.63	27%
Low Density	1,388	19%	.49	22%
Medium Density	1,606	22%	.99	43%
High Density	111	2%	.09	4%
Mixed Use	177	2%	.09	4%
Total	7,380	100.0%	2.3	100%

Table 3.6 Kicukiro District - Proposed Population and Dwelling Units

PLANNING AREA	TOWNSHIP	POPULATION (YEAR X)	DWELLING UNITS
CENTRAL	KT1	128,000	33,200
	KT2	79,000	20,600
	KT3	480,000	124,800
SOUTHERN	KT4	184,000	47,700
	KT5	253,000	65,700
SOUTH CENTRAL	KT6	83,000	21,600
	KT7	133,000	34,400
	KT8	110,000	28,500
	KT9	158,000	40,900
EASTERN	KT10	278,000	72,700
	KT11	386,000	100,300
	I4	18,000	4,700
TOTAL	KICUKIRO DISTRICT	2,290,000	595,100

zoned under this housing development in order to stimulate the redevelopment and intensification of these housing areas. The key features of Low-rise developments are:

- Low-rise residential developments are characterized by a dwelling unit density of 90 Du's/Ha; with minimum plot size of 1000 sq.. m for low rise apartments and 150 sq.. m for single family houses.
- Low rise residential areas are generally cited close to Public transportation.

MEDIUM RISE RESIDENTIAL

With an increasing urban population and a shortage of suitable flat land, medium to high residential density developments will have to be accepted by the District. Medium rise residential developments in Kicukiro District is proposed to host more than 32.5% of the total residential population. Most of the affordable and public housing will be built under this housing development. The key features of medium-rise residential are as follows:

- Medium-rise residential is characterized by a dwelling unit density of 160 Du's/ha.
- These residential developments are proposed along major transport corridors. This is to ensure easy access to the public transport for a sizeable population.

- Medium-rise residential developments are primarily proposed around major commercial nodes and relatively flat areas on ridges within the District.

The District would benefit greatly from this residential development; developed to its maximum allowed Gross Floor Area. It would help anchor the proposed Transit corridor and commercial Centres. A few medium density developments are coming up in Masaka Sector. The trend although is new to the District, would be quickly picking up pace due to the new proposed varied commercial developments.

Affordable housing by the Government would predominantly be Medium Density Developments.

HIGH RISE RESIDENTIAL

High rise residential developments are proposed at few key locations within the District. These residential developments provide high-quality and high density living for those who desire an urban lifestyle with easy access to regional goods and services. Communal facilities with generous green spaces are encouraged to enhance the quality of living in this high density environment It occupies less than 2% of the total residential use and houses 6% of the District's residential population. The Key

features are:

- High rise residential is characterized by a dwelling unit density of 200 Du's/Ha.
- These developments are proposed around the Regional Centres in Gahanga and Masaka Sectors.

The proposed Business parks, Commercial Centres, recreational and public facilities in the Regional Centre would attract young aspiring individuals to these developments.

MIXED USE DEVELOPMENT

Mixed Use Developments allow both commercial and residential uses together. The lower two floors are developed as commercial and retail; with cafe's, window displays and landscaped walking promenades. The floors above the Commercial sections are developed as residential apartments. These developments in the prime areas of the city create vibrant City Centres that are active 24 hours due to the residents.

The distribution of commercial to residential use is 20:80. The existing commercial markets in Kicukiro, Gikondo, Niboye, Nyarugunga are proposed to be redeveloped into Mixed Use developments. Around 72 Ha of land is allocated in the Regional centres of Masaka and Gahanga for Integrated Mixed Use Developments.

3.8.2 PROPOSED RESIDENTIAL USE PLAN - YEAR 2025

The proposed Residential Use Plan for the Year 2025 presents the initial phases of residential development which cater to the estimated 1.3 mi population. The average household size is projected to be 4.15 p/ Du's (till Year 2025). Growth is focused around the fringe areas at Kicukiro, Niboye, Gikondo, Gatenga, Nyarugunga, Masaka Town area and parts of Gahanga sector. The unplanned areas in the above urban sectors

are proposed to be redeveloped as low density residential developments. In the suburban areas, the existing Imudugudus are retained and upgraded with necessary public facilities.


Refer to Fig.3.14 for Residential Use Plan -Year 2025, for Kicukiro District.

Refer to Appendix 2 for detail Residential Land Use Distribution in Kicukiro District and Planning Areas.

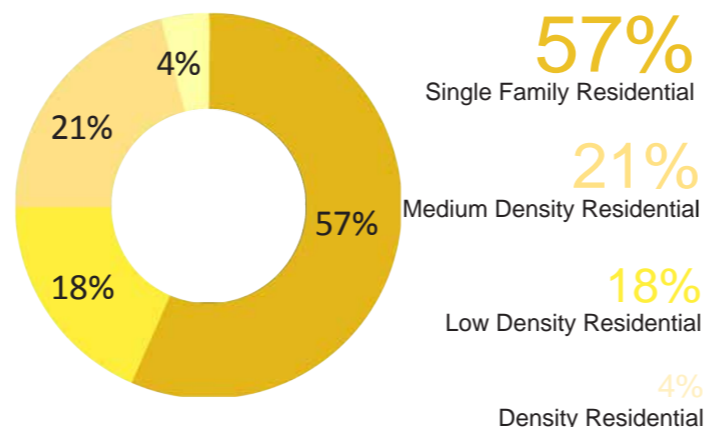
Table 3.9 Kicukiro District - Residential Development Density and Development Character

HOUSING DEVELOPMENT	STOREYS	DENSITY	DEVELOPMENT CHARACTER
SINGLE FAMILY RESIDENTIAL	SINGLE FAMILY HOUSING - VILLAS, CLUSTER HOUSING, TOWNHOUSES	40 DU'S/HA	LOW-RISE, IDYLIC CITY CHARACTER
LOW DENSITY / LANDED HOUSING	2-4 STOREY APARTMENTS / ESTATES	90 DU'S/HA	LOW-RISE CITY CHARACTER
MEDIUM DENSITY / WALK-UP APARTMENTS	4-8 STOREY APARTMENTS / ESTATES	160 DU'S/HA	PREDOMINANTLY PUBLIC HOUSING
HIGH DENSITY / PUBLIC HOUSING APARTMENTS	>8 STOREY APARTMENTS / ESTATES	>200 DU'S/HA	HIGH-END APARTMENTS / INNER CITY APARTMENTS / SERVICED APARTMENTS AT CBD AND REGIONAL CENTRES

2,318,000  Kicukiro Projected Population by Year X

11  Self Sufficient Townships (600ha-900ha)

600,000  Affordable Homes by Year X



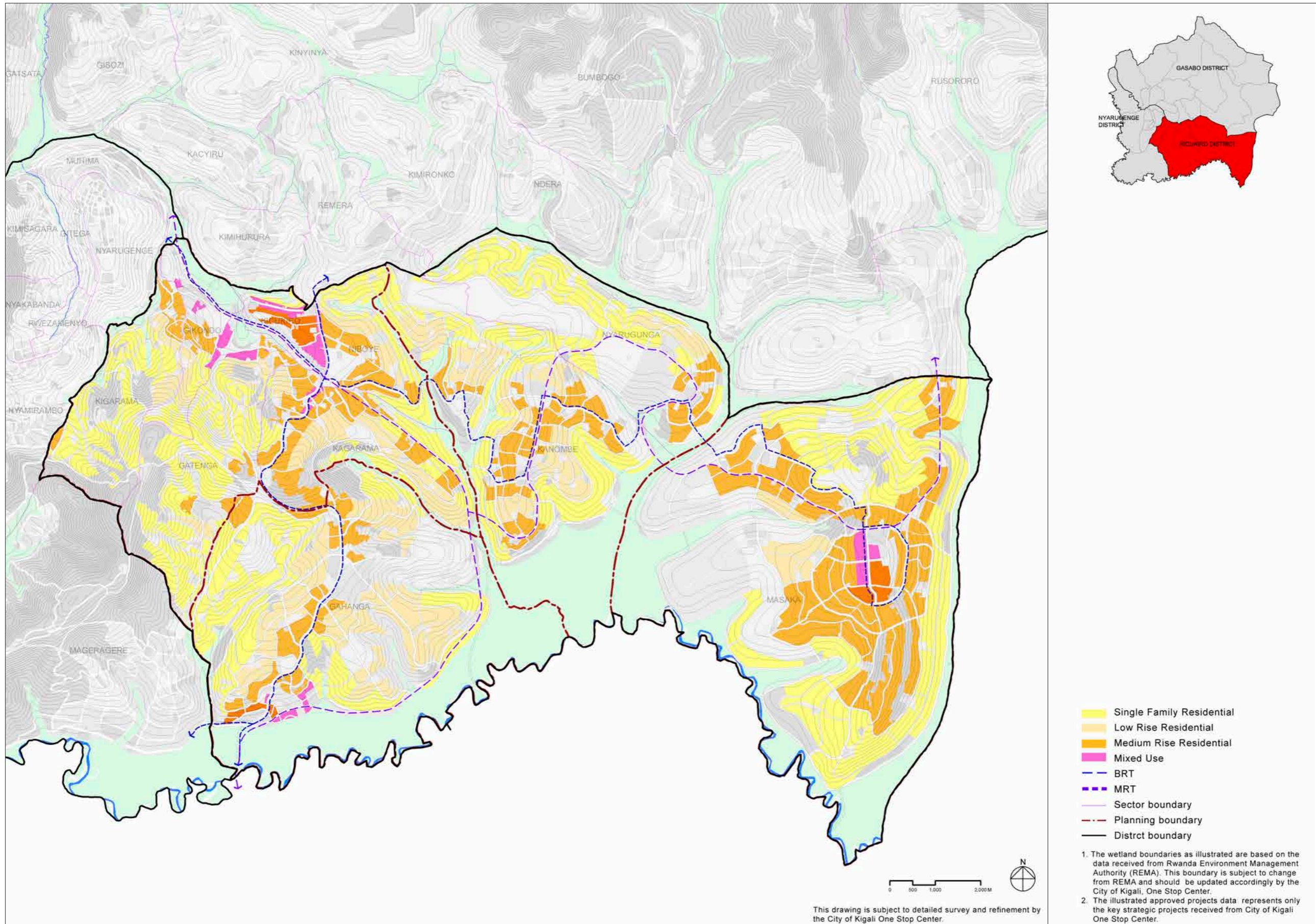


Fig.3.13 Kicukiro District - Proposed Residential Use Plan - Year X

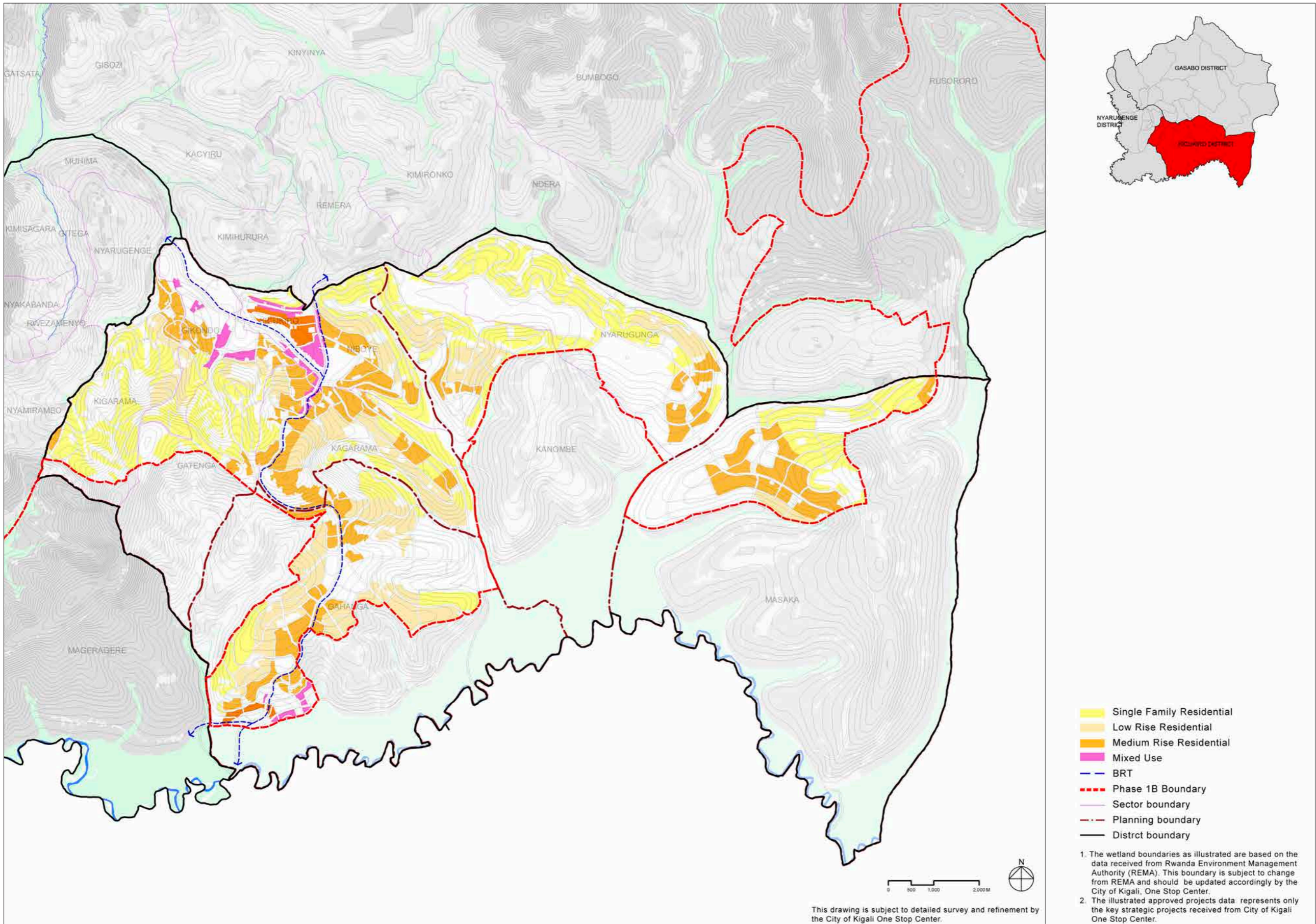


Fig.3.14 Kicukiro District - Proposed Residential Use Plan - 2025

3.9 Proposed Facilities Plan

Adequate facilities like schools, medical Centres, post offices, religious Centres, parlours etc are provided within townships in Kicukiro District. These facilities are distributed as per the density and population catchment.

With growing trends such as, broader distribution of wealth, more leisure time, higher standards of education and better public awareness of the importance of improving quality of urban life, the demand for variety of outlets for social activities will have great demand. While deriving new standards for these facilities, considerations for finance, land ownership and other practical limitations are considered. Ease of access through Public transportation is another major consideration while locating these facilities.

3.9.1 PROPOSED FACILITIES PLAN - YEAR X

DISTRICT LEVEL FACILITIES

The district level facilities catering to the needs of the three districts including district hospitals, sports and recreation facilities, cemeteries, higher education institutes etc are provided with respect to the existing available facilities, Approved projects that are in the pipeline, and the catchment population.

It includes facilities such as District Hospitals, Higher Education Institutes, Polyclinics, Cultural Centres, Religious Centres, Town Park, Sports Facilities, a Regional Library, Bus Interchanges, Police Stations, Post Offices, Government Offices etc. A few key proposed District Level facilities in Kicukiro District are listed below:

- The existing Military hospital in the Nyarugunga sector is upgraded to a Regional Hospital.

- Sports Hub with indoor and outdoor stadiums, sports complex and water sports facilities are proposed in the Gahanga Sector.
- The existing Poly-Technique Institute in Kicukiro sector is upgraded to a University.
- Two major University towns with student accommodation facilities are proposed in Gahanga and Masaka sector, close to the Regional Centres. This allows for more interaction between students, research management and working professionals.
- A new approved Cultural Village and Nyanza Genocide Memorial Centre is integrated in the Master Plan to create a cultural and heritage node in the Central Planning Area.

Refer to Appendix 2 for standard allocation of facilities in Kicukiro District.

TOWNSHIP FACILITIES

With a variety of commercial developments, industrial estates and public facilities proposed within the township, the need to travel beyond the township to other places is reduced. The Town Centre provides facilities for educational, health care and recreational needs like schools, hospitals, parks, sports complexes, Religious Centres and food markets. The standard space provisions for each facility is laid out in Appendix 2.

NEIGHBOURHOOD FACILITIES

Neighbourhood facilities are provided within each neighbourhood (approximately 15,000-20,000 residents). Facilities for everyday requirement such as religious centres, community halls, Schools and local parks are provided at a walking distance to the residents. Special care is taken to revitalise existing health, civic and commercial uses to further integrate them with new facilities, forming urban social

- nodes. These facilities include
- Neighbourhood Parks, Health Centres Cultural and Religious Centres with the Neighbourhood Centres
 - Primary Schools
 - Secondary Schools
 - Non motorized Transport infrastructure.

The facilities are sited as per the township model within catchment areas and close to arterial and collector roads.

Refer to Fig.3.16 for Kicukiro District - Public facilities Plan for Year X.

3.9.2 PROPOSED FACILITIES PLAN 2025

The 2025 Plan focuses on strengthening existing facilities and developing new facilities with required new infrastructure. New facilities would be provided in the City Fringe Area of Central Planning Areas, and the proposed new township in the Southern Planning Area. New national level facilities like the Sports stadium at Gahanga, which can host international and national events, are proposed for 2025. The District hospital and Sports and Recreational Centre would be the first few projects to be developed.

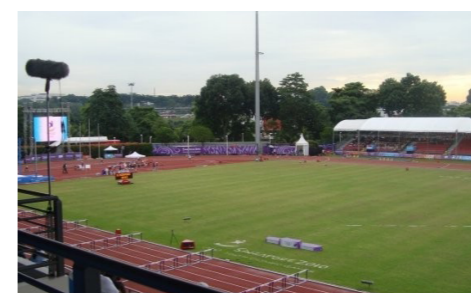
It further proposes rejuvenation of unplanned areas by providing quality facilities. As per the phasing plan, the key public facilities to be provided by the Year 2025 are illustrated in Fig.3.17



Public Library and Neighbourhood Parks



Urban Recreational facilities



Sports and Neighbourhood Centres



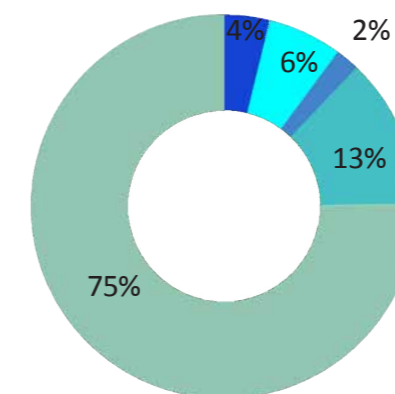
162
Schools by year X



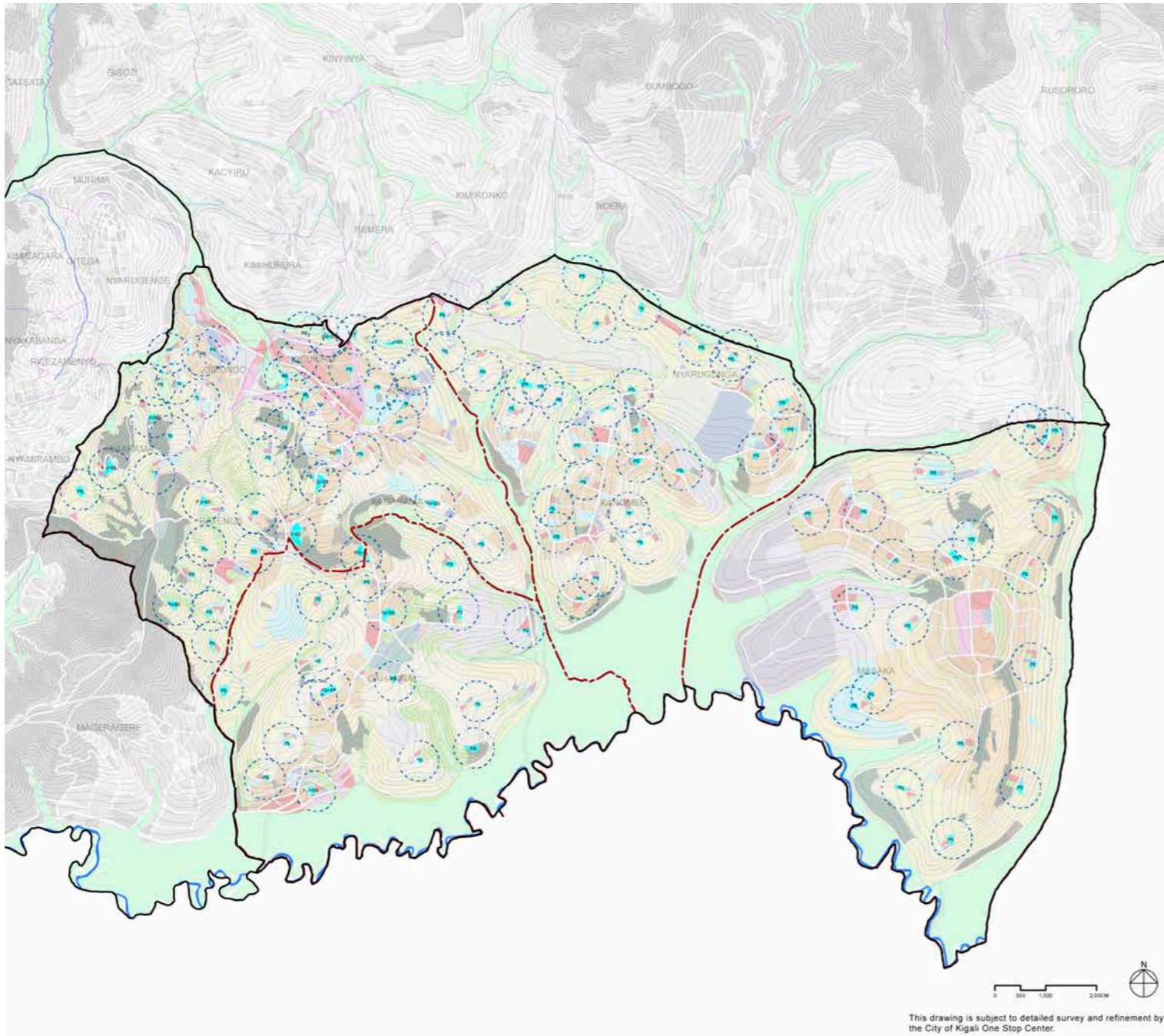
73
Neighbourhood Centres by year X



61
Health Facilities by year X



13%
Parks and Recreational Spaces
6%
Educational Facilities
4%
Commercial and Civic Facilities
2%
Health Facilities
75%
Residential Area



3.9.3 PROPOSED EDUCATION FACILITIES

With an average literacy rate of 48% in Kicukiro District¹, one of the key priority areas for development is Education. The Development guideline Plan prioritizes the provision of standard primary, secondary and tertiary education facilities across the whole city in the light of long-term education policies, demographic changes and future manpower demand.

As per the proposed Township model, a few key aspects for siting Educational facilities are:

- Primary schools are sited within 400 m of walking distance in each neighbourhood.
- Primary Schools are integrated with the Neighbourhood Centre for their central location and accessibility .
- Shared Use of facilities with the Community - In view of the shortage of school sites, particularly in the urban areas, consideration is given for schools to share the use of adjacent community and recreation facilities (the neighbourhood parks, assembly grounds, community halls etc). Where appropriate,

1 Kicukiro DDP-2008, statistics for year 2000

government school facilities should also be shared for use by the community.

- Clustering of Schools: To utilise land and other resources more efficiently, Primary and Secondary Schools are combined where feasible, in either pairs or in clusters so that the school facilities can be shared, or the sites can be developed jointly.
- Facilities for technical education and vocational training are sited one in each township close to the Town Centre.
- New University towns are sited in new development areas in the Eastern and Southern Planning Areas due to availability of large developable land.

Fig.3.15 highlights the proposed primary schools in Kicukiro District.

- PS Primary School
- PS+SS Primary + Secondary School
- 400m Radius Catchment
- Rivers
- Wetland
- Sector boundary
- Planning boundary
- District Boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

Fig.3.15 Kicukiro District - Proposed Primary schools within 400 m of walking distance

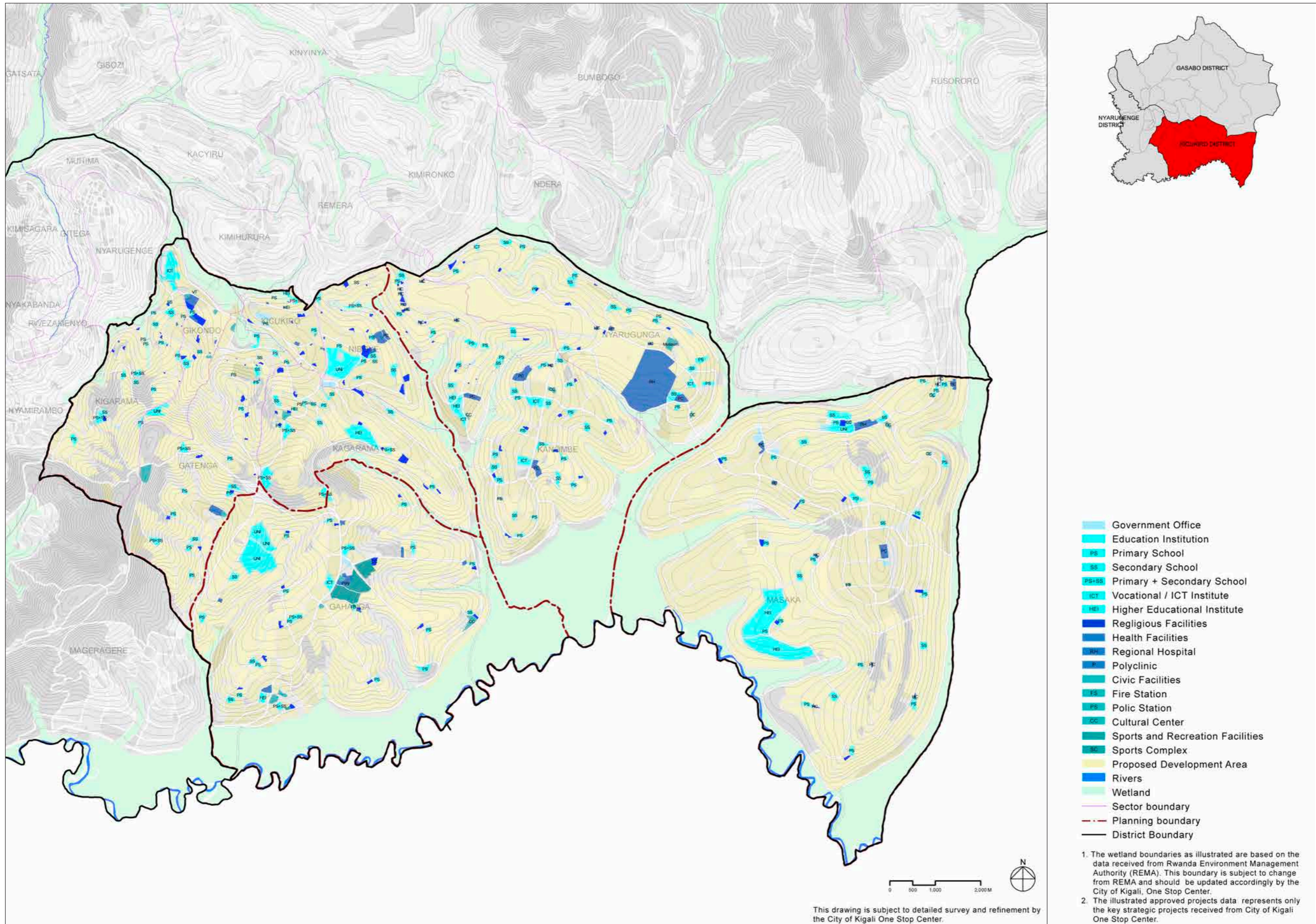


Fig.3.16 Kicukiro District - Proposed Facilities Plan - Year X

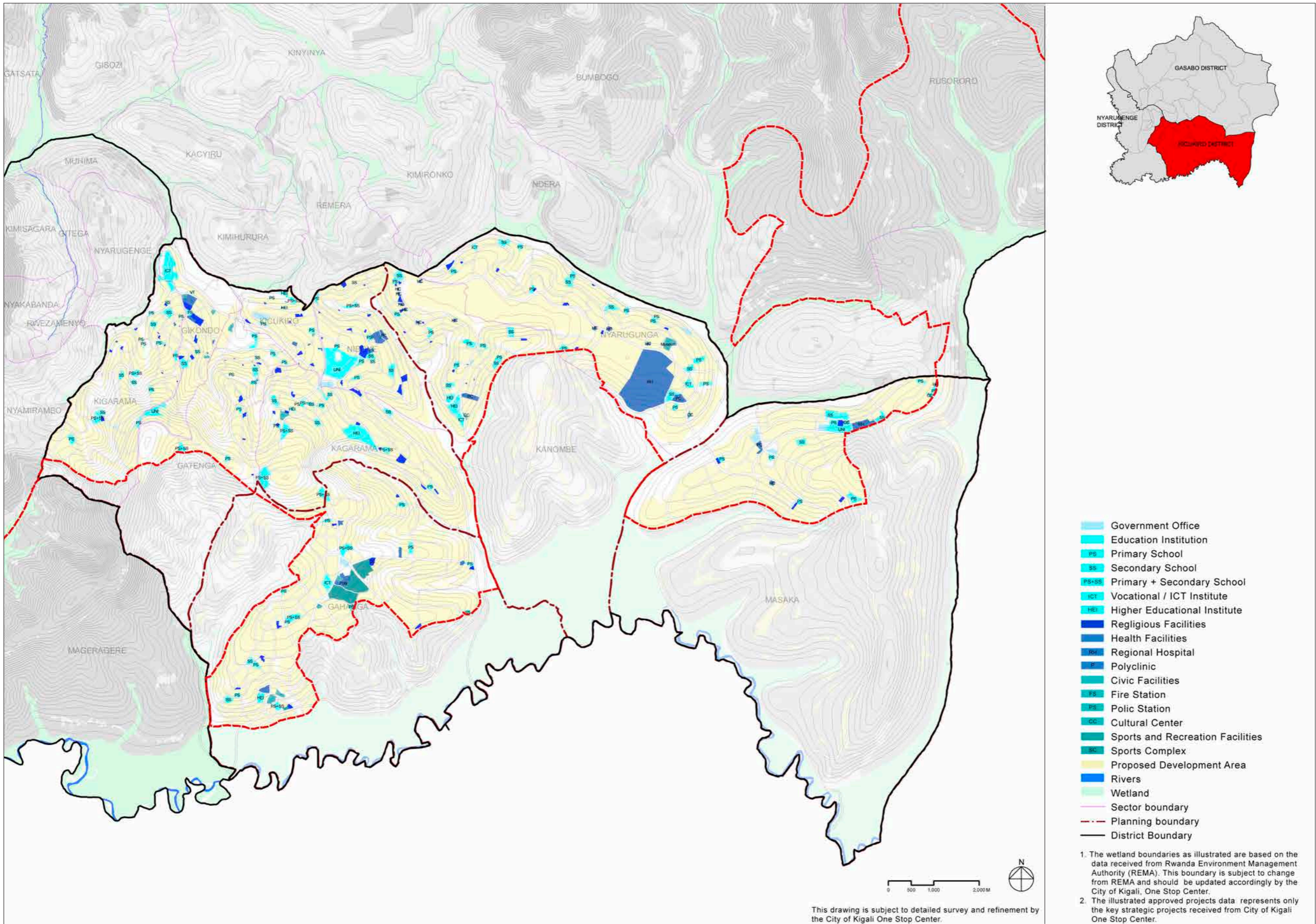


Fig.3.17 Kicukiro District - Proposed Facilities Use Plan - 2025

3.10 Proposed Environmental Strategies Plan

The district of Kicukiro is endowed with natural features. Lakes, rivers, streams, wetlands, forests and steep slopes combined with the existing agricultural areas constitute 83% of the City's land area. In Kicukiro District, 22% of the land comprises of natural features.

3.10.1 PROPOSED ENVIRONMENTAL STRATEGIES PLAN -YEAR X

The key objective for environmental conservation in Kicukiro District is to protect the existing forests, steep slopes, watersheds and wetlands. In line with the recommendations from the Regional Concept Plan, the detailed Master Plan proposes the following environmental measures for the Planning Area:

- Slope Protection - In Kicukiro District, 6.8% of the land falls under Steep Slopes (slopes greater than 20% gradient). These large areas of slopes need to be managed through appropriate slope protection methods. Fig.3.18 presents the existing slope analysis map of Kicukiro District. Table 3.10 illustrates the type of

Table 3.10 Development Guidelines for Slopes

URBAN AREA DEVELOPMENT	SLOPE
Any Development	<20%
Conditional Use	20-40%
Afforestation and no development Zone	>40%

RURAL AREA DEVELOPMENT	SLOPE
Agriculture/ Development	<20%
Farming and forestry/ Conditional Use	20-40%
Afforestation and no development Zone	>40%

development allowed in urban and rural areas.

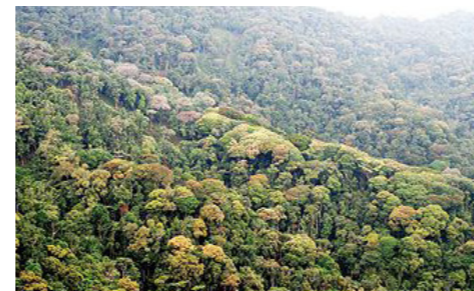
- Forest Conservation - 2.5 % of the land is occupied by existing forests. These forests are conserved by zoning them as protected areas. Further plantation, agriculture, and agro-based activities are proposed in moderate slopes to increase vegetation and help mitigate soil erosion.
- Improve Surface Run Off - Eliminate the risk of landslides and improve surface run-off quality by adopting appropriate slope protection measures in steep slopes (20%-40%).
- Restore Natural Drain Channels - Restore and protect the watershed by reclaiming natural drainage courses and wetlands from developments. Introduce riparian buffers along wetlands and river streams.
- Wetland Protection - Implement a 20 m environmental buffer for wetlands, 10 m for rivers and 50 m for lakes as per Organic Law. Use natural vegetation along these buffers.
- Open Space Strategy - Develop scattered forests and open spaces around wetlands and waterways in urban areas as nature parks which can be used for passive recreation. Large open areas with slopes greater than 20% and that cater to township recreation are developed as Community parks within each township.

The proposed Kicukiro District Environmental Strategies - Year X is presented in Fig.3.20 .

3.10.2 PROPOSED ENVIRONMENTAL STRATEGIES PLAN -YEAR 2025

Agriculture will be allowed in Masaka, and parts of Gahanga, Kanombe , Kigarama and Gatenga sectors until 2025. In future, these areas would be allowed to redevelop into new townships to meet the future residential needs of the District. Refer to Fig.3.22 for Kicukiro District -

Environmental Strategies for Year 2025



Agriculture on steep slopes



Agriculture on steep slopes



Existing Wetlands



Existing Forests

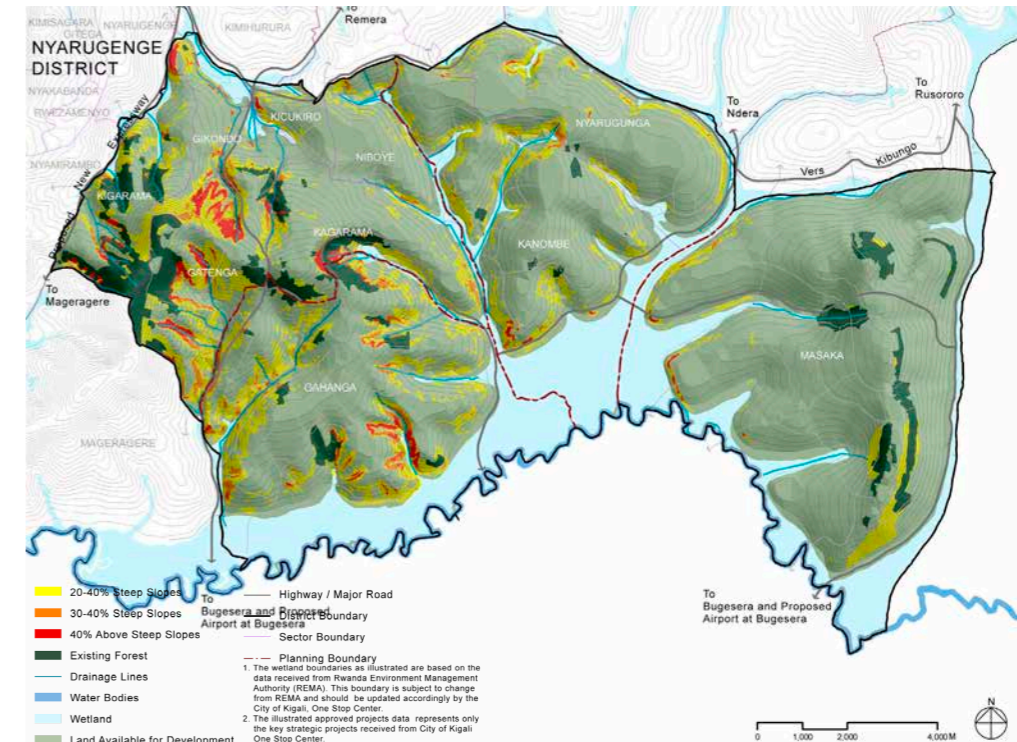


Fig.3.18 Kicukiro District -Existing Slope Analysis map

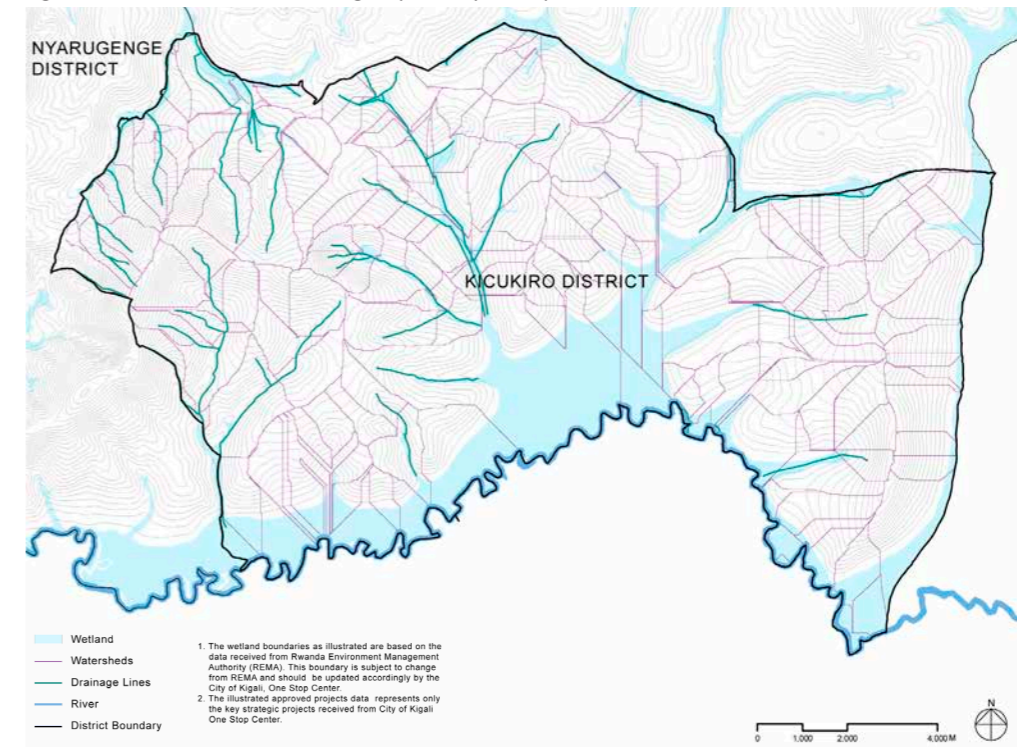


Fig.3.19 Kicukiro District - Existing water Shed



Imagery : Proposed Bio Diversity Park and Lake Park



Imagery : Proposed Flower Valley and Sports Hub



Imagery : Proposed Golf Course and Wetland Park



3.11 Proposed Green and Blue Plan

Kigali City is endowed with many hills and wetlands. These natural assets are identified and protected to ensure that the population can enjoy them today as well as secure it for the future generations. These features are utilized to generate economy and become special attractions of the city. The three districts in the City are developed on three key themes taking advantage of the existing nature of the developments:

- Nyarugenge - 'The Adventure Gateway' - Landscapes with scenic views. Theme - **ADVENTURE SPORTS AND PARKS**
- Gasabo- 'The Land of Origins' - Raw Natural Character, Theme - **NATURE AND AGRO BASED TOURISM**
- Kicukiro- 'The Golden Parks' - New Urban Ambience, Theme - **URBAN PARKS AND THEMATIC RECREATIONAL PARKS**

3.11.1 PROPOSED GREEN AND BLUE ATTRACTION PLAN - YEAR X

Kicukiro District is relatively flat when compared to the terrain in the other two districts. About 22% of the District Land area is occupied by wetlands, steep slopes and forests patches. Hence with more land available for future development, the

District could potentially take a more urban character in the future.

The Green and Blue plan capitalizes on the existing natural features to create new parks and recreational features. These Open green spaces are well connected to form a continuous pedestrianized network traversing the whole District. The key Urban parks that bring in new identity to the District are listed below:

NATURE BASED TOURISM ATTRACTIONS- Vast wetlands located between Gahanga, Kanombe and Masaka sectors offer great potential to be developed as a Bio Diversity Park. This new park will compliment the wetland stretch along the Nyabarongo river's migratory bird path.

PARKS & RECREATION ATTRACTIONS - Revitalizing the original wetlands in the Gikondo and continuing the wetland landscape stretch from the CBD, Gikondo Lake Park is proposed close to the proposed mixed use corridor. The Lake park will provide relief in the central urban mixed use corridor.

- The northern wetland stretch along Kicukiro, Niboye, Nyarugunga and Masaka is developed as a flower valley promoting the existing City's horticulture industry. The proposed Flower Valley explores and exploits the commercial and aesthetic aspects flower farming in the city. This creates value added agriculture while creating an attractive feature in the city.
- Gahanga Sector is endowed with steep slopes and forests along the wetlands. This valley stretch allows for potential development of Botanic gardens encouraging research, education and aesthetics of the place. This is further connected to the proposed Biodiversity Park in Kanombe sector.
- Integrating the two approved Stadium projects in Gahanga Sector, the DGP plan proposes a full fledged Sports hub comprising of sports complex, indoor

and outdoor stadiums, water sports, basket ball and tennis courts. With the district's new role as Education hub, the Sports hub compliment the University facilities.

- Equestrian Park is proposed along the wetlands in Kanombe sector as a unique recreational activity close to the wetland parks
- Golf course & resorts are proposed in Masaka Sector as an anchor for premium residential development.

A variety of other open green spaces are proposed at town and neighbourhood level. A hierarchy of open spaces are:

TOWN PARKS - Town Parks support recreational and leisure activities and give a unique identity to the township. 5 ha of land for Town park is proposed within each Town Center.

LOCAL PARKS - Local parks cater to the neighbourhood. They range in sizes and are programmed for active and passive recreation. They are located near residential developments for easy access to the park and to promote community gathering.

REGIONAL PARKS - These parks are unique to the District, emerging from its natural topography and wetlandscape unique to these Planning Areas.

- **NATURE PARKS** - Large drainage channels within towns, unbuildable slopes and forest patches in the city are converted into nature parks.
- **WETLAND PARK** - Wetland parks are developed along the existing wetlands and wetland buffers. They collect and recycle surface runoff from the surrounding areas. They feature indigenous plantation and allows passive recreation use.
- **EDGE PARKS** - Wetland buffer is redeveloped as a continuous pedestrian and cycling network that connects the entire wetland network across the District and the various open greens .

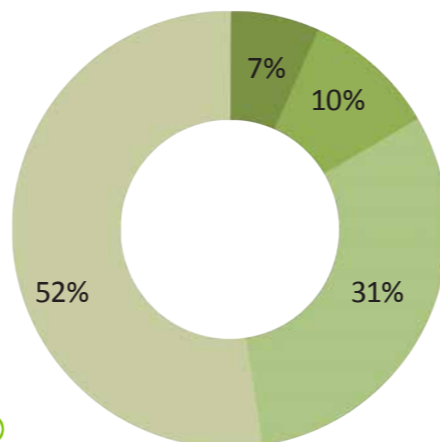
35,000ha
Green Area in Kicukiro District



48%
Open Space in Kicukiro District



17,00 Ha
Proposed Public Parks



31%
Protected Wetlands

10%
Public Parks and Open Space

7%
Protected Wetlands

52%
Urbanized Area

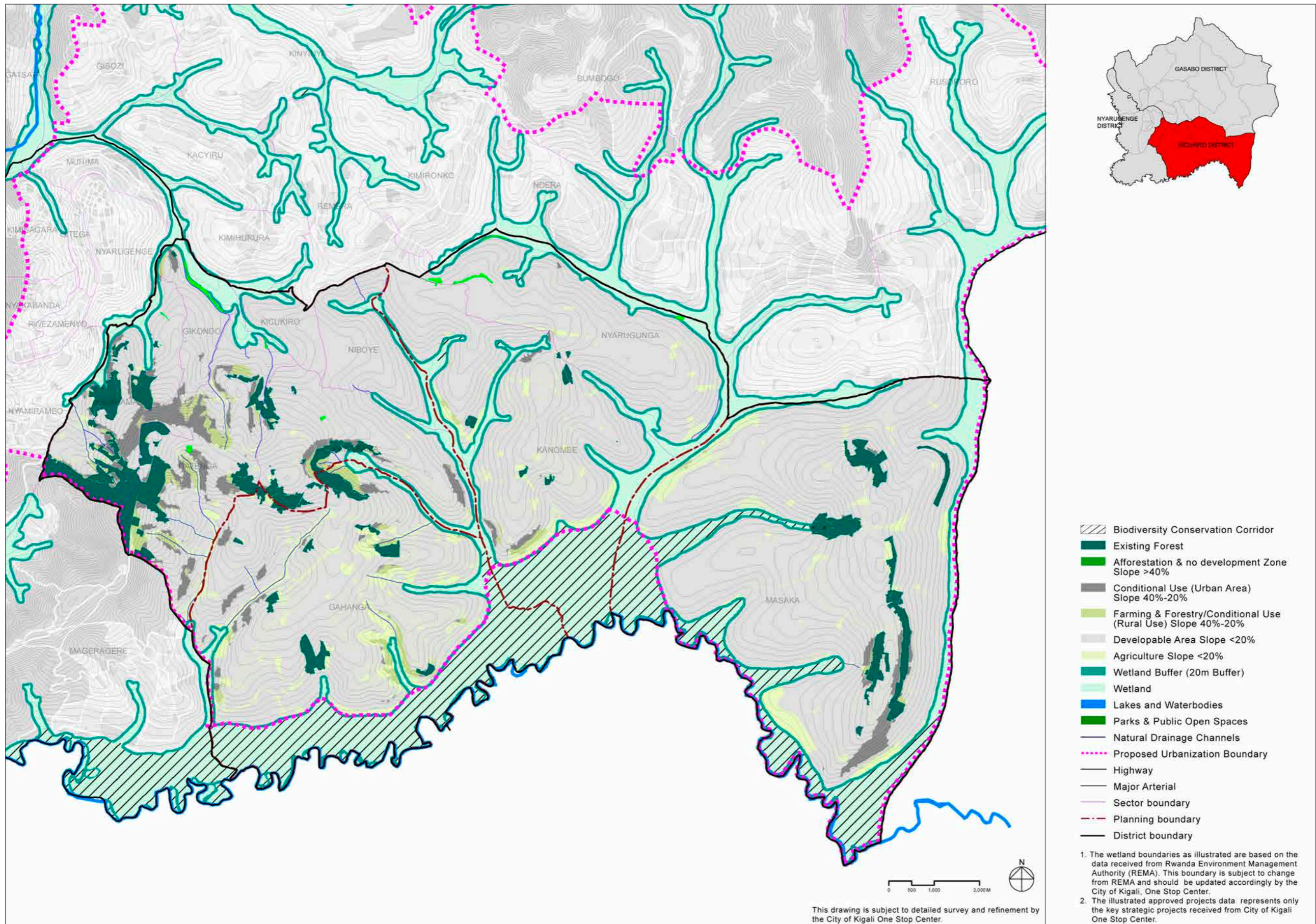


Fig.3.20 Kicukiro District - Environmental Strategies Plan - Year X

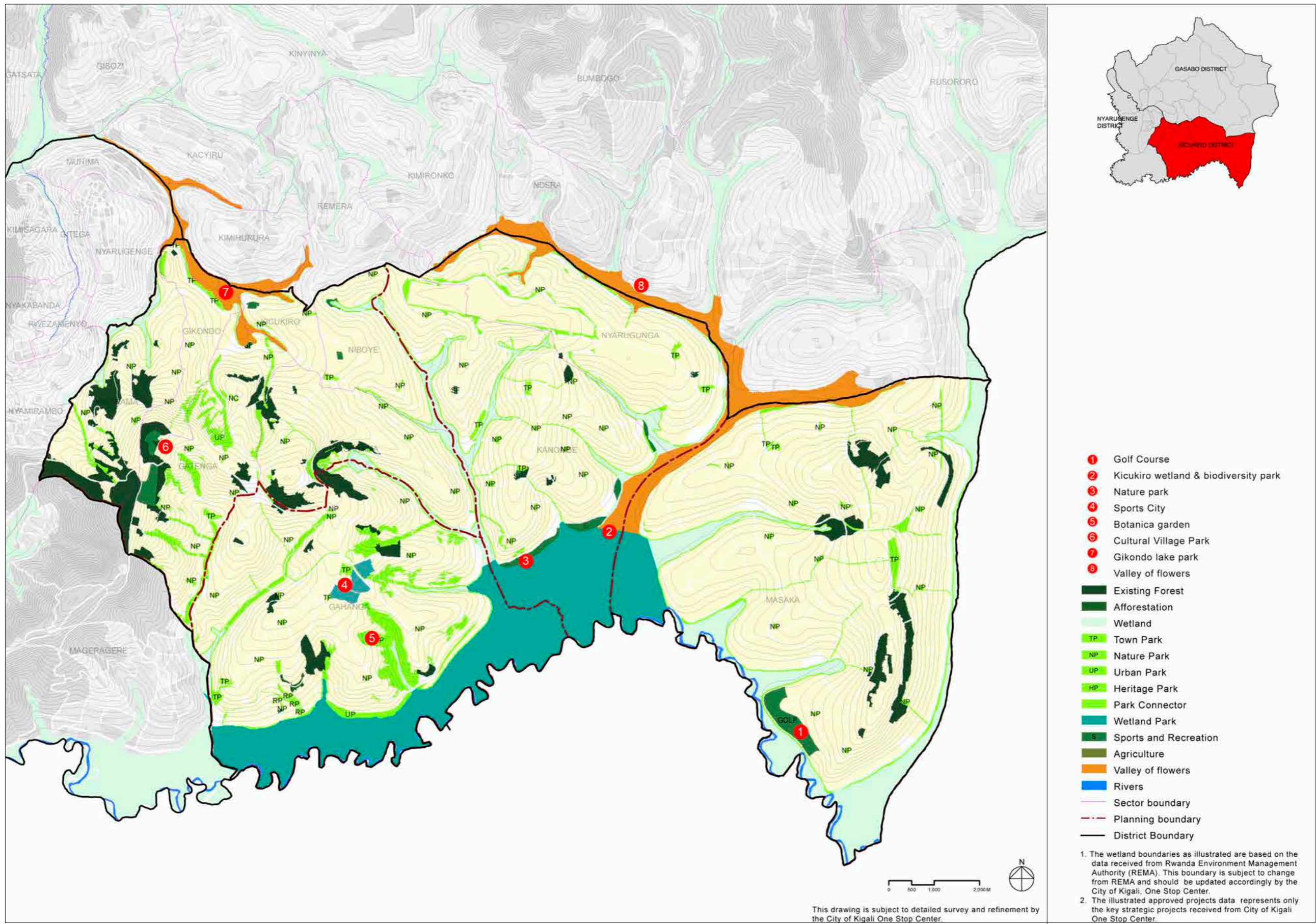


Fig.3.21 Kicukiro District - Proposed Green and Blue Attraction Plan Year X

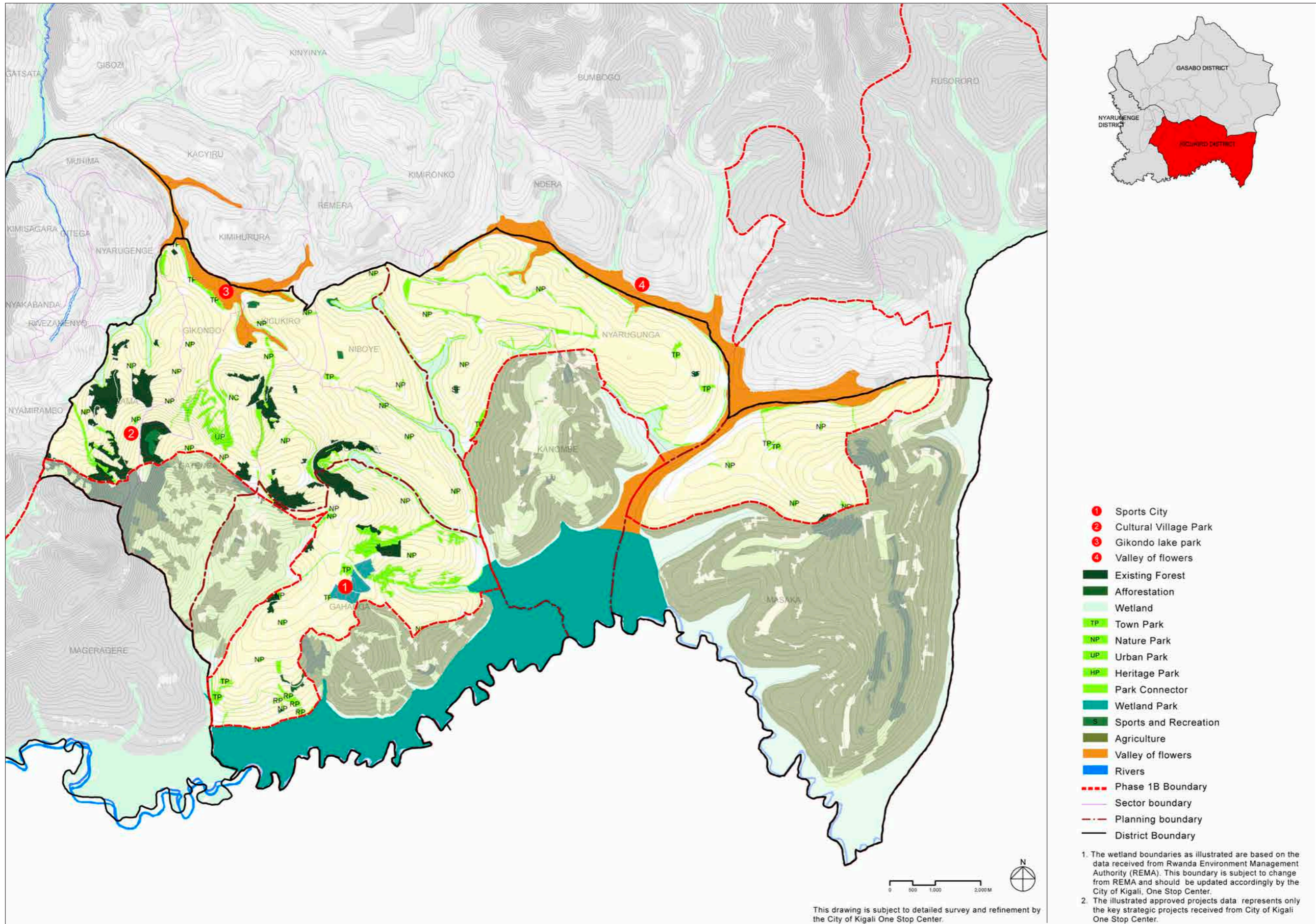


Fig.3.22 Kicukiro District - Proposed Environmental Strategies Plan - Year 2025

3.12 Proposed Transport Use Plan

The City of Kigali is well connected to other parts of Rwanda and beyond by a network of National Roads. The paved roads are mainly concentrated within the urban area and road network is not so extensive beyond these areas. Many of the major roads outside the main urban area follow the topography and are located primarily on ridges or in valleys. The unpaved roads are mostly of single carriage way without uniform side table and road furniture. Public transport is limited to mini buses, motor taxis and cycle taxis.

INTEGRATING TRANSPORT AND LAND USE PLANNING

Transport and land-use are inter-related to each other. Land-use planning which encourages urban sprawl encourages car reliance. Planning a compact city served by Public transport provides viable alternatives to using cars. Hence, land-use planning is critical in managing travel demand through the location of activity areas and providing for alternative transport choices. The planning of transportation for the City of Kigali is guided by the following planning considerations:

- Township organization - Compact, walkable neighbourhoods with easy access to daily necessities, schools, health care & recreation to achieve a high mode share of non- motorized transport (NMT)
- City organization - Promote green transport through Public Transit. Public Transit is run along high density corridors to connect to employment nodes & regional facilities and achieve a maximum 1 hour travel time within the City
- Maintain a high mode share of public transit
- Efficient management of private transport & parking in the City through clear hierarchy of road network.

3.12.1 PROPOSED TRANSPORTATION PLAN - YEAR X

KICUKIRO DISTRICT - ROAD NETWORK PLAN - YEAR X

The Road Network Plan - Year X, is an extensive city road network for the district as well as the city. It caters to the projected economic development while integrating the Land Use for a projected population of 5 mi. The plan proposes the following:

- To Utilize and upgrade the existing roads and alignments
- To expand the existing system and create a hierarchy of road network.

A clear hierarchy of the City Road Network ensures smooth distribution of traffic and efficient connectivity. The structure plan from the City Master Plan proposes 'a ring and radial system of highways with inner ring containing the City Fringe areas & other ring for heavy vehicle movement between industrial clusters. The City is proposed to be served by the following major road types:

EXPRESSWAY - Expressways connect the three districts of the city and also serve as bypass roads (to bypass the city traffic when travelling long distances). They are generally located along the low lying areas (outside the wetland buffer) at 3 km to 4 km spacing. Approximately a 70 km long network of expressway are to be developed in Kicukiro district by Year X.

MAJOR ARTERIAL AND MINOR ARTERIAL - A network of Arterials connect the various sectors of the district. Most of the public transport system are proposed to run along the major arterials. These are mostly provided at spacing interval of 800-1000 m, forming a grid of roads in the district. Approximately, about 300 km arterial road network is proposed in Kicukiro District by the Year X.

COLLECTOR (22 M) -Most developments are not allowed to have direct access from arterial roads and are filtered in through collector roads. Collector roads are mostly provided in residential areas of the district. A collector network of approximately 235 km length is proposed in Kicukiro District.

Refer to Fig.3.23 for Proposed Road classification and Fig.3.24 for Proposed Road sections in Kicukiro District.

3.12.2 KICUKIRO DISTRICT - ROAD NETWORK PLAN- YEAR 2025

The key developments in the Road Network Plan - 2025, are as follows:

- To continue expanding and upgrading the existing road network
- To Secure road reserves for future roads
- To Identify and develop key road linkages

Refer to Fig.3.26 for Kicukiro District-Proposed Road Network- 2025.

3.12.3 PUBLIC TRANSPORT PLAN

About 68% of the population in Kigali travel by public transport. The aim for the entire District is to achieve 70:30 ratio for Public: Private Transport with excellent quality. The proposed Public transportation modes are:

BUS RAPID TRANSIT : The proposed BRT network connects the townships with the CBD and employment nodes. It runs across the wetlands connecting the various town Centres, Neighbourhood Centres and Industrial estates.

MASS RAPID TRANSIT : The proposed MRT connects the major commercial, employment and industrial nodes to both CBD and the proposed New International Airport in Bugesera. The MRT network imposes great challenges in the District's

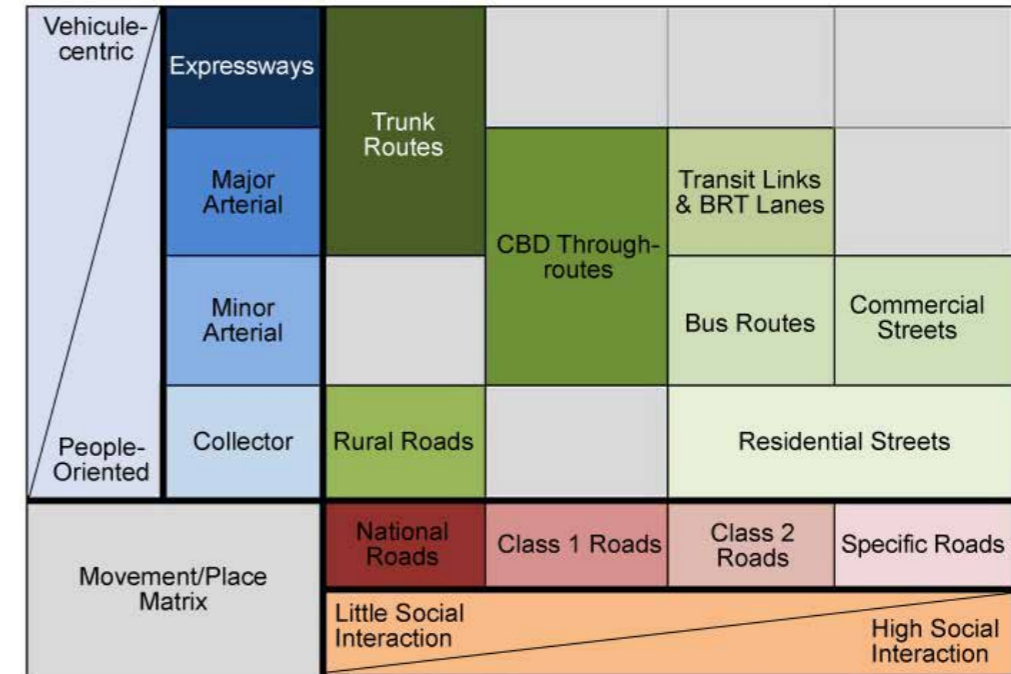


Fig.3.23 Road Type and Classification

Hilly terrain with steep slopes along the wetlands. Cutting across such level differences results in high infrastructure costs. Hence, the proposed MRT runs along the wetlands connecting all the Planning Areas. For the construction of MRT, the District needs to build the required catchment population. Hence the decision for MRT construction initiation rests on the economic and population growth achieved by the year 2025. The key proposals for Public Transport Plan are as follow:

- The BRT will be built initially in the district in phases.
- In future, once the catchment population is achieved a high capacity MRT will be developed. Both MRT and the BRT will serve the population of the district.
- Initially the BRT system and the normal bus services (trunk + feeder) serve the existing developments and future growth areas to serve the estimated population of 1.2 million by 2025.

- Two major BRT routes are proposed in Kicukiro District. One connecting the CBD at Muhima all the way to the industrial areas in Masaka sector while passing through all major commercial Centres. Another route is from the CBD at Muhima to the new proposed Regional Centre in Gahanga and further down to Nyarugunga District.
- BRT routes have stops approximately at every 600 m.
- One major MRT route is proposed in the Kicukiro District starting at the CBD in Muhima and running all the way to Masaka Regional Centre. The MRT diverts at Kigarama sector connecting the Gahanga Regional Centre to the new Proposed International Airport in Bugesera.
- The MRT stops are proposed at a Distance of approximately 1 km.

The Proposed Public Transport network for Kicukiro District is shown in Fig.3.27

NON - MOTORIZED TRANSPORT PLAN

Non motorized transport is an important part of the District's infrastructure to promote sustainable transport network. This also forms one of the most important recreational space in the entire city. The Non motorized transport is promoted at three levels.:

- **CITY LEVEL:** A seamless green network of pathways is proposed through cycle lanes and green connectors along some of the most scenic parts of the city. Originating from the CBD in Muhima, the green network connects the Regional Centres, the Fringe Centres, Town Centres and all the key Public nodes in the city.
- **PLANNING AREA LEVEL:** Similar to the city level green network, a second layer of green network connects the commercial nodes, civic facilities within townships. This promotes a non- motorized transport network through which people travel from one place to the another using sustainable transport like walking, bicycling, human powered vehicles etc.
- **OTHERS:** Additional linkages along wetlands in the form of wetland parks and promenades promote cycling and pedestrian connectivity. The proposed wetland buffer helps in a continuous green protected network.



Imagery- Cycling paths in Parks



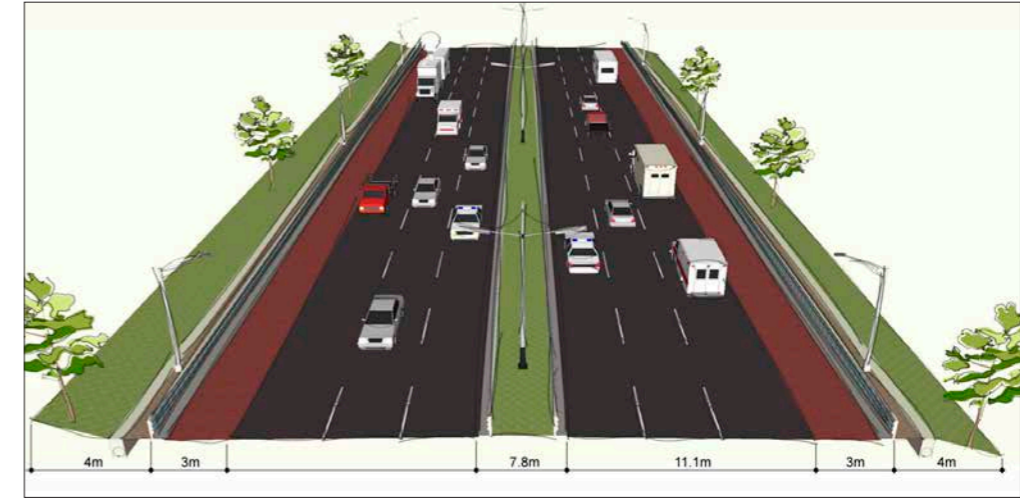
Imagery - Green Connectors

Strategies to promote NMT are:

- To construct a network of pedestrian footpaths along open green spaces which link to the footpaths along the roads in the District and within the townships.
- To promote bicycles by providing dedicated cycle lanes along major roads.
- Dedicated cycle lanes are also part of the BRT and MRT network.
- Neighbourhood commerce and amenities within townships are planned to promote the use non motorized means, through Neighbourhood Centres that are located within a walking distance of 500m.
- To make walking and cycling comfortable along all roads including local level roads within the neighbourhoods with plantations on both sides of the road.



