IMPROVED SPACE ALLOCATION AND UTILIZATION ALONG RONALD NGALA STREET {SECTION BETWEEN TOM MBOYA STREET AND MUNYU ROAD}

BY:

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A PLANNING DEVELOPMENT PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF ARTS IN URBAN AND REGIONAL PLANNING

DEPARTMENT OF URBAN AND REGIONAL PLANNING
UNIVERSITY OF NAIROBI

JUNE, 2014
DECLARATION

This Planning Development Project is my original work and has not been presented for a degree in any other university

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This Planning Development Project has been submitted for examination with my approval as the University Supervisor.

Signed .................................. Date .............................................

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DEDICATION

I dedicate this planning development project to Almighty God who has given me strength and knowledge to produce this work in pursuant of my first degree. To my beloved family, friends and all those who never lived to achieve their dreams, this I dedicate.
ACKNOWLEDGEMENTS

I would want to extend my sincere and honest gratitude to Mr. Zacharia Maleche (my Supervisor) for the wonderful guidance and encouragement he gave me and for seeing me through this whole work, without tiring for even a single day. He dedicated himself to ensuring that the purpose of this exercise was adequately completed. It was a long and rough journey for me but he kept on keeping on with me always. God bless him.

Great gratitude also goes to the project coordinators, Mr. Karisa and Mr. Maleche for the insightful guidance that they offered me throughout. The whole fraternity of the Department of Urban and Regional Planning and the Nairobi City County are some of the entities that cannot be forgotten for the continuous support they gave during the project process.

Finally, I thank my family and friends since they were important pillars in various ways and definitely without them, a lot of things would not have come true in this work.
ABSTRACT
Ronald Ngala Street is one of the oldest streets within Nairobi CBD. It was formed during the colonial period as one of the grid patterned streets within the CBD and has ever since been very important commuter zone as well as commercial centre. Currently, Ronald Ngala Street serves as one of the links of the CBD to the Nairobi Eastlands and its hinterland such as Kiambu County. The street also is an important commercial zone since many commercial activities within the CBD are located along this street as it attracts many people ranging from pedestrians, motorists and other street users.

This influx of activities and many usages along Ronald Ngala Street has made the street experience a number of challenges. These challenges have made the conditions and functionality of this street wanting. Considering the fact that the street is the busiest street within the CBD, proper space allocation and utilization, management and maintenance are therefore necessary, so as to improve the functionality of the street. This street requires urgent reorganization in space and utilization.

This development project envisions contributing towards this endeavour by providing a development framework for Ronald Ngala Street development, which will ensure that the street is efficiently reorganized in terms of space allocation and utilization.

To understand the current situation within this area, data collection process was carried out. This involved the use of primary and secondary sources. The primary data sources included data collected directly during field work i.e., direct observation, administration of questionnaires, interview schedules among others. The secondary data employed the use of published and unpublished documents, library research and internet sources.

The development project examined four possible alternatives for future development of the street. These included: neighbourhood street model, transit corridor model, mixed use street approach as well as the balanced ‘link and place’ approach/model. After critical evaluation of these alternatives, the balanced ‘link and place’ approach model was chosen as it effectively addresses the problems in the project area. The planned improvement programme for the future of the street will thus be based on the balanced ‘link and place’ approach.
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<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CCN</td>
<td>City County of Nairobi</td>
</tr>
<tr>
<td>EMCA</td>
<td>Environmental Management and Coordination Act</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>KENHA</td>
<td>Kenya Highway Authority</td>
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CHAPTER ONE

INTRODUCTION

1.1 Overview
This development project is essentially a reaction towards the conflicts in space use along Ronald Ngala Street which were discovered in a planning research project undertaken earlier between November 2013 and February 2014 by the same author. The project is among the recommendations that were made towards solving the conflicts in space use along the street. After a meticulous evaluation and consultation with the supervisor, the researcher found this project to be more viable and preferable over the other alternative remedies that were advanced in the said earlier done research project.

1.2 Planning Research Project Title:
The study of the conflicts in space use along Ronald Ngala Street; Nairobi CBD.

1.3 Summary of the Main Findings from the Research Project
The main problem issues included the following:

- **Competitive land uses** - The land uses along Ronald Ngala Street competing for the space include public purpose such as primary and secondary schools, colleges and post offices, commercial activities and developments such as hawking, exhibition halls, transportation land use such as Matatu stages, street carriage way, pedestrian walkways and sidewalks and public utilities such as sewerage, storm water drainage, water supply, and electricity lines. Essentially, the space along this street is one of the highly competed for areas in the Nairobi CBD with most businesses fronting the street extending into the street space (street pavements), and hawkers taking advantage of the high street pedestrians population by spreading out their wares on the pavements/sidewalks/walkways. According to the field findings, an average of seventy per cent (70%) of the land users in the Ronald Ngala Street perceive the space to be competed for on a daily basis. All these result into heavy pedestrian and vehicular congestions. This brings about inefficiency of operation along the street, and also conflicts in operation among space users. Congestion together with these conflicting land uses have negative implications on the performance of this street.
• **Inadequate street infrastructure and utilities**-The existing support infrastructural facilities along Ronald Ngala Street especially street furniture such as benches, traffic barriers, bollards, streetlamps, traffic lights, traffic signs, bus stops, taxi stands, public lavatories, fountains, watering troughs, and waste receptacles are inadequately provided for. This is evident from the fact that there are only two benches for public use close to the intersection of Ronald Ngala Street and Moi Avenue. According to the field survey there are few traffic lights along the street hindering traffic movements. The street furniture along the street is inadequate and poorly maintained by the NCC. The only available benches are usually overcrowded and insufficient to accommodate large numbers of the street users.

• **Conflict management**-According to the study most of the conflicts arise among the hawkers themselves (32.9%). They usually scramble for space to spread out their wares. This sometimes leads to fighting among themselves. These hawkers also block access to the formal businesses along the street. This creates conflicts between hawkers and premise owners (28.6%). The hawking activities also trigger conflicts with vehicles (21.4%) and pedestrians (17.1%) by blocking the movement of the people. Most of these conflicts on the use the pavements (70%) are not resolved while 30% of conflicts of space occupation by hawkers are resolved by security guards within the formal premises along the street.

• **Lack street vending facilities**-Most of the hawking activities along Ronald Ngala Street take place on the pavements of the buildings and this causes obstruction to the formal businesses along the street. Accessibility of the shops, supermarkets and other public places by customers become difficult due to huge numbers of pedestrians and hawkers who spread out their wares in front of the formal business buildings’ frontages. The implication of hawking activities taking place up to the pavements and shop frontages is that the activities reduce the speed of pedestrian movements and accessibility to other businesses within the street.

• **Street traffic dominance**-The study further revealed that most hawkers (79.2%) have resorted to locate their businesses along Ronald Ngala Street because of the huge customer supply who are mostly pedestrians along the street. Some of the hawkers (4.2%) got space of operation from inheritance from their friends who were previously
using different hawking points along the street. This leads to traffic congestion on the sidewalks and pavements which are normally used by these hawkers as the trading space. This eventually slows down general movement and in particular vehicle traffic along the main road.

- **Business barriers**- 85.2% of the respondents in hawking activities did not follow any criteria in space allocation for their businesses. They responded that they just took spaces on the building frontages which are also the pavements on a first come first serve basis, with the aim of targeting the pedestrians and passengers. This interferes with both vehicular and pedestrian movement since the hawking activities encroach into sidewalks and pavements, and even the carriage way.

- **Illegal trading activities**- Some of the challenges faced by street traders along Ronald Ngala Street according to the study are congestion (18%) within the street, obstruction (18%) and no permanent space to operate the business along the street. Some of the hawkers are also harassed by NCC officials on a daily basis due to lack of license for conducting business along the street. This leaves street hawkers with no option but to clump themselves on the limited street space available on walkways or sidewalks where pedestrians pass.

- **Environmental pollution**- A majority (80.7%) of street users interviewed along Ronald Ngala Street showed concern about environmental pollution such as air and noise pollution and also littering of the street by hawkers during rush hours. Respondents said pollution affects air quality making the atmosphere unpleasant while others said that air pollution results in health complications. This in turn causes health problems among people using Ronald Ngala Street. The study revealed that there are a number of health risks for users of Ronald Ngala Street. In addition to the congestion that hawkers cause, there are also health concerns to selling food in the street. Vegetables and fruits are displayed on pavements, exposing them to dust and engine fumes along this street. The hawkers leave paper wrappings and garbage from vegetables all over the street, making the street an eyesore. Moreover, motor vehicle emissions along Ronald Ngala Street which include a range of pollutants, including particulate matter (PM), carbon monoxide, sulfur oxides, nitrogen oxides and a wide range of volatile organic compounds react with sunlight to form ozone. Many of these pollutants have well-
known health effects which may be exhibited with short term exposure, including wheezing, coughing, shortness of breath phlegm and sore throats as well as irritation of existing respiratory conditions such as asthma.

- **Inadequate infrastructure**-Other existing support infrastructural facilities along Ronald Ngala Street such as; water, and waste management systems are inadequately provided for. The study also revealed that there is no water to be used by the public along the street. There are no water points provided for by the NCC. This poses great challenge to the users of the street especially during sunny days when water is needed. Storm water drainage is also not properly done along this street and this results to difficulties during rainy seasons when the entire street gets flooded hindering both pedestrians and vehicles movements along the street.

- **Insecurity**-Insecurity along the street is another major challenge faced by the street users especially pedestrians. Safety of the street is always compromised by pickpocketing and mugging practices, which are rampant along the street during rush hours. The study revealed that the cases of insecurity are always common during morning hours and evening hours when there is both human and vehicular traffic congestion. Insecurity cases such as crime along this street has also slowed down the use of the street by pedestrians and also hindered the spirit of investments along the street.

- **Congestion**-Another major challenge is the operation within the matatu stages along Ronald Ngala Street. There are usually many PSVs comprising of buses and minibuses which are usually overcrowded especially during the rush hours. These long buses park almost across the street carriage way blocking the vehicular movement along the street. This causes huge jam along the street by blocking other vehicles from moving along the street. The stage in front of Nakumatt Ronald Ngala is chaotic on a daily basis since the long buses to Githurai and Kahawa West do park in large numbers hooting all sorts of sounds and blocking the carriage way. This sometimes makes the other vehicles to use even the parking spaces along the street and also the pavements and sidewalks. Down the street there is also another stage close to Oiligbya which is also overcrowded by buses and matatus to Dandora and Kariobangi. These vehicles do cause a lot of chaos along the street since they do not observe any rules concerning the use of the street by motorists.
Traffic accidents-There are also accidents along Ronald Ngala Street caused by the unscrupulous matatu and bus drivers along the street. Pedestrians do get run over by the PSVs along the street. The matatu operators along the street do not observe traffic rules while using the street. They usually swerve from one lane to another without observing other users of the street. These matatus and buses sometimes collide with one another and even overturn along the street causing a lot of jam along the street.

1.4 Summary of Major Recommendations
To adequately respond to the above problems, the following are recommended:

- **Development of street furniture along the street.** There is inadequate street furniture along Ronald Ngala Street and this calls for urgent improvement of street furniture along the street. People using Ronald Ngala Street need to have sites where they can sit and rest. Street furniture such as benches, traffic barriers, bollards, streetlamps, traffic lights, traffic signs, bus stops, taxi stands, public lavatories, fountains, watering troughs, and waste receptacles need to be provided for along the street.

- **Improvement and Upgrading of Infrastructure and Service Facilities.** The existing infrastructural and service facilities within Ronald Ngala Street require widening it to be able to accommodate the high traffic flow that is generated along the street. The capacity of the sewer and drainage channels need to be upgraded for them to meet both the current and future demands of the street.

- **Relocation of hawkers.** Hawking activities are common along Ronald Ngala Street especially during the evening hours from 6pm to around 8.30pm. The spaces hawkers use along this street are small and along pavements and pedestrians walkways/sidewalks. The hawkers along this street have reorganized their spaces of operation and with their huge numbers the street proves inadequate in terms of hawkers operation. Therefore, the hawkers should be relocated other designated locations where space can be reorganized to accommodate most of them such as Muthurwa and Kariorkor Markets where rearrangement is possible. This will help to decongesting the street which is normally flooded with many hawkers spreading their wares on the pavements of the buildings along the street. This could also facilitate the efficient flow of traffic along this key business street.
- **Improved Space Allocation and Utilization along Ronald Ngala Street.** There is need to reorganization of functional activities along the street to demonstrate the capacity of what the street can handle and what it cannot handle in regards to accommodation of various activities, movement functions, utilities and parking spaces along the street. This will reduce conflicts in space use along the street. Major street components such as commercial activities, public purpose structures, public utilities and other land uses need to be developed to enhance functionality of the street.

- **Improvement of the street support facilities.** Support facilities such as street lights and water supply need to be enhanced along the street. Street lights will ensure that there is safety during night hours by providing adequate lighting of the street.

- **Provision of parking space.** Vehicles operating along Ronald Ngala Street use the inadequately provided parking spaces along the street. These existing parking spaces are few and in most cases vehicles are usually parked on the road leading to congestion hindering vehicular movement along the street. Proper parking spaces need to be provided for along the street to solve the problem of parking along the street.

- **Provision of proper storm water drainage.** The situation of Ronald Ngala Street during rainy seasons is usually worse. The water floods the whole street, making movement of pedestrians difficult. There is need for provision of proper storm water drainage system along the street to solve the problem of flooding when it rains.

- **Policy enforcement by the NCC on the use of the street by buses and matatus along the street.** This will reduce the space conflicts along the street and reduce the vehicular congestions. Accidents caused by the motorists will also reduce through the enforcement of traffic rules along the street.

1.5 Planning Development Project Title:
*Improved Space Allocation and Utilization along Ronald Ngala Street {Section between Tom Mboya Street and Munyu Road}*

1.6 Justification of the Planning Development Project
From the findings of the research project, we have identified that Ronald Ngala Street is faced by a number of challenges which range from congestion, inaccessibility, insecurity, inefficient space operationalization, ineffective space allocation and unsatisfactory
transportation facilities such as sidewalks/walkways, carriage way, and public utilities such as water, storm drainage among many others.

In this physical development project, a section of the street will be used to demonstrate the capacity of what it can handle and what it cannot handle in regards to accommodation of various activities, movement functions, utilities and parking spaces along the street.

1.7 Location of the Development Project
The location of the action site will be the space (carriage way and road/street reserve) between Tom Mboya Street and Munyu Road. This space is currently occupied by the street carriage way, sidewalks, pavements, public utility services (power lines, drainage channels), frontages of commercial buildings, recreational facilities such as restaurants/bars and public institutions offices, and transport facilities such as bus stops/matu stages, and contains space users such as tuktuks, bodabodas, pedestrians, handcart and also both public and private parking space for vehicles. There are also hawking activities within the sidewalks, pavements/shop fronts and the street carriage way. This forms one of the major conflict zones within the entire Ronald Ngala Street.

1.8 Area Coverage of the Development Project
The project site covers an area of 1260 square metres (0.32 acres). The project area which is the street carriage way and its reserve is owned and managed by the Nairobi City County, KURA and KENHA and NEMA. For this reason, acquiring the land for redevelopment is not expected to be difficult since it is a government land.

The site has been chosen for demonstration of the improved space allocation and utilization along Ronald Ngala Street. In other words, it is this section of the study area that is intended to act as a model of space allocation and utilization as a way to achieve efficient land use along Ronald Ngala Street.

