

**Walkability in Rapidly Growing Cities in Developing Countries:
The Case of Dar es Salaam, Tanzania**



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Wakability in Rapidly Growing Cities in Developing Countries:
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Declaration

I hereby declare that this doctoral thesis is the result of an independent investigation and that it has not been submitted to TU Dortmund University or to any other university in any version for purposes of examination. Where citations were made from works written by other scholars, acknowledgements have duly been made.

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Motivation

This study is inspired by my interest in walking, drawing on the practical case experience acquired in living and working in Dar es Salaam City, Tanzania. Walking is a typical practice characterising the life in the city. As a result of the practice, it has been quite common to witness cases of pedestrians being knocked by motorists in the city. While on roads, one can observe the way pedestrians struggle for their safety in day to day walking, especially when crossing the busy roads. To understand safety issues of pedestrians, I decided to take a trip from my residential neighbourhood to the Central Business District on foot. This gave me a clear picture of what pedestrians face daily as they make their trips. The walk was not comfortable at all. In an incidence, a lady who was walking in front of me accidentally slide and fell into an open drain which was full of mud and waste water. At a junction of the main highway, a motorcycle collided with an oncoming private car, thereby severely injuring a young man who was walking by the roadside. I wondered whether these accident incidences were coincidental or simply events regarded as the normal routines that one should not even bother to reflect on what they meant.

It appeared that pedestrians had no right of way, even in areas where the infrastructure used by pedestrians such as crossing facilities were available. As such, I had to wait for a long time to cross the highway irrespective of the zebra crossings provided. In traffic lights, the case was not different. Neither the motorists nor pedestrians seemed to bother about them. In most areas, there were no lanes for pedestrians, the situation that forced pedestrians to share the road with motorists and cyclists. In some areas, where pedestrian lanes were provided, they were encroached upon by parked cars and street vendors, and some places the walking space was muddy with burst sewers. These chaotic incidences probed me to study the status of walking environment with a view to come up with a policy and planning measures which could be used to improve the walking environment in rapidly growing cities in developing countries.

Secondly, the selection of this research topic was motivated by the fact that walkability is a global movement. Attesting to that, every year walkability professionals meet and convene international conferences on walking commonly known as “Walk21”. For the first time the Walk21 conference was held in London in February 2000, while the recent conference was held in October, 2016 in Asia, Hong Kong, where over 800 people from 38 countries gathered to learn from each other, to share their successes and difficulties in facilitating peoples movements. Following this fact, I wanted to investigate how cities of developing countries take concern of the global movements, particularly in considering the pedestrian requirements in situations of increased motorised transport.

Thirdly, Goal 11 of 2030 Agenda for Sustainable Development aims to make cities inclusive, safe, resilient and sustainable. That being the case, I was motivated to see how cities of developing countries ensure inclusive mobility, taking into account the situation of increased motorised transport.

Lastly, this study was inspired by the fact that, Tanzania has been a beneficiary of the Safer Cities Approach since 2000. The overall goal of Safer Cities is to have sustainable urbanisation which is supported by good governance, urban planning and management and social inclusiveness. The approach focuses on three areas: safer design, planning and management of public spaces to encourage interaction of people, social crime and violence prevention and institutional enforcement to ensure justice. Therefore, I was interested to see how the Safer Cities movements have enhanced the pedestrian safety, planning and management of public spaces, and inclusiveness of non-motorised means of transport in the situations increased motorised transport prevails.

Abstract

Although a significant number of trips in cities of developing countries are made on foot, especially in Sub Sahara Africa, the pedestrian environment has largely been neglected by most city authorities. Faced with high rates of motorization and the need to accommodate the growing requirements in increasingly urbanizing population; cities of the developing world are more preoccupied with motorised transport systems such as building arterial streets, Rapid Bus Transport systems (BRTs), fly overs, highways and so on so as to inter alia reduce congestion. In so doing, the needs of pedestrians that constitute the biggest users of walkways and streets are often ignored.

The policy shift from social welfare to liberal economies coupled with the slow transformation of the economy from agriculture to manufacturing and services has widened the income gap between the rich and the poor; leading to further marginalization of the basic needs such as pedestrian walkways and the future for the most vulnerable groups. Continued disregard of planning for pedestrian friendly environment has also resulted in increased numbers of pedestrian fatalities, road traffic deaths as well as rise in household expenditure on transport costs, decreased quality of the public realm and hostile pedestrian environment. Despite researches and scholarly debates have identified insufficient knowledge on safety management, there is limited knowledge on how the pedestrian requirements are considered in policy making, planning and implementation of plans in situations of increased motorised transport.

From this background, the overall objective of this study was to explore policy and planning interventions through which the walking environment in cities of developing countries can be improved. Specifically, the study aimed to achieve a number of objectives. Firstly, to study the pedestrian movement patterns in three case studies; explore the reasons why people walk more often for everyday life activities including their perspectives on the walking environment. Secondly, to examine how the existing urban design concepts, planning standards and national policies consider the pedestrian requirements in the formal planned and informal settlements including their implementations.

On the methodological fronts, a multiple case study research design was employed. Sinza, Kariakoo, and Buguruni settlements in Dar es Salaam City, Tanzania, were used as case study areas. The data collection methods included interviews, observations, review of documents, pre structured group discussions, measurements, sketches and photographing.

The analysis shows that people in the case study areas and the Dar es Salaam City in general often walk primarily because of: low income, proximity to services, a form of physical exercise, challenges related to public transport, and nature of their occupations. Regarding where they go most often, the results show that, the majority commute to workplaces, commercial service centres, community service centres, and social activities areas. Many people also walk in order to meet their recreation needs.

Overwhelmingly, people in the City of Dar es Salaam commented that pedestrians are excluded from urban mobility and are not respected by motorists. Respondents further asserted that the walking environment is uncomfortable, dangerous, insecure due to crime, and that public facilities are inconveniently located. The study has also demonstrated empirically that in the situation of increased motorised transport, the pedestrians' requirements are generally inadequately considered. Even where they are considered, their implementation was generally poor. In a few cases, where pedestrian walkways are adequately provided, they were encroached by informal and formal vendors; used as parking areas or invaded due to extension of buildings. Their protection and maintenance were also given little or no attention by the respective authorities.

To improve the walking environment this study recommends a number of measures: These include: formulation of a single consolidated pedestrian policy, establishment of pedestrian advocacy groups, review of design concepts and planning standards, provision of planning guidelines that adequately meet the pedestrian accessibility and safety needs, implement redevelopment schemes, pedestrianisation of the congested streets, expansion of the BRT services, promotion of the concept of shared space, establishment of transport department at municipal level, and launching of a transport authority within the city (DUTA). For effective implementation of the plan proposals, the study further recommends the establishment of a steering committee, formulation of strategic action plans and stringent enforcement of land use development control. Finally, it is also important to encourage private and public firms to partner with LGAs and invest part of their corporate social responsibilities to promote pedestrian facilities and overall environment in neighbourhoods.

Acronyms

ADA: American with Disability Act

CC: City Council (Tanzania)

CCM: Chama Cha Mapinduzi

CIUP: Community Infrastructure Upgrading Programme

COST: The acronym for European Cooperation in Science and Technology

BRT: Bus Rapid Transit

DAPE: Dar es Salaam Association of Pedestrians

DART: Dar Rapid Transit Agency

DCC: Dar es Salaam City Council

DFID: Department for International Development (DFID)

DSM-RAS: Dar es Salaam Regional Administrative Commissioner

DUTA: Dar es Salaam Urban Transport Authority

GTZ: Deutsche Gesellschaft für Technische Zusammenarbeit -German Agency for Technical Cooperation

HH: Resident Households

ICTCT: International Cooperation on Theories and Concepts in Traffic Safety

ITF: International Transportation Forum

JICA: Japan International Cooperation Agency

LAMATA: Lagos Metropolitan Area Transport Authority

MLHHS: Ministry of Lands, Housing and Human Settlement Development

MOF: Ministry of Finance

MOHA: Ministry of Home Affairs

MOT: Ministry of Transport

MOW: Ministry of Works

NBS: National Bureau of Statistics

PDs: Pedestrians

PMO: Prime Minister's Office

PMO-RALG: Prime Minister's Office for Regional Administration and Local Government

RFB: Roads Fund Board

SUMATRA: Surface and Marine Transport Regulatory Authority

TANRODS: Tanzania National Roads Agency

TEMESA: Tanzania Electrical and Mechanical Services Agency

UK: United Kingdom

UN-United Nations

UNEP: United Nations Environment Programme

URT: United Republic of Tanzania

WHO: World Health Organization

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CHAPTER ONE

1. BACKGROUND INFORMATION AND RESEARCH ISSUE

1.0 Introduction

This chapter introduces the study by giving a brief background to the research topic. The research topic is discussed from global, regional and national perspectives to illuminate on what is happening in different contexts for comparison, drawing lessons and identifying the knowledge gap. In this chapter, the research issue, objectives, propositions and significance of the study are also presented.

1.1 Urbanisation and the right to walk

The rapid urbanization has resulted into urban transport crises and urban sprawl in many cities of developing countries. Urban areas are rapidly urbanizing both economically and spatially, leading to increased movement of people from one place to another. This has called for transport planning to provide the infrastructure to facilitate this nature of movements (Givoni and Banister, 2010). In the past, attention was been given to some travel methods like public and private transport at the expense of other modes such as non-motorised transport, which has not solved the traffic jam problem but rather aggravated it (Schmeidler, 2008). Although authorities have been switching from one motorized mode to another in an attempt to reduce traffic congestion in urban areas, yet solution has never been found (ibid). The United Nations (2011) cited in Godard (2011) argue that walking assist in solving traffic congestions in urban areas, especially when short distance trips within the city are done on foot rather than using a car which in most cases is stuck in a traffic jam for long hours leading to high fuel consumption, delays, pollution and eventually affecting economic growth of a country. Schmeidler (2008) further emphasizes that walking as a mode of transport is absolutely essential and unavoidable in mobility (ibid). Due to this fact, since the 1990s, walkability has emerged as a major concern of public health, urban design and planning fields. For example, The International Charter for Walking has stated eight rights of communities, these are:

- *Communities have the right to expect land-use and spatial planning policies which allow them to walk to the majority of everyday services and facilities, maximizing the opportunities for walking, reducing car-dependency and contributing to community life;*
- *Communities have the right for their streets to be designed to prevent accidents and to be enjoyable, safe and convenient for people walking – especially children, the elderly and people with limited abilities;*
- *Communities have a right to up-to-date, good quality, accessible information on where they can walk and the quality of the experience. People should be given opportunities to celebrate and enjoy walking as part of their everyday social, cultural and political life;*
- *Communities have the right to a network of connected, direct and easy to follow walking routes which are safe, comfortable, attractive and well maintained, linking their homes, shops, schools, parks, public transport interchanges, green spaces and other important destinations;*
- *People in communities have the right to access streets, squares, buildings and public transport systems, regardless of their age, ability, gender, income level, language, ethnic, cultural or religious background, strengthening the freedom and autonomy of all people, and contributing to social inclusion, solidarity and democracy;*
- *Communities have the right to live in a healthy, convenient and attractive environment tailored to their needs, and to freely enjoy the amenities of public areas in comfort and safety away from intrusive noise and pollution;*
- *Communities have the right to expect an urban environment designed, maintained and policed to reduce crime and the fear of crime; and*
- *Communities have the right to expect authorities to provide for, support and safeguard their ability and choice to walk” (<http://www.walk21.com/charter>).*

Taking a note of the rights stated above, it can be argued that walking is not a favour; rather, it is a necessity. People have the right to walk, access, and use urban public spaces. This means, if such rights are not realized in a particular city, people have the right to reclaim. However, despite the fact that communities have the rights to access and use urban public spaces, this need is restrained in cities of developing countries. While cities of the developed world have plans to transform arterial streets to accommodate pedestrians¹ and further to create livable streets, cities of the developing world are more preoccupied with building arterial streets for motorized vehicles, thereby ignoring the needs of pedestrians that constitute the biggest users of streets (UN-Habitat, 2013b). However, growing evidence and international consensus claims that prioritization of motorized vehicles is a short-term approach that temporarily eases traffic flow, but also stimulates growth in vehicle numbers and use that will again result in more congestion. ITF (2012) adds that ensured walking is not only an attractive alternative that complements to motorized transport, but also a core response to the challenges of climate change, fossil fuel dependence, pollution, maintaining mobility for an ageing population, health and managing the explosion in motorization expected in low-income and middle-income countries.

1.2 Theoretical background

1.2.1 Walking as a means of transport

Walking is a common and basic mode of transport among all societies across the world (WHO, 2013). Every journey starts and ends with walking (ibid). That being the case, all human beings are pedestrians. Everyone is a pedestrian at least for a part of his/her journey because everyone walks or uses a pedestrian network to get to work, shop, worshipping places, reach the bus stop, get exercise or just to have fun. Walking is the fastest means of moving around and can access areas that cannot be accessed by motor vehicles (UN-Habitat, 2013b). People walk for various reasons, for example, making short trips in residential neighbourhoods like visiting friends and relatives and shopping for essential household commodities (Schmeidler, 2008). Walking is also used for leisure activities like jogging and hiking. In other cases, walking may be used to connect to other modes of transport like bus or train (ibid). People also walk for health reasons and recreational purposes (<http://www.ocpcrpa.org>). However, in developing countries, walking is the only means of transport for the very poor meaning that they walk simply because they do not have an alternative (UN-Habitat, 2013b).

Walking distances are determined by climatic conditions, topography and land use patterns (Otak, 1997). The harsh climate like rainy or sunny seasons may limit people from walking. Many people prefer to walk long distances for leisure; but short distances when in a hurry like from bus stops to their offices (ibid). Levels of household incomes determine transport modes to be used by different groups (Dimitriou and Banjo, 1990). High and middle income classes tend to use motorized transport as compared to the low income group who highly depend on walking as a mode of transport (ibid). However, with the increased traffic congestion in urban areas, the middle income and high class group is also forced to walk to their destinations which are less time consuming and relatively cheap (ibid).

Despite the significance of walking, this mode of transport is not prioritized in transport planning, especially in developing countries irrespective of the fact that it requires inexpensive measures to invest in as compared to other modes (Schmeidler, 2008). The increased demand for walking as a mode of transport requires sustainable planning and planning interventions in the built environment. Travel choices are greatly influenced by urban planning since it organizes the city spatial structure (ibid).

¹ A pedestrian is anyone on foot (WHO, 2013). This includes also those aided by some equipment like wheelchairs, walkers, canes, roller blades and motorized scooters. A person is considered a pedestrian while jogging, running, hiking or lying down by roadside (ibid).

1.2.2 Walkability

Walkability is the physical environment in which walking takes place (Glanz, 2011). Walkability is “the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network” (Southworth, 2005:148). A walkable network comprises six important attributes namely: connectivity of path network (both locally and in the larger urban setting); linkage with other modes (bus, streetcar, subway, train); fine grained and varied land use patterns (especially for local serving uses); safety (both from traffic and social crime); quality of path (including width, paving, landscaping, signing, and lighting); and path context (including street design, visual interest of the built environment, transparency, spatial definition, landscape, and overall explorability) (ibid). However, walkability is considered differently in developed and developing countries:

Walkability in developed countries

Walkability discussions in many developed countries focus on encouraging mode shifts from motorized to non-motorized means of transport for short trips, or on promoting walking as a healthy leisure activity (Krambeck, 2006). Moreover, in many developed countries, walkability is regarded as a measurement of how many people are walking (UN-Habitat, 2013b). According to the UN-Habitat report, people in developed countries often have the choice to walk or not to walk, irrespective of whether the design is inviting or not essential to the results. Muhlbach (2012) claims that in many high income countries, walking is considered as the best remedy for the chronic diseases like obesity, diabetes and asthma, a situation that had forced planners and public health professionals to promote healthy plans in some American communities. These plans are referred to as pedestrian and bicycle plans. These plans strive to increase the overall quality of life for residents and making communities healthier by promoting physical activity; and the easiest way to get people interested in getting out is by simply walking (ibid).

To promote walking, streets in most cities of the developed world are redesigned to accommodate various modes of transport like motorists, cyclists and pedestrians (UN-Habitat, 2013b). Following this desire, cities are being re-designed to allocate more spaces for walking, cycling and promoting the use of public space. The core of the cities has more than 25% of land allocated to the streets and less than 15% in Suburban areas (ibid). Nevertheless, cities are dedicating increasing amounts of public space to pedestrians, cyclists, and public transit. For example, London has pedestrianized a part of the famous Trafalgar Square. Vienna has also closed its central streets to vehicle traffic and Copenhagen has built an extensive bicycle network (ibid). Additionally, several movements and projects regarding walkability in cities of developed countries have been established. For instance, in Europe, North America and Oceania, there are “livable streets” movements or “complete streets” projects that aim not only to make streets more accessible by all the user groups, but also make cities more environmentally friendly by reducing motorized transport (ibid). However, the UN-Habitat report adds that various options for enhancing pedestrian safety; such as construction of separate lanes for cyclists and pedestrians and the adjustment of traffic signal timing that allows sufficient time for pedestrians to cross a street are being implemented.