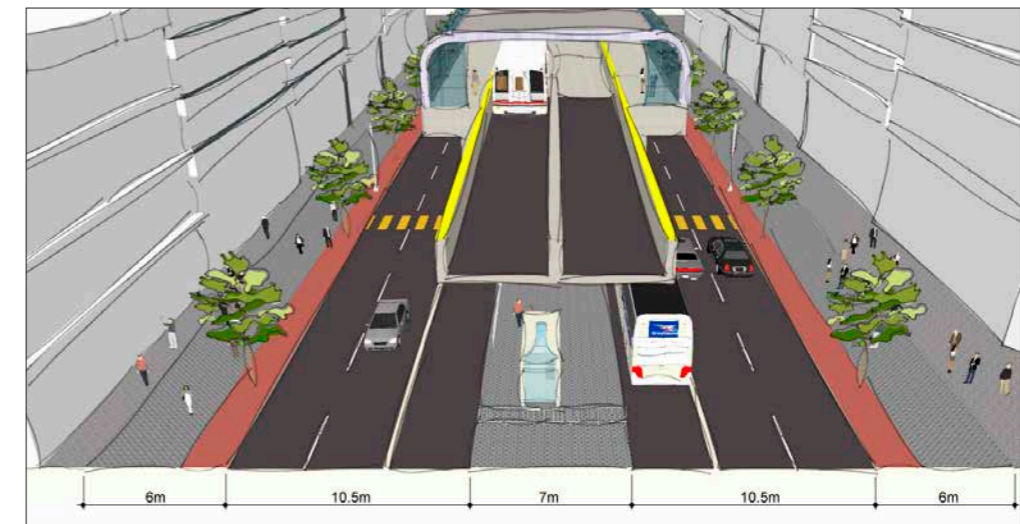
Imagery - Tree lined pedestrian paths in Residential areas



44 m - Expressway - Trunk Route

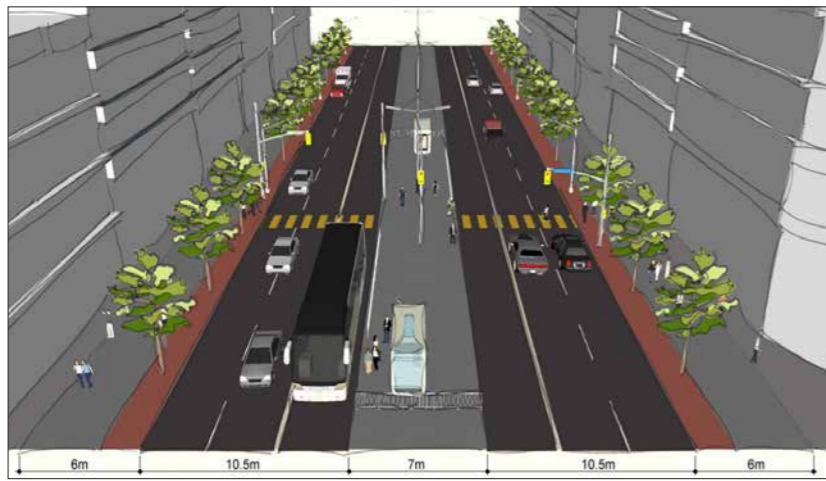


37m Major Arterial - Trunk Route

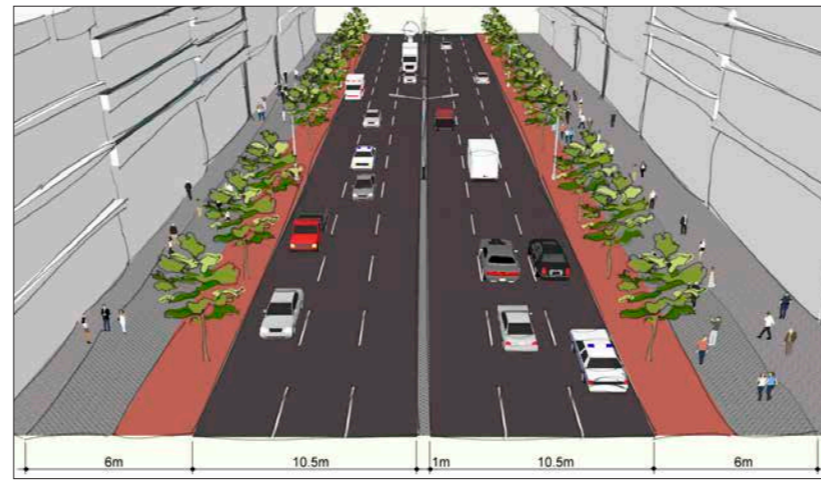


37 m - Major Arterial - MRT+ 2 lane

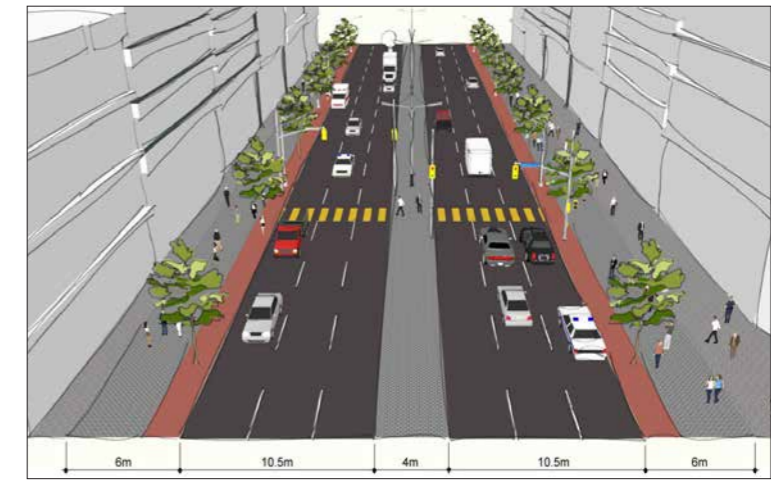
Fig.3.24 Kicukiro District - Proposed Road Sections



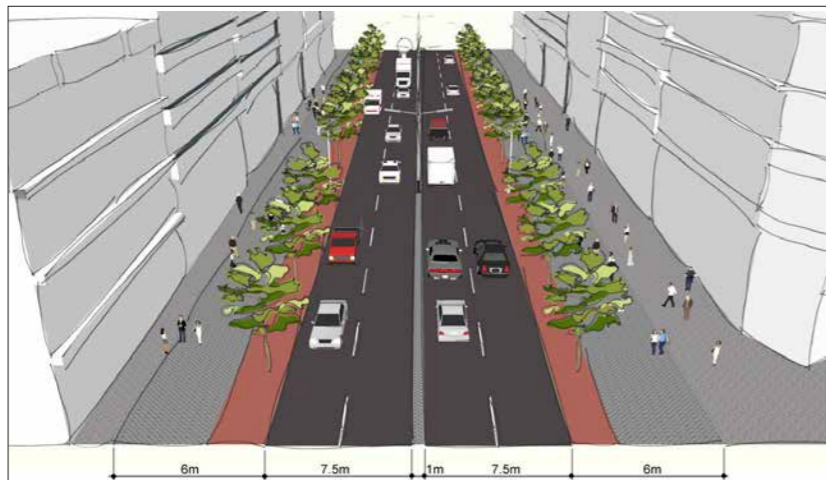
37 m - Major Arterial - BRT+ 2 lane



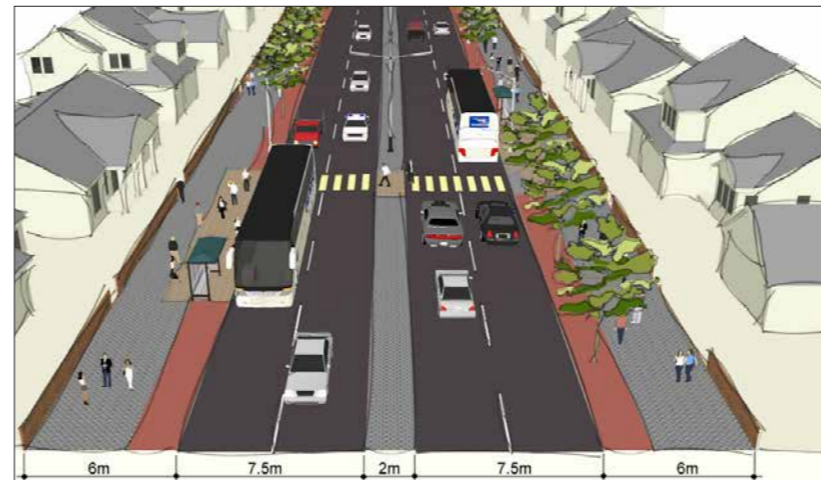
37 m - Major Arterial - CBD Road



37 m - Major Arterial - 3 lane



29 m - Minor Arterial - CBD Road



29 m - Minor Arterial - Bus Routes



Typical Split Road Section in City Area along Steep slopes



29 m - Minor Arterial - Commercial Road



22 m - Collector Road - Residential Street



Typical Split Road Section in Rural Areas

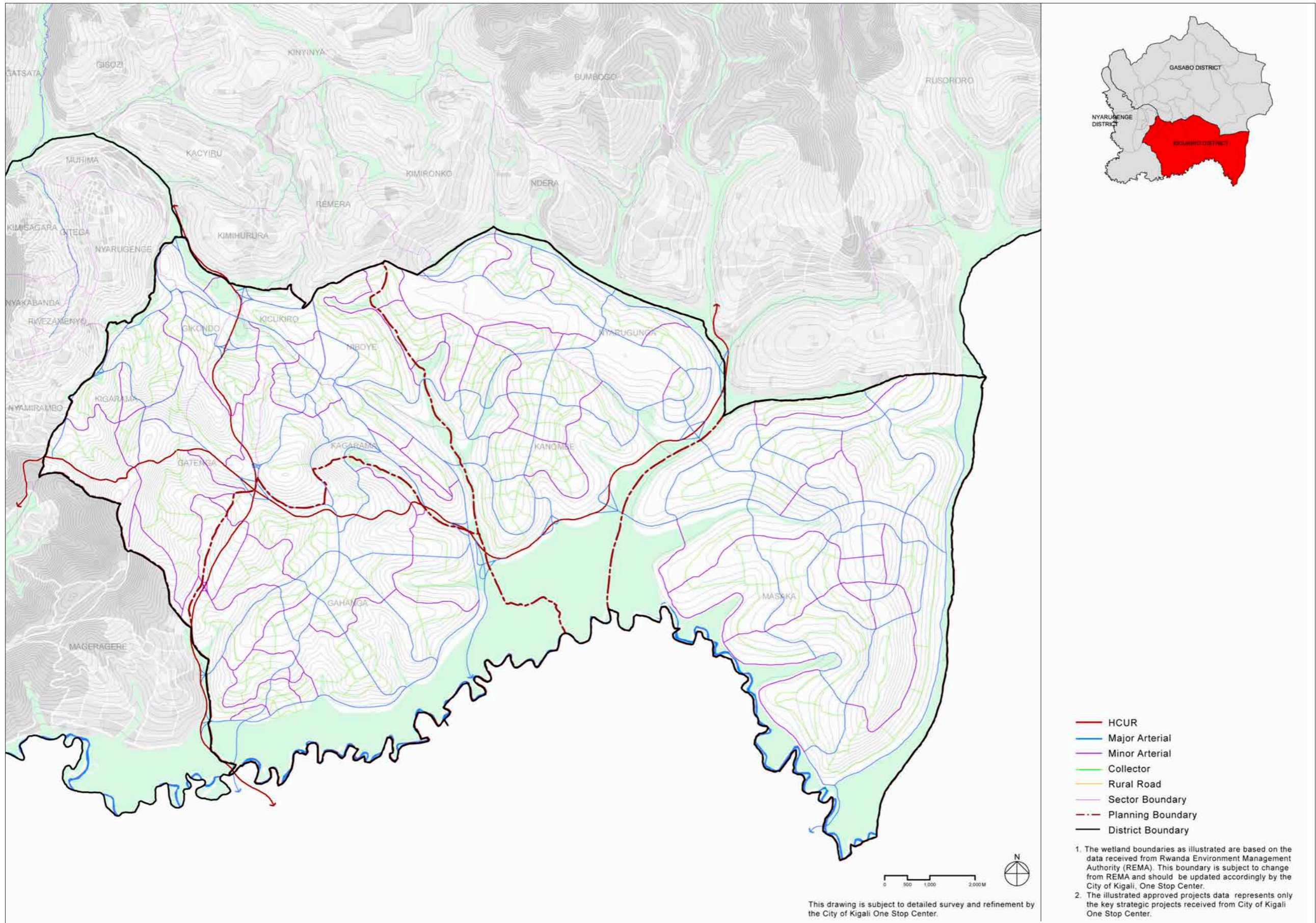


Fig.3.25 Kicukiro District - Proposed Road Network -Year X

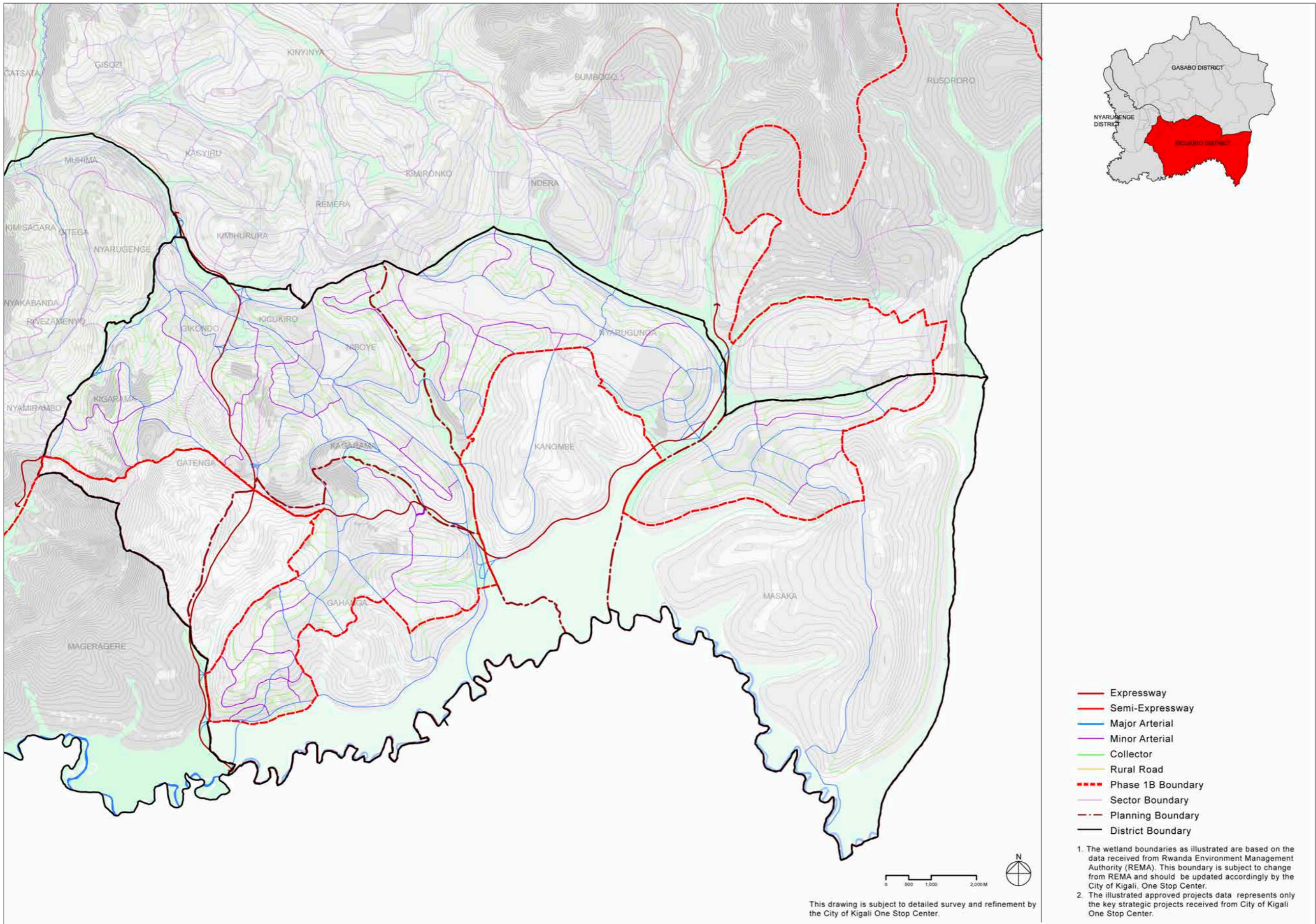


Fig.3.26 Kicukiro District - Proposed Road Network - Year 2025

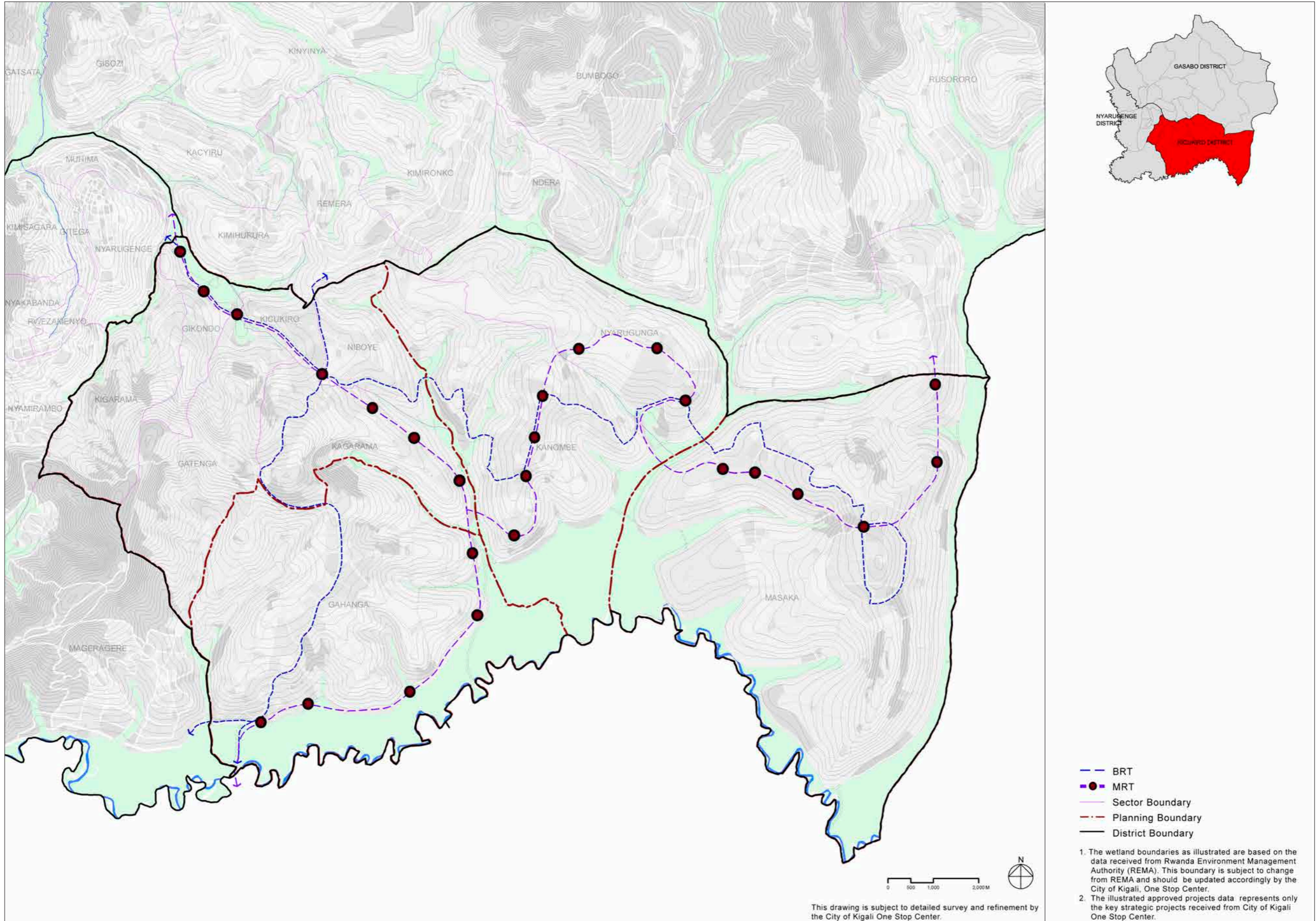


Fig.3.27 Kicukiro District - Proposed Public Transport - Year X

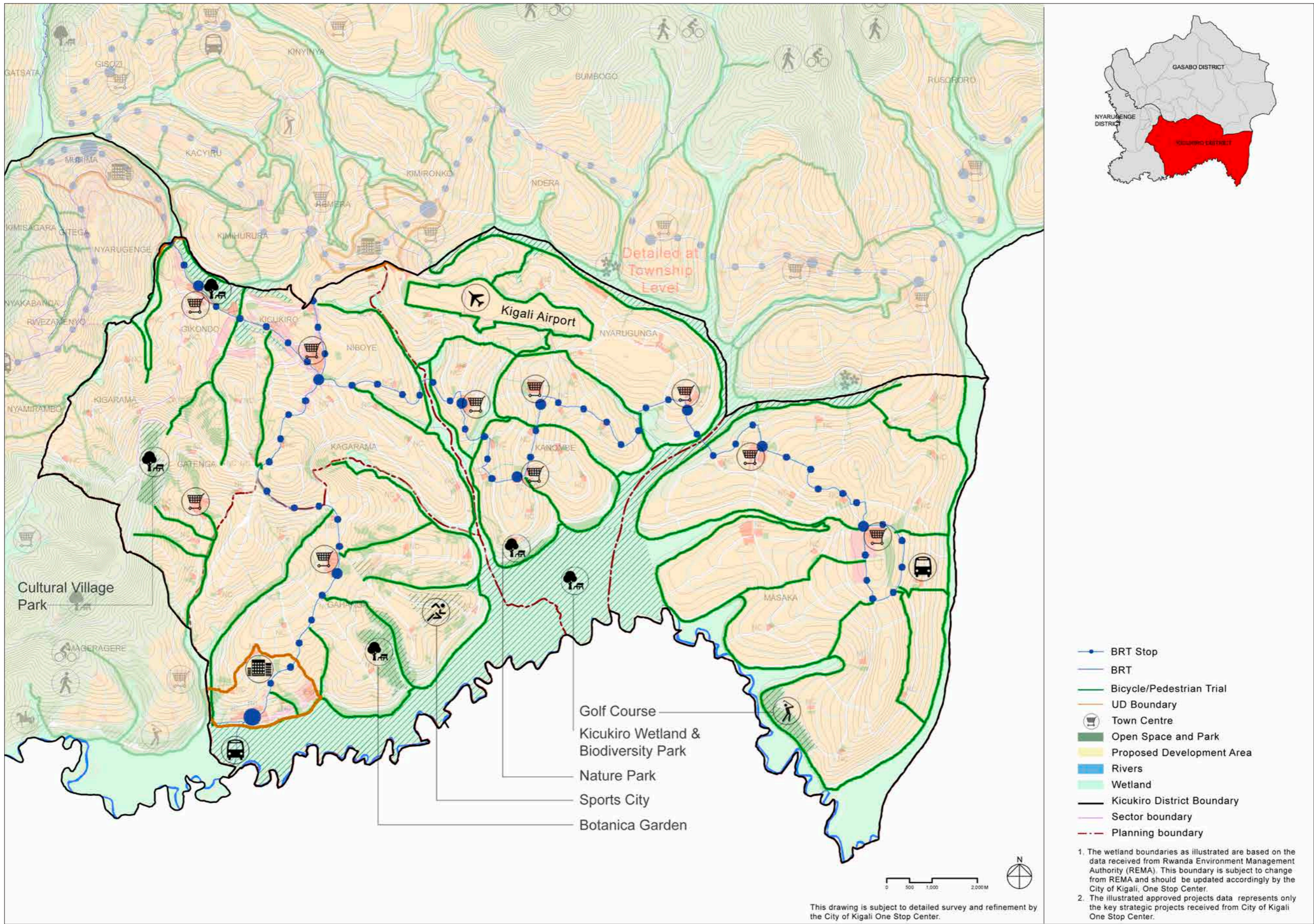


Fig.3.28 Proposed Non Motorized Transport



Fig.3.29 Existing Water Source Map

3.13 Water Supply Plan

3.13.1 EXISTING CONDITION

WATER SOURCE

Water supply for Kicukiro District comes from three Water Treatment Plants (WTP). They are Nyabarongo, Kimisagara and Karengwe WTP. Raw water sources include Nyabarongo River, Yanze River and Lake Mugesera respectively (refer to Fig.3.29). The three WTPs have combined a daily treatment capacity of 59,000 cu. m that is shared among three districts in City of Kigali.

WATER DISTRIBUTION SYSTEM

The western side of the District is serviced by Nyabarongo and Kimisagara WTP while eastern side of the District is serviced by the Karengwe WTP.

Potable water supply from the 3 WTP's is stored at various water storage facilities within the District. It is distributed through EWSA's piped water network to residents. Pumping stations are in place to maintain optimum pressure within the water network.

The water supply network expansion is planned and carried out by EWSA based on the demand from the users. New users will have to apply directly to EWSA and pay for water connection.

The existing piped water network covers most of the built-up area in the northern side of the District such as Gikondo, Rubirizi and Kabeza. Connections to households are available for residents in these areas. Towards the southern side, residents get water from public tap stands.

The average distance from the residential areas to public stands is about 280 m. The city-wide goal is to increase the number of tap stands so as to shorten the walking distance to 250 m.

WATER CONSUMPTION

The extensive water network and the existence of public facilities and newer residential developments in the urban area encourage higher water consumption. Water consumption in larger homes, office buildings and tourism facilities could reach as high as 200 lpcd (litre per capita per day). Residents at informal neighbourhoods with no access to indoor plumbing have lower water consumption that ranges from 15 - 25 lpcd.

3.13.2 ESTIMATED WATER DEMAND

The planning horizon to develop water supply was split into two Land Use Plans, for Year 2025 and Year X. Different water demand unit rates were used for rural, urban and industrial areas.

The water demand for rural areas is proposed to be in line with City-wide goal to supply 80 lpcd of potable water to residents.

The water demand for the urban areas is significantly higher to cater to the District's projected growth in the future. In the long run, as the District develops into various townships, standard of living is expected to rise significantly. Water demand was assumed to rise to 120 lpcd. This is still relatively lower than the average water consumption of other urban cities such as Singapore, Cape Town, Amsterdam and Melbourne (refer to Table 3.11). This

relatively lower rate is adopted based on the assumption that substantial water demand management strategies will be implemented as the District is develops. For planning purposes, water demand for industrial areas is proposed to be 10 cu. m/ha.d as a general guide.

The water demand unit rate in Table 3.12 is used to estimate the District's future water demand in the Year 2025 and Year X (refer to Table 3.13).

3.13.3 PROPOSED WATER SUPPLY PLAN

POTENTIAL WATER SOURCE

The combined capacity of the WTPs of 59,000 cu. m/d is far behind the District's future demand of 153,425 and 280,597 cu. m/d. To overcome this deficit, new water resources must be identified and existing WTPs have to be expanded to augment the water supply.

The City of Kigali is currently planning to abstract 120,000 cu. m of spring water daily from Mutobo, Muzanse District by 2017. Beside this, There have been plans to upgrade the daily treatment capacity of Nyabarongo WTP to 40,000 cu. m. While the combined supply would be able to meet the City's future water demand in short term, it would not be sufficient to meet the future water demand in the Kicukiro District. It is also not recommended to continue depending on Nyabarongo WTP for future water supply as Nyarugenge District would also be heavily dependent on it.

Taking into account the Nyabarongo WTP expansion plan and Mutobo spring water abstraction plan, there would be 194,000 cu.m/d of potable water supplied to the City by 2025. (Refer to z)

While new water resource is usually decided at a national level, the District could start working with the City or service providers to explore the nearest big water bodies to the District, which is Lake Mugesera. The 4 m deep lake has surface area of 42 sq km which provides potential of 169 mi cu. m of raw water. Kareng WTP has been drawing and treating water from Lake Mugesera at capacity of 12,000 cu. m daily. To cater for future water demand, Kareng WTP capacity need to be upgraded.

Water from Kareng WTP would mainly supply Kicukiro District, except for Townships K1 and K3. These two townships will be supplied water from the existing water network (Nyabarongo WTP or future Mutobo spring water) as they fall within it's coverage. Through the exclusion of K1 and K3, Kareng WTP would require an additional capacity of 90,000 and 220,000 cu. m/d by 2025 and 2040 (after taking into consideration 10% less unaccounted-water). It is recommended to carry out yield and feasibility study on Lake Mugesera immediately to catch up with the growing water demand.

WATER DISTRIBUTION SYSTEM

The District would be expecting a growth of eleven townships and one industrial zone by Year X. It is very crucial to support the growth of urban fabric with 100% access to piped water.

Currently, the District is not entirely connected to the existing water supply network, due to low demand. While it is slowly upgrading Kareng WTP and building

Table 3.11 Water Demand Unit Rate Comparison

CITY	SINGAPORE	CAPE TOWN	AMSTERDAM	MELBOURNE	KIGALI
WATER DEMAND (LPCD)	155	225	147	142	120

up the connecting water infrastructure, townships that are within the coverage of the existing water supply network should connect to it for short term supply. The future upgraded Kareng WTP would be proposed to supply water to all townships excluding townships K1 and K3. A water transmission line would be proposed to distribute water to future service reservoirs from the WTP (refer to Fig.3.30 and Fig.3.31).

All the service reservoirs need to be sized for 1-day demand to ensure that there would be water supply for the townships even if there is any disruption to the network. The service reservoirs would be built on high ground within each township to provide minimum water pressure of 3-4 bars to supply to the household.

Various plots within the townships shall be reserved for construction of future service reservoirs (refer to Fig.3.30 and Fig.3.31). It is assumed that each service reservoir would have maximum capacity of 5,000 m³/d, each township would be served by 2-11 service reservoirs.

WATER DEMAND MANAGMENT

Besides augmenting the water supply, it is advisable to manage the water demand from the household level to township level. At the household level, installing water saving devices would help reduce the water use. To encourage citizens to install water saving devices, the District could subsidize the cost of water saving devices or give water bill rebates.

Table 3.12 Water Demand Unit Rate

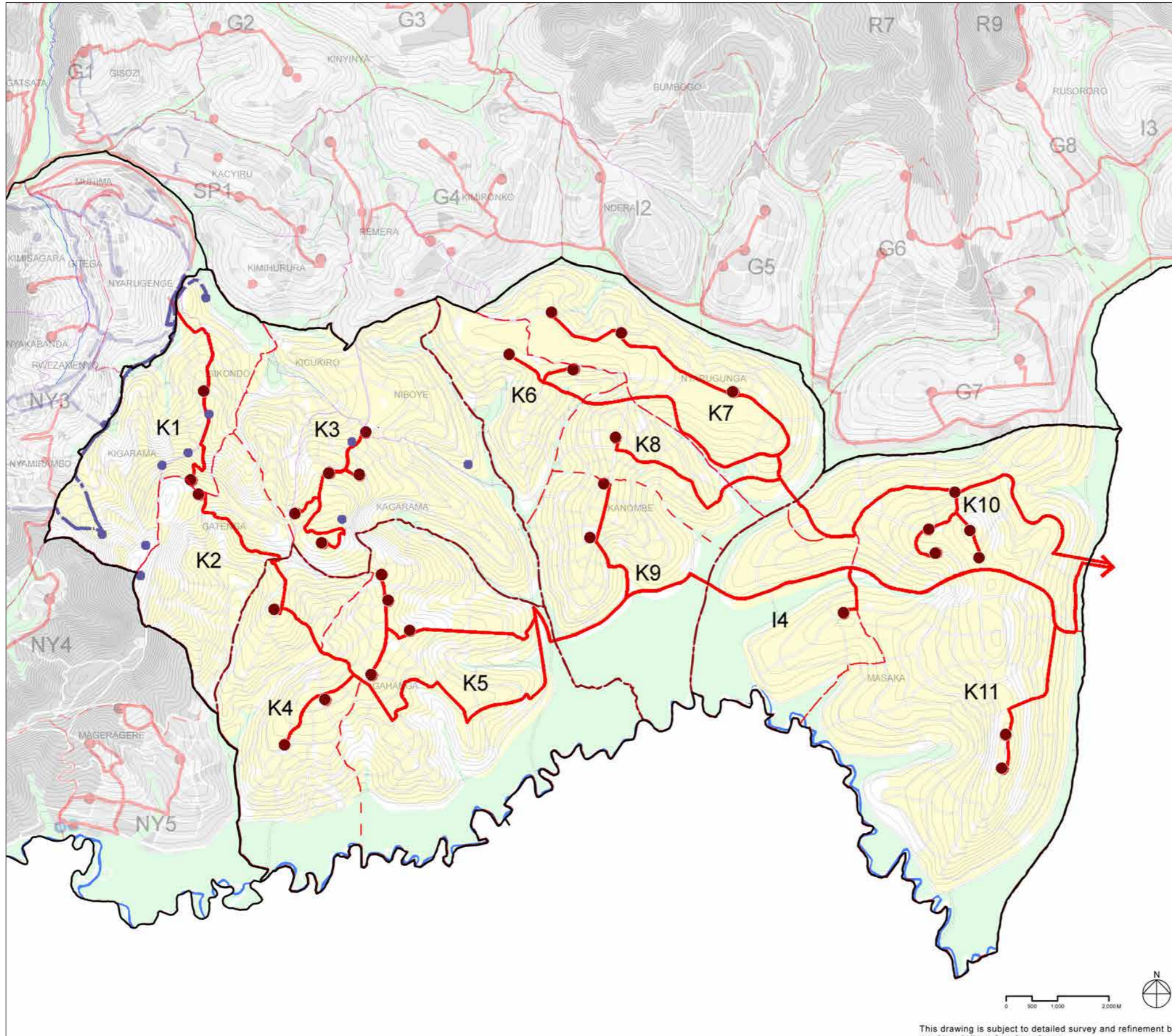
LAND USE	WATER DEMAND UNIT RATE
RURAL AREA	80 LPCD
TOWNSHIP	120 LPCD
INDUSTRIAL	10 CU. M/HA.D

Table 3.13 Projected Water Demand for Year 2025 and 2040

LAND USE	YEAR 2025 (CU. M/D)			YEAR X (CU. M/D)		
	TOWNSHIP	RURAL	INDUSTRIAL	TOWNSHIP	RURAL	INDUSTRIAL
KT1	14,118	-	-	16,010	-	-
KT2	2,030	-	-	9,690	-	-
KT3	48,051	-	-	54,164	-	-
KT4	21,055	-	-	28,682	-	-
KT5	22,173	-	-	33,526	-	-
KT6	9,251	-	-	10,428	-	-
KT7	13,699	-	-	15,357	-	-
KT8	1,705	-	-	12,389	-	-
KT9	2,164	-	-	19,046	-	-
KT10	11,894	-	-	31,105	-	-
KT11	4,740	-	-	44,105	-	-
I4	-	-	2,545	-	-	6,095
TOTAL	150,880	-	2,545	274,502	-	6,095
GRAND TOTAL	153,425			280,597		

Table 3.14 Planned Water Supply for City of Kigali

WTP	WATER SOURCE	EXISTING SUPPLY (M ³ /D)	PLANNED SUPPLY BY 2025 (M ³ /D)
KIMISAGARA	YANZE RIVER	22,000	-
NYABARONGO	NYABARONGO RIVER	25,000	15,000 (ADDITIONAL)
KARENGE	LAKE MUGESERA	12,000	-
-	MUTOBO SPRING	-	120,000
TOTAL		59,000	135,000
GRAND TOTAL		194,000	



- Existing Water Tank
- Existing Water Transmission Pipeline
- Proposed Water Transmission Pipeline
- Proposed Raw Water Intake Pipeline
- Proposed Service Reservoir
- Proposed Raw Water Intake Structure
- Proposed Slow Sand Filtration
- Proposed Development Area
- Wetland
- - - Township Boundary
- - - Sector boundary
- - - Planning boundary
- District Boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

Fig.3.30 Kicukiro District - Proposed Water Supply Plan - Year X

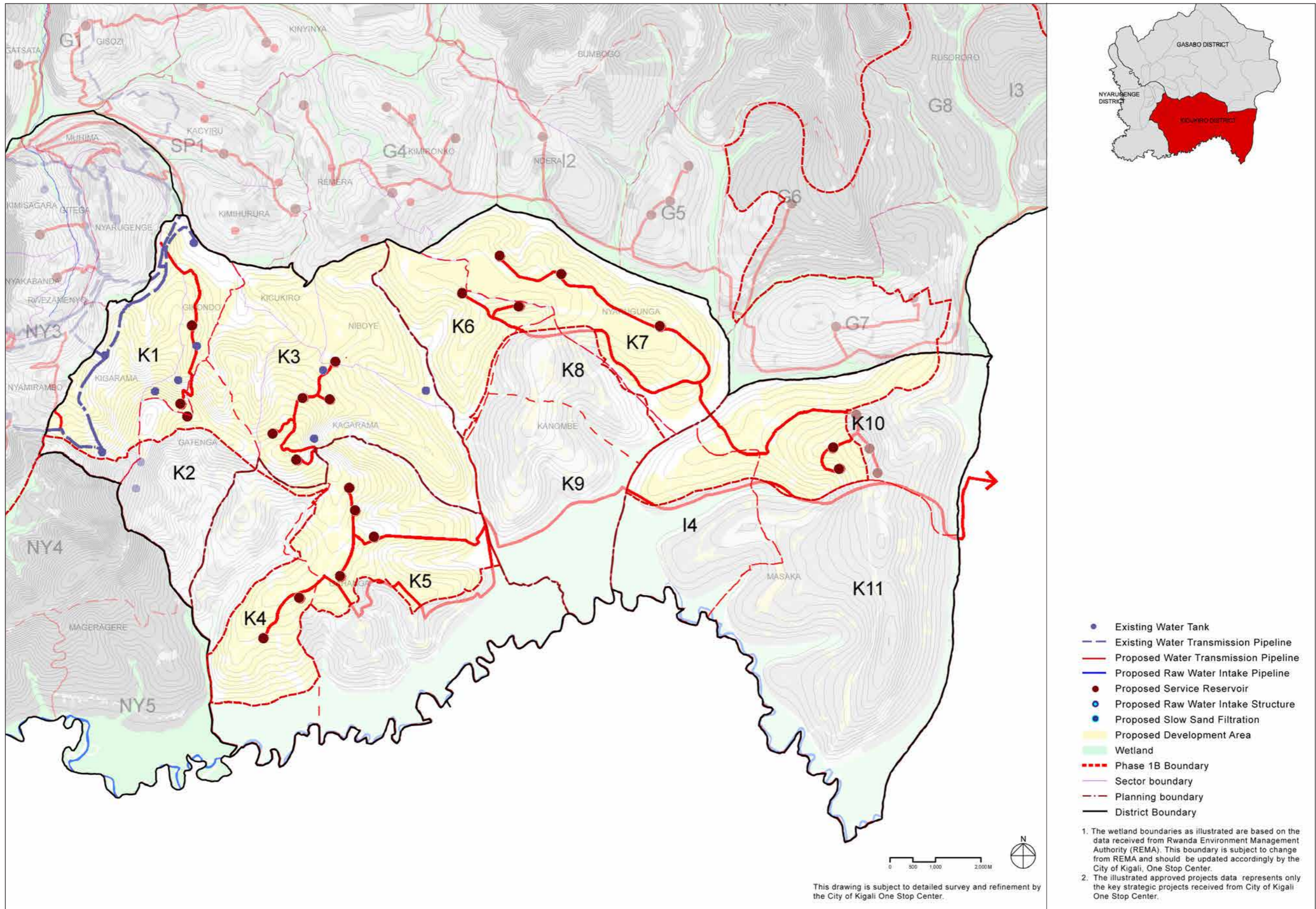


Fig.3.31 Kicukiro District - Proposed Water Supply Plan - Year 2025

At the township level, the District should examine using alternative water sources such as rainwater harvesting or treat effluents from STPs for non-potable uses such as irrigation, cleaning and other industrial uses. These strategies, if implemented properly, would be able to reduce the dependence on the potable water by 10 – 20%.

3.14 Sewerage Plan

3.14.1 EXISTING CONDITIONS

Currently, there is no sanitary sewer network or centralized sewage treatment plant (STP) in the Kicukiro District. 2 main domestic sanitation systems that are widely used are:

- Septic Tanks – Septic tanks are widely used in the urban areas. Effluence from the septic tank is directed into leech fields. The City operates 3 pumpers to handle and dispose sludge from the septic tanks in the landfill at Nyanza.
- Pit latrines – Traditional soak-away pit latrines and ventilated pit latrines are the most common types. Pit latrines are commonly used in informal settlements and rural areas without piped water supply. In some areas with high ground water table, the use of pit latrines has been found to contaminate the ground water.

EcoSan (Ecological Sanitation) toilet has been implemented in several public schools in the District. It provides an economical and hygienically safe system that separates and recycles urine and faeces back into the environment through agriculture.

The funding for the EcoSan construction comes from the NGO (Non Government Organization) while the District Office provides the man power required. The long

term goal is to equip all the public school in the City with EcoSan.

3.14.2 PROJECTED SEWAGE GENERATION

Future sewage flow is estimated based on the assumption that 80% of the water consumption will be collected as sewage. Table 3.15 lists the projected sewage flow for Kicukiro District in Year 2025 and Year X.

3.14.3 PROPOSED SEWERAGE PLAN

PHASING OUT OF PIT LATRINES

The use of pit latrines is to be phased out gradually by 2025 as there would be no more rural areas in the District. Continual usage of pit latrines may cause groundwater contamination if not properly maintained, especially in areas with high water table.

SEWAGE TREATMENT PLANT

The sewerage network would be connected to individual houses to collect the sewage and convey it to a designated Sewage Treatment Plant (STP) for treatment. Treated sewage effluence would be further refined in the constructed wetland before finally being discharged into the receiving water bodies in order to maintain the water quality of the water bodies.

Due to undulating topography, Decentralised STPs would be proposed for townships in Kicukiro District. Numerous hills and mountains that separate the proposed townships make it uneconomical to collect all the sewage and channel to a centralized STP as extensive pumping will be required.

The number of STPs within each township would depend on the terrain, Land Use and estimated sewage flow. In general, each township would be served by at 1-3 STPs.

Various treatment methods, such as membrane bioreactors, activated sludge systems and Constructed wetlands can be employed depending on the requirements.

Treated sewage effluence from the STP shall be discharged into constructed wetlands for further refinement before final discharge into the water bodies or wetlands. The effluence from constructed wetland could be reused for non-potable use such as irrigation, washing, industrial use, etc. It would help to reduce the potable water demand from the municipal water network.

ENVIRONMENTAL TREATMENT ZONE

Each decentralised STP would be housed inside an Environmental Treatment Zone (ETZ). ETZ is an integrated waste management concept adapted from the Kigali City Master Plan (KCMP) report. It will have an STP, a constructed wetland and a solid waste management facility (refer to Fig.3.32). The concept of ETZ is to isolate and treat all the unwanted waste in the contained, remote location so as to minimize contact between the residents and waste.

Every ETZ does not necessarily have to include all the above mentioned elements. However STPs and constructed wetland are the basic elements which will be present within each ETZ. The decision on which solid waste facility, if any, to be included in each ETZ will depend on the actual type of waste generated by the area contributing to it.

All the townships within the District are partially surrounded by wetlands with road access and sufficient green buffer which provides suitable environment to build an ETZ.

Table 3.15 Projected Sewage Flow for Year 2025 and Year X

LAND USE	YEAR 2025 (M ³ /D)			YEAR 2040 (M ³ /D)		
	TOWNSHIP	RURAL	INDUSTRIAL	TOWNSHIP	RURAL	INDUSTRIAL
KT1	11,295	-	-	12,808	-	-
KT2	1,624	-	-	7,752	-	-
KT3	38,441	-	-	43,331	-	-
KT4	16,844	-	-	22,946	-	-
KT5	17,738	-	-	26,821	-	-
KT6	7,401	-	-	8,342	-	-
KT7	10,959	-	-	12,286	-	-
KT8	1,364	-	-	9,911	-	-
KT9	1,731	-	-	15,237	-	-
KT10	9,516	-	-	24,884	-	-
KT11	3,792	-	-	35,284	-	-
I4	-	470	1,566	-	-	4,876
TOTAL	120,704	470	1,566	219,601	-	4,876
GRAND TOTAL	122,740			224,477		

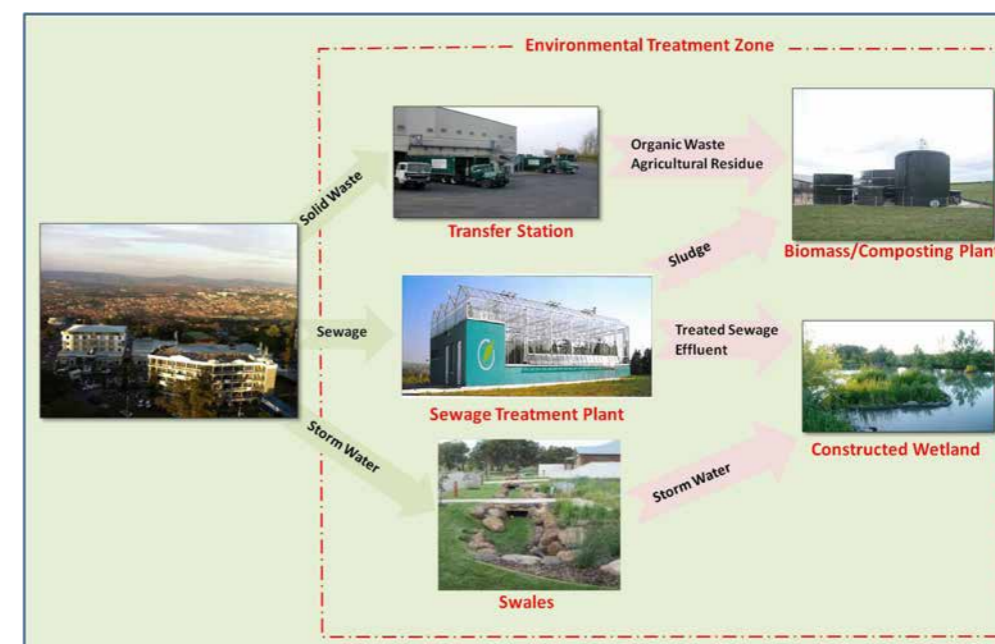


Fig.3.32 ETZ Process Flow Diagram

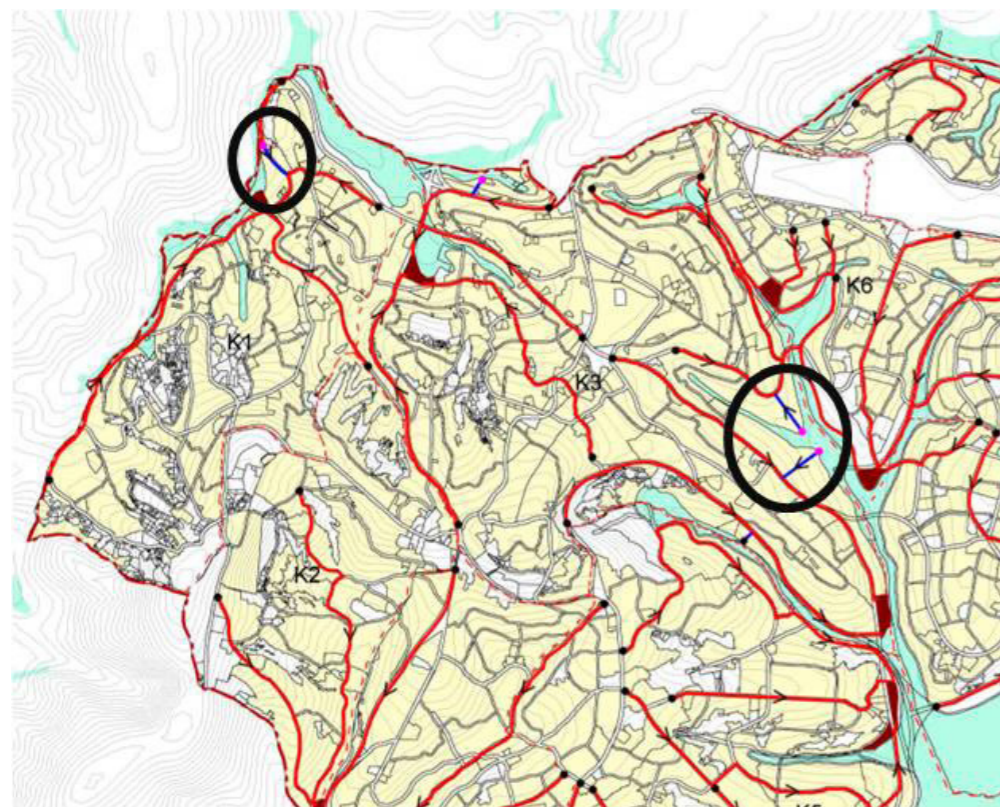


Fig.3.34 Areas that Require Pumping

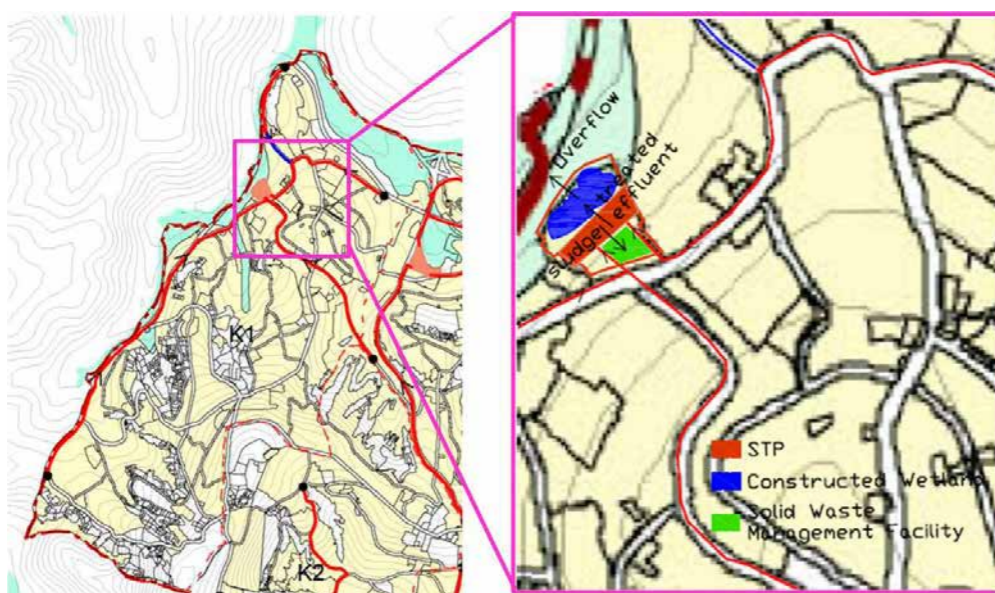


Fig.3.35 Typical ETZ Configuration

PROPOSED SEWERAGE NETWORK

Refer to Fig.3.37 and Fig.3.36 for the proposed main sewer alignment and ETZ locations for the Kicukiro District for Year 2025 and Year X.

The ETZ construction would be split based on two time frames, year 2025 and Year X. Some townships are expected to grow faster than others by 2025, therefore the ETZ's in these areas need to be constructed earlier. As population grows gradually, proposed facilities within the ETZ, such as STP and constructed wetland, can be constructed in phases. However sufficient land areas need to be reserved to cater for future demands.

A total of 9 ETZs, located in K1, K3, K4, K5, K6, K7, K8 and K10 would be built by 2025. The remaining 8 would be completed by Year X.

Two townships may share one STP depending on the existing topography, the amount of sewage flow and the proximity of the neighbouring township's ETZ. An example of such arrangement is the STP at the south of Township K6. This will treat sewage flow from half of K6 by Year 2025. It will also be treating additional sewage flow from K8 and K9 by Year X. Sufficient land must be reserved within the ETZ of K6, for future STP expansion.

Localized sewage pumping station may be required for developments that are located at low lying areas that are lower than the public sewer line (refer to Fig.3.36 and Fig.3.37). Example of these areas are small residential pockets at K1 and K3 (refer to Fig.3.34).

To get a clearer idea of how the various components within an ETZ could be arranged, township K1 has been selected as an example. ETZ location depends mainly

on the required STP location.

There is one sewerage catchment within K1. It is projected to generate 11,295 and 12,808 m³/d of sewage in 2025 and 2040. All the sewage would be collected by gravity in north-east of K1. The STP would be built here by 2025 Since there is no large increment in the sewage flow generation between 2025 and Year X, the STP could be designed based on its ultimate capacity of 12,808 m³/d .

A Constructed wetland is located at the lower elevation of the STP which is nearer to the natural wetlands for final discharge. The location is chosen due to its gentle slope. A solid waste facility is proposed next to the STP as it is nearer the main road for waste collection vehicle access. The blow up configuration of the ETZ is shown in Fig.3.35.

As I4 zone consists of Light Industry, there is no ETZ provision for this zone. It is not recommended to mix and treat all the industrial waste water in one STP as every industry would generate waste water with specific characteristics. It is proposed that every future industrial user construct and operate its own on site industrial waste water treatment plant within its plot of land before discharging it into the water bodies.



Fig.3.33 Compartment to Separate Human Waste in EcoSan

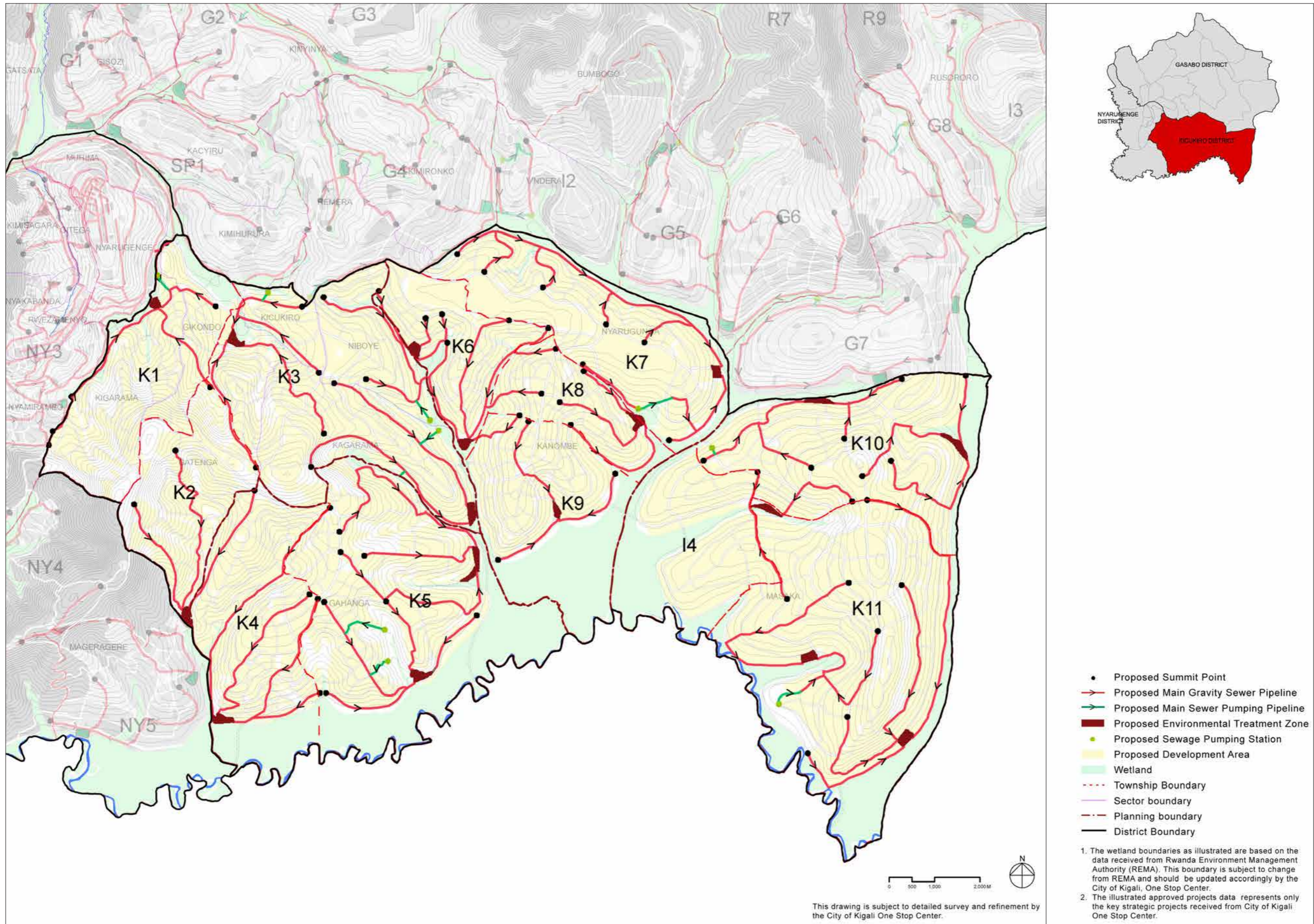


Fig.3.36 Kicukiro District - Proposed Sewerage Plan - Year X

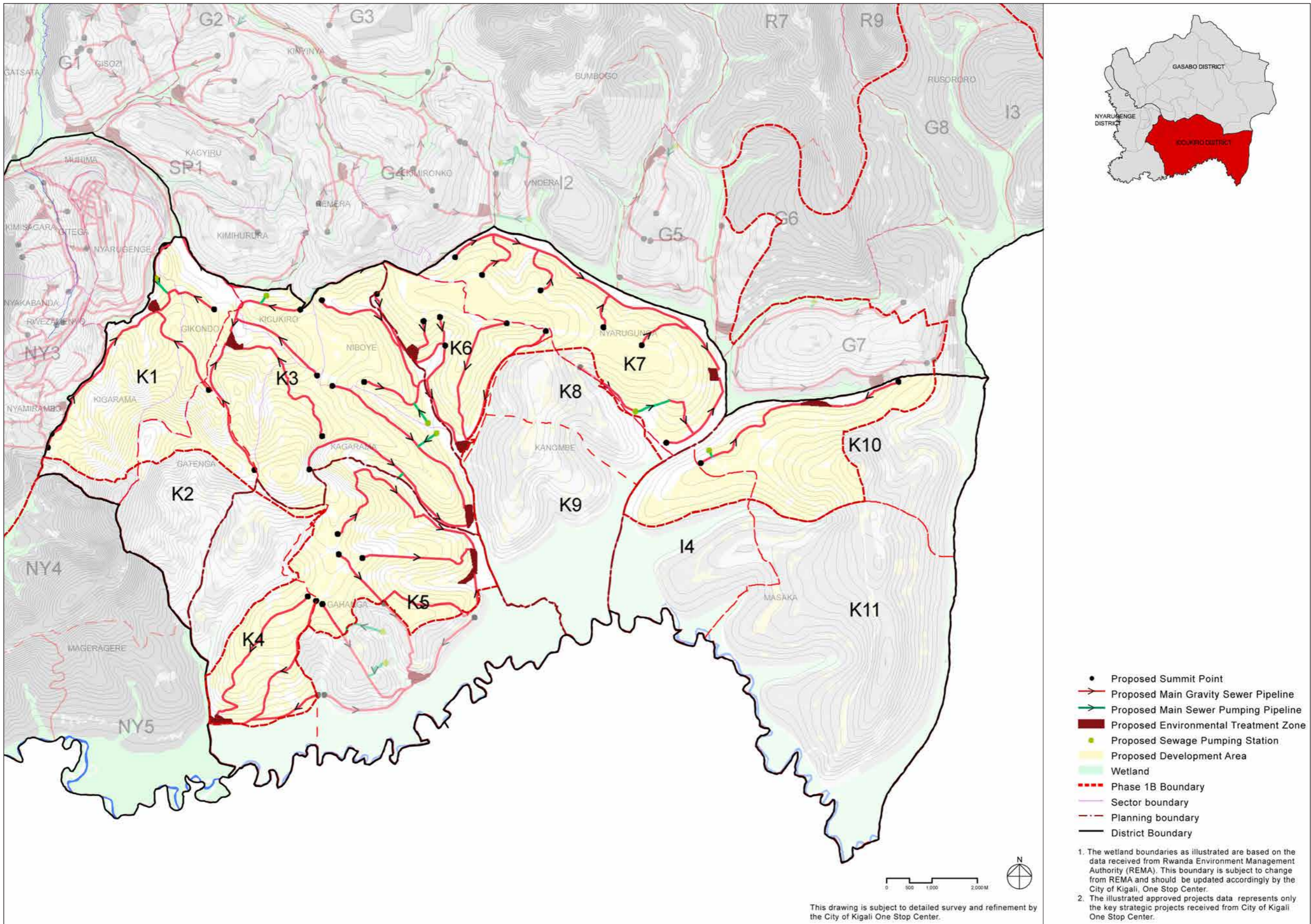


Fig.3.37 Kicukiro District - Proposed Sewerage Plan - Year 2025

3.15 Drainage Plan

3.15.1 EXISTING CONDITIONS

The City of Kigali has an annual rainfall of 1,000 mm with April being the wettest month and July the driest.

The existing drains in Kicukiro District are usually constructed on one side of the road and the ones in the urban area are mostly covered. Most of the existing structured channels are well constructed and have adequate drainage capacities. In general, the existing drainage network in the District consists of 3 types of drain structure:

- Open masonry storm channels;
- Covered masonry storm channels;
- Unlined natural channels.

There are still drains that are not covered in the District. It allows residents to dispose of their waste water and solid waste directly into the drains. During a storm event, the naturally steep drains may cause all the waste materials to be washed down and accumulated at the receiving water bodies.

The absence of sewerage network and proper on-site treatment has prompted the discharge of sewage into public drains. This in turn reduces the capacity of the drains and creates health problem to the residents.

At areas where there is no proper drainage system, temporary ditches are constructed by the residents to prevent storm water from flowing into their homes.

3.15.2 RUN OFF CHARACTERISTICS

Most of the storm water runoff from Kicukiro District will flow directly into

Nyabarongo River at the southern boundary of the District. Generally this catchment has lower percentage of steep slope as compared to Gasabo District. Several catchments in the Central Planning Area such as Kigarama, Gikondo and Gatenga, will drain northwards toward Nyabugogo River then into Nyabarongo River at the western boundary of the District.

3.15.3 STORM WATER MANAGEMENT

Kicukiro District would be highly urbanized as residential and commercial centre with 20% of the site is preserved as nature area. When the District is fully developed by 2040, it would generate more storm water runoff due to the lesser previous surfaces for water infiltration the ground. The undulating topography of the District, especially at the steeper sectors such as Kigarama, Gatenga and Gahanga, would also increase the velocity of storm water runoff and increase flooding risk if there is no proper channel to drain the runoff into the water bodies.

Despite its flooding risk, the urban storm water runoff should also be seen as a resource to be valued. As the District has a considerable amount of annual rainfall, it could be harvested for non potable use such as landscape irrigation and general areas washing.

The proposed storm water management for the District is a combination of conventional drainage system (i.e. concrete drain and canals) and sustainable storm water features while preserving the existing streams and channels. The objectives are:

- To provide a clear pathway for storm water runoff into the water bodies;
- To minimize the flood risk through on site retention;
- To improve the water quality to be

discharged into the existing water bodies;

- To integrate the storm water infrastructure into the urban setting.

3.15.4 SUSTAINABLE STORM WATER FEATURES

The following sustainable storm water management features shall be proposed for the District, wherever applicable.

VEGETATED SWALES

A Vegetated swale is an open-channel drainage ways used to convey storm water runoff that can be used as a replacement for the conventional drainage system (refer to Fig.3.38). It has both conveyance and pre-treatment functions to remove soil particles and gross pollutants from storm water runoff. It will not only beautify the surrounding landscape, but also aid in the spreading and slowing of velocities of runoff.

Vegetated swales are usually installed at gentler slopes (1% to 4%) to maintain its conveyance function and prevent ponding during low flows. It is the most suitable to be installed within the development plot, recreational parks, car parks, etc. It can also be used to replace the road side drain for local streets with gentler slopes.

BIORETENTION SWALE

A Bioretention swale is a vegetated swale with an additional bio-treatment system at the base (refer to Fig.3.39). In addition to conveyance and sediment removal functions, it provides further treatment by allowing the runoff to percolate through the filter. The cleansed water would be collected by the perforated pipe at the drainage layer and conveyed to the water bodies downstream.

Similar to vegetated swales, these can be installed within the development plots, recreational parks, car parks, etc.

BIORETENTION BASIN

A Bioretention basin is a landscaped depression or a shallow vegetated basin that is designed to slow down and treat the storm water runoff on-site (refer to Fig.3.40). It lets the runoff percolate through the filtration media. It does not have conveyance functions like a swale.

It can be installed at various scales and shapes such as planter box, roof top, car parks, etc. It is recommended to be installed upstream before main drains or constructed wetlands.