The section is usually ever congested. At the same time a lot of functional activities such as exhibition halls, supermarkets, hotels, restaurants and public institutions such as public offices front it. Furthermore, this section also impacts greatly on the traffic flow patterns along Ronald Ngala Street.

1.9 Planning Development Project Objectives
1. To determine suitability of the site and its existing space allocation and utilization.
2. To review related planning regulatory standards and requirements.
3. To develop a site plan for the development project.
4. To propose planning and design considerations governing space allocation and implementation of the project as well as an institutional structure for the space allocation and utilization in the project area.

5. To propose land use control mechanisms, monitoring and evaluation frameworks.

1.10 Assumptions of the Planning Development Project
1. A re-organized urban space in terms of space allocation and utilization through incorporation of creative urban design form will have a profound impact on functionality of the project area, proper provision of services and improve the aesthetic capacity of the area to enhance its robustness, vibrancy, productivity and effectiveness.

1.11 Scope of the Development Project and the Organization of the Project Chapters
The project sought to establish and demonstrate improved space allocation and utilization approach that would lead to the achievement of efficient organization of land use activities, improved traffic generation patterns and thus efficient traffic flow on Ronald Ngala Street. The project thus provides a land use plan for the section chosen for demonstration of an appropriate plan typology and detail out the proposed space allocation.

Although the entire study area is not covered, it is envisaged that the outcome of this project will be replicated in the whole Ronald Ngala Street as it may be found appropriate. An institutional framework to oversee the implementation, monitoring and evaluation of the project is also provided to ensure that all the objectives of this project are actualized.

The project chapters are organized as follows:

Chapter 1: Introduction
This chapter comprises of the summary of the main findings and recommendations of the planning research project, identification of the development project, justification of the development project, location and area coverage of the project area, objectives and assumptions of the development project and the methodology for the project.

Chapter 2: Policy Review
The main concerns under this chapter are conceptual, theoretical, policy, and regulatory frameworks as well as planning standards guiding land use, urban areas and transportation planning in Kenya. These guidelines are keenly considered in the realization of this project’s products. Case studies will also be examined in this chapter and the development of a conceptual framework for the development project.
Chapter 3: Situational Analysis of the Project Area

This chapter comprises of physical location of the study area (both in the regional and local contexts) and landscape or topographical and environmental characteristics of the area, background (history, planning and development) of the area, population characteristics therein, land use analysis and institutional, legal and financial issues of the project area.

Chapter 4: Project Planning, Design and Implementation

This chapter articulates the main findings from situational analysis and how they facilitate the planning process to be followed, alternative plans, designs and models arrived at, expected outputs and outcomes of the project and implementation strategies and programs for the project.

Chapter 5: Monitoring and Evaluation

In this chapter, what is discussed includes monitoring and evaluation stages in the implementation of the project, implementation agencies and the site/Environmental Management Plan.

1.12 Development Project Study Methodology

This section describes, in detail, the types of data that will be sought, sources of such data, the subjects targeted for the study, methods of data collection and data analysis. All these have to be informed by the project objectives. A summary of all the methodology is finally represented in the form of a data needs matrix.

1.12.1 Data Needs and Requirements

The information that will be required will be on policy and legal guidelines which shall comprise of zoning regulations and development control information; planning standards for various land uses along the street; lessons from relevant case studies; location and historical development of the project area; physical and environmental characteristics of the area; population and demographic characteristics of the area; and land use patterns of the project area.

1.12.2 Data Sources

The data mentioned above shall be obtained from both primary and secondary sources. The physical and environmental characteristics of the area and the land use information will be gathered through site analysis.

Most of the data required for effective application of this development project will be got from either field survey; from the county government and other government agents; or from desktop research and review of relevant policy guidelines and standards. The planning standards information such as plot ratios, ground coverage, setbacks among others shall be needed and this information will be obtained from layout design manuals.
and handbooks, local legislation, Metric Handbooks, council minutes and reports, and by-laws among others. Case studies will be reviewed in order to examine the practical application of the theories of redevelopment and best practices.

The population and demographic information will be majorly got from the Kenya National Housing and Population Census Report (2009) while the rest of the information shall be obtained from various books, plans, and study reports.

1.12.3 Methods of Data Collection

1.12.3.1 Methods for Primary Data Collection

a. Interviews

The respondents who will be interviewed shall be majorly the key informants, some of whom include government institutions like City Council of Nairobi (Departments of City Planning and City Engineering), KURA and KENHA. As a way to guide these interviews, the researcher will come up with interview schedules for each respondent.

b. Photography

This essentially entails taking pictures of various phenomena for illustration purposes. The major features that will be captured through photography comprise of the physical characteristics e.g. buildings, transport networks, drainage systems, people undertaking various activities among others.

c. Field Sketching

The researcher will also draw sketches of various features for illustration purposes. These include elevations of buildings along the street section, cross-sections of the street and perspective drawings at various sections of the street and the street space occupation and utilization.

d. Observation

This involves capturing observable variables and recording them down. Some of the aspects that shall be observed include road user behaviour, modal splits; land uses along the street section and street design characteristics, measurements and space utilization amongst others.

1.12.3.2 Methods of secondary data collection

This basically involves review of the relevant city country by-laws, plans, records, and research reports. It also entails reading of past plans, case studies relevant to the development project and review of the previous project related studies.
1.12.4 Methods of Data Analysis

This is whereby the data that will be collected shall be cleaned, sieved and synthesized for meaningful interpretation of findings. Qualitative data shall be analyzed through logical reasoning while quantitative data shall be analyzed using Excel and SPSS programs. Spatial data will be analyzed using GIS tools AutoCAD and ArchiCAD.

1.12.5 Limitations

The following limitations are likely to be faced during the project:

- Time and financial constraints. The methodology aims at a complete makeover of the proper urban fabric through improved space allocation and utilization which might be beyond the resource capacity of the county government and involved stakeholders.

- Difficulty in acquiring some of the needed statistical information of the recent years from the county government since the involve purchasing of such information.

1.12.7 Definition of Key Terms and Concepts

a. Transportation and transport

Transportation is defined as the means of movement of persons, goods and services from one point to another. It is however not necessarily the movement of vehicles. Transport on the other hand refers to the link between activity spaces (Obiero, 1992).

b. Road

The area of a street reserve which is provided for the movement or parking of vehicles and bicycles.

c. Setback

The minimum distance which a wall faces or window is required to be from a property boundary or another window to a habitable room. It is measured as the horizontal distance between the proposed wall or window and the boundary or other window.

d. Streetscape

The visible components within a street between the facing buildings, including the form of the buildings, garages, setbacks, fencing, landscaping, driveway and street surfaces, utility services and street furniture such as lighting, signs, barriers and bus shelters.

e. Street Reserve

The land set aside for a street and verge and usually vested in a public authority.
f. **Structure Plan**
A plan showing in outline the overall development intentions for an area, including land use, major transport and utility networks, drainage and urban water management, open space systems and indicative built form. Also known as Outline Development Plans.

g. **Verge**
That part of the street reserve between the road and the boundary of adjacent lots (or other limit to street reserve). It may accommodate public utilities, footpaths, stormwater flows, street lighting poles, street trees and other landscaping.

h. **Traffic**
This is the numerical movements of persons, goods and services using the various modes. Because persons, goods and services use vehicles to move, vehicles are also sometimes referred to as traffic. Traffic is determined in terms of the number of people and capacity/volume/weight of goods (Obiero, 1992).

i. **Traffic flow**
This is the study of interactions between vehicles, pedestrians, drivers, and infrastructure (including highways, signage, and traffic control devices), with the aim of understanding and developing an optimal road network with efficient movement of traffic and minimal traffic congestion problems.

j. **Traffic volume**
This is the numerical representation of the flow of traffic from, through and to a particular place (or along a route) at a particular time (Obiero, 1992).

k. **Traffic congestion**
It is seen as a condition that occurs when demand exceeds the capacity of the transport system (Banks, 1998 in Kasuku, 2001). It is seen as a threat to the effectiveness and efficiency of transport systems because it highly impedes movement of traffic to their destinations.

l. **Traffic impedence**
It refers to the measure of the volume of traffic at a particular section of the route at a given time and speed and towards one direction. The importance of the concept and its remedial measures on roads is that it indicates the degree of congestion, the adequacy or inadequacy of the streets (lanes) and queuing delays at junctions and average speeds vis-à-vis the permitted speeds (Obiero, 1992).
m. Carriageway
A carriageway consists of a width of road on which a vehicle is not restricted by any physical barriers or separation to move laterally (Banks, 1998).

n. Public Transport
Public transport is a shared passenger transportation service which is available for use by the general public, as distinct from modes such as taxicab, carpooling or hired buses which are not shared by strangers without private arrangement (Banks, 1998).

o. Vehicle operators
For the purposes of this study, the vehicle operators are taken to include the drivers and conductors.

p. Mixed Use
The compatible mixing of a range of appropriate uses, integrated in close proximity to each other to improve the efficiency and amenity of neighborhoods, reduce travel demand, increase walkability, and make more efficient use of available space and buildings.

q. Kerb
The road verge interface of a street which may also serve to channel storm water run-off.

r. Frontage
The distance along the street right-of-way line of a single property or development within the property lines. Corner property at an intersection would have a separate frontage along each street.

s. Street
A public way for vehicular, pedestrian, and bicycle travel, including the entire area within the right-of-way. This includes alleyways.
### Table 1.1: Data need matrix

<table>
<thead>
<tr>
<th>Project objectives</th>
<th>Data needs</th>
<th>Source of Data</th>
<th>Data collection methods</th>
<th>Data analysis methods</th>
<th>Data presentation methods/ expected outputs</th>
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<tr>
<td><strong>To determine suitability of the site proposed for demonstration of improved space allocation and utilization along the street.</strong></td>
<td>Land use patterns in the project area Transportation networks in the area Travel and traffic generation patterns in the area Planning standards for various land uses Activity/functional spatial organization Space use conflicts and limitations</td>
<td>City Council of Nairobi Departments of City Planning and City Engineering KENHA KURA Researcher’s observations Site Operators</td>
<td>Observations Photography Mapping Sketching Interviews Questionnaires Discussions</td>
<td>GIS, Sketch up, Report writing</td>
<td>Reports, sketches, maps</td>
</tr>
<tr>
<td><strong>To develop a site plan for development project.</strong></td>
<td>Relevant planning principles and standards</td>
<td>Policy Guidelines Secondary sources Field sketches and survey</td>
<td>Review of panning standards and guidelines Field survey</td>
<td>Drawings Diagrams Mapping Sketches Report writing GIS tools AutoCAD ArchiCAD.</td>
<td>Reports, sketches, maps Reports</td>
</tr>
<tr>
<td><strong>To propose planning and design</strong></td>
<td>Preparation of land budget and land suitability for the project site</td>
<td>Physical Planning Handbook of 1996</td>
<td>Report writing and illustrations</td>
<td>Two-dimensional plans, three dimensional models Report writing</td>
<td></td>
</tr>
</tbody>
</table>
considerations governing reorganization and implantation of the project.

| **To propose land use control mechanisms, monitoring and evaluation frameworks as well as an institutional structure for the space allocation and utilization in the project area.** | Legal and policy goals in urban land use management and transportation
- Institutional framework for transportation and land use planning Stakeholders | Project design | Review of planning standards and guidelines, project proposals and designs | Interpretation of the Data | Implementation framework (phasing, costing, monitoring and evaluation) |

*Source; Author, 2014*
CHAPTER TWO

PLANNING POLICY REVIEW

2.0 Overview
This chapter outlines the various policies, guidelines and standards governing the allocation and utilization of urban spaces aimed at improving the functionality of the particular planning contexts. Relevant case studies will be reviewed and the best practices from the case studies adopted to inform the furtherance of this development project. The weaknesses and failed projects for the case studies will be used as lesson learnt to inform the alternative development scenarios to be adopted by this study. Most design guidelines discussed under this chapter will be design guidelines and principles theorized in space allocation and utilization concepts of street space design.

2.1: Planning Policies Framework

2.1.0 Overview
Planning Policies are guiding documents that outline the country’s position on key planning issues (such as sustainable development, heritage or affordable housing) and how they should be dealt with in redevelopment projects like the one endeavored by this planning project. All development applications must generally comply with the policies that apply to their redevelopment and/or planning area and that are relevant to the type of development being proposed. They establish a land use planning system, provide processes for assessment of development applications and provide management powers for other planning matters.

2.1.1: Legal Context

2.1.1.1: The Constitution of Kenya, 2010
The Constitution of Kenya (2010) gives every person the right to a clean and healthy environment, which includes the right to have the environment utilized well for the benefit of present and future generations through legislative and other measures and to have obligations relating to the environment fulfilled. Article 174 states that the devolution is aimed at promoting social and economic development and the provision of proximate, easily
accessible services throughout Kenya. This is keenly followed in this development project since the overall goal of the project is to achieve improved space allocation which will in turn improve utilization and functionality.

Also, article 66 (1) of the constitution states that the State may regulate the use of any land, or any interest in or right over any land, in the interest of defense, public safety, public order, public morality, public health, or land use planning. This clause is localized in the development of this project whereby power over land use is vested in planning for the purposes of public interest.

2.1.1.2: The Physical Planning Act

The Physical Planning Act in Kenya is still in force even in the new government dispensation as there is no other Act that has been put in place to repeal it. This act vests power on the local authorities to ensure orderly development, regulate zoning, approve development plans and prohibit unauthorized developments through reinforcement of the law. Thus any development in the project area ought to go through the approval of the City County of Nairobi authority as per the County Government’s zoning regulations and standards.

Section 29 of the act empowers the local authority (City County of Nairobi) to: prohibit or control the use and development of land and buildings in the interests of proper and orderly development of its area; control or prohibit the subdivision of land or existing plots into smaller areas; consider and approve all development applications and grant all development permissions; ensure proper execution and implementation of approved physical development plans; formulate by-laws to regulate zoning in respect of use and density development and; to reserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical development plan.

Other relevant aspects important for the furtherance of this project study discussed in the act include:

❖ Renewal or redevelopment plans

In the third schedule of the Physical Planning Act, sub-article C, outlines the contents of renewal or redevelopment plans which includes:
• providing a broad land use framework illustrating a coordinated policy of renewal and guiding both public and private redevelopment activities;

• Providing a pattern of road and traffic networks designed to improve vehicular access and parking space and also facilities segregation of vehicles and pedestrians.

• Providing a basis for determining development applications on extensions of leases, extension of users and change of users.

• Land use patterns: the analysis should deal with policy measures and land use proposals to facilitate:

  • Conservation of areas whose historic, architectural, property or commercial values are relatively high

  • Improvement or general upgrading of areas whose existing conditions are desirable

  • Comprehensive or cumulative redevelopment of areas whose conditions are undesirable

Traffic systems: This analysis should comprise policy statement and land use proposal for: Safe pedestrian movement; Easy access to buildings; Efficient circulation of traffic within and outside business premises; Convenient and ample public car parks and; Efficient road links.

2.1.2.3: The Urban Areas and Cities Act, 2011
This is an act of Parliament to give effect to Article 184 of the Constitution to provide for the, classification, governance and management of urban areas and cities to provide for the criteria of establishing urban areas, to provide for the principle of governance and participation of residents and for connected purposes. Part V of the act alters the contents of the plans to be prepared from those provided by the Physical Planning Act. The act also lays emphasis on integrated plans therefore calls for broader participation. It also calls for city or urban area integrated development plan to be aligned to the development plans and strategies of the county governments. This development plan is therefore in line with the provisions of the act as its development will be integrated with other development plans.
For each city and municipality there shall be the following plans—

(a) City or municipal land use plans;

(b) City or municipal building and zoning plans; and

(c) City or area building and zoning plans.