Walkability in developing countries

Contrary to cities of developed countries, walking in cities of developing countries is often considered in terms of providing mobility for the poorest residents who normally walk to reach their places of work because they cannot afford the cost of public transport (UN-Habitat, 2013b:viii). In slum areas of many cities of the developing world, walking on the streets is not a choice, but a necessity due to lack of other affordable transport alternatives (ibid). This argument is also supported by Montgomery and Roberts (2008) who argue that in urban areas of developing countries, where high rates of urban

growth, large poor populations and high densities prevail, walking is the only option available to a significant portion of the population. Montgomery and Roberts further claim that many people in cities of developing countries are “captive walker”, meaning that they cannot afford an alternative. That being the case, improvement in the state of the pedestrian environment is inevitable to allow walkers to reach their daily needs.

Nevertheless, various studies have indicated that walking is probably a major transport mode in cities of developing countries as it provides mobility to a high percentage of the urban population. For example, in Dhaka, Bangladesh about 62% of daily trips are made on foot, especially the urban poor who have only few or no alternatives (Jöhnson, Tengström & Tiwari., 2005; Shumi, 2013). Similarly, Gwilliam (2002) cited in Krambeck (2006) argues that the modal share of pedestrians in developing cities tends to very high. For example, the modal share of pedestrians in major Indian cities ranges between 25 and 50% of all trips made within cities, and about 50 % of all trips in major African cities are done entirely on foot. In medium and smaller developing cities, the share of walking trips can be as high as 60 to 70 per cent (ibid). Likewise, a study by Pendakur (2005) found out that walkers in developing cities across the globe comprise over a third of the modal share of all trips made.

Similarly, urban transport studies in Africa show that walking and cycling contribute 50% of all trips (Pendakur, 2005; Montgomery and Roberts, 2008; Mosha and Mosha, 2012). Sub-Saharan African cities hold the largest numbers of walkers, where many of the cities have greater than 50 per cent of all trips made on foot. In view of Pendakur (2005) the share of walking is 70% in Addis Ababa and Kinshasa, 63% in Harare, approximately 62% in Ugandan and Zimbabwean cities, and 61% in Cape Town, South Africa, especially the lower income people in Cape Town. He adds that the modal share for walking accounts for 60% in Bamako and Niame, 47% in Nairobi, 45% in Dar es Salaam and 42% in Ouagadougou.

Despite the significant number of trips made on foot in cities of developing countries, yet infrastructural facilities for pedestrians and cyclists are inadequate. Cities in developing countries make improvements in vehicular rights of way at the expense of pedestrians with a substantial decrease in the quality of public realms and walking environment (Mosha and Mosha, 2012). The welfare of pedestrians is often sacrificed to planning for the fast flow of vehicles and investment in facilities for pedestrians is comparatively low (Pendakur, 2005; Montgomery and Roberts, 2008). Pedestrian infrastructure, amenities and services are often neglected in municipal planning and budgets (Krambeck, 2006). Automobiles have caused unbalanced land-use developments that increasingly favour urban sprawl, which causes most people to spend more time in their vehicles, which in turn causes traffic congestion, pollution and makes a more unsafe environment for pedestrians of all ages and abilities. Although eliminating usage of automobiles is impossible, however, eliminating the use of a vehicle for short trips could be drastically reduced if walkability is promoted in residential neighbourhoods.

A study by UN-Habitat (2013b) note that most cities in the developing countries have inadequate and deteriorating transport infrastructure and poor facilities for non-motorized transport (walking and cycling). In most cities of developing countries, there are not enough streets. Even where they exist, they are either not well designed or well-maintained and in most cases street norms and regulations are inadequately enforced (UN-Habitat, 2013b). As opposed to street in developed countries where large amount of land is allocated to the streets, in most city cores in developing countries, insufficient land is allocated to street (usually less than 15% of the land), the situation is worse in the suburbs where less than 10 % of land is allocated to street (ibid). For example, out of 40 cities of developing countries analysed by UN-habitat in 2013, only 7 cities allocated more than 20% of land to the streets in their city core and less than 10% of land is allocated to the streets in their suburban areas (ibid). The large gap between street connectivity in the city core and in the suburban areas is a reflection of

the huge inequalities in most cities of the developing world. Due to the negligence of facilitating the pedestrian movements, most people are forced to walk to reach services and facilities using narrow, unpaved streets without sidewalks as the pedestrian infrastructure are often lacking and there are few affordable alternatives of transport. The few streets built are arterial and are meant for motorized means of transport. As a consequence, pedestrians are exposed to car accidents which sometimes claim their lives (ibid).

1.2.3 Walking, a neglected mode of transport

Despite the fact that every journey starts and ends with walking, yet walking is rarely captured in government statistics on mobility and is often neglected in planning and policy development. Walking is forgotten in data, forgotten in cities and in the decision making process (ITF, 2012).

- Neglected in data,

According to the ITF, most cities have abundance of data on motorised traffic, but shortage of data on pedestrians despite of the fact that information on walking are key performance measures and are necessary for understanding the correlation between urban and street design and to evaluate the impact of pedestrian infrastructure improvements. ITF noted that many countries, particularly ITF/OECD countries, collect mobility data about the population on a national scale, with more emphasis on motorised travel sometimes without recording pedestrian mobility. Even if pedestrian mobility is recorded, it is usually underestimated. Because pedestrian trips are typically quite short, people tend to forget many of these short trips when reporting their daily travel behaviour (ibid). In most travel surveys, a pedestrian trip is recorded as a trip if and only if the whole journey is completed on foot. Persons travelling by using more than one mode of transport over the course of a journey may be asked to only report on the mode of travel used for the longest distance covered on the journey. Based on this approach, short trips like walking the dog, walking to the mailbox to post a letter or visiting a neighbour are often overlooked and forgotten by the respondent, and thus never reported. However, the walking trips are not only limited to trips completed on foot, but also includes trips taken by other transport modes. For example, a simple trip using public transport has at least three components or stages. These include: walking from home to the bus stop on foot; the bus ride and walking from the bus stop to the destination on foot. For example, in Switzerland 28% of all trips are pedestrian trips (done entirely on foot), while 45% of all stages are pedestrian stages. This example illustrates that the real *proportion of walking* is much higher than the statistics suggest (ibid).

- Neglected in cities

Through history, a key notable feature of cities has been the problem of facilitating the movement of people going about their daily life, such as travelling to school, work and recreational activities, as well as running errands (Tira and Daudén, 2010; ITF, 2012). Historically, the development of towns and cities were meant to reduce travel distances by locating facilities and services in proximity travels. Experiences show that when populations depended more on walking and animal transport alone, cities and towns were limited to a size accessible on foot. In this case, proximity was necessary to facilitate peoples' movements of going through their everyday life activities. ITF (2012) argues that cities were created as a safe and secure place against enemies and natural threats. Cities and towns were mostly developed for less demanding modes of transport in contrast to modern day societies. Since the ancient times, provision of pedestrian infrastructure was a priority. For instance, during the Roman times, pedestrians' pathways throughout towns were perceived to be safe and comfortable, despite the animal powered chariots posing potential danger to pedestrians (ibid). However, the rapid urbanization has resulted in increased population, urban transport crises and urban sprawl in many cities of developing countries. Due to the high population growth, most towns and cities spatially expanded with the invention of motorised transport supporting longer distance trips. The era of the private car has completely changed the town design worldwide (ibid).

Consequently, the modern day societies have become considerably more reliant on motorised vehicles, leading to serious health, economic and environmental implications. Most cities in developing countries do not make walking as a priority strategy for urban and transport development. The general increases in economic growth coupled with increased personal income have promoted car ownership (ITF, 2012). As a result, convenient use of motor vehicles has increased at the expense of pedestrian movement. The welfare of pedestrians is often sacrificed to planning for the fast flow of vehicles (Pendakur, 2005). Likewise, Mosha and Mosha (2012) argue that in cities of developing countries, walking receives a minimum attention from transport planners, spatial planners, architects and other professionals involved in urban planning and development programmes. Following the negligence in facilitating the pedestrian movements, the sprawling of cities and the Mono-centric urban city structure in most cities, home and workplaces have become separated by greater distances due to availability of private cars. The loss of proximity considerations in urban design has led to fewer walking trips despite some views that support the notion of liberalisation of locations.

- *Neglected in the decision making process*

Despite the fact that everyone is a pedestrian in one way or another, yet pedestrian needs are inadequately represented in the urban policy making and institutions representing specifically the interests of pedestrians are rare (ITF, 2012). This implies that it is very rare to find either national comprehensive strategies or national policies established to support walking. Less than 35% of low- and middle-income countries have policies in place to protect pedestrians and cyclists (WHO, 2013). The exclusion of pedestrian need in decision making process has negative implications to the pedestrians, especially the most vulnerable groups are such as the children, the elderly, the poorest residents and those with mobility related impairments. Despite the fact that these groups rely heavily on walking, still are inadequately involved in making their needs known to decision makers and generally lack support from advocacy groups who are active in the transport sector. Pedestrian advocacy groups and institutions that solely represent the interests of pedestrians are rare (ibid).

Even though policy makers rely on mobility statistics, including data on personal travel behaviour to formulate strategic transport policies and to improve the safety and efficiency of transport systems, yet pedestrian mobility is clearly under-researched and under-represented in the transport statistics. ITF (2012) and OECD/ITF (2008a) have reported that responsibilities for accommodating the pedestrian needs are spread across a wide range of organisations and ministries, including transport, safety, environment and health. As a result, there is no clear institutional responsibility, especially at the national level. However, the mechanisms to ensure collaborative and coordinated efforts towards pedestrian mobility and safety needs and incentives for agencies to promote walking a priority are lacking (ITF, 2002). According to ITF (2012) only a few European countries such as the Netherlands have public officials in charge of pedestrian issues within the transport ministry. Nevertheless, in terms of fostering innovation and creating new knowledge about pedestrians, there is still a small (although growing) number of institutions and countries establishing research programmes that aim at creating sustainable transport options, including pedestrian mobility (ibid).

1.2.4 Pedestrians as the weakest group of users in the City

Continued negligence of facilitating pedestrian movements in cities of developing countries has led to the number of pedestrian-motor vehicle related crashes, injuries and fatalities, increased travel time and cost (especially for the low income earners), physical inactivity, traffic congestion, air and noise pollution and street insecurity. Details regarding these consequences are as discussed below:

Increased pedestrian fatalities and injuries

Pedestrians and cyclists have been pinpointed to be the most vulnerable road users in terms of accident fatalities (GTZ, 2010). Although pedestrians do not pose significant risks to other road users,

surprisingly, they are exposed to life threatening situations by them. In many cases, whenever there is a road accident involving either motorists or cyclists, pedestrians are usually the victims of such accidents and their fatalities are high as compared to other road users (ibid). In an urban set up, a pedestrian would typically be described as a walking Urbanite (ibid). Other road users regard them as a bother and causing inconvenience to them not knowing that at one point in time, they will become pedestrians as well.

The inadequate planning for pedestrians has many negative consequences, the most notable being unnecessary fatalities and injuries. Pedestrians in developing countries are much more likely to be injured or killed than they are in developed countries, even at equal vehicle flow rates. Downing (1991) cited in Krambeck (2006) noted in a British study that at a rate of 1,500 vehicles per hour, risk rates in Nairobi and Surabaya were 86% and 172% respectively greater than in urban areas in the UK. A study by Transportation Research Laboratories (TRL) as cited by Sayer (1997) argues that more than half of all traffic-related fatalities in developing countries are pedestrians. Moreover, the UNEP report of 2009 on promoting the road sharing and ensuring safety in use of infrastructure recognizes safety as a major concern in urban roads. Elizabeth and Mitchell (2006) argue that pedestrian safety is a concept loaded with comfort, convenience and security. The Global status report on road safety shows that over 90% of the world's fatalities on the roads occur in low-income and middle-income countries (WHO, 2009). Besides that, over a third of road traffic deaths in low- and middle-income countries are among pedestrians and cyclists (WHO, 2013). However, half of the world's road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (5%) out of all road deaths globally, 22 per cent are pedestrians (ibid).

In many urban areas of developing countries, pedestrians are at risk of being attacked as they walk, the risk of being run-over/being knocked down by motor vehicles and at risk of falling in the deteriorating infrastructure (Elizabeth and Mitchell, 2006). Their needs are usually not adequately addressed due to the lack prioritization in urban design (Dimitriou and Banjo, 1990). However, when pedestrians are considered in transport planning, attention is usually given to the infrastructure provision not considering their safety in using the infrastructure (UNEP; 2009). Moreover, the infrastructure provided is never respected by the motorists, despite the fact that pedestrians are also required to have a right of way which is usually not the case many times. This current study investigated if this global issue is also a typical trend in developing countries.

The Asian cities are generally faced by insufficient pedestrian signature, insufficient and unmaintained sidewalks, poor road designs, poor implementation of traffic rules and regulations and personal insecurity (Mittal, 2010). This trend is equally observed in Sub-Saharan cities whereby pedestrian safety is usually an afterthought by many urban authorities (World Bank, 1998). Pedestrian infrastructure is missing in many urban areas and those existing have been poorly maintained leading to less safety in walking. Zimmerman et al., (2011) has noted that pedestrian fatality in Africa stands at 38 per cent. Although the urbanisation rate is high in Latin America and Caribbean region as compared to other developing countries, the scenario is not different. Walking is done with a lot of difficulties whereby pedestrian ways are neglected making it unsafe for those using baby carriers or wheelchair (UN, 2011). In addition, the ways are not lit, making them insecure at night (ibid). Pedestrian deaths account for 31 per cent in Latin America and Caribbean region (WHO, 2013).

In Tanzania, the situation is similar to many Sub-Saharan cities. Pedestrian victims of road accidents stand at 55.1 per cent (Zimmerman et al., 2011). Although the National Transport Policy (2011) recognizes the lack safe infrastructure for pedestrians as factors contributing to poor safety on urban roads, very little has been done to address this challenge. This has been associated with limited financial resources by the authorities (Pendakur, 2005). Walking in Tanzania is unsafe due to lack of safe

pedestrian ways, difficulties in crossing at various intersections, encroachment of the available pedestrian walkways by vehicles and petty traders and also safety awareness among the public is inadequate (ibid). It is therefore clear that the state of pedestrian safety is at risk in developing countries which are fast urbanizing. This situation is different from the developed countries such as Germany and Netherlands where safety has been prioritized in planning. The urban designs have shortened travel distances by densification of land uses in a neighbourhood. Massive pedestrian infrastructure has been provided and rules and regulations strictly enforced for law breakers against pedestrians (Cobbies, 2003).

Increased household expenditure on transport

As noted by the UN-Habitat (2013b), in most African, Asian and Latin American and Caribbean cities, the poor walk to reach their places of work because they cannot afford the cost of public transport. The vast majority of the urban poor in Sub Saharan Africa depend on non-motorized transport (NMT) as their main means of transport and their urban transport expenditures account for 10 per cent (in the smaller cities) to 20 percent of their household income (Pendakur, 2005). According to Pendakur, it accounted for 12.4 % of household expenditures in Abidjan (1993), 13 % in Ouagadougou, Lomé and Cotonou (1996) and 17 % in Yaoundé (1996). From 1993 to 2002, the overall household transport expenses in Abidjan increased by 20 %, despite the 1994 devaluation of its currency (ibid). As cited in Pendakur (2005), a study by Kane and Godard conducted in Dakar in 1999 indicates that the urban poor spent as much as 28 % of their household incomes on transport. In Buenos Aires, though the low income households walk for over half of their work journey, yet they spent 32% of their family income on public transport journeys to connect to work places (Montgomery and Roberts, 2008). Because of the increased transport expenditures, the urban poor households are forced to depend more on walking, have fewer travelling days and reduced number of trips, especially those in large cities.

Increased travelling time by the low income families

Automobiles have caused in-balance in land-use developments that increasingly favour urban sprawl, which causes most people to spend more time in a vehicle which in turn causes traffic congestion, pollution and makes a more unsafe environment for pedestrians of all ages and socio-economic status. Although eliminating usage of automobiles is impossible, however, eliminating the use of a vehicle for short trips could be drastically reduced if walkability is promoted in residential neighbourhoods. A study by Pendakur (2005) revealed that 49 per cent of Walkers in Morogoro (Tanzania) spend between 30 and 75 minutes on average per a walking trip. As a consequence of sprawl, in Mexico City, people are forced to commute sometimes 3 hours in one direction on their journey to work, spending 6 hours per day travelling 7 to 8 hours per day working (Kombe et al., 2002). As a result, the only resources the poor have, that is, time and physical energy are depleted (Pendakur, 2005). The limited pedestrian accessibility and mobility in cities of developing countries due to inappropriate pedestrian infrastructure and disconnected origins and destinations has added substantial travel time to pedestrian journeys.