CONSTRUCTED WETLAND

A Constructed wetland is a shallow and extensively vegetated water body (refer to Fig.3.41). It is usually constructed downstream, to further treat the pre-treated runoff from swales, rain gardens or

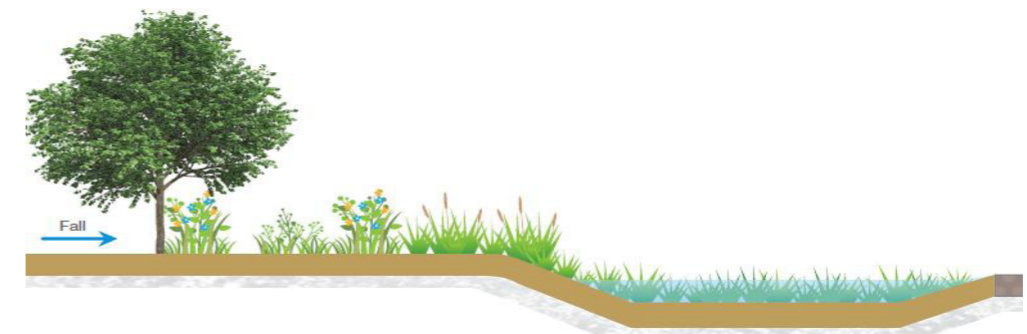


Fig.3.38 Vegetated Swale
Source: ABC Water Guideline

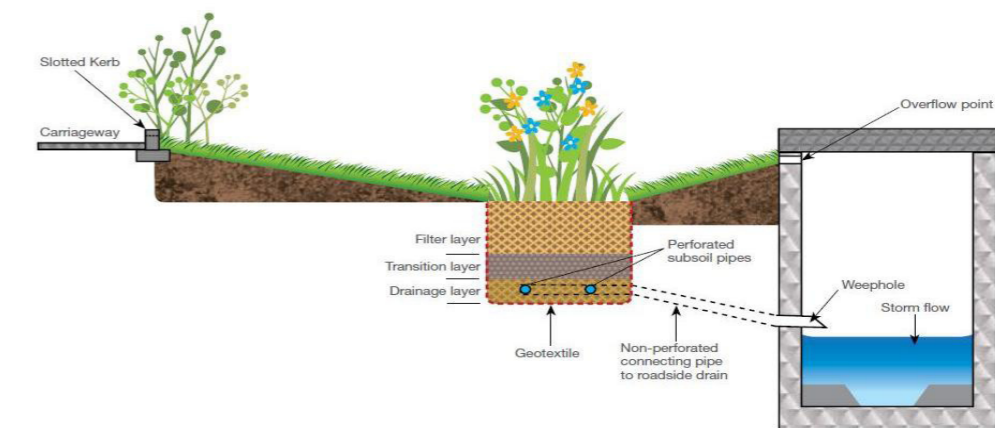


Fig.3.39 Bioretention Swales
Source: ABC Water Guideline

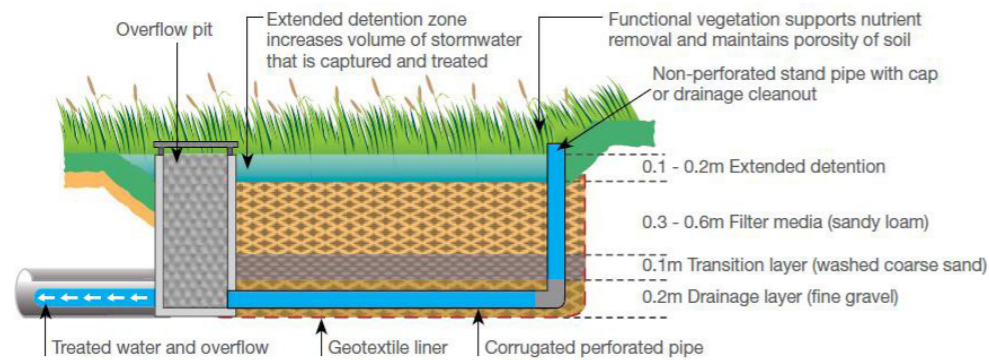


Fig.3.40 Bioretention Basin
Source: ABC Water Guideline

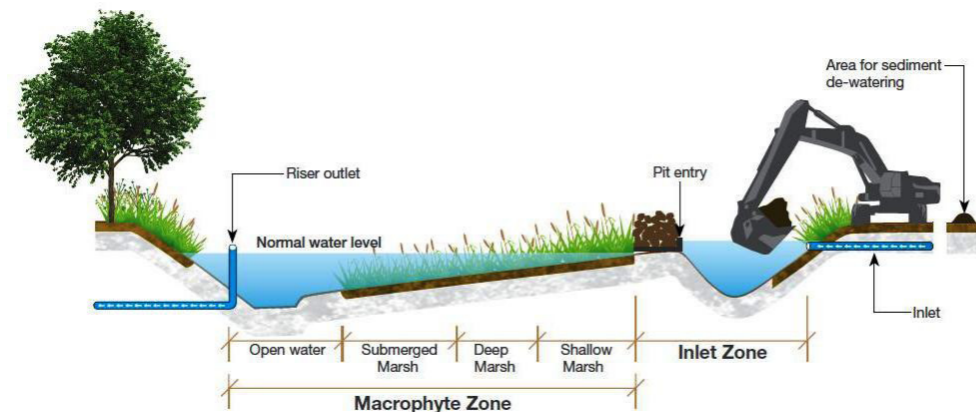


Fig.3.41 Constructed Wetland
Source: ABC Water Guideline



Fig.3.43 Green Retaining Wall

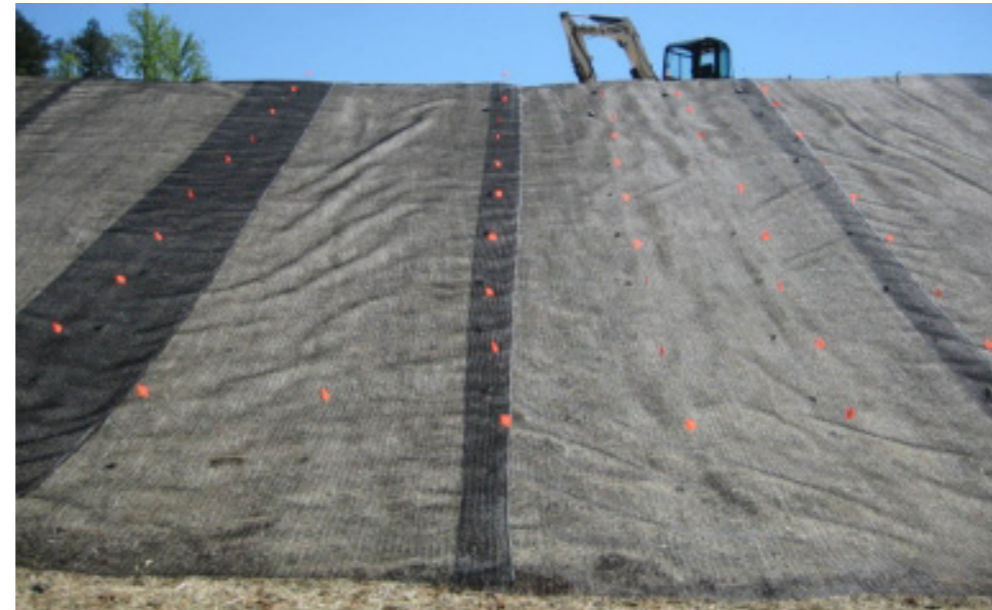


Fig.3.42 Geogrids
Source: Huesker Inc

public drains. It is designed to remove finer and dissolved particles. It consists of three treatment zones:

- Inlet zone (sedimentation basin), to let larger to medium size pollutants settle down. It also acts as an energy dissipater and prevents scouring;
- Macrophyte zone (shallow heavily vegetated pond), to remove fine particles;
- High flow bypass channel, to discharge the excess runoff and protect the macrophyte zone during heavy storm event.

Constructed wetlands can be proposed in urban settings within the ETZ zone. Constructed wetlands within the ETZ can be designed to receive discharge from both the surrounding contributing catchments and treated effluence from STPs. The wetlands can be constructed on different scales according to the design capacity.

The final product from the constructed wetland can be slowly released to other water bodies or reused for non-potable use such as irrigation.

MAINTENANCE AND OPERATION

Vegetation plays an important role in every sustainable storm water management features. The selected plants should have fibrous root systems to keep the soil porous, good nutrient removal capabilities and ability to withstand dry and wet environment.

Maintenance of these features will be concerned with:

- Weed removal;
- Removal of debris;
- Maintenance of the features profile;
- Maintenance of the vegetation by irrigation, mowing, pruning;
- Cleaning of the inlet and outlet to prevent clogging;
- Flushing of the perforated pipe.

3.15.5 PROPOSED DRAINAGE NETWORK

Refer to Fig.3.45 and Fig.3.44 for the proposed drainage network in Year 2025 and 2040. Existing streams and proposed primary drain lines are indicated on both plans.

The existing main streams should be preserved as much as possible. As the District would be densely built up, there are instances where the streams would be surrounded by residential or commercial development especially at township K1, K2 and K4. For this case, it is encouraged that the new development is built around them to avoid diversion work.

To preserve the water quality and conveying capacity of these streams, the District may enforce the following preventive measures:

- No developments shall be carried within the flood plain of the streams. If there is a need for redevelopment, the District has to ensure proper redirection of the streams;
- Treat the runoff pollutants at source using one of the sustainable water features;
- Install pollutants trap at the outlet of the drains feeding into the streams.

Main drainage channels would be proposed along the road to discharge the storm water runoff into the existing wetlands.

For a typical township, the storm water runoff from the household would be channelled to the sustainable water features such as swales or bioretention basins before flowing into the road side drain, main drain and eventually into the wetlands.

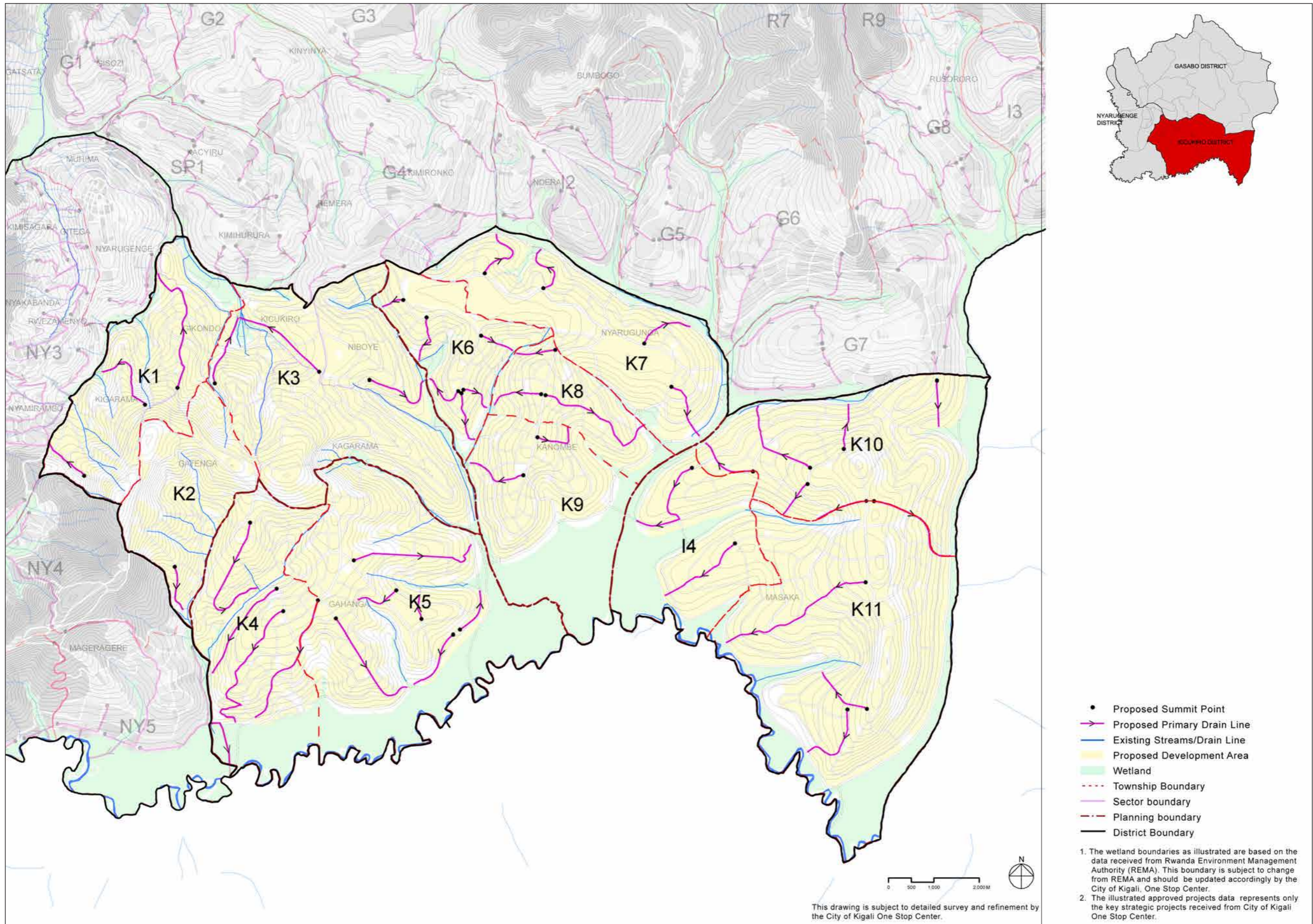


Fig.3.44 Kicukiro District - Proposed Drainage Plan - Year X

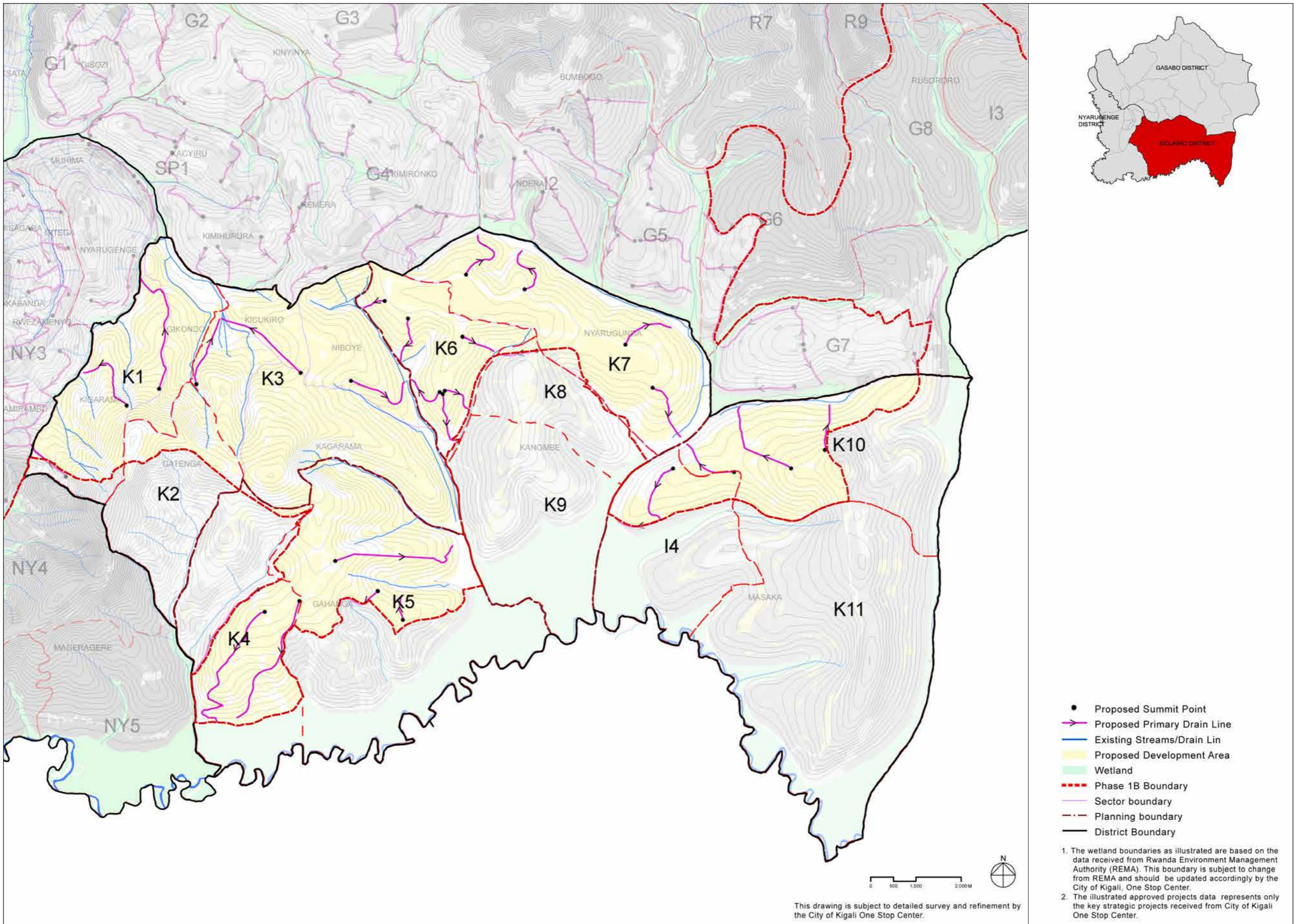


Fig.3.45 Kicukiro District - Proposed Drainage Plan - Year 2025

3.16 POWER SUPPLY PLAN

3.16.1 EXISTING CONDITIONS

POWER SUPPLY SOURCES

Currently, the nearest electrical substations to the Gasabo and Kicukiro District are the Gikondo and Jabana Substations. Gikondo Substation is located in central Kigali, southwest of the Gikondo Industrial Park. The major 110 kV transmission line from the hydroelectric plants in southwest Rwanda (Rusizi I and Rusizi II) joins the 110 kV transmission line from the north at the Gikondo substation. Step-down transformers then feed into 15 kV transmission lines serving central and east Kigali.

For Jabana Substation, the major 110 kV transmission line from the hydroelectric power plants (Mukungwa and Ntaruka) feeds into this substation and continues south through Kigali to the Gikondo Substation. The Jabana substation contains step down transformers to the 70 kV transmission line extending east of Kigali and to the 15 kV lines serving Kigali. In the absence of detail information, it is not possible to indicate the coverage of each HV/MV substation.

The electricity for the urban area within Gasabo and Kicukiro District are served by overhead power lines. Most of the resident's electricity meters are prepaid type. The biggest challenges of the EWSA in expanding the power network are lack of utility reserve along the public road for laying the cable. For new future development, space for the utility corridor should be planned alongside the road in order to lay new cable and water pipes in addition to the land for new substation.

Kicukiro district is part of the City of Kigali. However, the electrification rate at the

district is believed to be quite low. High electricity cost is part of the reason why wood remains the main source of energy. Minister has aim to increase the public access to the electricity within the region. Therefore, heavy investment in the power supply sector is needed in order to expand the power plants, transmission system and distribution system.

3.16.2 ESTIMATED LOAD DEMAND

The Master Plan details the different planning parameters for year 2025 and year 2040. The load estimates for the new developed area is calculated based on the built up areas of the different Land Used, and the electricity demand VA/m² of each Land Used.

The proposed electrical load density for various Land Uses is depicted in Table 3.17. Assumption of 1kVA per DUs is based on ambient temperature of 18°C to 21°C at City of Kigali which generally eliminates the usage of the air conditioning.

As all type of installed loads (domestic, commercial, industrial, public lighting) never operates at the same time in practice, certain diversity factor had been taken in order to estimate the load. The following diversity factor is been used as shown in Table 3.17

3.16.3 ELECTRICAL POWER SUPPLY FOR KICUKIRO DISTRICT-YEAR X

The table below shows the total maximum demand for the Master Plan Kicukiro district for Year X. The total maximum demand is 517 MVA.

The estimated numbers of 220kV/110 kV substation, 110kV/70kV substation and 70kV/15kV substation at year 2040 are summarized in the Table 3.19. Fig.3.46 shows the substation location and the

transmission line for the Kicukiro district -Year X.

3.16.4 ELECTRICAL POWER SUPPLY FOR KICUKIRO DISTRICT YEAR 2025

Table 3.21 shows the total maximum demand for Kicukiro district for development planning of phase 1 for year 2025. The total maximum demand is 239 MVA.

The estimated nos of 220kV/110 kV substation, 110kV/70kV substation and 70kV/15kV substation at year 2025 are summarized in Table 3.22. Fig.3.47 shows the substation location and the transmission line for Kicukiro district for Year 2025.

3.16.5 PROPOSED INSTALLATION FOR KICUKIRO DISTRICT

According to the calculation, the total power demand for Kicukiro district is 239MVA for Year 2025 and will increase to 517MVA for Year 2040. The types of substation proposed for the development are as follows:

A new national grid of 220kV or higher is proposed for the Rwanda as the estimate load for whole country will be more than 720MVA at year 2025. All the power plants, either existing or new are proposed to connect to the new national grid to supply the electricity throughout the nation.

From outside the city, the 220kV overhead transmission line shall be connected to the proposed 220/110kV main substations at Kicukiro district and also to other 220/110kV main substations at Gasabo district and Narugenge district within in the City of Kigali.

The 220/110kV substation will step down the voltage level to 110kV before step down again to 70kV at 110/70kV

Table 3.16 Type of Substations

LAND USE	ELECTRICITY DEMAND (VA/S ^{qM})	ELECTRICITY CONNECTED LOAD (KVA/DU)
RESIDENTIAL	10	1*
COMMERCIAL	20	
LIGHT INDUSTRY IN TOWN	35	
INDUSTRY - MANUFACTURING	50	
INDUSTRY - LOGISTIC	5	

Table 3.17 Electrical Load Density

	DIVERSITY FACTOR	ACCUMULATIVE DIVERSITY FACTOR
AT MAXIMUM DEMAND AT USED LEVEL (MD) CONNECTED LOAD AT USER LEVEL X 0.85 = MAXIMUM DEMAND AT USER LEVEL	0.85	0.85
AT 15kV /0.4kV SUBSTATION MAXIMUM DEMAND AT USER LEVEL X 0.85 = DEMAND LOAD AT 15/0.4kV SUBSTATION	0.85	0.72
AT 70kV /15kV SUBSTATION DEMAND LOAD AT 15kV/0.4kV SUBSTATION X 0.85 = DEMAND LOAD AT 70kV/15kV SUBSTATION	0.85	0.62
AT 110kV /70kV SUBSTATION DEMAND LOAD AT 70kV/15kV SUBSTATION X 0.85 = DEMAND LOAD AT 110kV/70kV SUBSTATION	0.85	0.52
AT 220kV /110kV SUBSTATION DEMAND LOAD AT 110kV/70kV SUBSTATION X 0.85 = DEMAND LOAD AT 220kV/110kV SUBSTATION NOTE: WE ASSUME THE NEXT LEVEL OF VOLTAGE IS 220kV. LOCAL POWER SERVICE PROVIDER SHALL ADVISE WHICH IS THE NEXT LEVEL OF VOLTAGE SUCH AS 345kV OR 400kV TO SUIT THEIR LOCAL CONTEXT.	0.85	0.45

Table 3.18 Estimated Power Demand for Kicukiro District - Year X

PLANNING AREA	ELECTRICAL LOAD FOR 15kV/0.4 kV ESS (kVA)			
	TOTAL	DIVERSITY FACTOR	MAX DEMAND	ESTIMATED NOS OF 15kV/ 0.4kV ESS
KT1	50,842.13	0.85	43,215.81	44
KT2	36,722.17	0.85	31,213.85	32
KT3	146,923.74	0.85	124,885.18	125
KT4	88,047.39	0.85	74,840.28	75
KT5	95,058.11	0.85	80,799.39	81
KT6	32,286.97	0.85	27,443.92	28
KT7	47,171.19	0.85	40,095.51	41
KT8	35,416.79	0.85	30,104.27	31
KT9	53,152.61	0.85	45,179.72	46
KT10	86,588.65	0.85	73,600.35	74
KT11	124,274.26	0.85	105,633.12	106
I4	192,479.75	0.85	163,607.79	164
TOTAL	988,963.75		840,619.18	847

Table 3.19 Proposed Number of Substations - Year X

VOLTAGE LEVEL	LOAD ESTIMATE (MVA)	NOS OF SUBSTATION
70kV / 15 kV	714.53	24
110kV / 70kV	607.35	9
220kV / 110kV	516.25	2

Table 3.20 Proposed Types of Substations - Year X

TYPE OF SUBSTATION	TRANSFORMER SIZE, MVA	LAND AREA,
220kV / 110kV ESS	100 – 250 MVA (3 TO 4 NOS)	150 x 150
110kV / 70kV ESS	60 – 90 MVA (2 TO 3 NOS)	150 x 150
70kV / 15kV ESS	20 – 40 MVA (2 TO 3 NOS)	50 x 50
15kV/ 400 V ESS	1 MVA (2NOS)	13 x 8 (CAN BE ATTACHED TO THE BUILDING. LOCATION TO BE DETERMINED BY DESIGNER DURING DETAIL DESIGN)

Table 3.21 Estimated Power Demand for Kicukiro District - Year 2025

PLANNING AREA	ELECTRICAL LOAD, KVA AT 15/0.4kV SUBSTATION			
	TOTAL	DIVERSITY FACTOR	MAX DEMAND	ESTIMATED NOS OF 15kV/ 0.4kV ESS
KT1	50,842.13	0.85	43,215.81	44
KT2	0	0.85	0	0
KT3	146,923.74	0.85	124,885.18	125
KT4	88,047.39	0.85	74,840.28	75
KT5	0	0.85	0	0
KT6	32,286.97	0.85	27,443.92	28
KT7	47,171.19	0.85	40,095.51	41
KT8	0	0.85	0	0
KT9	0	0.85	0	0
KT10	0	0.85	0	0
KT11	0	0.85	0	0
I4	92,390.28	0.85	78,531.74	79
TOTAL	451,661.70		389,012.44	392.00

Table 3.22 Proposed Number of Substations - Year 2025

VOLTAGE LEVEL	LOAD ESTIMATE (MVA)	NOS OF SUBSTATION
70kV / 15 kV	330.66	12
110kV / 70kV	281.06	5
220kV / 110kV	238.90	2

substation. The transmission line, either overhead or underground cables are assumed to run along main express way. The underground cable can be lay together during the construction of the express way. The right of way will be the road itself if the cable is run beneath the driveway. For the overhead cable, the reserve land of 30 to 40m wide is required depending on the local authority requirement on different level of transmission line.

The 70/15kV substation is normally located at the load centre. The substation transmits the power to the distribution transformer (15kV/400V transformer) which located at community centre. The distribution transformer has limited capacity and serving radius, normally about 250m from the further unit. All the outgoing cables from the 70/15kV substation are assumed to be underground.

POWER GENERATION PROPOSAL

Kicukiro district is part of City of Kigali. In order to determine the needs of power plants, we need to look at larger scope, i.e. the demand of the City of Kigali or whole nation. The estimated load demand for the City of Kigali including Gasabo district is 1,575MVA a year 2040. Assuming the reserve required is 15% and transmission losses of 30%, the required generation capacity is 2,600MVA.

The current power plants capacity is about 85MW including power supply import from neighbor country. There is a plan from EWSA to generate additional 1000MW from year 2011 to 2017 from various sources such as hydropower (232MW), geothermal (310MW), methane (300MW) and peat (200MW).

For additional power requirement, the service provider could consider other power plant such as natural gas power plant, wind, solar and so on.

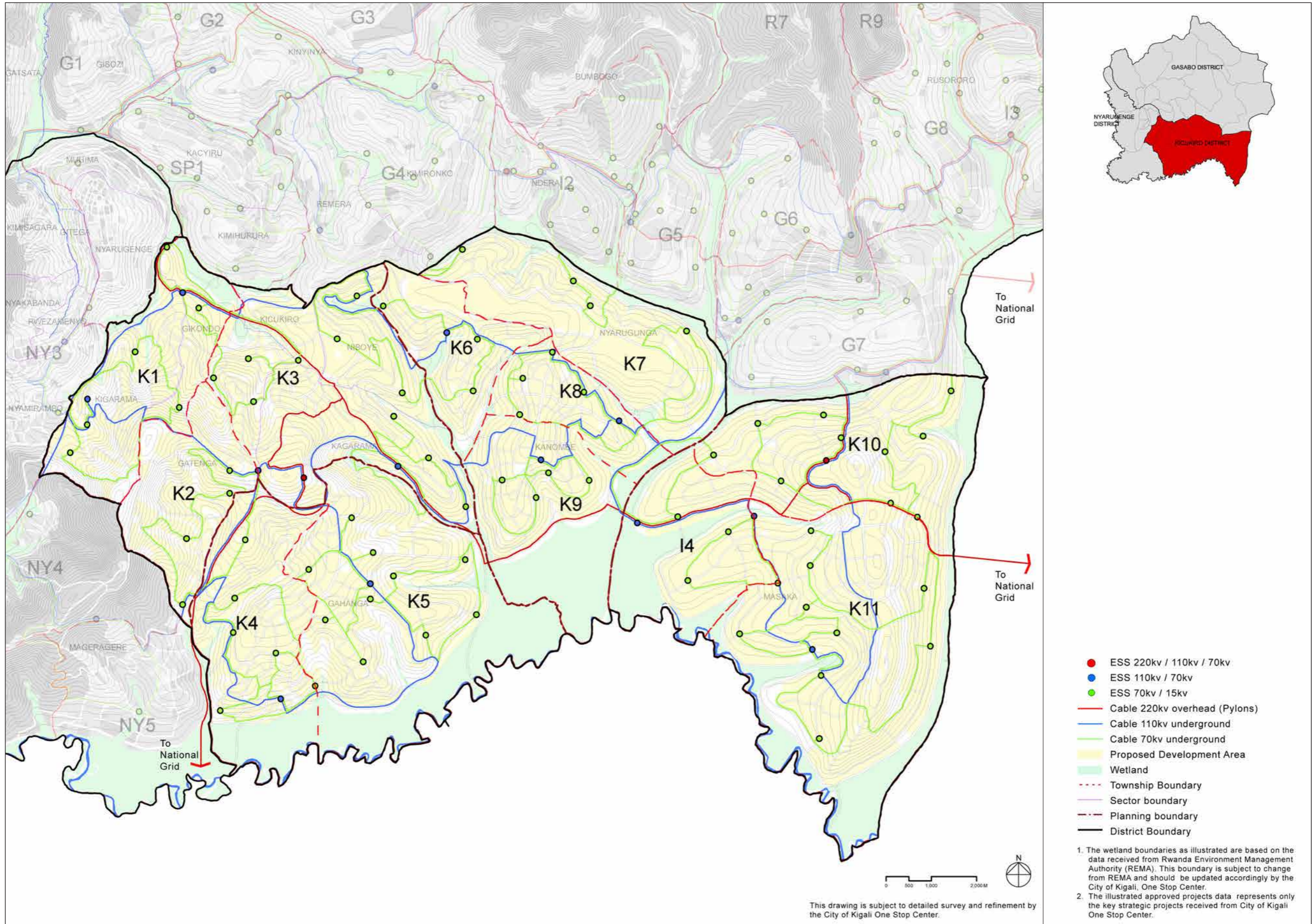


Fig.3.46 Kicukiro District - Proposed Power Supply Plan - Year X

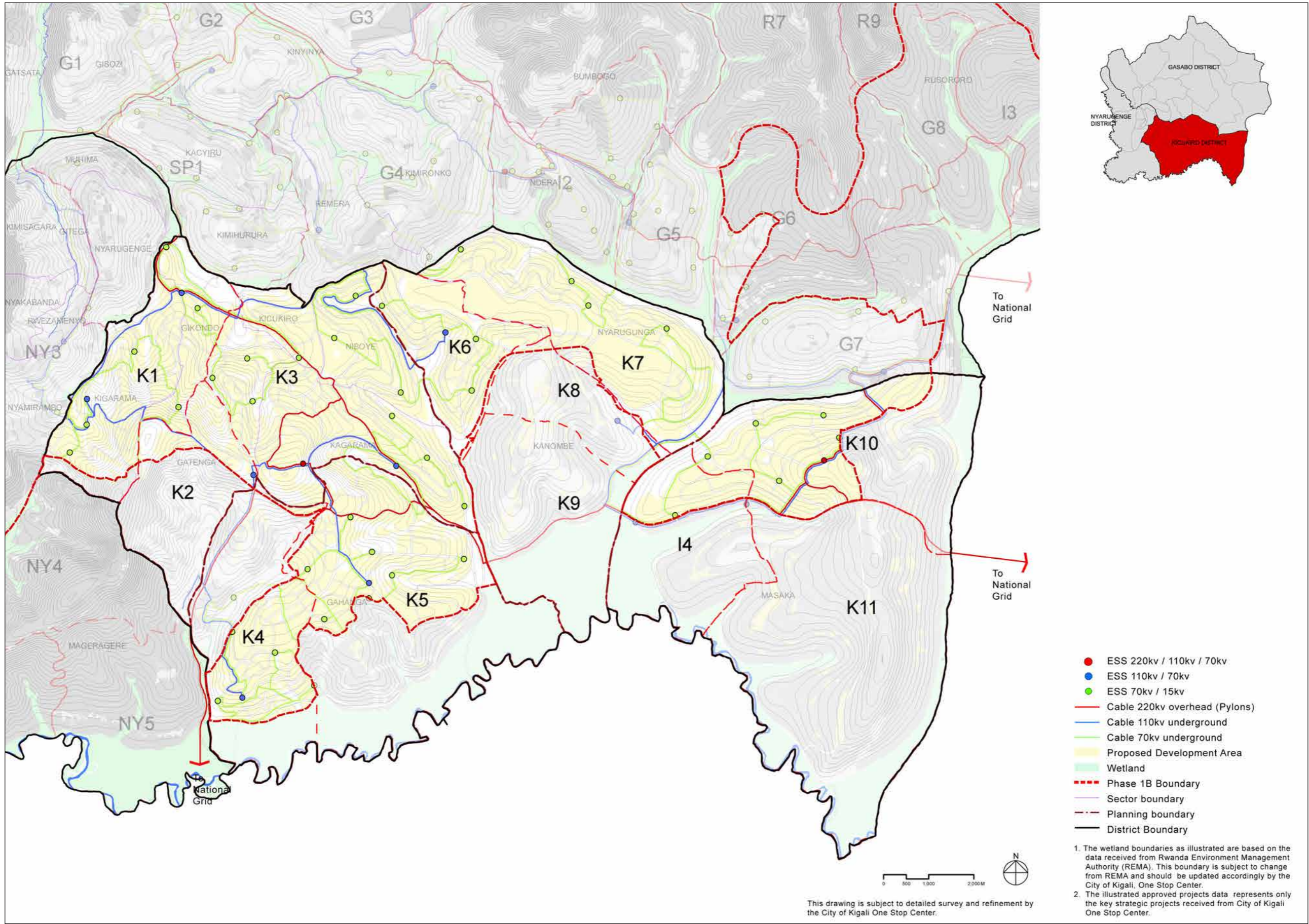


Fig.3.47 Kicukiro District - Proposed Power Supply Plan - Year 2025

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4 Detailed Master Plan for Central Planning Area

This section presents the detailed Master Plan for Central Planning Area. Based on the analysis of the existing context, opportunities and constraints, a vision and concept are derived which guide the development of the Master Plan and the design of key features within the Sector.

4.1 Central Planning Area - Existing Context

Planning Area: The Central Planning Area comprises of the following 6 sectors : Kigarama, Gikondo, Kicukiro, Niboye, Kagarama and Gatenga. The combined total area of Central Planning Area is 3941 ha and the combined current population is 0.14 mi².

4.1.1 LOCATION AND CONNECTIVITY

The Central Planning Area is located in the north west of Kicukiro district. It is bound by the most urbanized sectors of Nyarugenge District, i.e. Muhima, Nyarugenge and Nyamirambo Sector to the west and North West; Kimihurura sector and Remera sector of Gasabo District to the North; Kanombe sector to the East; and Gahanga Sector to the South. Its location in the middle of the City and right next to the CBD makes it an important site for prime residential developments and secondary commercial facilities. Ref to Fig.4.1 for Central Planning Area - Location Map

Boulevard de l’OUA also called the African Union Road, connects this Planning Area to the CBD and the Kigali International Airport. Avenue Des Communications and Kigali Nyamata Road connect the Central Planning Area to Gahanga Sector and further down to the proposed Bugesera International Airport. Avenue Rwampara and Avenue de Rugunga connects to the Nyarugenge sector.

1 Source : Estimations based on EICV 2006

4.1.2 EXISTING CONDITIONS

The Central Planning Area is the most urbanized area in Kicukiro district. It is the backbone of the city in terms of Industrial employment and commerce. Avenue Gikondo, Boulevard de l’OUA, and Boulevard des communications are the three prime roads with commercial, industrial/logistics and educational Institutes.

Industrial zone in Kicukiro and Gikondo sectors with heavy, light and warehouse functions is located in the valley area along wetlands and natural drain channels; occupying prime area in the city close to the CBD. The Magerwa Dry port occupies strategic high value area in Gikondo. The Planning Area has adequate educational facilities. The existing University and the Polytechnic Institute currently play a major role in Higher Education in the City. Juro Park, (the highest point in the city) and the Genocide Memorial are important cultural and heritage areas with immense tourism potential.

The City’s new economic growth curve has resulted in new developments. Some of the new Approved projects in the Central Planning Area are:

- Housing projects
- Kigali Youth Park, Sports and Resort Project
- INILAC University, Oklahoma University, Mt. Kenya University and Rwanda Tourism University
- Rebero Sub Area Proposal by Oz architects
- Cultural village

4.1.3 NATURAL CONSTRAINTS

Only 50% of the Planning Area (1972.18 ha) is developable as 3% of the land is occupied by wetlands (125.25 Ha) and the remaining 47% by forests and Steep slopes (slopes greater than 20% gradient).

3941ha
Total Planning Area

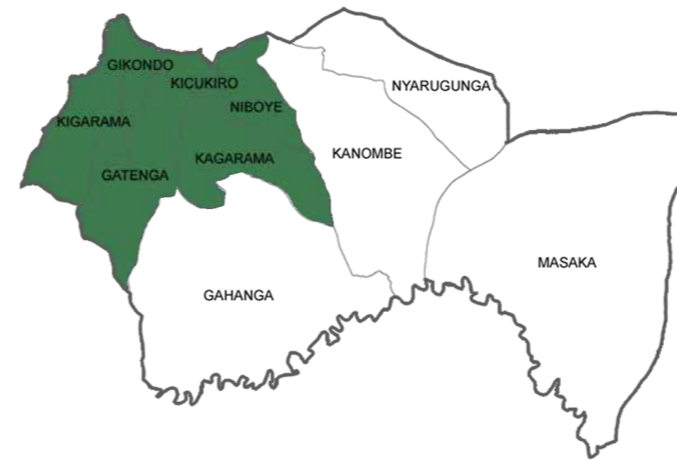
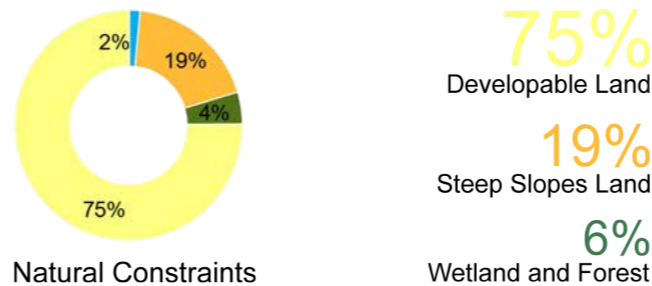


Fig.4.1 Central Planning Area - Location Map

175,780
Population 2011



Natural Constraints

46p/ha
Existing Density



Fig.4.2 Central Planning Area - Natural Constraints and Existing Population density

Table 4.1 Central Planning Area - Existing and Projected Population

PLANNING AREA	AREA (HA)	EXISTING 2012 (KCMP)	PROJECTED YEAR X
CENTRAL	3941	175,780	711,000

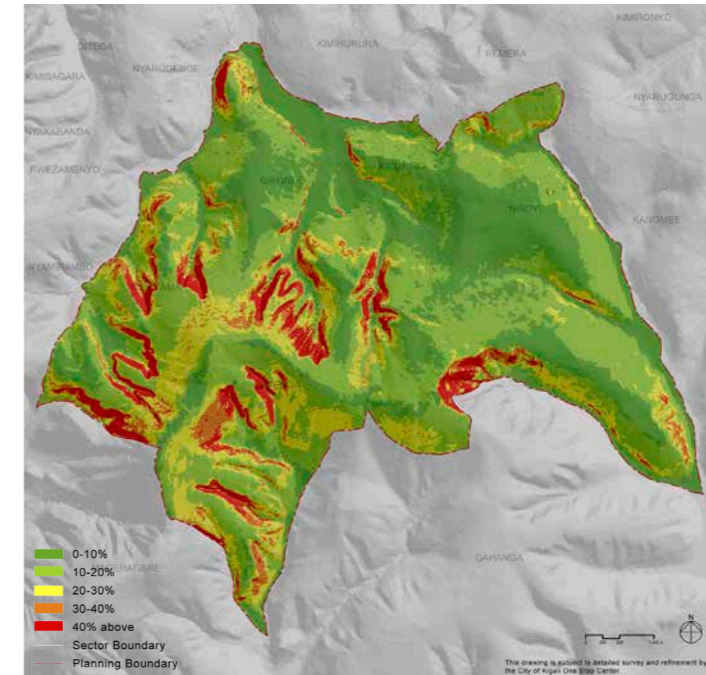


Fig.4.3 Central Planning Area - Slope Analysis

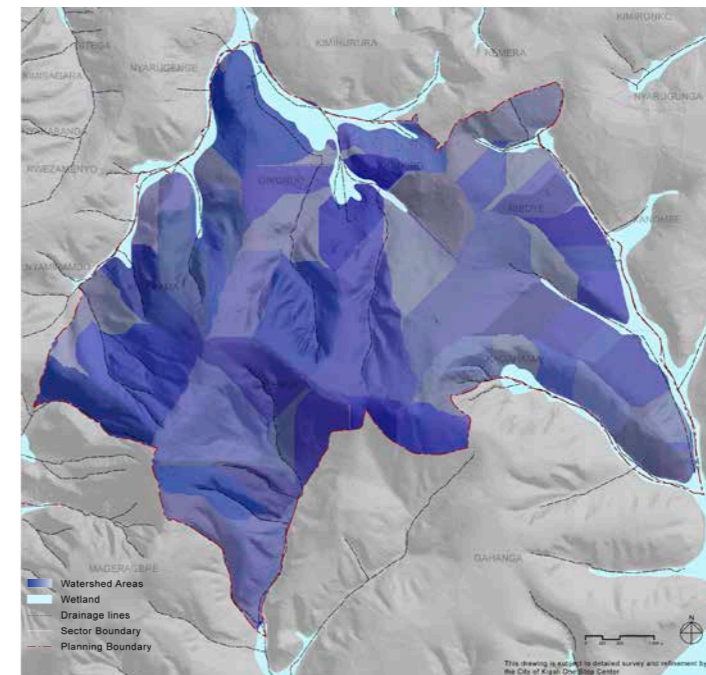


Fig.4.4 Central Planning Area - Watershed and Drainage

Table 4.2 Central planning Area - Existing Land Use Distribution

BROAD LAND USE	DETAIL LAND USE	AREA(HA)	TOTAL AREA(HA)
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	462	1113
	LOW RISE RESIDENTIAL	644	
	MEDIUM RISE RESIDENTIAL	7	
COMMERCIAL	COMMERCIAL GENERAL	22	27
	COMMERCIAL OFFICE	1	
	HOTEL	5	
MIXED USE	MIXED USE	4	4
PUBLIC FACILITIES	GOVERNMENT OFFICE	9	243
	EDUCATIONAL	153	
	RELIGIOUS FACILITIES	37	
	HEALTH FACILITIES	18	
	CIVIC FACILITIES	13	
	SPORTS AND RECREATION	13	
INDUSTRIES	LIGHT INDUSTRIAL	20	173
	HEAVY INDUSTRIAL	108	
	WAREHOUSE	45	
NATURE AREA	EXISTING FOREST	418	489
	WETLAND	71	
AGRICULTURE	FARMLAND	652	1386
	PLANTATION	734	
OPEN SPACE	OPEN SPACE AND PARK	10	10
INFRASTRUCTURE	TRANSPORTATION	212	234
	UTILITIES	22	
SPECIAL USE/RESTRICTED AREA/UNCLASSIFIED	GRAVEYARD	13	262
	VACANT LAND	249	
TOTAL		3941	3941

- | | | |
|---------------------------|------------------------------|---|
| Low Rise Residential | Farm Land (General) | Kironko Market |
| Single Family Residential | Plantation | Stadium and Educational Facilities |
| Commercial General | Open Space and Park | Gikomero Commercial and Roundabout |
| Hotel | Sports and Recreation | Kimihurura Roundabout and Administrative Centre |
| Mixed Use | Vacant Land | Proposed Muhima CBD Phase 1 |
| Civic Facilities | Wetland | Nyarugenge CBD |
| Education Institution | Wetland Within Planning Area | Kigali Institute of Science and Technology (KIST) |
| Government Office | Existing Major road | Nyamirambo Regional centre |
| Health Facilities | Sector Boundary | Nyamirambo Stadium |
| Religious Facilities | Planning Boundary | Graveyard |
| Light Industrial | | Pollutive heavy Industries In Wetland Stretch |
| Heavy Industriail | | Polytechnique Institute |
| Warehouse | | Nyanza Genocide Memorial Centre |
| Defence Area | | Existing Huge Forest Cover |
| Quarry Land | | Gahanga Sector Office |
| Graveyard | | |
| Existing Forest | | |
1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

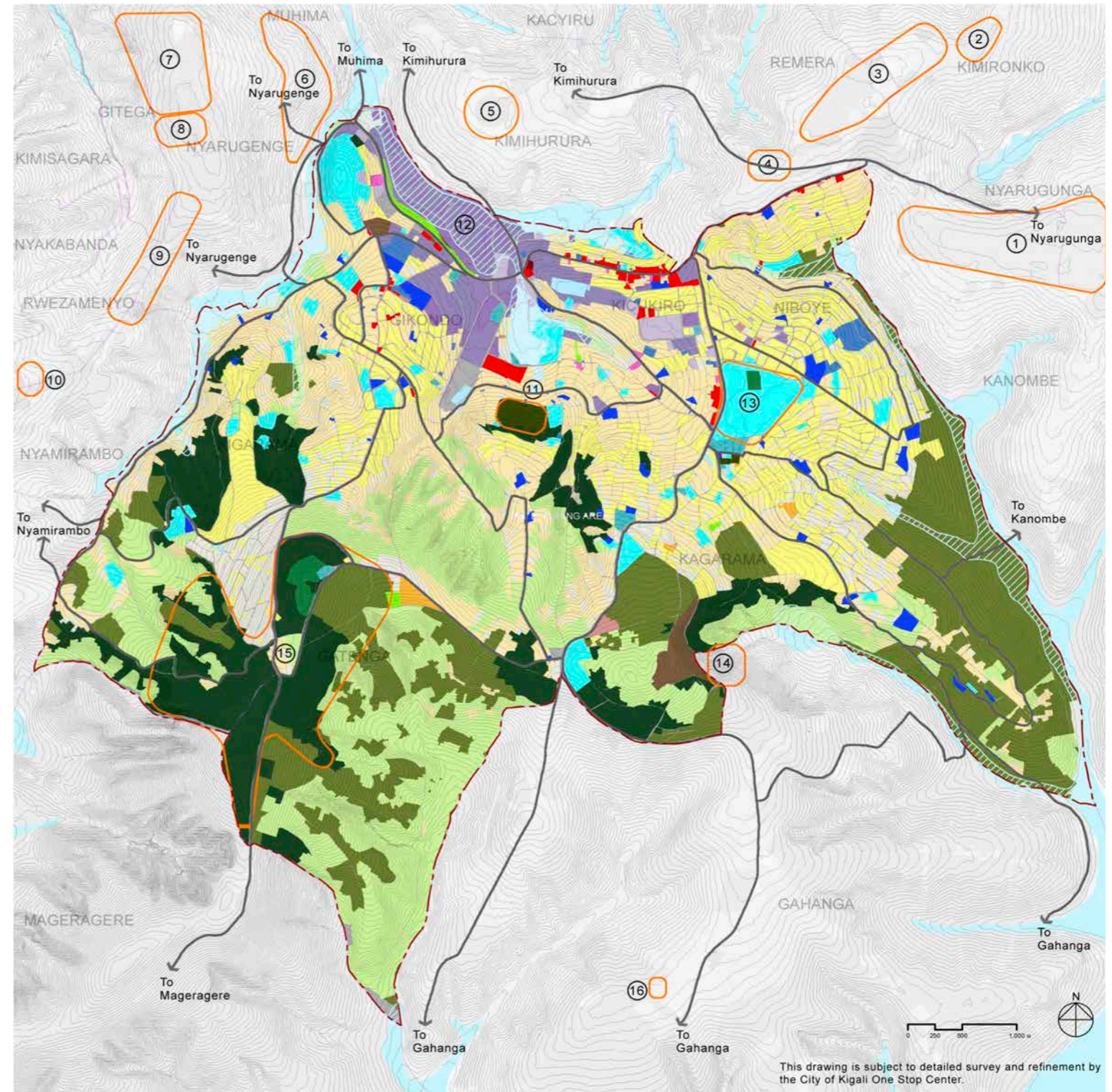


Fig.4.5 Central Planning Area- Existing Land Use and Context Map

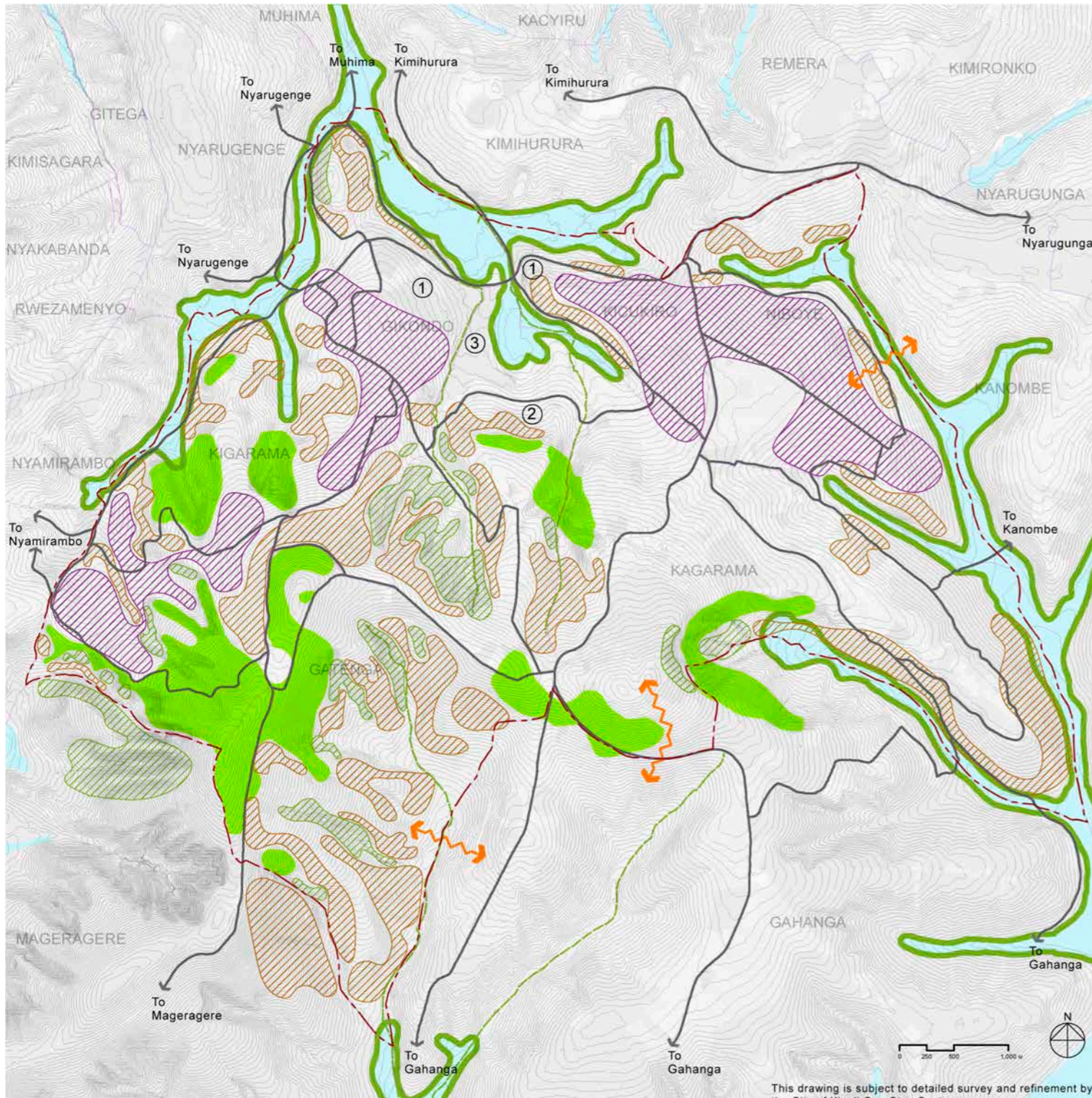


Fig.4.6 Central Planning Area- Constraints Map

Steep slopes in the south west region, occupy almost half of the Planning Area and restrict high density developments. In order to safeguard the existing terrain from flooding and soil erosion, these Steep slopes need to be protected. Most of the existing developments already occupy the available flat areas. Industrial Area currently encroaches the wetlands towards the northern side, depleting this wetland stretch completely. The forests' set in the south west part of the Planning Area look into the huge prominent valleys in Magaregere sector of Nyarugenge District, hence framing the beautiful landscape.

4.2 Central Planning Area- Opportunities and Constraints

4.2.1 CONSTRAINTS

The Central planning Area lies close to the Administrative Zone in Gasabo and the Financial Centre in Muhima Sector of Nyarugenge District. It has immense potential to be a hotspot for commercial and secondary offices. However the key constraints in planning the area are:

- Pollutive industries and a dry port in prime location, mar both the wetlands

and decrease the land value. This area has extremely high development potential. These industries need to be relocated to optimize the land value.

- Majority of the area is already developed, and there is shortage of land for new growth.
- Large low density unplanned areas in prime areas, need be restructured and revitalized to accommodate the increasing population.
- Around 21% of the land is steep slopes. As per the City's strategy² for a flood-free city (for the next 50 years), these Steep slopes and natural drainage channels need to be protected through afforestation and a no build zone.
- Newly approved projects need to be retained and integrated into the new Master Plan for suitable development clusters.
- Due to uncontrolled growth and development, existing forest patches are disappearing at a very fast rate. These forests, mostly located in the southern sectors need to be preserved in order to be able to restore the lost forest cover.
- 2% of the wetland area (Wetland boundary as per REMA) is covered with

2 Organic Law N° 04/2005 of 08/04/2005 determining the modalities of Protection, Conservation and Promotion of Environment in Rwanda

- Slopes between 20-40% that restrict high density development in areas with good views
- Steep slopes (above 40%) that need to be protected to prevent soil erosion and flooding
- Largely unplanned built-up areas with very low density development in prime area
- Forest conservation
- Wetlands to be protected
- Steep slopes/wetlands restrict connectivity and impose high infrastructure costs
- Existing natural drain lines that need to be safeguarded
- Existing rural/mud roads need to be upgraded to accommodate future

- upgraded to accommodate future population
- Sector Boundary
- Planning Boundary
- ① Existing pollutive industries over wetland stretch
- ② Existing graveyard that needs to be retained
- ③ Existing Magesera dry port needs to be relocated

1 The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2 The illustrated approved projects data represents only

Industries in the North, residential development in the west and Agricultural land in the East. These wetland stretches that are also valley areas, will be prone to floods, soil erosion and poor environment quality, if not safeguarded.

4.2.2 OPPORTUNITIES

The Central Planning Area is bound with forests and steep slopes offering plenty of recreational development opportunities. The key strengths and opportunities of the Central Planning Area are:

- Wetlands in the middle of the city although have been destroyed by the existing Industrial Zone, can be reinstated. The wetland parks from the CBD area could be continued to form beautiful landscaped parks.
- Existing commercial streets along the boulevard de l’OUA and Avenue Gikondo can be rejuvenated and rezoned into mixed use to increase vibrant character. The ‘round the clock population’ will keep these central commercial markets lively.

- Potential low density development areas with scenic views along wetlands/slopes
- Opportunity to develop large parks utilizing existing forests, drain channels and greens
- Potential to intensify and rezone the existing built up areas into compact and walkable neighbourhoods
- Opportunity to connect open greens and forests and wetland parks through existing drain channels as recreational parks
- Wetlands offer scenic views
- ▲ Highest elevation
- Good site views with potential to develop residential layouts
- ★ Nyanza Genocide Memorial Centre as a heritage landmark with unique local identity to the city
- Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
- Existing Major road
- Sector Boundary
- Planning Boundary

- The existing industrial area can be redeveloped as a light Industrial zone with only non pollutive industries. More industrial zones can be developed away from the wetlands.
- Juro Park, as it the highest point in the city and offers beautiful city views can be developed further as the ‘City park’ with more recreational facilities.
- The Oz’s Sub area proposal for Rebero which includes Hotels, housing and resort facilities offers great tourism potential at Rebero.
- The existing Nyanza Genocide Memorial park has great potential to be developed as a tourist destination with cultural and historical importance.
- Due to the need for housing for the increasing population, the areas close to the forest cover in the south west could be developed as a new housing typology.
- Existing forests, natural drain channels, steep slopes and wetlands can be connected through park connectors and linear parks for a continuous open green network.

- ① Opportunity to develop existing commercial belt along main roads as mixed use corridors for vibrant character close to the city centre
- ② Opportunity to restore the original wetlands and continue wetland park landscape from the CBD
- ③ Potential to create vibrant commercial and educational node at the Polytechnique Institute node
- ④ Great potential to develop the existing Juro Park as observatory deck and as a tourist place incorporating OZ’s Sub area proposal
- ⑤ Potential to develop urban forest resorts and new housing close to the forest area

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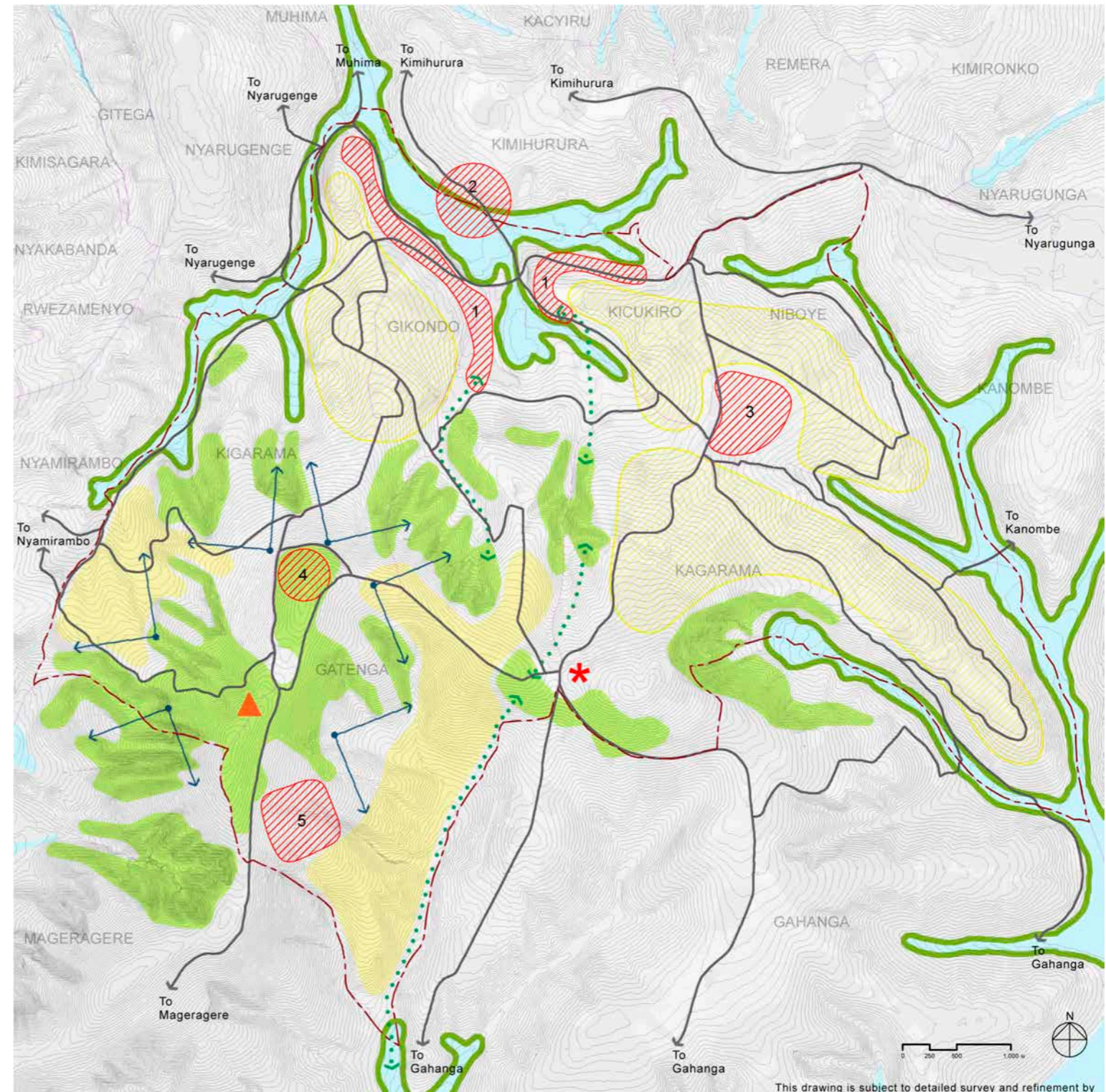


Fig.4.7 Central Planning Area- Opportunities Map

This drawing is subject to detailed survey and refinement by

- Existing land fill area at Kagarama is relocated and is redeveloped as a Park.
- Utilize the Steep slopes and forests as 'Urban Forest Resorts' in the south west sectors of Kigarama and Gatenga, for both active and passive recreational activities.
- Respecting the cadastre, most of the proposed roads originate from the existing roads.
- Earlier in KCMP, Rebero was identified as a potential Tourist Centre with high and medium density hotel, resort and residential developments. These key features have been incorporated in the detailed plan for Rebero.
- Approved projects including residential developments, public facilities, gardens and University projects are integrated into the Detailed Masterplan encouraging new growth.
- Connectivity - A well connected Vehicular and Pedestrian network is proposed with more emphasis on public transportation. The existing main Roads will continue as the main spine.
- The proposed future MRT line (northwest-southeast) connects the CBD to the new proposed International Airport at Bugesera passing through Gikondo, Kicukiro, Niboye and Kagarama.
- Two Proposed BRT lines, one from Nyarugenge to Kanombe, the other from Remera to Gahanga intersect at the proposed Fringe Centre. This interchange will be a major urban node in this Planning Area.
- High density housing and Commercial Centres are located along the transit corridor.
- The existing forests, natural drainage channels, steep slopes and wetlands are protected and connected through linear parks, neighbourhood parks and town parks to form a continuous green recreational and pedestrian network.
- Juro park and the surrounding slopes are further developed as integrated 'Urban forest resorts'.
- Existing public facilities are retained and revitalized.

4.5.1 CENTRAL PLANNING AREA - PROPOSED RESIDENTIAL USE PLAN

Existing low density housing in prime areas, closest to the CBD are rezoned into a medium density residential developments. Most of the existing residential areas in Gikondo and Kagarama are unorganized and scattered along steep slopes. These areas are rezoned into Single Family residential developments. The existing informal residential neighbourhoods far away from the transit corridor and characterized by steep slopes, are rezoned into single family cluster housing. The relatively gentler areas are marked for low to medium rise apartment developments. Neighbourhoods

are designed as holistic communities with access to health care, education, sociocultural and sports activities.

4.5.2 CENTRAL PLANNING AREA- PROPOSED COMMERCIAL USE PLAN

- One Fringe Centre and 2 Town Centres catering to City scale commercial requirements are proposed in the Central planning Area. These commercial centres are integrated with Public transit.
- 'Fringe Centre' includes a variety of retail spaces, hotels, entertainment centres, office spaces, cultural and recreational facilities. 12 ha land is assigned for the Fringe Centre which offers approximately 0.09 mi sq. m of commercial space with 50,000 employment opportunities in the service sector.
- Town Centre in townships K1 is proposed along Boulevard de l'OUA and Avenue Gikondo, close to the existing open space and Park. The existing non pollutive light industrial are zoned next to the Town Centre and the pollutive industries are relocated to the nearest Industrial FTZ.
- Town centre in township K2 is proposed to be developed in the second phase of the City development.
- Each Town Centre offers 0.09 mi sq. m of commercial space with approximately 10,000 employment opportunities in the service sector.
- Compact commercial Neighbourhood Centres with cultural, educational and civic facilities, surrounded by residential Land Use act as the main urban nodes in these proposed communities. The neighbourhood centres caters to the needs of the communities at neighbourhood scale. The three townships in Central Planning Area are served by 27 such Neighbourhood Centres.
- Mixed Use Developments - The existing commercial centres along the Boulevard de l'OUA and Avenue Gikondo road are

rezoned as Mixed Use developments to retain the existing active and vibrant character by inducing residential population.

4.5.3 CENTRAL PLANNING AREA- PROPOSED PUBLIC FACILITIES PLAN

Central Planning Area has abundant schools, religious and educational facilities. These facilities are redeveloped and revitalized by combining with new support facilities and formalized communities. Few public facilities are added in the southern agricultural areas to accommodate the projected population.