The city or municipal plans shall be the instruments for development facilitation and development control within the respective counties. The city or municipal plans shall, within each city or municipality, provide for—

- Functions and principles of land use and building plans;
- Location of various types of infrastructure within the city or municipality;
- Development control in the city or municipality within the national housing and building code framework.

The County Assembly shall:

- Approval of all County plans and policies
- Approval of an amendment to a county’s integrated development plan adopted by a decision taken by a county executive committee.

This Act makes further provision as to the functions and powers of the National Land Commission, qualifications and procedures for appointments to the Commission; to give effect to the objects and principles of devolved government in land management and administration, and for connected purposes.

2.1.2.4: Traffic (Amendment) Act (2012)

The Act seeks, among other things, to enhance the penalties for various traffic offences in order to deter commission of those offences and consequently minimize loss of lives on Kenyan roads through accidents. Some of the traffic offences are directly linked to traffic congestion and so penalizing the offenders in such respects may also help to control traffic congestions.

2.1.1.5: The County Government Act, 2012

This is an Act of Parliament to give effect to Chapter Eleven of the Constitution to provide for county governments’ powers, functions and responsibilities to deliver services and for connected purposes laws that will guide planning in the devolved system. Part XI of the Act provides for county planning where its principles and objectives are outlined. The Act provides for the establishment of a county planning unit which will be responsible for
among other things: coordinating integrated development planning within the county; ensuring integrated planning within the county; ensuring linkages between county plans and the national planning framework and ensuring meaningful engagement of citizens in the planning process. It also provides for the preparation of; county integrated development plans, county sectoral plans, county spatial plans and cities and urban areas plans as provided for under the Urban Areas and Cities Act. This development project plan is part of the County’s sectoral plans and can be integrated in the overall County integrated development plan.

2.1.1.6: Environmental Management and Coordination Act
This act aims at promoting safe, clean and healthy environment. Sections 7 provides for the establishment of the National Environmental Management Authority (NEMA) as the institution responsible for the execution of the requirements stipulated in the act in relation to policies related to the environment. Some of the restricted activities in the act include erection, reconstruction, placement, alteration, extension, renewal or demolition of any structure or part of any structure on land. Section 58 requires that every development project likely to have impact on the environment to undergo an EIA. For the purpose of this project, it calls for prohibitive and mitigative measures to curb any chances of pollution and unhealthy environment especially in the development site and neighboring areas.

2.1.1.7: National Land Policy (2009)
This policy is based on the premise that land is critical to the economic, social and cultural development. The policy further recognizes that land use planning is essential to the efficient and sustainable utilization and management of land and land based resources (Section 103). It also points out, in its 104th section, that the key issues that need to be addressed in land use planning include:

- Preparation of land use plans at national, regional and local levels on the basis of predetermined goals and integrating rural and urban development
- Review and harmonization of the existing land use planning laws
- Actualization of spatial frameworks for orderly management of human activities to ensure that such activities are carried out taking into account considerations such as economy, safety, aesthetics, harmony in land use and environmental sustainability.
• Review of strategies for human settlement in relation to service centres, growth centres, transport and communication network, environmental conservation and rural development

• Efficient and sustainable utilization and management of land and land based resources

• Establishment of an appropriate framework for public participation in the development of land use and spatial plans

• Establishment of effective framework for coordination of land use plans to ensure implementation of the planning proposals and regulations.

2.1.1.8: Nairobi Metro 2030 (2009)
This strategy takes cognizance of the fact that by the year 2020 more than 57% of the world’s population would be living in cities and thus the need for efficient transportation systems (Howe, 1994). It recognizes transport as a key component in creating a competitive business environment as well as a viable means through which other economic and social objectives will be achieved. This therefore creates the need for an efficient transport system which minimizes travel times and distance. The strategy thus suggests a draft of policy intervention areas which include promotion of public transport, mobility and freedom of movement.

2.1.1.9: Draft National Urban Development Policy (2012)

The policy recognizes planning as the software for delivering urban development. It postulates that planning provides a structured framework for coordinating and integrating sectoral plans and activities, and supports the systematic implementation of urban development programmes. In addition, it provides a platform for mobilization for public participation in urban development, while also seeking to optimize resource allocation and utilization. Planning promotes individual initiatives while safeguarding public interest. Moreover, planning is an instrument for initiating, guiding, monitoring and appraising of urban development activities.
2.1.1.10: Devolved Government Act (2011)
This is an Act of Parliament to provide for county governments powers, functions, and responsibilities to deliver services and to provide for other connected purposes. The Act points out that to guide, harmonize and facilitate development within each county the planning authority will aid the formulation and implementation of the following plans:

(a) County Integrated Development Plans

These will be five-year development plans for each county and which shall have clear goals and objectives; an implementation plan with clear outcomes; provisions for monitoring and evaluation; and clear reporting mechanisms.

(b) County Sectoral Plans

The County sectoral plans shall be ten-year plans which will be a component part of the County Integrated Development Plans and which will be programme based, will form the basis for budgeting and performance management; and will be reviewed every five years by the county executive and approved by the county assembly, but updated annually.

(c) County Spatial Plans

These will be ten-year plans which will be a component part of the County Integrated Development Plans which will aid in providing:

- A spatial depiction of the social and economic development programme of the county as articulated in the integrated county development plan;

- Clear statements of how the spatial plan is linked to the regional, national and other county plans; and

- Clear clarifications on the anticipated sustainable development outcomes of the spatial plan.

2.1.1.11: Sectional Property Act, No 21 of 1987
The Act provides for the division of buildings into units to be owned by individual proprietors and common property to be owned by proprietors of the units as tenants in common and to provide for the use and management of the units and common property and
connected purposes. This Act applies only in respect of land held on freehold title or on a leasehold title where the unexpired residue of the term is not less than forty five years.

This strategy paper was published by the Government in 2001. The two key goals of the strategy is poverty reduction and economic growth. The document outlines the priorities and measure necessary for poverty reduction and economic growth. The objectives of economic growth and poverty reduction are borne out of realization that economic growth is not a sufficient condition to ensure poverty reduction. In this regard, measures geared towards improved economic performance and priority actions that must be implemented to reduce the incidence of poverty among Kenyans have been identified. With respect to the environment the paper proposes that adequate awareness be created among stakeholders regarding environmental costs and benefits. It further calls for community involvement and participation in environmental management and conservation.

2.1.2: Global Initiatives and Policies

2.1.2.1: The Millennium Development Goals (MDGs)
The eighth goal: This goal of the MDGs draws attention to achieving and developing a global partnership for development. Growth and development is a resultant of many factors including proper organization of the space. Global economies will tend to form partnerships with stable and safer economies to stimulate and enhance growth. The design anticipated by this development project aims at achieving organized urban environment which will boost the vibrancy and productivity of the zone hence enhancing growth.

2.1.2.2: UN-Habitat Safer Cities Concept Note
This document was prepared by the UN-Habitat in a move to incorporate built environment professionals to adhere to principles of safety in the structuring of cities. It is a very important document in support and guidance of this study as it will provide guidelines while developing strategies and tools to support local initiatives and strengthen the capacities of local authorities to address urban safety issues and organization.
2.2 Planning and regulatory institutions
The street is the responsibility of the Nairobi City County (NCC). Within this system is housed the Department of planning and forwarding within City Hall Nairobi where planners overseeing planning activities in the county are found. The overall mandate is bestowed with the City Planning Director.

2.3: Design Guidelines and Standards; and plans

2.3 Overview

This section reviews design guidelines that are key to the success of the design output of this development project. Design Guidelines set out the requirements for building design and development standards for land within a specific project area. They include standards for aspects such as building design, materials, height, setbacks and car parking. Of importance is the review of the street design principles as this will be the guiding framework within which the design of this development project is based on. Design Standards and plans will be incorporated from various literatures both on global and local platforms of done projects of a similar nature to this project.

2.3.1 Regulatory Guidelines, Planning and Design Standards

2.3.1.1: Design and Building Standards

- **Building lines and setbacks**

According to the Physical planning Handbook (2007) Nairobi City Council currently the County Government of Nairobi has a policy of enforcing 9m building line for all major roads including CBD, 6m building line for roads below 18m and greater than 12m. The Physical Planning (Building and Development Control) Rules, 1998 provides for a building line of 9m for roads above 18m wide and 6m for roads between 6m and 18m. However, if the road is less than 6m., the building line should be the width of that road plus the difference between 6m and the road. As such, this development project will base itself on the standards endeavored in these legislations which are prone to amendments once the design layout and proposals are done.
• **Plot coverage**

The project area is part of the Nairobi CBD and as such; only commercial/light industry/residential uses are allowed with plot coverage of 80% and a plot ratio of 50%.

• **Density of Development**

Density in development may be defined by population size, plot coverage and the number of dwelling units. The level of density is determined by availability of services such as water, sewerage, size of roads etc. and the zoning recommended.

• **Plot Frontage**

All plots on which residential buildings are to be erected should have proper and sufficient frontage to a street, such a street not being a sanitary lane or passage.

• **Plot Areas (Sizes)**

The minimum Plot size should generally be determined by the user, type of waste disposal, availability of water and level of building technology applied. Another important factor is the type of housing in the given scheme whether consisting of row housing, detached or semi-detached units.

• **Distance Between Buildings**

The distance between any two dwellings, front to front, across a street, walk or common area shall be not less than 2 times the total height of the taller buildings.

• **Dead-end Streets (Cul-de-sac)**

A dead-end street should be aligned such that it shall give access to not more than 8-10 residential plots. It should not exceed 60m in length and shall have a turning radius of at least 15m hammerhead.
Roads

Nairobi City County has a policy of enforcing 9m building line for all major roads and a 6m building line for roads below 18m and greater than 12m. In shopping centres buildings should have a setback of 3m. The canopy should be within the plot and not on the road reserve.

The Physical Planning (Building and Development Control) Rules, 1998, provides for a building line of 9m for roads above 18m wide and 6m for roads between 6m and 18m. However, if the road is less than 6m, the building line should be the width of that road plus the difference between 6m and the road.

No building should be constructed on the space in front of the building, created by the building line, except for a fence or wall which should not exceed 1.4m in height.

Requirements for Transportation Network

i. Road Reserve widths

The following urban road reserve widths are recommended:

- Primary distributor

Major communication routes.................................................. 60m

Important through routes..................................................... 30-36m

- District distributors

Spine roads and roads in commercial or industrial area.................. 25m

Bus routes................................................................. 25m

- Local distributor roads

With no direct vehicular access to individual plots....................... 18m

Major access road exceeding 150m long ......................... 15m

Access road not exceeding 150m long (normal residential street).... 12m
- Access roads

Cul-de-sac or short connection road not exceeding 60m .................. 6-9m
Service lanes ................................................................. 6m
Cyclist lanes ................................................................. 3m
Footpaths ................................................................. 2m


ii. Carriageway widths

- Trunk and Major Roads ................................................. 7.5m or more
- Commercial and Industrial Streets ..................................... 7.0m or more
- Spine Roads and Bus Routes .............................................. 7.0m
- Access roads (in residential areas) ...................................... 5.5m
- Cul-de-sac (not exceeding 60m) ......................................... 5.0m

iii. Car Parking Space Standards

The maximum distance between a dwelling and its associated parking area should be 50m. A standard of 15-35 square meters parking space per car is recommended.

2.3.2 Building Code

<table>
<thead>
<tr>
<th>Table 2: Structural Design Guidelines</th>
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<td><strong>Footpaths</strong></td>
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<td><strong>Pedestrian ways</strong></td>
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<td><strong>Surfacing of footpaths</strong></td>
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<tr>
<td><strong>Drainage</strong></td>
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<td><strong>Channels</strong></td>
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<td><strong>Eaves, cornices and molding’s</strong></td>
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<td><strong>Balconies and canopies over streets</strong></td>
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<td><strong>Floor area</strong></td>
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<td><strong>lighting and ventilation</strong></td>
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the case of detached and semi-detached buildings, at least 2.1m above the level of the floor

| Windows      | No prescribed window shall face into the external air unless:- it faces into a street which is not less than 6.0m wide; or it faces into a space uncovered and unobstructed above the area delineated by the rectangular horizontal plane; |


2.3.3: Redevelopment Plans

These are plans and documents adopted under various redevelopment schemes, but they are not part of the Scheme itself. These plans act as statutory planning tools and their preparation will be necessary for this development project. They include:

- **Structure Plans**

These are graphical plans and supporting documents that set the structure and layout of a defined area proposed for redevelopment. They typically identify the road and lot layout, proposed different uses of land, areas of public open space and general housing form or density.

- **Development Contribution Plans**

These are documents setting out the infrastructure and public amenities required for a project area and their associated costs. The plans set out the required payment or other contribution from landowners within the project area towards these costs, from which they will benefit when they redevelop or sell their land.

2.4: Case Study: Broadway Boulevard, Street, New York.

**Background**

Broadway runs diagonally through the street grid in Manhattan, creating both irregular intersections and room for world-class public spaces. Prior to this project’s changes, Broadway was congested with vehicles that were forced to idle as it converged with congested avenues. At the same time, too many pedestrians were forced onto too little
sidewalk, which resulted in an unpleasant working and shopping environment, and pedestrians unsafely walking on the roadbed.

**Planning Interventions**

The NYC Department of Transportation (NYC DOT) determined that reconfiguring this corridor to focus on the needs of its teeming pedestrians would result in safety, livability, and mobility benefits. NYC DOT’s study predicted that removing vehicle traffic lanes, limiting turns, and closing the entire street to vehicles in places would provide much needed pedestrian infrastructure and actually reduce gridlock and improve area-wide travel times.

Beginning in 2009, New York City made changes to the design of Broadway and nearby streets, first with temporary low-cost treatments, and then with permanent designs once the benefits of the changes had been confirmed. These changes were made to roughly 2.3 miles of Broadway, from Union Square at 14th Street, north past Madison Square Park, Herald Square, and Times Square, all the way to Columbus Circle at 59th Street. In the process, NYC DOT transformed many of the most iconic and highly frequented areas in the city.

**Plate 1: Broadway, New York City 2009 before planning intervention**

![Image of Broadway before planning intervention with annotations: Congested avenues, Pedestrians onto too little sidewalk, Unpleasant working and shopping environment](source: The NYC Department of Transportation (NYC DOT), 2009.)

This project involved changes not just to Broadway itself, but also to nearby streets, in order to implement an area-wide transportation network overhaul that involved adjusting turning lanes, parking regulations, and signal timing. In one of the most dramatic changes to the corridor, Broadway was completely closed to vehicle traffic at Times Square and Herald.
Square, which created room for new pedestrian plazas and spaces, and allowed for longer signal times for vehicles at the adjacent avenues. More permanent, capital-intensive designs are forthcoming for many areas of the project. These designs will include modifications to correct issues with the original redesign.


Broadway between 23rd Street and 59th Street: Intersections simplified by closing some or all of Broadway to motorized traffic where it intersects other avenues, and creating or altering pedestrian crossing signal phases i.e.:

- Pedestrian plazas with street furniture created at Times Square, Herald Square, and Madison Square Park.
- Bike lanes added that are in many places separated from vehicular traffic.

Broadway between 14th Street and 23rd Street:

- Two moving and two parking lanes with an on-street bike lane reconfigured to create one moving and two parking lanes with a median-protected bike lane on Broadway.
- East 17th Street converted from a two-way street to a one-way street, with bike and pedestrian lanes added, separated from traffic by planters.
- Pedestrian plaza created on former street space, by extending the sidewalk corner at Broadway and East 17th Street where turns were no longer possible.