Street insecurity / Daunting walking environment

In cities of developing countries street muggings, pick-pocketing, and other forms of pedestrian-directed crime influence the ability and willingness to walk. Montgomery and Roberts (2008) citing conversation with Shomik Menhdiratta argue that security is particularly relevant for women and children who, may not choose the alternate modes (use a taxi to cross the street, rather than walk) or may be forced to eliminate trips due to negative perceptions toward pedestrian conditions. The fearless urban walking of intimidation or physical harm influences the life of the city, particularly at night-time and for vulnerable users, such as women, children, and the elderly. Montgomery and Roberts (2008) and McNeil et al (2003) argue that in Wuhan (the capital of Hubei Province, China)

“women were keenly aware of security issues; they feel vulnerable to theft and assault, especially at night because street lighting is poor.” However, Montgomery and Roberts (2008) claim that other walkers in a neighbourhood contribute to the security of a place, and without eyes on the street, the walking environment becomes treacherous for everyone, even men. This argument indicates that there was a need of exploring ways through which walkability in cities of developing countries could be improved, which was the subject of this study.

From the foregoing evidence, policy and planning interventions that encourage walking for short trips are highly needed in cities of developing countries to reduce the burden suffered by the vulnerable group. (Montgomery and Roberts, 2008) argue that traveling long distances along physically daunting walking environment reduces the time and energy residents can spend on jobs, families, studies, and other productive activities. Therefore, whenever planning for an urban environment, it is important to consider pedestrian needs because walking is inevitable in urban areas. Walking is a convenient mode of transport required for short trips. It is time saving and enhances people’s mobility from one place to another (Schmeidler, 2008). This calls for town planners to develop a pedestrian friendly environment that is conducive for walking (Corben et al, 2011 cited in International Transport Research Centre publication 2011). The main question that the current study sought to answer was: How can walkability in rapidly urbanizing cities in developing countries be improved?

Global discussions and local debates have identified insufficient knowledge on pedestrian safety management in urban areas of developing countries. However, there is limited knowledge on how the rapidly urbanising cities in developing countries consider the pedestrian requirements in policy making, planning and implementation process, in a situation of increased motorised transport.

This study therefore geared towards finding out planning and policy interventions that could be adopted to sustainably improve walkability in rapidly growing cities in developing countries. The study was particularly cognizant of the situation of increased motorised transport in rapidly urbanising cities in developing countries. Notably, this study was not intended to test theories. On the contrary, its focus was on examining the reality between the existing urban design concepts, planning standards and relevant national policies adopted versus their actual implementation in regard to recognition of pedestrian requirements in situations of increased motorised traffic. Therefore, the study focused on assessing the pedestrian movement patterns, perspectives of pedestrians on the walking environment and examining how the physical environment supports walking in cities of developing countries.

1.3 Statement of the problem

Although walking contributes to about 50 per cent of all trips in low income countries, especially in Sub Saharan African cities, the pedestrian environment has largely been neglected by most cities. Faced with the high rates of motorization and the need to accommodate growing congestion, cities of the developing world are more preoccupied with building arterial streets for motorized vehicles to reduce traffic congestion, thereby ignoring the needs of pedestrians. In Dar es Salaam, Tanzania, the situation is similar to many Sub-Saharan Cities. The walking environment is unsafe, uncomfortable and inconvenient. Currently, the City is already implementing a number of strategies to minimize traffic congestion. These are such as improving the capacity of roads in terms of increasing the number of lanes, proposing new overpasses and underpasses at the main road intersections and improving public transport services. In so doing the needs of pedestrians that constitute the biggest users of walkways and streets are ignored. Research and scholarly debates have identified insufficient knowledge on pedestrian safety management in urban areas of developing countries. However, there was limited knowledge on how the pedestrian requirements are considered in policy making, planning and implementation of plans, taking into account the situation of increased motorised transport.

1.4 Research objectives and research questions

Main objective

The overall objective of the study was to explore the pedestrian mobility patterns, policy and planning interventions through which the walking environment in cities of developing countries could be improved in a situation of increased motorised transport.

Specific objectives

- i) To explore the pedestrian movement patterns in three case study areas, the reasons why people in cities of developing countries walk more often, including their perspectives on the walking environment and how the physical environment supports pedestrian movements with regard to their vulnerability.
- ii) To examine how the existing key urban design concepts, planning standards and relevant national policies consider pedestrian requirements in the formal planned and upgraded informal settlements.
- iii) To analyse how the existing urban design concepts and planning standards adopted in the formal planned and upgraded informal settlements are being implemented to enhance the pedestrian concerns.

Research questions

1. How and why people in Sub-Saharan African cities walk more often for everyday life activities?
 - 1.1 Why people in Sub-Saharan African cities walk more often for everyday life activities?
 - 1.2 How can the pedestrian mobility patterns in the formal and informal settlements be classified?
 - 1.3 How do people perceive the walking environment in the formal and informal settlements?
 - 1.4 How does the physical environment in the formally planned and upgraded informal settlements support pedestrian mobility?
2. How do the existing key urban design concepts, planning standards and the relevant national policies, consider pedestrian requirements in the formal planned and upgraded informal settlements?
3. How are the urban design concepts and planning standards adopted in the formal planned and upgraded informal settlements being implemented to enhance the pedestrian concerns?

Propositions

Yin (2003: 23) claims that propositions direct attention to something that should be examined within the scope of the study. He adds that without propositions an investigator may be tempted to cover 'everything'. Similarly, Yin (1993:39) argues that propositions are important in the case study research approach because they provide the reference point against which the data are collated and results generalized. The Yin's argument implies that a research issue may be inconceivable if left unbounded, especially when the phenomenon being studied is influenced by several variables.

The proposition for this study were based on the literature reviewed, the policy shift in Tanzania from social welfare to liberal economies, a situation that contributes to the marginalization of walking in favour of motorized means of transport), and more importantly the author's own experience as a resident in the study area over ten years. Based on the preceding explanations, two propositions were formulated to guide the study. These are as follows:

- i) In a situation of increased motorized transport in cities in developing countries, pedestrian requirements are inadequately considered due to the low priority given.
- ii) Even where the pedestrian requirements are adequately considered, their protection and maintenance are given little or no attention by the respective authorities.

1.5 Significance of the study

Pedestrian accidents in Dar es Salaam stand at 55.1% of all the road accidents (Zimmerman et al, 2011). In 1998 the figure was 41%, according to the Ministry of Communication and Transport cited in Thum (2004). This implies that, over a thirteen years period, the figure increased by 14%, meaning that if no intervention measures are provided, the figure is likely to rise further. Apparently, this is likely to adversely impact on the economic development of the country. If this study was not done, the policy makers, spatial planners, urban designer, transport and traffic engineers, architects and other urban development actors would lack intervention measure to adequately facilitate the pedestrian mobility in Dar es Salaam. The community would continue to have limited understanding of measures to be undertaken regarding their rights to walk in their neighbourhoods. The study adds knowledge to the field of integrated transport planning whereby effective pedestrian planning measures are identified. Completion of this study will contribute knowledge towards urban design concepts, planning standards and planning guidelines relevant for improving walkability in cities in developing countries.

It is considered that the body of knowledge generated from this study will contribute towards re-orienting urban and transport planning and the design of settlements to consider the pedestrian requirements. This is because planning has an important role to play, particularly as it influences the urban form, which finally sets the scene for pedestrian mobility in cities. It is anticipated that improving practice in planning for walking will create more opportunities for people to live in places with easy walking access to urban services and public transport. This will help reduce car use and create healthier neighbourhoods and cities. Ensuring a foot-network to connect the entire urban area will facilitate the ability of the vulnerable groups to reach essential destinations, such as employment centres, health care services, shopping, schools, worshipping places and other recreational areas. These can be achieved if and only if cities of developing countries design /redesign and implementing a series of planning standards, design concepts and policy guidelines that consider the pedestrian needs. ITF (2012) has argued that walking should take a central position in urban transport policies to build the sustainable cities of tomorrow, because walking is a key mode of transport for short trips and a part of longer multi-modal trips.

1.6 Structure of the report

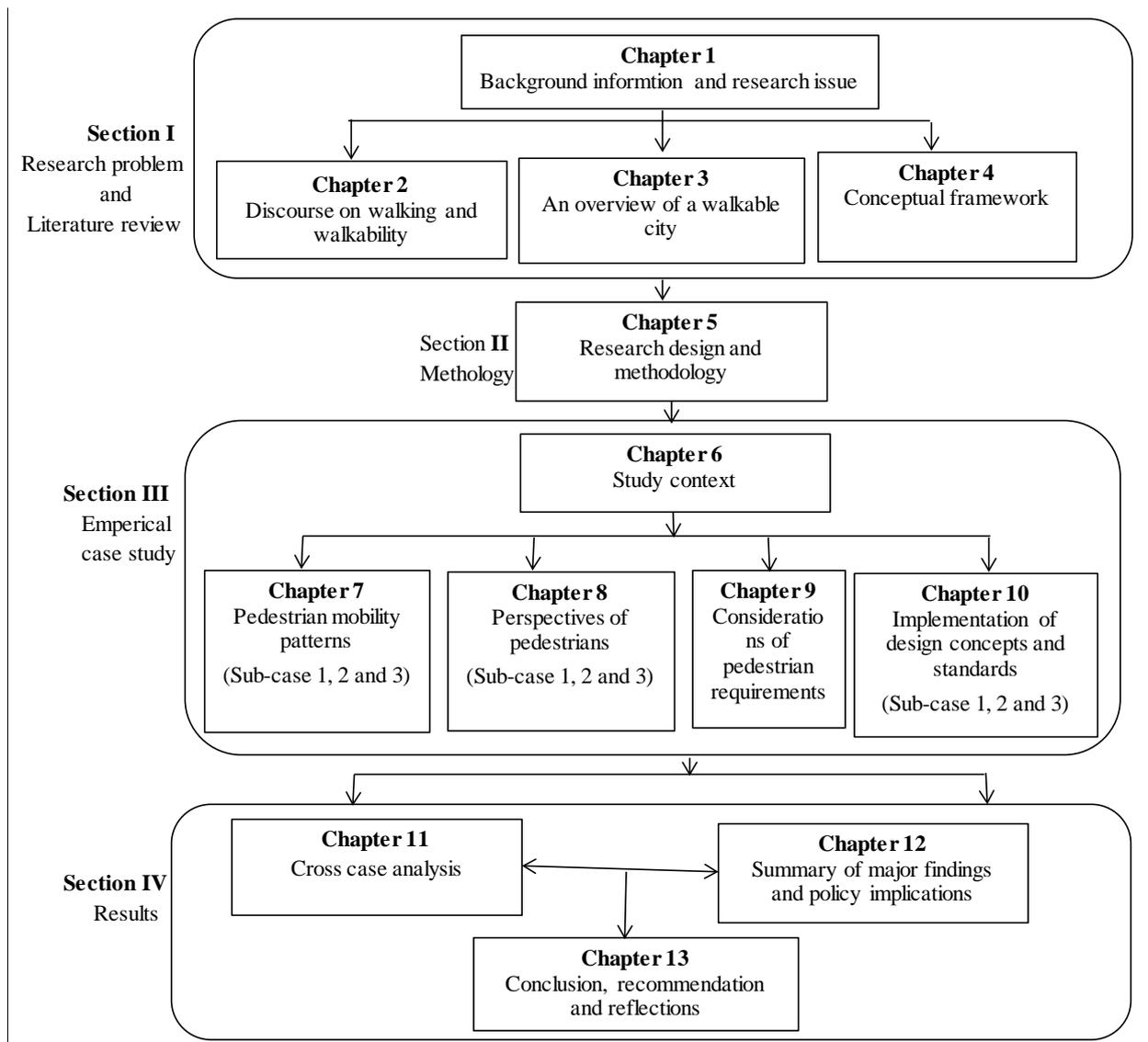
This dissertation report has been organised into four parts covering thirteen chapters. In each chapter, a distinct outlook that relates to each stage of analysing the main research focus and answering the research questions is presented. The twelve chapters address a variety of issues at various levels. The structure of the entire report has been diagrammatically presented in Figure 1.1.

Section I of the thesis constitutes chapters 1, 2, 3, and 4, which describe the research problem and the reviewed literature underpinning the entire research. Chapter 1 provides a brief background to the research issue and states the research problem, the research objectives and research questions, the significance of the study, propositions and the structure of the entire report. Chapter 2 discusses the dialogues of walking and walkability and how they are perceived globally, regionally and in the national context. The chapter defines the key concepts, discusses the purposes for walking, the factors influencing people to walk, barriers of walking, tools for measuring walkability, walkability research approaches and the benefits of walking and walkability. Chapter 3 is an overview of a walkable city. The chapter highlights the urban philosophers supporting walking, pedestrians and street designs. It also presents characteristics of a walkable city, the design concepts for promoting and improving walkability in the built up areas, and finally the urban visions and design guidelines for walkable communities. Chapter 4 presents the conceptual framework that guided the study.

Section II is covered by chapter 5, which gives a detailed discussion on the methodological approach, research design and strategy, research process, selection of case study areas, unit of analysis, sampling and fieldwork procedures, data collection techniques, data analysis, validity and reliability of the data collected.

Section III of this report constitutes chapter 6, 7, 8, 9 and 10, which cover the study context and the finding results. Chapter 6 describes Dar es Salaam City as the case study. It describes the location, size and climatic condition of Dar es Salaam city. It also provides the administrative structure of the city, population growth, economic activities, urban structure, the travel patterns within the city, spatial expansion and land use coverage of the city. Chapter 7 presents the pedestrian movement patterns in the three sub-cases (i.e. Sinza, Kariakoo and Buguruni). The chapter highlights the reasons for walking, the daily and weekly pedestrian mobility patterns and the means of transport used by the respondents. Chapter 8 presents the investigations regarding the perspectives of pedestrians on the walking environment, particularly on the connectivity of the walking routes, safety and security of the walking routes, accessibility to public facilities, convenience and attractiveness of the walking routes in the study areas. Chapter 9 discusses the notion of pedestrian requirements in the context of Tanzania. It covers the National level comprehensive documents, sectoral policies, local level planning documents and the planning standards adopted. Chapter 10 is about the implementation of the existing design concepts, planning standards with regard to the walking environment and describes the various issues that were emerging.

Section IV comprise the Chapters 11, 12 and 13 whereby the results emerging from the three cases are compared and recommendations found to the research problems are outlined in this part. Chapter 11 is a cross-case analysis where the pedestrian movement patterns, perspectives of pedestrians, the implementation of design concepts and planning standards, and the cross cutting issues emerging from the findings of the three cases are compared and contrasted. Chapter 12 provides a summary of major findings and policy implications. Finally is Chapter 13, which provides conclusions of the entire research, recommendations and also reflecting on the conceptual framework and methodology. In the light of the findings, suggestions on possible areas for further research are also presented in this chapter.



Source: Own construction, June 2017

Figure 1.1: Structure of the Report

CHAPTER TWO

2. DISCOURSE ON WALKING AND WALKABILITY

2.0 Introduction

This chapter presents a review of walking and walkability from different parts of the world (i.e. global, regional and national levels). The chapter starts by describing walking and walkability, the walking purposes, factors influencing people to walk, measurements of walkability, walkability research approaches, the benefits of walking and walkability, and finally walking and walkability situations at global, regional and national context are presented. The chapter summarizes the lessons and challenges drawn from different countries with regard to the walking environment.

2.1 Walking

Walking and walkability are terms that are increasing in prevalence in both the planning and health fields (Glanz, 2011). However, walking is different from walkability in the sense that *walking* is simply a form of physical activity while *walkability* is the physical environment in which walking takes place (ibid). Walking can be described as the most natural human way of getting around, of integrating and living the urban space and of accomplishing salutary physical activity (Paulo, 2012). He adds that while walking, the human body exercises both physically and mentally. However, walking is associated with many benefits to individuals. Emery and Crump (2003) cited in Paulo (2012) argue that walking is an essential factor in the creation of “livable communities”, encouraging neighborly interactions and making the urban environment a more enjoyable and safer place to live. Nevertheless, John Butcher, Founder of Walk21 has covered many benefits of walking for the individual as he says:

“Walking is the first thing an infant wants to do and the last thing an older person wants to give up. Walking is the exercise that does not need a gym. It is the prescription without medicine, the weight control without diet, and the cosmetic that can’t be found in a chemist. It is the tranquilliser without a pill, the therapy without a psychoanalyst, and the holiday that does not cost a penny. What’s more, it does not pollute, consumes few natural resources and is highly efficient. Walking is convenient, it needs no special equipment, is self-regulating and inherently safe. Walking is as natural as breathing”

John Butcher, Founder of Walk21, 1999²

These lines from the International Charter for Walking adequately cover the many benefits of walking. Because of the above benefits, walking needs to be given priority by urban authorities as it is the universal mode of transport in urban settings, connecting households to the transportation system and destinations.. For the poorest people, the children, the elderly and those with limited mobility, walking is often the only form of transport which they can afford. Even for those who can afford to public transport, yet walking is still the first and last-mile of these journeys. Despite these benefits, yet there are many barriers hindering walkability and it is a neglected mode of transport, particularly in developing countries for the transportation disadvantaged.