4.5.4 CENTRAL PLANNING AREA - PROPOSED GREEN AND OPEN SPACE PLAN

Wetlands along the northern boundary are conserved by relocating heavy industries away from the wetlands. Existing forest patches, natural drainage channels, steep slopes and wetlands are all connected together through park connectors. These natural features are protected by zoning them as protected zones. Those that can afford human intervention are zoned as passive and active recreational zones. The 'Urban Forest resorts' is an effort to integrate both residential and natural assets in a balanced manner. The genocide

Table 4.3 Central Planning Area - Proposed Land Use Distribution Data

BROAD LAND USE	DETAIL LAND USE	AREA (HA)	
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	1097	1985
	LOW RISE RESIDENTIAL	354	
	MEDIUM RISE RESIDENTIAL	489	
	HIGH RISE RESIDENTIAL	45	
COMMERCIAL	COMMERCIAL GENERAL	92	92
MIXED USE	MIXED USE	122	122
PUBLIC FACILITIES	GOVERNMENT OFFICE	9	324
	EDUCATIONAL	197	
	RELIGIOUS FACILITIES	36	
	HEALTH FACILITIES	21	
	CIVIC FACILITIES	16	
	SPORTS AND RECREATION	44	
INDUSTRIES	LIGHT INDUSTRIAL	26	26
NATURE AREA	EXISTING FOREST	374	610
	WETLAND	236	
OPEN SPACE	OPEN SPACE AND PARK	291	291
INFRASTRUCTURE	TRANSPORTATION	407	441
	UTILITIES	34	
SPECIAL USE/RESTRICTED AREA/ UNCLASSIFIED	GRAVEYARD	36	36
RESERVE SITE	RESERVE SITE	14	14
TOTAL		3941	3941

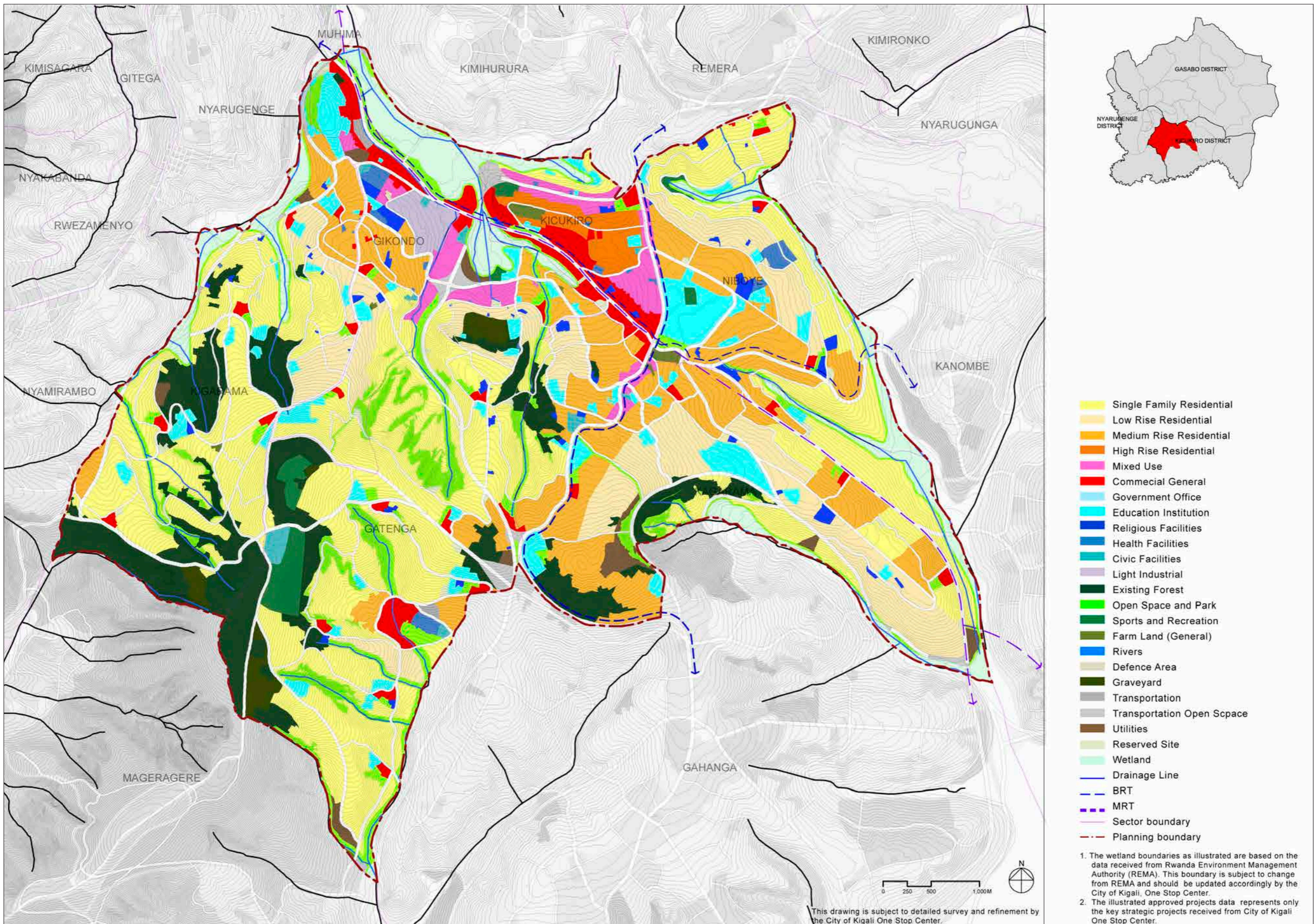


Fig.4.9 Central Planning Area- Proposed Land Use Plan - Year X

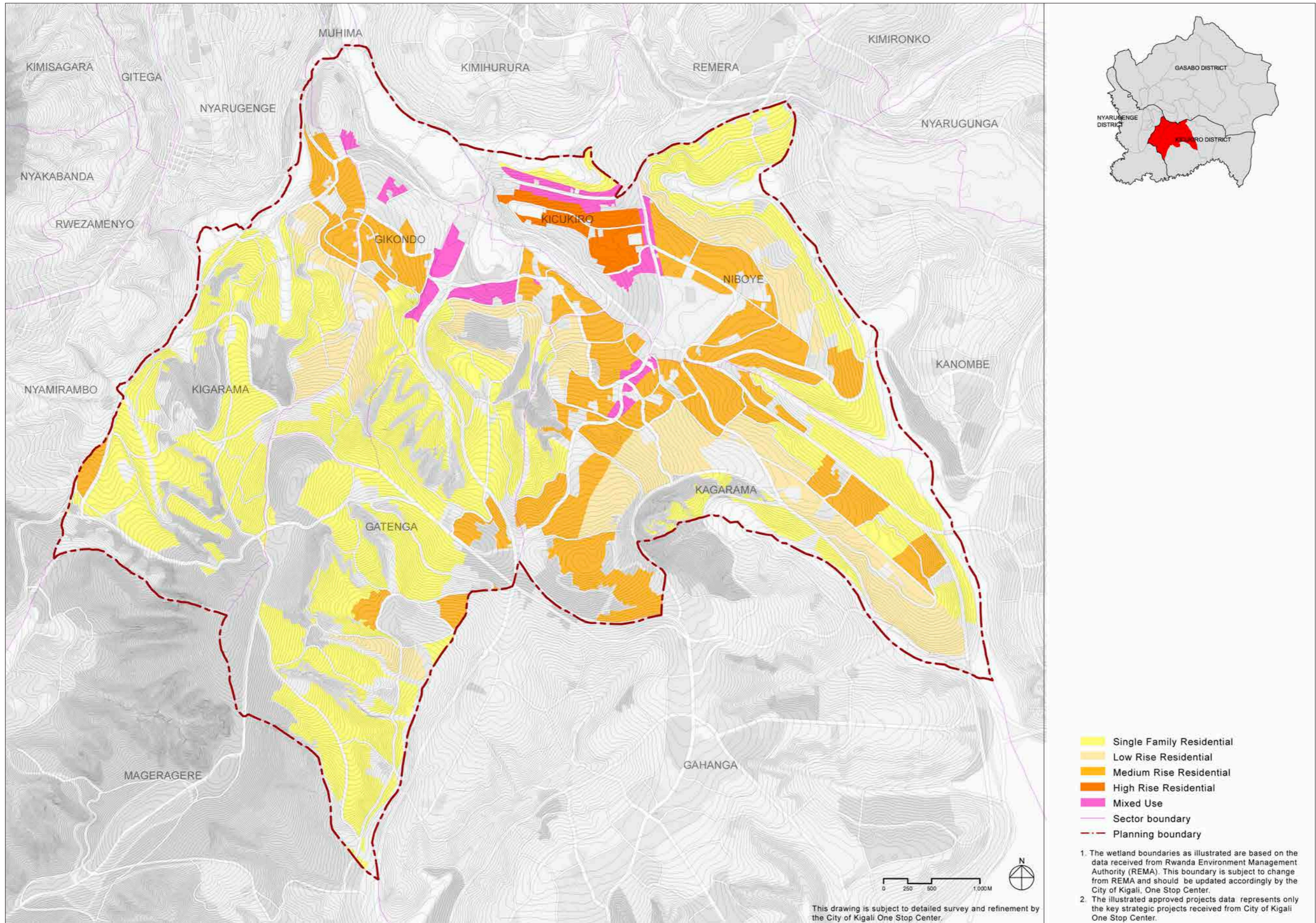


Fig.4.10 Central Planning Area- Proposed Residential Use Plan - Year X

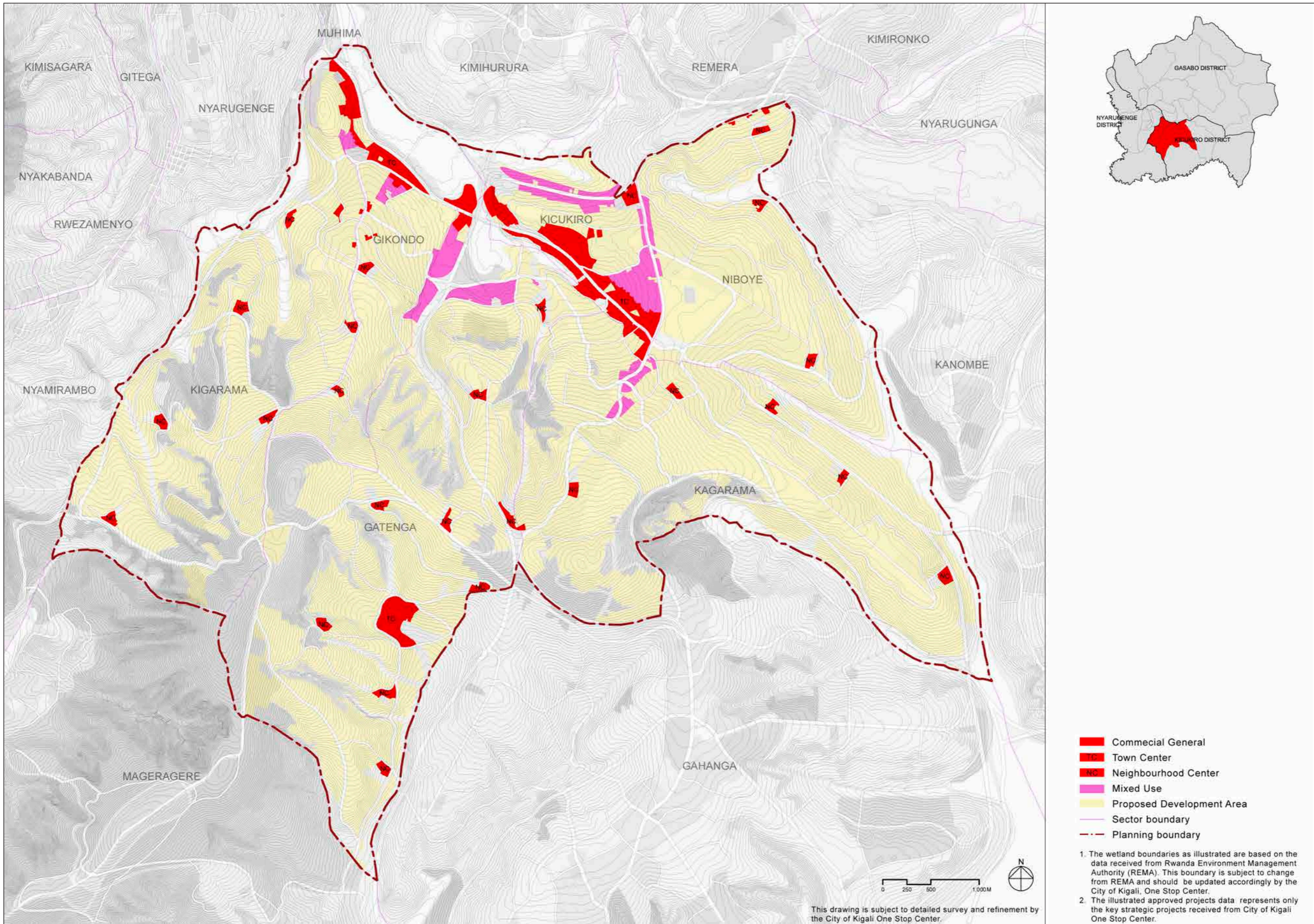
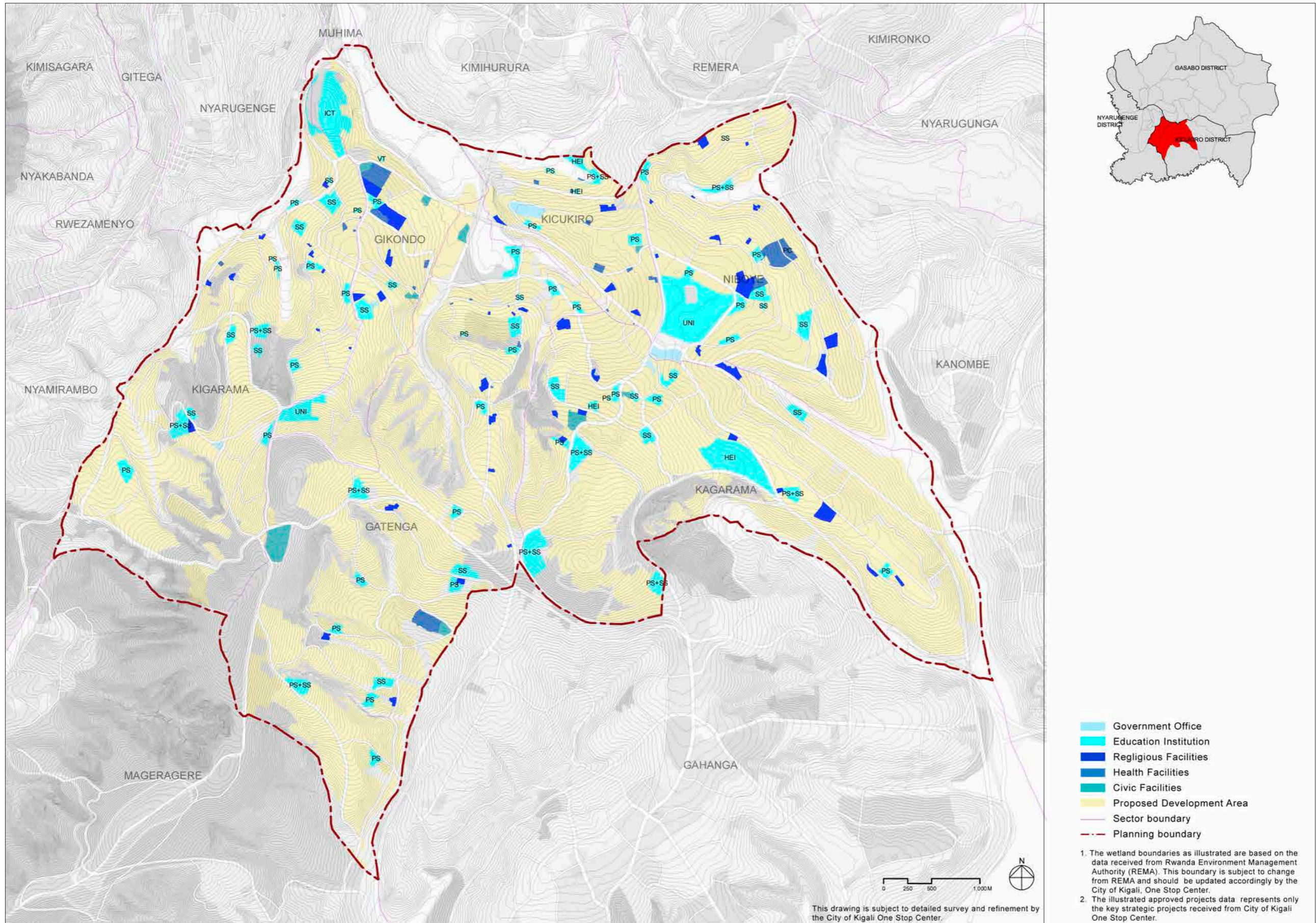


Fig.4.11 Central Planning Area- Proposed Commercial Use Plan - Year X



- Government Office
 - Education Institution
 - Religious Facilities
 - Health Facilities
 - Civic Facilities
 - Proposed Development Area
 - Sector boundary
 - Planning boundary
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Fig.4.12 Central Planning Area- Proposed Public Facilities Plan - Year X

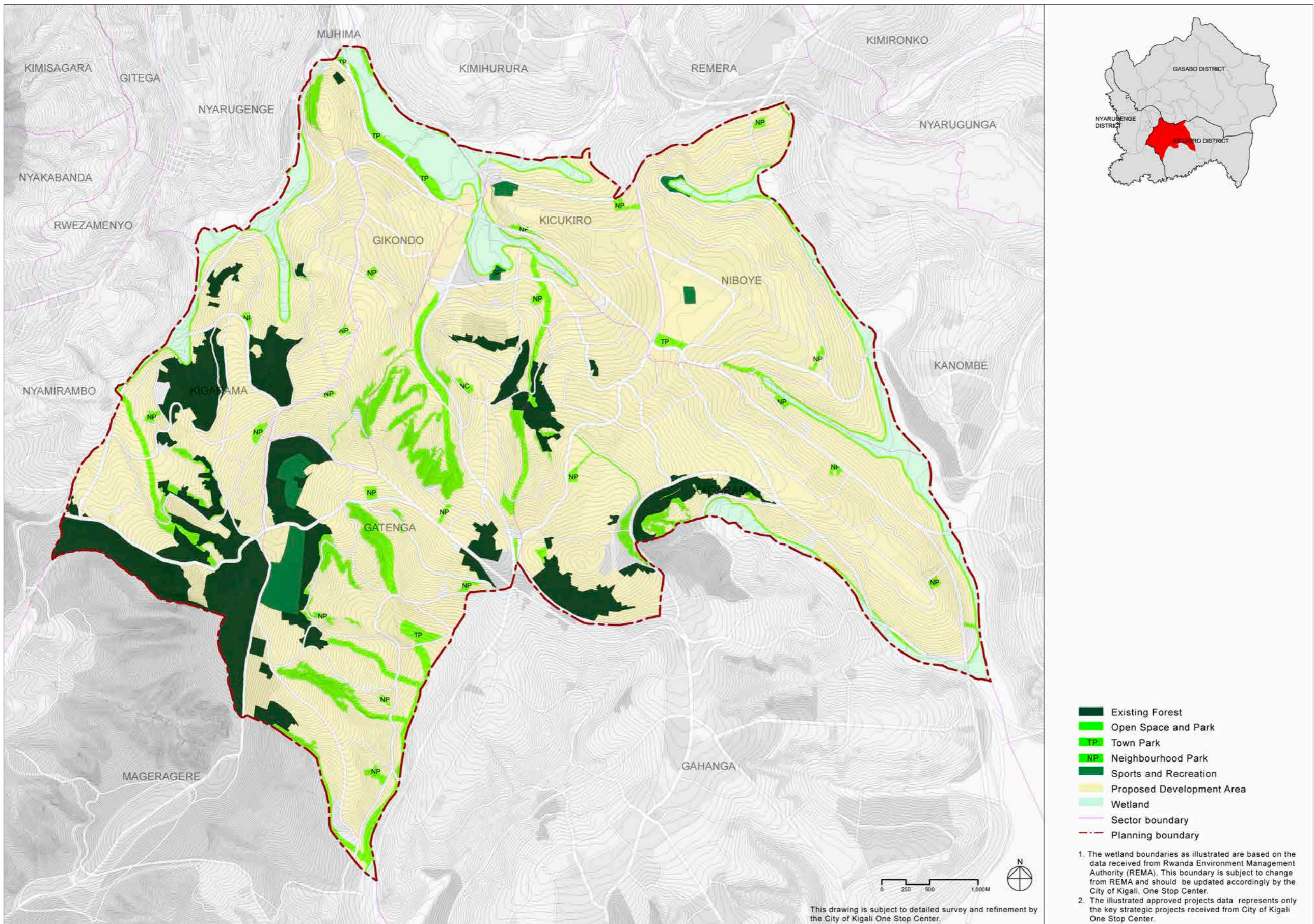


Fig.4.13 Central Planning Area- Proposed Public Facilities Plan - Year X

memorial is surrounded by green open space due to its national importance as a tourist destination. The existing marshland close to Zion Temple Church is proposed to be redeveloped as 'Gikondo Lake Park', that will act as central recreational open space.

4.6 Central Planning Area-Key Feature Development

4.6.1 FRINGE CENTRE:

The proposed Fringe Centre close to Kicukiro Market, Ecole Polytechnic and Niboye Sector Office rejuvenates the existing Commercial Centre with added public facilities and mixed use developments to form a new urban node. The Fringe Centre also acts as a transport hub with the intersection of BRT and future MRT corridor. Young crowd from Ecole Technique (proposed to be developed as a University), and transient crowd of all age groups visiting markets and commercial centre; along with the residential population will add an omni present vibrant character to this place.

4.6.2 MIXED USE DEVELOPMENTS AND GIKONDO LAKE PARK

The existing marshlands in the heart of the City are proposed to be redeveloped as Gikondo Lake Park. This 26 Ha Park will act as a relief space amidst the commercial and mixed sue developments. Gikondo lake Park will celebrate access to the wetland front which previously was heavy industrial. The new park directly accesses the downtown, revitalizing the urban core and the wetland front. Sustainability will be an integral part of the park development, the design will not be sensitive to the site's current ecological needs but also to its future environmental impact. This Park will be a key component in the Planning Areas 'placemaking strategy'. It will provide a place for people to gather and recreate,

enjoy nature, and will heal the wetland environment for future generations

4.6.3 URBAN FOREST RESORTS

The Detailed Master Plan integrates Oz - Sub Area Proposal for Rebero. Resort facilities cited at the highest point in the City, close to Juro Park and nestled in nature; provide panoramic views of the scenic valleys in Nyarugenge District. . The Urban Forest Resort will act as one of the green lungs of the city occupying approximately 30 Ha of nature area and 10 Ha of recreational resort land.

These resorts lie close to the approved Cultural Village project. The Cultural Village is spread across 25 Ha of Land. Improved connectivity from City Centre and Airport will help create a new and revived tourist destination close to the CBD and also the new Regional Centre in Gahanga.

Refer to Fig.4.14 for Key Feature Developments in Kicukiro Planning Area.

- ① Kicukiro Fringe Centre
- ② Gikondo Lake Park and Mixed Use Corridor
- ③ Urban Forest Resort and Cultural Village

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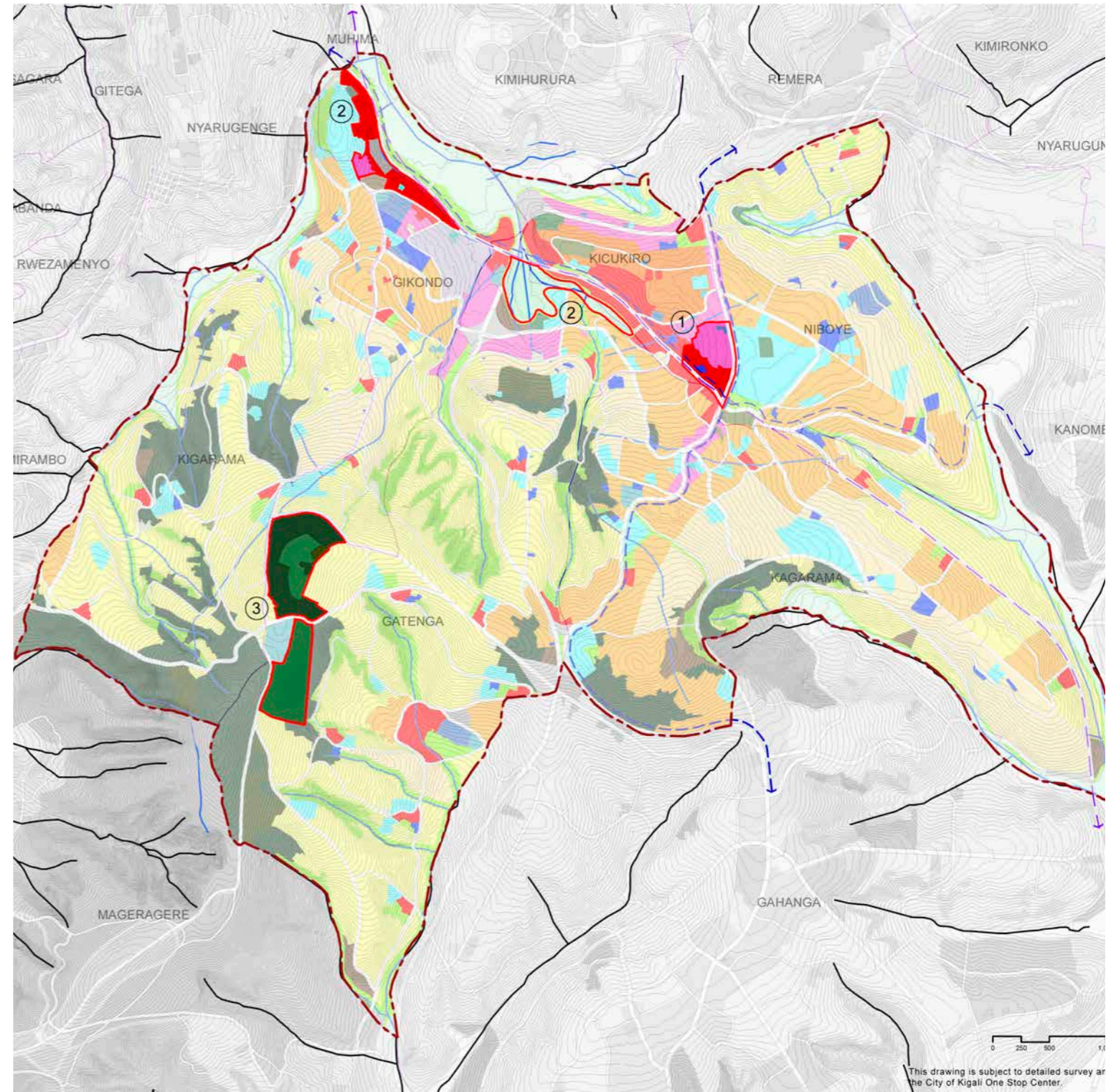


Fig.4.14 Central Planning Area - Key Feature development - Year X

5

Detailed Master Plan for South Central Planning Area

This section presents the detailed Master Plan for the South Central Planning Area. Based on the analysis of the existing context, opportunities and constraints, a vision and concept are derived which guide the development of the Master Plan and design of the key features within the Planning area.

5.1 South Central Planning Area - Existing Context

Planning Area: The South Central Planning Area comprises of two sectors, the Nyarugunga sector and the Kanombe sector. The total combined Planning Area is 3841 Ha. Fig.5.1 shows the location of South Central Planning Area in Kicukiro District.

5.1.1 LOCATION AND CONNECTIVITY

South Central Planning Area lies in the centre of Kicukiro District and accommodates key functions such as the Kigali International Airport, the Military Hospital and Defence Area. It is located within 10 km radius from the City's CBD and is centrally located along the main East West Highway that connects the City to the rest of the country.

The Planning Area is located centrally in Kicukiro District, bound by Gahanga, Niboye and Kagarama sectors to the west; Remera, Kimironko and Ndera sectors from Gasabo District to the North, Rusororo and Masaka sector to the east. To the south, it is separated by the Nyarbarongo river and wetlands from the neighbouring Bugesera District.

Currently Vers Kibungo is the only road that connects South Central Planning Area with the rest of the city. Vers Hospital Militaire road takes most of the residential traffic through the sector other than Vers Kibungo. The rest of the roads are mostly rural and unpaved.

5.1.2 EXISTING SITE CONDITIONS

South Central Planning Area is one of the larger urbanized Planning Areas of Kicukiro District, second to Central Planning Area. The area currently has a population of 62,707¹, with an average density of 1631 p/sq. km.

Nyarugenge sector is largely urbanized with low density housing, few commercial centres, industries, civic and health facilities located around the Kigali International Airport. Commercial development along Airport Boulevard has great potential to be redeveloped as a City Level Commercial zone. Large stretch of flat land is occupied by the Military Hospital and Defence Area. In the southern region, the Kanombe sector is mostly occupied by sustenance agriculture. A few areas on the flat ridges towards the west are urbanized with commercial centres, low density residential developments, health clinics, schools and an Agricultural University.

Lately, the area has been experiencing development pressure from housing projects. Care has to be taken to direct this development and avoid haphazard growth.

5.1.3 NATURAL CONSTRAINTS

The Planning Area is surrounded by wetlands on three sides. This promontory is relatively flat but has Steep slopes along the wetland edges. Panoramic views towards the South towards Bugesera make this a prime area.

Only 79% of the area (3057.57 Ha) is developable, with 18.8% of the land occupied by wetlands (722.94 Ha) and the remaining 1.66% by steep slopes (slopes greater than 20% gradient) and forest patches. Small fragments of forested

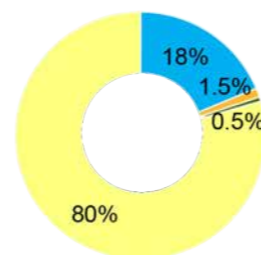
1 EICV 2006

3837ha
Total Planning Area



Fig.5.1 South Central Planning Area- Location Map

68,936
Population 2011



Natural Constraints

18p/ha
Existing Density



Fig.5.4 South Central Planning Area- Existing Constraints, Population and Density

PLANNING AREA	AREA (HA)	EXISTING 2012 (KCMP)	PROJECTED 2040
SOUTH CENTRAL	3837	68,936	479,000

Table 5.1 South Central Planning Area - Existing and Projected Population

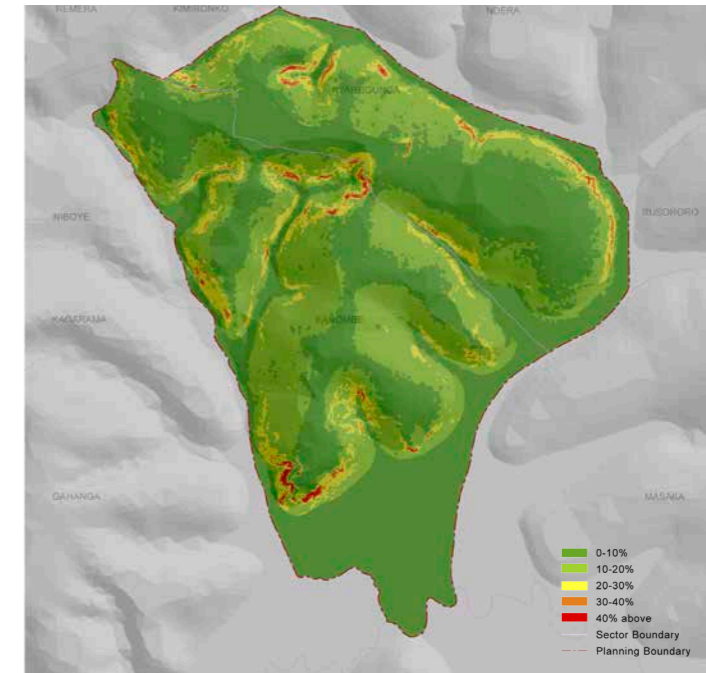


Fig.5.2 South Central Planning Area- Existing Slope Analysis

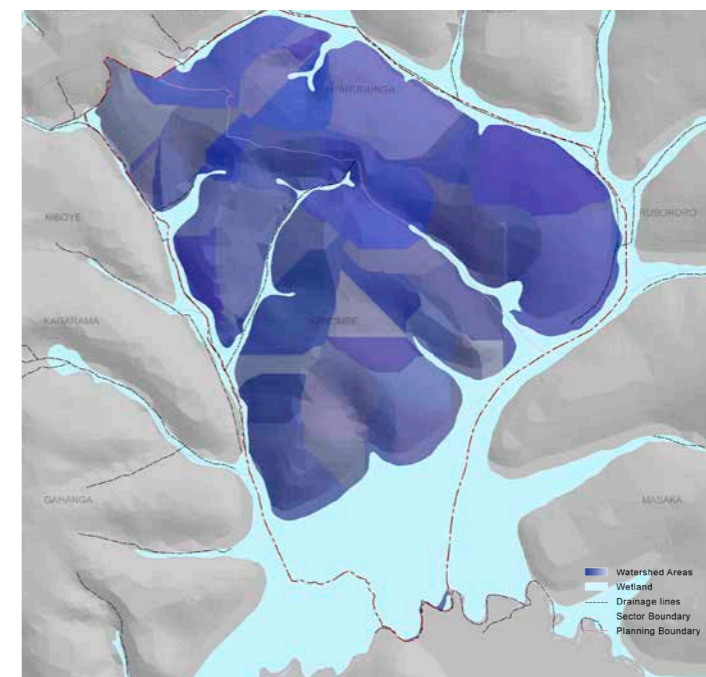


Fig.5.3 South Central Planning Area- Watershed and Drainage

Table 5.2 Central Planning Area - Existing Land Use Distribution

Broad Land Use	Detail Land Use	Area (Ha)	
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	75	658
	LOW RISE RESIDENTIAL	583	
COMMERCIAL	COMMERCIAL GENERAL	9	9
	HOTEL	3	3
PUBLIC FACILITIES	GOVERNMENT OFFICE	5	232
	EDUCATIONAL	50	
	RELIGIOUS FACILITIES	10	
	HEALTH FACILITIES	159	
	CIVIC FACILITIES	5	
	SPORTS AND RECREATION	3	
INDUSTRIES	LIGHT INDUSTRIAL	1	13
	HEAVY INDUSTRIAL	8	
	WAREHOUSE	4	
NATURE AREA	EXISTING FOREST	19	739
	WETLAND	720	
AGRICULTURE	FARMLAND	1184	1560
	PLANTATION	376	
OPEN SPACE	OPEN SPACE AND PARK	9	9
WATER BODIES	RIVER	3	3
INFRASTRUCTURE	TRANSPORTATION	355	355
	GRAVEYARD	3	258
	AIRPORT AND DEFENCE	109	
SPECIAL USE	QUARRY LAND	10	
	VACANT LAND	135	
	TOTAL		3837

- | | |
|---|--|
| Low Rise Residential | Sports and Recreation |
| Single Family Residential | Vacant Land |
| Commercial General | Wetland |
| Hotel | Wetland within planning area |
| Mixed Use | Existing Major road |
| Civic Facilities | Sector Boundary |
| Education Institution | Planning Boundary |
| Government Office | ① Existing Kigali International Airport |
| Health Facilities | ② Defence Area |
| Religious Facilities | ③ Military Hospital |
| Light Industrial | ④ Education Institute of Farming |
| Heavy Industrial | ⑤ Existing commercial centres |
| Warehouse | ⑥ Nyanza Genocide Memorial Centre |
| Defence Area | ⑦ Polytechnique Institute |
| Quarry Land | ⑧ Commercial along Boulevard de l'OUA |
| Transportation | ⑨ Commercial along Ave du Lac Ruhondo |
| Graveyard | ⑩ Amahoro Stadium |
| Existing Forest | ⑪ Kigali Institute of Education |
| Farm Land (General) | ⑫ Free Trade Zone |
| Plantation | ⑬ Masaka Town - commercial |
| Open Space and Park | |

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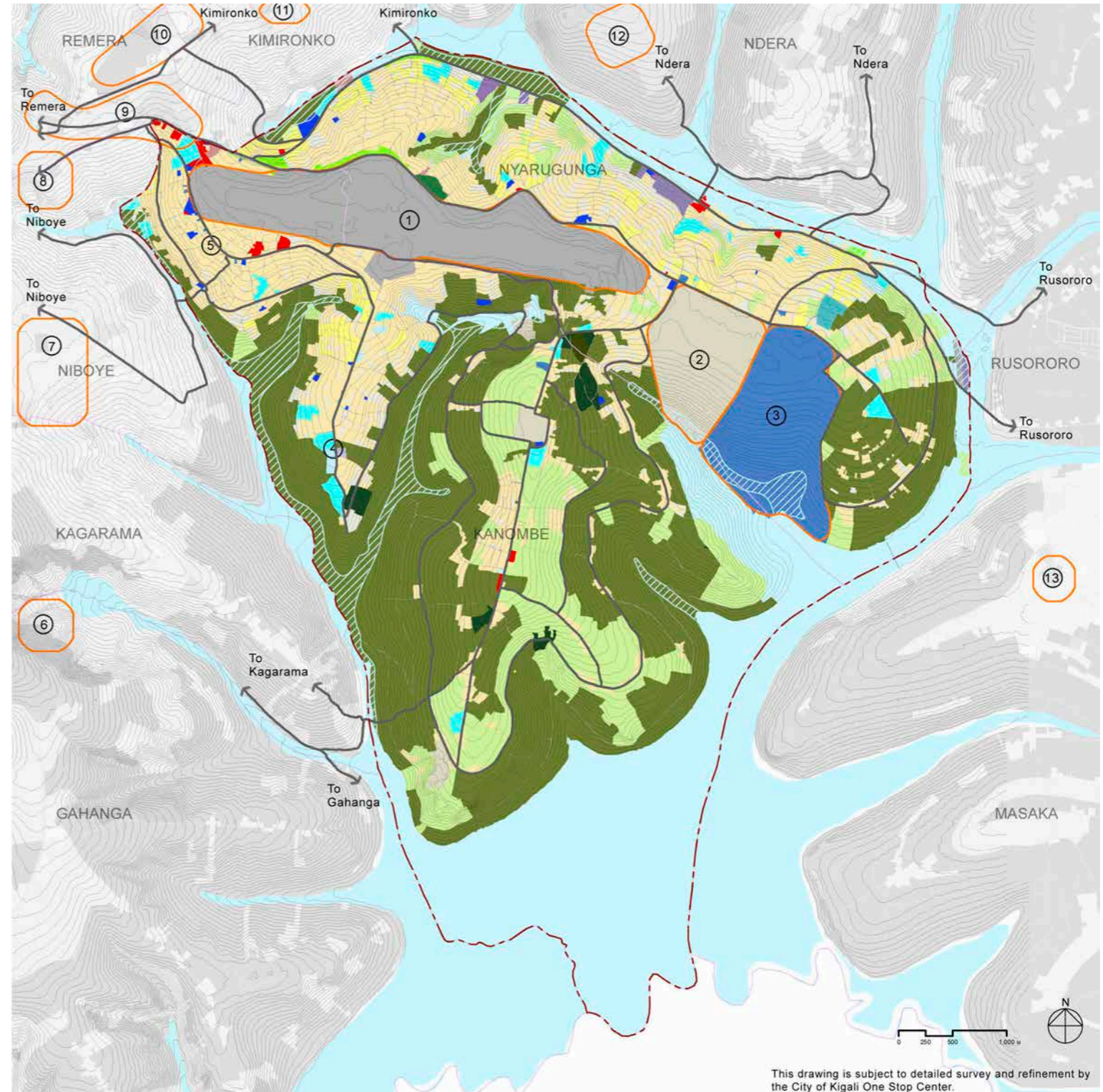


Fig.5.5 South Central Planning Area- Existing Land Use and Context Map

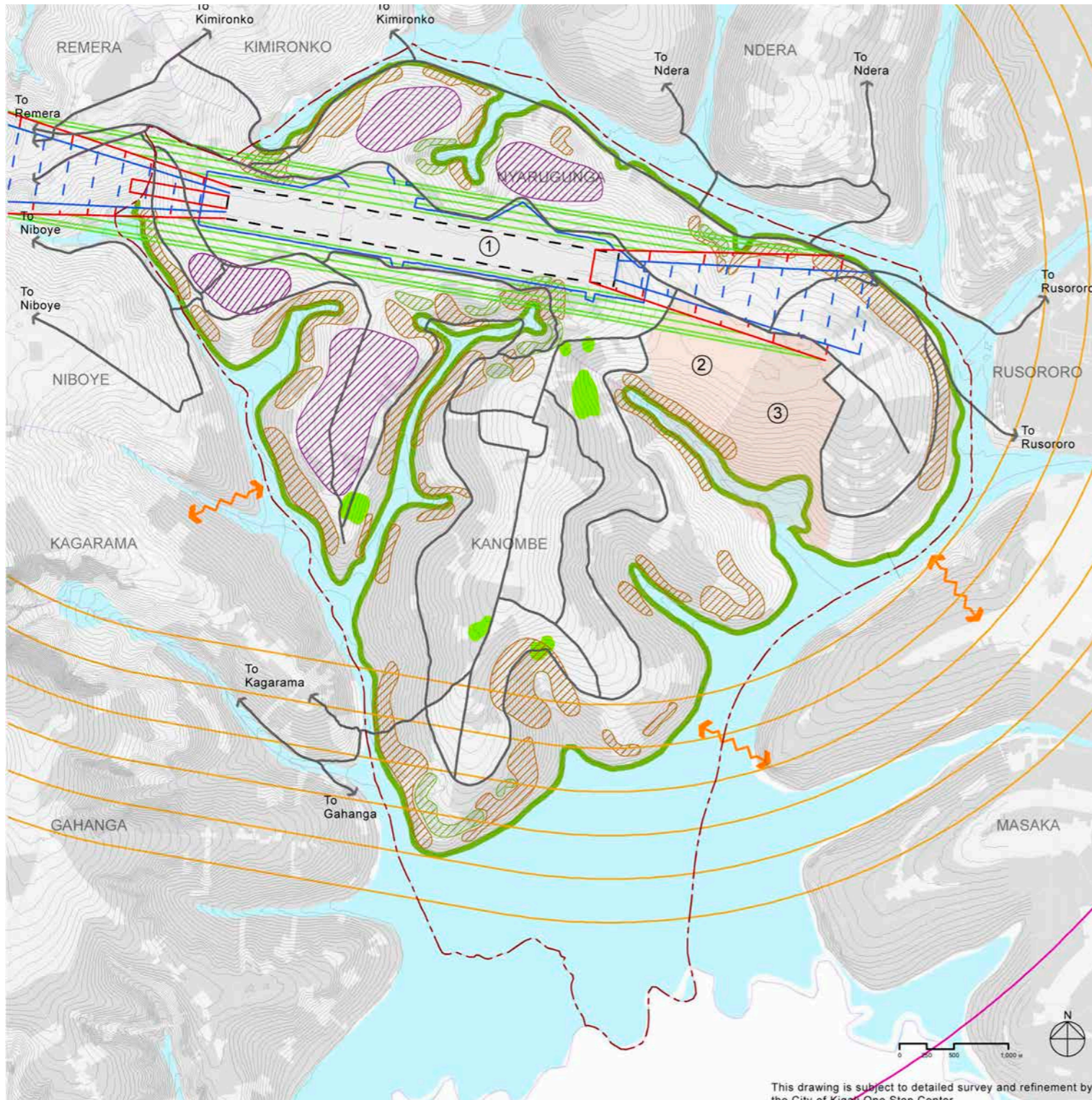


Fig.5.6 South Central Planning Area- Constraints Map

areas and natural drainage channels along the wetlands and valleys need to be safeguarded to prevent flooding and soil erosion. Fig.5.5 presents the Existing Context Plan for South Central Planning Area.

5.2 South Central Area - Opportunities and Constraints

5.2.1 CONSTRAINTS

The South Central Planning Area lies on the East West axis, and is relatively urbanized along Vers Kibungo; commercial and residential development can be found around Kigali International Airport and the Defence area. Currently, around 40% of the total land area is developed. The key constraints are as follows:

- The presence of the International Airport imposes height restrictions at nearby areas and hence limits high density development in this prime land.
- The large Defence Area and the Military Hospital occupy large prime developable land.
- Wetlands and existing forests occupy around 19% of the land. Most of the wetlands towards the north are

completely occupied by agricultural activity and spontaneous housing. These wetlands need to be restored and protected.

- About 1.66% of the land falls is categorized as steep slopes, which is unsuitable for development. These steep slopes are generally sited close to wetlands which also make connections to roads a challenging task.
- Limited Access - Apart from Vers Hospital Militaire Kanombe and Vers Kibungo, road infrastructure is still quite weak in this Planning Area.
- The areas towards the South lack infrastructure, facilities and connectivity with the rest of the city.

- Airport Height Restriction Zone
- Slopes between 20-40% that restrict high density development in areas with good views
- Steep slopes (above 40%) that need to be protected to prevent soil erosion
- Largely unplanned built-up areas with very low density development in prime area
- Fragmented clusters of greens, drain channels and forests need to be connected/integrated
- Wetland
- Steep slopes/wetlands restrict connectivity and impose high infrastructure costs

- Existing rural/mud roads need to be upgraded to accommodate future population
- Sector Boundary
- Planning Boundary
- ① Existing Kigali International airport fixates height restrictions and occupies large developable land
- ②&③ The existing defence area and military hospitals occupy large prime large in the centre of the city

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5.2.2 OPPORTUNITIES

Although the City Centre lies in Nyarugenge, the South Central Planning District is located in the centre of the City along the major thoroughfare Vers Kibungo.

- The Planning Area has great potential to be developed as affordable residential destination with various amenities; due to its central location, close proximity to the City's existing International Airport, sparsely developed land in the Kanombe sector and large wetland stretches.
- Existing residential developments in Nyarugunga and Kanombe sectors can be intensified and rezoned so as to develop compact walkable neighbourhoods with schools, commerce and public facilities.
- The entire Airport road can be landscaped to make the airport entry to the City a scenic experience by capitalizing on the approved garden projects close to the Airport.
- Vast stretches of wetlands can be

connected through recreational parks and promenades. These can be further integrated into new proposed residential townships for quality and open recreational spaces.

- Large green field areas in the South and South East region have the potential to be developed as new townships with high density housing and commercial centres.
- The existing Commercial Centres and Public facilities can be redeveloped as compact Neighbourhood Centres according to the township model proposed for the City.
- New parks and open recreational spaces can be developed to utilize the drainage and steep slopes which are well integrated with the developments.
- The North west edge of the Planning Area can be developed as Industrial Zone with the new proposed trans National Rail along Western edge of Masaka sector.

-  Relatively flat areas with potential to be developed as high density residential areas
-  Potential low density development areas with scenic views along wetlands/slopes
-  Opportunity to develop light industrial zone close to international rail freight line for local employment
-  Opportunity to develop large parks utilizing existing forests, drain channels and greens
-  Opportunity to intensify and rezone the existing developments into low/medium density compact walkable neighbourhoods
-  Opportunity to connect open greens and forests
-  Wetlands offer scenic views
-  Highest elevation
-  Good site views
-  Proposed International Rail freight line
-  Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
-  Existing Major road
-  Sector Boundary

-  Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
-  Existing Major road
-  Sector Boundary
-  Planning Boundary
-  ① Potential to develop the large wetland sanctuary / Bio diversity park as a tourist place
-  ② Potential to develop the large stretches of wetland recreational parks and gardens
-  ③ The wetland stretch can be redeveloped as the gateway to the city from the existing International Kigali Airport
-  ④ Potential to develop the existing military hospital as regional hospital catering to larger population
-  ① Existing Kigali International Airport
-  ② Defence Area

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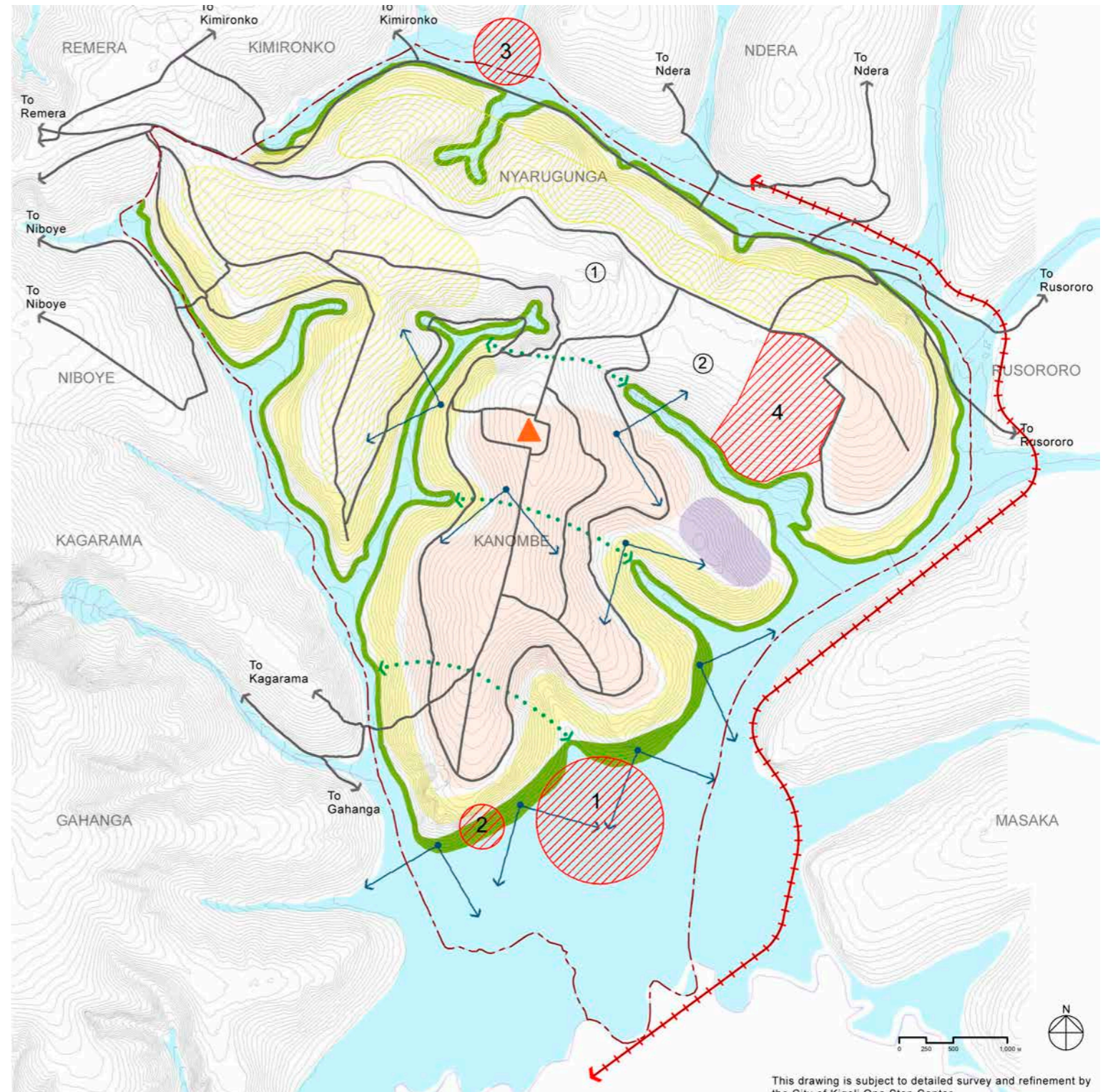


Fig.5.7 South Central Planning Area- Opportunities Map

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center

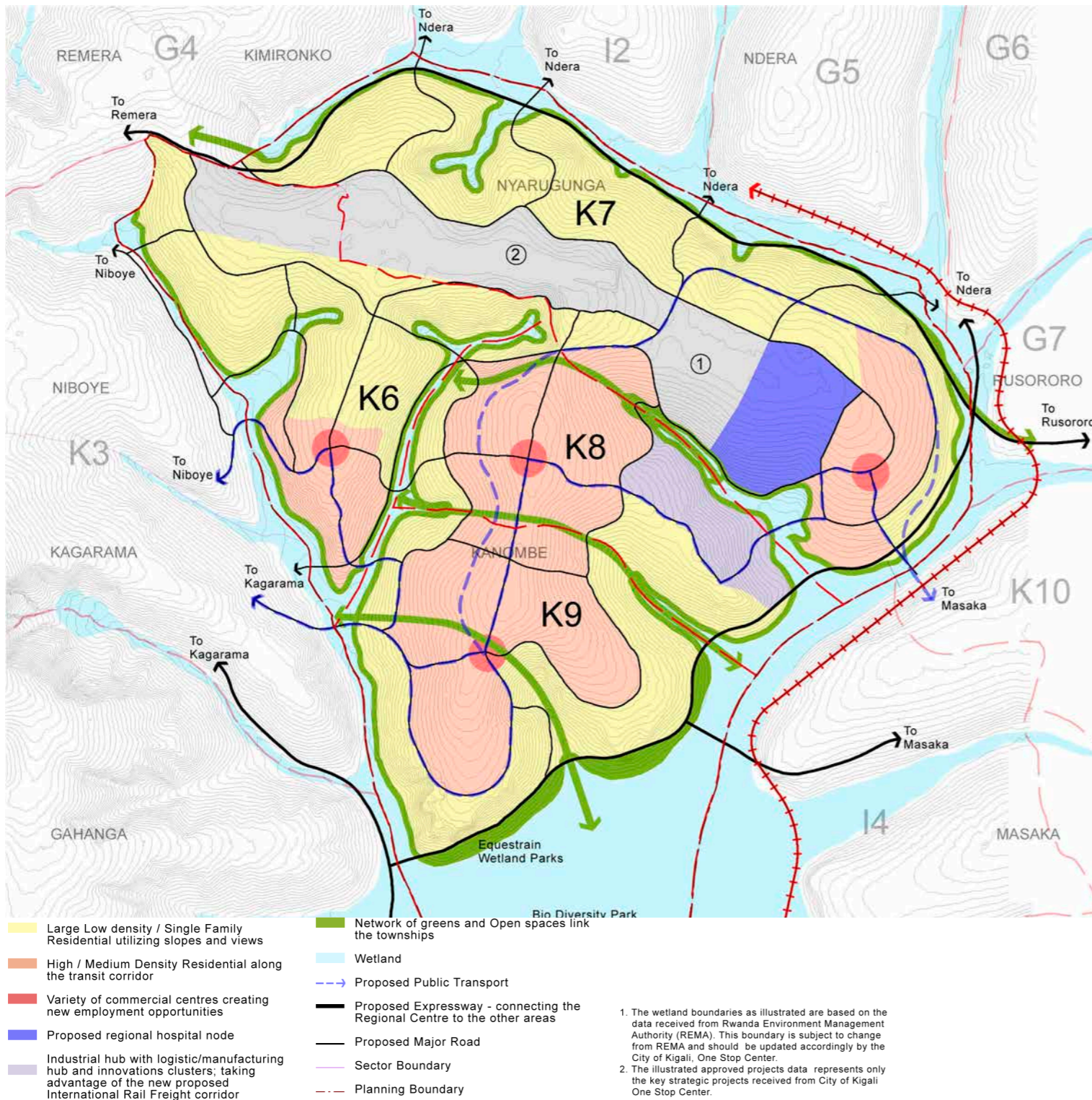


Fig.5.8 South Central Planning Area- Concept Map

5.3 South Central Planning Area - Proposed Vision

'NEW AFFORDABLE HOMES AMIDST SCENIC WETLANDS'

With close proximity to the Airport and new proposed Bio Diversity Park in the south, the vision for South Central Planning Area is 'New affordable homes amidst scenic wetlands'. The extensive wetland network is tapped to create wetland Parks and gardens amidst high quality new Residential Townships, hence making it the most sought after residential area.

5.4 South Central Planning Area - Proposed Concept

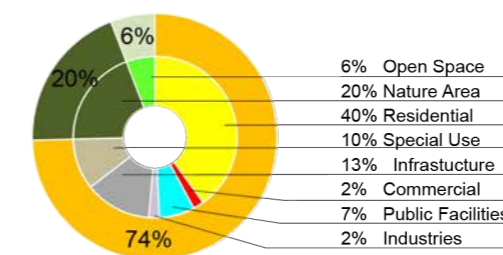
As per previous KCMP, Kanombe and Nyarugunga sectors will have a combined residential population of 74,555, with an overall City population of 3 million by 2030². However the population projection for South Central Planning Area as per the Detailed District Plan is 0.47 million

² Source - Kigali Conceptual Master Plan Report

by Year X. Based on the existing context, opportunities and constraints, as well as the proposed vision, a development concept has been proposed for the South Central Planning Area, as illustrated in Fig.5.8 . The key proposals of the Concept plan for South Central Planning Area are as follows:

- The Planning Area is restructured into 4 new compact townships with adequate public facilities.
- An effective and well-integrated public transportation network connects all the proposed commercial and industrial areas.
- Employment opportunities are proposed by segregating land for commerce and industries.
- The existing Military hospital is upgraded to a Regional Hospital and a new residential community with medium density housing is proposed closeby.
- The existing built up residential developments in Nyarugunga sector is reorganized and rezoned to create compact walkable neighbourhoods with comprehensive public and community facilities.

479,000 
Projected Population Year X



Proposed Land Distribution

157p/ha
Proposed Density

74%
Total Urbanized Area

20%
Total Nature Area

6%
Total Open Spaces



- New affordable medium density residential developments are proposed in the south, close to the wetlands and parks.
- A seamless pedestrian green network allows cyclists and pedestrians to enjoy the open recreational facilities in the Southern Wetlands.
- Wetland stretch in the North is proposed to be developed as 'Flower Valley' promoting local horticulture.

5.5 South Central Planning Area - Proposed Land Use Plan

The Land Use Plan aims to build upon the physical opportunities and constraints of the sectors and offer incentives for integrated township developments. The key proposals for the Land Use Plan are:

- Downgrade the existing Vers Kibungo to a semi expressway and divert the traffic in order to reduce congestion in the city.
- Reserve land close to the wetlands in the north, along Vers Kibungo for the proposed Flower Valley.
- Integrate existing public facilities such as schools and markets along the main roads with new amenities that are required for the projected population.
- Reduce land acquisition and respect private land ownership and propose new roads along existing roads alignment.
- Provide sufficient land for industries.
- Develop large public facilities in the south as wetland parks.
- Allocate high density residential zoning along the transit corridor.
- Redevelop and intensify existing residential developments in Nyarugunga Sector.
- Allow for development of single-family residential neighbourhoods as part of the township development.
- Integrate the two approved garden projects into the Master Plan.

- Redevelop existing commercial nodes and add more commercial centres to serve the needs of the new neighbourhoods.
- Safeguard areas with steep slopes and natural drainage courses as parks and green connectors.

5.5.1 SOUTH CENTRAL PLANNING AREA - PROPOSED RESIDENTIAL USE PLAN

The Planning Area will accommodate the projected population of 0.47 million by Year X. The key moves in Residential Use Plan are:

- The Planning Area is divided into four compact Townships - with various housing typologies and densities for quality lifestyle and environment.
- The townships are served by Bus Rapid Transit and Mass Rapid Transit in the future.
- Nyarugunga sector is zoned as single family and low density housing due to existing residential population and Airport height restrictions.
- Medium density housing is proposed close to the military hospital area, leveraging on the new proposal to upgrade the military hospital to a Regional Hospital .
- Medium density housing is proposed along the transit corridor in the three new townships K6, K8 and K9. Refer Township Boundary Plan in Appendix 2.
- Areas next to the Agro University are zoned as medium density along with the new proposed town centre.
- Areas along the wetlands and other natural features like forests are developed into single family and low rise residential developments.
- Proposed Imudugudus developments within urban areas have been integrated with the township developments.

5.5.2 SOUTH CENTRAL PLANNING AREA - PROPOSED COMMERCIAL USE PLAN

- The South Central Planning area with its four townships has four town centres one in each town. These Town Centres form the major commercial centres catering to all town level commercial needs.
- The town centres and the proposed Industrial development would cater to 70,000 new job opportunities in service and Industrial sector.
- The Town Centre are well integrated with Public Transit and surrounded by medium density housing (160 Du's/Ha). They form the main urban nodes with parks and public facilities like religious centres, hospitals and schools.
- Each Town Centre offers 0.09 mi sq. m of commercial space with approximately 10,000 employment opportunities in service sector.
- They form the main urban nodes with public transport access, parks and public facilities like religious centres, hospitals and schools.
- As per the township model, the Neighbourhood centres are located on main collector roads integrated with neighbourhood parks and public facilities.
- The Planning area is served by 19 Neighbourhood Centres. Each Neighbourhood Centre will have 3000 sq m of Gross Floor Area. They contribute to approximately 10% of the total retail space proposed in the district.
- The existing commercial along the Samuduha Rubilizi Road are retained and revitalized with added public facilities to form compact neighbourhood centres.

5.5.3 SOUTH CENTRAL PLANNING AREA - PROPOSED PUBLIC FACILITIES PLAN

Currently, the Sector has quite a number of health centres, religious centres and schools in Nyarugunga Sector and around the existing Agro University.

- The new proposed Town Centres are integrated with Poly Clinics, Religious Centres, Town parks, Cultural centres and Higher educational Institutes.
- The existing Public facilities are retained and integrated with these Neighbourhood centres wherever possible.
- The southern most township close to the wetlands has additional wetland park infrastructure creating new Public Recreational facilities. This waterfront recreational facilities distinguish this township from the rest of the townships.
- Public facilities are well integrated with public transportation network.
- Primary and Secondary schools are proposed based on the township model,

- keeping in mind ease of accessibility and a walking distance of less than 500 m.
- Smaller public facilities such as health centers, religious facilities and community halls are integrated within the Neighborhood Centers.
- Special uses like Graveyards, Reserve Sites and Utilities like Sub stations, Fire Stations and ETZ are distributed as per catchment population.