Source: The NYC Department of Transportation (NYC DOT), 2009.
Bike and pedestrian facilities upgraded throughout this section, including traffic-separated bike lanes and shorter crossing distances at intersections created by constructing neck downs and refuge islands.

All of Broadway

- Signal and turning regulation changes in order to optimize traffic flow for new street conditions.

The project was completed in two major phases. Broadway north of 23rd Street was reconfigured in 2009, while Broadway between 14th Street (Union Square) and 23rd Street was remade in 2010.

Outcomes

NYC DOT carefully tracked before-and-after data on the project, and found that the changes to Broadway successfully improved traffic flow and increased safety, while creating new space for pedestrians and bicyclists. The measurements collected by the agency are too exhaustive to fully explore here, but they included tracking safety by mode, traffic volumes by mode, satisfaction surveys, and area-wide trip times using on-board taxi GPS data and travel-time surveys.

Broadway between 23rd Street and 59th Street:

- **Point to point travel times improved** by 17% in northbound trips in West Midtown, and 8% in East Midtown. East and West Midtown southbound times improved 3% and slowed 2% respectively, whereas crosstown trips showed westbound improvements of 9% and 7% in East and West Midtown and eastbound improvements of 5% and 2% in East and West Midtown.
- **Motorist and passenger injuries decreased by 63%**
- **Pedestrian injuries decreased 35%**.
- **Pedestrian volumes increased** by 11% in Times Square and 6% in Herald Square, and the pedestrians in those locations lingered longer.
- Pedestrians entered travel lanes less, as the project provides sufficient sidewalk and plaza space.

Broadway between 14th Street and 23rd Street:

- **Vehicles speeding over the 30 MPH limit declined** from 28% to 12% of all vehicles on Broadway between 19th and 20th streets.
- **Bicycle volumes increased** 16% on weekdays and 33% on weekends.
- **The combined southbound traffic volume on Park Ave and Broadway together was maintained**.
- Median speed for trips taken on 18th Street within the project area (6th Avenue to Irving Place) improved by 14%.
- Speeds on Park Avenue remained relatively unchanged in both the northbound and southbound direction.
- 74% of area survey respondents liked the new traffic configuration and 20% of business owners/managers thought that it had improved business, while none stated that it adversely affected their business.

Plate3: Broadway Boulevard: Transforming Manhattan’s Most Famous Street, New York

The new government guidance, recognizes the wider role of streets in creating successful places. It acknowledges that streets need to respond to the complexities of public life, promoting the interaction of people with different priorities, different circumstances and different expectations. It emphasizes an interdisciplinary approach, innovation and flexibility, and the need for a better balance between pedestrians and vehicles in the design of residential and lightly trafficked streets. It also states that these principles could equally be applied to other urban streets.

From the case study above its evident that for a successful improved space allocation and utilization along Ronald Ngala Street (section between tom Mboya street and Munyu road), the key pillars are:
Vision

a) Maintain a strong physical and organizational vision. Solve problems within that framework, adapting structures and service delivery accordingly. Good street design requires the co-operation and integration of a wide range of professional disciplines, user groups and local authority directorates. Successful.

b) Streets serve as areas of our collective values and cultural interactions. Some streets assume a symbolic and iconic significance well beyond their function as spaces for movement and public interaction.

c) Public participation. Establishing frameworks for public involvement and sharing information hence requires considerable creativity and resources.

Commitment

Be committed to long delivery timescales and to management and maintenance after delivery, i.e.:

a) Plan for high-quality skills and materials: The benefits of simple, durable materials, capable of withstanding the impact of heavy loads and continuous activity, were evident in the case study.

b) The Case study reveals the remarkably long timescales required to initiate, plan and implement schemes. Ten years between first reports and completion of works on the ground is not unusual. Most projects require significantly more time than initially anticipated. The time required to raise public expectations and to establish the need and potential for change is usually underestimated.

Integration

Accommodate everyone and every different use. Connect street networks to help people to choose to travel sustainably.

a) Integrate the widest range of people and activities—Civilized streets are used by the widest range of people and activities, and good ‘inclusive’ design should reflect this. It is important that those involved in street design consider from the outset how a full range of users are likely to access a street, rather than make this an afterthought.
Adaptation

Take account of climate and culture change in order to deliver sustainable spaces that are fit for purpose in the 21st century. i.e.

a) Take climate action-The urgent need to reduce carbon emissions has yet really to influence street design in Kenya. Yet its significance is clear, from traffic speed, lighting and planting right down to details like the selection of paving materials, and their transportation there. Streets will have to cope with heavier rainfall and more storms and flooding, as well as higher temperatures.

Coherence

Deliver projects where organizational, political and technical issues are resolved into a coherent design solution. This is achieved by:

a) Balance stakeholder needs and interests-In common with much good design, the most successful streets seem simple and effortless. This masks the immense organizational, political, logistical and technical problems that have to be balanced and resolved. Most street projects require Byzantine diplomacy between different authorities and stakeholders well as the patient balancing of a multitude of interests and the infinite diversity of human needs and circumstances.

b) Select visual simplicity- Streets serve as the plinth and visual frame for architecture and street life, the backdrop for an unscripted play. Integrating street design into the wider built environment suggests a move away from standardized highway masts and poles, and the use of building-mounted lights to articulate space whilst achieving highway illumination standards.

Outstanding issues

a) Legal factors include regulatory factors include acts of parliament and associated regulations, international and national standards, local government by-laws, and mechanisms to monitor and ensure compliance with these.

b) Political factors are basically to what degree the government intervenes in the economy (Policy and Governance Framework). Specifically, political factors include
areas such as tax policy, labor law, environmental law, trade restrictions, tariffs, and political stability.

c) Technological factors include technological aspects such as automation, technology incentives and the rate of technological change. They can determine barriers to entry, minimum efficient production level and influence outsourcing decisions. Furthermore, technological shifts can affect costs, quality, and lead to innovation.

2.5. Emerging Issues

✓ Diversity and empowerment from the Planning Policies Framework - such as The Constitution of Kenya (2010), PPA, UACA, EMCA etc. Planning Policies are guiding documents that outline the country’s position on key planning issues (such as sustainable development, heritage or affordable housing) and how they should be dealt with in redevelopment projects like the one endeavored by this planning project.

✓ All development applications must generally comply with the policies that apply to their redevelopment and/or planning area and that are relevant to the type of development being proposed. They establish a land use planning system, provide processes for assessment of development applications and provide management powers for other planning matters.

✓ Room for redesigning of the study area. This is guided by design Guidelines and Standards; and plans from the Physical planning Handbook (2007), Building Code.

✓ Democracy and accountability - Miller (2010) democracy aggregate individual preferences into a collective choice in as fair and efficient a way as possible. The CGA provides for Citizen Participation aiming democracy and accountability.

2.6: Conceptual Framework

From the review of the policy guidelines we identified relevant guiding principles and regulatory legislative provisions.

From the case study reviewed the following guiding principles were identified;

- Vision
- Adaptation
- Integration
- Commitment
- Coherence

This has to be guided by specific regulatory factors, government policies and technological factors.

We consider this to form the conceptual basis to improve Ronald Ngala Street situation.
Fig. 1: CONCEPTUAL FRAMEWORK MODEL:

Source: Author, 2014
CHAPTER THREE

SITUATIONAL ANALYSIS OF THE PROJECT AREA

3.1 Overview
This chapter articulates on the physical location of the project area (both in the regional and local contexts) and landscape or topographical and environmental characteristics of the area, background (history, planning and development) of the area, population characteristics therein, land use analysis and institutional, legal and financial issues of the project area.

3.2 The Location context of the Project Area
The project site is along Ronald Ngala Street, Nairobi CBD, and it covers the section between Tom Mboya Street and Munyu Road. The site covers the carriage way and street reserve on both sides.
3.2.1 Regional Context

The project area, at its regional context, is located in Nairobi which lies 1.19° south of the Equator and 36.59° east of the Prime Meridian 70. Its altitude is between 1600 and 1850 meters above sea level. The climate is generally a temperate tropical climate, with cool evenings and mornings and becomes cold during the rainy seasons. The long rains in Nairobi fall between April and June, while the short rains are experienced between November and early December. The average daily temperatures range from 29°C in the dry seasons to 24°C during the rest of the year.
3.2.2. Neighbourhood

The site is within walking distance from Moi Avenue. It neighbors many commercial shops, hotels, restaurants/bars and supermarkets such as Naivas, Ukwala, Tusks, and Nakumatt fronting the street. Its neighbourhood is characterized by two key components:

- Road/street infrastructure
- Commercial developments

Source: Author, 2014
3.3 Background of the Project Area

3.3.1 Historical Development of Nairobi
The origin of Nairobi dates back to the year 1898 as a grazing front for Maasai and the Kikuyu. In 1899, a trading centre emerged as a result of the construction and passage of the Kenya-Uganda Railway. In the same year, the provincial headquarters was moved from Machakos to Nairobi (Shihembetsa, 1995 in Mwaura, 2002).

The plan of Nairobi as a railway town manifested a lot of racial segregation. The Europeans, who were senior officers, resided on the higher topographical area to the West
of the railway line. The subordinates, who were Asian junior officers, were located near the railway line on a partially flat area near the hill area. Along Station Road (currently Moi Avenue), the European and Asian traders provided their own housing, which was mixed with commercial enterprises.

During this time, permanent residence for African labourers was not catered for. They were either accommodated in tents behind railway sheds or were expected to seek accommodation outside the Railway Town in Kileleshwa (Maskini area) and across Nairobi River in Ngara, Kariakor and Pangani areas.

In 1903, Nairobi was granted the status of a township. In 1908, it became the official capital of Kenya Protectorate and was granted Municipality status in 1919. By mid 1920s, Nairobi was planned as a settle capital with emphasis being laid on residential zoning strategy, but with racial segregation (Mwaura, 2002).

The Europeans who comprised 10% of the population were located in the best areas in the northern and western parts of the town, on 2700 acres (1093ha) or 42% for residential purposes. The Asian community (then 30% of the population) settled both in Parklands and Pangani on 300 acres (121.4ha) or 4.7% of the total area for residential use. The Africans, forming 60% of the total population were to live in Pumwani location, an area less than 5% of the total area of Nairobi.

In the 1948 master plan for Nairobi, the Neighbourhood Unit Concept was highly advocated for and it affected the Africans the most. Courtesy of this concept, the density expected in African locations was 30 persons per acre (80 persons per hectare). The neighbourhood units were planned such that workers in the industrial area could walk through a distance of at most 2 miles to their work places. The present layout of both the Industrial area and the Road Network is attributed to the 1948 master plan (Mwaura, 2002).

In 1963, the new independent government expanded the city boundaries from 90 sq. km to 690 sq. km. The intention was to include adequate land for future expansion for residential and commercial development and to absorb the peri-urban settlements.
3.4 Site Analysis

3.4.1 Topography
The location of project site is majorly on the Upper Athi Basin (Morgan, 1967 in Kasuku, 2001) which is generally flat with a very low gradient of about 5%. Its altitude is between 1600 and 1850 meters above sea level. It naturally slopes from South West to North East. The topography can therefore said to be generally favourable for physical developments such as buildings and roads.

3.4.2 Geology and Soils
Dominant in the study area are phonolites of middle Pliocene rocks. They are found 2-3 feet below the ground. Soils within the area are basically black cotton soils which are 2-3 feet deep in most parts. This geological structure can support building densities intended for this project (8-10 floors)

3.4.4 Hydrology
The site is drained by Nairobi River, which is perennial in nature. It is however highly polluted by commercial, industrial and domestic waste thus rendering its waters unfit for human consumption. The greatest flow recorded has been about 450 cusecs at the beginning of the heavy rains in November 1961. The average volume of flow is however from 5 to 8 cusecs for 7 to 9 months of the year rising to peaks of 30 to 60 cusecs in April and May. Any drainage channel provided in the area must thus be deep enough to accommodate 60 cusecs of run off as well as the waste water that will arise from the developments in the area.

3.4.5 Rainfall
The area has a bimodal rainfall pattern in which the long rains occur in March-April while the short rains occur between November and December. The average rainfall amount is 30 inches while the average number of rain-days is 90-100 per year. The area, just like any other part of Nairobi, has however a 30% chance of receiving less than 30 inches of rainfall from year to year and a 10% chance of getting less than 20 inches of rain. Rainwater harvesting is thus possible to supplement the piped water supplied by the Nairobi City County.
3.4.6 Temperature

The average daily temperatures of the project area range from 29°C in the dry seasons to 24°C during the rest of the year. The minimum daily temperature range is huge, from 10°C to 30°C in May and February respectively. The hottest months are from January to March. Design of the buildings in the area must thus be such that the room temperatures are neither too cold nor too hot for the comfort of the occupants.

Chart1: average temperature of Nairobi

Source: http://www.southtravels.com/africa/kenya/weather.html

3.4.7 Humidity

Maximum relative humidity occurs near dawn whereas the minimum relative humidity happens in the rainy seasons. The relative humidity however generally ranges from a daily maximum of 88% in May to daily minimum of 35% in April.

3.4.8 Sun and Wind Paths

The mean direction of prevailing wind within the corridor is westerly with variations for part of the year. The sun path has equally an East to West orientation. The orientation of the buildings in this area will thus have to ensure appropriate sun lighting and air circulation based on sun path and the wind direction therein.
3.4.9 Sun Radiation and Solar Radiation

The city of Nairobi experiences a total of about 2500 hours of bright sunshine per year. This averages to about 6.8 hours of sunshine per day. July and August experience cloudiness with an average daily sunshine of about 4 hours. About 30% more sunshine is experienced in the afternoons than in the mornings. The highest radiation is experienced in February followed by January.

3.5 Population and Demographic Characteristics

• Population characteristics

The project area has no fixed population since the population is composed of the moving population and hence establishing the area’s population is difficult. This is also due to the fact that the site is predominantly commuter zone and has numerous commercial activities.

• Demographic characteristics
Table 3: Demographic characteristics of the project area

<table>
<thead>
<tr>
<th>Information category</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fertility rate</td>
<td>4.72</td>
</tr>
<tr>
<td>Crude death rate</td>
<td>13.1/1000</td>
</tr>
<tr>
<td>Infant mortality rate</td>
<td>53/1000</td>
</tr>
<tr>
<td>Neo-natal mortality rate</td>
<td>32/1000</td>
</tr>
<tr>
<td>Post neo-natal mortality rate</td>
<td>34/1000</td>
</tr>
<tr>
<td>Child mortality rate</td>
<td>27/1000</td>
</tr>
<tr>
<td>Under five mortality rate</td>
<td>78/1000</td>
</tr>
</tbody>
</table>

Source: KNHPC Report (2009)

3.6. Land Use Analysis

3.6.1. Land Size
The project area covers an area of 7 acres, with a street reserve of 75 metre stretch from Tom Mboya Street to Munyu Road. It also covers a width of 25 metres across Ronald Ngala Street.

3.6.2. Land Tenure
The site lies on a land owned by KURA and KEHHA as government land and is within the jurisdiction of Nairobi County government.