2.1.1 Walking purposes

The literature shows that Walking is done mainly for two purposes. These include: Walking for transport or utilitarian purposes and walking for leisure/recreational purposes (Paulo, 2012). In walking for transport or utilitarian, walking is regarded as a mean of reaching a destination such as going to school, work, shopping, grocery store, parks, meeting friends, etc., while in walking for leisure/recreation, walking becomes a mean to an end, being for exercise, for relaxing, for contemplation, etcetera (Saelens et al., 2003; Paulo, 2012). Though walking for leisure is considered to be of

² In International charter for walking

greater importance in terms of physical activity, mobility studies have always paid more attention to the utilitarian walking than the recreational walking (Schmid, 2006 cited in Paulo, 2012:10).

2.1.2 Factors influencing people to walk

Walking is a fundamental means of transport for everyone. However, there are factors that influence peoples' decisions on whether to walk or not. These include the followings:

Proximity: Studies (Perry, 1929; Allan, 2001; Emery and Crump, 2003; Saelens *et al.*, 2003; Elizabeth and Mitchell, 2006) have argued that the distance needed to walk or the time needed to walk those distances influence people's decisions on whether to walk or not. Over short distances, walking has been regarded as the most attractive means of transport. However, many studies have shown that almost 80% of people are willing to walk up to half-mile (nearly 800m) to reach their destinations, provided the adverse weather conditions (heat, rain, snow) are also compromising. Only twenty percent of people are even willing to walk up to two miles to reach their destinations (Emery and Crump, 2003: 12).

Environmental factors: Environmental stressors (e.g. crowding, noise, traffic congestion, community violence and crime), *physical features* that reduce a sense of defensible space, incivilities that increase neighbourhood disorder, high levels of information overload and distraction, and excessive participation in sedentary activities such as use of the internet are the key environmental factors that constrain or decreases the physical activity in a particular area (Handy,2005: 15-16; King, Stokols et al. (2002). On the contrast, the restorative or stress-reducing features (e.g. water, foliage, vistas, aesthetic elements), dominance of recreational facilities (e.g. parks, gyms, playing fields, bike trails), high levels of social capital or cohesion among community members, physical features that enhance imageability and legibility, and community-based electronic networks that disseminate information about the health benefits of physical activity are considered to be the main environmental factors that promote the physical activity (ibid). In addition, safety and fear of crime are being frequently regarded as the uppermost constraining factor to walking, especially by the vulnerable groups and those who rely more on walking (Evans, 2009) in Paulo (2012).

The built environment: Handy (2005) argues that some characteristics of the built environment are likely to influence physical activity levels, or at least certain types of physical activity (e.g., destination-oriented travel or recreational physical activity). Studies (Handy 2005; Paulo (2012) have noted that certain characteristics of the built environment like certain *land use patterns* (e.g. density, diversity of uses), certain *design features*, and certain aspects of the *transportation infrastructure* (sidewalks in particular) encourage walking in the built environment. Although *safety and secure from crime* are non-physical attributes of the built environment, Handy (2005) adds that these parameters are also closely linked to the decisions to be physically active in many population groups (i.e. women, including minorities; children; and older adults). Handy's argument is in line with a study by Saelens *et al.*, (2003) where it is reported that people living in traditional neighborhoods characterized by *higher residential density, mixture of land uses, grid-like street patterns with short block lengths* engage in more walking and cycling trips for transport than do people living in sprawling neighborhoods. Saelens *et al.*, (2003) further argue that *Proximity* (distance) and *Connectivity* (directness of travel) can also influence the choice whether to walk or not. In view of these authors, proximity relates to the distance between trip origins and destinations, while connectivity characterizes the ease of moving between origins and destinations within the existing street and sidewalk-pathway structure. Connectivity is highly observed if and only if *streets are laid out in a grid pattern* and barriers to direct travel between origins and destinations are controlled or only a few exist. In addition to direct routes, gridiron pattern streets are highly recommended due to the fact that they can offer the choice of taking alternative routes to the same destination (ibid).

Socio-economic characteristics: Apart from the environmental factors, socio-economic characteristics are also believed to have impacts on the travel behaviour (Handy 2005). To understand what influences people to whether walk or not; and what do people value when they choose a particular path, the study addressing travel behaviour theories have been found most useful in answering such questions. Generally, the Physical activity behaviour is influenced by both individual characteristics and the social environment (Handy, 2005). Handy makes it clear that, whether or not an individual is physically active depends on demographic characteristics (*gender, age, and ethnic background*), and on socio-economic characteristics (*education and income level*). With regard to individual's behaviour, the physical activity depends upon other three factors, namely; *attitudes, preferences, motivations and skills*. Thus, personal attitudes, motivation, and social support systems are also found to be critical for physical activity (ibid).

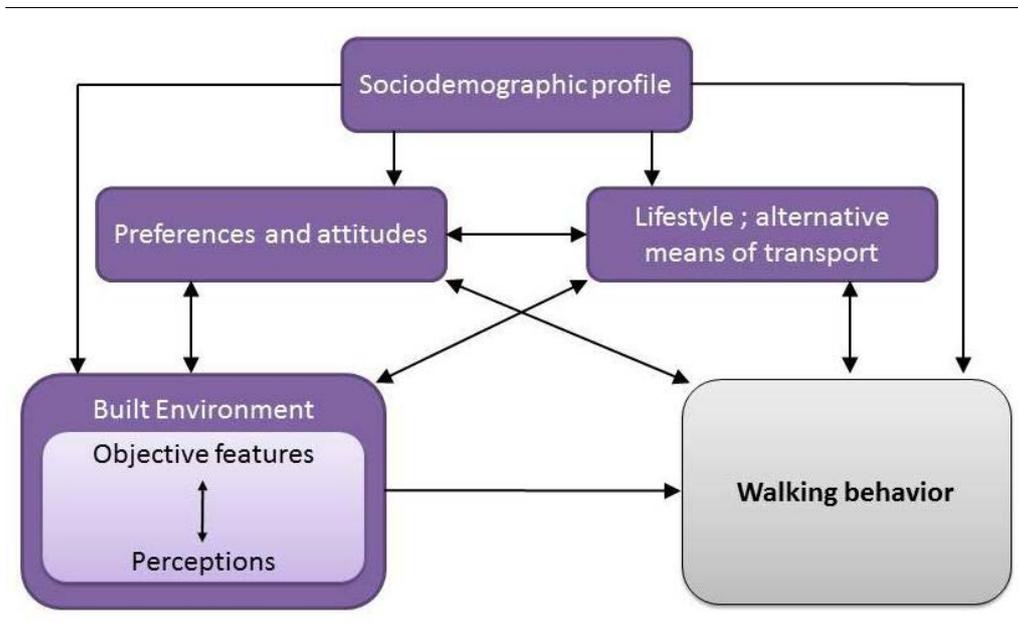
Additionally, in travel demand forecasting models, Handy argues that utility maximization generally equates to the minimization of monetary cost and/or travel time (Handy, 2005). With regard to this model, Handy argues that “the generalized cost can be operationalized as a linear sum of attributes, each with a weight reflecting its importance. Besides, the standard measures of cost, including out-of-pocket monetary costs and travel time, generalized costs can include such factors as *comfort and convenience* – anything that contributes to the disutility (or takes away from the utility) of the trip” (Handy, 2005:9). As discussed by Handy, the standard application of utility-maximization model in travel behaviour has assumed that travellers will minimize travel time in order to maximize utility, and, in this case, walking would be a travel choice if only if it delivers shorter travel times compared to other means of transport (ibid). However, other positive utilities can be associated with walking (such as *the enjoyment of walking itself, the social interaction or the scenery interaction*) that might add significantly to the utility of the walking choice. Therefore, for walking it is suggested that considering generalized cost factors like *comfort and convenience* are undoubtedly more relevant than considering travel time or distance alone. When considering travel time or distance, the *perceived* time or distance may be more relevant to travel choices than actual time and cost (ibid).

Generally, a study by Handy (2005) has indicated clearly that individuals are often willing to sacrifice the maximization of utility for the sake of variety. This implies that instead of selecting the option that maximizes utility at that moment, individuals will usually choose a less-preferred alternative, gaining but a more favourable memory of the sequence of choices.

Perceptions: Perception has been defined in the urban planning literature as the process of attaining awareness of understanding of sensory information. Ewing and Handy (2009) argue that what is perceived normally results from “*interplays between past experiences, one's culture and the interpretation of the perceived*” As explained by Paulo (2012), the theories of planned behavior, drawn from the field of psychology have included the individual ‘perceptions’ as an insight component towards understanding and identifying factors that determine behaviour. With regard to walking, the presence or absence of sidewalks, presence or absence of traffic calming measures for instance, can facilitate or limit a behaviour; and hence peoples’ perceptions are likely to encourage or discourage people whether to walk or not. As explained (Handy, 2005), it is the individual's beliefs or perceptions about the existence of such factors than explain behaviour, rather than their objective existence. Social norms also play an important role in this theory, especially when related to choosing alternatives to automobile such as walking, biking or public transportation (Paulo, 2012).

Person's lifestyle: When it comes to longer term choices, a person's lifestyle influences the choice (Silva et al., 2006; Paulo (2012). This implies that certain types of persons may choose to live and work in areas that suit their lifestyles and resources, what is referred to as “self-selection” (ibid). In this case, persons who enjoy walking will always prefer to live in more walkable neighborhoods than

those who depend on motorized transport. As argued earlier that the built environment affects choices, Schmid (2006) cited in Paulo (2012) admits that people who live in walkable neighborhoods will choose to walk more often.



Source: Adapted from Paulo (2012:9) citing Handy (2005) and Schmid (2006)

Figure 2. 1. Conceptual relations between walking and the built environment

Figure 2.1 above summarizes the relationship between the factors influencing people to walk or not. These include: socio-demographic factors, preferences and attitudes, lifestyle (more related to availability of alternative means of transport) and the built environment (objective features and perceptions). However, it can be noted from figure 2.1 people’s lifestyle, preferences and attitudes are influenced by the walking behaviour. When it comes to travelling, the relationship between the built environment and walking behaviour depicts that the individual’s choice is influenced by the attributes of a place. On one hand, this relationship implies that people’s perceptions, lifestyle, preferences and attitudes can be affected by the attributes of a place; and on the other hand, people’s perceptions, lifestyle preferences and attitudes can influence the walking behaviour. Schmid (2006) and Paulo (2012) conclude that factors that discourage people from walking are likely to change with time and under the influence of a pedestrian friendly walking environment. From these conceptual relations, only the relation between the built environment and walking are considered in this study. This is due to the fact that this current study intended to examine how the built environment support walking in cities of developing countries and how people perceive the walking environment.

2.1.3 Barriers of walking

It is argued that the personal and environmental barriers and the two main sets of variables believed to negatively influence the decision to walk (Lawrence and Peter, 2000). Personal barriers are subjective considerations that operate on an individual level that inhibit physical activity, while *environmental barriers* are objective conditions that restrict one’s mobility and physical activity (ibid). Personal factors such as lack of motivation, lack of time, physical inability to exercise (injuries or disability), lack of social support for exercise, one’s household obligations (like childcare responsibilities), weather and lack of health knowledge may increase or decrease the decision to go on a trip and, if so, using which mode (Booth et al., 1997: 34; Lawrence and Peter, 2000: 13-14). Besides, *environmental barriers* are more related to how the physical environment supports the physical activity. Handy (1996) argues that if the available routes to be taken by bicycle or foot are unsafe, unpleasant, or unattractive, for example, the odds increase that walking or biking will not be chosen.

2.2 Walkability

Walkability is “the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network” Southworth (2005:148). According to Southworth, a walkable network comprises six important attributes namely: connectivity of path network (both locally and in the larger urban setting); linkage with other modes (bus, streetcar, subway, train); fine grained and varied land use patterns (especially for local serving uses); safety (both from traffic and social crime); quality of path (including width, paving, landscaping, signing, and lighting); and path context such as street design, visual interest of the built environment, transparency, spatial definition, landscape, and overall explorability.

Walkability is a global movement through which every year walkability professionals come together at the international walking conference commonly known as Walk21 (Matan and Newman, 2016). For the first time, a global gathering and the first Walk21 conference was held in London in February 2000. The Conference aimed at confirming the importance of walking issues at political and policy levels; provide an international platform for an inclusive discussion of walking issues; acknowledge the research, practice and promotion undertaken so far and to highlight best practice and identify the need for future research and opportunities for funding future networking (<http://www.walk21.com>). The walk21 conference was held in October, 2016 in Asia, Hong Kong, where over 800 people from 38 countries gathered to learn from each other, to share their successes and to share their difficulties. Matan and Newman acknowledge that in the walkability field there is perhaps no one more persistent nor better known than Jan Gehl, the Danish urban designer and architect who has been studying walking and advocating for people-focused design of cities for over 50 years.

2.2.1. Measuring walkability

One way of assessing and measuring walkability is to undertake a walking audit (Dibyendu and Soumen, 2013). According to these scholars, *PERS* (Pedestrian Environmental Review System) and *Walk Score* are the commonly audit tools that have been widely used in the UK. The Walk Score is an algorithmically derived Walkability Index based on the distance to the closest amenity in each of several categories. Walk Score uses Google maps to compute the distance between residential addresses and nearby destinations. The Walk Score algorithm looks at destinations in 13 categories (grocery store, restaurant, bar, coffee shop, movie theatre, school, park, library, bookstore, fitness, drug store, hardware store, clothing and music store) and awards points for each destination that is between one-quarter mile and one mile of the subject residential property. However, the walk score does not consider factors such as sidewalk availability, safety of the neighbourhood, and topography (Ibid). Moreover, a study by Krambeck (2006) has developed the Global Walkability Index (GWI) for assessing improvements of walkability in developing cities. With regard to developing countries, Krambeck has proposed three walkability parameters, namely; *safety and security, convenience and attractiveness, and the degree of policy support* (i.e. the degree to which the municipal government supports improvements in pedestrian infrastructure and related services).

2.2.2 Walkability research approaches

The research into walkability has two common approaches to the variables: one such approaches depends on measuring the spatial configuration of street networks and the other depends on operationalizing urban design qualities such as imageability, enclosure, transparency and complexity by measuring the actual physical environment (Özer and Kubati, 2014). This research utilized the latter approach (i.e. operationalizing urban design qualities) so as to understand how the pedestrians perceive the walking environment and how the physical environment supports the walking environment.

2.2.3 Benefits of walking and walkability

According to Matan and Newman (2016) Walkable urban design plays critical role in terms of creating health, environmental and economic benefits. In addition, the important implications of walkability are further discussed by Matchett (2010) from which this study benefited. According to Matchett, walkability does have important implications for health, sustainability, economics, equity, and social capital.

Health: Forsyth and Southworth (2008) in McNally (2010:5) argue that many recent health studies have confirmed that walking can promote mental and physical health, including cardio-vascular fitness and reduced stress, constituting a moderate intensity physical activity. Moreover, McNally adds that walkable neighbourhoods promote healthier and more sustainable lifestyles for their residents. This is because when people shift from dependence of automobiles and automobile trips to walking, residents are able to make the healthy decision by walking to the various land use destinations within the neighbourhood instead of driving.

Safety: From road safety perspectives, McNally adds that injuries from road traffic crashes are a leading cause of death and disability worldwide (Matchett, 2010). According the Global Status Report on Road Safety 2015, road traffic injuries kill more than 1.2 million people each year and have a huge impact on health and development. The burden of these deaths falls mostly on low- and middle-income countries where rapid economic growth has been accompanied by increased motorization and road traffic injuries, with double fatality rates of high-income countries and 90% of global road traffic deaths (WHO, 2015:vii). The young people aged 15 to 29 are the most victimized age group, and cost government approximately 3% of GDP (Ibid). The continued road deaths among the young people have a particularly significant impact on people in their most productive years. However, pedestrians, cyclists and motorcyclists are the most vulnerable road users-make up half of these fatalities (ibid).

A study by Matchett (2010) indicates that road traffic deaths are expected to increase to as many as 2.4 million per year by 2020. While the vast majority of these deaths is forecasted to occur in low- and middle-income countries, death rates in high-income countries are predicted to decrease over time. Even though WHO (2015) indicates that 49% of all road traffic deaths occur among pedestrians, cyclists and motorcyclists it is generally recognized that pedestrians, cyclists and motorists, specific data on pedestrian deaths and injuries in the low- and middle-income countries is limited. However, as noted by Matchett (2010), a study by Odero et al., (1997) indicate that pedestrians account for between 41 and 75 per cent of road traffic fatalities occurring in developing countries.