5.5.4 SOUTH CENTRAL PLANNING AREA - PROPOSED GREEN AND OPEN SPACES PLAN

The South Central Planning Area is bound by wetland stretches in the South. These

Table 5.3 South Central Planning Area - Proposed Land Use Data - Year X

BROAD LAND USE	DETAIL LAND USE	AREA (HA)	TOTAL AREA
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	868	1574
	LOW RISE RESIDENTIAL	334	
	MEDIUM RISE RESIDENTIAL	372	
COMMERCIAL	COMMERCIAL GENERAL	83	83
MIXED USE	MIXED USE	0	0
PUBLIC FACILITIES	GOVERNMENT OFFICE	5	332
	EDUCATIONAL	128	
	RELIGIOUS FACILITIES	12	
	HEALTH FACILITIES	131	
	CIVIC FACILITIES	8	
	SPORTS AND RECREATION	47	
INDUSTRIES	LIGHT INDUSTRIAL	63	
NATURE AREA	EXISTING FOREST	11	63
	WETLAND	771	
OPEN SPACE	OPEN SPACE AND PARK	185	185
WATER BODIES	RIVER	1	
INFRASTRUCTURE	TRANSPORTATION	395	425
	UTILITIES	30	
	GRAVEYARD	51	
	AIRPORT AND DEFENCE	332	
RESERVE SITE	RESERVE SITE	9	9
TOTAL		3837	3837

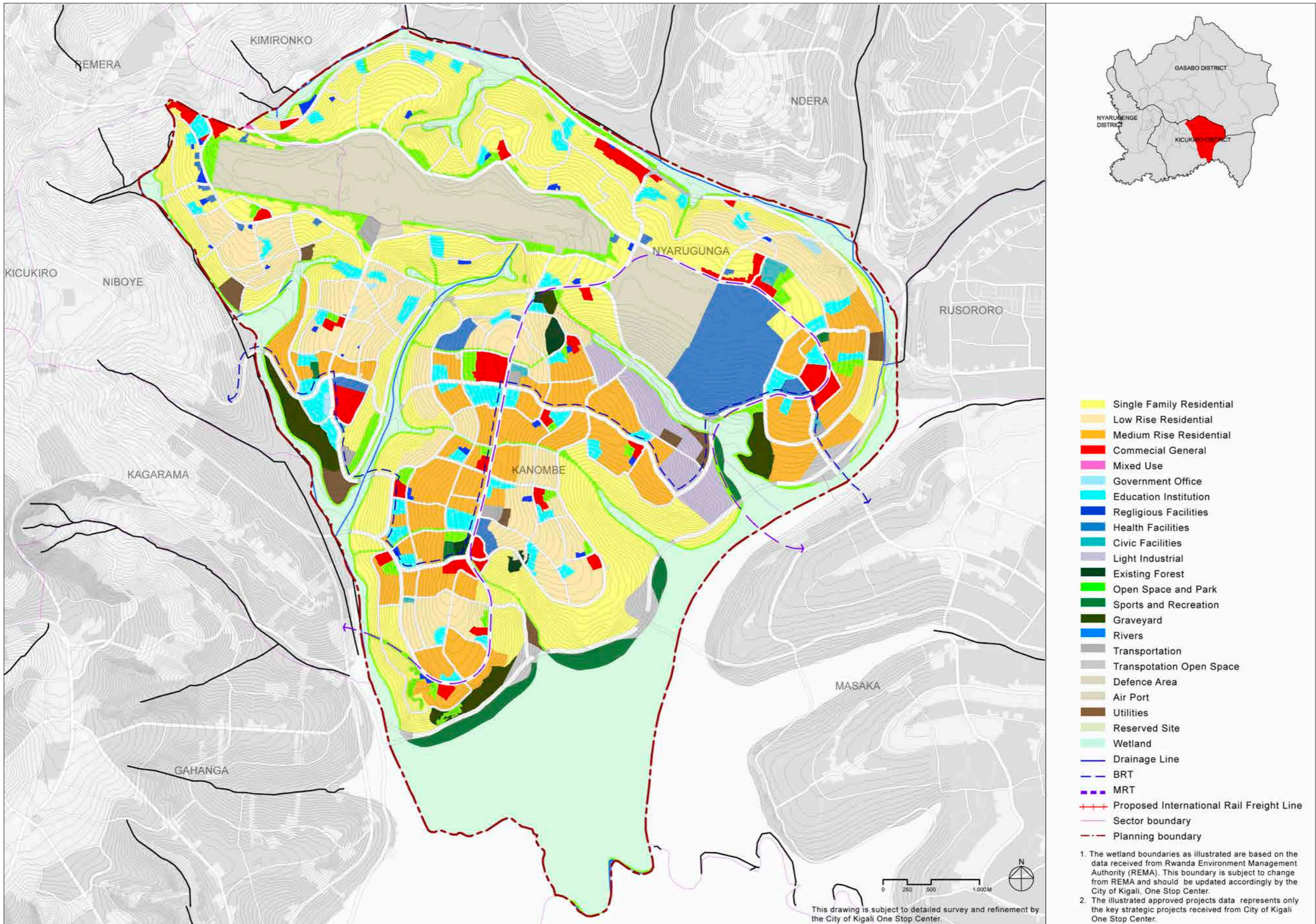
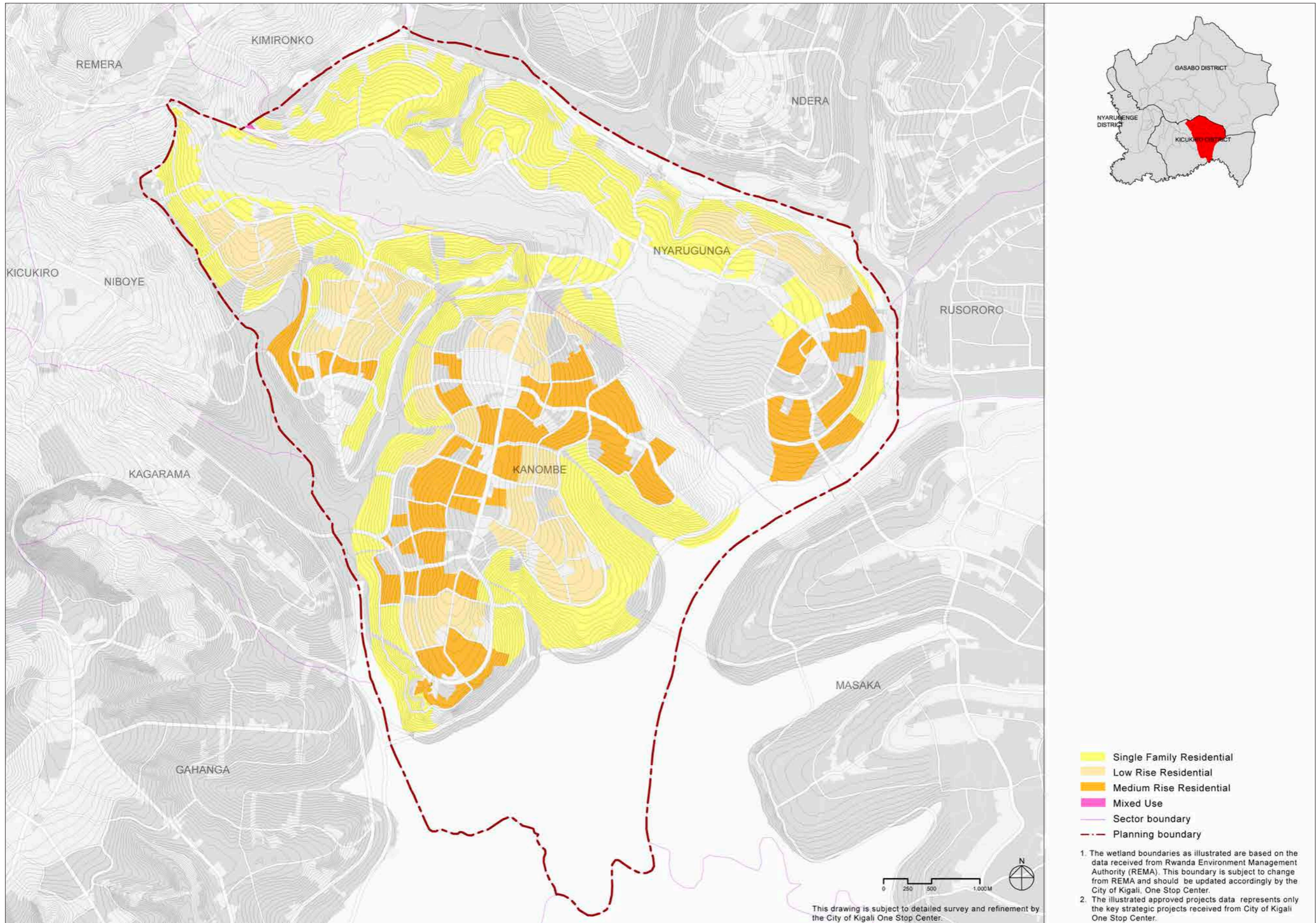


Fig.5.9 South Central Planning Area- Proposed Land Use Plan



- Single Family Residential
- Low Rise Residential
- Medium Rise Residential
- Mixed Use
- Sector boundary
- Planning boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

82 Fig.5.10 South Central Planning Area- Proposed Residential Use Plan

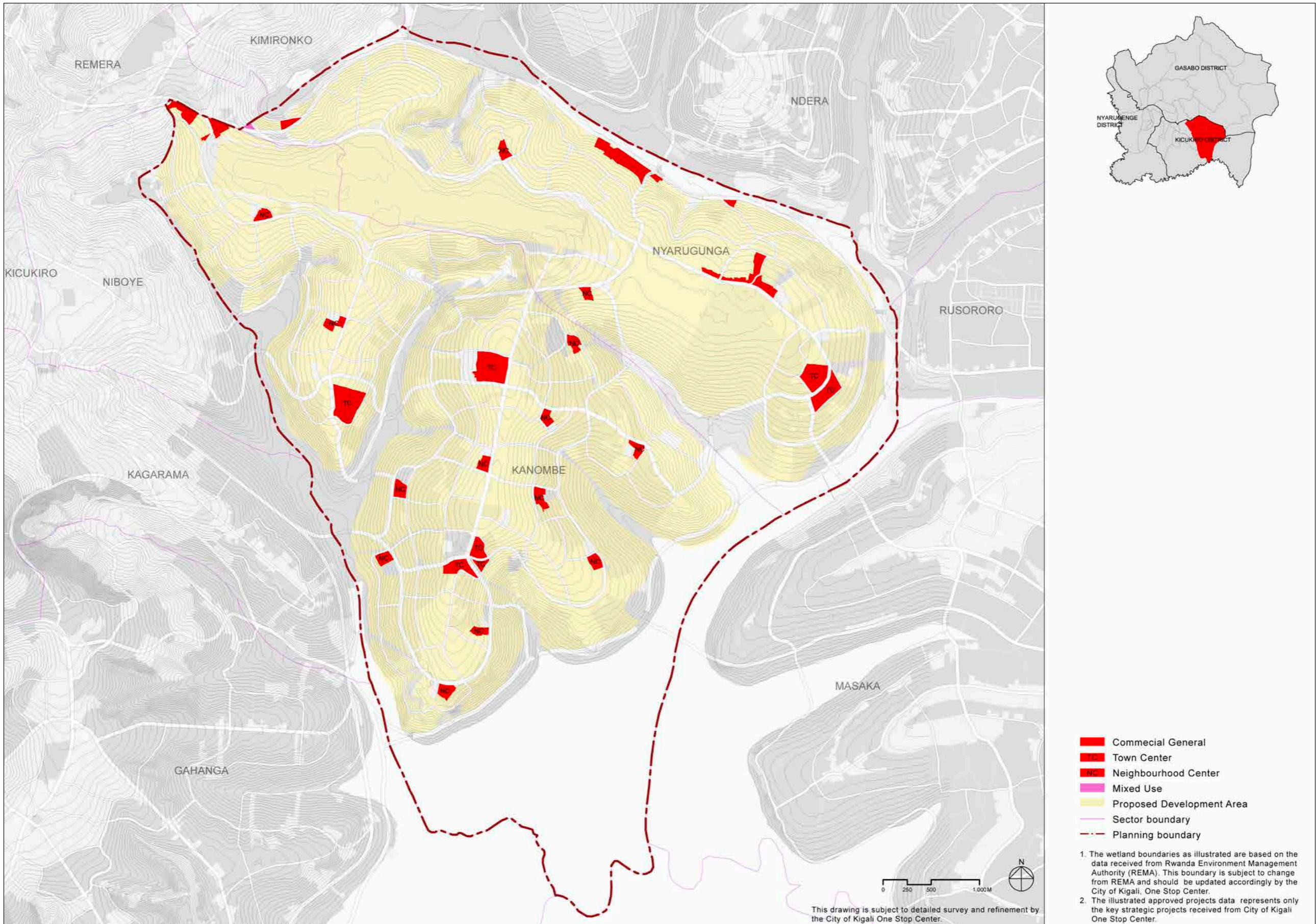


Fig.5.11 South Central Planning Area- Proposed Commercial Use Plan

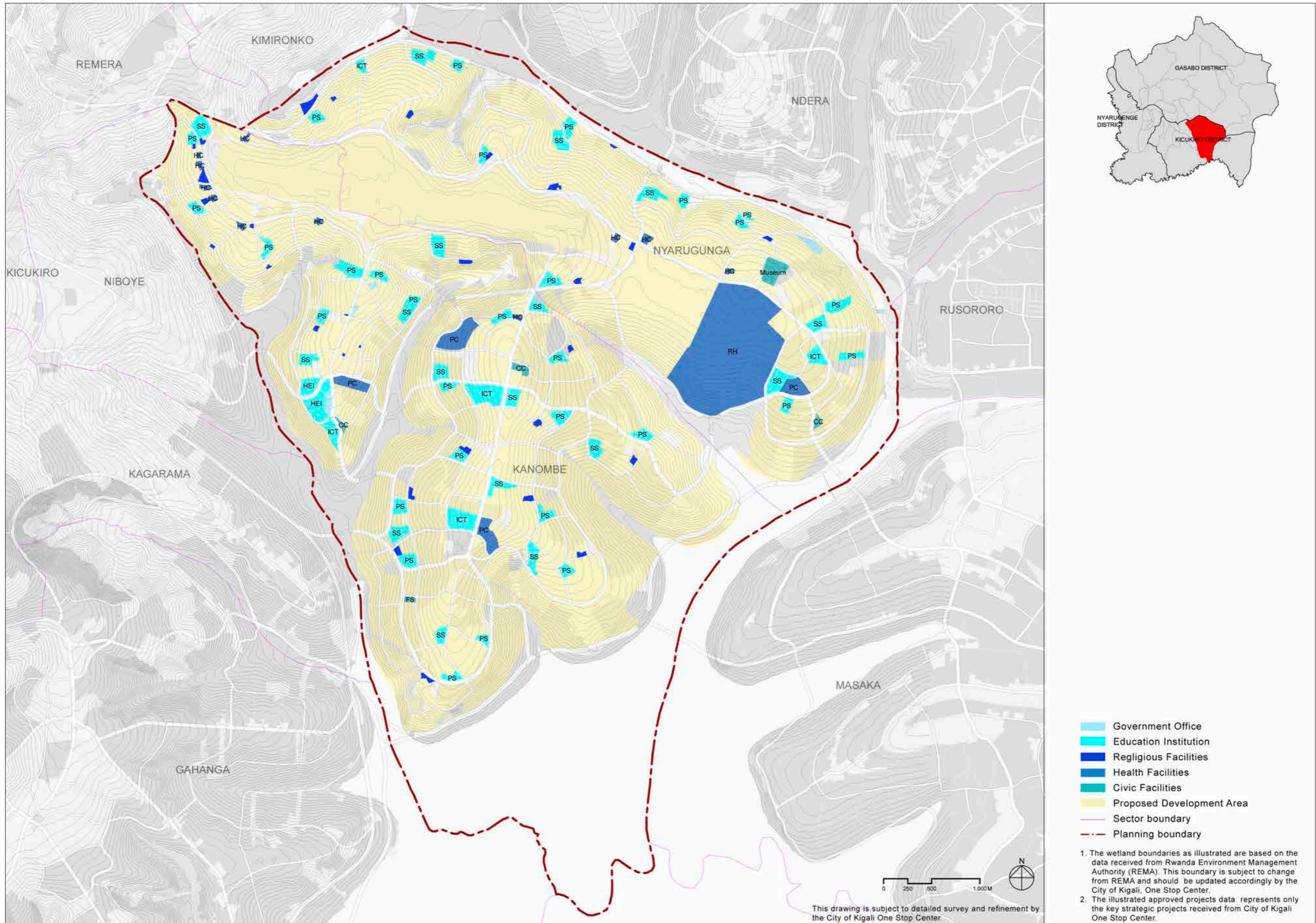


Fig.5.12 South Central Planning Area- Proposed Public Facilities Plan

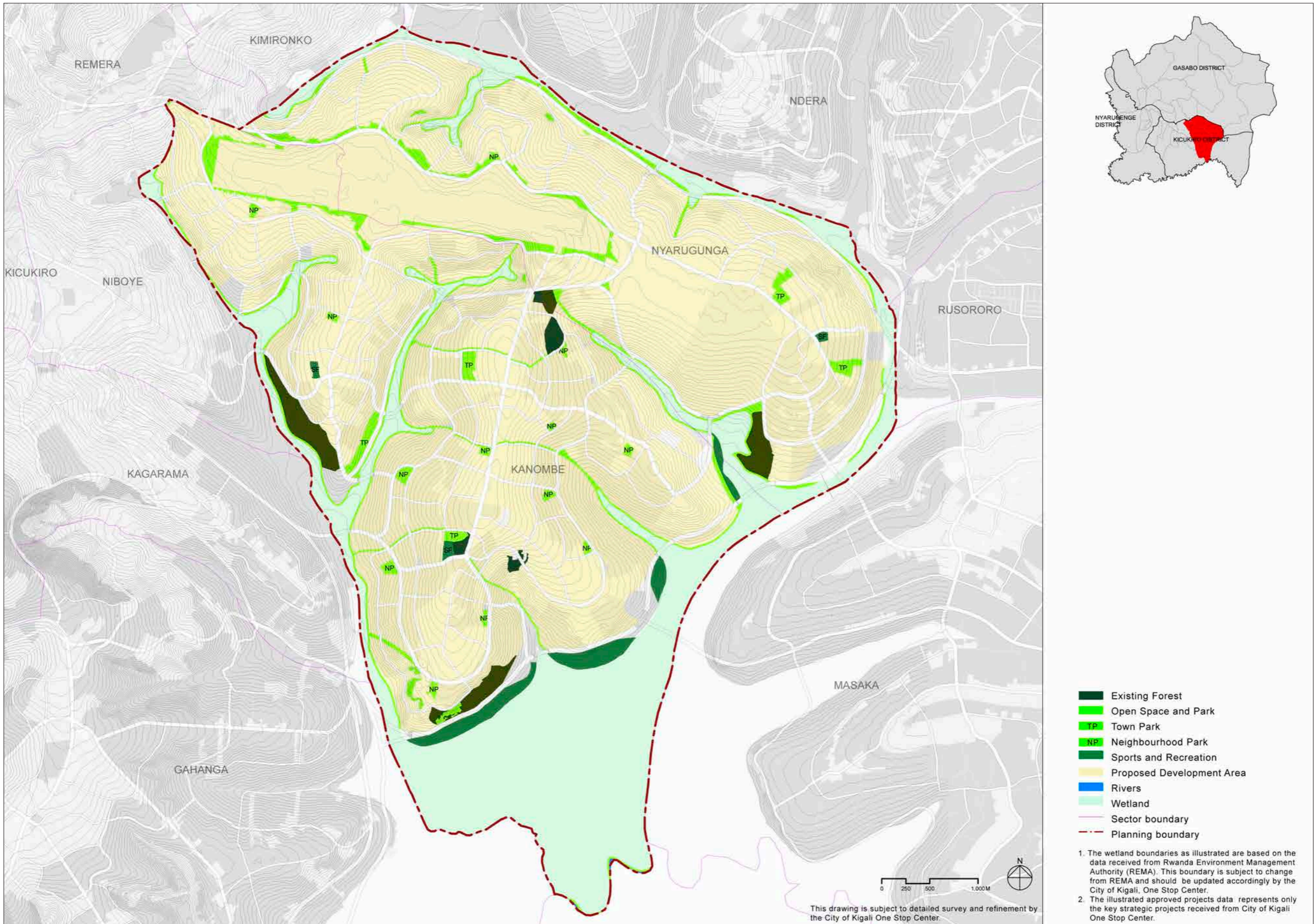


Fig.5.13 South Central Planning Area- Proposed Green and Open Space Plan

wetlands are proposed to be protected and developed into Bio-diversity Park as per the strategic plan.

- Capitalizing on the large wetland network unique to the South Central Planning Area, the proposed Bio Diversity Park would restore the lost eco system in the City.
- Two wetland parks are proposed as an extension to the Bio Diversity Park, that hosts children’s parks, themed parks, small eco friendly resorts and restaurants, with huge public promenade and board walks.
- The wetland parks are further connected with the natural drain channels, existing forests and steep slopes (protected slopes) through park connectors to form a continuous green open space.
- The new proposed medium density residential developments are integrated with this green network to form Garden residential projects ‘unique’ to this Planning Area.
- The existing wetland Valley in the Northern edge is proposed to be developed as ‘Valley of Flowers’
- Passive recreational areas along steep slopes and along wetlands as buffer zone create more public open spaces besides benefitting the environment.

5.6 South Central Planning Area - Key Feature Developments

5.6.1 VALLEY OF FLOWERS

The country is popular for its highlands and year round rainfall, and humidity levels well suited for long stemmed and big headed flowers. This provides for an opportunity to further explore and exploit the commercial and aesthetic aspects flower farming in the city.

The central wetland stretch along Vers Kibungo that divides Kicukiro District from Gasabo District is proposed to be redeveloped as ‘the Valley of Flowers’. This Existing wetlands buffer area is recommended to be planted with lush plantation of roses and Alstrmeria flowers. The parks will feature flower gardens, green house exhibits, commercial flower fields with the gift shops and florist shops.

The City could easily supply summer flowers when the rest of the country receives it dry spells during this season. With basic infrastructure in place, flower farming culture will be encouraged leading to small scale jobs and livelihood.

5.6.2 WETLAND PARKS AND BIO DIVERSITY PARK

Wetlands form the essential element in the City’s landscape. With around 600 ha of land in the form of Wetlands and rivers (that constitute 20% of the Planning Area) South Central Planning area is endowed with natural landscape. Capitalizing on this feature, a Bio Diversity Park is proposed that helps bring back the lost wetland eco system into the City. The proposed Bio Diversity park will not just protect the marine life and provide recreational values, this eco system protection offers other benefits like increased water supplies and temperature reduction etc.

1) Valley of Flowers
 2) Wetland Parks and Bio Diversity Park

the wetland boundaries as illustrated are based on the data received from Rwanda Environment Management authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
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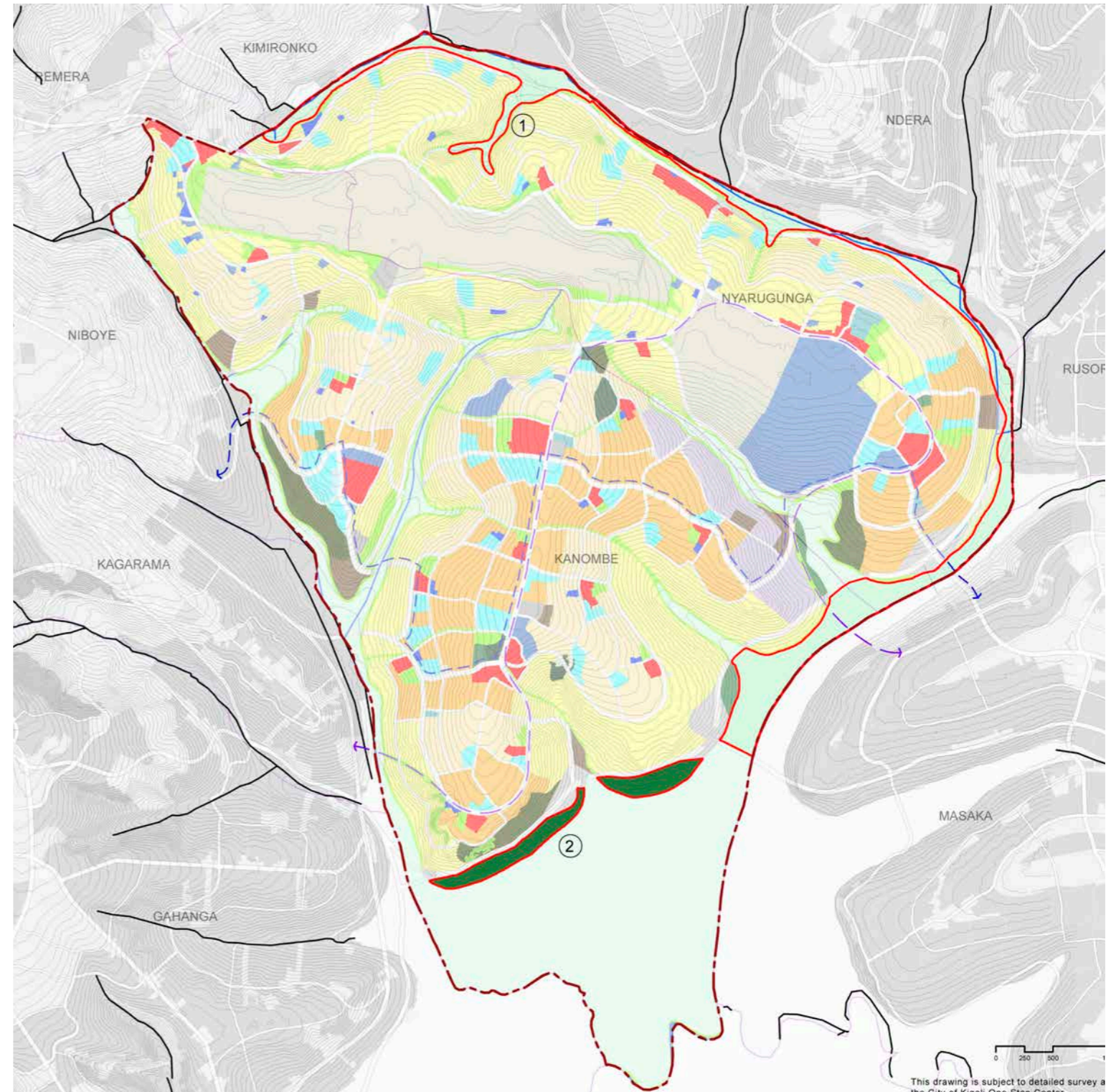


Fig.5.14 South Central Planning Area- Key Feature Developments

6 Detailed Master Plan for Southern Planning Area

This section presents a detailed Master Plan for the Gahanga Planning Area. Based on the analysis of the existing context, opportunities and constraints, a vision and concept are derived which guide the development of the Master Plan and design of the key features within the Planning area.

6.1 Southern Planning Area - Existing Context

Planning Area: Southern Planning Area comprises of Gahanga Sector. The total Planning area is 3662 Ha. Refer to Fig.6.1 for Gahanga Sector Location Plan

6.1.1 LOCATION AND CONNECTIVITY

Gahanga Sector is considered a suburban area with immense growth potential located at the South western part of Kicukiro District. The Planning Area is the main entry point into Kigali City from the Southern part of the country. It will also be the gateway into Kigali City from the proposed new international airport at Bugesera. Refer to Fig.6.5 for Existing Land Use and Context Map

The Planning Area is bound by Magaregere sector of Nyarugenge District to the west, Gatenga and Kagarama sectors of Kicukiro District to the North and Kanombe Sector to the east. To the south, it is separated by wetlands from the neighbouring Bugesera District, which falls beyond Kigali City Planning boundary.

As per the KCMP and Nyarugenge Master Plan, a new proposed highway connects Muhima to the proposed International Airport bordering Gahanga Sector. Kigali Nyamata Road in Gahanga is currently the city's key connection to the Southern Districts, from the rest of the City.

6.1.2 EXISTING SITE CONDITIONS

Southern Planning Area is considered one of the larger planning areas of Kicukiro District with available developable land. The area currently has a population of 15,164 (2006) with an average density of 413 p/ sq km. The planning area is surrounded by wetlands and steep slopes on three sides with suitable developable land along the ridge line. Majority of the Planning area is currently utilized for sustenance agriculture. The existing key developments in Gahanga are, commercial market place with Sector Office and few schools. There is an industry in the south east, close to the wetlands and several scattered Imudugudus along key roads. Due to its close proximity to the city, the area is currently experiencing development pressure. Some of the key upcoming approved projects in Gahanga are:

- Stadium with 60,000 seat capacity
- Indoor Stadium and Hotel project close to the Kigali Nyamata Road
- 6.2 Ha Industrial project along the Kigali Nyamata Road

6.1.3 NATURAL CONSTRAINTS

Only 57% of the Planning Area (2499.42 Ha) is developable, 25% of the land is occupied by wetlands (918.77 Ha) and the remaining by steep slopes (slopes greater than 20% gradient). The terrain is steep near the wetlands and generally flat on the ridges. Around 17% of the land falls under steep slopes that need protection. The small fragments of forested areas and natural drainage channels along the wetlands and valleys need to be safeguarded to prevent flooding and soil erosion.

Refer to Table 6.2 for land under Natural Constraints

3662ha
Total Planning Area

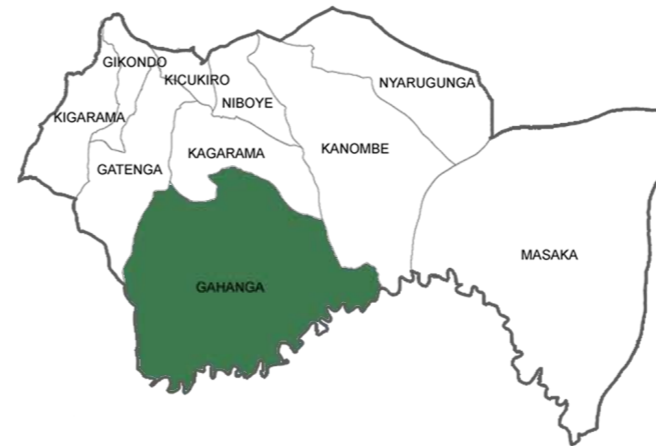
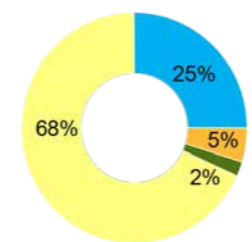


Fig.6.1 Southern Planning Area - Location Map

19,660
Population 2011



Natural Constraints

68%
Developable Land

27%
Wetland and Forest

5%
Steep Slopes Land

5p/ha
Existing Density



Fig.6.2 Southern Planning Area - Existing Land Use and Population

Table 6.1 Southern Planning Area - Projected Population

PLANNING AREA	AREA (HA)	EXISTING 2012 (KCMP)	PROJECTED YEAR X
SOUTHERN	3669.50	19,660	518,400

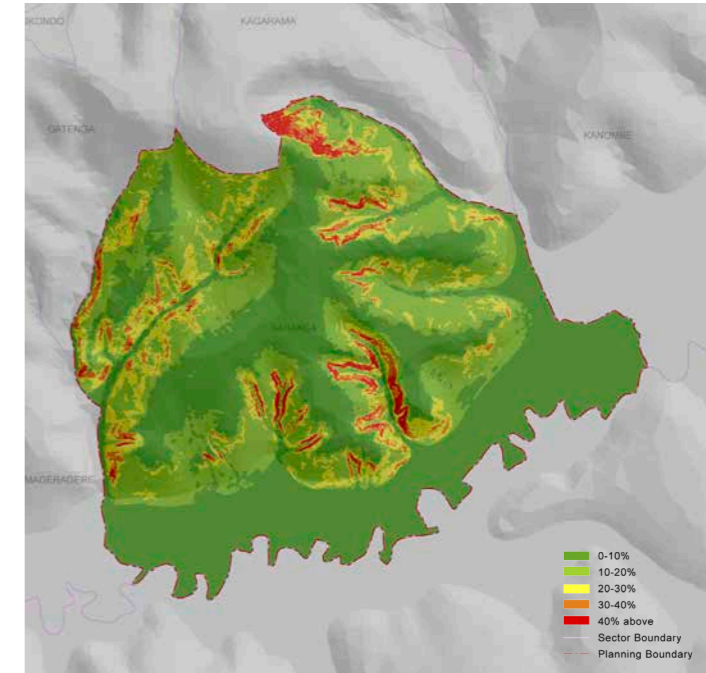


Fig.6.3 Southern Planning Area - Existing Slope Analysis

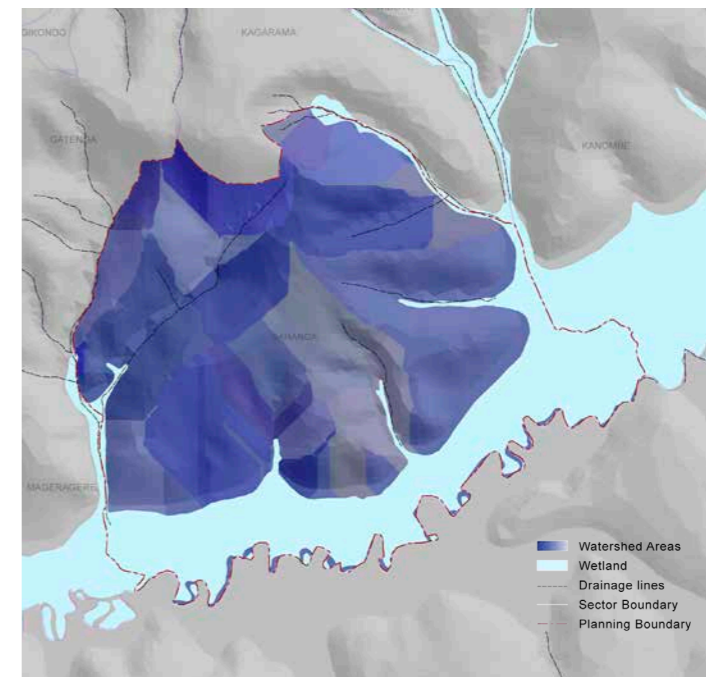


Fig.6.4 Southern Planning Area - Watershed Map

Table 6.2 Southern Planning Area - Existing Land Use

Broad Land Use	Detail Land Use	Area (Ha)		
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	0	112	
	LOW RISE RESIDENTIAL	112		
	MEDIUM RISE RESIDENTIAL	0		
	HIGH RISE RESIDENTIAL	0		
COMMERCIAL	COMMERCIAL GENERAL	1	1	
	HOTEL	0		
MIXED USE	MIXED USE	0	0	
PUBLIC FACILITIES	GOVERNMENT OFFICE	3	16	
	EDUCATIONAL	13		
	RELIGIOUS FACILITIES	0		
	HEALTH FACILITIES	1		
	CIVIC FACILITIES	0		
	SPORTS AND RECREATION FACILITIES	0		
	INDUSTRIES	LIGHT INDUSTRIAL	1	1
	NATURE AREA	EXISTING FOREST	102	981
AFFORESTATION		0		
WETLAND		879		
AGRICULTURE	FARMLAND	1603	2417	
	PLANTATION	814		
OPEN SPACE	OPEN SPACE AND PARK	0	0	
WATER BODIES	RIVERS	40	40	
INFRASTRUCTURE	TRANSPORTATION	67	67	
	UTILITIES	0		
SPECIAL USE/RESTRICTED AREA/UNCLASSIFIED	GRAVEYARD	0	19	
	QUARRY LAND	19		
	RESERVE SITE	7	7	
TOTAL		3662	3662	



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 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

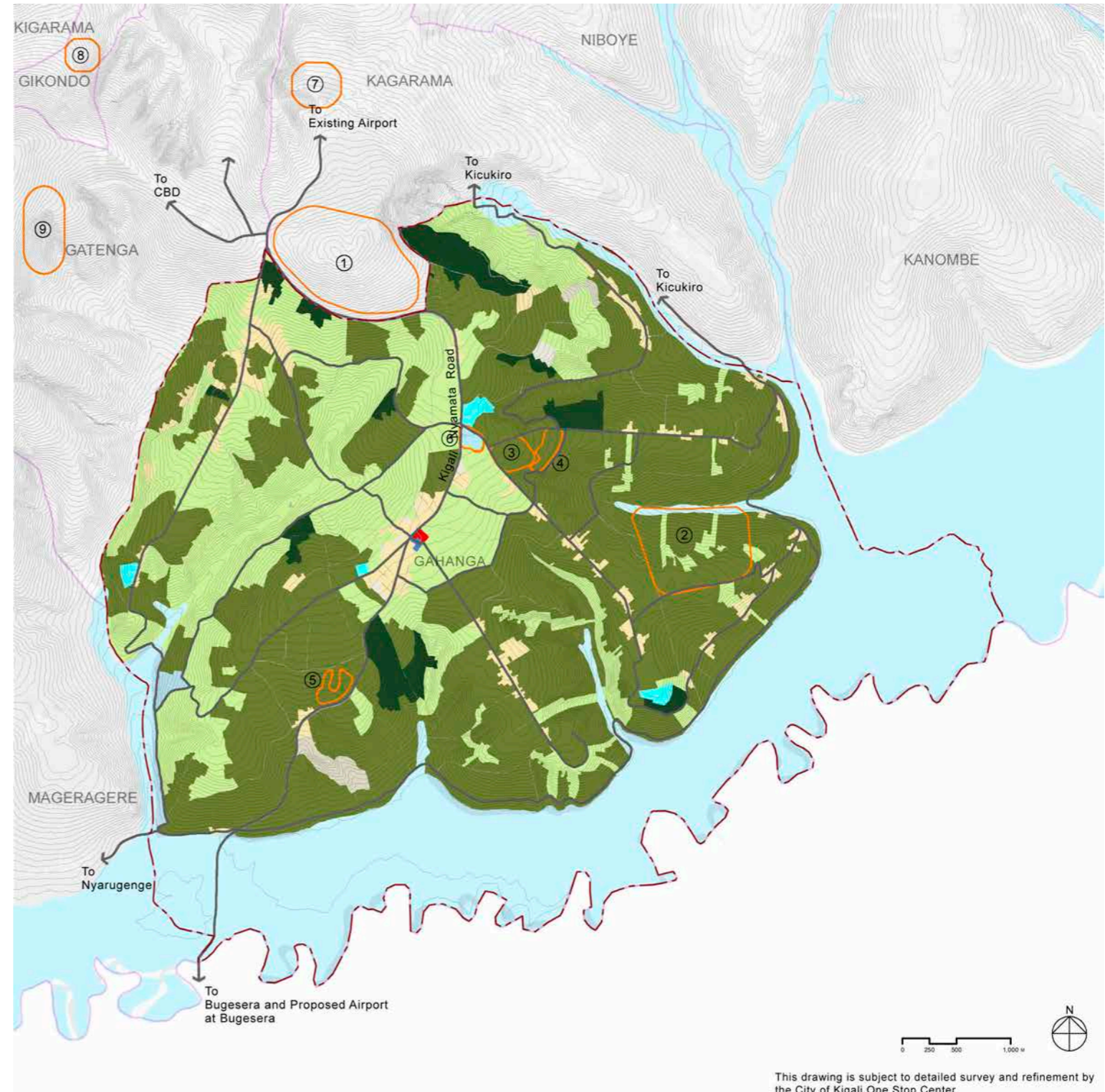


Fig.6.5 Southern Planning Area - Existing Land Use and Context map

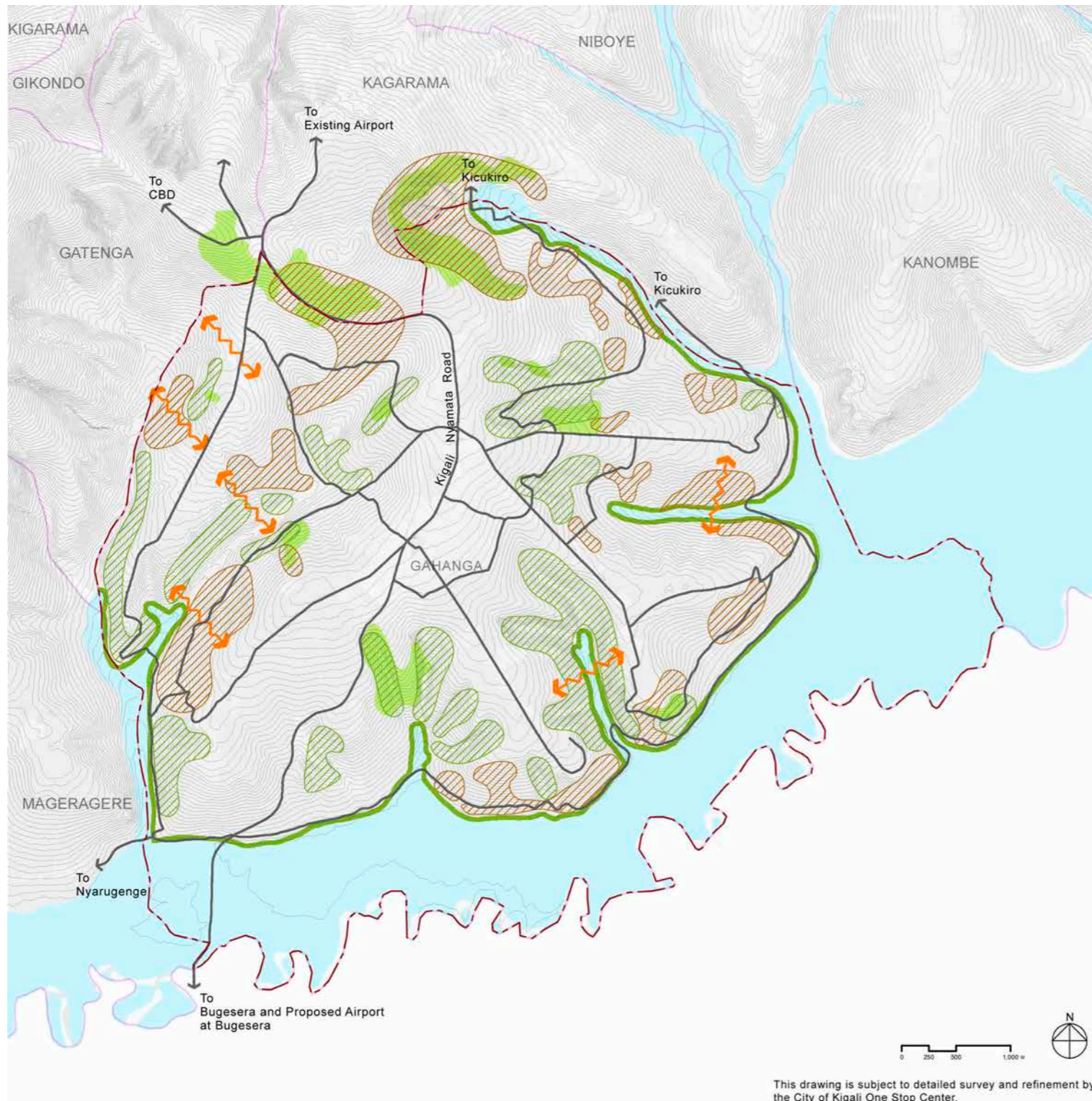


Fig.6.6 Southern Planning Area - Constraints Map

6.2 Southern Planning Area - Constraints and Opportunities

6.2.1 CONSTRAINTS

Wetlands, forests and steep slopes occupy almost 32% of this Planning Area, leaving 68% for Development. These natural assets need to be protected to secure them for future generations. Fig.6.2 represents the land under natural constraints. The main threats and Constraints in Southern Planning Area are:

- The wetlands in the South are a part of Nyabarongo River floodplain. These river floods the wetlands after heavy rainfall. This flood Basin needs to be secured from development.
- The scattered forest patches and natural drain channels are spread along the southern wetland crevices along steep slopes. The drain channels are largely occupied by existing farmlands. In order to safeguard the natural watersheds, these drains and forest lands need to be protected.

- Steep slopes in many areas restrict High density development.
- Afforestation as a measure of steep slope protection (slopes greater than 30% in Urban areas) reduces the land area for development.
- Infrastructure provision within the Sector is minimal with most of the existing roads being mud tracks.
- The approved project steel factory, hotel and stadium projects need to be integrated in the Master Plan for suitable surrounding developments.
- The new dual one Kigali Nyamata road has opened up the entire sector for new developments and connects the City to the proposed International Bugesera Airport. The road, however needs to be widened/upgraded to serve as a major arterial.
- Private land ownership restricts infrastructure and new Road development.

Fig.6.6 illustrates the Constraints for Southern Planning Area.

6.2.2 OPPORTUNITIES

Some of the key opportunities in the Southern Planning Area are:

- Potential for a new ‘Gateway Development’ at the entry of the City.
- Integrate the proposed new stadiums and hotels to create a new ‘Sports Hub’ with various additional recreational facilities like playgrounds, sports complex, training centres, water sports etc.
- Potential to develop areas with large wetland frontage as new recreational areas.
- Potential to develop large green field areas as new townships with high density housing and commercial centres.
- Opportunity to develop new parks and open spaces utilizing the large natural drain and steep slopes by integrating these within the proposed developments.

- Potential to incorporate the University programme, proposed in the ‘New City Centre Master Plan’ in KCMP and establish the District as the new ‘Education Hub’ in Kigali.
- The proposed development on relatively sparsely developed land, reduces the number of people that will need to be displaced or integrated into the plan.

- Relatively flat areas with potential to be developed as high density residential areas
- Potential low density development areas with scenic views along wetlands/slopes
- Potential development of industrial zone
- Opportunity to develop large parks utilizing existing forests, drain channels and greens
- Opportunity to connect open greens and forests and wetland parks
- Wetland
- Highest elevation
- Good site views
- Gateway development - unique local identity to the city at the entry point from proposed Bugesera International Airport
- Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
- Existing Major road
- Sector Boundary
- Planning Boundary

- ① Opportunity to develop “Sports Hub” with outdoor & indoor stadiums, water sports and sports complexes
- ② Potential to redevelop the existing market commercial into an integrated neighbourhood/town centre with public amenities
- ③ Potential to develop new commercial / mixed use area to mark the image of progressive city of Kigali
- ④ Opportunity to develop the flat ridge located close to the cultural village
- ⑤ Potential to redevelop the existing Beautiful Valley area as a tourist area
- ① Approved 60,000 capacity stadium project
- ② Approved Gahanga hotel project
- ③ Approved Gahanga indoor stadium project
- ④ Approved Gahanga industrial site

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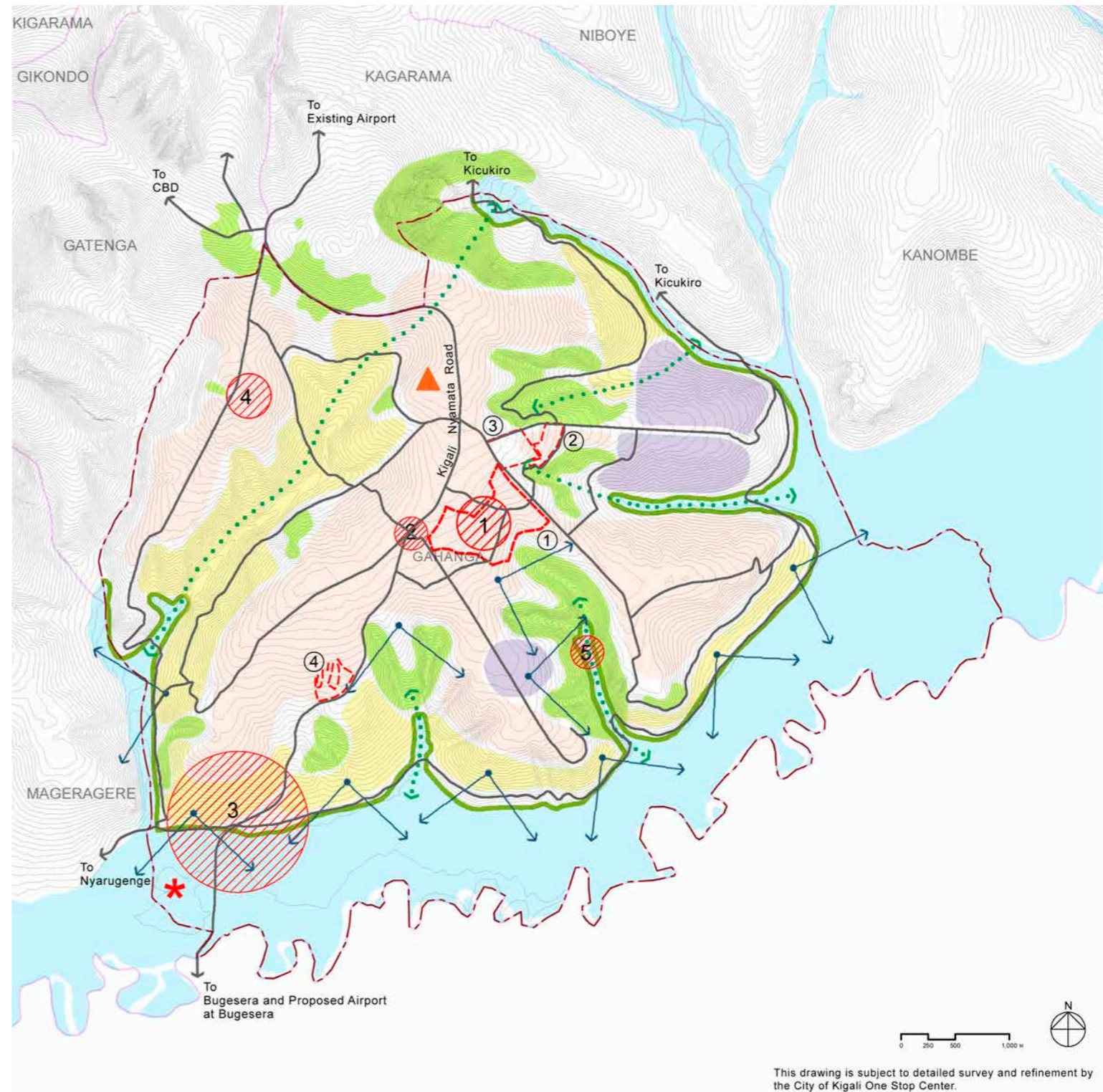
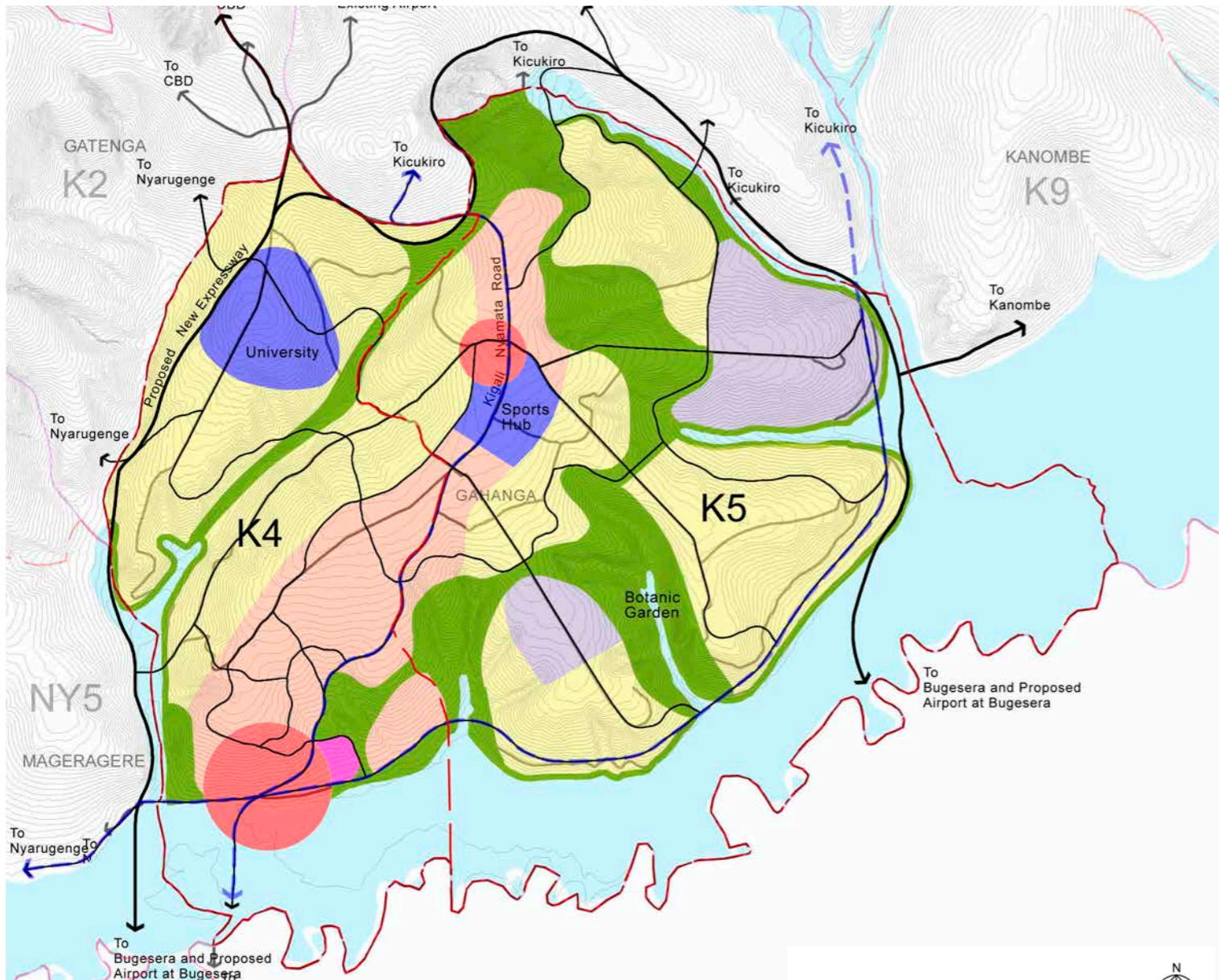


Fig.6.7 Southern Planning Area - Opportunities Map

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.



- Large Low density / Single Family Residential utilizing slopes and views
- High / Medium Density Residential along the transit corridor
- Variety of commercial centres creating new employment opportunities
- New Civic / Institutional / Sports hub creating new identity to the planning area
- Industrial hub with logistic / manufacturing hub and innovations clusters - located close to the proposed highway
- Mixed Use Corridors
- Network of greens and Open spaces link the townships
- Wetland
- Public Transport
- Proposed Expressway
- Proposed Major Road
- Sector Boundary
- Planning Boundary

Fig.6.8 Southern Planning Area - Concept Plan

6.3 Southern Planning Area - Proposed Vision

'SOUTHERN GREEN GATEWAY AND SPORTS HUB'

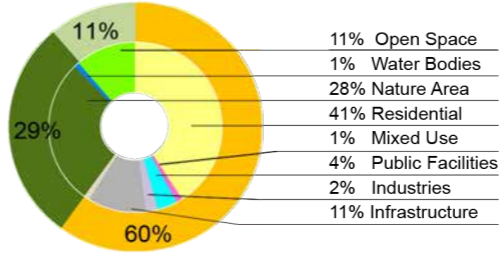
Gahanga Planning Area is envisioned to be the Gateway hub to Kigali city with a Regional Centre, Sports Hub and an International Expo. With a whole range of residential choices, public spaces and recreational facilities, Gahanga would boast of quality lifestyle integrated with nature.

6.4 Southern Planning Area - Proposed Concept

Key features from KCMP have been incorporated in the preparation of the detailed plan for Kicukiro District. KCMP assumes the City's proposed population to be 3 million by 2030¹ and Southern Planning Area will accommodate 0.25 million. The Detail District Physical Plans for Southern Planning Area plan for the projected population of 0.43 million. Based

1 Source - Kigali Conceptual Master Plan Report

434,000
Projected Population Year X



Proposed Land Distribution

174p/ha
Proposed Density

Fig.6.9 Southern Planning Area - Proposed Population, Landuse and Density

on these projections, existing site context, opportunities and constraints, as well as the proposed vision, a Concept Plan has been developed for Southern Planning Area. The proposal aims:

- To develop two new compact townships with integrated public and community facilities, high density residential developments along the transit corridor and include single-family residential neighbourhoods as part of the township development.
- To develop Gateway Regional Centre at the entry of the City; well connected with BRT and future MRT network.
- To redevelop the existing Kigali Nyamata Road as a BRT transit corridor, which will connect the Southern Planning Area with the rest of the key developments in the City.
- To provide new commercial centres such as a Regional Centre, a Town Centre, Industrial Zone and University Town to create more job opportunities.
- To establish a new Sports Hub by integrating the two approved stadium projects.

60%
Total Urbanized Area

29%
Total Nature Area

11%
Total Open Spaces



- To develop an International Expo/ M.I.C.E spreading over 20 ha at close proximity to the Regional Centre and the future International Airport at Bugesera.
- To establish the District as a Knowledge hub and Innovation Centre in Kigali by reserving area for University towns and Business Parks.
- To safeguard the areas of natural drainage courses as parks and green connectors.
- To regularize and widen the key dirt roads into collectors and local access roads.
- To develop large public facilities in the south as part of waterfront regional centre.

6.5 Southern Planning Area- Proposed Land Use Plan

The Land Use Plan aims to provide the location, distribution and character of the future Land Uses within the Sector, while offering incentives and flexibility for redevelopment into higher density uses. Key developments proposed in the Land Use Plan are:

- Two Townships - The Planning Area is divided into two townships with the arterial road and natural drain as the Township Boundaries. These townships offer comprehensive facilities and services and at the same time allow for medium to high density planned developments.
- A Gateway Node - The proposed highway, BRT and MRT mode intersection and the proposed Regional Centre close to this Interchange mark entry into the City and the identity of the new progressive Kigali City.
- Connectivity - A well connected Vehicular and Pedestrian network is proposed with more emphasis on public transportation. The existing Kigali Nyamata Road is retained and will continue as the main spine.
- Major Employment Centre focused on

Services sector - The new proposed Regional Center, the Industrial zone and the new University Town along with the Commercial Centres open employment opportunities to 0.34 million population. M.I.C.E spread over 20 Ha is proposed close to the Regional Centre

- Sports Hub - The two approved Stadium projects are integrated in the Masterplan.
- Knowledge Hub - A University town is proposed close to the proposed cultural Village (near Rebero), Business Park and Sports Facilities enabling students to experience a quality environment.
- The existing forests, natural drainage channels, steep slopes and wetlands are protected and connected through linear parks, neighbourhood parks and town parks, to form a continuous green network.

Table 6.3 shows the proposed Land Use Distribution in Southern Planning Area.

6.5.1 SOUTHERN PLANNING AREA - PROPOSED RESIDENTIAL USE PLAN

The proposed Regional Centre, Industrial zone and Sports facilities will attract a whole new body of residents that would want to enjoy live, work and play environment. The key strategies for the Residential Use Plan:

- The Southern Planning Area is divided into two compact Townships - with various housing typologies and densities for quality lifestyle environment.
- The townships are served by Bus Rapid Transit and future Mass Rapid Transit.
- High density and mixed use zoning around the Regional Centre caters to walkable neighbourhoods, easily accessible Public Transportation, shared amenities and a vibrant lifestyle.
- Medium density zoning along the transit corridor with attractive commercial, public amenities and ease of access caters to quality living environment.

- Low density housing is allocated on relatively steep slopes.
- Single family housing has been cited on areas with scenic views and relatively steep slopes. This low density development along the contoured terrain would retain the rich local residential character of the existing city.
- Proposed Imudugudus developments within urban areas have been integrated with the township developments.

6.5.2 SOUTHERN PLANNING AREA - PROPOSED COMMERCIAL PLAN

The Southern Planning Area is served by - A Regional Centre, a Town Centre and 14 Neighbourhood Centres.

- The Regional Center is proposed to include a variety of retail spaces, hotels, an entertainment centre, office spaces, cultural and recreational facilities. It provides 0.29 million employment opportunities in the services, retail and entertainment sectors.
- Town Centre is developed along the existing market road close to the approved hotel and stadium projects.
- Compact commercial Neighbourhood Centres with cultural, educational and civic facilities, surrounded by residential Land Use act as the main urban nodes in these proposed communities.
- M.I.C.E is sited next to the Regional Centre. It will host large scale temporary /permanent exhibitions and trade fairs.

6.5.3 SOUTHERN PLANNING AREA - PROPOSED PUBLIC FACILITIES PLAN

Public facilities in the sector are distributed as per the township model.

- All existing schools and public places are retained and additional facilities which cater to the increasing population have been proposed in strategic locations.
- The proposed Regional Center provides

large scale public facilities serving a larger population including Higher Education Institutes, Regional Hospital, Regional Library and a Cultural Center.

- The Neighbourhood Centres clubbed together with public amenities are located within walkable distances.
- Primary and Secondary schools are proposed and a walking distance of less than 500 m.
- Smaller public facilities such as Health Centers, Religious facilities and

Community halls are integrated within the Neighborhood Centers.

6.5.4 SOUTHERN PLANNING AREA- PROPOSED GREEN AND OPEN SPACES PLAN.

As per the City's long term goal of 'City of Enchanting Nature and Biodiversity, the following key proposals are laid out for the Southern Planning Area:

- Sports Hub, Botanic gardens, and water

Table 6.3 Southern Planning Area - Proposed Land Use Distribution - Year X

BROAD LAND USE	DETAIL LAND USE	AREA (HA)	TOTAL AREA(HA)
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	616	1377
	LOW RISE RESIDENTIAL	543	
	MEDIUM RISE RESIDENTIAL	199	
	HIGH RISE RESIDENTIAL	19	
COMMERCIAL	COMMERCIAL GENERAL	60	68
	HOTEL	8	
MIXED USE	MIXED USE	17	17
PUBLIC FACILITIES	GOVERNMENT OFFICE	2	186
	EDUCATIONAL	109	
	RELIGIOUS FACILITIES	9	
	HEALTH FACILITIES	12	
	CIVIC FACILITIES	11	
	SPORTS AND RECREATION FACILITIES	42	
INDUSTRIES	LIGHT INDUSTRIAL	195	195
NATURE AREA	EXISTING FOREST	93	1015
	AFFORESTATION	4	
	WETLAND	918	
OPEN SPACE	OPEN SPACE AND PARK	377	377
WATER BODIES	RIVERS	36	36
INFRASTRUCTURE	TRANSPORTATION	322	344
	UTILITIES	22	
SPECIAL USE/RESTRICTED AREA/ UNCLASSIFIED	GRAVEYARD	37	37
RESERVE SITE	RESERVE SITE	11	11
TOTAL		3662	3662

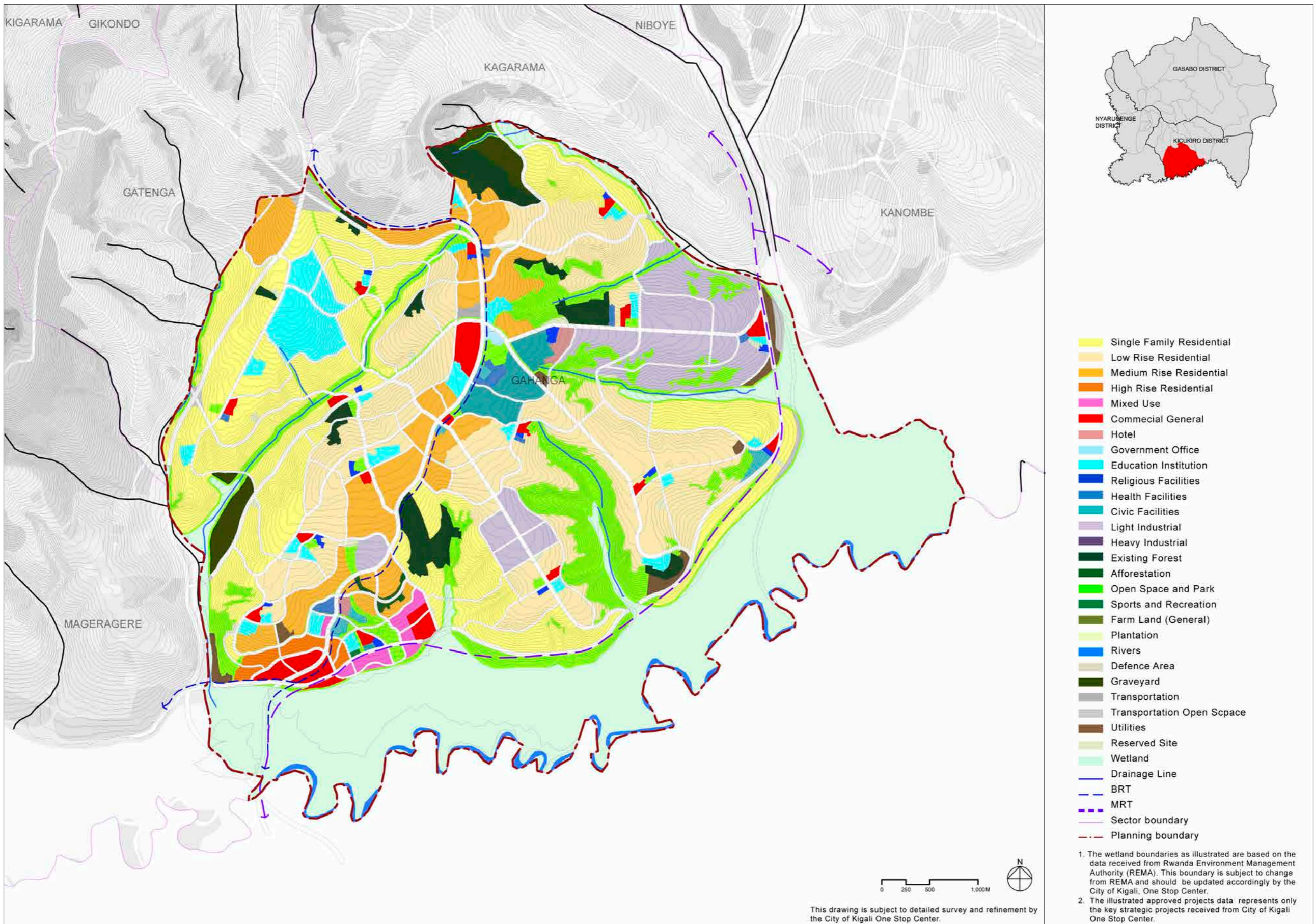


Fig.6.10 Southern Planning Area - Proposed Land Use Plan - Year X

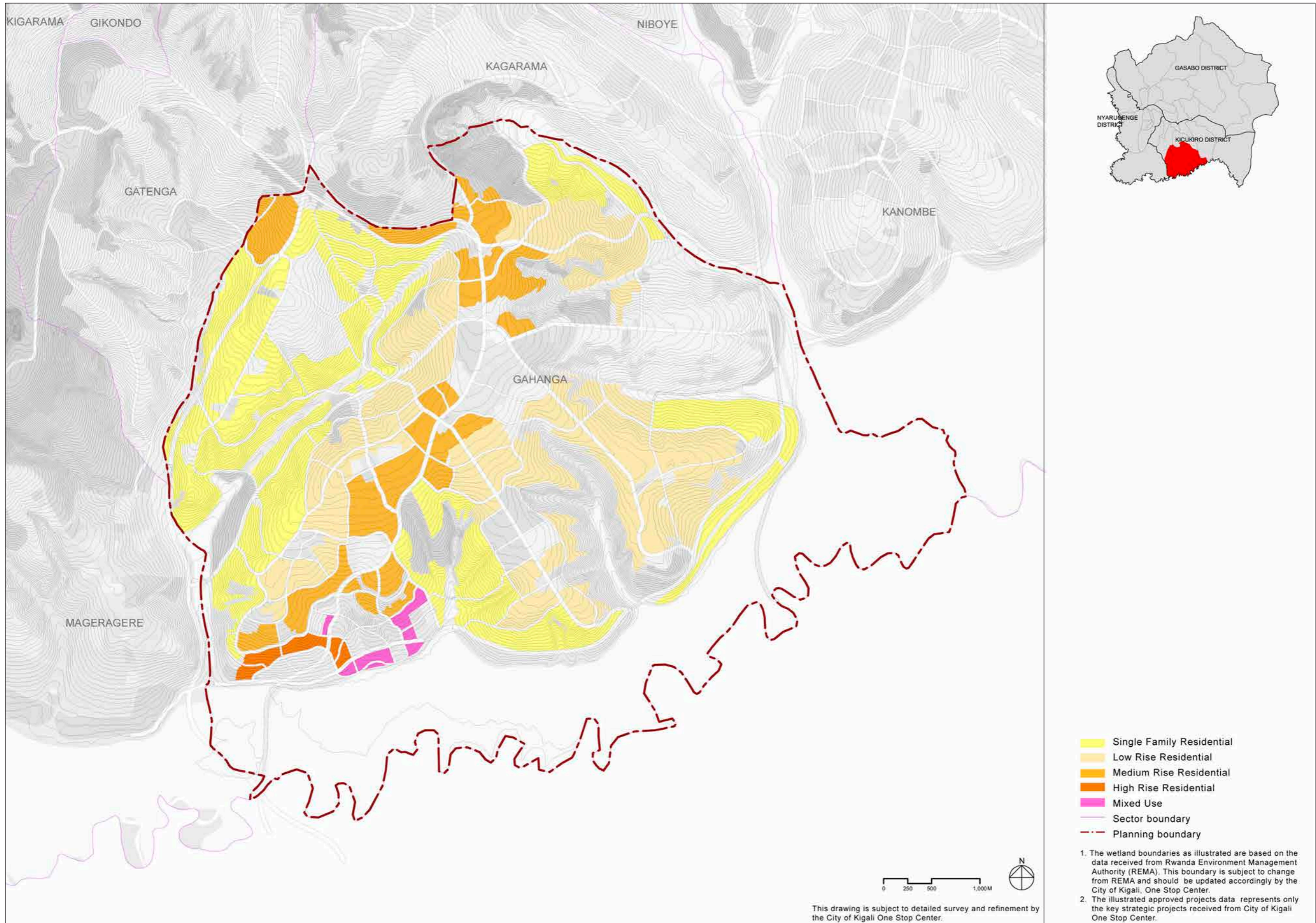


Fig.6.11 Southern Planning Area - Proposed Residential Use Plan - Year X

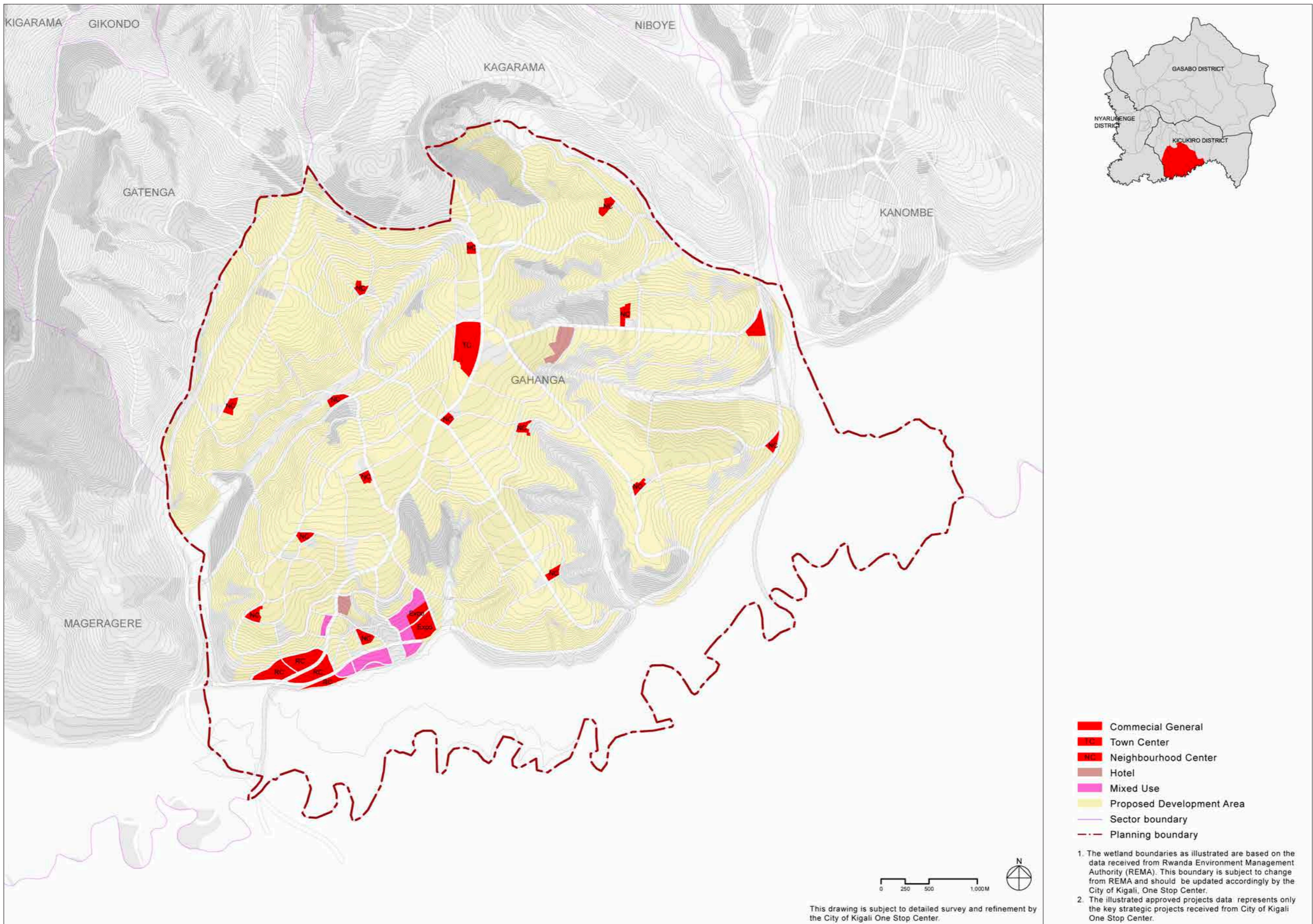
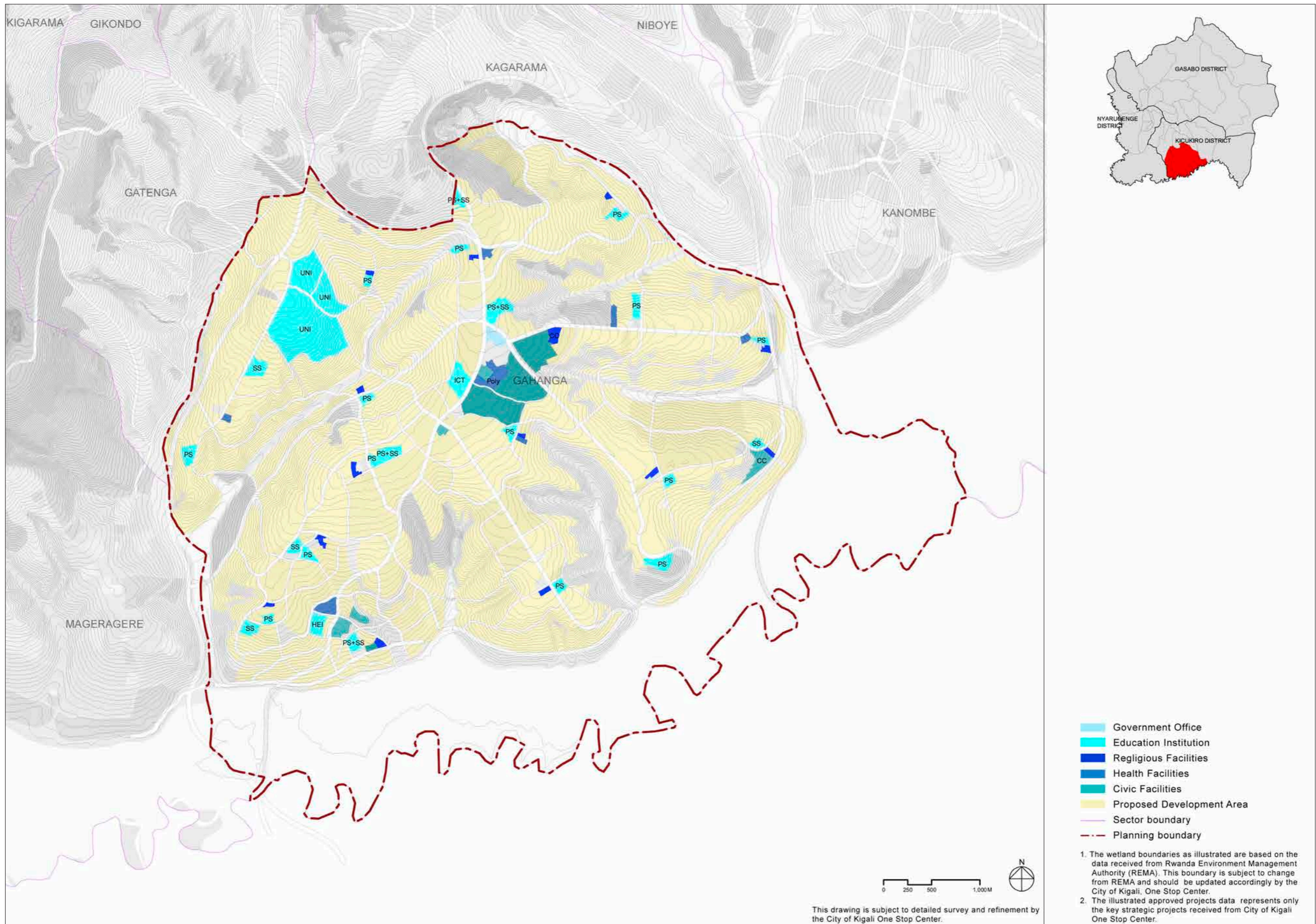


Fig.6.12 Southern Planning Area - Proposed Commercial Use Plan - Year X



- Government Office
 - Education Institution
 - Religious Facilities
 - Health Facilities
 - Civic Facilities
 - Proposed Development Area
 - Sector boundary
 - Planning boundary
1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

96 Fig.6.13 Southern Planning Area - Proposed Public Facilities Plan - Year X

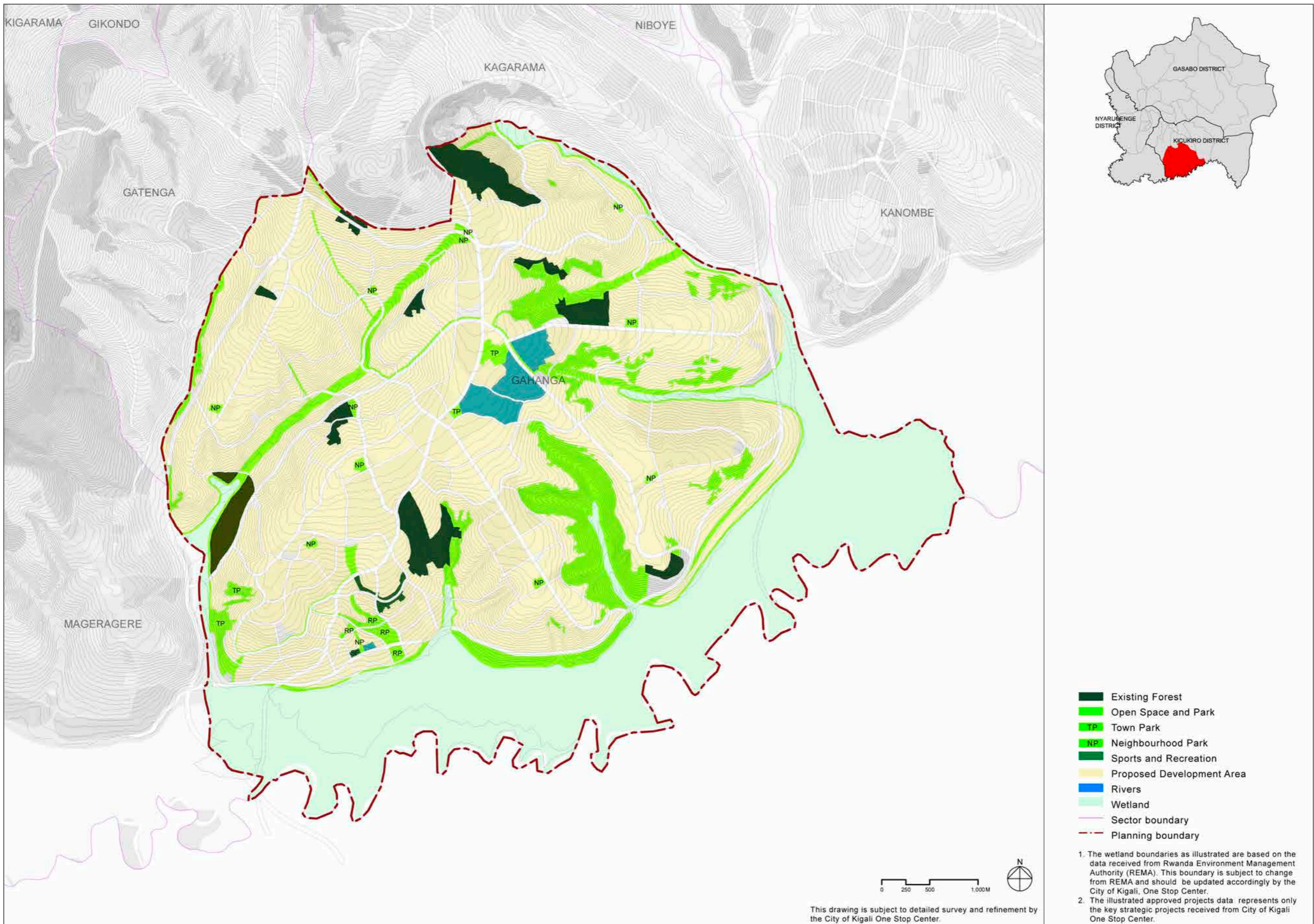


Fig.6.14 Southern Planning Area - Proposed Green and Blue Plan - Year X

front urban parks form major recreational venues in the Planning Area as well as the District.