3.6.3. Land Use Structure
The land use structure of Ronald Ngala Street, being a very important commercial street and commuter zone within the CBD is dominated by commercial and transportation use. This has a very high implication especially on the provision of commercial and transportation services/facilities as is the case, the need for improved space allocation and utilization is highly necessary, absence of which results in the existence of the current deteriorating situation along the street (influx street vendors, chaotic transport system, and uncoordinated street activities)

- Commercial Use
The commercial component of the areas adjacent the project site is the most predominant character of space use. This is such that all the activities around
commercial use, and transportation. The commercial use has manifested itself in four ways here:

- High rise commercial development (five floors)
- Medium rise commercial development (two and three)
- Low rise commercial development
- Mixed use commercial development; and
- Vending activities

The commercial activities have continued to intensify in the project area to the extent that they spill over into the street/road reserves. Beside generating so much traffic and channeling it into Ronald Ngala Street, they are also reducing the road space and so compounding the difficulty of traffic flow both on Ronald Ngala Street and the feeder streets like Moi Avenue, Tom Mboya Street, Munyu Road and Mfangano Street.

3.6.4 Housing
Most of the housing units within and around the site are for commercial use. Commercial use is predominantly exhibited on the ground floors of the buildings along the project site.

3.6.5 Infrastructure Services
Ronald Ngala Street suffers shortage of infrastructural services such as water and sanitation, surface drainage and transport facilities. The area also lacks public sanitary facilities. The street surface condition on the other hand is dilapidated and has numerous potholes. There is no grade separation for different types of traffics along the study area.

3.6.6. Transportation/Movement systems
The main transport route which is a collector street (Ronald Ngala) connects to Moi Avenue and Race Course Road which are also main transport channels within the neighbourhood. Ronald Ngala Street also cuts through Tom Mboya Street, Mfangano street, Munyu Road and River Road which are important transport channels into and outside the project site. The project site is particularly bound by Tom Mboya Street and Munyu Road.
3.6.7 Land issues
Being an area covering Ronald Ngala Street’s carriage way and street reserve, the project site experiences a lot of issues regarding space allocation among different usages especially space tenureship issues and other issues related to vending activities. Other land issues dominating the site are plot coverage, setbacks, building heights and parking.

- Plot coverage

Most of the buildings have taken a plot coverage of close to 100% which results in chronic congestion where there is inadequate space for traffic circulation forcing human traffic into the main carriage way within the project area.

- Building heights

The high plot coverage is further exacerbated by the high building heights of some of the structures which increase densities without scheme of circulation. Therefore the project site is noted to have a chronic problem of human traffic and circulation.

- Parking

The other challenge that the project site faces is the lack of adequate public parking spaces. Most of the parking is done at the shoulders of the streets enclosing the project site. This poses a major challenge in future as regards to the parking facilities for the entire Ronald Ngala Street.

3.6.8 Socio economic activities
The highest number of individuals on the site is the youth and members of young families mostly the household heads. The project site (Ronald Ngala Street) is as such seen to be the sole bread winner for great majority of individuals within the site since most space users reside within low income residential areas of Nairobi. Most of the space users in the site engage in commercial activities. Findings from the research project identified that an individual’s average income per month is Ksh.5000 (especially street vendors) while it
ranges from Ksh.15000 to 25000 for a few who are better off. A number of people also operate bodaboda using motor bikes.

These businesses also generate traffic (both Motorized and non-motorized traffic) that add onto the volumes on Ronald Ngala Street.

3.7. Institutional, legal and financial issues of the project area
The key institutions governing Nairobi CBD is the county government. As such the project area falls under jurisdiction of Nairobi County government and is governed by the provisions of the urban areas and cities act of 2011, the county government act and the physical planning act. The plan for the site will be a part development plan in accordance with the physical planning act giving precise sites for immediate implementation of the project’s components. Due to the changes to be brought about by the project there will be cases of harmonization or regularization of standards and acquisition of private land.

The county government of Nairobi is the key institution in charge of the development; however, due to the complexity of the actors and components of the development, other stakeholders will be involved such as;

- NEMA in charge of the environment
- KURA and KENHA
- Local community unions representing traders and other users of the space
- Department of physical planning.

Finances will be generated from the kitty for implementation of county plans. However, a scheme for the contribution of the stakeholders and space users will be necessary either before, during or after the installation the project components. The project components will be under the management of the county government of Nairobi who may opt to deliberate the function appropriately (with supervision to ascertain attainment of objectives)
3.8. Emerging Issues

- **Environmental conservation**—such as landscaping e.g. planting of trees either at the median or along foot paths has a potential for environmental conservation and improvement of the aesthetic quality of town.

- **Need for law enforcement** especially on laws/policies related to space use and environmental conservation.

- **Existence of various means/modes of transport** that facilitate mobility and provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments.

- **Lack of consideration of other road users** like non-motorized transport in the road designs. Hence this calls for improved space allocation and utilization through rehabilitation and redesigning of transport infrastructure to suit the set standards.

- **Well set legal and institutional frameworks** that will ensure financing and implementation of various strategic projects. For example the county government of Nairobi is the key institution in charge of the development; however, due to the complexity of the actors and components of the development, other stakeholders will be involved such as; NEMA in charge of the environment, Local community unions and other users of the space and the department of physical planning.

- **Lack of infrastructural services** such as storm water drainage along the street. This poses a great threat for road users especially during rainy seasons where frequent flooding occurs. Therefore there is need for improved space allocation and utilization.
CHAPTER FOUR

PROJECT PLANNING DESIGN AND IMPLEMENTATION

4.1 Overview
This chapter starts by understanding the issues to be addressed by the project and their implications in relation to the reviewed principles of chapter two. It then outlines the proposed project planning design, implementation and evaluation framework. As outlined in Chapter one of this report, the objectives of this project will be achieved through a series of designs. The designs have been developed through a series of steps as outlined in the subsequent sections of this chapter.

4.2. Planning and Design of the Project

4.2.1. Summary of the emerging issues from Chapter 2 and 3

- **Environmental conservation**-such as landscaping e.g. planting of trees either at the median or along foot paths has a potential for environmental conservation and improvement of the aesthetic quality of town.

- **Need for law enforcement** especially on laws/policies related to space use and environmental conservation.

- **Existence of various means/modes of transport** that facilitate mobility and provide economic and social opportunities and benefits that result in positive multipliers effects such as better accessibility to markets, employment and additional investments.

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- **Lack of infrastructural services** such as storm water drainage along the street. This possess a great threat for road users especially during rainy seasons where frequent flooding occurs. Therefore there is need for improved space allocation and utilization.

- **Diversity and empowerment from the Planning Policies Framework** - such as The Constitution of Kenya (2010), PPA, UACA, EMCA etc. Planning Policies are guiding documents that outline the country’s position on key planning issues (such as sustainable development, heritage or affordable housing) and how they should be dealt with in redevelopment projects like the one endeavored by this planning project.

- **Development types** - All development applications must generally comply with the policies that apply to their redevelopment and/or planning area and that are relevant to the type of development being proposed. They establish a land use planning system, provide processes for assessment of development applications and provide management powers for other planning matters.

- **Room for redesigning of the study area.** This is guided by design Guidelines and Standards; and plans from the Physical planning Handbook (2007), Building Code.

- **Democracy and accountability** - Miller (2010) democracy aggregate individual preferences into a collective choice in as fair and efficient a way as possible. The CGA provides for Citizen Participation aiming democracy and accountability.

### 4.2.2 The guiding principles from the conceptual framework

From the review of the policy guidelines we identified relevant guiding principles and regulatory legislative provisions.

From the case study reviewed the following guiding principles were identified;

- Vision
• Adaptation
• Integration
• Commitment
• Coherence

This has to be guided by specific regulatory factors, government policies and technological factors.

4.3 Expected Outputs and Outcomes of the Development Projects
The project design is expected to produce the following results and impacts on-site and offsite.

4.3.1 Expected Outputs
Considering the findings from the earlier work on research project, the case study and the site analysis, it is imperative that the area be developed in four tier system which involve:

• Better planned commercial developments along Ronald Ngala Street with adequate capacity for all the potential uses.
• A transport and circulation plan
• Parking facility plan and Project’s Implementation Strategies and schedules; Project’s Monitoring and Evaluation framework; Institutional framework for project’s implementation.

This is because the project area is born out of high level of vibrancy from commerce and transport. As such the need for the four components arises.

4.3.2 Expected Outcomes
The expected outcome is primarily a spatial plan in form of design drawings guiding the development of the area. In this case it involves plan views, elevations and cross sections of the proposed development to be laid on the project site. These are presented in the form of schematic drawings and working drawings. The plan has the following components:

• High economic space use
• Efficient transport circulation (More coordinated traffic generation and distribution patterns)
• Improved space allocation (especially for street vendors)
• Improved space occupation and utilization
• Disaggregation of human and vehicular traffic
• Adequate implementation, monitoring and evaluation of developments in the project area.

4.4 Formulation of alternatives

4.4.1 Alternative Street planning models/Approaches for Ronald Ngala Street.

1. Neighborhood Street Model (NSM)

NSM Model uses more of an integrated approach in development of streets. It combines storm water management features, curb extensions, vertical speed control elements, and bicycle facilities that encourage safe speeds and meter through traffic. NSM streets should provide safe and inviting places to walk with direct access to local stores and schools. Design for NSM streets can combine storm water management features, curb extensions, vertical speed control elements, and bicycle facilities that encourage safe speeds and meter through traffic.
2. Transit corridor Model (TCM)

Transit corridors, including light rail (LRT), streetcar, and bus rapid transit (BRT), promote economic development around high-quality transit service while fostering a pedestrian scale in which walking and biking actively complement public transit. As major generators of pedestrian traffic, heavy surface transit routes should be prioritized for pedestrian safety improvements in both the immediate surrounding area and major access routes within the transit access shed. When redesigning streets for high-quality transit service, designers should assess how transit service is impacted not only by the geometry of the corridor, but also its existing signal timing, signal phasing, turns, and other operations that may jeopardize the quality of service.
3. **Mixed use Street (MUS)**

MUS serve important transport link functions, both for private vehicles and public transport, their primary identity and role is provided through the place functions that they facilitate. Streets are key determinants of neighborhood livability. They provide access to homes and neighborhood destinations for pedestrians and a place for human interaction: a place where children play, neighbors meet, and residents go for walks and bicycle rides.
A Balanced ‘link and place’ approach/ Model (BLPAM) is a comprehensive and consistent approach to street planning and design that fully recognizes and pays equal attention to the link and place functions of mixed-use streets. This will first require a better understanding and codification of the place functions of urban mixed-use streets. Success of a Balanced ‘link and place’ approach/ Model (BLPAM) is likely to depend on micro-aspects of design, such as the precise location and orientation of public seating, taking into account both their patterns of use and their impact on movement along the footway. Improvements also need to be skilfully introduced, so that they do not lead to commercial pressures that exclude the existing businesses or groups of people who have contributed to the character of the area.
Fig 5: Illustration of a balanced ‘link and place’ approach/Model (BLPAM) on London Road, UK.

Source: TfL AIMS database; Ordnance Survey, © Crown copyright, all rights reserved.

4.4.2 Evaluation of the Alternative Street planning models/Approaches for Ronald Ngala Street

1. Neighborhood Street Model (NSM)

NSM Model uses more of an integrated approach in development of streets.

Advantages

- There is adequate Parking. When parking opportunities are inadequate, people are more likely to park illegally in locations that may block access by emergency service vehicles and lastly
- It promotes Connected street net-works which provide multiple ways for emergency response vehicles to access a particular location and multiple evacuation routes. In addition, a connected street system encourages slow, cautious driving since drivers encounter cross traffic at frequent intervals.

Disadvantages
An undifferentiated traveled way encourages higher speeds. Crash rates have been shown to increase as lane width increases. However, its major strengths include, left-side bike lanes that reduce the risk of dooring conflicts and are an effective treatment for most neighborhood streets. Raised crosswalks or curb extensions maintain safe travel speeds and reinforce the residential nature of the street.

2. **Transit corridor Model (TCM)**

Transit corridor Model coordinates with land use changes to maximize a corridor’s potential for economic growth and physical transformation. Setback guidelines and other land use regulations should be tailored to create a pedestrian-scale environment.

**Advantages**

- A raised cycle track on both sides of the corridor promotes the combination of bicycle and transit usage. A center-running 1-way or 2-way cycle track may be preferable in some cases to reduce the dangers of turning conflicts in combination with transit. Enforcement measures should be put in place to discourage encroaching vehicles from using the dedicated bus lanes. In some cases, median transit lanes may serve as a route for emergency vehicles.
- Corridors with high transit traffic, where double-parking and local traffic pose obstacles to effective transit, should be considered for BRT, LRT, or streetcar. High-quality transit service and lanes decrease conflicts between buses and through traffic on heavy transit routes, can speed travel times, and reinforce the desirability of transit as an option. Wide transit corridors are challenging to cross in a single cycle.

**Disadvantages**

- The major drawback of this model is it expensive to implement especially in Kenya which has not included light rail (LRT), streetcar, and bus rapid transit (BRT), to promote economic development around high-quality transit services.

3. **Mixed use Street Model (MUSM)**

Mixed use Street Model (MUSM) encourage residents to walk or cycle to retail, leisure and public facilities in their local area. However, for their economic survival, businesses also depend on customers drawn from further away. The evolution of these streets on arterial routes, served by high-frequency public transport services (bus and underground), means that they provide good accessibility for a wider base of regional customers, enabling many of them to use more sustainable means of transport than cars.

**Advantages**

- *Facilitating social inclusion* - In general, the three case study areas appear to be able to attract a wide range of population groups, in terms of age and ethnicity, that are both
representative of the local area and are drawn from a wider catchment area. The streets are accessible to those without access to a car, as well as to car drivers.

Providing community focus and local identity - Mixed-use streets provide a natural focal point where local people can meet friends, both formally and informally, by appointment or by chance. They offer many opportunities for unplanned encounters, and enable people to expand their personal horizons by observing those from other cultures and with other perspectives, in a non-threatening environment. As important meeting places for social activity, mixed-use streets help to sustain and build local community capacity and social capital, and can contribute to reducing feelings of isolation and depression.

Offering safe environments - mixed-use local high streets they are not generally perceived to be pleasant public spaces in which to spend time, either by local residents or visitors. Their physical environment does not contribute to environmental sustainability or livability, thereby detracting from their attractiveness and risking undermining their future use, and hence their ongoing contribution to economic and social sustainability.

Disadvantages

Dominance of traffic in the street scene - In mixed-use streets the design of the high street has given priority to the link traffic function over the place activity function. In all three of the case study areas, the most significant problems that street users and residents identified related to the volumes of road traffic on the high street, and associated concerns about traffic dominance, including air pollution and traffic noise.

4. A Balanced ‘link and place’ approach Model (BLPAM)

Advantages

The successes of the case study streets were achieved despite tensions and problems that affected both their link and place functions, and had a detrimental effect on the streets as livable spaces.

BLPAM integrates mixed-use local high streets by serving as important transport link functions, both for private vehicles and public transport, their primary identity and role is provided through the place functions that they facilitate.

A comprehensive and consistent approach to street planning and design is required that fully recognizes and pays equal attention to the link and place functions of mixed-use streets. This will first require a better understanding and codification of the place functions of urban mixed-use streets.

BLPAM approach overcomes the Mixed use Street Model (MUSM) by the fact it reduces traffic dominance, accident risk and severance by widening footways, adding barrier-free median strips, planting greenery, providing extra controlled pedestrian crossings.
4.4.3 Choice of the preferred Street planning models/Approaches for Ronald Ngala Street

As seen from the alternative street models. One of the greatest design innovations will come from a recognition that footways cater for a wide range of pedestrian place activities and sensitively catering for them without formalizing space use too much and so jeopardizing the attractiveness that comes from the buzz of diverse, interacting and intensive street activity. Success is likely to depend on micro-aspects of design, such as the precise location and orientation of public seating, taking into account both their patterns of use and their impact on movement along the footway. Improvements also need to be skilfully introduced, so that they do not lead to commercial pressures that exclude the existing businesses or groups of people who have contributed to the character of the area.