Another study by Downing (1991) estimates pedestrian fatalities in developing countries to range between 29% and 51%. Generally, the poor walking environment contributes to health problems, though in more indirect ways. Experience shows that when the walking environment is difficult or dangerous, people who can afford an alternative will often choose to travel by motorised means of transport despite the environmental pollution from vehicles. Matchett argues that when the walking environment is difficult and dangerous to walk on, people living in auto-oriented neighbourhoods are less expected to be physically active as most of their time will be spent on motorised means of transport. Combined with poor nutrition, the lack of physical activity ends to obesity and overweight (ibid).

Therefore, to achieve the health related benefits, designing for Walkable streets/neighbourhoods, communities and cities is inevitable as it creates a safer environment for pedestrians and other non-motorized transport users within cities. Pedestrians feel safe and more comfortable travelling within the city when sidewalks, crosswalks, traffic calming measures and street buffers are adequately provided.

Sustainability: From an environmental point of view walking is recognized as a ‘green’ and the most sustainable mode of transport as it has low environmental impacts, without air and noise pollution which significantly impact the environment (Matchett, 2010; Paulo, 2012). A friendly walking environment coupled with good public transit system may act as an alternative to the use of private cars, thereby reducing traffic congestion, air and noise pollution in urban areas. Furthermore, walking is a sustainable mode of transport as it reduces the usage of fossil fuels and other non-renewable sources which also impact the urban environment. Walkability also reduces the use of cars, residents’ expenses on gas and helping decrease CO₂ emissions (McNally, 2010; Matchett, 2010). In addition, walking is a sustainable mode of transport as it requires less space compared to motorized vehicle travel. This is because walking encourages compact development, which finally leads to more efficient land use and less sprawl of cities.

Economy: From the economic point of view, walkability is associated with both positive and negative economic impacts (Litman, 2009; Matchett, 2010; Paulo, 2012). Regarding the positive side, walking is relatively cheaper as it is little cost associated; it needs only basic infrastructure (Paulo, 2012). “Walkable neighborhood design promotes the economic vitality of communities, bringing business and economic opportunities to residents. High-density, mixed use development allows the opportunity for residents to meet all of their basic needs within the community” (McNally, 2010:4). This argument is also supported by Matchett (2010) that a pedestrian friendly environment means more customers are attracted to walk to shops and more residents patronizing local businesses, both of which are important for economic growth of cities. Walkable communities also enhance access, particularly in countries where walking is the primary mode of travel. Montgomery and Robert (2008:5) argue in the same line that “Ensuring that there is a foot-network to connect the entire urban area can facilitate the ability of the urban poor to reach essential destinations, such as employment centres, medical facilities, and schools”. Even though all households in the middle and low income countries would like to access basic services and other economic activities using a low cost transportation such as walking, still is particularly of a great significant and valuable to the poor households that would otherwise have to dedicate significant portions of their income to travel costs.

On the negative side, poor walking environment imposes a number of economic costs on low- and middle-income countries, including costs associated with pedestrian deaths, injuries, and illnesses (Matchett, 2010). According to WHO (2015), the road traffic fatalities cost governments approximately 3% of GDP. So long as pedestrians are reported to be the most vulnerable group of road traffic injuries than other road users, it is obvious that the economic costs of pedestrian crashes in low- and middle-income countries are likely to be higher as well. Matchett adds that pedestrian crashes can also have some economic impacts at the household level due to funeral expenses, costs associated with caring for an injured household member, and the loss of income that occurs when a household member stops working due to death or disability. As cited in Matchett (2010), a study by the Commission for Global Road Safety on households in Bangladesh and Bangalore revealed that poverty in these countries was an outcome of death and injuries from road traffic crashes. Based on the study, 71% and 33% of the urban households studied in Bangladesh and Bangalore respectively were not poor prior to road traffic crashes (Commission for Global Road Safety). Reasons identified for this drop included: “funeral costs (which represented three months’ income in urban areas), loss of income from primary breadwinners injured or killed, and loss of income from household members staying home to care for an injured person” (Matchett, 2011: 76).

Equity: With regard to equity, walking can be regarded as the most equitable means of transport as it is cheap and needs only basic infrastructure. McNally (2010) and Lo (2009) argue that pedestrian facilities can provide accessibility benefits to a greater portion of the community when compared to road or rail improvements. This means that a pedestrian friendly environment can provide transporta-

tion options for vulnerable groups that are traditionally underserved by auto-oriented transportation systems. A pedestrian friendly environment helps to provide access for the vulnerable groups, particularly the elderly, children, the disabled, women, and others who cannot use or afford other modes of transportation (Montgomery & Roberts, 2008). According to Litman (2009:14) argue that “Walkability can help achieve several equity objectives, including a fair distribution of public resources for non-drivers, financial savings and improved opportunity for lower-income people, increased accessibility to people who are transportation disadvantaged, and providing basic mobility”. However, walkability is associated with equity in the sense that sidewalks, street corners, and other public spaces provide opportunities for people of all ages and ability, classes, and occupations meet and interact with one another on an equal footing. As cited in Matchett (2010), Enrique Peñalosa, the mayor of Bogota between 1998 and 2001, said, “*In our highly hierarchical societies, we meet separated by our socioeconomic differences. The CEO perhaps meets the janitor, but from his position of power. In sidewalks and parks we all meet as equals*” (Peñalosa, 2002).

Social capital: Many studies indicate that residents of walkable neighbourhoods have higher social capital than residents of auto-oriented neighbourhoods. For example, a study of walkability in Ireland indicated that, “residents living in walkable and mixed-use neighbourhoods are more likely to know their neighbours, to participate politically, to trust others, and to be involved socially” Leyden (2003: 1550) cited in Matchett (2010). The rapid urbanization coupled with urban sprawl and increased motorised transport has resulted in the loss of social networks, which increases household vulnerability to economic shocks. Improving walkability in cities of developing countries can help to address this problem by providing opportunities for urban residents to interact and build their social networks. This implies that by reducing dependence on motorised transport, residents in an area are able to interact with fellow members if they choose to walk.

2.3 Walkability in the global, regional and national contexts

As discussed earlier, walking is a mode of transport which is used by all individuals. Journeys start and end with walking. That being the case, pedestrian movement should be facilitated since it affects all individuals. Walking as a mode of transport is important in many ways: it promotes door to door transport, promotes social interaction, and does not require waiting time like in public transport; it is cheaper, healthy and acts as bimodal means of connecting other modes of transport. Increasing urbanisation accompanied by congestion in the cities has led to many people opting to walk so as to save time and reduce travel costs (Piet Rietveld, 2001). Despite the significance of walking, surprisingly, the pedestrian requirements have been neglected by many authorities, especially in developing countries (Corben et al., 2011). Pedestrians are major victims of road clashes in the world (WHO, 2013). Neglect of this group has impacts on the economic development of a country. This is simply because since walking saves time and costs, enhance the health of people and conserves the environment (does not emit smoke, noise and dust like automobiles) (GTZ, 2005).

Schmeidler (2008) argues that “municipalities with a good environment for pedestrians support gatherings and social life; they flourish with life and often visited. On the contrary, the shopping avenues that are highly congested with motor traffic may be most likely to discourage people from visiting. The improvement of conditions for pedestrians’ supports local economy brings more activities to municipal centres and enhances access to local stores, libraries and other facilities. Safer streets allow parents or guardians to give children more freedom, and thus also room for social communication and development”.

2.3.1 Walking at global context

According to the Global Status Report on Road Safety of 2015, more than 1.2 million people die each year on the world's roads, making road traffic injuries a leading cause of death globally (WHO, 2015: ix). Out of these, almost half of the world's road traffic deaths occur among motorcyclists (23%), pedestrians (22%) and cyclists (5%). Only 31% of the world's road traffic deaths occur among car occupants and the remaining 19% among unspecified road users (WHO, 2013:6). Mostly these deaths occur in cities of developing countries where rapid economic growth has been accompanied by increased motorization and road traffic injuries, with double fatality rates of developed countries (WHO, 2015:vii). Over a third of road traffic deaths in low- and middle-income countries are among pedestrians and cyclists. However, the African Region has the highest proportion of pedestrian and cyclist deaths at 43% of all road traffic deaths (WHO, 2015: 8). Despite the high rates of world's road traffic deaths among motorcyclists, pedestrians and cyclists, yet less than 35% of low- and middle-income countries have policies in place to protect these road users (WHO, 2013: ix).

Moreover, very little data is documented about the accidents in residential neighbourhoods, especially in developing countries where the records are almost nonexistent (ibid). Pedestrians have over time been neglected by city authorities in their programmes who seem to focus more on motorized transport modes especially on highways neglecting inner roads. Corben et al., (2011) reaffirm this by stating that pedestrians are an afterthought of city planning and in some cases never considered at all. However, with regard to developing countries, the majority of trips is still made by walking and cycling, especially in African cities. For example, in Dakar, Senegal, walking typically represents 71 percent of all trips UN (2010a: 13). Despite the fact that walking is integral part of the transport system and conveniently for shorter distances, its importance is neglected in urban transport planning in developing countries. This trend is further revealed by failure to recognize transportation in the Millennium Development Goals (MGDs). None of the eight MDGs directly addresses transport needs. As Table 2.1 indicates, globally pedestrian accidents are increasing as compared to other modes transport which seems to be decreasing.

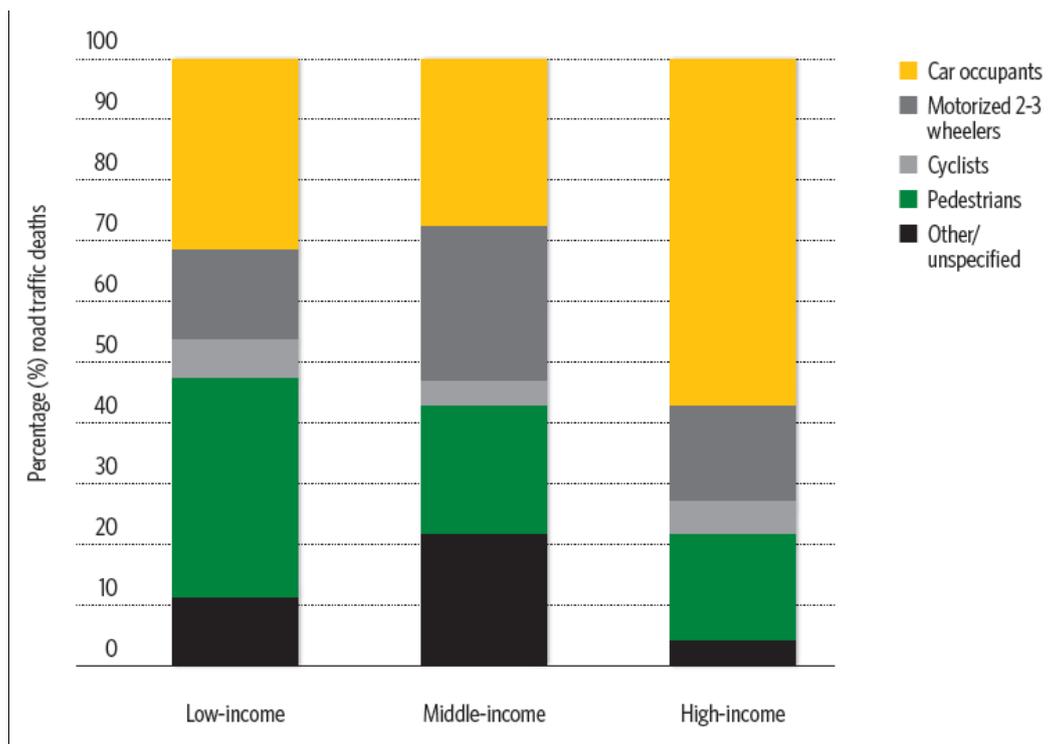
Table 2. 1: Global road traffic deaths by road users (in percentages)

Transportation modal split	2004	2009	2013
Pedestrians	19	20	22
Motorised (2-3 wheelers)	28	25	23
Cyclists	8	8	5
Motorised (4 wheelers)	40	35	31
Others	5	12	19

Source: (WHO Global Status Report 2013:18; WHO 2013:9; WHO 2004:59; and WHO 2009:26)

Pedestrians are more exposed to life threatening situations, especially in developing countries whereby pedestrian facilities are high as compared to developed countries whereby motorised fatalities out-pass pedestrian fatalities.

WHO (2013:7) reports that low-income countries have the highest proportion of deaths among vulnerable road users (pedestrians, cyclists and motorcyclists combined) contributing to about 57%, of road traffic deaths. This figure is lower in both middle-income (51%) and high-income countries (39%). Figure 2.2 further shows the breakdown of road fatalities among road user types by country income status.



Source: WHO 2013: 7

Figure 2.2: Road traffic deaths among road users

Status of pedestrian infrastructure in developing countries

Despite the fact that infrastructure for pedestrians is relatively cheaper as compared to motorised, yet it is lacking in many urban areas of developing countries making the mode unsafe and inconvenient for travel. In many developed countries, streets are designed to accommodate various modes of transport including walking, cycling and driving, but in developing countries, there is limited space for different modes of transport (Pirie, 2013). This has led to the chaotic mix of various modes of transport which is unsafe. Pedestrians compete for road space with many other non-motorized and motorized transport means. In areas where the infrastructure is provided, its management is lacking. Pedestrian walks are usually covered with uncollected garbage, hawkers selling their wares, construction materials and overflowing storm drains. The main reason being the fact that not many urban dwellers are aware of the existence of the infrastructure provided and their meanings (World Bank, 1986).

The same facility is used by hand carts, passengers waiting and being alighted from public vehicles making this area a zone of confusion. It is in this zone of confusion that crimes take place. Pedestrians lose their belongings to thieves who seem to be very active in the crowded and also isolated streets. The poor state of the streets makes it uncomfortable to walk on especially during the rainy season when they are muddy. Although walking is seen as convenient, especially in areas with vehicular traffic, in some cases this may not be possible. The poor state of streets exposes walkers to unhealthy and insecure situations such that arriving at destination on time may be almost impossible. Bad attitude of drivers and pedestrians towards respecting traffic rules together with poor enforcement of laws further aggravates the situation (WHO, 2013). Congested neighbourhoods are a threat to pedestrian security while the location of functions within shorter distances increases conveniences of people within a neighbourhood (Burton and Mitchell, 2006). The shorter the distance covered to access services and goods, the less the risk a pedestrian is exposed to and vice versa (ibid).

In residential neighbourhoods, children and the elderly are also vulnerable to accidents, especially when children walk to and from school (Sebastian et al., 2011). This mostly occurs at road junctions or places where they have to cross the roads. Designs in residential areas which allow for through traffic without pedestrian infrastructure being provided, pose safety threats to children playing in the residential neighbourhoods (ibid). The land use planning affects pedestrian safety through building densities, land use mixes and city structure (Burton and Mitchell, 2006). If these three factors are not considered during planning, then land use conflict are bound to occur which may lead to increase in pedestrian accidents and insecurity. Pedestrians are exposed to risks when their facilities are not provided for in road design and land use plan (ibid). The mixture of pedestrians and motor vehicles increases accidents on urban roads in low and medium countries.

In practice, there are three components that are crucial for pedestrian safety to be achieved in residential neighbourhoods. These include: Ensuring human presence in streets for natural surveillance; minimizing conflict through traffic segregation and territorial designing and community involvement (Llewellyn, 2000). Natural surveillance may be determined by the way buildings are designed and oriented to the street. Jacobs (1961) and Llewellyn (2000) argue for this kind of design as “keeping eyes on street” meaning that the orientation of buildings to streets attracts the occupants to relax on their free time by watching the activities on the streets. Human presence is achieved by having mixed land uses with different activities coupled with integrated street pattern (ibid). People begin to take responsibilities of their urban spaces if they view them as their own. This increases safety in the neighbourhood since much control is extended into the public space.

The WHO report appreciates that world widely; pedestrian needs have recently been recognized in land use planning, public space and transport planning but little input has been done on making sustainable plans on who is financing the initiative. However, in many developing countries, financing for pedestrian safety is limited to central governments which seem to be more biased to motorised transport (UN Habitat; 2013b). This nature has led to pedestrian planning and safety management being allocated minimal funds or being ignored completely (ibid). The main reason for less consideration of pedestrian needs in the budgets of authorities in cities of developing countries is because pedestrian infrastructure does not generate revenue to the government (ibid). This means that private investors and international lending agencies are not very keen much as to provide funding for this project, which will not have financial returns from the investment. The local authorities are therefore constrained financially to sustainably plan and manage the safety of the pedestrians. This situation has led to poor implementation of the good plans and initiatives (WHO, 2013). Implementation of pedestrian needs is another area that has not fully been decided. Who will do what and at what level has still remained a debatable issue in many countries (ibid).