- Botanic gardens are located in the huge valley and wetland area in the south east.
- In order to recover the lost forest cover in the City, scattered forest patches are integrated into the green plan as Protected Zones.
- Passive recreational areas along steep slopes, natural drainage channels and along wetlands act as buffer zone to create more public open spaces while benefitting the environment.
- The continuous network forms a part of the storm water management system, and offers recreational venues for pedestrian and bicycle network across the Sector.

Fig.6.14 presents the Proposed Green and Blue Plan for the Southern Planning Area.

6.6 Southern Planning Area - Key Feature Development

6.6.1 REGIONAL CENTRE

With Southern Planning Area being developed as the new development corridor that leads to the new proposed International Airport in Bugesera, the proposed Regional Centre in Gahanga Sector capitalizes on the Infrastructure Development. It allows for the opportunity to set up a new commercial centre with a Business Park in this green field area. The Regional Centre is located at the entry point of Kigali city from the Bugesera Airport, endowing it to act as the 'Gateway of the City of Kigali'. The proposed Regional centre reflects an attractive waterfront with mixed use developments and commercial centres and is surrounded by lush green networks of town parks and city parks. Public and civic facilities like the Cultural Centre, Educational Institutes, the M.I.C.E, waterfront activities and high density housing make it a vibrant place for

business, entertainment and recreation. The Urban Design of the Regional Centre is presented in detail in 'Gahanga Urban Design Report' - Task Order 5. And it's Implementation is presented in 'Kigali City -Implementation Report' - task order 6

6.6.2 SPORTS CITY

The two new approved Stadium projects in the Gahanga Sector are incorporated into the Master Plan. These new programmes promote the development of the Southern Planning Area as a 'Sports Hub'. Facilities like easy access, Public transportation, new housing Estates and access to botanical garden and Bio diversity Park, make it a very happening and lively place for all age groups. The proposed new Town Centre and mixed use development close to the Sports Hub facilitate support facilities like Hotels, the food and Beverage industry and Recreational activities during International Sports Events.

6.6.3 BOTANICAL GARDENS

As the country is already popular for its bird watching activity and has a share of international tourists, the proposed Botanical Gardens close to the wetlands will be the icing on the cake. The intangible benefits of these Botanic Gardens range from educating people about the importance of Bio Diversity and Conservation to aesthetics and Research.

90 Ha of land earmarked for the Botanical gardens is accessible through public Transportation. The waterfront parks from the Regional Centre are connected to these gardens through promenades, bike lanes and pedestrian walkways. These gardens create friendly and secure environment, improve and beautify the existing and proposed settlements, help in city greening and restore nature.

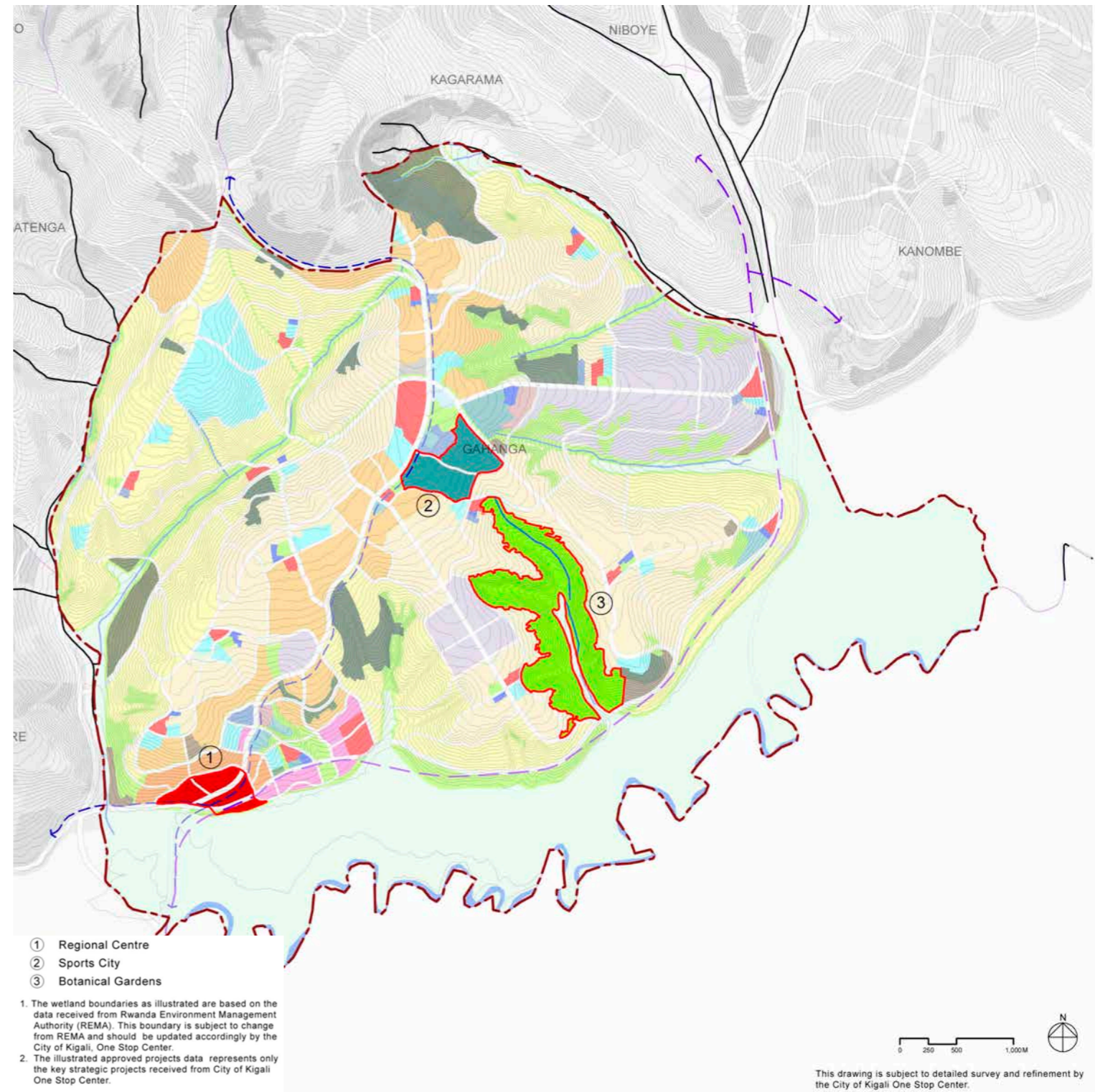


Fig.6.15 Key Feature Developments in Southern planning Area

7

Detailed Master Plan for Eastern Planning Area

This section presents the detailed Master Plan for the Eastern Planning Area. Based on the analysis of the existing context, opportunities and constraints, a vision and concept are derived which guide the development of the Master Plan and the design of the key features within the Planning Area.

7.1 Eastern Planning Area - Existing Context

Planning Area: The Eastern Planning Area comprises of the Masaka Sector. The total Planning area is 5239.93 Ha. Refer to Fig.7.1 for Eastern Planning Area Location Plan

7.1.1 LOCATION AND CONNECTIVITY

Eastern Planning Area falls in a strategic location within the City and Kicukiro District as such. It is surrounded by several key economic developments on all four directions. The new proposed International Rail freight line through Masaka offers great potential to develop an Industrial Zone in Masaka. With its proximity to the existing Kigali Airport, the new Proposed International Airport in Bugesera and Eastern provinces to the east; Masaka has the capacity to become a prime centre for Business and Residential development.

The Eastern Planning Area is located in the Eastern side of Kicukiro district. It is bound by Kanombe and Nyarugunga sectors to the North west, Rusororo sector of Gasabo District to the North and the Rwamagana district to the East. To the south and south west, it is separated by wetlands from the neighbouring Bugesera District.

The Planning Area is located about 20 km from the Kigali City Center, 10 km from the Kigali Airport, 15 km from the proposed Bugesera International Airport to the southwest, and 25 km from Rwamagana Town to the east. Vers Kibungu currently

connects the Planning Area to the main City Centre and the Eastern provinces. The new proposed rail freight line from Tanzania passes through the north west edge of the sector connecting it to the rest of the country.

7.1.2 EXISTING SITE CONDITIONS

Eastern Planning Area is the largest of all the Planning Areas in Kicukiro District with plenty of available developable land. It currently has a population of 27,156 (2006) with a low average density of 518 p/sq km. It is surrounded by wetlands on three sides and has relatively flat terrain when compared to the rest of the City. Majority of the Planning Area is currently being utilized for sustenance agriculture. The current key developments are the Masaka Town with its commercial market place, low to medium density housing, schools, health clinics, Kabuga Town and a functioning military base. The area is picking up rapid medium density developments and is experiencing development pressure due to its location amidst potential economic growth areas. Some of the key upcoming approved projects in Masaka are:

- Hospital Project
- University Project
- Government Association
- Public Facility near Kabuga Town
- Oz Sub Area Proposal - KCMP

7.1.3 NATURAL FEATURES

Only 73% of the area (3827.16 Ha) is developable, 21% of the land is occupied by wetlands (1101.19 Ha) and the remaining is forest cover and steep slopes (slopes greater than 20% gradient). The Planning Area presently houses its population in just 9% of the developable land. Around 3.35% of the land falls under Steep slopes that restrict high density development. Slopes greater than 20% need to be protected in order to safeguard the existing terrain.

5231ha
Total Planning Area

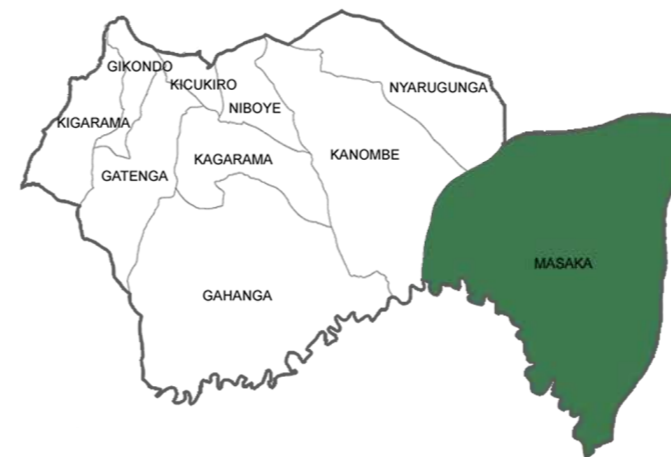
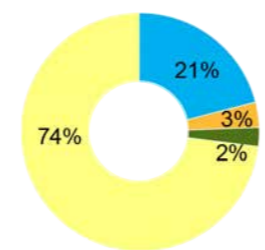


Fig.7.1 Eastern Planning Area - Location Map

5,339
Population 2011



Natural Constraints

74%
Developable Land

23%
Wetland and Forest

3%
Steep Slopes Land

0.2p/ha
Existing Density



Fig.7.2 Eastern Planning Area - Existing Natural Constraints and Population density

Table 7.1 Eastern Planning Area - Existing and Projected Population

PLANNING AREA	AREA (HA)	EXISTING 2012 (KCMP)	PROJECTED 2040
EASTERN	5231	35,212	693,000

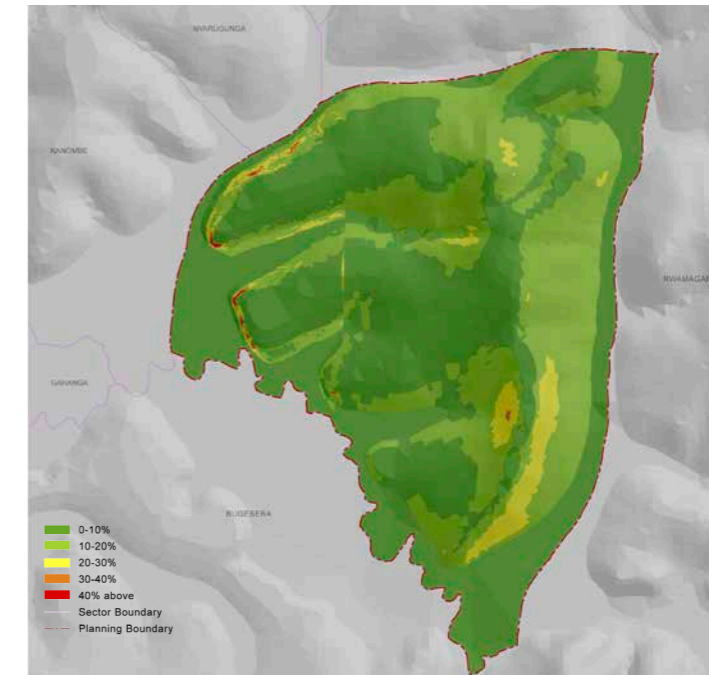


Fig.7.4 Eastern Planning Area - Slope Analysis

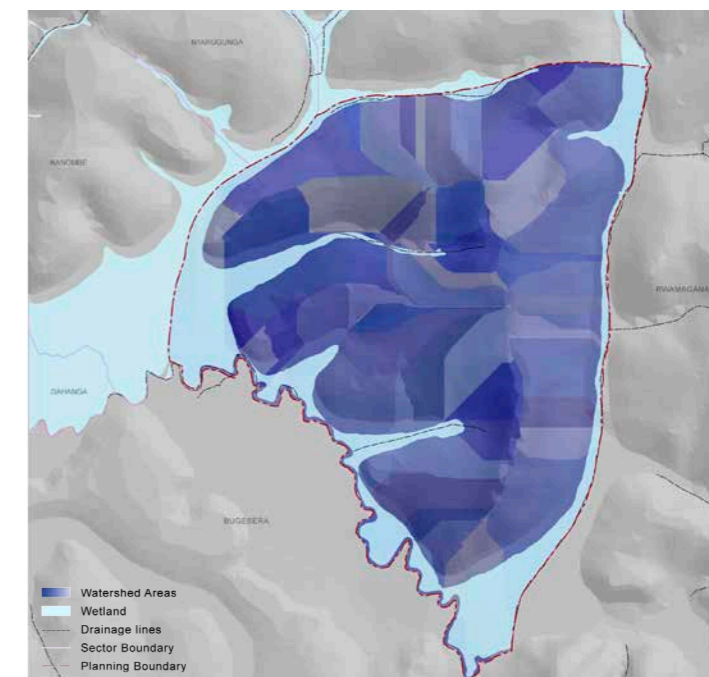


Fig.7.3 Eastern Planning Area - Watershed and Drainage

Table 7.2 Eastern Planning Area - Existing Land Use Distribution

Broad Land Use	Detail Land Use	Area (Ha)	
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	3	403
	LOW RISE RESIDENTIAL	400	
COMMERCIAL	COMMERCIAL GENERAL	2	2
PUBLIC FACILITIES	GOVERNMENT OFFICE	6	44
	EDUCATIONAL	32	
	HEALTH FACILITIES	7	
INDUSTRIES	LIGHT INDUSTRIAL	3	3
	EXISTING FOREST	203	1256
NATURE AREA	WETLAND	1053	
	AGRICULTURE	FARMLAND	3020
PLANTATION		286	
WATER BODIES	RIVERS	48	48
INFRASTRUCTURE	TRANSPORTATION	114	114
	DEFENCE AREA	39	55
SPECIAL USE/RESTRICTED AREA/ UNCLASSIFIED	VACANT LAND	17	
	TOTAL	5231	5231

Wetland stretches pierce into the promontory, bringing in more scenic landscapes. Few existing forest patches spread from the military area in the north along the central ridge towards the south.

These forested areas and natural drainage channels along the wetlands and valleys need to be safeguarded to prevent flooding and soil erosion.

- Single Family Residential
- Low Rise Residential
- Commercial General
- Government Office
- Education Institution
- Health Facilities
- Light Industrial
- Existing Forest
- Farm Land (General)
- Plantation
- Defence Area
- Vacant Land
- Transportation
- Wetland
- Major road
- Sector Boundary
- Planning Boundary

- ① Kigali International Airport
- ② Military Hospital
- ③ Defence Area
- ④ Commercial Centre
- ⑤ Military Area

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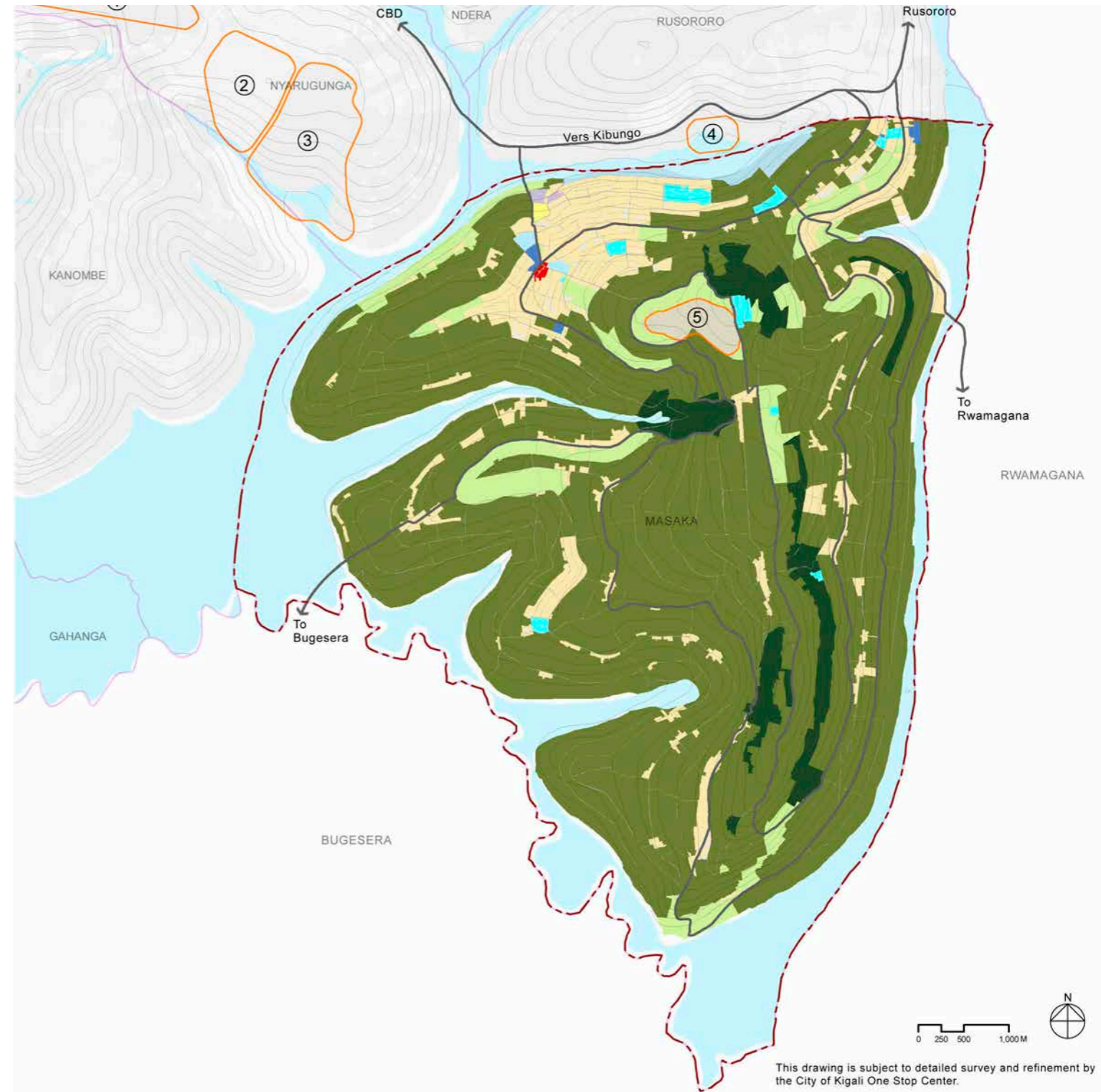


Fig.7.5 Eastern Planning Area - Existing Land Use and Context Map

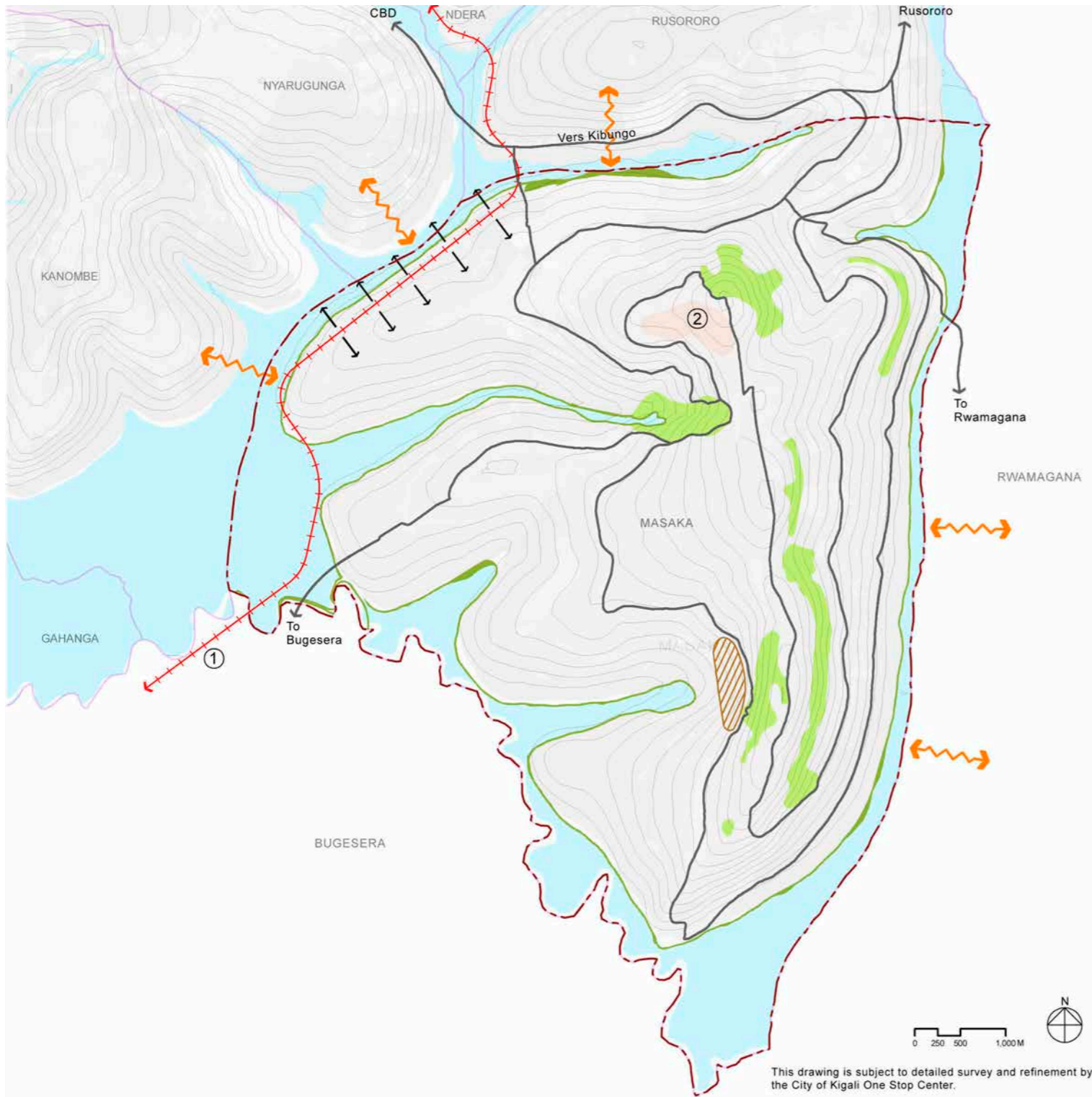


Fig.7.6 Eastern Planning Area - Constraints Map

7.1.4 CONSTRAINTS

The development near Masaka Town has been rapid in recent times and needs to be structured to prevent haphazard growth. As almost all the land in the City is privately owned, the biggest challenge in the detailed Guideline Plan is to optimize and balance land acquisition by the Government for all the proposed development. The following are the key constraints:

- The promontory lacks connections with its surrounding areas. Currently few mud tracks connect the Planning Area with neighbouring Bugesera, Rwamagana and Rusororo sectors.
- The new proposed International Rail Freight line will be a physical barrier between South Central and the Eastern Planning Area. Establishing road network across this boundary would be a challenge.
- The approved Oz Sub Area Plan proposal does not take existing roads and cadastral into consideration. The proposal needs to be adjusted accordingly.

- Steep slopes (slopes greater than 20%) in the south restrict high density development.
- Scattered forest patches, natural drainage channels and wetlands need to be protected through buffer zones. These natural constraints take up around 22% of the land.
- Like most of the other Planning Areas, Eastern planning Area lacks roads and infrastructure provision.

Fig.7.6 presents the Constraints Map for the Eastern Planning Area.

- Slopes between 20-40% that restrict high density development in areas with good views
- Fragmented clusters of greens, drain channels and forests need to be connected/integrated
- Wetland needs to be protected
- Steep slopes/wetlands restrict connectivity and impose high infrastructure costs
- Physical barrier - the proposed international rail freight line along Masaka sector's edge would make direct connection from Kanombe and Nyarugunga difficult
- Existing rural/mud roads need to be upgraded to accommodate future population
- Sector Boundary

- Planning Boundary
- ① Proposed International Rail freight line will form a physical barrier between Kanombe, Nyarugunga and Masaka Sectors
- ② Military Area is to be retained for strategic purposes

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7.1.5 OPPORTUNITIES

- The Eastern Planning Area has relatively flat terrain with gentle slopes in comparison to the rest of the city, thus allowing for potential large high density developments.
- The areas along the wetlands offer potential for developing single family/low density housing with wetland views.
- The New Proposed International Rail Freight line through the sector allows for potential development of a high capacity Industrial Zone in the north west.
- Existing forests, drainage channels, wetlands and wetland buffer zone, can be protected and connected through park connectors, creating Recreational Open spaces. This allows for a continuous green pedestrian network running throughout the Planning Area.
- Capitalizing on the large wetland area in the west, a Bio diversity park is proposed as per the strategic Plan for the City. This allows for potential to attract visitors into the Eastern Planning Area as a tourist point with various commercial and recreational amenities.
- The existing Masaka town Commercial centre can be redeveloped as an integrated Town Centre with Public

Transport access and public amenities.

- With large available land for development and following the District's interest in promoting higher education; Eastern Planning area has huge potential to be developed as an 'Education Hub'. The new approved University and Hospital projects in the sector help promote Education and Research in the sector.
- With the new proposed International Airport in the South, the existing Vers Kibungo and the existing International Airport very close by, the Eastern Planning area has high potential to be developed as a commercial centre with employment opportunities. The Sector further allows for quality residential infrastructure development on its gentle slopes.

Fig.7.7 shows the Opportunities Map of Eastern Planning Area

- Potential low density development areas with scenic views along wetlands/slopes
- Potential development of industrial zone close to the proposed international rail freight line
- Opportunity to develop large parks utilizing existing forests, drain channels and greens
- Opportunity to intensify and rezone the existing Masaka Town into high density compact walkable neighbourhood while preserving its local identity
- Opportunity to connect open greens and forests to create continuous open green recreational spaces
- Wetland
- Highest elevation
- Good site views suitable for residential development
- Proposed International Rail freight line
- Wetland buffer offers an opportunity to develop a continuous Open Public Green Network
- Existing Major road
- Sector Boundary
- Planning Boundary
- Opportunity to rejuvenate and intensify the existing commercial node at Masaka Town
- Approved Hospital and University project offer potential to develop an Institution Node

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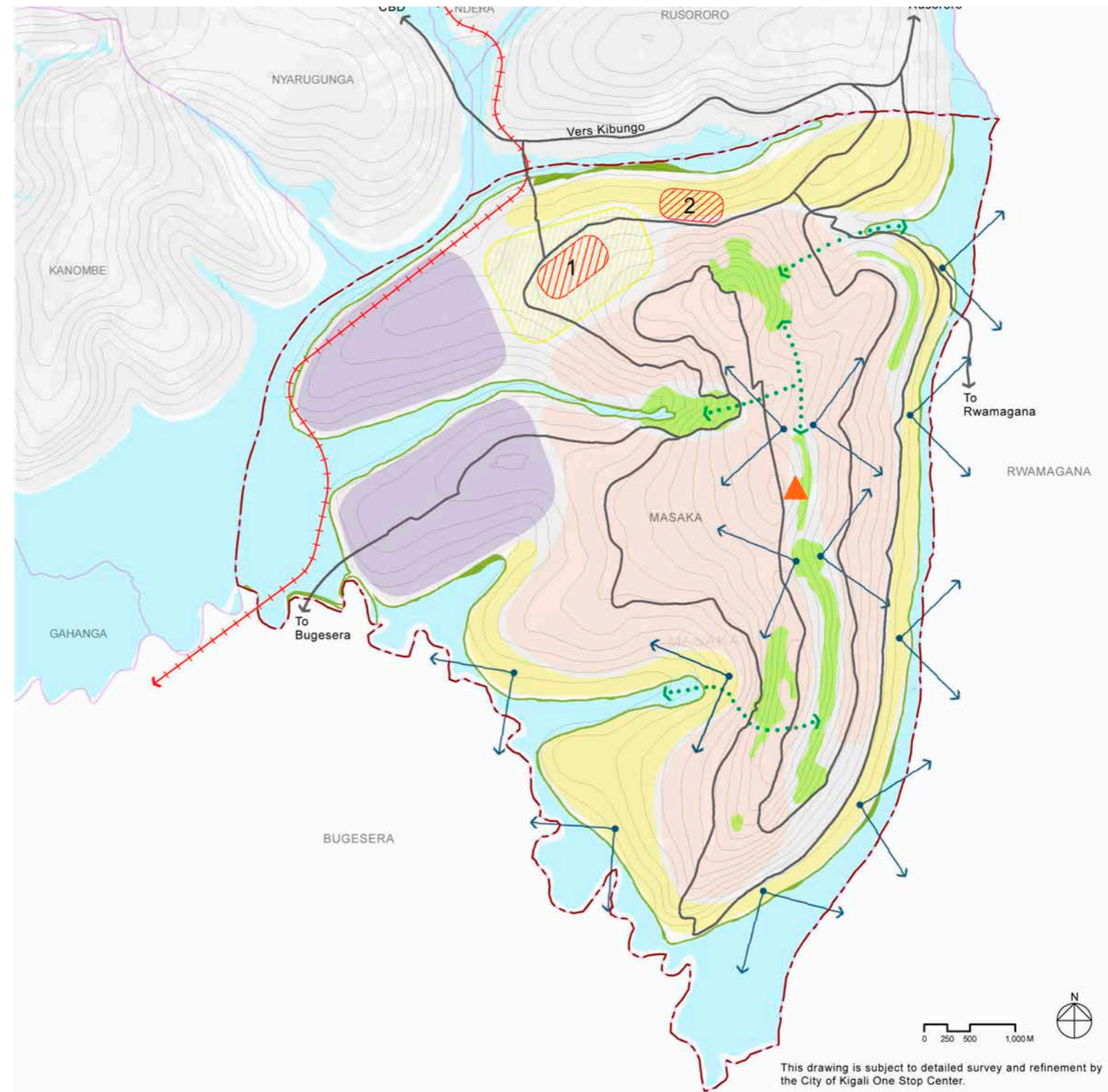


Fig.7.7 Eastern Planning Area - Opportunities Map

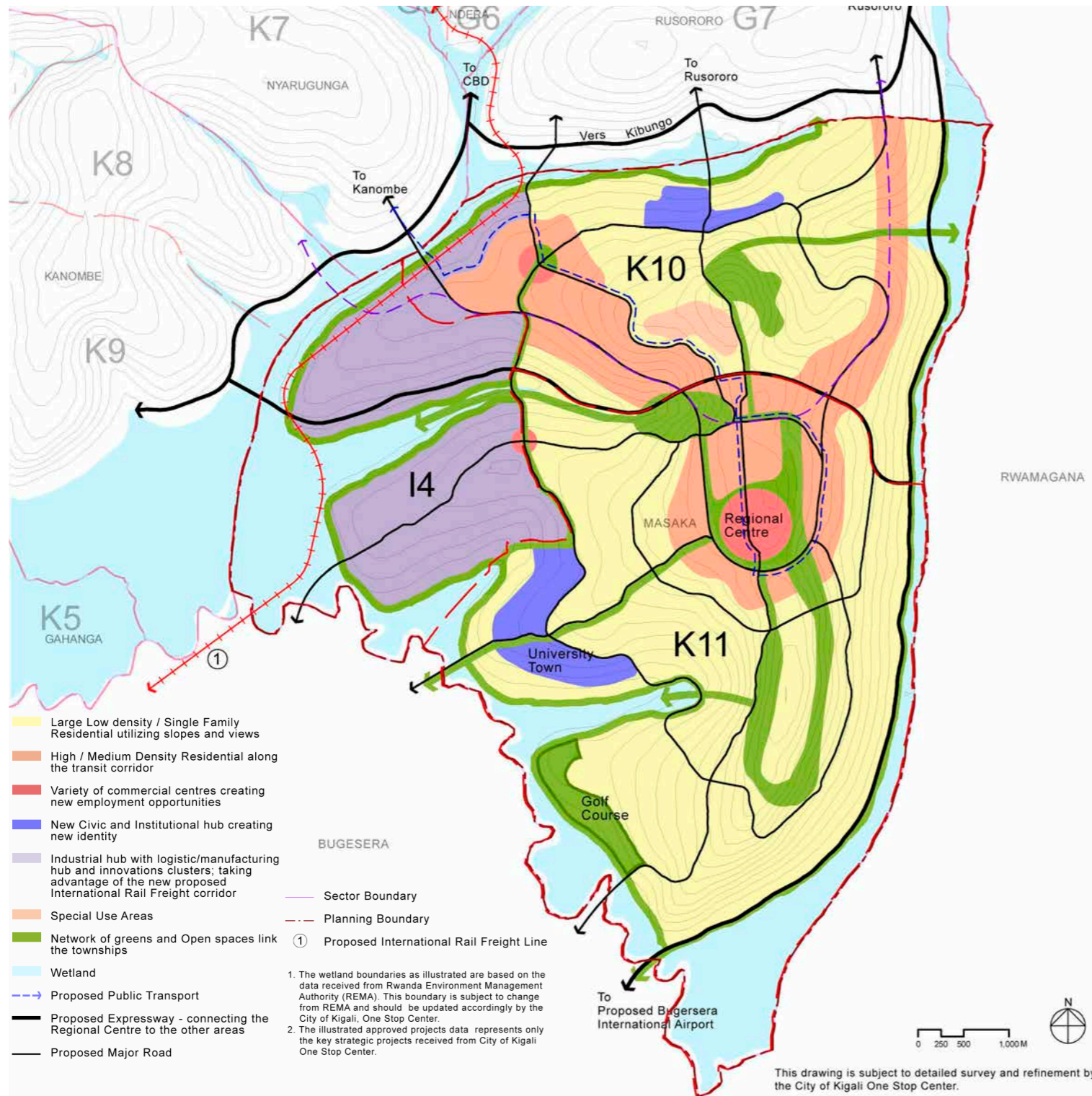


Fig.7.8 Eastern Planning Area - Concept Plan

7.2 Eastern Planning Area - Proposed Vision

'HI-TECH EDUCATION AND INNOVATION HUB'

Masaka is envisioned as a 'Regional Centre' and an 'Education Hub'. New Industrial Zone along the new proposed International Rail freight Line would house manufacturing and packaging industries. The Education Hub includes innovation clusters, Research and Development for health industries and a new University. The sector will provide quality housing options.

7.3 Eastern Planning Area - Proposed Concept

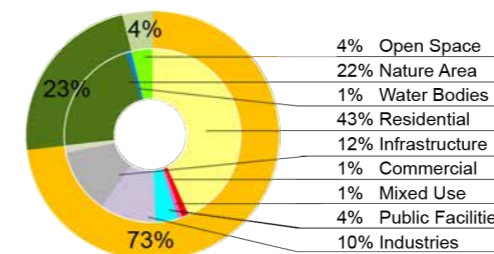
Earlier in the KCMP, Masaka was identified as a potential new City Centre with five residential towns. The key features from the KCMP have been incorporated in the preparation of the detailed plan for Kicukiro District. In addition to the previous concepts, new programmes have also been added in line with the strategic development direction for Kigali city.

Appendix 2 shows a comparative analysis of the proposed Concept and Masaka Sub Area Plan.

According to the Population and Employment projection, Eastern Planning Area will have a residential population of 0.69 million and employment population of 0.33 million in Service and Industrial sectors. Based on the economic and population projections, existing site context, opportunities, constraints and proposed vision, a concept has been developed for Eastern Planning Area. The key features are:

- To divide the Planning Area into two compact residential townships and an Industrial Zone close to the new proposed International Rail Freight Line.
- To establish employment Centres focused on Services, research and development, logistics and Industrial sector. This includes a Regional Centre, Research and University Town close to the Industrial Innovation clusters
- To redevelop the rapidly growing

693,000 Projected Population Year X



Proposed Land Distribution

181p/ha
Proposed Density

73%
Total Urbanized Area

23%
Total Nature Area

4%
Total Open Spaces



Masaka town by concentrating existing commercial and public facilities into a 'Town Centre' and link with BRT and future MRT network. This will establish Masaka Town as an urban node serving the surrounding communities .

- To introduce high density housing around the new proposed Regional Centre and introduce low density and luxury housing along the southern region of the sector.
- To establish a well connected vehicular and Pedestrian network with more emphasis on public transportation.
- Develop world class golf course and golf course resorts close to the Regional Centre with quality lifestyle.
- Protect and connect the existing forests, watersheds and wetlands with the proposed neighbourhood parks to form a seamless green pedestrian network throughout the sector.

7.4 Eastern Planning Area - Proposed Master Plan

The Concept is further refined and developed into Detailed Master Plan for Eastern Planning Area. Presented below is the Proposed Land Use Plan for the Eastern Planning Area.

7.4.1 EASTERN PLANNING AREA - PROPOSED LAND USE PLAN

The proposed Land Use follows the overall planning intention of 35% urbanization through nature conservation strategies. It aims to provide the location, distribution and character of the future Land Uses within the Sector, while offering incentives and flexibility for redevelopment. The key considerations are:

- Reserves land for the future proposed MRT line and reduce acquisition of land by locating the MRT along the proposed arterial roads.
- BRT and MRT corridors are proposed

through Masaka town and the new Regional Centre.

- Land close to the international Rail freight line is allocated for industrial use.
- Existing commercial and public facilities are retained and revitalized into an integrated Neighbourhood centre with easy access to public transportation.
- Wetlands and scattered forest patches are protected through buffer and zoning regulations.
- High density residential developments are proposed along the transit corridor.
- Single-family residential neighbourhoods are integrated as part of the township development.
- The newly approved Hospital, University and Government Office projects are integrated in the Detailed Master Plan. These functions are supported by civic facilities and residential developments in the nearby areas.

Eastern Planning Area is proposed to accommodate a population of 693,000 by Year X based on the proposed Land Use Plan. Refer to Table 7.2 and Fig.7.9 for Land Use Distribution.

7.4.2 EASTERN PLANNING AREA - PROPOSED RESIDENTIAL USE PLAN

The Planning Area is divided into two residential townships and an industrial estate.

- The two residential townships are divided by the proposed highway.
- The areas around the proposed Regional Center will be developed into high density mixed use residential developments.
- High to Medium density housing is proposed along the BRT corridor (transit overlay).
- The areas close to wetlands, steep slopes and golf course are zoned as low density housing.
- Zoning regulations for these areas will encourage developers to provide

a range of commercial, public and recreational amenities within the housing developments.

Fig.7.10 presents the Proposed Residential Use Plan- Year X, for Eastern Planning Area.

7.4.3 EASTERN PLANNING AREA - PROPOSED COMMERCIAL USE PLAN

- The two townships are served by a Regional Centre, a Town Centre and 15 Neighbourhood Centres.
- The Proposed Regional centre is located centrally with access to public transportation. It includes a variety of retail spaces, hotels, entertainment centres, office spaces, cultural and recreational facilities. It will provide 0.2 million employment opportunities in service, retail and entertainment sectors.
- Existing commercial developments in Masaka town are redeveloped as an integrated Town Centre with new public facilities like the town park, religious centre and increased commercial uses.
- Neighbourhood Centres are distributed within communities to host commercial use sufficient to meet needs at neighbourhood level.
- Commercial Land Use in the Industrial Estate facilitates warehouse and retail functions like car showrooms, Home DIY stores, material superstore etc. Around

Fig.7.11. presents the Proposed Commercial Use Plan for Eastern Planning Area

7.4.4 EASTERN PLANNING AREA - PROPOSED PUBLIC FACILITIES PLAN

The existing public facilities including schools, health centres and religious buildings are concentrated in and around Masaka Town.

- New public facilities are distributed close to the proposed Neighbourhood Centres, all throughout sector as specified in the proposed township model for the city.

7.4.5 EASTERN PLANNING AREA - PROPOSED GREEN AND OPEN SPACES PLAN

Structure for the Green and Open Space Plan is developed by connecting the existing forests, wetlands and natural drainage channels through park connectors. This network is further enhanced by the proposed golf course that stretches across 60 hectares.

Fig.7.13 presents the Proposed Green and Open Space Plan for Eastern Planning Area.

- Primary and Secondary Schools are proposed based on the township model.
- Other than these facilities, a new University Town is proposed 2 km away from the Regional centre.
- A cemetery each for the two townships is proposed close to the proposed highway.
- The new approved University, Hospital and the Government Office projects near Masaka Town are integrated and developed as a new urban node by introducing cultural and religious centres.

Fig.7.12 presents the Proposed Public Facilities Plan for Eastern Planning Area.

Table 7.3 Eastern Planning Area - Proposed Land Use Distribution - Year X

BROAD LAND USE	DETAIL LAND USE	AREA (HA)	TOTAL AREA (HA)
RESIDENTIAL	SINGLE FAMILY RESIDENTIAL	1516	2267
	LOW RISE RESIDENTIAL	157	
	MEDIUM RISE RESIDENTIAL	546	
	HIGH RISE RESIDENTIAL	48	
COMMERCIAL	COMMERCIAL GENERAL	69	69
MIXED USE	MIXED USE	37	37
PUBLIC FACILITIES	GOVERNMENT OFFICE	10	275
	EDUCATIONAL	176	
	RELIGIOUS FACILITIES	8	
	HEALTH FACILITIES	21	
	CIVIC FACILITIES	4	
	SPORTS AND RECREATION	57	
INDUSTRIES	LIGHT INDUSTRIAL	169	349
	HEAVY INDUSTRIAL	380	
NATURE AREA	EXISTING FOREST	177	1158
	WETLAND	981	
OPEN SPACE	OPEN SPACE AND PARK	185	185
WATER BODIES	RIVERS	52	52
INFRASTRUCTURE	TRANSPORTATION	528	562
	UTILITIES	34	
SPECIAL USE/RESTRICTED AREA/UNCLASSIFIED	DEFENCE AREA	38	38
	GRAVEYARD	30	
RESERVE SITE	RESERVE SITE	10	10
TOTAL		5231	5231

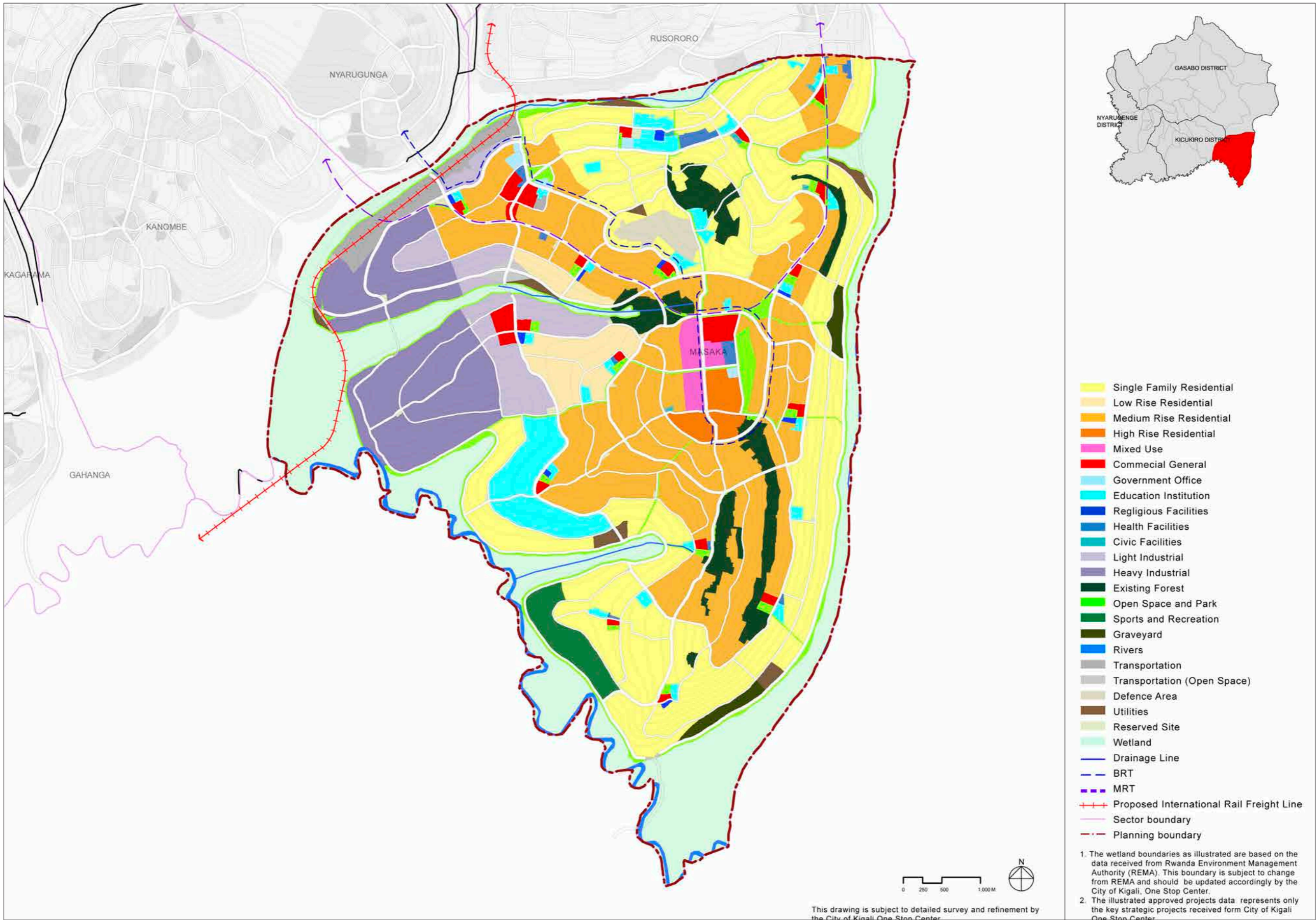
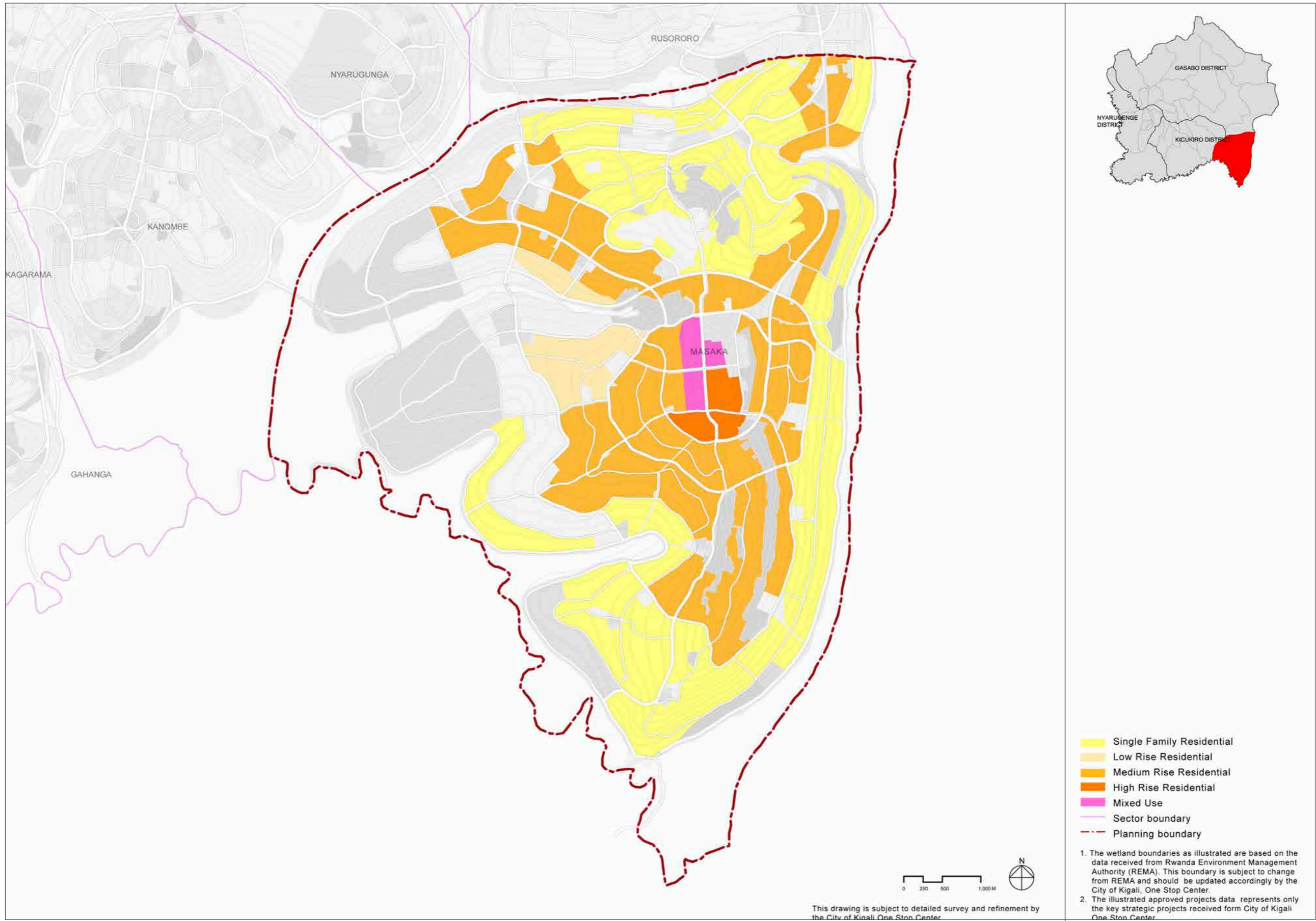


Fig.7.9 Eastern Planning Area - Proposed Land Use Plan



This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center

- Single Family Residential
- Low Rise Residential
- Medium Rise Residential
- High Rise Residential
- Mixed Use
- Sector boundary
- Planning boundary

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Fig.7.10 Kicukiro District- Eastern Planning Area - Proposed Residential Use Plan

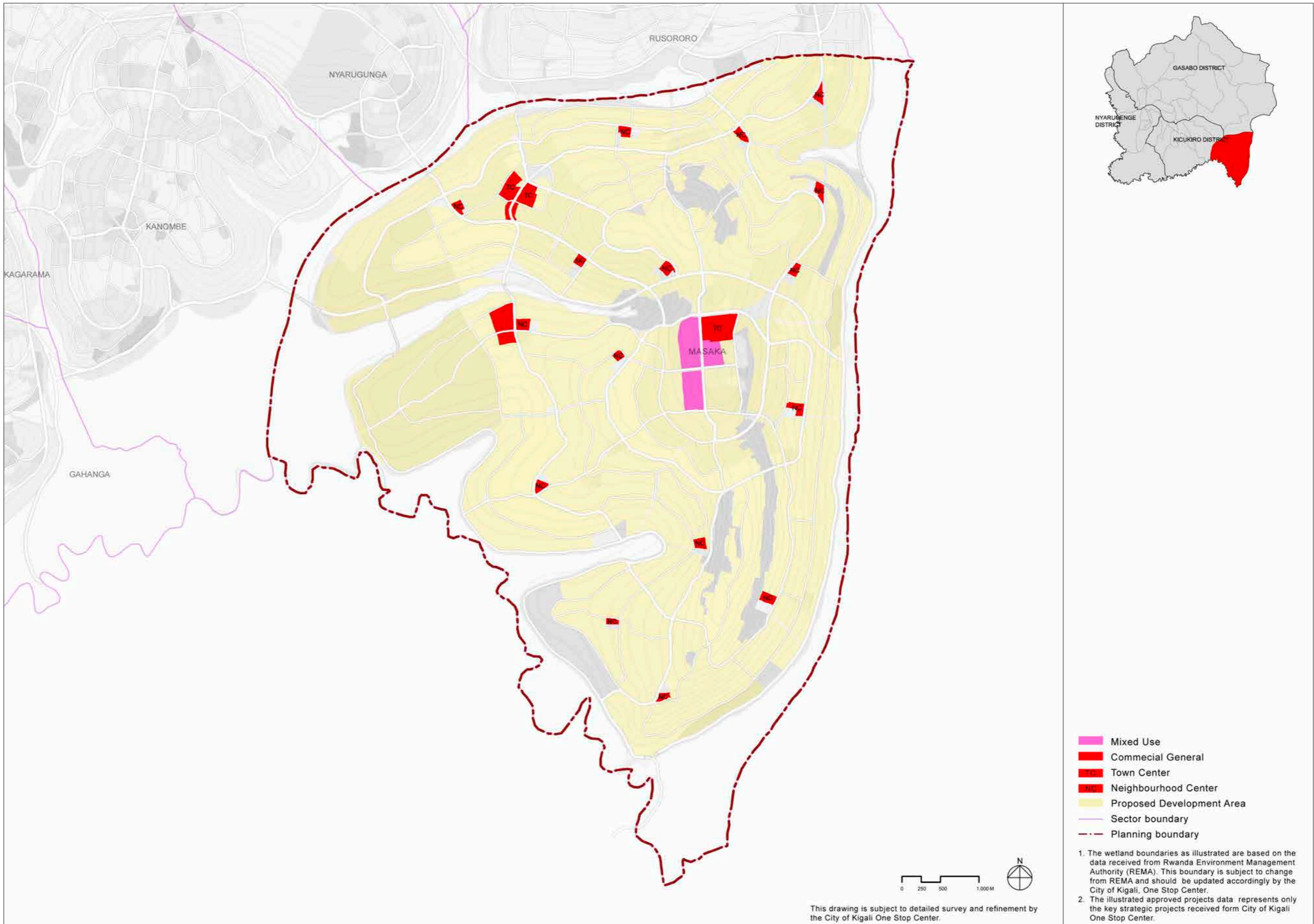
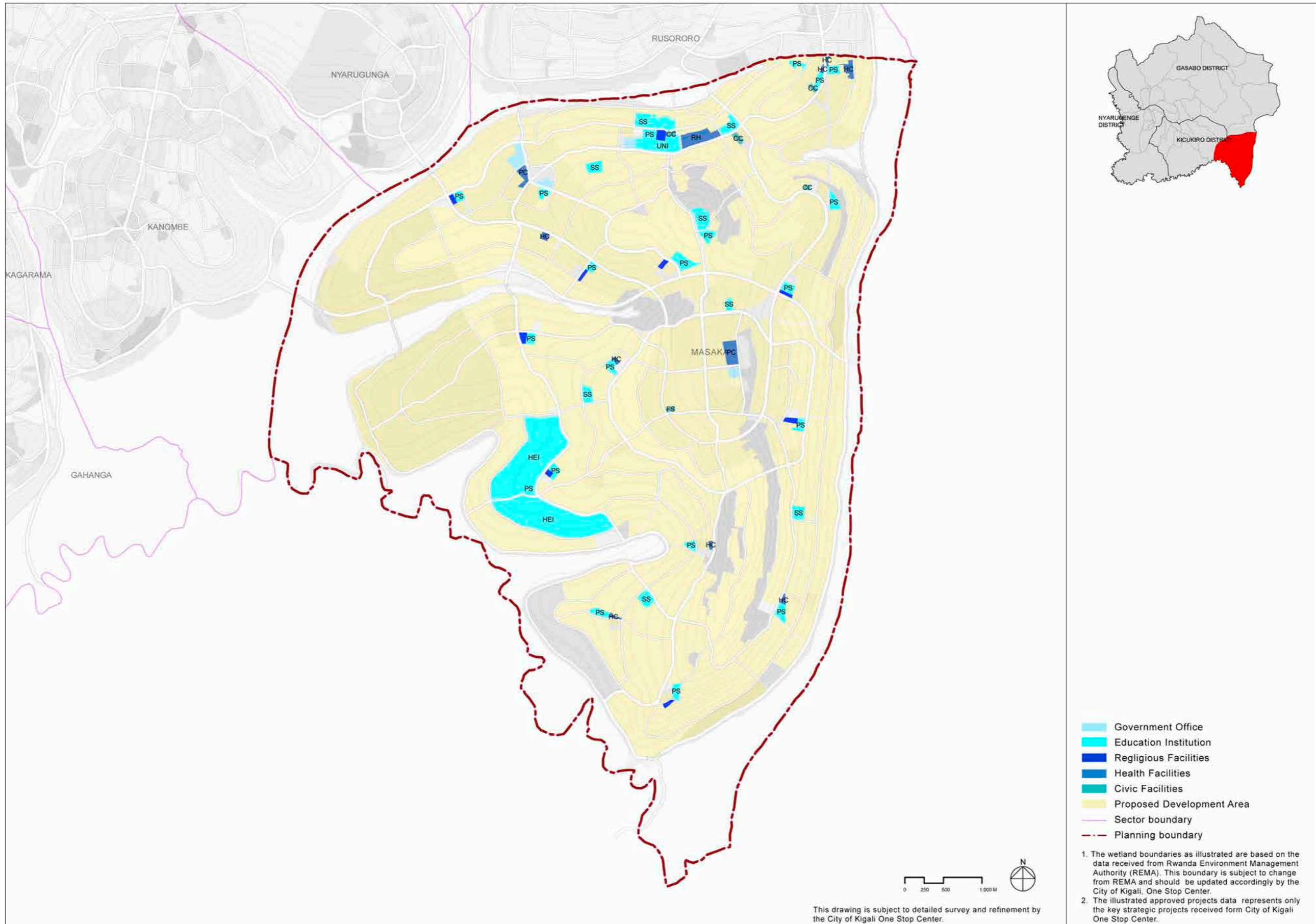


Fig.7.11 Kicukiro District- Eastern Planning Area - Proposed Commercial Use Plan



This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

- Government Office
- Education Institution
- Religious Facilities
- Health Facilities
- Civic Facilities
- Proposed Development Area
- Sector boundary
- Planning boundary

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Fig.7.12 Kicukiro District- Eastern Planning Area - Proposed Public Facilities Plan

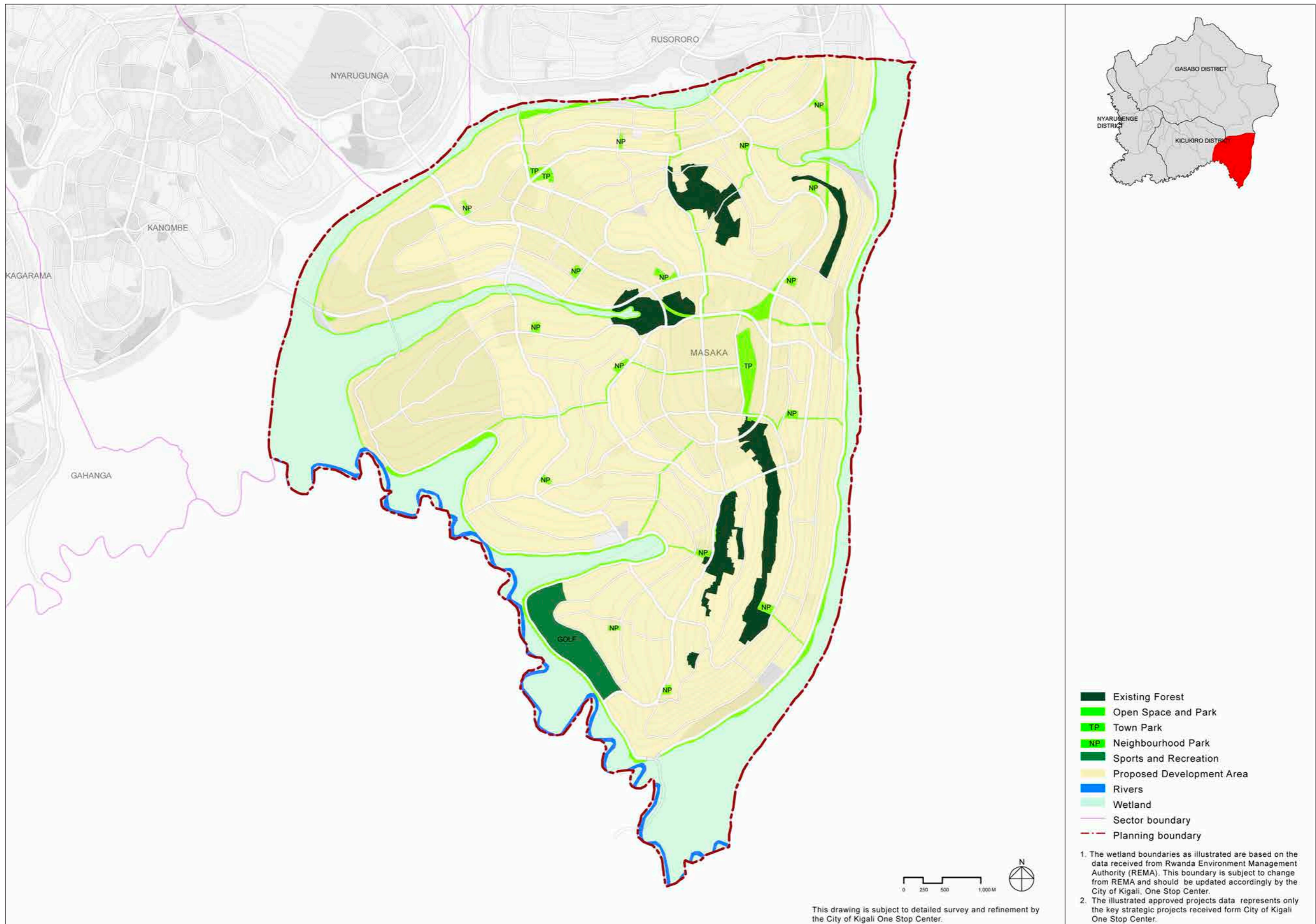


Fig.7.13 Kicukiro District- Eastern Planning Area - Proposed Green and Open Space Plan

7.5 Eastern Planning Area - Key Feature Development

7.5.1 THE REGIONAL CENTRE

While the CBD in Muhima, remains the main Business Centre, new commercial hubs developed outside the City Centre provide more choices of business locations and bring jobs closer to homes. This will alleviate infrastructure and traffic congestion in the City. According to the Strategic Planning, Nyamirambo, Gahanga and Ndera host the three other Regional Centres other than Masaka.