The preferred development scenario/Model for Ronald Ngala Street is the balanced ‘link and place’ approach Model (BLPAM) which is in line with improved Space Allocation and Utilization. The major strengths that this model will address as far as Ronald Ngala Street is concerned include:

a) Enabling street spaces the hawkers should be relocated to other designated locations where space can be reorganized to accommodate most of them such as Muthurwa and Kariorkor Markets where rearrangement is possible. This will help to decongesting the street which is normally flooded with many hawkers spreading their wares on the pavements of the buildings along the street. This could also facilitate the efficient flow of traffic along this key business street.

b) Provision of parking space where vehicles operating along Ronald Ngala Street use the inadequately provided parking spaces along the street such as those parking close to Ronald Ngala post office and Tusker House. These existing parking spaces are few and in most cases vehicles are usually parked on the road leading to congestion hindering vehicular movement along the street. Proper parking spaces need to be provided for along the street to solve the problem of parking along the street.

c) Reorganization of functional activities along the street. The model will enhance the accommodation of various activities, movement functions, utilities and parking spaces along the street. This will reduce conflicts in space use along the street. Major street components such as commercial activities, public purpose land use, public utilities and other land uses need to be developed to enhance functionality of the street.

d) Supporting economically sustainable centres- Strong transport links, both regionally and locally, contribute to the economic sustainability of the local high street by providing good access for customers drawn from a wide catchment area. By providing vibrant centres for local business activity, the balanced ‘link and place’ approach Model
(BLPAM) also contribute more generally to sustaining their local economies. Well-balanced ‘link and place’ approach local high streets are able to achieve high levels of satisfaction among their local and visitor populations in terms of the services they provide.

e) Providing street lighting that facilitates the various footway activities, assists with wayfinding and provides a strong sense of personal security, as well as meeting the needs of road traffic. Support facilities such as street lights and water supply need to be enhanced along the street. Street lights will ensure that there is safety during night hours by providing adequate lighting of the street.

f) Reducing street clutter and improving the quality, attractiveness and cleanliness of the footway and frontages. The situation of Ronald Ngala Street during rainy seasons is usually worse. The water floods the whole street, making movement of pedestrians difficult. There is need for provision of proper storm water drainage system along the street to solve the problem of flooding when it rains.

g) Improving and increasing the number of public amenities, such as seating, lighting and well-maintained public toilets, and providing a generally higher-quality public realm; there is inadequate street furniture along Ronald Ngala Street and the model will lead to improvement of street furniture along the street. People using Ronald Ngala Street need to have sites where they can sit and rest. Street furniture such as benches, traffic barriers, bollards, streetlamps, traffic lights, traffic signs, bus stops, taxi stands, watering troughs, and waste receptacles need to be provided for along the street.

h) Coordinating public transport provision to facilitate informal modal interchange and reduce traffic and pedestrian congestion, and accidents.

4.5. Development of the Spatial Plan
The first stage of this whole process was problem identification which was enabled by the research undertaken on the Ronald Ngala Street between October 2013 and February 2014. This led to the realization that this project was necessary but before anything was done, objectives of the project were set. After that, the planning process adopted for this project was as summarized in charts 4 & 5 below.

4.6. Site Planning and Design Process Stages
The project adopted the conventional planning and design process. The process encompassed the following stages:

Phase 1: Research and Analysis
This was done through a research project – The study of conflicts in space use along Ronald Ngala Street Nairobi CBD. From the research one of the main problems was inconsistence between space allocation, occupation and utilization along the street. To arrive at this problem (and others), a number of factors were studied and analyzed in light of their planning and policy implications. Some of these included:
• **Site Location** – The site was placed within its proper geographical, political, and functional context. This helped to fix the site in relation to adjacent land uses, transportation patterns, utility and infrastructure availability, employment, and commercial.

• **Existing Conditions** – these included topography and slopes, geology and soils, vegetation, hydrology and drainage as well land use patterns in and around the project area. Analysis of the existing conditions enabled an evaluation of the physical attributes and constraints for the parcel of land onto which this development would to take place.

**Phase 2: Program Development**
This stage entailed drawing up a guide for the designer to accomplish his task. Items outlined to accomplish this encompassed:

- A statement of goals that the project should achieve.
- A list of project objectives by which these goals will be accomplished.
- A list of project elements that will be included and a description or analysis of their interrelationships.

**Phase 3: Synthesis (Design Phase)**
This phase entails a series of stages. First, one comes up with a conceptual design which begins with functional diagrams in which one explores the relationships of program elements and activities. Next on line is a preliminary design which resolves each program element into a physical component, suggesting basic form, size, and materials to be used. The final is the site plan which gives precise form, dimension and indication of materials to the proposed elements.

It is however important to note that before the designs were made, the planner had to do a few other things like undertaking a land suitability analysis, population and traffic projections and finally a land budget.

**A. Current Land Use**
The current use of the project area illustrates the amount of land allocated for each use along the streets:

**B. Business Occupancy Analysis**
According to the situation analysis done in this project, the main businesses had been categorized into three main different typologies in the project area:

**Shops**: They approximately measured 2x3 meters.

**Exhibition halls**: They approximately measured 20mx8 meters.

**Street vendors**: They encroached about 2m of the street/road reserve.

**C. Land Suitability Analysis**
Once land use and standards are analyzed, land suitability analysis provides the amount of land suitable for construction and healthy living conditions in order to prepare the land budget for the urban planning of the area. The analysis is summarized in the table below:
Table 4: Land Suitability Analysis

<table>
<thead>
<tr>
<th>Land Suitability Analysis Item</th>
<th>Land size 28000m² or 7 acres</th>
<th>Non-developable land =6.2 acres</th>
<th>Net Developable land =1.2 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed land uses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shopping mall</td>
<td></td>
<td></td>
<td>0.4 acres</td>
</tr>
<tr>
<td>Street carriage way and sidewalks</td>
<td>AREA COVERAGE</td>
<td></td>
<td>0.6 acres</td>
</tr>
<tr>
<td>Parking</td>
<td></td>
<td></td>
<td>0.2 acres</td>
</tr>
</tbody>
</table>

Source: Author, 2014

4.7 Detailed design formulation stage and the development of detailed action plans

4.7.1 Land Acquisition Programme

a) Mapping, Survey, and Planning Procedures
There are a number of basic standards approaches that would be used in Mapping out Ronald Ngala Street for tenure security. These will include; stakeholder mobilization, comprehensive aerial mapping of the study area, physical planning and adjudication of rights, property valuation, compensations, acquisition of secure tenure and construction.

b) Determination of Boundary
This will involve walking to establish the boundaries with the settlers to understand the extents and location of the settlement. Hand held GPS equipment’s will be used to acquire approximate coordinates of the perimeter of these boundaries. This is vital for subsequent planning for acquisition of relevant spatial data for mapping of the area.

c) Acquisition of spatial data
This stage will involve the acquisition of the various spatial data sets that will allow for re-planning of the site. Such data sets will include old topographical maps, old photographs, satellite imagery, cadastral maps, physical planning maps, town planning zoning maps and any information that may support the re-planning of the site. It is also at this stage that the aerial orthophoto or satellite imagery will be planned and acquired if necessary.

d) Interpretation of imagery
This will involve interpretation of the satellite data or orthophoto to derive boundaries coordinates locations of features such as commercial buildings, water points, sewerage
systems and position of water pipes. Other features will include public utilities, streets, power wayleaves, and any spatial attributes that can be mapped. This process will be undertaken by trained local residents particularly the youth and serve to provide ownership of the project.

e) Physical planning stage
On a contemporary level, this stage will involve physical planners, in consultation with the street space users and local authorities. They will work in tandem to develop and produce structural plans. These plans will be regulated by the physical planning and the environmental management and coordination acts. This will be done in partnership with the various professional experts in the built environment.

f) Valuation
After planning, valuation will be carried out to determine compensation rates for structures that would be demolished and those that would be re-organized. The valuation reports would then inform the compensation decisions.

g) Acquisition
Because the site is located on government land, it will be easier to apply for allocation through the City County of Nairobi.

4.7.2. Housing
- Commercial units

The design proposes 120 commercial units with 50 units being located along the street in the ground floor while the remaining 70 will be located in the upper floors. The commercial units will be of a footprint of 18m²

4.7.3 Infrastructure Accommodation Program

a) Access Roads
The design proposes two types of access roads; street carriage way (8 meters wide) and lanes (4 meters wide). These will be designed using bitumen.

The following drain sizes have been proposed. Closed trapezoidal channel drain (for both lined and unlined channels) of dimensions 0.5m bottom width, 1.0m top width and 1.0 m deep for street and lanes.

The design life for the street carriage way will be for 15 years. Design life is a period considered appropriate to the function of the street.

b) Multi-level Parking Space
The design proposes a multi-level parking space next to Tusker House. This space is currently occupied by parking lots that are not effective and has to be improved so as to bring convenience to mainly personal cars and bicycles on the upper levels, PSVs such as taxis, matatus and buses on the lower levels.
c) Sidewalks
The design proposes two separate sidewalks (3m); one on the ground and the other elevated on the first floor of the building along the street. This will open up the first floors of buildings for more commercial use. The tertiary street (lanes) will be entirely pedestrianized. The foot and bike paths will be self-draining at a cross fall of 2%. The design life for foot and bike paths considered is 15 years. The design proposes the use of the following materials as wearing surface: The design proposes the use of paving slabs (600 x 600 x 50 mm) for the entire pedestrian and bicycle paths.

d) Storm water drainage (stand-alone)
The design proposes primary and secondary drains. The primary drains will be larger drains which will be constructed along the main street. The primary drains will be IBD+4, IBD+2 drains or trapezoidal channel of dimensions 0.5m bottom width, 1.0m top width and 1.0m deep. Secondary drains will be smaller drains which will be constructed along the secondary and tertiary access. The secondary drains will be IBD+4, IBD+2 drains or trapezoidal channel of dimensions 0.25m bottom width, 0.5m top width and 0.5m deep.
The design proposes the use of both lined and unlined channels will either be lined (using concrete, stone pitching, and building blocks both on the bottom and on the sides). The design life for storm water drainage facilities considered is 5 years; this is in accordance to the manual for Surface Water Drainage by J. Keenan.

e) Elaborate sewerage system:
An Elaborate sewerage system will consists of a sewer reticulation lines connected to existing trunk sewer. The size of the sewer reticulation line proposed is a DN 225mm dia PVC pipe. The design life for the sewerage system considered is 25 years.

f) Street and Security lighting
i. Security lighting
The power source for the security lighting proposed will be obtained from:
- Kenya Power and Lighting Company (KPLC)
The type of security light proposed is the 150 Watt Halogen floodlight with motion PIR sensor mounted on a 12 metre high mast.

ii. Street lighting
The design proposes use of street lights to provide uniform lighting at a level that is adequate and comfortable for vehicular and pedestrian movement on the streets and lanes. The design life for security and street lighting considered is 5 years. The power source for the street lighting will be obtained from:
- Kenya Power and Lighting
- Solar panels
The proposed maximum allowable spacing between adjacent street lights will be 50 metres.
The design proposes the use of solar powered street lighting, a 28 Watt LED street lamp mounted on a 6.0 metre high straight shaft polymer coated (12B21) lighting column. The following materials will be provided 2 x 120 Watt, monocrystalline or polycrystalline solar panel and a Gel cell deep cycle battery.
Fig. 6: Proposed Site Plan for Ronald Ngala Street (section between Tom Mboya Street and Munyu Road)

SITE PLAN

Source: Author, 2014
Fig 7: Street Scape Design Details:

A View of the Street Scape and the Multi-Level Parking Building behind bus station, fronting Ronald Ngala Street

A View of the Street Scape and the proposed shopping complex alongside the elevated street

Source: Author, 2014
Fig. 8: Street Detailed Designs:

A View of the Proposed Street Design with Elevated Sidewalks Meant For Better Movement, Accessibility and Aesthetic Value

An Overview Of The Elevated Walkway, Ground Level Pedestrian Walkways, Bus Stop And The Carriage Provided With Street Lights For A Secure Working, Walking And Motoring Environment

Source: Author, 2014
Fig. 9: Major Developments along the project site

A View of the Proposed Multi-Level Parking Building adjacent to the Street

A View of the Proposed Shopping Complex along the street

Source: Author, 2014
Less Dominance of traffic in the street scene

Reduction of traffic dominance, accident risk and severance by widening footways, adding barrier-free median strips etc.

Source: Author, 2014
Fig. 10: Elevated Side Walks To Open Up The First Floor For Shoppers Traffic And More Stalls

Source: Author, 2014
Fig 11: Side view of development

The balanced ‘link and place’ approach Model (BLPAM) which is in line with improved Space Allocation and Utilization.

A recognition of footways that cater for a wide range of pedestrian place activities and sensitively catering for them without formalizing space use too much and so jeopardizing the attractiveness that comes from the buzz of diverse, interacting and intensive street activity.
Elevated Side Walk Design Overview

Street Design Overview

Source: Author, 2014

Top Elevation of the development site
Plate 5: The proposed 18m detailed street layout: take note of the drainages, greenery, street lighting, bicycle and walking paths and the carriageway.

Source: Author, 2014
4.8. Implementation strategies
The successful implementation of the project will be anchored on stakeholder involvement in the process and necessary goodwill to fruition. This will call for an intensive public awareness campaign to enable them to comprehend the purposes of the process, its intricacies and the role they are likely to play. This will also call for the need to inculcate the sense of ownership and belonging in the entire process of the project through measures that will not only lead to facilitation by other stakeholders, but also project ownership which will lead to smooth implementation.

The project will also call for a deeper consultative approach among the various stakeholders (local authority urban designers, KURA and KENHA officials, developers, civil society and NGOs among others) this is to ensure an appropriate team has been assembled to steer the process without unnecessary halts.

The implementation of the improved space allocation and utilization will mainly be visualized in four stages: the plan approval, sensitization and adoption; space allocation and infrastructural layout; building construction and monitoring, evaluation and impact assessment.

4.8.1 Plan approval, sensitization and adoption
This will mainly include the approval and adoption of the space allocation and utilization plan and building plans by the local authority, the public and other stakeholders. It will also include the sensitization of public and stakeholders on provisions and conditions of both plans.

4.8.2 Space allocation and utilization and infrastructure layout
This will mainly involve the identification and marking of structures affected by infrastructure provision and negotiating with the owners of the affected structures for relocation. Further, the site will be prepared followed by construction and installation works.

4.8.3 Building construction
This phase will mainly involve the identification of early phase construction areas; site securing management and safety provisions; site preparation and lastly routine construction management and supervision.
4.8.4. Monitoring, evaluation and Impact Assessment
This will entail routine inspection and post occupancy evaluations through user surveys, observations and project auditing.

Table 5: Costing Matrix

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost (Kshs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public awareness and re-planning</td>
<td>5 Million</td>
</tr>
<tr>
<td>Building construction and space allocation</td>
<td>150 Million</td>
</tr>
<tr>
<td>Road/street construction</td>
<td>30 Million</td>
</tr>
<tr>
<td>Support infrastructure</td>
<td>15 Million</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 Million</strong></td>
</tr>
</tbody>
</table>

Source; Author, 2014

4.8.5. Guidelines for the Implementation Process
The implementation process for the entire project will be a two tier; both consultative and participatory approach. All the stakeholder; ranging from the public community members, clients, civil society, service providers, local administration, structure owners, businessmen and the private body among others will all be involved and their contribution given the necessary attention. The implementation of the project will be guided under the following fundamental guidelines:

- The Nairobi County Planning Unit in conjunction with the City Board for Nairobi shall be responsible for and approval of any developments in the project area other than the ones provided for in the plan.