However, WHO (2013) pointed out that the requirements of this vulnerable group (pedestrians in this case) should be ensured by adopting sustainable integrative measures that incorporate different actors in the process. It should therefore be a priority in transport and land use planning to ensure the pedestrian requirements are considered in a collaborative manner. The next section highlights what constitutes an Integrated Transport System:

The concept of Integrated Transport System for enhancing pedestrian requirements

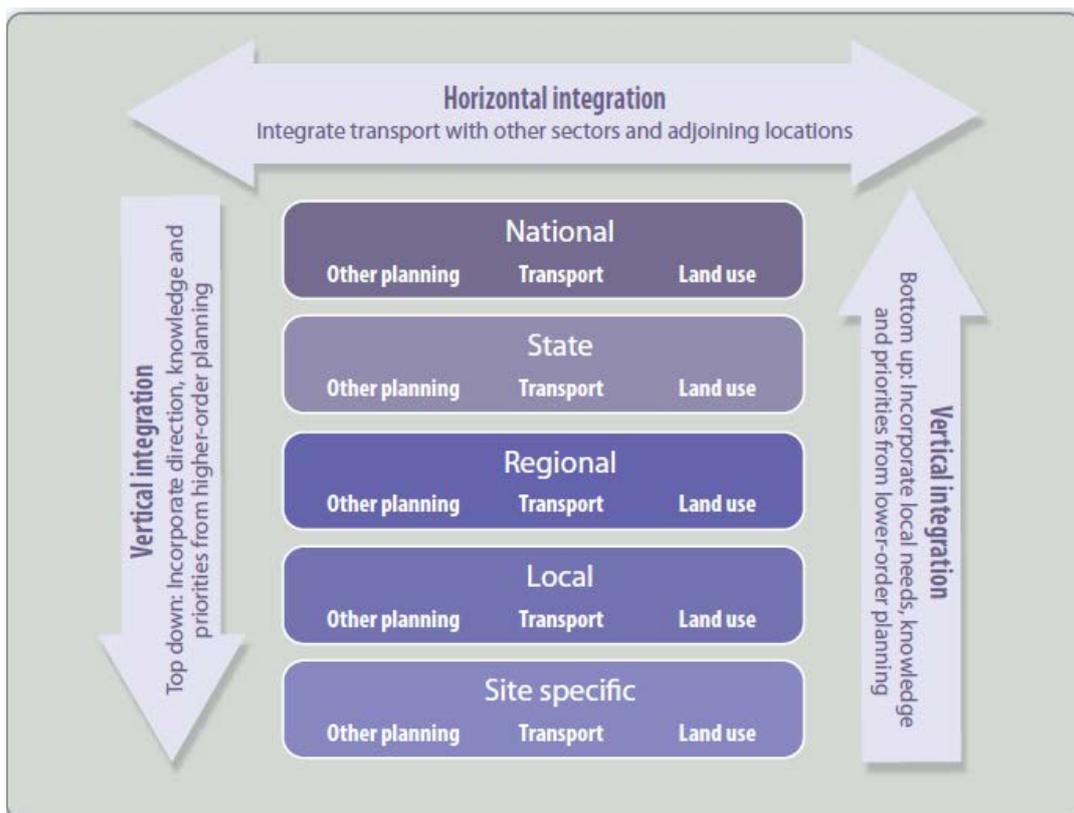
Integrated Transport Planning according to Intergraded Transport Planning Framework for Queensland (2012) is defined as: “A process to identify current and future access needs for people, places, goods and services and inform decision makers on ways to manage the transport system and land use to best address these needs. It aims to do this in a way that sustains economic growth, conserves the environment and supports the quality of life current and future generations”

A well-integrated system requires a mix of tool and measures. These include management of traffic and transport operations, management of land use, provision of infrastructure and services and influencing of traffic demands (*ibid*). If the tools and measures are mixed properly, they can lead to effective results. For example, mixing land use and traffic management in an efficient manner can lead to proper utilization of existing infrastructure and reduction of investment of new infrastructure (*ibid*). Integrated transport planning, aims at providing different choices for travel, reduction of need for travel and length of trips, thereby making it safe for people to access goods and services and reach their destinations by using different modes of travel, increase the sharing of trips by walking, cycling, private cars and public transport. It minimizes the needs for the establishment of new infrastructure and achieves the desired outcomes by using cost effective measures. Integration is achieved by its application in three areas namely:

Horizontal integration: This is the synergy between distinct parts of a whole system, usually in respect to land use planning and transport.

Vertical integration: This is the synergy between different levels of government and the private organisations and groups.

3-D integration: Works with the above to deliver outcomes to the community. It is concerned with planning, design and implementation involving both aspects of vertical and horizontal integrations (Western Australian Planning Commission, 2012).



Source: Western Australian Planning Commission, (2012: 40)

Figure 2. 3: Concept of integrated Transport System

2.3.2 Walkability in the regional context

As per the Western Australian Planning Commission (2012), Godard (2011) cited in UN Habitat publication (2011) argues that pedestrian needs should be prioritized in agenda of planning, since walking encompasses almost every individual. To achieve this, Godard suggests that integration of urban land use plan and transport plan. The two plans should not be done in isolation, but should be integrated to properly address issues of security, comfort and convenience. In sub-Saharan Africa, these plans have over the years been done independently. This has created land use conflicts that are being witnessed in most cities in the region. The experience shows that where pedestrian infrastructure is provided, its management is usually poor. Hawking, vehicle parking, garbage dumping and building materials have overtaken the pedestrian walks. A close look at specific cases in different regions of the world gives a clear understanding regarding how pedestrian needs are considered.

Promotion of walking in Bogota City, Colombia

Walking is preferred as a mode of transport in many cities of Latin America and Caribbean region despite the fact that 31 percent of all road accidents are pedestrians (Jirón, 2011). About 27 per cent of trips in most cities are made by walking (*ibid*). However, the situation is not comfortable and friendly to encourage walking. In Bogota, 15 per cent of residents prefer to walk irrespective of the high pedestrian fatalities which stand at 56 per cent (WHO, 2009).

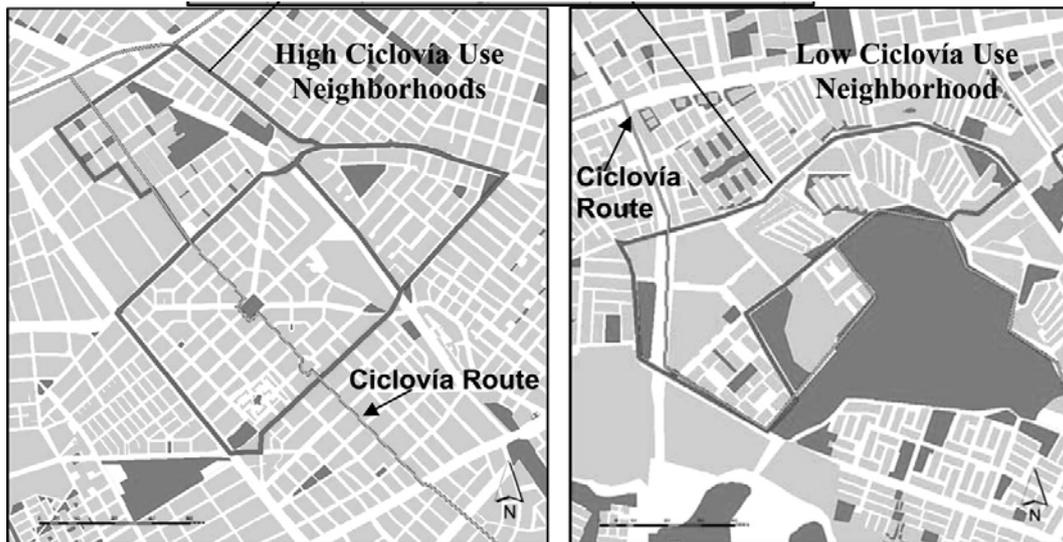
Table 2. 2: Transport modal split in Bogota city

Public transport	Walking	Cycling	Car, Motorcycle and Taxi
57	15	2	25

Source: Jirón (2011: 3)

In Bogota City, crimes and fear of being robbed has been increasing, especially in deserted public space (Robert et al., 2009). Pedestrian infrastructure is dangerous and difficult to use (*ibid*). Although pedestrian walks have been provided, their condition has been poor (Jirón, 2011). This situation exposes pedestrians to accidents like falling in open drains. Baby carriers are difficult to use due to narrow state of walkways. At night, the situation is worse since no street lights are provided for the pathetic walks; hence making walkers mix with motorists thereby exposing them to accidents (*ibid*). A common feature of pedestrian safety shared almost by all cities in Latin America is the fear of being mugged and air pollution, which exposes the pedestrians to health problems (*ibid*).

The city of Bogota is well known for sustainable urban public transport systems, including pedestrian considerations in land use (GIZ, 2010). Pedestrians are as tourist attractors since best stores and shops are usually located along pedestrian streets (Nair and Kumar, 2005). Pedestrian safety and comfort are more important with streets being kept safe for tourists, children, the elderly and overall citizens (*ibid*). On Sunday and holidays; city and some residential streets are set aside for pedestrians and cyclists only “*Ciclovia*”, a program in which streets are closed temporarily for motorists for some days to allow pedestrians and cyclists for recreation and socialization in Colombia (*ibid*). Streets on these particular days are free from cars. To enhance access to the bus stations, landscaped pedestrian walkways have been provided in many city streets (Robert et al., 2009). The city leaders have previously given much attention to pedestrians (*ibid*). Walking and cycling has been prioritized with private motorization being discouraged (Nair and Kumar, 2005). Funds have always been directed to the management of public squares, recreational parks and streetscaping (Robert et al., 2009). This management aspect has improved the safety of pedestrians within the city and its neighbourhoods



Source: Robert et al (2009: 222)

Figure 2. 4: Ciclovía use in residential neighbourhoods in Bogota

The safety measures have also been taken to ensure pedestrians are safe even in residential areas. Bollards have been installed between streets and the pedestrian walkways to prevent motorists from parking in the walkways (Robert et al., 2009). This has been realized due to commitment of actors in ensuring that pedestrian safety is ensured. the vision of the City Master Plan reads as follows: “ *We want a city with more public space for children than for motor vehicles; a high population density and relatively short travel distances; people in public spaces; autonomy and freedom of movement for the children and the elderly; very low levels of noise and air pollution; small children walking out of home to the safety of pedestrian streets; homes with nearby stores, restaurants, movies and cultural activities; abundant parks, pedestrian streets, wide sidewalks, bicycle paths*” (Nair and Kumar, 2005:20).

Design aspects have however challenged walking in Bogotá. The existing street pattern and layout in the inner city create a dense network with high connectivity (Robert et al., 2009). Use of gridiron patterns and subdivision of land into small blocks produce dense development and high connectivity of places especially in residential zones (ibid). In the suburban areas where high class residents live, the case is different. Supper-blocks with sparse street networks are created, which are mostly car-oriented giving little attention to pedestrians (ibid). This design; arrangement gives an insight on how design concepts can influence access to services and the safety of a pedestrian in residential neighbourhoods.

A study by Ardila (2005) shows that transport planning in Bogotá is done by both central government and the municipals. The central government is mandated to prepare policy guidelines and standards; whereas the municipal governments are responsible for planning, financing and maintenance of urban transportation systems. The municipal governments are required to partner with the private sector to open up more chances for funding.

Poor management of pedestrian infrastructure in Lagos City, Nigeria

Walking remains the major mode of transport in Sub-Saharan African cities but this is not adequately reflected in their transport systems (Howe, 2001). This mode of transport is faced with negative connotations of poverty rather than an indicator of progress and efficiency (UN-Habitat, 2010a). As a result, this mode of transport is given an afterthought in transport planning (ibid). In Lagos, the priority has been given to BRT (Bus Rapid Transit) system for public transport; but little has been done to integrate pedestrians in the system (ibid).

Attempts have been made at the Central Business District of Lagos City where major streets have been provided with pedestrian crossings. However, road users are ignorant of this safety measure (Odeleye, 2005) in ICTCT Workshop, (2005). Motorists continue with their journey without minding the number of pedestrians waiting to cross at the crossings. These make pedestrians wait for long hours to use the facility in which they have a right of way. Zebra crossings are obstructed by on street parking and in some cases the vehicles on traffic jam obstruct pedestrians from using them (ibid). Provided pedestrian bridges are not effectively utilized mainly because of poor locations or lack of maintenance (Augustus, 2013). Many of these bridges lack facilities for physical challenged people; which force them to dangerous cross busy roads (ibid).

The management of pedestrian infrastructure is very poor (Odeleye, 2002). The poor management by authorities has led to poor documentation of accident figures which is not adequately captured and in many cases it is usually misleading (WHO, 2009). The zebra crossings have faded off the paint, making it impossible for road users to visualize them (ibid). Other road facilities like lighting for pedestrian crossing and traffic lights have become malfunction without replacement. Ironically, this state exposes pedestrians to safety risks while using facilities which are supposed to safeguard their safety. Due to financial constraints by local authorities, residents in many neighbourhoods have organised themselves to safeguard their safety (World Bank, 1998). For example, in Ibadan, residents have introduced speed bumps to roads to limit speeds of vehicles (ibid). This has been the case in many African cities where the state has not been able to address safety concerns.



Source: UN Habitat (2010:13)

In Lagos, the space for pedestrian movement is poorly protected (Pirie, 2013 in UN Habitat, 2013b). This has forced pedestrians to mix with other road users (Figure 2.5) which expose them to road accidents. Pedestrian infrastructure like overpasses, underpasses, pedestrian walkways are missing in many towns of Nigeria. Buildings have encroached to road reserves; limiting availability of space for pedestrian ways (ibid).

Figure 2.5: Road sharing by many users in Lagos, Nigeria

Nigeria has a National Transport Policy of 2010 which does not recognize pedestrians in its objectives. One of the objectives of the document reads: “to promote the use of public transport over private cars”. The country has been more focused to motorised public transport as seen in the establishment of BRT the system in Lagos (Dayo, 2009). This is different from some countries like Germany and Netherlands whereby policies for pedestrians are isolated from the main transport policy (Cab-

bies, 2003). However, the same Transport Policy identifies pedestrian walkways construction as one of the strategies to promote urban mobility.

Pedestrian safety management is under Lagos Metropolitan Area Transport Authority (LAMATA), which is a state body mandated to manage transport needs of the metropolis (Dayo, 2006). The body coordinates with other actors who include: Lagos Urban Transport Project funded by the World Bank, civil society (validation of major infrastructure investments and monitor policy changes), private sector, state government, federal government, development partners, drivers and residents of the city (ibid). LAMATA ensures active participation of different stakeholders in all its projects. This has made it possible to implement its projects without opposition and conflicts. The Next section describes the experience of walking in Asian cities:

Un-separated modes of transport in New Delhi City, India

Just like the cases in Africa and Latin America, high percentage of transport in Indian cities is made by walking and cycling due to the fact that a big number of people lack capacity to afford motorised transport (Purcher et al, 2005). However, the state of pedestrians in cities has not yet been realized despite the fact that Asian cities have traditionally been with walking (WHO, 2013). While some countries like China and India are putting efforts on pedestrian safety, others like Singapore have already moved ahead in pedestrian safety measures (ibid).

Delhi like most Indian cities has a mixed transport use. Road space is shared by different means of transport (Shalin and Tiwari, 2013). These include pedestrians, motorists, cyclists, animal and human drawn vehicles, two-wheelers and three-wheelers. Out of all trips done in Delhi city; pedestrians contribute to nearly 32%, (Tiwari, 2003:445). Apparently, this group is the most prone to accidents, accounting for 45 per cent of road accidents (Government of India, 2012:59).

Table 2. 3: Road fatalities in Delhi in 2011

Road User	Pedestrians	Bicycle	Non-motorized vehicles	Two wheeler	Three wheeler	Car	Bus	Truck	Other motor vehicle
%	45	5	1	32	2	3	1	1	10

Source: Government of India, (2012:59)

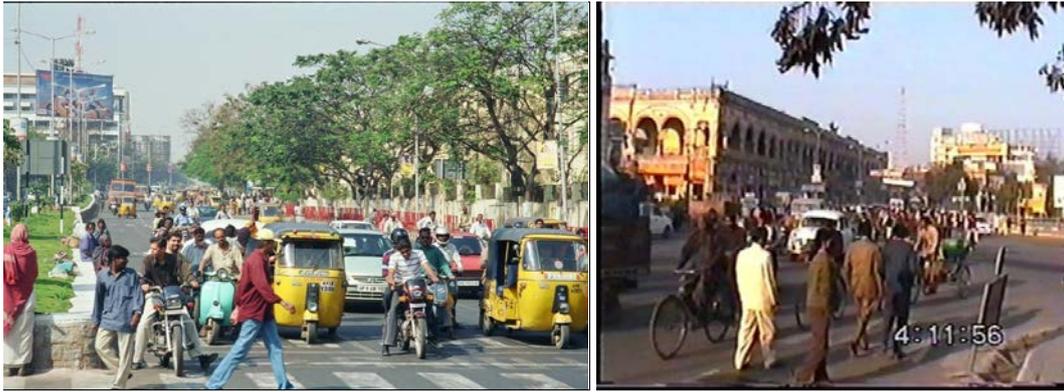
The National Urban Transport Policy of 2006 confirms that the poor are the most affected. This is due to the fact that 40 per cent of total road lengths in New Delhi have no pedestrian walkways and those that have, they are poorly managed (Delhi Development Authority, 2009). This has led to mixing of pedestrian with other road users (ibid). Figure 2.6 indicates encroachment of walkways by parked cars, thereby forcing non-motorized to share the carriageway with the motorized traffic.