The new proposed Regional Centre is well connected through public transport and road infrastructure with the rest of the City. The Regional Centre is centrally located on the flat ridges with 12 ha Public Park as the main Central Open Space. This park is further integrated with the existing 65 ha central forest cover. Wetlands and proposed wetlands parks are connected with this central green to form a continuous green pedestrian network.

Mixed use and high density housing around the Regional Centre create walkable dense neighbourhoods with civic, health, cultural and recreational facilities. The proposed green network leads one to the proposed active wetland promenades

7.5.2 EDUCATION HUB - UNIVERSITY TOWN

The entire District of Kicukiro currently has four institutes for Higher Education. Two new Universities are proposed in Masaka Sector¹. These new Universities along with the new proposed Regional Centre will establish Masaka as an Education Hub. It will also attract investment from Private enterprises and reduce the burden on the Government.

¹ The University proposed next to the Masaka Town is an Approved Project.

University Town will not just attract foreign investment but retain local students, build a regional reputation by providing access to high-quality education and training for both international and domestic students, and create a knowledge-based economy. This University town will include different combinations of domestic/international institutions, branch campuses, and foreign partnerships, within the designated region.

The 96 Ha University Town is located close to the Regional Centre and the Industrial Innovation cluster; thus share facilities like convention centres, auditoriums, research labs etc. This helps in sustainable resource management and help foster integrated growth.

7.5.3 GOLF COURSE AND PREMIUM RESIDENTIAL

The proposed Regional centre, Industrial zone and Education hub in Masaka sector is bound to attract major investments and bring in new residential population from all classes. Other than the high density and low density housing, care has been taken to cater for premium lifestyle housing options with exclusive recreational facilities. Golf course, Golf course resorts and premium Single Family housing are proposed close to the Regional centre and the University Town.

The area offers advantages of urban dwellings set amidst natural surroundings. Although the Planning Area falls far away from the City Centre, the proposed comprehensive facilities support live, work, play and learn environments that promote the Eastern Planning Area as the home to premium Housing estates.

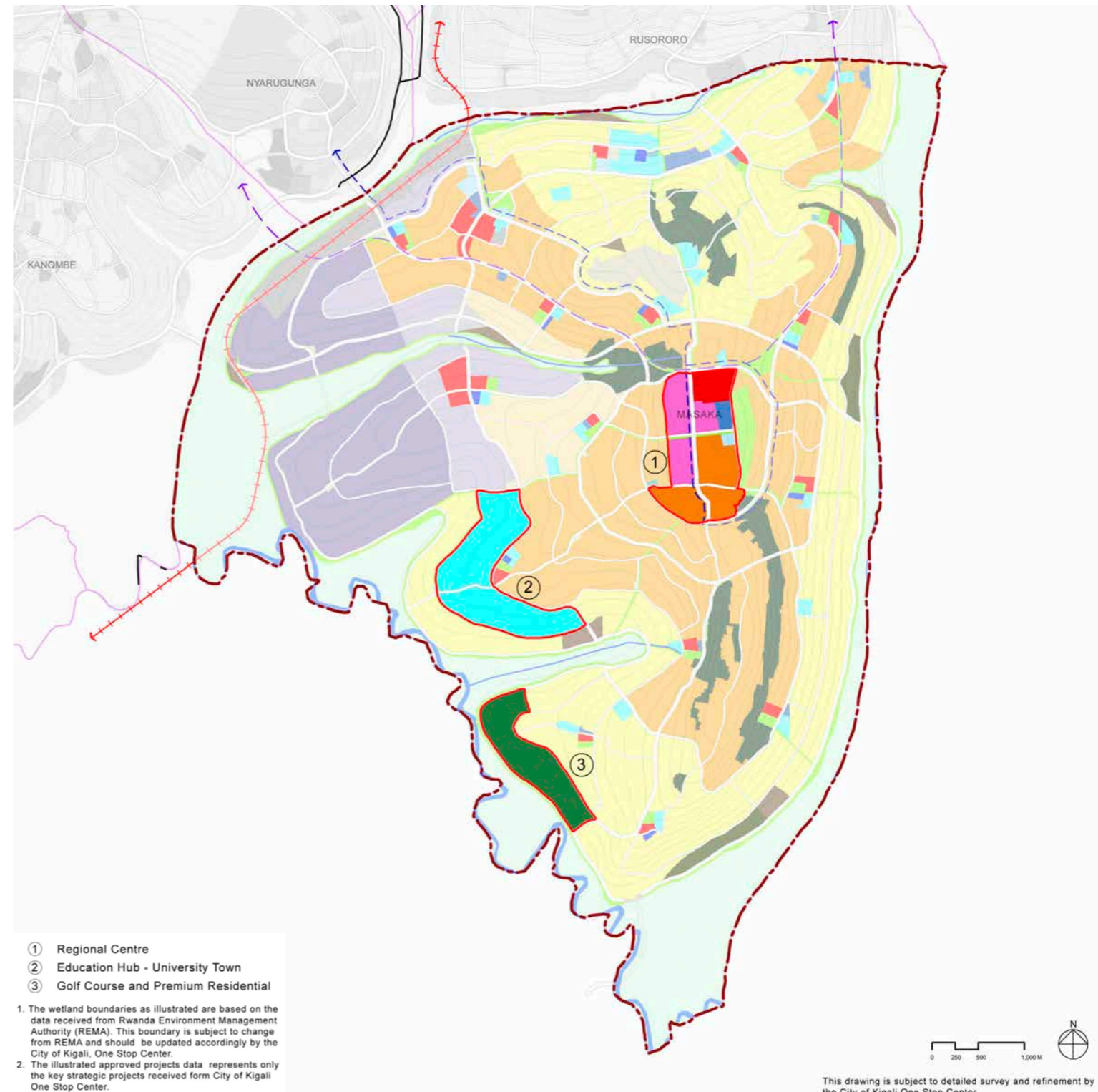


Fig.7.14 Key Features - Regional Centre, Education Hub and Golf Course resorts

8 Way Forward

8.1 WAY FORWARD

8.1.1 SUMMARY

The Detailed Master Plan Report defines the planning approach and lays down the broader planning concepts into detailed Land Use and the Zoning plan for the district. It illustrates in detail the development of Kicukiro and its planning Areas in various layers .

The Detailed Master Plan:

- Sets a clear hierarchy for commercial and employment centres
- Injects a variety of housing to provide quality as well as affordable housing with well distributed public amenities.
- Enhances accessibility by providing better & more transportation choices.
- Re-networks the green system to provide a wide variety of open spaces and protects the existing nature areas.
- Develops unique identities with exclusive heritage, culture, tourist and recreational areas.
- Provides a zoning plan with updated regulations and guidelines.

Zoning Plan Report:

Zoning Plan Reports for the two districts are released concurrently with the Detailed Master Plan Report which further refines the guidelines with the following key additions:

- Defined process for Non-Standard Application with clear assessment criteria and Review Committee comprising of representatives and experts from key Regulatory bodies;
- Evaluation criteria for special institutional buildings;
- Variety of Zoning Overlay Plans to guide zoning in specific areas which stipulate additional zoning regulations that will

- supersede the zoning guidelines; and
- Elaborated categories of uses to be considered for Application Assessment.

8.1.2 FOLLOW UP

TASK ORDER 5: URBAN DESIGN

In line with the Land Use proposal, special areas in the district have been identified to be developed for detailed Urban Design Layout. Each district in Kigali has an urban design proposal for an identified key area. Kimironko-Gisimenti Area in Gasabo District and Gahanga Regional Centre Area in Kicukiro District have been identified for detailed Urban Design Plans. The Urban Design Plan will look at the detailed context of the site and translate the proposed zoning and Land Use into a three dimensional plan for the area. This plan will demonstrate how the proposed development can enhance the character and identity of the place so as to become a special feature for the city and at the same time, demonstrate urban renewal and redevelopment. Detailed Urban Design guidelines will also be prepared for selected Urban Design Areas.

TASK ORDER 6: IMPLEMENTATION STRATEGY

The Master Plan in itself has no power to develop the economy or to improve the lifestyle of the people unless it is supported by efficient implementation strategies. Coordination with related Ministries & Authorities is key to successful implementation of the Master Plan and to achieve the vision for the city. To forge better integration with regards to land utilization in the city, it is recommended to explore the possibilities of strengthening the capacity of different institutions including One-Stop Centre by expanding its coordinating role.

The implementation strategy focuses on

various issues which will highlight:

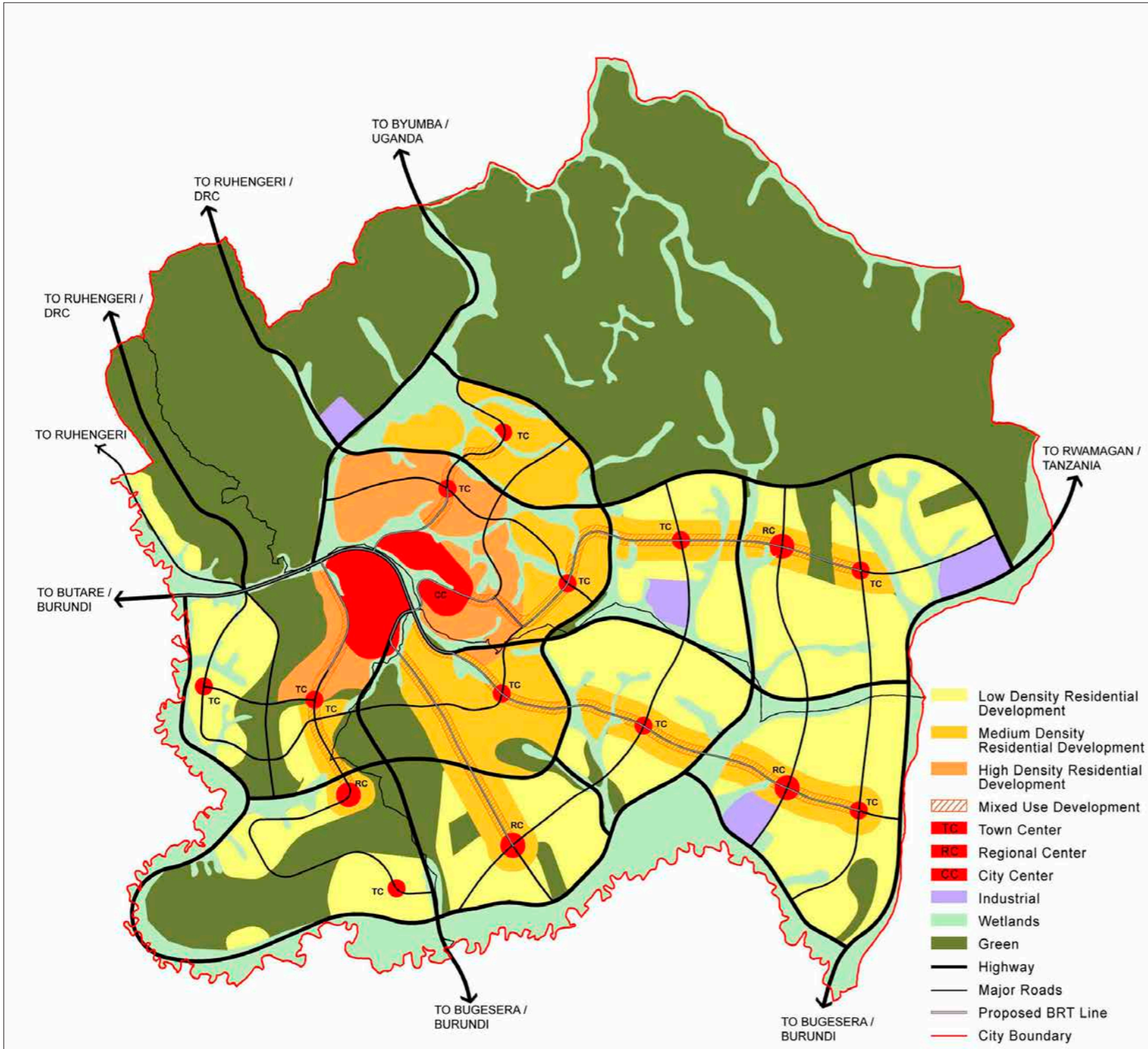
- Implementation and Refinement of Zoning Guidelines
- Capital Improvement Plan
- Additional Implementation Action Plan

GIS SETUP

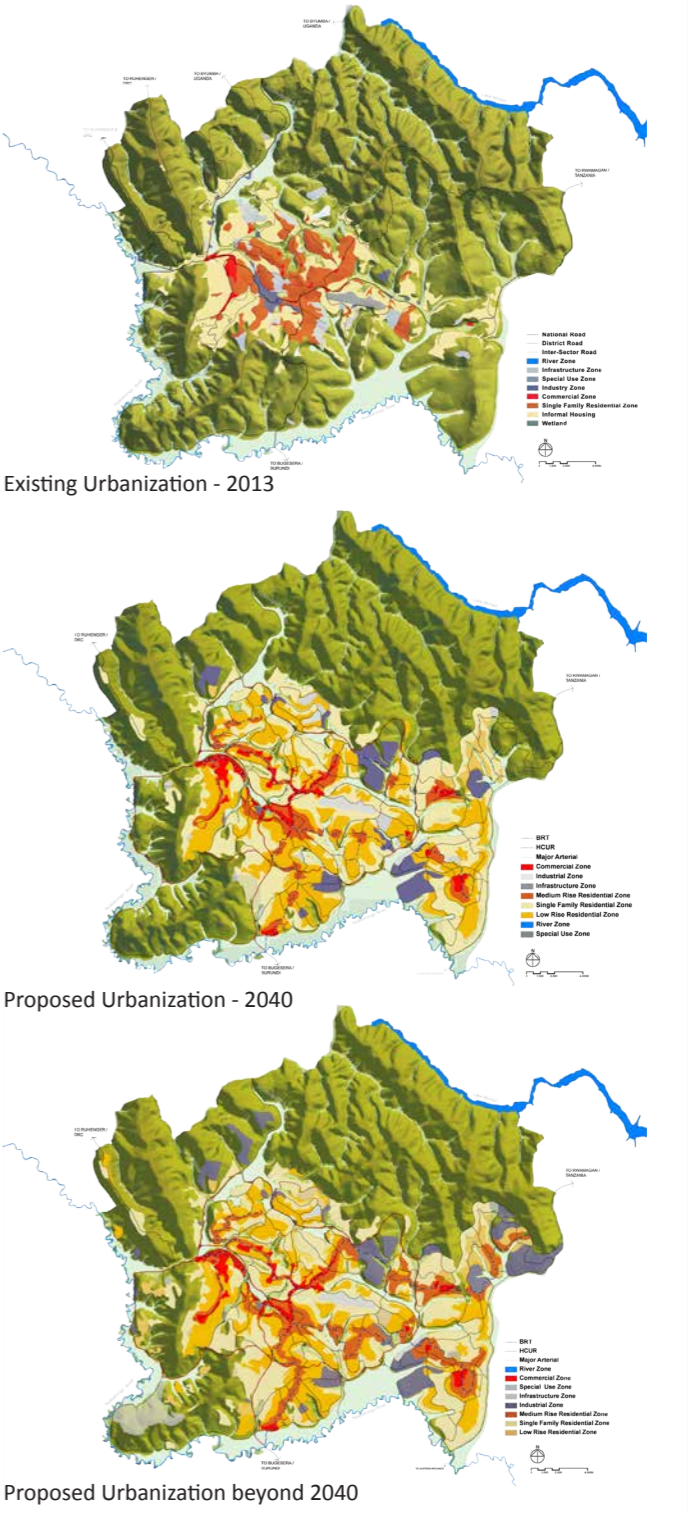
To establish a GIS database for the entire City with a coordinated base map, proposed Land Use plan & development control information for all areas of the City.

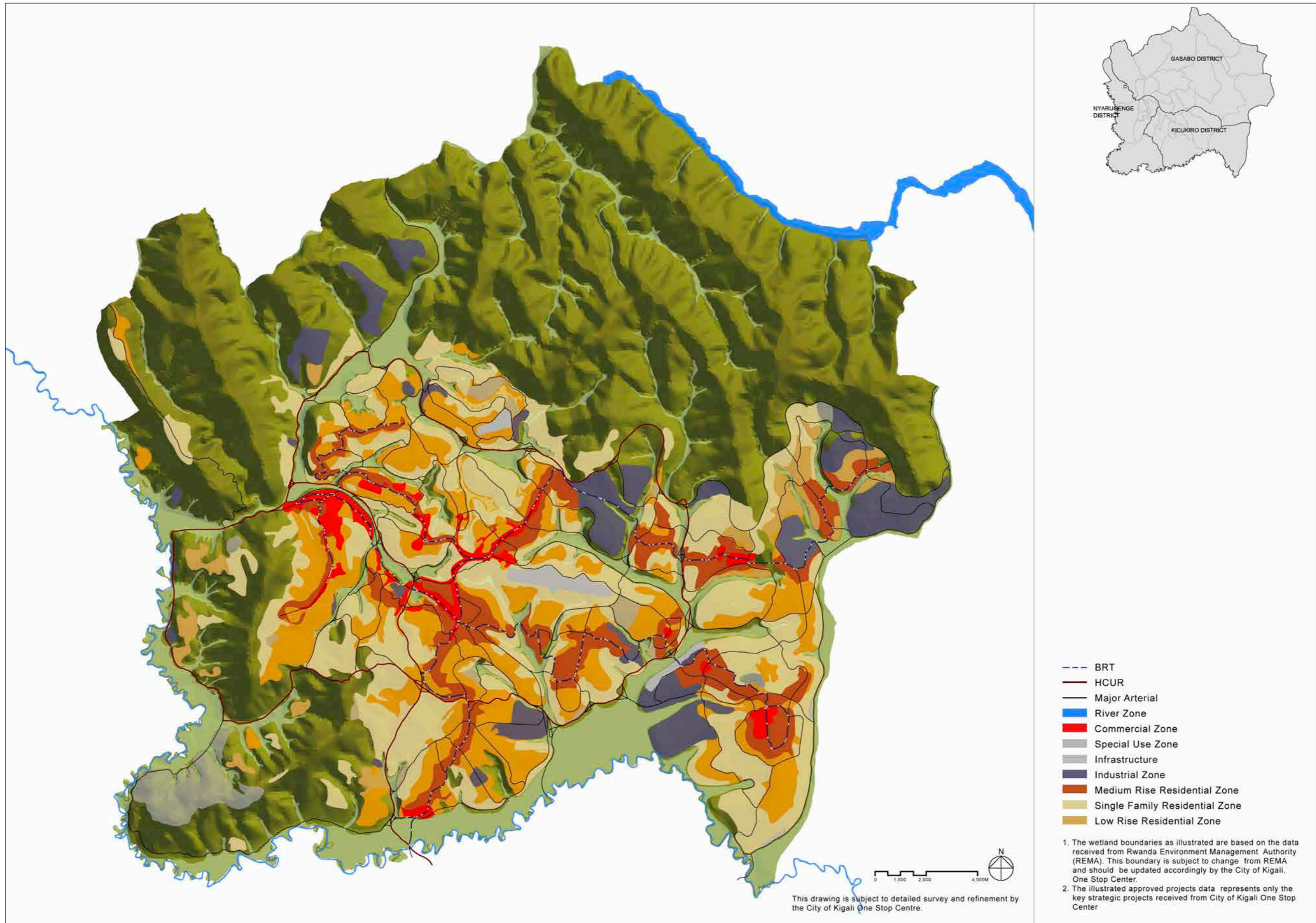
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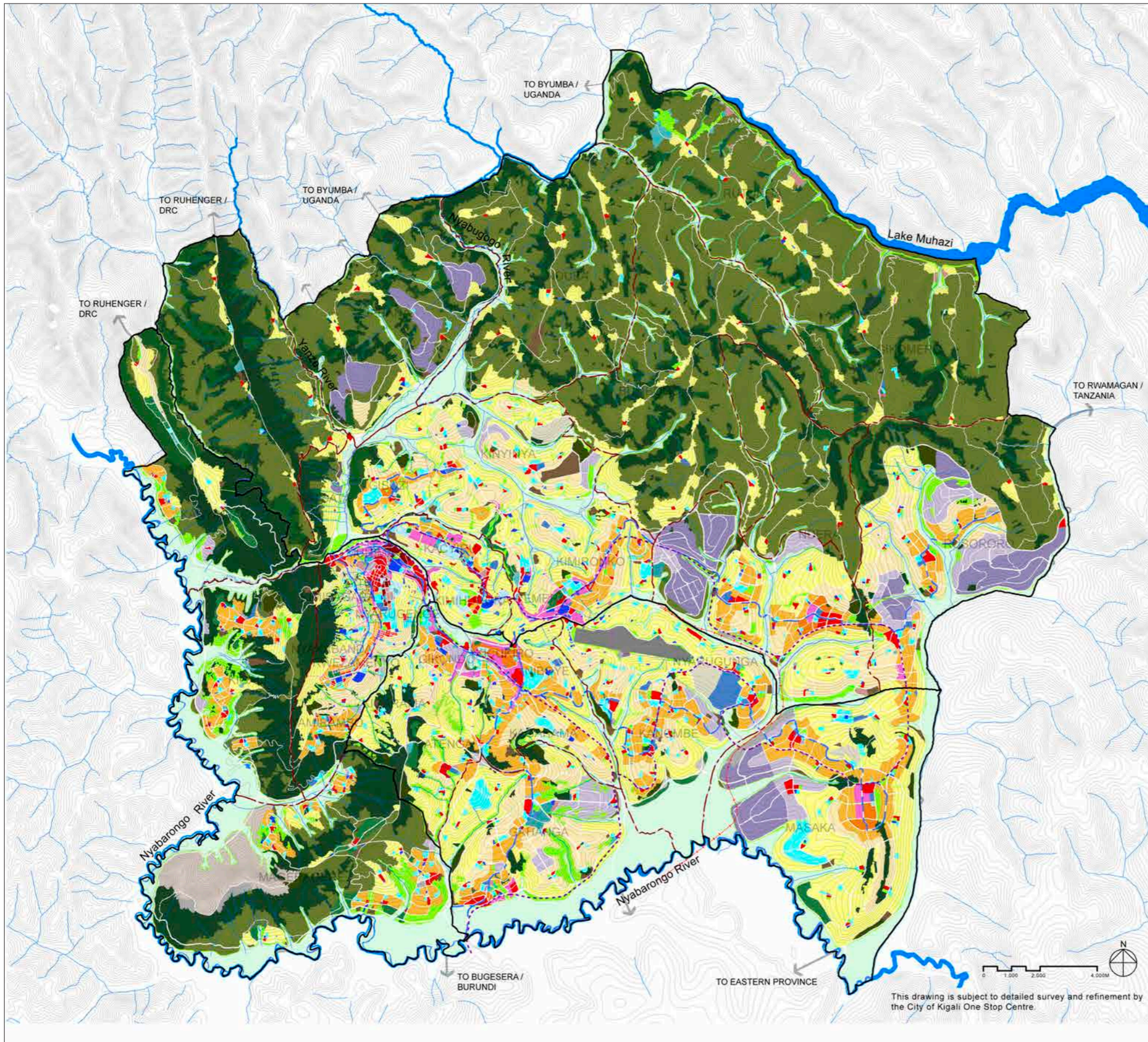
APPENDIX 1: Kigali City Context



Kigali Radial City - Concept Plan



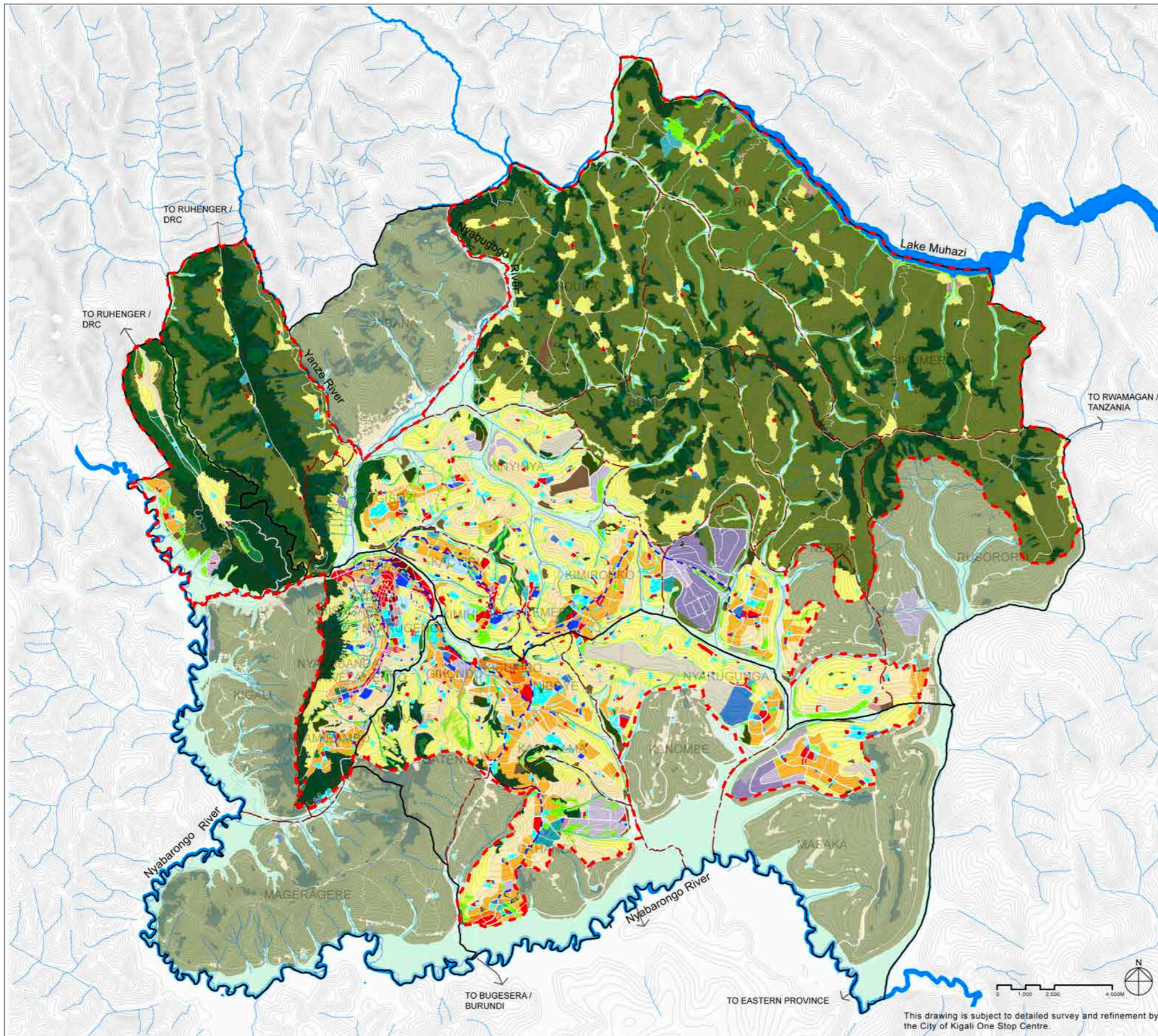




- Single Family Residential
- Low Rise Residential
- Medium Rise Residential
- High Rise Residential
- Mixed Use
- Commercial General
- Commercial Office
- Hotel
- Government Office
- Education Institution
- Religious Facilities
- Health Facilities
- Civic Facilities
- Sports and Recreation Facilities
- Light Industrial
- Heavy Industrial
- Existing Forest
- Afforestation
- Open Space and Park
- Sports and Recreation
- Farm Land (General)
- Rivers
- Defence Area / Quarry Land
- Prison
- Graveyard
- Transportation
- Transportation (Interchange)
- Utilities
- Reserved Site
- Wetland
- Drainage Line
- BRT
- MRT
- Railway Line
- District Boundary
- Sector Boundary
- Planning Boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center

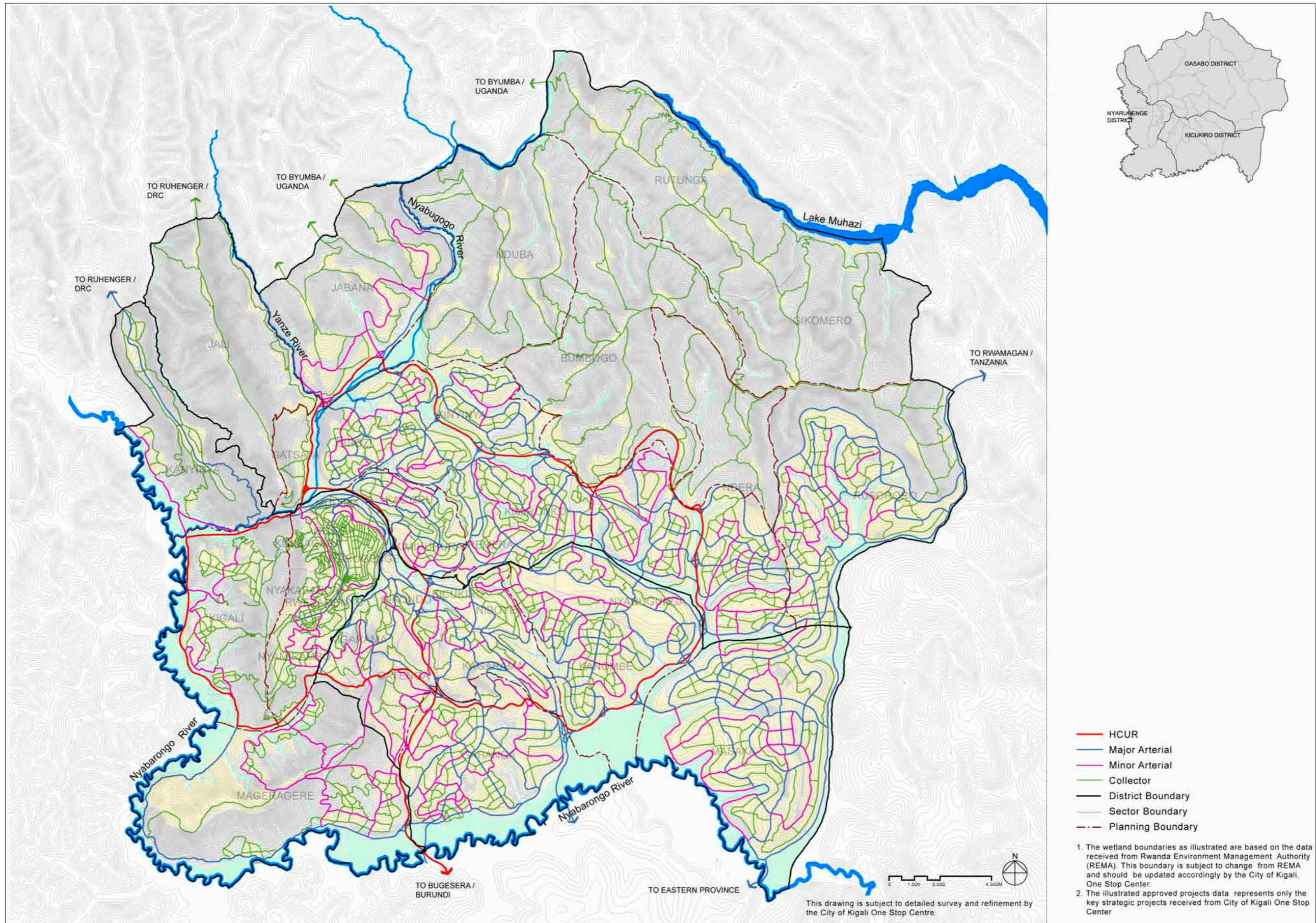
This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Centre.

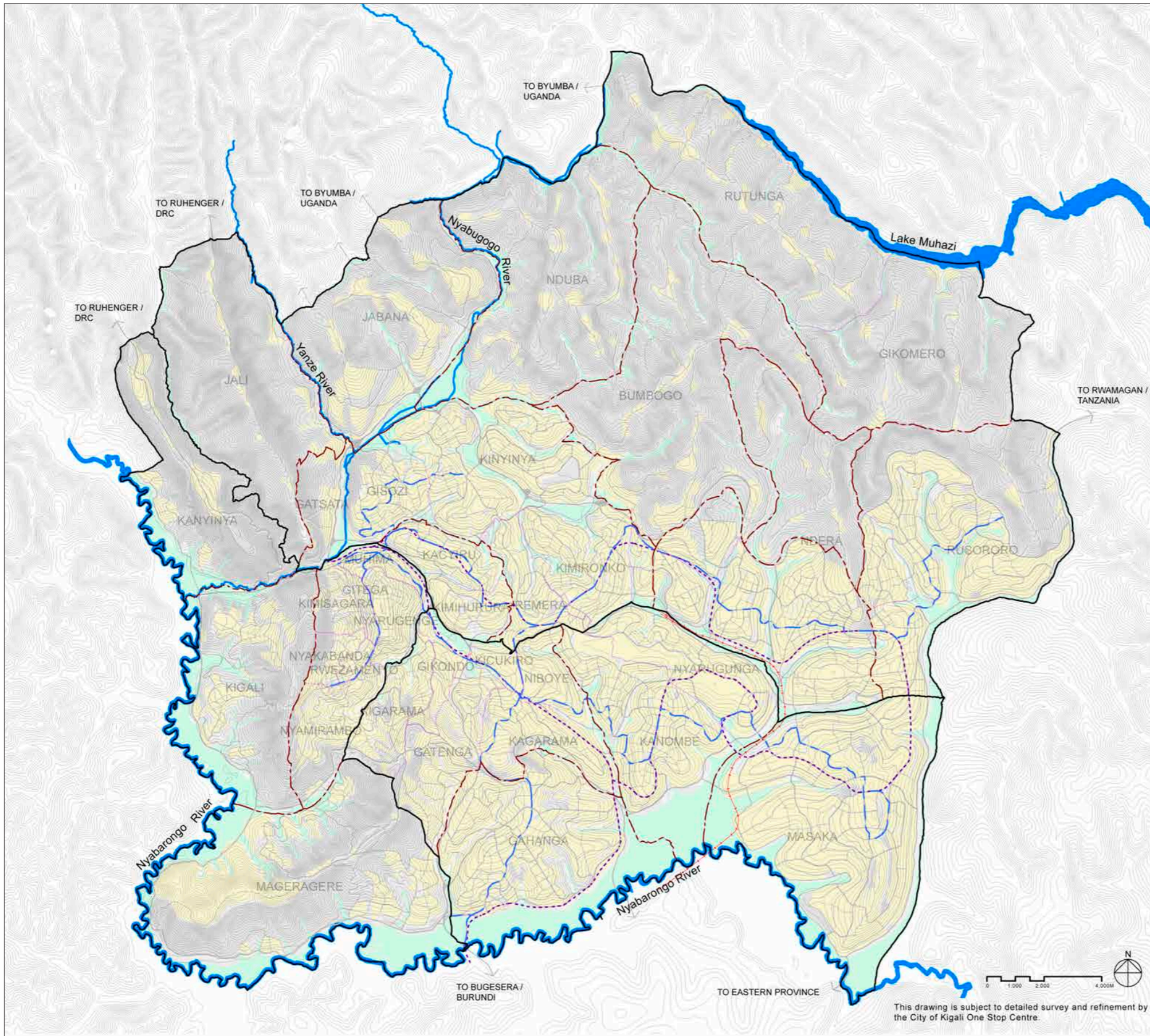


- Single Family Residential
- Low Rise Residential
- Medium Rise Residential
- High Rise Residential
- Mixed Use
- Commercial General
- Commercial Office
- Hotel
- Government Office
- Education Institution
- Religious Facilities
- Health Facilities
- Civic Facilities
- Sports and Recreation Facilities
- Light Industrial
- Heavy Industrial
- Existing Forest
- Afforestation
- Open Space and Park
- Sports and Recreation
- Farm Land (General)
- Rivers
- Defence Area / Quarry Land
- Prison
- Graveyard
- Transportation
- Transportation (Interchange)
- Utilities
- Reserved Site
- Wetland
- Drainage Line
- BRT
- Phase 1B boundary
- District Boundary
- Sector Boundary
- Planning Boundary

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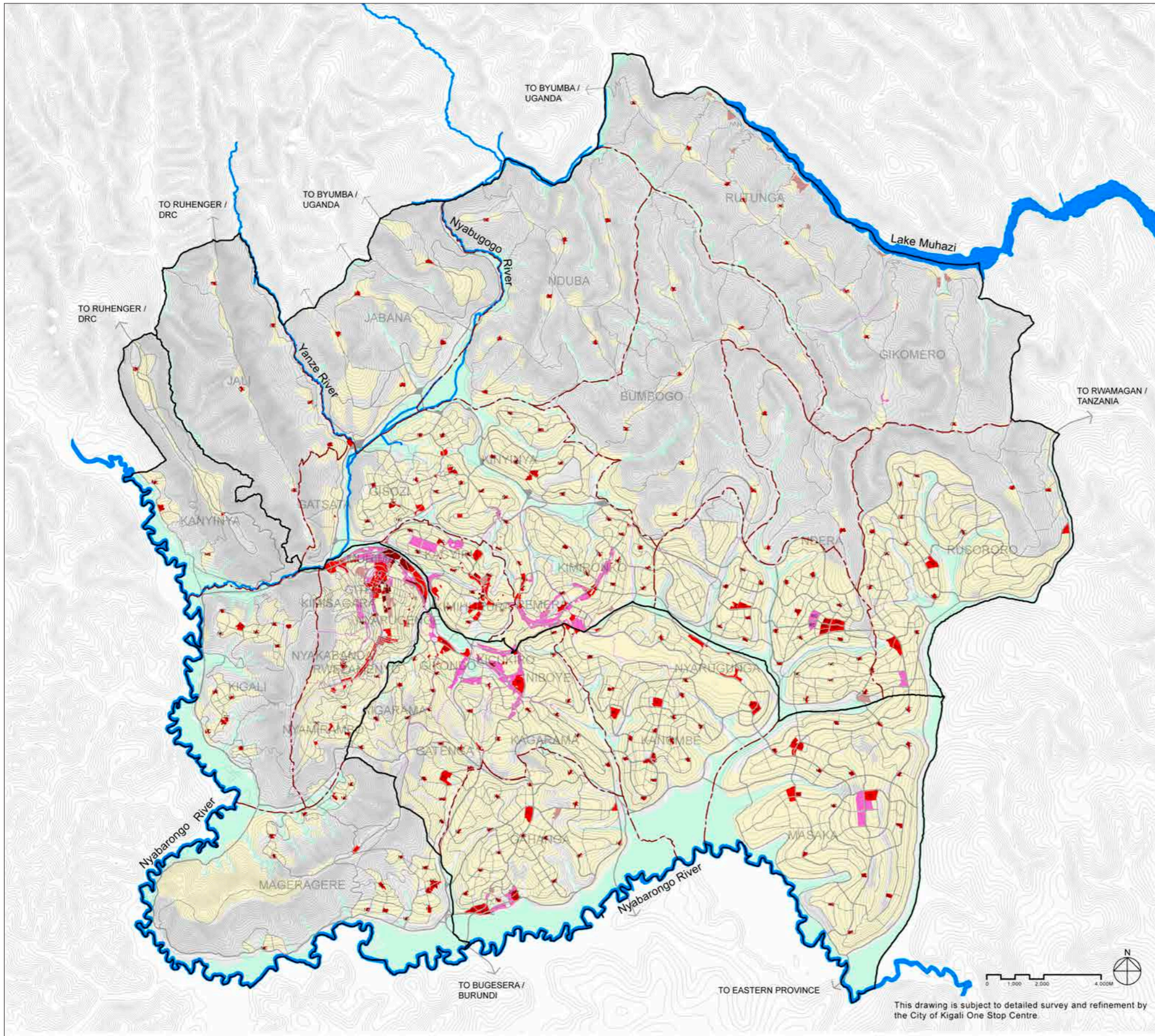




- BRT
- MRT
- Sector Boundary
- - - Planning Boundary
- District Boundary

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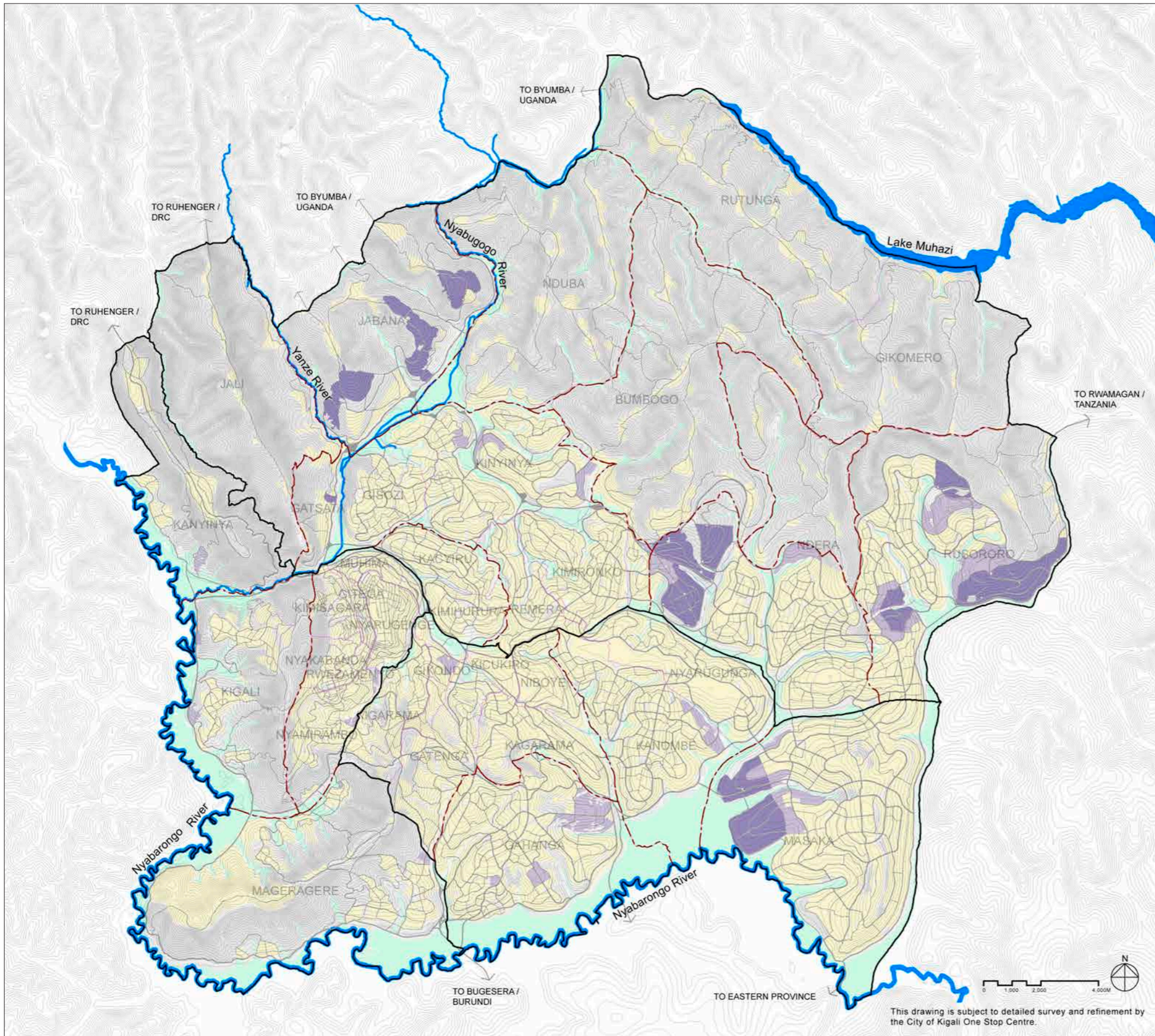


This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Centre.

- Mixed Use
- Commercial General
- Commercial Office
- Neighbourhood Center
- Town Center
- Fringe Center
- Hotel
- Proposed Development Area
- Wetland
- District Boundary
- Sector boundary
- Planning boundary

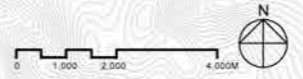
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Kigali City -Proposed Commercial Plan - Year X

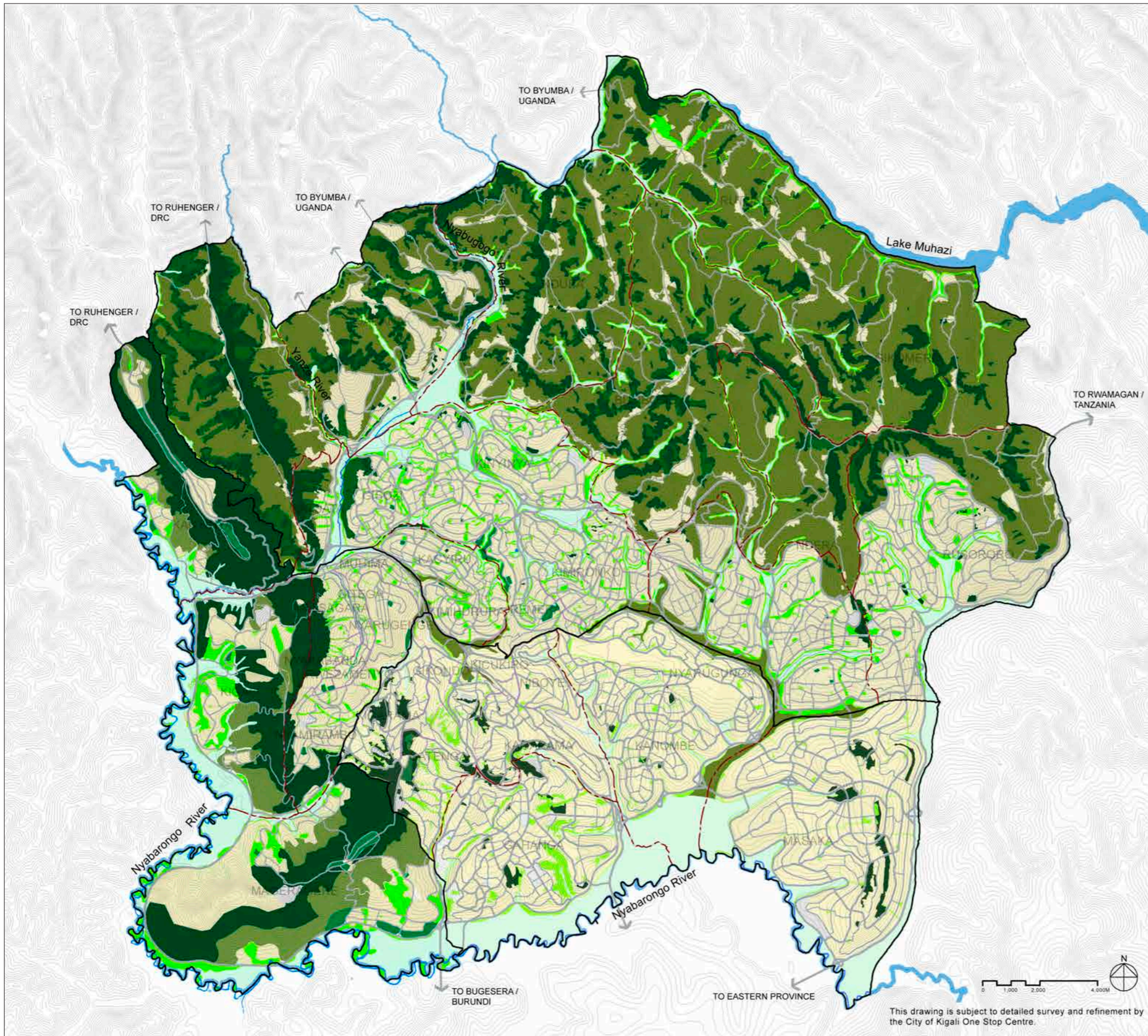


- Light Industrial
- Heavy Industrial
- Warehousing
- Rivers
- Proposed Development Area
- Wetland
- Gasabo District Boundary
- Sector Boundary
- Planning Boundary

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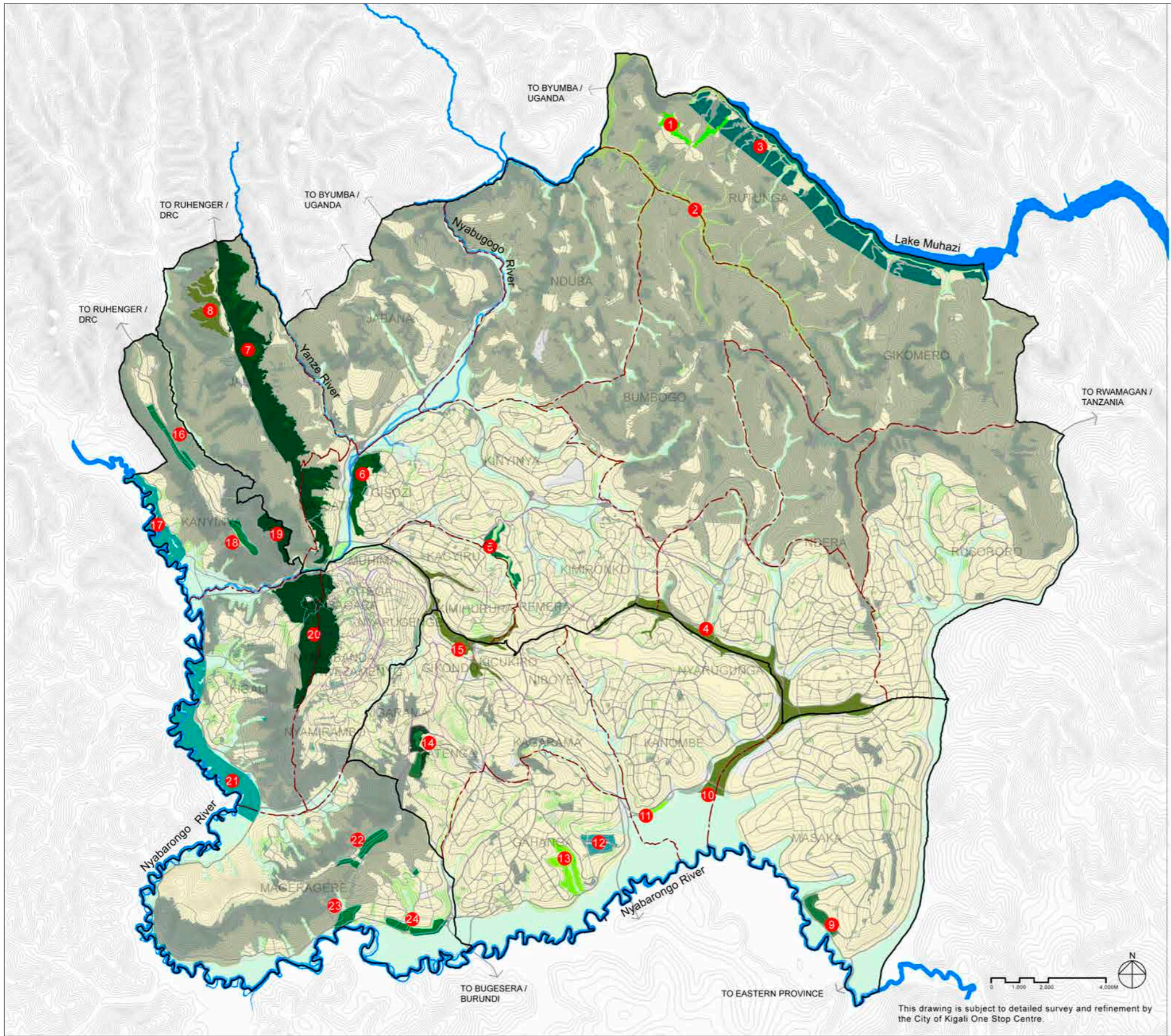
This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Centre.



- Existing Forest
- Afforestation
- Farm Land (General)
- Open Space Park and Natural Drain Channels
- Sports and Recreation
- Develop Area
- Rivers
- Wetland
- Drainage Line
- District Boundary
- Sector boundary
- Planning boundary

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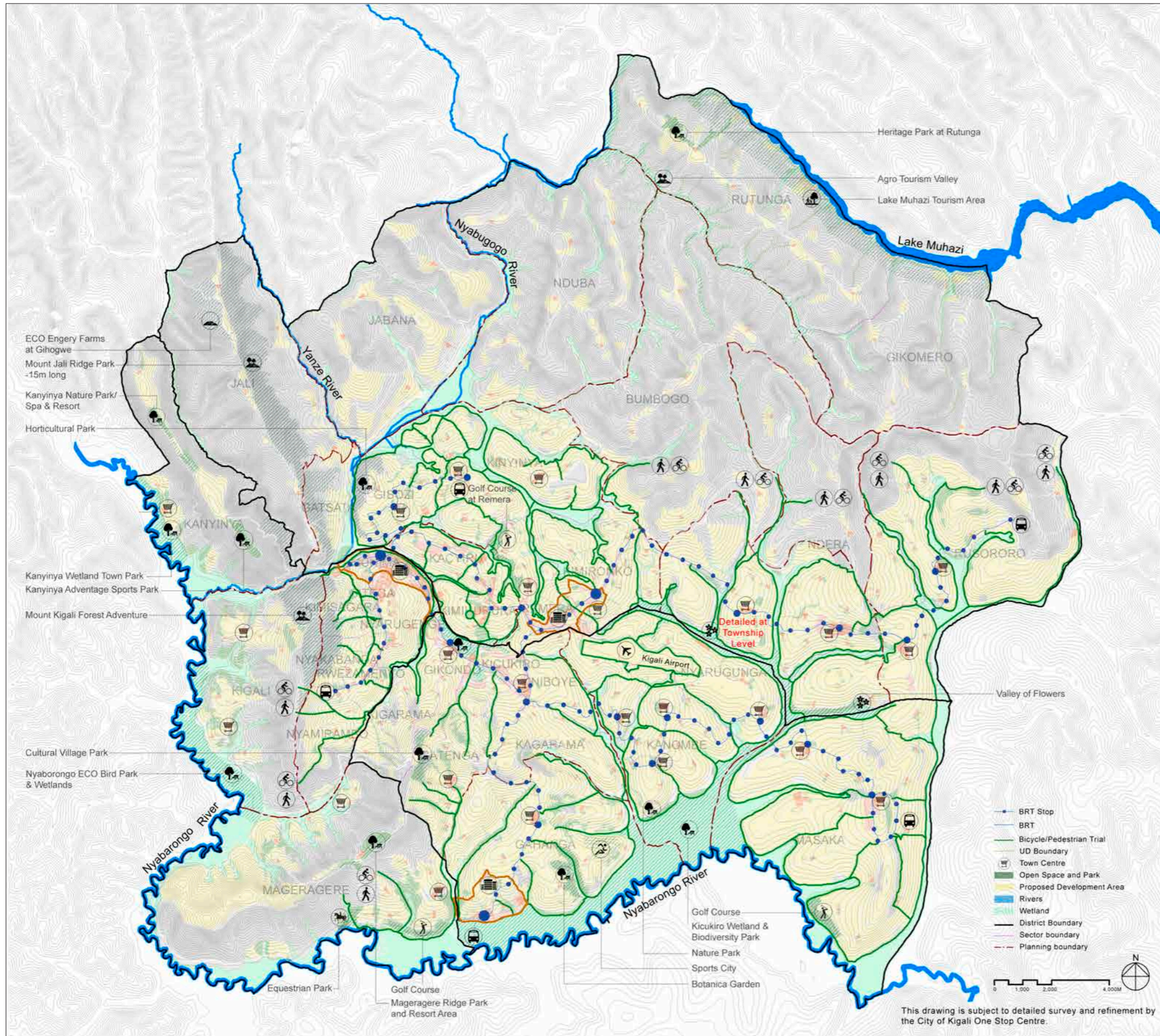
- 1 Heritage Park at Rutunga
 - 2 Agro Tourism valley Rutunga & Bumbogo
 - 3 Lake Muhazi Tourism Area
 - 4 Valley of flowers
 - 5 Golf Course at Remera
 - 6 Horticultural Park
 - 7 Mount Jali Ridge Park - 15m long
 - 8 ECO Engery Farms at Gihogwe
 - 9 Golf Course
 - 10 Kicukiro wetland & biodiversity park
 - 11 Nature park
 - 12 Sports City
 - 13 Botanica garden
 - 14 Cultural Village Park
 - 15 Gikondo lake park
 - 16 Kanyinya Pature Park Spa & Resorts
 - 17 Kanyinya Wetland Town Park
 - 18 Kanyinya Adventure Sports Park
 - 19 Secret Valley Park & Resorts
 - 20 Mount Kigali Forest Adventure Park
 - 21 Nyaborongo ECO Bord Park & Wetlands
 - 22 Mageragere Ridge Park & Resort Area
 - 23 Equestrian Park
 - 24 Golf Course
- Sector boundary
 - District Boundary

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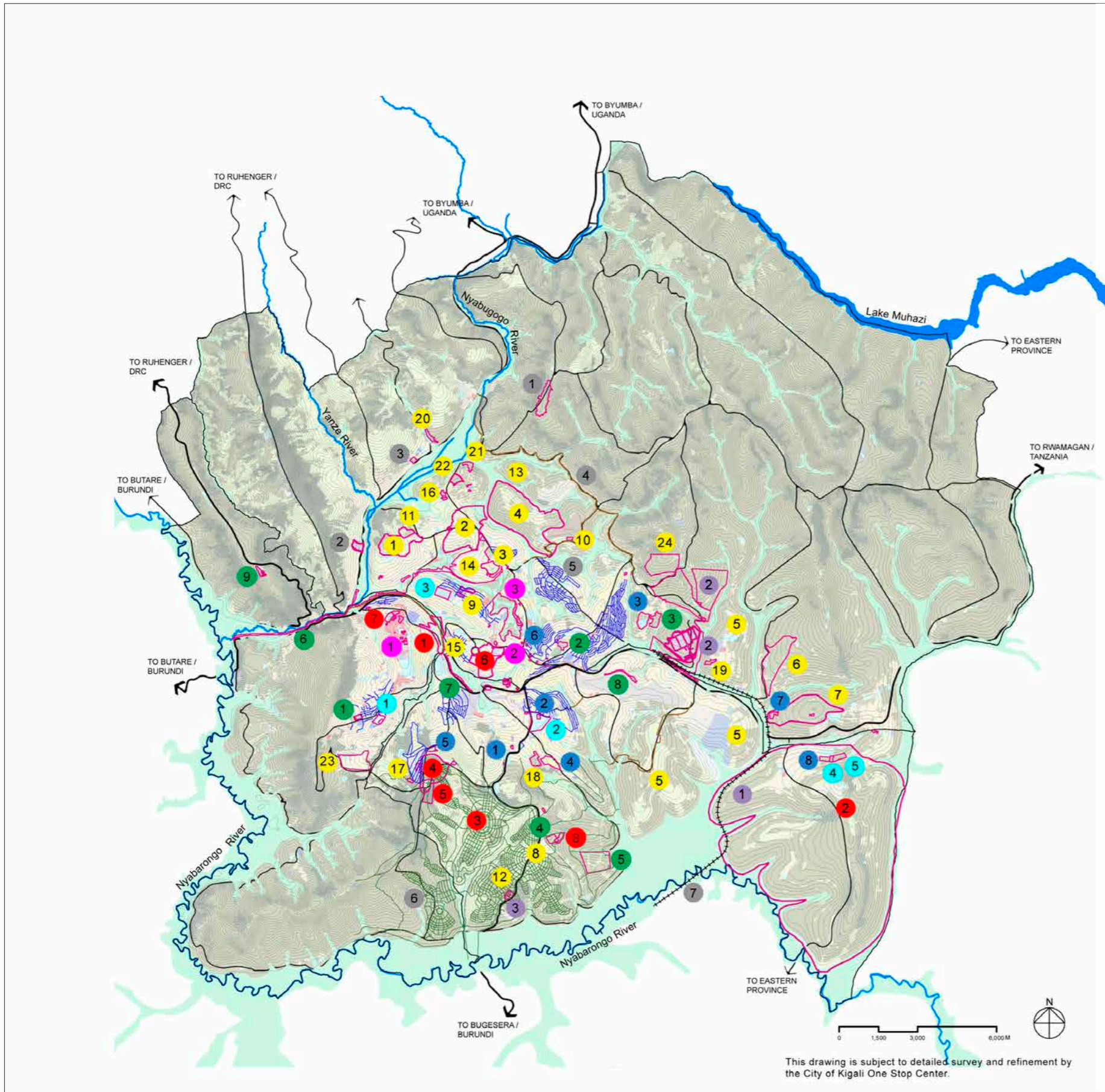
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Centre.