- All developments in the cluster shall be according to the Nairobi County Integrated Development Plan and Sectoral plan.

- The community members will be involved in any decision making by the County government or other developers in the project area.
• Provision of infrastructure services and facilities shall precede all other developments and will include well marked access streets of between 6-9 meters
• Environmental protection shall be a core responsibility of everyone and everybody will work towards such goals as to reduce environmental pollution
• No structure shall be constructed outside the limits of the project area unless it is deemed by the City Board that such adds value or is compatible with other uses
• The maximum plot ratio will be 300% and plot coverage exceeding 75% will not be allowed (this is to allow for space for parking and other services)
• The provision of the public health act, EMCA, as to the safety of persons and the environment will be adhered to by any form of development and the persons involved.
• Coordination of activities of different institutions implementing any project in the area will be mandatory.

4.8.6 Implementation Schedule
The table below shows the implementation schedule to be used for the project. The schedule defines the duration and the timing of the key milestones to be achieved in the project.
## Table 6 Implementation Time Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
</tr>
<tr>
<td>Land acquisition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community and stakeholder awareness campaign</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mapping and survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valuation and Compensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land acquisition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commissioning of Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Designing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan Approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Impact Assessment</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Laying of Infrastructure</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restoration of all land affected by project</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring &amp; Evaluation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment and Feed Back</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost Recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Author, 2014*

Q1 = First Quarter of the year; Q2 = Second Quarter of the year; Q3 = Third Quarter of the year; Q4 = Fourth Quarter of the year
CHAPTER FIVE

MONITORING AND EVALUATION

5.1 Overview

Monitoring will be undertaken in all the projects/programmes and will be done regularly to ensure that activities involved are being carried out as planned. This will ensure that the project is kept on track. Monitoring and valuation process will enable the review of progress, identification of problems in design and/or implementation and initiation of relevant adjustments.

Monitoring will be carried out from commencement stage of the project to the post construction phase of development. Each phase of development will be reviewed by professionals and feedback given to stakeholders to identify the compliance and relevance to the common goals and visions regarding this development project.

5.2 Monitoring and evaluation stages in the implementation of the project

Monitoring and evaluation is important in this development project for various reasons. First, it ensures that actual project implementation is carried out within the required time, the budgeted financial limits is outlined and also that the quality is stipulated at the design stage. It also allows for lessons to be learnt for future similar projects about the actual workability of such designs by looking at the actual impacts of the projects versus those that had been expected.

Monitoring and evaluation also allows for stakeholder participation to be incorporated throughout the project lifespan. Monitoring and evaluation during the project life will be conducted through the use of various components; therefore, this project will be anchored on the following:

5.2.1 Stakeholders monitoring and observation

All stakeholders of this development project including representatives of all space users (the public) shall be equipped with skills for observations, documentation, and assessment of the characteristics prevailing at the project site during implementation and operation phases with the aim of interpreting these against project objectives. These will further be accompanied
with bi-annual field surveys by other stakeholders where several aspects of the implementation will be noted down. These notes will then be consolidated and kept for record purposes. Reports will be compiled to detail the progress of the project, resource utilization at each point and the stakeholder’s actions. The report will also include the sentiments of the public about the on-going project impacts, the report will also recommend possible solutions in the challenges faced in actual implementation of the project.

5.2.2 Project tracking

The project components for tracking and gauging of success shall be aligned to the main areas of change. The tracking will be in terms of project inventories, post occupancy user surveys, and project programme reviews guided by the goals achievement matrix.

The goals achievement matrix is a tool used for evaluating purposes for projects. The matrix lists out the various goals of a project against their achievement scores. The scores will be estimated out of ten and are given for different contexts. For this project therefore, the goals achievement matrix will be used for evaluation purposes on an annual basis. A draft example of the goals achievement matrix with the goals of this development project is illustrated below:

Table 7: Goal achievement matrix

<table>
<thead>
<tr>
<th>Goals</th>
<th>Score (out of 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physical context</td>
</tr>
<tr>
<td>1. To create a better street that comfortably accommodates all space users (street for all)</td>
<td></td>
</tr>
<tr>
<td>2. To provide improved space allocation, occupation and utilization within the project site</td>
<td></td>
</tr>
<tr>
<td>3. To provide alternative transportation options including transit, bike lanes, and pathways</td>
<td></td>
</tr>
</tbody>
</table>
4. To preserve the character of the commercial neighbourhood through compatible design and scale of structures

5. To create a pedestrian and other NMT user friendly environment within the project site.

6. Environmental protection

Source: Author, 2014

5.2.3 Feedback and adjustment

Outputs from the various monitoring components, evaluation, tracking and auditing shall be fed back into the project implementation to enable project review and where necessary adjustment of project components to allow for proper implementation.

Table 8: monitoring and evaluation framework

<table>
<thead>
<tr>
<th>Implementation stage</th>
<th>Expected outputs and outcomes</th>
<th>Indicators of Success</th>
<th>Main Problem</th>
<th>Target</th>
<th>Means of monitoring and evaluation</th>
<th>Actors responsible</th>
<th>Resource needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space acquisition and allocation</td>
<td>Improved space allotment</td>
<td>Allotment letter</td>
<td>There is no proper space allocation and utilization</td>
<td>Proper space occupation</td>
<td>Progress reports</td>
<td>Civil Societies</td>
<td>Time Human Resource</td>
</tr>
<tr>
<td>Plan approval</td>
<td>An approved space allocation and utilization plan for the project area</td>
<td>Improved street conditions</td>
<td>Poorly Coordinated developments</td>
<td>A design that will enhance street performance</td>
<td>Examining the level of achievement of the specified goals of the project (Goal Achievement Matrix) Examining the level conformity</td>
<td>City Board for Nairobi Nairobi County Assembly Commuity Members Civil Society</td>
<td>Time Human resource</td>
</tr>
<tr>
<td>Developing of building designs and infrastructure designs and approval of the same</td>
<td>Approved building and infrastructure designs</td>
<td>The level of adequacy of the designed buildings and infrastructure services</td>
<td>Existing buildings are overcrowded by commercial use and do not have support infrastructure</td>
<td>Building designs that conform to the plot ratios and coverage proposed for the area and which will meet the demands of the people</td>
<td>Access to adequate infrastructure services</td>
<td>Examining the level of the design’s conformity to national policy goals, planning standards and zoning regulations of the project area</td>
<td>Architect and Engineer consultants, Urban Planners, City Board for Nairobi Surveyors, Community members</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Environment Assessments of different implementation projects</td>
<td>EIA reports with guidelines to mitigate adverse environmental impacts of projects</td>
<td>The levels of achievement of the environmental standards set both locally and globally</td>
<td>No EIA has been carried out to form the baseline for subsequent Impact Assessment reports</td>
<td>Minimal damage on the environmental status by the development projects</td>
<td>Assessing the expected environmental status against the approved standards both locally and globally</td>
<td>NEMA Environmental Experts (consultants), Community Members, Research Institutions</td>
<td>Funds (consultation fees)</td>
</tr>
<tr>
<td>Procurement of resources for the improved space allocation and utilization</td>
<td>Presence of all the material and human resources required for allocating space</td>
<td>The adequacy of resources and competencies of the contractors</td>
<td>Most cases of use of undesignated spaces that are not use reservedly</td>
<td>Acquisition of adequate resources needed for the carrying out the space allocation</td>
<td>Evaluating the cost of resources from various bidders against the project’s financial budget</td>
<td>Ministry of Transport and Infrastructure (KURA)</td>
<td>Ministry of Land and Housing (KISIP, KENSUP)</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Actual Construction</td>
<td>More dense commercial developments with adequate services and circulation</td>
<td>Adequately planned commercial developments</td>
<td>Access to adequate and efficient infrastructural services</td>
<td>Level of street performance</td>
<td>Conflicts in space use</td>
<td>Improved mobility and accessibility – Availability of buildings which will meet the demands and needs of the space users</td>
<td>Improved levels of security</td>
</tr>
</tbody>
</table>
Improved access and mobility

Restoration of all land affected by the projects and landscaping

- Good living and working environment
- Restoration of flora and fauna that would be interfered with by construction activities

Levels of restoration of the original state (or improvement of the beauty) of the surrounding

Achieving Minimal damage on the environment by the development projects and thus high aesthetic value of the surrounding

Ensuring that the environmental standards are observed

- Contractors
- Landscape Architect(s)
- Human resource
- Finances

5.3 Site /Environmental Management Plan

It is expected that the project will cause various disruptions on site and environment alike. The environmental management plan below is thus offered to help the contractors mitigate the possible damages.

Table 9: Environmental Management Plan

<table>
<thead>
<tr>
<th>Potential Environmental Impacts</th>
<th>Mitigation</th>
<th>Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Relocation and demolition of premises/business holdings during implementation of the project</td>
<td>• Provision of an alternative site for the displaced activities/premises; This should be done to only those who had not contravened any legislations in setting up their premises • Undertake the</td>
<td>• City Board for Nairobi • Contractor • Ministry of Transport and Infrastructure (KURA)</td>
</tr>
</tbody>
</table>
implementation of the project in phasing providing alternative routes for affected motorists such that all the impact will not be felt at the same time.

| 2. Disruption of the drainage pattern | • All works should adapt to the setting of the area drainage rather than trying to change the pattern through channelization | • Contractor  
|                                           |                                                                                       | • NEMA       |

| 3. Loss of flora and fauna | • A clear environmental impact assessment should be carried out to identify the species to be affected and possibilities of relocation | • City Board for Nairobi  
|                            |                                                                                       | • Contractors |

| 4. Noise Pollution during construction | • Minimize noise and during the working hours | • Contractors |

| 5. Decommissioning -Material sites -Equipment removal | • Rehabilitate all material sites and preparation yards  
|                                                       | • Remove all construction equipment and excess materials from the site | • Contractors |
6. Environmental pollution
   - Visual pollution (from dust and emissions)
   - Pollution of water

<table>
<thead>
<tr>
<th></th>
<th>Establish dust control program and machinery performance</th>
<th>Contractors</th>
</tr>
</thead>
</table>

*Source; Author, 2014*

5.4 Conclusion
The success of this development lies squarely on the commitment and devotion of all the stakeholders, commencing with the different street users and culminating with the management and main financiers. Political goodwill is also paramount if the project has to be successful. Strict measures should be put in place to ensure the intended consumers of the project are catered for first and avoid cases of gentrification of costs.
11. UN-HABITAT (2012), Global Urban Observatory. Street Connectivity, Promoting Street for all users.
13. UNEP (August 2012), Linking non-motorized transport to public transport, UNEP, Nairobi, Kenya.
15. Climate XL-Africa and UNEP (September 2009), Share the road; Minimum standards for safe, sustainable and accessible transport infrastructure, Climate XL-Africa, Nairobi, Kenya.
17. Obiero (1993). Roles of non-motorized transport services in Nairobi; a paper to the velocity conference Nottingham, UK.
20.
40. Internet Sources: www.opendata.go.ke
43. Ernst and peter Neufert Architects data 3rd ed.
62. Institute of Quantity surveyors of Kenya (2012). The quantity surveyors official journal
63. World health organisation standards
64. http://www.plan4sustainabletravel.org/keyThemes/neighbourhood_design_street_layout/
APPENDICES:

Appendix 1: interview schedule

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

THE STUDY OF CONFLICTS IN THE SPACE USE ALONG RONALD NGALA STREET IN NAIROBI CBD.

Declaration: This questionnaire is a part of a study of the conflicts in the space use along Ronald Ngala Street in Nairobi CBD, in partial fulfillment of the requirements for the degree of B.A (Urban and Regional Planning). Any information provided is confidential and will be used for this purpose only.

KII (City Planning Department)

QUESTIONS:

1. Who are the street users along Ronald Ngala Street?
2. How is the operation of each category of space user along this street?
3. How are these current functional use activities along Ronald Ngala Street distributed or allocated?
4. How many businesses are located along the street?
5. Have you ever counted them?
6. What are the criteria used in registering informal traders along the street?
7. Are these informal businesses allocated specific site for operation?
8. What are the criteria in the allocation of space?
9. After allocation is there security of tenure?
10. Is there monitoring of the operations of these businesses by the Nairobi City County?
11. What are the conflicts in the space use experienced along this street?
12. What are some of their main causes?
13. What are the effects of the above mentioned conflicts on the street?
14. Who resolves these conflicts?
15. What role do the individual business operators play?
16. How have these plans redefined the space especially considering the interaction of road users with the formal and informal businesses?
17. Have these plans been geared towards relocation or inclusion of the above mentioned functional use activities along the street?
18. What are some of the existing efforts to deal with operational conflicts?
19. What are the guiding policies that are provided on the design and operation of this street?
20. What are space requirements for the various types of businesses along the street especially the hawkers?
21. What are the standards and regulations on the use of this street?
22. What are the challenges that have been registered in planning for this area?
23. What maintenance measures are put in place for this street?
24. What is your view towards an effective improvement of the operation of the street?
Appendix 2: interview schedule

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

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INTERVIEW SCHEDULE TO THE STREET STAKEHOLDERS

NCC OFFICER

PART A: RESPONDENTS DETAILS

Date:……………………………

Name of respondent…………………………………………………………………………..Position
…………………………………………………………………………………

Phone number………………………………………….. Email
Address……………………………………………………………………

PART B: GUIDING QUESTIONS

25. Who are the street users along Ranald Ngala Street?
26. Who allocates space along the street among different users?
27. What is the criteria used?
28. How is the operation of each category of space user along this street?
29. How are these current functional use activities along Ronald Ngala Street distributed or allocated?
30. How many businesses are located along the street?
31. What are the criteria used in registering informal traders operating along the street?
32. Are these informal businesses located to specific site of operation?
33. What are the criteria in the allocation of space?
34. What security of tenure does the council/county provide?
35. Is there any monitoring of the operations of these businesses by the Nairobi City County?
36. How is this carried out?
37. How is the information used?
38. What are the conflicts in the space use experienced along this street?
39. What are some of their causes?
40. What are the effects of the above mentioned conflicts in the operation of business on the street?
41. How are these conflicts usually resolved?
42. What are some of the existing efforts to deal with these conflicts?
43. What are the guiding policies that are provided on the design and operation of activities on this street?
44. What are space requirements for the various types of businesses along the street especially the hawkers?
45. What are the challenges that have been experienced in planning for this area?
46. What maintenance measures does the council/county provide for this street?
47. What further improvements would you wish to suggest for the planning and control of space allocation, occupation and utilization along this street?

THANK YOU!!
Appendix 3: interview schedule

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

THE STUDY OF CONFLICTS IN THE SPACE USE ALONG RONALD NGALA STREET IN NAIROBI CBD.