Source: Tiwari (2010:20)

Figure 2. 6: Pedestrian lane encroached by cars for parking in New Delhi

In New Delhi, one way streets have been used to facilitate long distance motorists detouring short distances made by pedestrians and cyclists (National Urban Transport Policy, 2006). This has forced people wishing to cross a shopping street about two Kilometres away to use a taxi rather than walk since walking wastes a long time due to road designs which do not consider them (ibid). Crossing at road intersections and high traffic volume has been much difficulty due to lack of crossing facilities. Pedestrian ways have been poorly designed which seem to challenge the users. Some of the challenges are lack of continuous lanes and narrow lanes which expose pedestrians to risks (ibid).



Source: Tiwari (2010:2)

Figure 2. 7: Crossing at an intersection and midblock in New Delhi City

Spatially, New Delhi is experiencing urban sprawl, which has increased travel distances, making it impossible to cover such distances by walking (National Urban Transport Policy, 2006). However, with this development trend in mind, the policy still advocates for walking as a mode of transport. Equitable allocation of spaces among all transport modes is emphasized in the document. New Delhi City has recognized pedestrian needs in its plans. Some of the objectives in its Urban Transport Policy 2006 read as follows: “*encourage greater use of public transport and non-motorized modes by offering central financial assistance for this purpose; bringing about a more equitable allocation of road space with people, rather than vehicles as the focus*”.

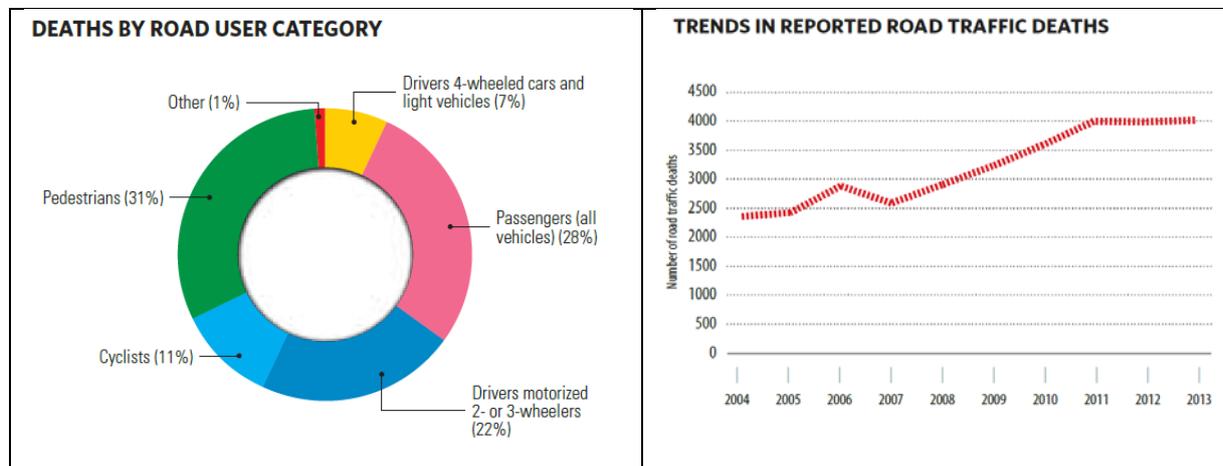
The City of the New Delhi through the Delhi Development Authority has developed a Street Design Guideline of 2009 that is geared towards ensuring that pedestrian safety is managed by the city. The Master Plan of Delhi 2012 devises mechanisms of managing safety of a pedestrian (Ibid). City level policies have also recognized pedestrian safety. Some of these include the Central Motor Vehicles Rules (CMVR) 1989 Safety Rules, the Indian Penal Code (sec 283), the Urban Street Vendor Policy (2007), the National Policy on Urban Street Vendors (2009), the Police Act, Persons with Disabilities Act 1995 (sec 44) (Delhi Development Authority, 2009).

Recognizing the needs pedestrians at policy level gives greater opportunities of ensuring their mobility, accessibility and safety needs than considering them only in designs and not in policy documents. New Delhi has made attempts to document pedestrian needs in its policies, unlike many cities of developing countries. However, poor enforcement of traffic laws and limited financial resources are quoted to challenge the achievement (Tiwari, 2001). Although pedestrian needs are considered in policies, its *implementation* is not effectively done. Authorities *are constrained by resources* to maintain the facilities already in place. *Poor enforcement of laws* and negligence by road users to requires road rules result into collisions between pedestrians and motorists (ibid).The New Delhi case give rise to the following question: What initiatives can be put in place to ensure pedestrians are separated from other road users, especially in (developing) countries where space is limited due to encroachment of public space by developments?

2.3.3 Walking environment in Tanzania

Like in many other African countries, in Tanzania pedestrians, are among the vulnerable roads. By 2013, pedestrian fatalities in Tanzania stood at 31% of all road traffic deaths, according to the Global Status Report on Road Safety of 2015, and the trend is keeping on increasing (WHO, 2015). A report by UN Habitat (2000) reveals that 61 per cent of people feel unsafe in residential areas after dark. Walking on the streets is unsafe too, because of the risk of being knocked by motorists and other road users. The issue is contributes by limited pedestrian infrastructure in most urban areas due to disregard of pedestrian movements in neighbourhood designs by the authorities and also because of lack of policies to separate road users to protect the Vulnerable Road Users (VRUs). As a result, mixing of

different modes is a common feature in Tanzania (Pendakur, 2005). A study by Zimmerman et al, (2011) revealed that, in Tanzania, pedestrian victims of road accidents stand at 55.1 per cent. Walking in Tanzania is uncomfortable and unsafe. The issue has been contributed by the lack of safe pedestrian ways, difficulties in crossing at various intersections, encroachment of the available pedestrian walkways by vehicles and petty traders, and also safety awareness to the public is inadequate (Pendakur, 2005).



Source: WHO, 2015:247

Figure 2.8: Road traffic deaths by users in Tanzania

Institutional arrangements for urban transport in Tanzania

Pedestrian safety in Tanzania is an issue that has been dealt with by the combined efforts of both the government and self-organised community initiatives. Community watch neighbourhood groups (Sungusungu) have effectively reduced crime and insecurity rates in urban areas of Tanzania (UN-Habitat, 2000). These watch groups are recognized by the law under people's Militia Laws (Miscellaneous Amendments) ACT, 1989 (ibid). These watch groups have assisted in managing safety of pedestrians in neighbourhoods. The community has further organised for self-initiatives to manage their safety by erection of speed bumps along urban roads which are insecure to cross (Pendakur, 2005). The Tanzania National Strategy on Urban Crime Prevention (2008) suggests creation of social cohesion at community level whereby community social resources can be utilised to promote safety.

Moreover, various institutions are responsible for transport management in the country. The Ministry of Transport and Communication is the main institution responsible for making of policies and directives for transport management (Tanzania National Transport Policy, 2011). The PMORALG is responsible for the local road management and maintenance (ibid). The role of providing security to local communities has been bestowed upon Local Governments Authorities as provided in the Constitution of the United Republic of Tanzania Article 147 (URT Constitution (1998) in the Tanzania National Strategy on Urban Crime Prevention, 2008). The land use planning and implementation is done by the respective local authorities (the Policy Paper on Local Government Reform Programme, 1998). The Ministry of Lands, Housing, and Human Settlements Development mainly focuses on policy formulation on land use in the country (<http://www.ardhi.go.tz>). The Tanzania police force is tasked with enforcement of law and order in the country. Other actors include: The Tanzania National Road Roads Agency (TANROADS); The Tanzania Electrical and Mechanical service Agency (TEMESA) under the Ministry of Work (MOW); the Dar es Salaam Rapid Transit Agency (DART) and the Surface and Marine Transport Regulatory Authority (SUMATRA).

Faced with increased motorization, the City of Dar es Salaam is now implementing a number of strategies to minimize traffic congestion. These are such as improving the capacity of roads in terms of increasing the number of lanes, proposing new overpasses at the main road intersections (Ubungu and

TAZARA). Following completion of Phase I of the newly BRT system, the government is expanding BRT services to other parts of the City.

However, despite the availability of various actors it has not been clear how these actors are coordinated. There is inadequate knowledge on how the National comprehensive documents, National sectoral policies and planning documents adopted in Tanzania consider the pedestrian requirements for everyday life activities. These questions are answered in Chapter Nine of this report.

2.4 Concluding summary

From the preceding discussions, it is evident that the non-consideration of pedestrian requirements in cities of developing countries is a major issue that calls for policy, planning and management measures:

Policy issues: Across the reviewed regions it appears that in the initial stages of policy making, pedestrian needs were not considered before; they only came during the design stage. Some cities in Colombia and India have separated pedestrian policies from the broad transport policy, while other countries like Tanzania and Nigeria are still grouping pedestrians with other road users in a broad policy document, called “Transport Policy”. Similarly, a separate department dealing with pedestrians has been established in Bogota, Colombia, unlike cities in India, Tanzania and Nigeria, where pedestrian issues are handled by the engineering and transport departments respectively.

Planning issues: In all reviewed cases, space for pedestrian facilities has been inadequate. For many years, pedestrian needs have been taken as an afterthought of urban planning, but, with continued debates and urbanization effects taking courses, the topic is gaining momentum to ensure that pedestrian needs are prioritized. Pedestrian safety has largely been affected by the design elements of urban areas. Many streets were narrowly designed at the initial stages, but also with the increase of motorization and economic activities they have been encroached by these activities. Neighbourhoods are changing densities without consideration of the sizes of streets in the area. This has congested the streets which carry a bigger capacity of activities than they were designed for. Pedestrians are usually the victims of these changes. Even where the designs considered pedestrian facilities, they end up not being implemented. This is witnessed mostly at intersections where pedestrian crossings and traffic lights are totally missing. In Bogota, the case is different. Implementation of pedestrian facilities is a priority in any road construction and urban design. The major challenge encountered in this design is the high rate of urbanisation in the country. Suburbanisation has led to a decrease in densities in the periphery of cities whereby pedestrian movement has become difficult. Designs in such areas seem to favour car transport than walking due to an increase in distances to the city centre. Nevertheless, many cities of developing countries lack traffic segregated networks. In areas where separation is provided, for example, over and under passes, their locations are not appropriate.

Management challenges: Pedestrian facilities available in many urban areas of developing countries are poorly managed and maintained. Sidewalks are dangerous and uncomfortable to walk on. Many of the streets are poorly lit, making them insecure to use at night. Traffic rules and regulations are poorly enforced. The actors responsible for pedestrian needs are poorly coordinated leading to duplication of tasks and activities in some cases. The limited financial resources are associated with some of the management challenges affecting pedestrian safety. While other countries have made tremendous efforts to manage the pedestrian infrastructure, others are still in the pipeline to devise the methods that could be used to tackle the problem. The earlier plans prepared to accommodate pedestrians have been encroached by other uses. These activities have occupied space which was meant for pedestrians forcing them to mix with other road users which exposes them to accidents. Many city authorities like Bogota have provided measures in urban areas to ensure that pedestrians are safe. Some of these include traffic lights, pedestrian crossings, pedestrian walkways and speed bumps, among others. How-

ever, these facilities are poorly managed in such a way that with time they become dysfunctional. In other areas like in Tanzania and Lagos, crucial safety measures are lacking in the roads, a situation that has forced the local community to mobilize resources to guarantee their own safety.

The next chapter will provide an overview of a walkable city, in which the key parameters for improving the pedestrian (walking) environment and necessary for achieving a walkable city will be clarified.

CHAPTER THREE

3. AN OVER VIEW OF A WALKABLE CITY

3.0 Introduction

This chapter discusses characteristics of a walkable city, the urban philosophers supporting walking, pedestrians and street designs, urban visions and design concepts for promoting and improving walkability as well as the design guidelines towards achieving a walkable city. Lastly, a summary on the parameters necessary for a walkable city is presented.

3.1 Characteristics of a walkable city

The Bicycle Federation of America has developed a general description of what someone might expect to find in a walkable community/city. According to the Bicycle Federation of America, a walkable city is realized when: *“People of all ages and abilities have easy access to their community ‘on foot’- an automobile is not needed for every trip: People walk more and the community and neighbourhoods are safer, healthier, and friendlier places: Parents feel comfortable about their children being outside in their neighbourhoods; they don’t worry about the threat of motor vehicles: Children spend more time outside with other children and are more active, physically fit, and healthy: Streets and highways are designed or reconstructed to provide safe and comfortable facilities for pedestrians, and are safe and easy to cross for people of all ages and abilities: Pedestrians are given priority in neighbourhood, work, school, and shopping areas; Motor vehicle speeds are reduced (and, in some places, motor vehicles have been eliminated entirely) to ensure compatibility with pedestrian traffic: Motor vehicle operating speeds are carefully controlled to ensure compatibility with adjacent land uses and the routine presence of pedestrians: Drivers of motor vehicles operate them in a prudent, responsible fashion, knowing that they will be held strictly accountable for any threat, injury, or death caused by their lack of due care or violation of the vehicle code; and the air and water quality is good”* (Bicycle Federation of America, 1998:3).

Moreover, the Bicycle Federation of America has described the characteristics of a walkable city to include the following parameters:

- *Coherence*: A clear, understandable and organized sidewalk, street and land-use system consistent with the scale and function of the surrounding urban context. The sidewalk and street system should link points of interest and activity, provide clean lines of sight and travel, and include simple instructive signage (*The Bicycle Federation of America*, 1998:4)
- *Continuity*: A pattern of design and usage that unifies the pedestrian system (ibid)
- *Equilibrium*: A balance among transportation modes that will accommodate and encourage pedestrian participation.
- *Safety*: Pedestrian protection from automobiles and bicycles. Adequate time to cross intersections without interference. Physical separation from fast moving cars. Signalization protection when crossing intersections (ibid).
- *Comfort*: Secure and negotiable paving materials for sidewalks and crosswalks. Unobstructed passage on the sidewalk and at corners. Signals timed to enable safe and quick crossings (Ibid).
- *Sociability*: A sense of hospitality and suitability for individual and community interactions. Sidewalks should provide for a variety of uses and activities characteristics of the diverse urban scene (ibid).
- *Accessibility*: The opportunity for all individuals to utilize the pedestrian environment as fully as possible (ibid).

- *Efficiency*: Simplicity and cost-effectiveness in design and function. Minimum delay along a walking route (ibid).
- *Attractiveness*: Clean, efficient and well-maintained surroundings, with adjacent storefronts and activities that provide sidewalk interest (Bicycle Federation of America, 1998:4).

Similarly, a study by Matchett (2010), the Bicycle Federation of America (1998) recognizes safety, connectivity and pleasant aesthetic as the fundamental parameters to walkability. In view of Matchett, a walkable city needs to be safe to protect pedestrians from encountering unreasonable or disproportionate dangers when walking. He further argues that physical safety features like sidewalks or other barriers that separate pedestrian from vehicular traffic (such as buffering and on-street parking), well-marked zebra crossings and good lighting to facilitate night time walking and ensure personal security are the key features towards ensuring pedestrian safety in a walkable city. Moreover, the roadways designed have to maintain the vehicle speed of 30 km/hour or less. Matchett (ibid) citing WHO (2004) points out that pedestrians have a 90 percent chance of surviving crashes at speeds of 30 km/h or below, but less than a 45 percent chance of surviving crashes at speeds over 45 km/h. Apart from the physical components, Matchett adds that effective enforcements of traffic laws, rules and regulations by police officers are also part of the safety aspect of walkability.

With regard to connectivity, Matchett (2010) argues that a walkable city needs to be well connected (that is, the availability of walking routes and the availability of destinations). This implies that walkable cities need to provide many destinations for pedestrians of all ages and ability. In a walkable city, the basic necessities such as markets, health clinics, and jobs are within easy walking distance (1/4 to one mile) of residences, and also the pedestrian routes are inadequately blocked by barriers such as fences, freeways, or large parking lots (ibid). In a walkable city, pedestrians usually never walk far away from their way to get from one place to another as the walking routes are direct, convenient and are easily passable by all people, including the elderly and disabled. However, Matchett claims that pedestrian connectivity is closely related to safety, and many of the elements that improve safety (sidewalks, pedestrian crossings) also improve connectivity.

Matchett further argues that the walkable cities are pleasant aesthetics (ibid). Frazier Associates and Strategic Land Planning (2001) cited in Matchett (2010) argue that the streets of a walkable city are designed at a human scale, that is, in relation to building heights and articulation, street widths, and other streetscape elements that work together to create a sense of enclosure and “comfort” for pedestrians. Matchett adds that Walkable cities are generally clean and well-maintained, with undamaged sidewalks and street furniture. The building facades in walkable cities are typically located adjacent to sidewalks, and may include interesting or decorative architectural elements such as street art, murals, outdoor cafes, parks and other green spaces to enhance walkability (Matchett, 2010).