Kigali City - Proposed Green and Blue Plan - Year X



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 2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center



- Residential**
 - 1 Diplomatic Zone (Single Family Residential, Gisozi)
 - 2 RSSB Housing (Mixed Residential Township and town)
 - 3 OZ Proposal (Residential Township, Kinyinya)
 - 4 Surbana Proposal (Residential Township, Kinyinya)
 - 5 Imudugudu (Low Rise Residential)
 - 6 Single Family Housing, Cyaruzinge
 - 7 Single Family Residential, Nyagahanga
 - 8 Rukatsa Housing (Low Rise Residential)
 - 9 Urkunundu Potter's Village Kacyiru
 - 10 Gisozi Affordable Housing
 - 11 RHA Affordable Housing
 - 12 Amaremba / Nyarurembo
 - 13 Kagugu Housing
 - 14 Gaculiro Housing
 - 15 Kiyovu Housing
 - 16 Kubwimanac Estates
 - 17 Comfort Home
 - 18 Rukatsa Housing
 - 19 Naioth Estates
 - 20 Twagirayezu Celestin
 - 21 Low Rise Residential_Zigira John
 - 22 Batsinda_Masterplan
 - 23 Residential_Akumunigo Housing Project
 - 24 Residential_MININFRA & other institution prop res devts
- Commercial**
 - 1 Muhima Phase 1 CBD (Mixed Use)
 - 2 OZ Surbana Plan - Sector Plan & City Centre, Masaka
 - 3 OZ KCMP - City Centre Proposal (Commercial)
 - 4 OZ Sub Area Plan - Rebero (Resort & Conference)
 - 5 Kigali Culture Village (Tourism & Commercial)
 - 6 OZ Sub Area Plan (Mixed Use Commercial Centre, Kimihurura)
 - 7 CHIC
 - 8 Gahanga Hotel Project
- Mixed Use**
 - 1 Mariot Training Centre
 - 2 Convention Centre
 - 3 Century Park
- Education**
 - 1 University (Mount Kenya)
 - 2 Technical College
 - 3 Education Masoro
 - 4 Oklahoma University
 - 5 Rwanda Tourism University
 - 6 Advenist University
 - 7 Betha Ammi Christian University
 - 8 University
- Public Facilities**
 - 1 Achidiosis de Kigali
 - 2 IPRC
 - 3 Police Headquarters
 - 4 RALGA
 - 5 Hospital
- Infrastructure**
 - 1 Nduba Landfill
 - 2 Gatsata Fuel Depot
 - 3 Jabana Fuel Truck Depot
 - 4 COK Roads
 - 5 Pave Roads - Approved in Budget
 - 6 KCMP Roads
 - 7 RTDA Railway Project
- Industrial**
 - 1 OZ Sub Area Plan - Masaka
 - 2 RDB_FTZ
 - 3 Gahanga Industrial Site
- Landscape, Sports & recreation**
 - 1 Nyamirambo - Regional
 - 2 Stadium - Ferwafa
 - 3 Stadium_RCSF
 - 4 Gahanga Indoor Stadium
 - 5 Proposed Gahanga 60000 seater stadium
 - 6 Afforestation Project
 - 7 Kigali Youth Park
 - 8 Airport Garden
 - 9 Castle Wood Resort

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2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

Kigali City - Approved Projects

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APPENDIX 2 : Planning Requirements, Standards and Provisions

PROPOSED DISTRIBUTION OF TOWNSHIPS

The existing urban area are largely spread over 17 sectors and almost half of the City's urbanized area is unplanned. While there are a few new development projects that are proposed as cluster housing development, majority of the developments are developed individually. To move away from such small scale, individual plot based developments, it is proposed to organise the existing and new growth areas as integrated townships with a range of comprehensive facilities.

PROPOSED TOWNSHIP MODEL

Kigali City is proposed to be restructured into 24 self-sufficient townships. Majority of these townships are proposed to be served by public transit corridor which is also the main structuring element of these townships. The typical township size proposed for Kigali is around 900 to 1000 Ha accommodating an average population of 200,000 residents each.

Generally the townships are organized along the topography and 1-2 hills constitute one township entity. Arterial Roads form the township boundary and the main central spine formed by the BRT corridor. The

central spine holds commercial uses and major facilities with maximum density. Provision corridor for a future MRT corridor is also provided parallel to the BRT line.

Township model illustrates the key concept for typical new towns. The higher density residential neighborhoods are proposed around the town centre and in areas around the walking distance of the public transit corridor, as well as nodes around the proposed MRT stations.

Similar to the KCMP transect concept the density is proposed to gradually lower in the areas away from the transit corridor. Hence the higher density areas are located along the ridge. The density gradually reduces towards the lower areas along the wetlands.

All the townships are proposed such that it ensures the walkability within its smallest neighborhood cells with the key facilities such as neighborhood centres, primary schools and local parks at the walking distance of the residents. Further to the Town Centre catering to town level commercial needs, other town facilities such as the Vocational Training Institute, Polyclinic, Bus Interchange, Sports Field, Town Park, Cemetery and Light Industrial

Estate, etc are proposed to be safeguarded in each township. Low density residential area are proposed at lower slopes, near the scenic wetlands with quick access to the highway network.

PROPOSED TOWNSHIP BOUNDARIES

The township boundaries are determined based on the following criteria:

- The township boundaries are based on the natural boundaries and geographically conglomerated urban areas.
- The township boundaries follow the respective sector boundaries where possible.
- The developable urban areas are divided by the highway grids of 3-6 kilometers and major arterial roads spaced at 800 to 1200 meters. The township boundaries at some areas are influenced by these road networks.



Township Model - The combination of KCMP's Transect model and the proposed High Density Transit Corridors; to accommodate the projected population.

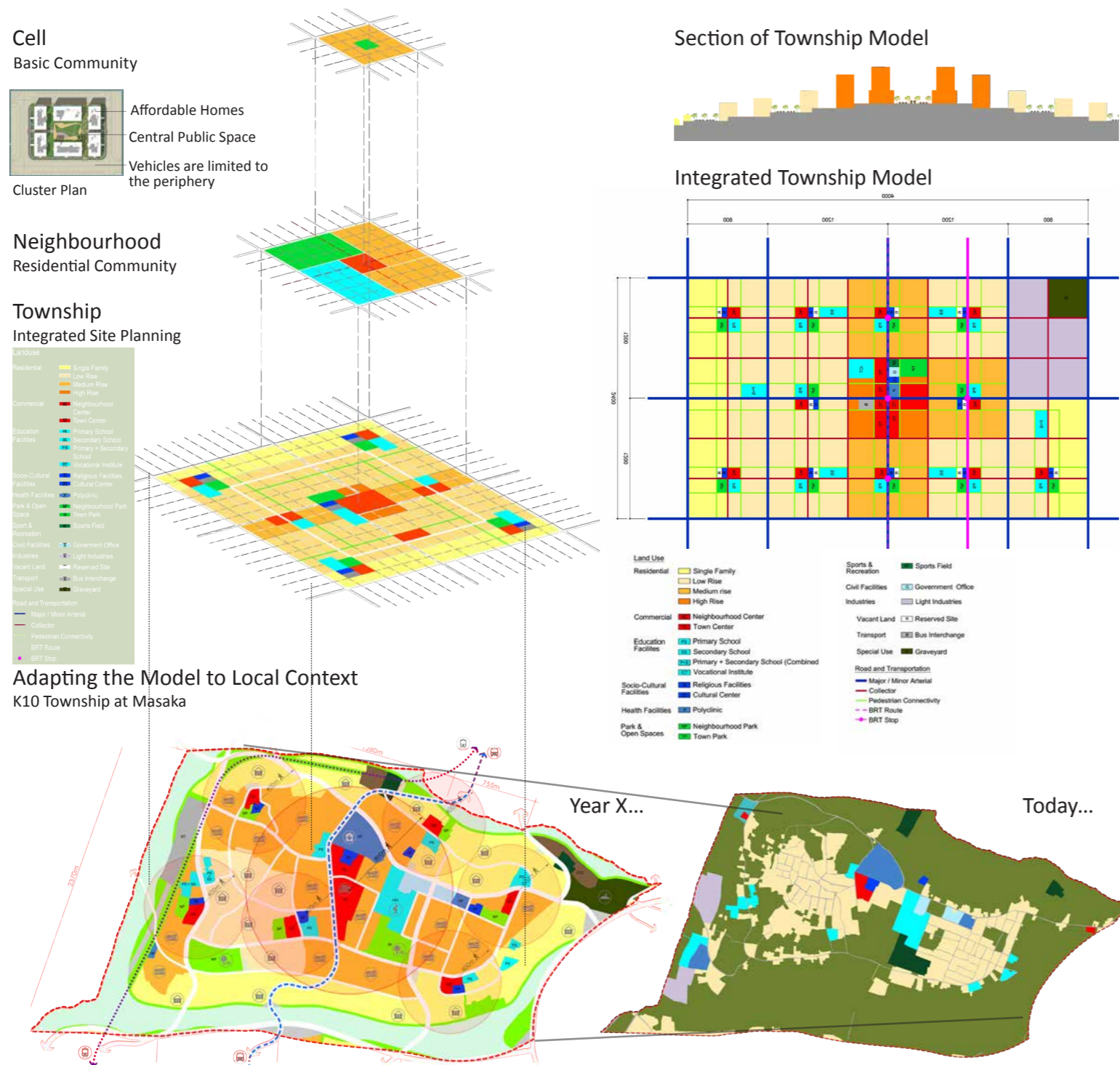


Fig.10.49 Model Township as the Organizing Unit for Kigali Planning

DEVELOPING MODEL TOWNSHIPS AS AN ORGANIZING UNIT FOR KIGALI CITY PLANNING

ESTABLISHING THE CELL AS CORE OF COMMUNITY CENTRIC PLANNING

- Promote larger development parcel between 2 - 8 ha to house up to 2000 housing units for creating a small community with ample greenery, playgrounds and vehicle free community spaces.

DEVELOPING WALKABLE NEIGHBOURHOODS

Integrate few cells into a walkable neighbourhood of around 5000 dwelling units with the following characteristics:

- Well served by pedestrian friendly “local streets” and pedestrian network.
- Well served by basic amenities such as neighbourhood shops, kindergarten, park and primary school location at walkable distances (about 400m radius)

CREATING VIBRANT TOWNSHIPS

Integrate few neighbourhoods into a vibrant township of around 10,000 dwelling units with the following characteristics:

- Well served by pedestrian friendly “local streets” and pedestrian network.
- Well served by basic amenities such as neighbourhood shops, kindergarten, park and primary school location at walkable distances (about 400m radius)

MAKING AFFORDABLE HOMES AS THE MAIN COMPONENT FOR EACH TOWNSHIP

ADAPTING TO LOCAL LIFESTYLE AND TOPOGRAPHY

Adapting the township model into the topography and local lifestyle as depicted in the transect model with the following characteristics:

- Placing the main activity corridor of the township along the hill top. These include the mass transit corridor, key public facilities and the higher value, high density mix development areas.
- Placing the medium density development at the slope and the low density at the lower portion of the hill.
- Larger parks should be located at the foot of the hill, taking advantage of the wetland areas.

AFFORDABLE HOUSING IS THE KEY COMPONENT OF THE TOWNSHIP

- Affordable housing is the form of medium density developments which have been planned close to the main activity corridor so that majority of the population lives in close proximity to the mass rapid transit and has quick access to local jobs and public facilities.

Government will drive initiatives and provide incentives to developers for constructing affordable housing, as it is the backbone of Kigali’s urban expansion.

PUBLIC FACILITIES STANDARDS

		SOUTH AFRICA (CAPE TOWN)	SINGAPORE	PROPOSED FOR KIGALI
COMMERCIAL	NEIGHBOURHOOD CENTRE	5 MIN WALK TO LOCAL MARKET; 1 PER 5000 POPULATION, 0.2 - 4 HA	1 PER 13,000 - 20,000 POPULATION, 1.7 HA SITE	1 PER NEIGHBOURHOOD; 1.2 HA SITE.
	TOWN CENTRE	DATA NOT AVAILABLE	1 PER TOWN, 17-25 HA SITE	1 PER TOWNSHIP; 12.0 HA SITE.
	REGIONAL CENTRE	DATA NOT AVAILABLE	1 PER 0.5 MILLION, CATCHMENT RADIUS - 5 KM , 57 HA SITE	1 PER 0.5 MILLION, 50 HA SITE.
EDUCATIONAL FACILITIES	PRIMARY SCHOOL	1 PER 5500 POPULATION, MAX WALKING DIST. 2.25 KM. MIN 2.8 HA SITE. (INCLUSIVE OF FIELD)	1 PER 13,400 POPULATION. 1.8 HA SITE	1 PER NEIGHBOURHOOD (15,000-20000 POPULATION). 1.5 HA SITE.
	SECONDARY SCHOOL	1 PER 12500 POPULATION, MAX DRIVING TIME. 15 MINUTES MINS.. 2.8 HA SITE, (INCLUSIVE OF FIELD)	1 PER 19,150 POPULATION. 3.0 HA SITE	1 PER 20,000 - 25,000 POPULATION. 2.4 HA SITE.
	PRIMARY + SECONDARY SCHOOL (COMBINED)	DATA NOT AVAILABLE	DATA NOT AVAILABLE	2.8 HA SITE. (BASED ON EXISTING SCHOOL SITES)
	VOCATIONAL / ICT INSTITUTE	1 PER 100,000 POPULATION, 1 HA SITE	1 PER TOWN. 5.0 HA SITE	1 PER TOWNSHIP. 5.0 HA SITE.
	HIGHER EDUCATION INSTITUTE	1 PER 1 MIL POPULATION, 8 HA SITE	1 PER 500,000 POPULATION. 6.0 HA SITE	1 PER 500,000 POPULATION. 6.0 HA SITE
SOCIO-CULTURAL FACILITIES	COMMUNITY HALL*	1 PER 10,000-60000 POP; MAX TRAVEL TIME 30 MINS...; 0.5 HA SITE.	1 PER 40,000 POPULATION. 0.4 HA SITE	1 PER 5,000 POPULATION. 0.5 HA SITE.
	REGIONAL LIBRARY	1 PER 40000- 70000 POPULATION, MIN SIZE 0.03 HA	1 PER 65,000 POPULATION. 0.4 HA SITE	1 PER 500,000 POPULATION. 0.5 HA SITE.
	RELIGIOUS FACILITY	1 PER 3000 - 6000 POPULATION; 0.15 - 1 HA SITE, DISTANCE OF 2 KM	1 PER 25,000 POPULATION. 0.2 -0.45 HA SITE	1 PER NEIGHBOURHOOD (15,000- 20000 POPULATION). 0.5 HA SITE.
	CEMETERIES	1 PER 100,000 PEOPLE 15.6 HA OVER 30 YEARS (2000 GRAVES PER HA)	DATA NOT AVAILABLE	1 PER TOWNSHIP 20 HA OVER 20 YEARS
	MUSEUMS/ CULTURAL CENTRE ETC.	1 PER 50000 (SMALL MUSEUM, SITE & PURPOSE SPECIFIC) 1 PER 50000 (PERFORMING ARTS CENTRE, SITE & PURPOSE SPECIFIC)	DATA NOT AVAILABLE	1 PER TOWNSHIP. 1.5 HA SITE.
HEALTH FACILITIES	HEALTH CLINIC *	0.2 HA PER 5000-20000 POPULATION 0.5 HA PER 30000-50000 POPULATION 1 HA PER 60000-70000 POPULATION	SERVED BY PRIVATE PRACTITIONERS AS PART OF COMMERCIAL FACILITIES	1 PER NEIGHBOURHOOD (15,000-20000 POPULATION). 0.5 HA SITE.
	POLYCLINIC	1.5 HA PER 60000 - 120000 POPULATION MAX. VEHICULAR TRAVEL TIME OF 30 MINS..	1 FOR MINIMUM POPULATION OF 150,000 (EXCLUDING PRIVATELY OPERATED CLINICS). 0.5 HA SITE FOR 150,000 - 200,000 POPULATION	1 PER TOWNSHIP. 5.0 HA SITE. MAX TRAVEL TIME OF 30 MINS...
	REGIONAL HOSPITAL	DISTRICT HOSPITAL: 450000 POPULATION; 5 HA SITE REGIONAL HOSPITAL: 1 MILLION POPULATION; 7 HA SITE TEACHING(SPECIALIST) HOSPITAL: 4.5 MILLION POPULATION; 35 HA SITE	4.5 BEDS PER 1,000 POPULATION. 5.0 HA SITE	1 PER 500,000 POPULATION. 5.0 HA SITE
PARKS & OPEN SPACES	NEIGHBORHOOD PARK	0.4 HA PER 1000 POPULATION, 20 MIN WALKING DISTANCE	DATA NOT AVAILABLE	1 PER NEIGHBOURHOOD (15,000-20000 POPULATION). 1.0 HA SITE
	TOWN PARK	(DISTRICT /REGIONAL PARK) 0.2 HA PER 1000 POPULATION; 20MIN BY PUBLIC TRANSIT	1 PER TOWN. 10 HA SITE	1 PER TOWNSHIP. 6.0 HA SITE
	SPORTS FIELD	0.56HA PER 1 000 PEOPLE (+ ADDITIONAL 0.3/0.4HA PER 1 000 IN METROPOLITAN AREAS FOR HIGHER ORDER FACILITIES) 1 PER 60000 POPULATION, GROUPING OF FIELDS AND/OR SPORT FACILITIES, 1.5- 2.5 HA	1 PER 125,000 POPULATION. 3.0 HA SITE	1 PER TOWNSHIP . 1.5 HA SITE. (NEAR TO SCHOOLS OR COMMUNITY CENTRES OR COMBINE WITH PARKS.)
SPORTS & RECREATION	SPORTS CENTRE (WITH SWIMMING POOL AND STADIUM)	SPORT STADIA , 1 PER 300,000 POPULATION (WITH TRACKS & 3000 SEATS) REGIONAL SPORTS ARENAS 1 PER 250000-500000, 0.5 HA (INDOOR SPORTS HALLS MAY HOST NON SPORTING EVENTS) INTERNATIONAL SPORTS COMPLEX, 10 PER 1.5 MILLION, 3 HA SITE	1 PER 125,000 POPULATION	1 FOR EVERY 500,000 POPULATION. 6.0 HA SITE.
CIVIC FACILITIES	FIRE STATION	1 PER MIN POPULATION OF 100000, 0.3 HA SUBURBAN STATION, 1.2 HA REGIONAL STATION	1 TO COVER 5 - 8 MINS.. RESPONSE TIME. 0.4 - 0.6 HA SITE	5 MINUTES RESPONSE TIME. 0.5 HA SITE.
	GOVERNMENT/ MUNICIPAL OFFICES	DISTRICT OFFICE - 40000 - 140000 POPULATION, TRAVEL TIME 30 MIN MUNICIPAL OFFICE - 1 PER SUB REGION/ 500000 POP., 0.3 - 1 HA SITE	DATA NOT AVAILABLE	1 SECTOR OFFICE PER SECTOR. 1 DISTRICT OFFICE PER DISTRICT.

*(as part of neighborhood centre)

BROAD LAND REQUIREMENTS: COMMERCIAL COMPOSITION YEAR X

	PLOT RATIO	RETAIL			OFFICES			TOTAL AREA	TOTAL FLOOR AREA
PROVISION STANDARD (M ² /PER)		1			1.2				
COMMERCIAL FLOOR AREA (MIL M ²)		5			6				
SPACE DISTRIBUTION		%	GFA (MIL M ²)	AREA (SQKM)	%	GFA (MIL M ²)	AREA (SQKM)	(KM2)	(MI M2)
CBD	3	25%	1.25	0.42	30%	1.8	0.80	1.22	3.05
REGIONAL CENTRE	2	35%	1.75	0.87	40%	2.40	1.20	2.07	4.15
TOWN/FRINGE CENTRE	2	20%	1.00	0.50	20%	0.60	0.30	0.80	1.60
OTHERS COMM	2	10%	0.50	0.25	10%	0.60	0.60	0.85	1.10
NCS	1	10%	0.50	0.50	-	-	-	0.50	0.50
TOTAL		100%	5.00	2.54	100%	5.40	2.90	5.44	10.40

BROAD LAND REQUIREMENTS: TOURISM FACILITIES YEAR X

	HOTEL			
PROVISION STANDARD (M ² /PER)	0.1			
COMMERCIAL FLOOR AREA (MIL M ²)	0.5			
SPACE DISTRIBUTION	%	(MIL M ²)	ROOMS*	AREA
CBD	40%	0.20	3,333	0.07
REGIONAL CENTRE	15%	0.08	1,250	0.04
TOWN CENTRE/FRINGE CENTRE	15%	0.08	1,250	0.04
OTHERS COMM	30%	0.15	2,500	0.08
NCS	-	-	-	-
TOTAL	100%	0.50	8,333	0.22

* BASED ON AVG 60 M²/ROOM

BROAD LAND REQUIREMENTS: INDUSTRIAL COMPOSITION YEAR X

MANUFACTURING			LOGISTICS			LIGHT INDUSTRIES IN TOWN			TOTAL AREA
FLOOR AREA (MIL M2)	AREA (KM2)	%	FLOOR AREA (MIL M2)	AREA (KM2)	%	FLOOR AREA (MIL M2)	AREA (KM2)	%	AREA (KM2)
16.75	23.93	8.1	5.36	5.36	1.82	10.72	7.7	2.6	36.95

Note: Manufacturing: 50% of employment, Logistics: 10% of Employment, Industries in townships 40%
 Plot Ratio: Manufacturing - 0.7, Logistics- 1, Industries in townships - 1.4
 Logistics: 80m²/worker, Manufacturing: 50m²/worker, Industries in townships: 40m²/worker

PROPOSED BROAD LAND USE REQUIREMENTS FOR KIGALI CITY YEAR X

	% OF URBAN EXISTING	% OF URBAN 2025	% OF URBAN YEAR X
PROTECTED FOREST / WETLAND/ WATERBODY	33%	75%	60%
AGRICULTURE	50%		
URBANIZED AREA (%)	17%	25%	40%
AREA	731.27	731.27	731.27
POPULATION	1.2 MILLION	2.9 MILLION	5 MILLION
GROSS DENSITY	1670 P/KM ²	3950 P/KM ²	6850 P/KM ²
GROSS URBAN DENSITY	11000 P/KM ²	15850 P/KM ²	17000 P/KM ²
URBANIZED AREA	RESIDENTIAL	9%	75 KM ² (41 %)
	INDUSTRIAL	0.4%	24 KM ² (12.5 %)
	COMMERCIAL + MIXED USE	0.4%	3 KM ² (1.5 %)
	TRANSPORTATION, INFRASTRUCTURE & UTILITIES	3.1%	44 KM ² (24 %)
	SPECIAL USE	1.6%	7 KM ² (4 %)
	URBAN RECREATIONAL OPEN SPACES	0.2%	18 KM ² (10 %)
	PUBLIC FACILITIES	1.6%	11 KM ² (6 %)
	TOTAL BUILT-UP AREA	119 KM ²	182 KM ²
			294 KM ² (100%)

Note: Residential Area is recommended to be secured for 5.5 Mil Population to balance the downzoning trend.

KIGALI CITY - POPULATION, COMMERCIAL AND INDUSTRIAL EMPLOYMENT DISTRIBUTION

Population (mil)	Year 2012	Year 2025	Year X
Kigali City	1.3	3.1	5

Employment Year X (mil)	Service (mil)	Industrial	Agriculture (mil)	TOTAL (mil)
Kigali City	1.62	0.67	0.08	2.37

COMMERCIAL DISTRIBUTION													
Type of Commercial	Central area		Regional Centre		Fringe Centre		Town Centre		Neighbourhood Centre		Other commercial		Total
	GFA share		GFA share		GFA share		GFA share		GFA share		GFA share		
Retail GFA (mil m2)	25%	1.25	35%	1.75	10%	0.50	10%	0.50	10%	0.50	10%	0.50	5.00
Office GFA (mil m2)	30%	1.80	40%	2.40	10%	0.60	10%	0.60	0%	0.00	10%	0.60	6.00
Hotel GFA (mil m2)	40%	0.20	15%	0.08	7.50%	0.04	7.50%	0.04	0%	0.00	30%	0.15	0.50
Total GFA		3.25		4.23		1.14		1.14		0.50		1.25	11.50

COMMERCIAL EMPLOYMENT DISTRIBUTION (TOTAL = 1.62 MIL)								
Type of Commercial	Central area	RC	FC	TC	NC	TC+NC	Other commercial	Total
GFA %	28	37	10	10	4		11	100.00
Service employment	0.458	0.595	0.160	0.160	0.070	0.231	0.176	1.62

COMMERCIAL EMPLOYMENT DISTRIBUTION FOR OTHER COMMERCIAL (TOTAL = 0.176 MIL)		
Share of SP2	Percentage Share	Employment
G7	5%	8804
SP1	20%	35217
G4	20%	35217
R5	4%	7043
R8	1%	1761
K4	50%	88043
	100%	176087

INDUSTRIAL EMPLOYMENT DISTRIBUTION (TOTAL = 0.67 MIL)										
Type of Industry	Employment share	Total Employment	I1	I2	I3	I4				
			Employment share	Employment	Employment share	Employment	Employment share	Employment	Employment share	Employment
Manufacturing	50%	335,000	10%	33,500	35%	117,250	40%	134,000	15%	50,250
Logistics	10%	67,000	40%	26,800	10%	6,700	10%	6,700	40%	26,800
Light industrial in Townships	40%	268,000	-	-	-	-	-	-	-	-
Sub-total				60,300		123,950		140,700		77,050
Total		670,000								

KIGALI CITY - EMPLOYMENT DISTRIBUTION IN YEAR X

KIGALI CITY	POPULATION	EMPLOYMENT					TOTAL		
TOWNSHIP	YEAR X	SERVICE	LIGHT INDUSTRY	MANUFACTURING	LOGISTICS	RURAL	TOTAL		
SP1	198,000		493,043	-	-	-	-	-	493,043
R1	6,300								
NY1	74,000	3	7,141	2	4,216	-	-	-	11,357
NY2	157,000	7	15,151	3	8,945	-	-	-	24,096
NY3	249,000	20	32,624	5	14,187	-	-	-	46,811
NY4	71,400	3	6,890	2	4,068	-	-	-	10,958
NY5	125,000	5	12,063	3	7,122	-	-	-	19,185
G1	126,000	5	12,159	3	7,179	-	-	-	19,338
G2	173,000	14	22,667	4	9,857	-	-	-	32,524
G3	118,000	5	11,387	3	6,723	-	-	-	18,110
G4	321,000	26	77,275	7	18,289	-	-	-	95,565
G5	134,000	6	12,931	3	7,635	-	-	-	20,566
G6	283,000	33	198,391	6	16,124	-	-	-	214,516
G7	212,000	9	29,262	5	12,079	-	-	-	41,341
G8	149,000	6	14,379	3	8,489	-	-	-	22,868
KT1	128,000	5	12,352	3	7,293	-	-	-	19,645
KT2	79,000	3	7,624	2	4,501	-	-	-	12,125
KT3	480,000	39	62,890	10	27,349	-	-	-	90,239
KT4	184,000	22	286,435	4	10,484	-	-	-	296,918
KT5	253,000	11	24,415	5	14,415	-	-	-	38,830
KT6	83,000	3	8,010	2	4,729	-	-	-	12,739
KT7	133,000	6	12,835	3	7,578	-	-	-	20,412
KT8	110,000	5	10,615	2	6,267	-	-	-	16,882
KT9	158,000	7	15,247	3	9,002	-	-	-	24,249
KT10	280,000	12	27,020	6	15,953	-	-	-	42,973
KT11	386,000	45	198,391	8	21,993	-	-	-	220,384
I1 (RURAL HOUSING)	25,000	-	-	-	-	33,500	26,800	-	60,300
I2 (HOUSING INCLD)	35,000	-	-	-	-	117,250	6,700	-	123,950
I3	98,000	-	-	-	-	134,000	6,700	-	140,700
I4	18,000	-	-	-	-	50,250	26,800	-	77,050
R5	37,000		7043						7,043
R8	18,000		1761						1,761
RURAL	224,000	-	-	-	-	-	-	80,000	80,000
TOTAL	5,125,700		1,620,000		254,479	335,000	67,000	80,000	2,356,479

KICUKIRO DISTRICT - PROJECTED POPULATION DISTRIBUTION - YEAR X

Planning Area	Overall Area (Ha)	"Nett Developable land (Ha)"	Existing Population(2013)	Projected Population (Using Density)	Projected Population (Using GFA)	Gross density (Year X)	Gross density (2013)
CENTRAL	3940.0	3039	171388	711,324	694,459	176	43
SOUTHERN	3660.0	2234	20733	434,248	436,457	119	6
SOUTH CENTRAL	3840.0	2869	72693	478,891	483,133	126	19
EASTERN	5230.0	3837	37131	693,492	684,161	131	7
TOTAL DISTRICT OF KICUKIRO	16,670	11979	301945	2,317,954	2,298,210	138	19

COMPOSITION OF HOUSING - KICUKIRO DISTRICT

Kicukiro District-Housing Type	Housing Area	Population	Housing Share	Population Distribution Share
Single Family	4096.61	630878	56%	27%
Low Density	1388.77	499031	19%	22%
Medium Density	1606.13	989376	22%	43%
High Density	111.64	91694	2%	4%
Mixed Use	177.01	87231	2%	4%
Total	7380.2	2298209.6	100%	100%

COMPOSITION OF HOUSING CENTRAL PLANNING AREA

Housing Type	Housing Area(Ha) (Gross)	Housing Area(Ha) (Net)	"House Size (in sqm)"	Du/ha (Net)	Gross Plot Ratio	"Housing Area Share"	Population share	Population (using GFA)	Population (Using Density)	Dwelling Units (Using GFA)	Dwelling Units (using Density)	"Floor Area (GFA) (sqm)"
Single Family	1097	1097	250	40	1	1	0	168901	168901	43870	43870	10967600
Low Density	354	283	120	90	1	0	0	127132	122592	33021	31842	3962560
Medium Density	489	391	90	160	2	0	0	301249	301249	78246	78246	7042176
High Density	45	36	90	250	2	0	0	36976	43332	9604	11255	864384
Mixed Use	122	78	90	160	2	0	0	60200	75251	15636	19546	1407283
Total	2107	1885				1	1	694459	711324	180379		24244003

COMPOSITION OF HOUSING SOUTHERN PLANNING AREA

Housing Type	Housing Area(Ha) (Gross)	Housing Area(Ha) (Net)	"House Size (in sqm)"	Du/ha (Net)	Gross Plot Ratio	"Housing Area Share"	Population share	Population (using GFA)	Popoulation (Using Density)	Dwelling Units (Using GFA)	Dwelling Units (using Density)	"Floor Area (GFA) (sqm)"
Single Family	616	616	250	40	1	0	0	94873	94873	24642	24642	6160600
Low Density	543	435	120	90	1	0	0	195201	188229	50701	48891	6084176
Medium Density	199	159	90	160	2	0	0	122559	122559	31834	31834	2865024
High Density	19	15	90	250	2	0	0	15269	17893	3966	4648	356928
Mixed Use	17	11	90	160	2	0	0	8555	10694	2222	2778	199987
TOTAL	1394	1236				1	1	436457	434248	113365	112792	15666715

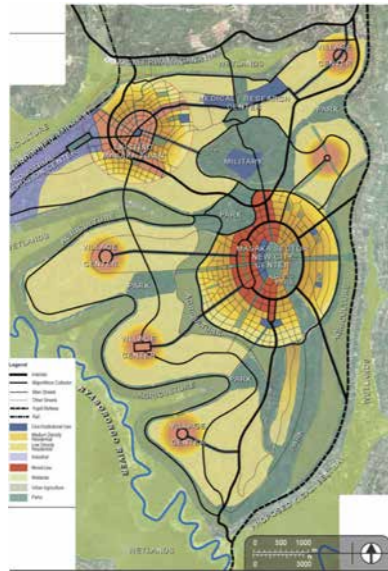
COMPOSITION OF HOUSING SOUTH CENTRAL PLANNING AREA

Housing Type	Housing Area(Ha) (Gross)	Housing Area(Ha) (Net)	"House Size (in sqm)"	Du/ha (Net)	Gross Plot Ratio	"Housing Area Share"	Population share	Population (using GFA)	Popoulation (Using Density)	Dwelling Units (Using GFA)	Dwelling Units (using Density)	"Floor Area (GFA) (sqm)"
Single Family	868	868	250	40	1	1	0	133683	133683	34723	34723	8680700
Low Density	334	267	120	90	1	0	0	120118	115828	31199	30085	3743936
Medium Density	372	298	90	160	2	0	0	229140	229140	59517	59517	5356512
High Density	0	0	90	250	2	0	0	0	0	0	0	0
Mixed Use	0	0	90	160	2	0	0	192	240	50	62	4493
TOTAL	1575	1433				1	1	483133	478891	125489	124387	17785641

COMPOSITION OF HOUSING EASTERN PLANNING AREA

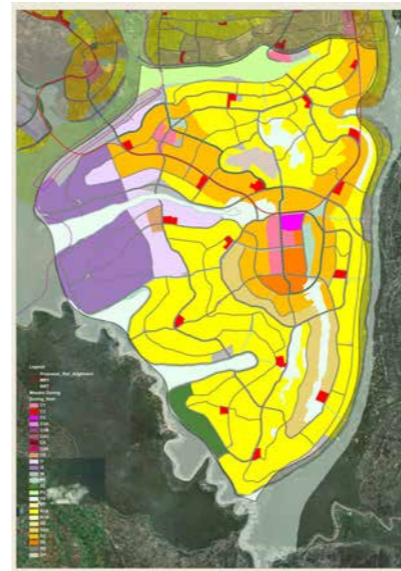
Housing Type	Housing Area(Ha) (Gross)	Housing Area(Ha) (Net)	"House Size (in sqm)"	Du/ha (Net)	Gross Plot Ratio	"Housing Area Share"	Population share	Population (using GFA)	Popoulation (Using Density)	Dwelling Units (Using GFA)	Dwelling Units (using Density)	"Floor Area (GFA) (sqm)"
Single Family	1516	1516	250	40	1	1	0	233421	233421	60629	60629	15157200
Low Density	157	126	120	90	1	0	0	56581	54560	14696	14171	1763552
Medium Density	546	437	90	160	2	0	0	336428	336428	87384	87384	7864560
High Density	48	38	90	250	2	0	0	39449	46229	10246	12008	922176
Mixed Use	37	24	90	160	2	0	0	18283	22854	4749	5936	427392
TOTAL	2304	2141				1	1	684161	693492	177704	180128	26134880

**SUB AREA PLANS IN THE NEW CITY MASTER PLAN
MASAKA SUB AREA (4327 HA)**



MASAKA - OZ SUB AREA PLAN		
LAND USE	AREA (HA)	PERCENT-AGE
CIVIC INSTITUTIONAL USE	89	2%
INDUSTRIAL	150	3%
INFRASTRUCTURE ROW	284	7%
LOW DENSITY RESIDENTIAL	1074	25%
MEDIUM DENSITY RESIDENTIAL	564	13%
MIXED USE	411	10%
PARK	740	17%
URBAN AGRICULTURE	537	13%
WETLAND	446	10%
TOTAL	4297	100%

EASTERN PLANNING AREA



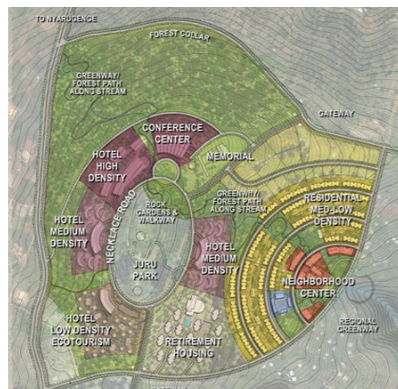
MASAKA -EASTERN PLANNING AREA - DETAILED MASTER PLAN		
LANDUSE	AREA_HA	PERCENTAGE
CIVIC FACILITIES	4	0%
COMMERCIAL GENERAL + HOTEL	78	2%
DEFENCE AREA + GRAVEYARD	43	1%
EDUCATION INSTITUTION	176	4%
EXISTING FOREST	177	4%
GOVERNMENT OFFICE	10	0%
HEALTH FACILITIES	21	0%
HEAVY AND LIGHT INDUSTRIAL	548	13%
HIGH RISE RESIDENTIAL	48	1%
LOW RISE RESIDENTIAL	157	4%
MEDIUM RISE RESIDENTIAL	542	13%
MIXED USE	37	1%
OPEN SPACE AND PARK	177	4%
RELIGIOUS FACILITIES	8	0%
RESERVE SITE	9	0%
ROAD	398	9%
SINGLE FAMILY RESIDENTIAL	1438	33%
SPORTS AND RECREATION	57	1%
TRANSPORTATION	87	2%
UTILITIES	29	1%
WETLAND + RIVER	254	6%
TOTAL	4297	100%

Source: Kigali Sub Area Plans, Schematic Planning; Oz architecture.era.edaw.tetrattech.winston associates-December 2010

- Mixed Use Zones**
- High Density
- Medium Density
- Neighbourhood Centre
- Residential Zones**
- High Density
- Medium Density
- Medium Low Density
- Hotel Zones**
- High Density/Conference Centre
- Medium Density
- Low Density (Eco-Tourism/Retirement Housing)
- Civic
- Educational
- Open Space

- Single Family Residential
- Low Rise Residential
- Medium Rise Residential
- Commercial General
- Government Office
- Education Institution
- Religious Facilities
- Health Facilities
- Civic Facilities
- Wetland
- Open Space and Park
- Transportation (Road)
- Reserve Site

REBERO SUB AREA PROPOSAL (89 HA)



REBERO - OZ SUB AREA PLAN		
LANDUSE	AREA	PERCENTAGE
OPEN SPACE	37	46%
RESIDENTIAL MEDIUM DENSITY	6	8%
RETIREMENT HOUSING	5	6%
COMMERCIAL	3	4%
HOTEL LOW DENSITY	3	3%
HOTEL MEDIUM DENSITY	4	5%
HOTEL HIGH DENSITY	2	3%
INFRASTRUCTURE-RIGHT OF WAY	20	25%
TOTAL	81	100%

JURO PARK AND URBAN FOREST RESORTS

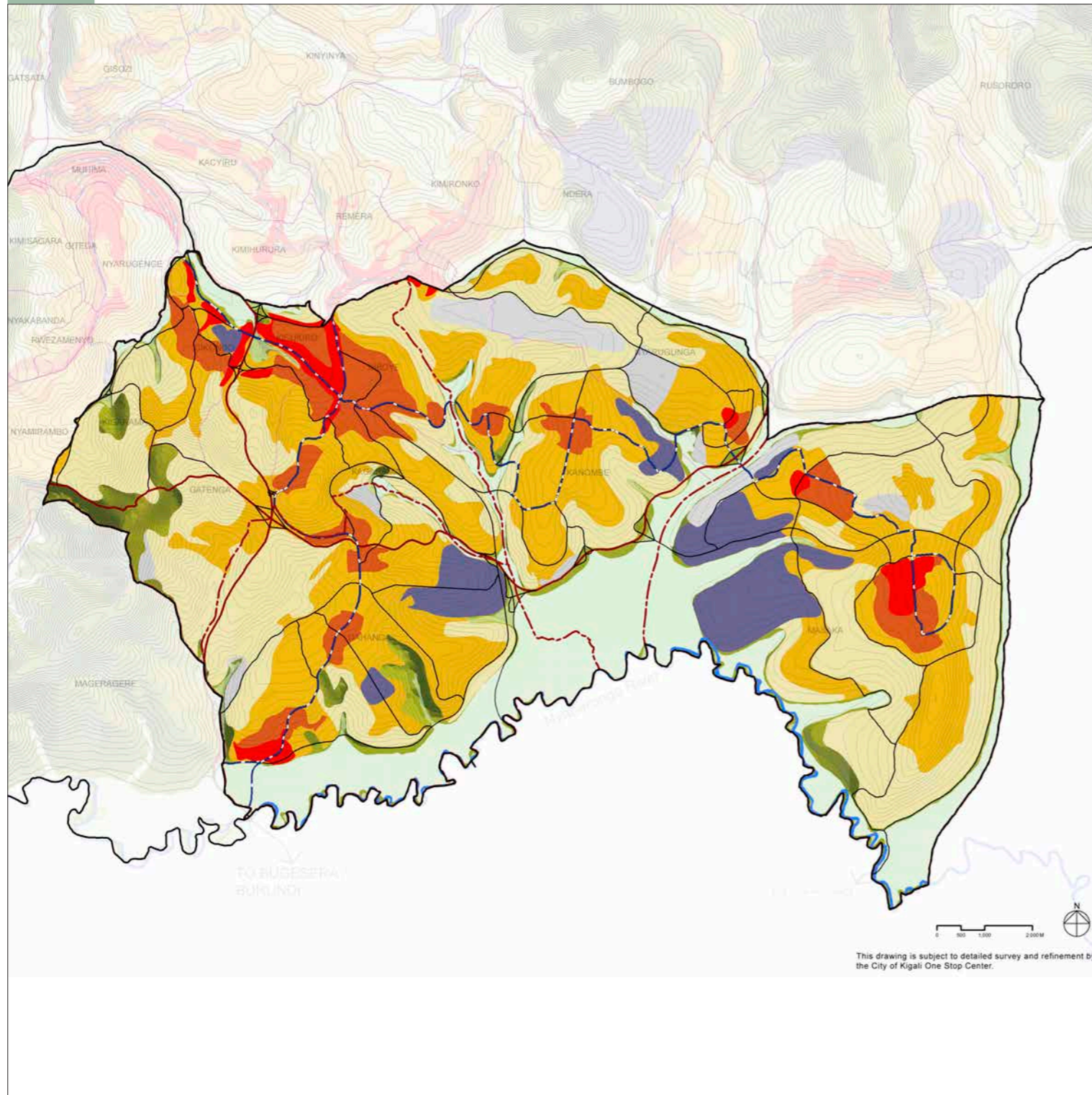


JURO PARK AND URBAN FOREST RESORTS - DETAILED MASTER PLAN		
LANDUSE	AREA	PERCENTAGE
CIVIC FACILITIES	7	9%
EXISTING FOREST	28	35%
GRAVEYARD	1	1%
ROAD	8	10%
SINGLE FAMILY RESIDENTIAL	25	31%
SPORTS AND RECREATION	11	13%
TOTAL	81	100%

Source: Kigali Sub Area Plans, Schematic Planning; Oz architecture.era.edaw.tetrattech.winston associates-December 2010

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APPENDIX 3: Zoning Plans - Kicukiro District



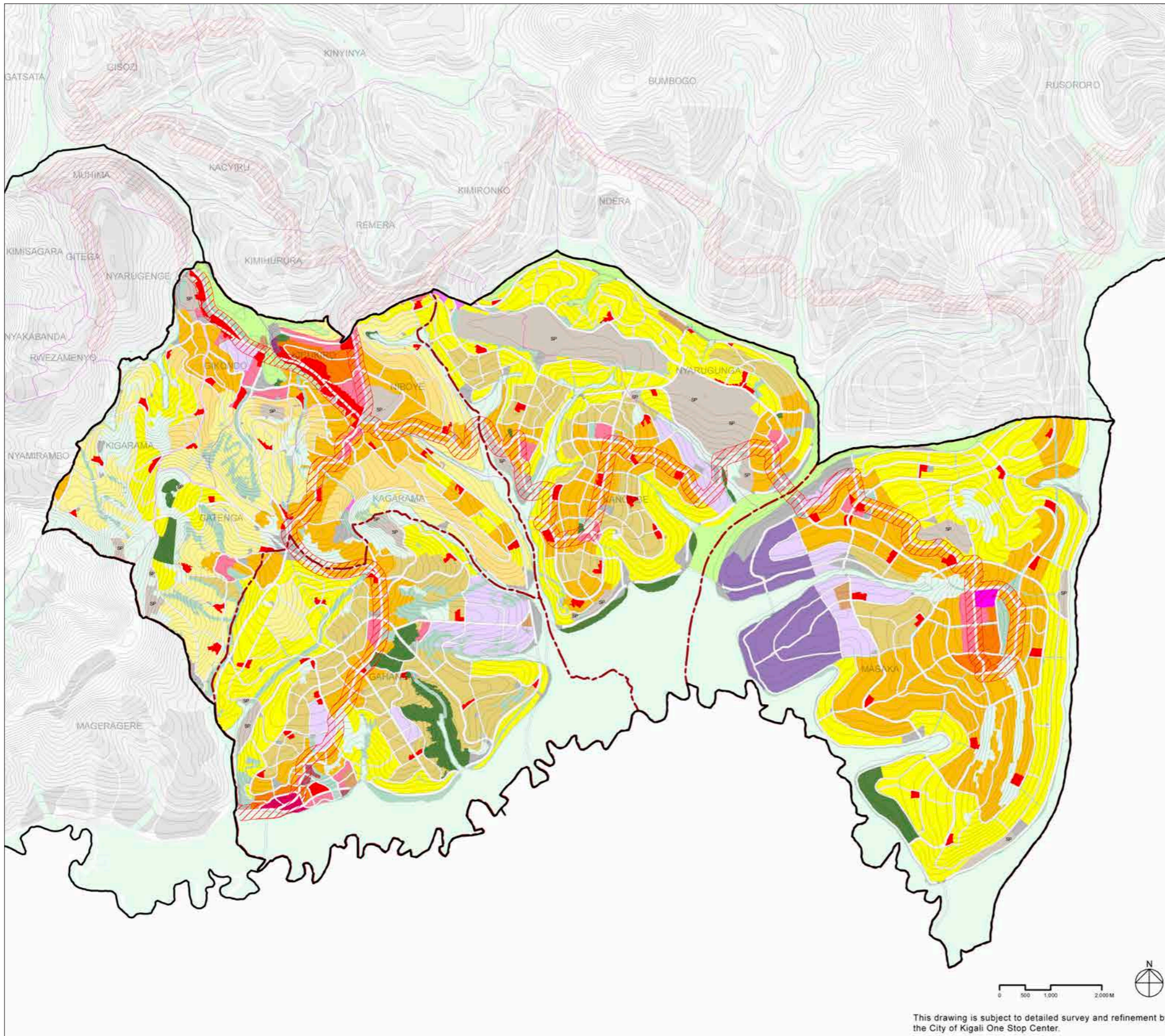
- BRT
- HCUR
- Major Roads
- Commercial Zone
- Industrial Zone
- Infrastructure Zone
- Medium Rise Residential Zone
- Single Family Residential Zone
- Low Rise Residential Zone
- River Zone
- Special Use Zone
- Sector Boundary
- - - Planning Boundary
- District Boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

ZONING CLASSIFICATION AND LAND USE MATRIX

Zoning Category	R1	R1A	R1B	R2	R2A	R3	R4	C1	C2	C3	C3A	C3B	C3C	C4	C4A	C5	I1	I2	P1	P2	P3	P4
Residential																						
Single Family Housing (Detached Villa)																						
Single Family Housing (Detached and Attached)																						
Multi-family Housing (Condominiums and Apartment Flat)																						
Workers' Accommodation																						
Commercial																						
Retail – Sundries / Grocery Shops / Food and Beverage (Cafes) not exceeding 30 seats	C	C		C	C	C	C										C	C	C	C		
Barber shops / Hair Salons / Health Spa	C	C		C	C	C	C										C	C	C	C		
Laundry / Dry Cleaning	C	C		C	C	C	C															
Commercial Retail & Services (e.g.. Fashion, Stationery Shops, Travel Agencies, Banks, Hardware, Supermarket)																						
Shopping Centres/Malls, Hyper-marts																	C					
Restaurants			C		C	C	C									C						
Offices					C	C	C									C						
Showrooms																C						
Retail - Warehouses																						
Entertainment Arcades, Cinema																						
Hotel	C	C		C	C	C	C															
Service Apartments				C	C	C	C															
Recreational Clubs/Holiday Chalets/Private Sport Club				C	C	C	C															
Petrol Station				C	C	C	C	C	C	C	C	C	C			C					C	
Industrial																						
Heavy Industrial	C	C																				
Minor Automotive Repair Workshop																						
Public Facilities																						
Kindergarten/Childcare Facilities																						C
Primary and Secondary Schools (Boys and Girls)								C		C												
Polytechnic / University / Vocational Schools																	C					
Hospital and Health Institutions				C	C	C	C										C					
Medical / Dental Clinics	C	C		C	C			C									C					
Religious Institution																						
Government Offices						C	C										C					
Public Library																						
Museum , Gallery, Cultural Centres																						
Sport Complexes/ Sport Facility																						
Equestrian Park																						
Rapid Transit Station	C	C																				C
Convention Centres																						
Open Space /Park																						
Public Parks																						C
Golf Course & Private Park																						C
Wildlife Park, Botanic Gardens, Conservatories, Arboretums																						C
Major Infrastructure:Utilities Corridor, Major Electrical Substation, Pumping Station, Expressways, Water Tank and Reservoir, Power and Desalination Plants, Sewage Treatment Works																						
Minor Infrastructure:11 KV ESS, Pumping Station, Roads (excluding Expressways), Telecommunications Antenna																						

Permitted Uses
 Conditional Uses
 Prohibited Uses



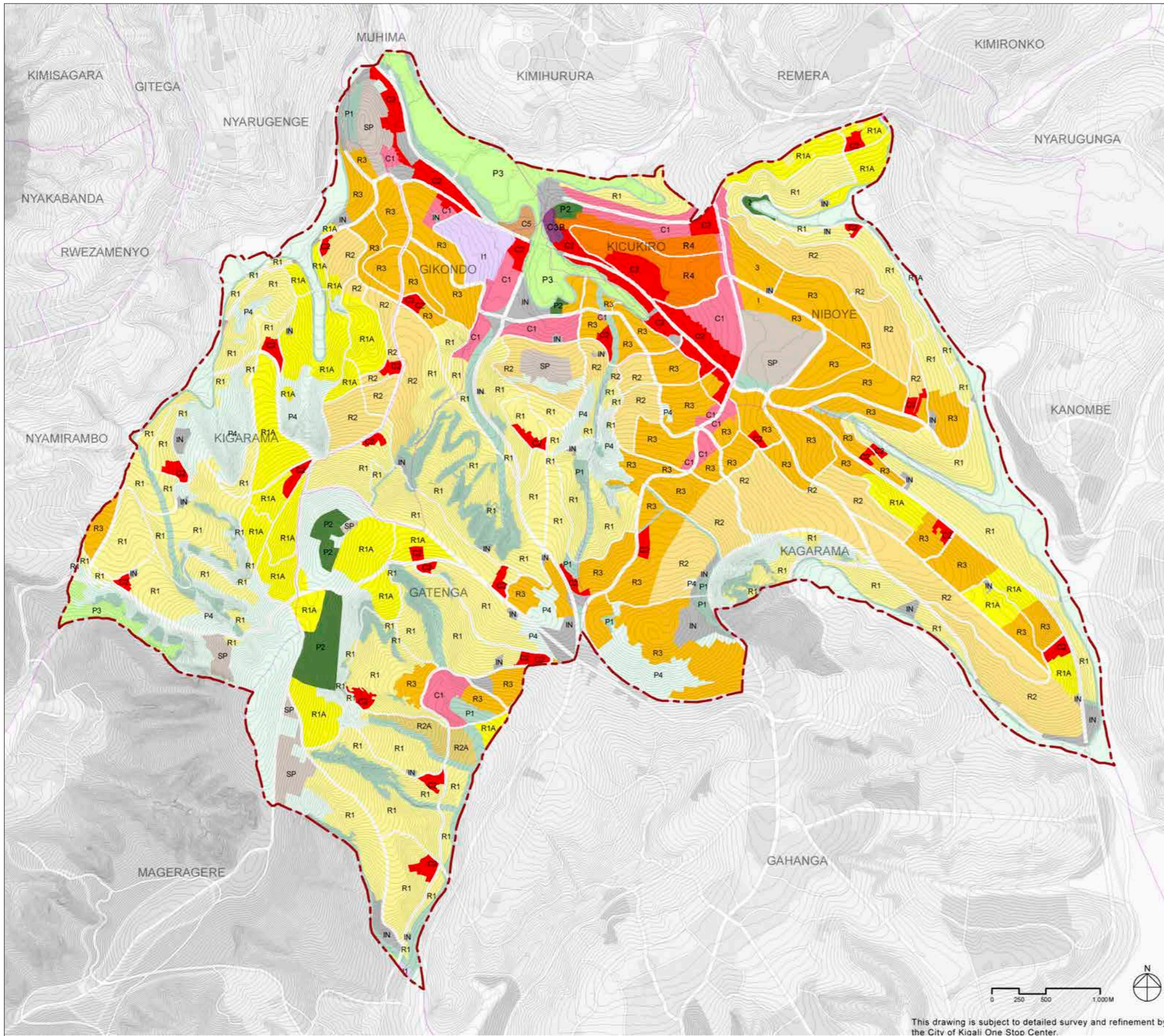
- R1 Single Family Residential District
- R1A Mixed Single Family Residential District
- R2 Low Rise Residential District
- R2A Low Rise Residential District
- R3 Medium Rise Residential District
- R4 High Rise Residential District
- C1 Mixed Use Commercial District
- C2 Community Level Commercial District
- C3 City Level Commercial District
- C3A City Level Commercial District
- C3C City Level Commercial District
- C4A Regional Level Commercial District
- C5 Retail Warehouse District
- I1 Light Industrial District
- I2 General Industrial District
- P1 Passive Recreational District
- P2 Active Recreational District
- P3 Agriculture District
- P4 Protected Area District
- SP Special Use
- IN Infrastructure
- Sector boundary
- Planning boundary
- District boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.

2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

Kicukiro District - Zoning Plan - Year X

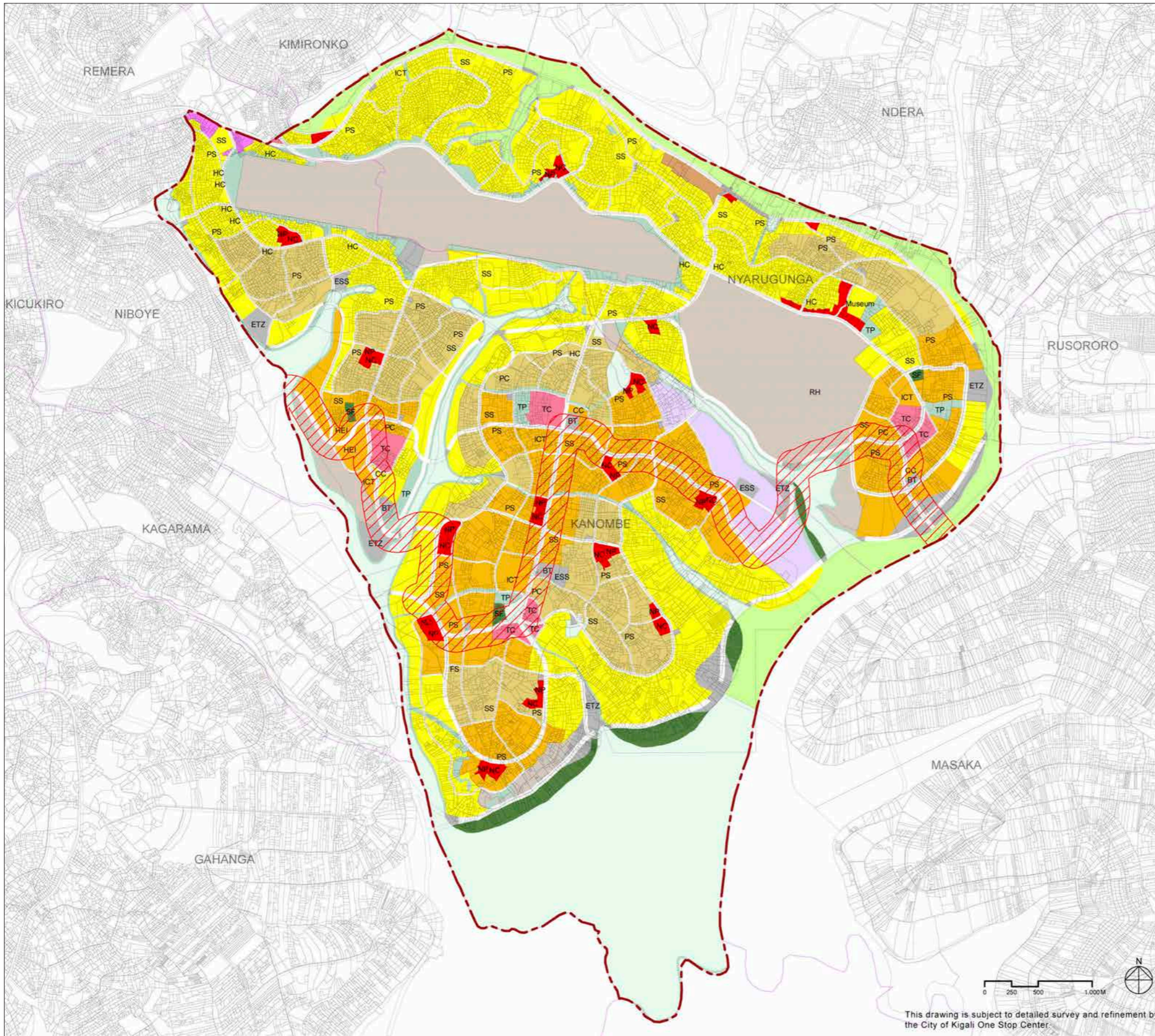


- R1 Single Family Residential District
- R1A Mixed Single Family Residential District
- R2 Low Rise Residential District
- R2A Low Rise Residential District
- R3 Medium Rise Residential District
- R4 High Rise Residential District
- C1 Mixed Use Commercial District
- C2 Community Level Commercial District
- C3A City Level Commercial District
- C5 Retail Warehouse District
- I1 Light Industrial District
- P1 Passive Recreational District
- P2 Active Recreational District
- P3 Agriculture District
- P4 Protected Area District
- SP Special Use
- IN Infrastructure
- Transit Overlay
- Sector boundary
- Planning boundary
- District boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.

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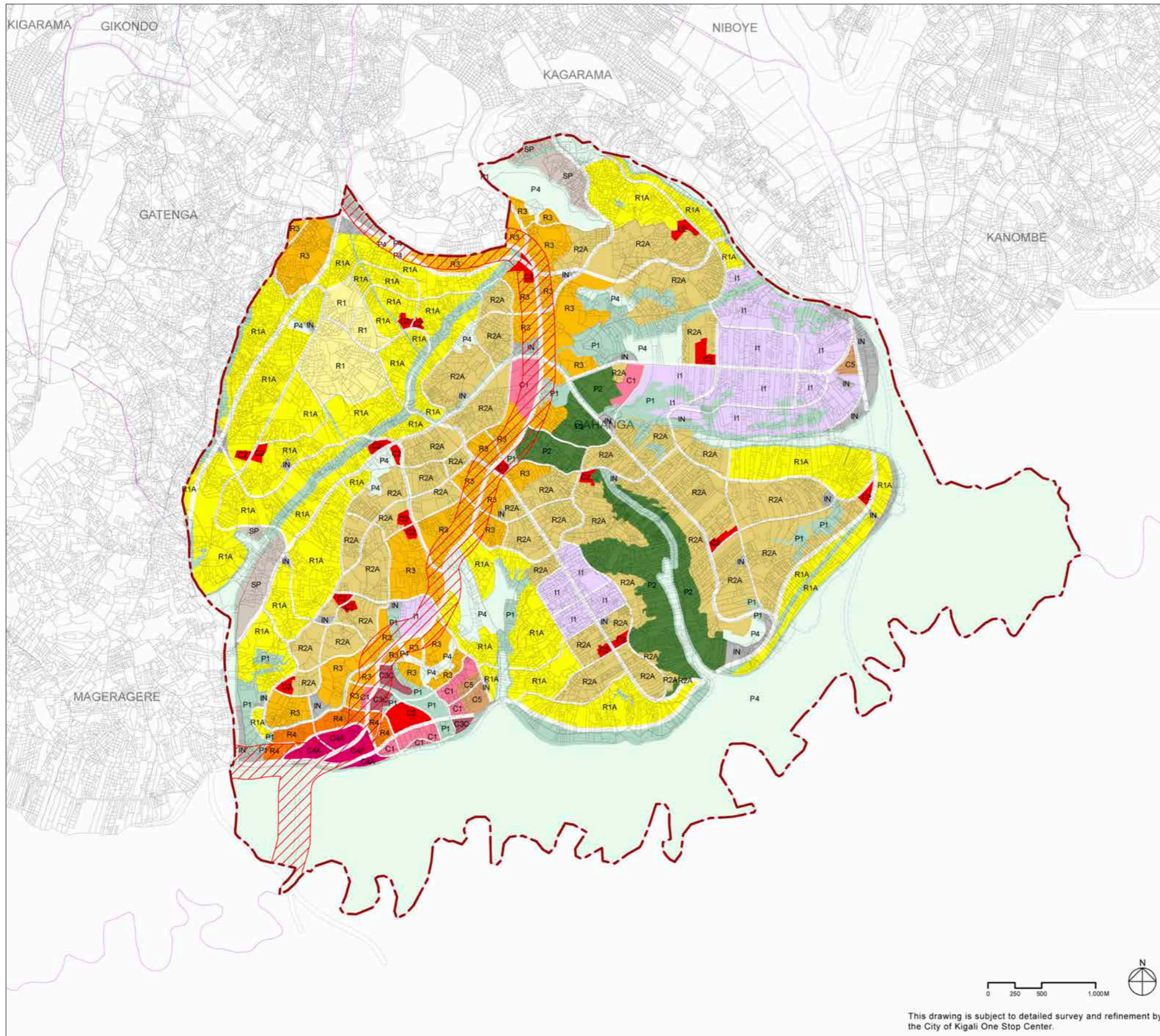


- R1A** Mixed Single Family Residential District
- R2A** Low Rise Residential District
- R3** Medium Rise Residential District
- C1** Mixed Use Commercial District
- C2** Community Level Commercial District
- C3A** City Level Commercial District
- C5** Retail Warehouse District
- I1** Light Industrial District
- P1** Passive Recreational District
- P2** Active Recreational District
- P3** Agriculture District
- P4** Protected Area District
- SP** Special Use
- IN** Infrastructure
- Transit Overlay
- Sector boundary
- Planning boundary
- District boundary

1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
2. The illustrated approved projects data represents only the key strategic projects received from City of Kigali One Stop Center.

This drawing is subject to detailed survey and refinement by the City of Kigali One Stop Center.

South Central Planning Area - Zoning Plan - Year X

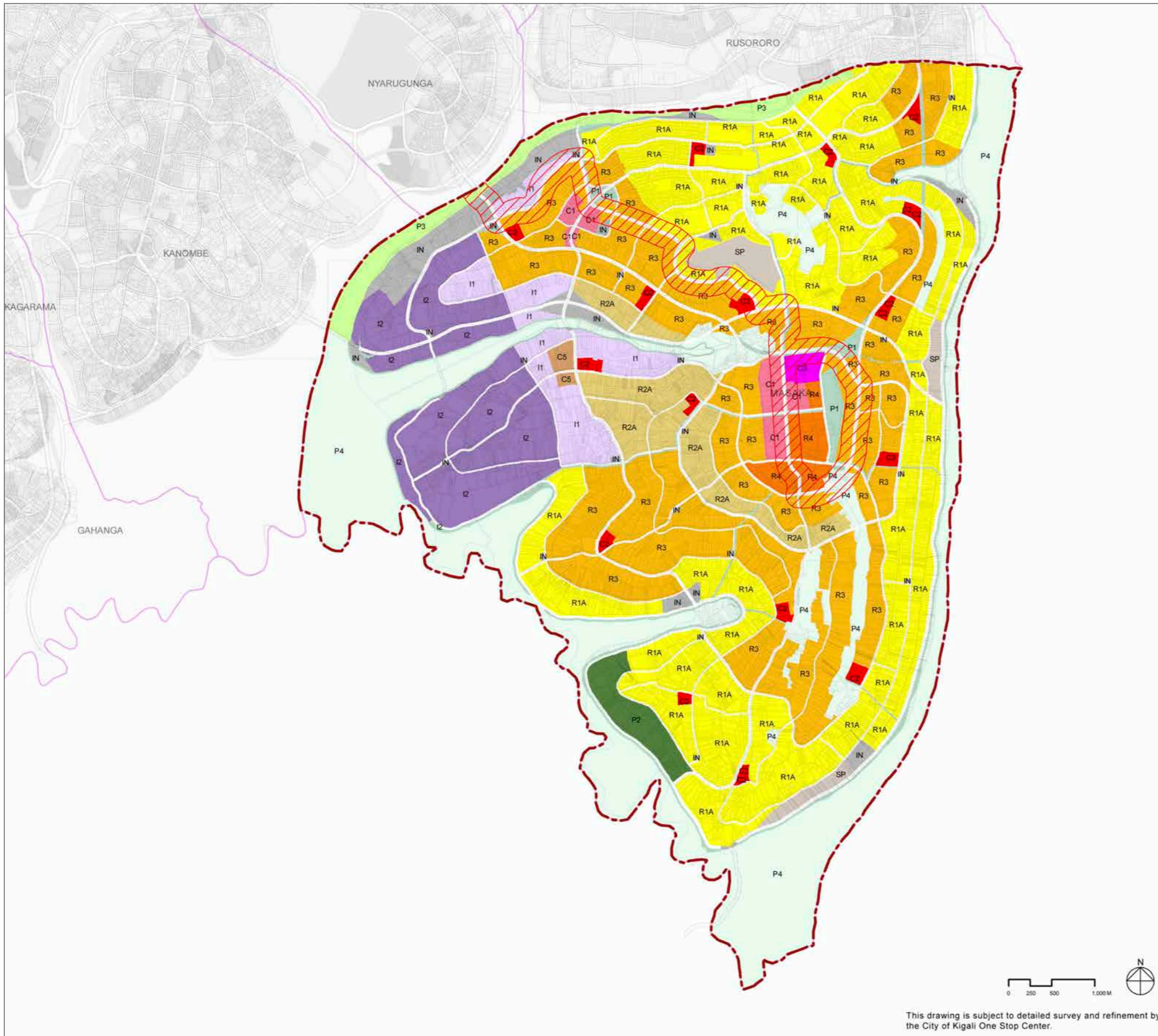


- R1 Single Family Residential District
- R1A Mixed Single Family Residential District
- R2A Low Rise Residential District
- R3 Medium Rise Residential District
- R4 High Rise Residential District
- C1 Mixed Use Commercial District
- C2 Community Level Commercial District
- C3C City Level Commercial District
- C4A Regional Level Commercial District
- C5 Retail Warehouse District
- I1 Light Industrial District
- P1 Passive Recreational District
- P2 Active Recreational District
- P4 Protected Area District
- SP Special Use
- IN Infrastructure
- Transit Overlay
- Sector boundary
- Planning boundary
- District boundary



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1. The wetland boundaries as illustrated are based on the data received from Rwanda Environment Management Authority (REMA). This boundary is subject to change from REMA and should be updated accordingly by the City of Kigali, One Stop Center.
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- R1A** Mixed Single Family Residential District
- R2A** Low Rise Residential District
- R3** Medium Rise Residential District
- R4** High Rise Residential District
- C1** Mixed Use Commercial District
- C2** Community Level Commercial District
- C3** City Level Commercial District
- C5** Retail Warehouse District
- I1** Light Industrial District
- I2** General Industrial District
- P1** Passive Recreational District
- P2** Active Recreational District
- P3** Agriculture District
- P4** Protected Area District
- SP** Special Use
- IN** Infrastructure
- Transit Overlay
- Sector boundary
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