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INTERVIEW SCHEDULE TO THE STREET STAKEHOLDERS
TRANSPORT SACCO REPRESENTATIVES AND DRIVERS

PART A: RESPONDENTS DETAILS
Date:…………………………..
Name of respondent…………………………………………………………………………..Position
…………………………………………………………………………………………
Phone number……………………………………………… Email
Address………………………………………………………………………………

PART B: GUIDING QUESTIONS

1. What number of public service vehicles is registered to operate along this street?
2. How many trips do they make on average per day?
3. Considering the location of matatu stages what from your experience are the major challenges experienced in parking or operating along the street?
4. Who is supposed to address these challenges?
5. Have there been any effort to address the issues in the past?
6. How were the efforts if any carried out?
7. Have you ever as stakeholders raised these issues with the city county?
8. How did they respond?
9. How well do you interact with the city county on the matter?
10. What would you propose as the further mitigation measures for the use of the street?
11.
Appendix 4: interview schedule

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

THE STUDY OF CONFLICTS IN THE SPACE USE ALONG RONALD NGALA STREET IN NAIROBI CBD.

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INTERVIEW SCHEDULE TO THE STREET STAKEHOLDERS

TRAFFIC OFFICERS

PART A: RESPONDENTS DETAILS

Date:……………………………

Name of respondent…………………………………………………………………………..Position
……………………………………………………………………………………………………

Phone number……………………………………………….. Email
Address………………………………………………………………………………

PART B: GUIDING QUESTIONS

1. What type of activities are undertaken along this street?
2. Are there accidents along Ronald Ngala Street?
3. If yes, which type of accidents?
4. What are the causes of these accidents?
5. What causes the traffic congestion along this street?
6. What are some of the efforts put in place to reduce traffic congestion along this street?
7. What do you think should be done to improve traffic condition along this street?
Appendix 5: pedestrian questionnaire

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

THE STUDY OF CONFLICTS IN THE SPACE USE ALONG RONALD NGALA STREET IN NAIROBI CBD.

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PEDESTRIAN QUESTIONNAIRE

Questionnaire No: ......................... Date of interview.........................

Time of interview ......................

PART A: RESPONDENTS DETAILS

1. Name of respondent (Optional):.................................................................
   Position in the family...........Age: below 20( ), 20-30 ( ), 31-40 ( ), 41-50 ( ),
   51-60 ( ), Above 60 ( )

2. Sex: (1) Male ( ) (2) Female ( )

3. Marital status: (1) Married (2) Single (3) Divorced/Separated (4) Widowed/Widower (5) other (specify)

4. Religion.................................................
5. Highest education level attained: (1) Primary (2) secondary (3) tertiary (4) other (specify)

6. What is the size of your household?

…………………………………………………………………………………………………………

7. Location of your residence………………….Distance from Ronald Ngala Street……………………………….

8. What is the purpose of your trip? Shopping (……) work (……) going home (……) recreation (……) other (specify)………………………………………………………………………………………………

8. What is the purpose of your trip? Shopping (……) work (……) going home (……) recreation (……) other (specify)………………………………………………………………………………………………

9. How often do you use Ronald Ngala Street? Very often ( ) often ( ) regularly ( ) infrequently ( )

10. What is your main mode of transport to:

<table>
<thead>
<tr>
<th></th>
<th>Walk throughout</th>
<th>Bike</th>
<th>Matatu</th>
<th>Taxi</th>
<th>Bodaboda</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work/school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social visits</td>
<td></td>
<td></td>
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<tr>
<td>(friends)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. How safe is this street: i) During the day for:

<table>
<thead>
<tr>
<th></th>
<th>Very safe</th>
<th>Safe</th>
<th>Average</th>
<th>unsafe</th>
<th>Very unsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>pedestrians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) During the night

<table>
<thead>
<tr>
<th></th>
<th>Very safe</th>
<th>Safe</th>
<th>average</th>
<th>unsafe</th>
<th>Very unsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>pedestrians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12. What in your opinion are some of the factors that lead to lack of pedestrian safety along this street?

.............................................................................................................................................................
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.............................................................................................................................................................
.............................................................................................................................................................

13. What facilities do you find provided in Ronald Ngala Street specifically for pedestrian use? Name them
.............................................................................................................................................................
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.............................................................................................................................................................
.............................................................................................................................................................

14. Who should provide such facilities in Ronald Ngala Street?
.............................................................................................................................................................
.............................................................................................................................................................
.............................................................................................................................................................
.............................................................................................................................................................
.............................................................................................................................................................

15. What other pedestrian facilities would you like to be provided in this street?

A.............................................................................................................................................................
B.............................................................................................................................................................
C.............................................................................................................................................................

16. What forms of insecurity have you witnessed on this street?
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.............................................................................................................................................................
.............................................................................................................................................................
.............................................................................................................................................................
.............................................................................................................................................................

17. What other improvements would you want to see made on the street to improve pedestrian movement?
Appendix 6: Passenger questionnaire

PASSENGER QUESTIONNAIRE

Questionnaire No: ………………… Date of
interview………………………..

Time of interview ………………..

PART A: RESPONDENTS DETAILS

1. Name of respondent (Optional):…………………………………………………………
   Position in the family………Age: below 20( ), 20-30 ( ), 31-40 ( ), 41-50 ( ),
   51-60 ( ), Above 60 ( )

2. Sex: (1) Male ( ) (2) Female ( )

3. Marital status: (1) Married (2) Single (3) Divorced/Separated (4) Widowed/Widower (5) other (specify)

4. Religion………………………………

5. Highest education level attained: (1) Primary (2) secondary (3) tertiary (4) other (specify)

6. What is the size of your household?
   ……………………………………………………………………..

7. Location of your residence………………Distance from Ronald Ngala Street…………………..

8. What is the purpose of your trip? Shopping (……) work (……) going home (……)
   recreation (……) other (specify)……………………………………………………………………
   ……………………………………………………………………..

9. How often do you use Ronald Ngala Street? Very often ( ) often ( ) regularly ( )
   infrequently ( ) very infrequently ( )

100
10. What is your main mode of transport to:

<table>
<thead>
<tr>
<th></th>
<th>Walk throughout</th>
<th>Bike</th>
<th>Matatu</th>
<th>Taxi</th>
<th>Bodaboda</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work/school</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social visits (friends)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. How safe is this street: i) During the day for:

<table>
<thead>
<tr>
<th></th>
<th>Very safe</th>
<th>Safe</th>
<th>Average</th>
<th>unsafe</th>
<th>Very unsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>pedestrians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) During the night

<table>
<thead>
<tr>
<th></th>
<th>Very safe</th>
<th>Safe</th>
<th>average</th>
<th>unsafe</th>
<th>Very unsafe</th>
</tr>
</thead>
<tbody>
<tr>
<td>pedestrians</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyclists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. What in your opinion are some of the factors that threaten pedestrian safety along this street?

…………………………………………………………………………………………………………………………………………………………………………………………

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……………………………………………………………………………………………………………………………………………………………………………………………………………………………………

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………

13. What form of insecurity have you witnessed along this street?

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

14. What facilities do you find provided for pedestrian use along the Ronald Ngala Street? Name them.

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

15. Who should provide such facilities along the street?
16. Are those provided adequate? 1. Yes ( ) 2. No (  

17. If no, what other improvements would you suggest to improve pedestrian use of the road?

What are some of pedestrian facilities would you like to be provided in this area?

A……………………………………………………………………………………..  
B………………………………………………………………………………………..  
C……………………………………………………………………………………..
Appendix 7: business questionnaire

UNIVERSITY OF NAIROBI
DEPARTMENT OF URBAN AND REGIONAL PLANNING

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BUSINESS QUESTIONNAIRE

Questionnaire No: …………………… Date of interview………………………

Time of interview …………………

PART A: RESPONDENTS DETAILS

15. Name of respondent (Optional):……………………………………………………………..

16. Position in the family……………… Age: below 20( ), 20-30 ( ), 31-40 ( ), 41-50 ( ), 51-60 ( ), Above 60 ( )

17. Sex: (1) Male ( ) (2) Female ( )

18. Marital status: (1) Married (2) Single (3) Divorced/Separated (4) Widowed/Widower (5) other (specify)

19. Religion……………………………

20. Highest education level attained: (1) Primary (2) secondary (3) tertiary (4) other (specify)
21. What is the size of your household?


...

22. Location of residence………………………………...Distance from Ronald Ngala Street………………………………..

23. How much is your monthly income? (Tick where applicable)

<table>
<thead>
<tr>
<th>Net monthly earnings (Ksh)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5,000</td>
<td></td>
</tr>
<tr>
<td>5,001-15,000</td>
<td></td>
</tr>
<tr>
<td>15,001-25,000</td>
<td></td>
</tr>
<tr>
<td>25,001-35,000</td>
<td></td>
</tr>
<tr>
<td>Above 35,000</td>
<td></td>
</tr>
</tbody>
</table>

NATURE OF BUSINESS

24. Observation on type and Location of Business

1. Formal (   )           2. Informal (   )                Location: Pavement (  )     Inside Shop (   )

11.

a) What type of business do you operate?..............................................................................

b) Why have you chosen to operate this kind of business?

................................................................................................................................................

..........................................................

c) Is the business registered? 1. Yes (   ) 2. No (   )

d) Do you pay any taxes to the Nairobi City County? 1. Yes (   ) 2. No (   )

e) If yes which ones?

................................................................................................................................................

..........................................................

f) How much do you pay per month?.........................
a) Have you employed anyone to assist in the operation of your business? 1. Yes ( ) 2. No ( )
   ii) If yes, how many people? ...........................................
   iii) Are you related (family members) 1. Yes ( ) 2. No ( )

b) Is there any other business activity you are involved in? 1. Yes ( ) 2. No ( )

c) If yes which one? ........................................................................................................

d) Where?.................................

e) How did you acquire space for locating your business along this street?
   A. Leased from NCC
   B. Room rented
   C. Took space where there were no developments
   D. Bought plot
   E. Others, please specify
      ................................................................................................................................

FACTORS FAVOURING BUSINESS ALONG RONALD NGALA STREET

13. Why did you choose this specific location for your business? ........................................

14. What advantages do you experience for your business by this location?
   ................................................................................................................................
   ................................................................................................................................
   ................................................................................................................................

   a) Where do you source goods for resale? ....................................................................

   b) Which people buy from you? ....................................................................................

15. Did you operate the business elsewhere before coming here? 1. Yes ( ) 2. No ( )
a) If yes where?........................................

b) Why did you move from the said site?..............................................................................................................................................

c) What is the main difference experienced between this place and the previous location?

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CONFLICTS

16. What are the challenges of working at this site/street?

...........................................................................................................................................................................................................
...........................................................................................................................................................................................................
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17. Are you satisfied with the width of the street? 1. Yes ( ) 2. No ( )

a) If No, why?..............................................................................................................................................................................................

b) If Yes, why?.............................................................................................................................................................................................

c) Are there space conflicts in this area? 1. Yes ( ) 2. No ( )

d) If Yes, which ones?...............................................................................................................................................................................

e) How are these resolved?......................................................................................................................................................................

18. Which of the following conflicts are experienced?

<table>
<thead>
<tr>
<th>Conflict type</th>
<th>Cause</th>
<th>Location</th>
<th>Effects</th>
<th>Resolution suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space tenureship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Obstruction of registered traders
Blockages of utility lines
Obstruction of traffic (both pedestrians and vehicular)
Environmental pollution
Health risks

19. Does the design (morphology) of the site affect your business and how you operate it? 1. Yes ( ) 2. No ( )

a) If yes, how?........................................................................................................................................

b) What is the state of the following in the site?

<table>
<thead>
<tr>
<th></th>
<th>Good</th>
<th>Bad</th>
<th>Very Bad</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drainage/channels/or facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid waste disposal</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Human traffic flow</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Vehicular traffic flow</td>
<td></td>
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</tr>
</tbody>
</table>

20. Is there any conflict between your business and the street carriage way? 1. Yes ( ) 2. No ( )
If yes, which type?........................................................................................................................

a) Are these conflicts resolved? 1. Yes ( ) 2. No ( )

b) How are the conflicts resolved?.............................................................................................

c) Who assists in the resolution?..................................................................................................

d) If not resolved, why are they not resolved?.............................................................................

e) Whose responsibility is it to resolve such conflicts within the street?
.......................................................................................................................................................

21. What role do you as business owners play in the process of resolving operational conflicts
   along this street?............................................................................................................................

...........

22. Is there harassment by the city county officers/officials? 1. Yes ( ) 2. No ( )

a) If yes, what are the reasons/basis of this harassment?
....................................................................................................................................................

...........
**UNIVERSITY OF NAIROBI**
**DEPARTMENT OF URBAN AND REGIONAL PLANNING**
**THE STUDY OF CONFLICTS IN THE SPACE USE ALONG RONALD NGALA STREET IN NAIROBI CBD.**

**FIELD OBSERVATION CHECKLIST**

<table>
<thead>
<tr>
<th>NO</th>
<th>WHAT IS TO BE OBSERVED</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Street character</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Encroachment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Surface standards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Slope character</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sizes of the carriage way and street wayleaves (measurements)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Surface water drainage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Direction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• blockages</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• channels</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• quality of effluents</td>
<td></td>
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<tr>
<td>3</td>
<td>On street activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• type of activities</td>
<td></td>
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<tr>
<td></td>
<td>• scale of activities</td>
<td></td>
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<tr>
<td></td>
<td>• location of activities</td>
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<tr>
<td></td>
<td>• effects of activities on pedestrians, transport, environment and other uses.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Space occupation and utilisation</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Organization of activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Type of activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Location- proximity to matatu stage</td>
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<tr>
<td></td>
<td>-average distance from the street</td>
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<td>---</td>
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<td></td>
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<tr>
<td>carriage way</td>
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<tr>
<td></td>
<td>• Spatial organization of the activities within the street space.</td>
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<tr>
<td>5</td>
<td>Solid waste disposal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Types of solid waste degenerated by different activities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Receptacles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Location</td>
<td></td>
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<tr>
<td></td>
<td>• Scale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Methods and frequency at disposal or collection</td>
<td></td>
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<tr>
<td></td>
<td>• Environmental and health implications</td>
<td></td>
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<tr>
<td>6</td>
<td>Buildings</td>
<td></td>
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<tr>
<td></td>
<td>• Scale (height) of formal and temporary buildings</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Encroachment into street</td>
<td></td>
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<tr>
<td></td>
<td>• Setbacks</td>
<td></td>
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<tr>
<td></td>
<td>• Redevelopments</td>
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<tr>
<td></td>
<td>• Functions of buildings</td>
<td></td>
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<td></td>
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<tr>
<td>7</td>
<td>Pedestrian traffic</td>
<td></td>
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<tr>
<td></td>
<td>• Direction of flow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Main entry point of traffic</td>
<td></td>
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<tr>
<td></td>
<td>• Main destination of traffic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Walkway provision and character</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Conflict points</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Size of pavements, road reserves</td>
<td></td>
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<tr>
<td></td>
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<tr>
<td>8</td>
<td>Vehicular traffic</td>
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<tr>
<td></td>
<td>• Direction of flow</td>
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</tr>
<tr>
<td></td>
<td>• Main entry point of traffic</td>
<td></td>
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<tr>
<td></td>
<td>• Main destination of traffic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Conflict points</td>
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<tr>
<td></td>
<td>• Parking spaces</td>
<td></td>
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<tr>
<td></td>
<td>• Defined parking/informal parking</td>
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<tr>
<td>10</td>
<td>Matatu stage</td>
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<td>---</td>
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</tr>
</tbody>
</table>
|   | • Design of the stage  
|   | • Space allocated  
|   | • Flow of passengers in and out of stage  
|   | • Conflict point within the street  
|   | • Bottlenecks  |
| **11** | Utility services  
|   | • Electricity lines  
|   | • Water points  
|   | • Sanitation facilities  |
| **12** | Street furniture  
|   | • Type location uses  
|   | • Space measurements  
|   | • position  
|   | • Location  
|   | • Use  
|   | • Condition and adequacy |