3.2 Pro-walking philosophers supporting pedestrians and design of streets

The planning profession has since its inception, devised models of neighbourhoods based on walking and walkability. From urban planning and design point of view, there are many urban philosophers who have supported the pedestrian friendly environment in cities and provided understanding about the use of streets. These include the work of Clarence Perry, Kevin Lynch, Jane Jacobs, William Whyte, Amos Rapoport, Donald Appleyard, Allan Jacobs, Jan Gehl and many others. These philosophers have shed more light on why and how the urban environment may support the pedestrian movements. The arguments held by their writings have broaden the knowledge on planning ideas that assisted the understanding of the concepts of walking and walkability and hence of a need to consider them during the process of urban design. The next section highlights the main ideas presented by various scholars with regard to walking and walkability in cities.

Clarence Arthur Perry (1929): *The Neighbourhood Unit Concept*

In 1929, Clarence Arthur Perry introduced a concept of a Neighbourhood Unit based on children and families state or extent to which they could walk safely from their homes to elementary schools and community centres (Banerjee and Baer, 1984). Social reforms that aimed at growing urban population (Woods, 1923), and ideas from Ebenezer Howard who came up with the concept (Garden City concept) that demonstrated “new” (turn of the 19th and 20th centuries) British cities on small agglomerations of 6000 to 30, 000 people living within walkable distance to services and linked by rail transit were the main factors towards the introduction of Perry’s neighbourhood model (Howard, 1965). Perry’s neighbourhood model had at its core a public space and facilities that allows easy walking from all directions, and thus car dependence was to be minimized. The distance each resident had to travel from home to the neighbourhood centre was to be no longer than half a mile walks (approximately 800metres). The public facilities located at the core centre included an elementary school, intuitions like churches, retail districts and an open space for recreation. Moreover, in this model, the main arterial streets were along the perimeter which allowed for residents to walk within less fear of traffic.

Kevin Lynch (1960): *The Legibility and Public Image of the City*

Kevin Lynch is among the authors who have contributed knowledge to understanding the field of urban design, particularly in terms of the design of environments which contribute positively to the look of the city and the lives of people. The works of Lynch published in his books titled *The Image of the City* (1960) and *Good City Form* (1984) provide some central principles to help city planners and urban designers operating within the city contexts. Kevin Lynch was more interested in planning for people as he believes that “moving elements in a city, and in particular the people and their activities are as important as the stationary physical parts” of the city (Lynch, 1960:2). Following what he believed in, Lynch decided to investigate the character of American cities, Particularly Los Angeles, Boston and Jersey City by conducting a study about how residents and visitors to these cities experience the urban environment. Specifically, Lynch was interested in two aspects: The importance of ‘legibility’, that is, the logical and navigable structure of the urban pattern and the ‘public image’ of the city environment projects, which gives its identity in the experience of its inhabitants.

In his work (1960), five elements that contribute to the city image and which are the fundamental concepts in urban design fields were identified. These elements are namely, *paths, landmarks, edges, nodes and districts*. Furthermore, Lynch also recommends five key performance dimensions through which the urban form can be assessed. These dimensions are namely; *vitality, sense, fit, access and control*. According to Lynch, *vitality* refers to how the vital requirements of human users are supported by the environment; while *sense* means the mental legibility of streets and spaces. He defines *fit* as the appropriateness and adaptability of the urban form, while *access* is meant to the ease of movement and *control* refers to the regulation sand management of the environment. Lynch, pinpoints justice and efficiency as the key factors required to achieve these performance dimensions.

Jane Jacobs (1961): *The Death and Life of Great American Cities*

Jane Jacobs in her book “The Death and Life of Great American Cities” describes three main qualities a successful street must have: “First, there must be a clear demarcation between what public space is and what private space is. Second, there must be ‘eyes upon the street’, eyes belonging to natural proprietors of the street. The buildings on a street are equipped to handle strangers and to ensure that the safety of both residents and strangers is oriented to the street. They cannot turn their backs or blank sides on it and leave it blind. Third, the sidewalk must have users on it fairly continuously, both to add to the number of effective eyes on the street and to include the people in buildings along the street to watch the sidewalks in sufficient numbers” (Jacobs, 1961:35). Regarding the ‘eyes on the street’,

Jane Jacobs is of the opinion that nobody enjoys sitting on a stoop or looking out the window at an empty street as people enjoy themselves, off and on, by looking the street activity. However, Jane Jacobs adds that the eyes-on- the street should go hand in hand with provision of good lighting, as the street light induce people to contribute their own eyes to the upkeep of the street. If successfully implemented, the concept of eyes-on-the street can help to minimize the problems of crime (street insecurity) and vandalism in the streets.

Generally, the work of Jane Jacobs was interested in enhancing pedestrian safety and security on the urban streets. With regard to a safe environment, Jane Jacobs identifies three fundamental qualities, namely, passive surveillance, active footpaths and clear delineation of public and private areas within the urban environment. In addition, the work of Jane Jacobs aimed to understand the physical actions by city designers that can support and contribute to economic and social vitality, and which activities are detrimental. According to her, diversity of land uses is the most critical factor in this regard. In order to achieve diversity, Jacobs (1961) proposes some elements to include: small/short blocks, mixed uses, retaining the old buildings and concentration of diverse populations and districts which serve more than simply one primary function (such as the dining district). She emphasizes the theme that cities have to be regarded as ‘a meeting place of strangers’ and thus, cities play an important social purpose and builds upon the concept of people attracting people and generating further social activity. She further emphasizes that physical planning need to focus on these social considerations as the role of designers is to provide environments which can accommodate a wide-range of human activities.

William Whyte (1980): The Social Life of Small Urban Places

Whyte (1980) in the book titled *The Social Life of Small Urban Places* identifies people-watching as one of the main activities shared by different classes of people in public spaces. He claims that activities like *walking, sitting, talking, eating, and sports* contribute to diverse life of a street. As cited in Choi (2012:30), Whyte argues that, in democratic streets, “a social connection links, ground floor building uses to the adjacent street space and that a truly public street has a healthy relationship between the private or semi-public life inside buildings and the public world outside”. In his work, on one hand, Whyte argues that businesses without display windows, banks, offices, parking garages and storage areas with bank walls should not be placed along the public street as they seem to be “dead” uses. On the other hand, he strongly recommends that uses like news-stands or restaurants are likely to enhance street life. He further points out that, in order to enhance the social life of the street and improve the pedestrian safety needs in residential neighbourhoods, the placement of the kitchen windows and other lived-in spaces overlooking the street, as well as of building elements such as ledges and stoops that encourage sitting are of great significance and hence needs to be considered in the design and management of the streets. His recommendations on providing “sittable space” (1980) are considered useful to the design and management of the streets. The lesson learn from this Scholar is that urban planners and designers need to consider for sittable space with pedestrian amenities like public benches and shade trees for convenience and attractive walking.

Amos Rapoport (1987): Pedestrian Street Use: Culture and Perception

Though many scholars have focused more on the use of streets and their associated quality of life and safety benefits, Rapoport (1987) pays more attention to how the urban environment supports walking. He believes that pedestrians have adequate knowledge and awareness regarding the urban environment. As cited in Choi (2012: 30), Rapoport argues that “it is done, other things being equal; by maintaining high levels of interest and that this is achieved through high levels of perceptual complexity”. It is further argued that the pleasure of walking is inspired by the perceptual characteristics of the urban environment as it stimulates exploratory activity and is related to the latent functions of pleasure, delight, interest, exploration, lucid behaviour and the like. Rapoport as cited in (ibid) argues further

that whereas environments are not determined but supportive, they can also be seen as catalysts. The perception of the city is dynamic and sequential (ibid). This implies that the city is experienced over time and its image is made up of the integration of successive partial views, each of which must be remarkably diverse, and never absolutely anticipated. According to Rapoport, the integration of partial views is affected by speed and the nature of the environment as both of them impact the rate of noticeable differences. Assuming that the environment provides potential noticeable differences, speed influences how often noticeable differences occur, how long they are seen, and hence, whether they are observed.

Based on these facts, it is believed that pedestrians have a much better understanding of the urban environment and stronger thoughts on the meaning and activities within the city than drivers or users of public transport have. Due to the low speed and the lower criticality of their movement, pedestrians can perceive many more differences in form and activity. Rapoport also argues that, at the scale of the city, the existence of many levels of complexity and their appropriate relationship to the context is important. Following this argument, he thinks that designers could modulate complexity levels to reflect the nature of the areas and their activities, their importance in the urban hierarchy, and the speed at which they will be perceived. It has also been noted that pedestrians rarely look above the eye level in enclosed urban spaces, where perception of detail is almost inevitable (Rapoport, 1987).

Donald Appleyard (1987): Public Streets for Public Use

The key issue discussed by the work of Appleyard in his book titled “*Public Streets for Public Use*” is about Streets that are pedestrian friendly and livable for residents. His work further describes how the streets have always been prospects of conflict in urban areas (Appleyard, 1987). Since inception of cities and towns, Streets are and have always been considered as public property for the benefit of all city dwellers, though power over them is vague as the street has an open and easily changeable nature. In his work, Appleyard also differentiates buildings from Streets in the sense that buildings are always with their defined activity areas and controlled entrances, while Streets are always open to all. Therefore, if not adequately guided, the detailed design of Streets, however, can imperceptibly favour certain group over another. To adequately ensure equal access to the streets, Appleyard cited in Choi (2012:29) is of the opinion that “it should be the *policy* of public agencies and their representatives to support the weaker users from accessing the Street as healthy streets are used by different people for a variety of activities”.

According to Appleyard (1987), a lively and successful street can only be achieved if and only if a *balanced mix of different user groups* and activities is realized. A lively street does not mean exclusion of motorists; it provides space for vehicles at a more equitable balance with other street users like pedestrians and other non-motorised means of transport. Appleyard further argues that user *diversity* exists when a variety of age groups and social classes can interact in a place, or at least tolerate one another without major physical or social controls. This argument of lively Streets is in line with the work of Jane Jacobs, who argued about the so called “eyes-on-streets”. According to Jane Jacobs, the ‘eyes-on-streets’ can be achieved by orienting buildings towards the street, thereby creating a safe and livable street which finally contributes to enhancing the walkability of the streets as well (Jacobs, 1989). The lesson learnt from Appleyard (1987) is that city authorities need to have a policy that favours the weaker groups like pedestrians from accessing the public Streets. Additionally, in order to have lively and successful Streets, inclusive design is highly encouraged to enable a balanced mix of different users.

Allan Jacobs (1993): Characteristics of Great Streets

Allan Jacobs is one of the scholars who have provided the most comprehensive and realistic criteria for the creation of good urban spaces to date (Stevenson, 2006). In his work, Jacobs intended to an-

swer the following questions: Which are the world's best streets, and what are the physical, designable characteristics that make them great? To answer these questions, Allan Jacobs had to survey street users and design professionals and studied a wide array of street types and urban spaces around the world. Following the raised questions, the work of Allan Jacobs (1993), discusses the importance of streets in creating communities and a comprehensive list of criteria for identifying the best streets, for what he terms 'great streets'. Allan Jacobs is interested in understanding the physical and designable elements which give identity to a space and contribute to its 'greatness' or lack thereof (Stevenson, 2006:16). Basically, the criteria discussed by Jacobs strive for public spaces which are accessible to all (easy to find and easy to get to), pleasant and comfortable to walk on (must be cooler, and more shady on a hot summer day), safe (one should not have to worry about being hit by a car or tripping on the pavement and without threats from robbers and muggers), encourage social interaction (should help make community), encourage participation (people stop to talk or maybe they sit and watch, as passive participants, taking in what the street has to offer), representative (can stand for others, it is the best), memorable (can be remembered, they leave strong, long continuing impressions) and have local meaning for the community (Jacobs, 1993:8-9).

Apart from the criteria for best streets, Jacobs also identifies a range of different 'street' types (plazas and pedestrian only spaces) from medieval streets and historical districts to sizable boulevards to contemporary shared traffic zones and pedestrian malls, and makes valuable comparisons using international case studies of each (Jacob, 1993) as cited in (Stevenson, 2006). Throughout his text, Jacobs stresses the important role of streets for adding a social experience in individual's lives and the important role that designers have to play in shaping their use. He notes: "*There is magic to great streets. We are attracted to the best of them, not because we have to go there, but because we want to be there. The best are as joyful as they are utilitarian. They are entertaining and they are open to all*" (Jacobs 1993: 11). His emphasis on this 'magic' ingredient is a major element which distinguishes Allan Jacobs from other authors in the field of pedestrian friendly urban environment. In addition, Jacobs also devotes particular attention to the role of the local context (particularly in regards to the surrounding street and block patterns and their functions) in shaping meaning and use for a particular street or space.

Jan Gehl (1980:2010): Life between Buildings and Cities for People

Jan Gehl's works (Gehl, 1980; Gehl, 2010) are among the most cited works of literature that contribute to creating urban environments that support and enhance walking activity. Matan and Newman (2016) argue that in the walkability field, there is perhaps no one neither more persistent nor better known than Jan Gehl, the Danish urban designer and architect, who has been studying walking and advocating for people-focused design of cities for over 50 years. In his book titled *Life between Buildings*, Gehl describes how the treatment of the city's edges, particularly the lower floors of buildings, has a significant influence on life in the city space. While clarifying what he refers to as "soft edges", Gehl's work describes how pedestrians experience ground floors closely and extremely. According to him, Walking in the city is an opportunity to experience everything that ground floors have to offer, and to savor the wealth of detail and information. An ideal "soft edge" would be a street with shops lined up, transparent facades, large windows, many openings and goods on display, where there is much to see and touch. Gehl argues that the city at eye level is the most important scale for city planning, and that the battle for quality is on the small scale.

Furthermore, in his book, *Cities for People*, Gehl (2010) presents details showing how to design better cities for walking. He considers parameters like the *acceptable walking distance*, providing room to walk freely and unhampered, avoidance of stairs, pavements, straight sightlines and interesting things to see at the eye level to be the mainly urban design issues for effective walking (Gehl, 2010). Thus, if cities want to have safe, livable, sustainable and healthy cities, pedestrian friendly urban environment

is the prerequisite for city life in lively, safe, sustainable and healthy cities. Gehl argues that when people reinforce life on foot, a multitude of valuable social and recreational opportunities naturally emerge as there is a direct contact between people and the surrounding community, experiences and information. Gehl adds that where conditions for life on foot are improved, it is not only the extents of walking activities which increase significantly, but also even more extensive growth in social and recreational activities can be seen. This means that improving conditions for pedestrians can not only strengthen the pedestrian safety, but also city life is improved as well. Gehl emphasizes the importance of *diversity* in the activities taking place on the streets.

Moreover, the work of Gehl (1987) categorized activities into three types: *necessary activities*, *optional activities*, and *social activities*³. According to Gehl, in successful urban spaces, the optional and social activities are abundant and as such should be a key objective of urban design. He stresses that the wider the range of activities a space enables, the better the quality of that environment. Concurring with Gehl, Brambilla and Longo (1977) in Choi (2012) also lists six primary human actions (*walking, standing, sitting, lying, running and playing*) which account for activity in public spaces, and divided these actions into 'necessary' and 'optional' activities.

All in all the literature indicates that Gehl has influenced and enhanced pedestrian amenity in various cities of the developed world. These include: Stockholm in Sweden, London in England, Wellington in New Zealand, and Zurich in Switzerland. Gehl has also undertaken pedestrian analysis studies in several Australian capital cities including Perth, Adelaide and Melbourne, which has particularly seen marked improvement in the quality of its public domain since Gehl's project commenced there in 1994 (Stevenson; 2006).

3.3 Urban visions and design concepts for promoting walkability

In this part, various design concepts supporting walkability are reviewed so as to explore relevant variables, planning guidelines and standards that can help to improve the walking environment in cities of developing countries. However, the main challenge remains how to apply the design concepts adopted in the global north to cities in the global south. This is because, in the developed countries, walkability have been largely focused on encouraging mode shifts from motorized to non-motorized vehicles for short trips or for promoting walking as a healthy leisure activity, while in cities of developing countries walkability is often considered in terms of providing mobility for the poorest residents who normally walk because they cannot afford an alternative mode of transport. Despite the challenges of having the urban design concepts relevant for developing countries, Tira and Daudén (2010) argue that because the rights of pedestrians are almost equal be it in developed or developing countries, most of the walkability parameters adopted in western countries can also be applied in cities of developing countries, as they aim to ensure pedestrian safety and proximity to services. Therefore, the review of literature has covered design concepts adopted in the developed countries which have/had an impact on the walking environment in many cities of developing countries. The next section explains the various urban design concepts for promoting walkability:

³ As categorized by Gehl (1987: 13-14), *necessary activities* are non-optional part of everyday activities. They include activities like going to school, or to work, shopping, waiting for a bus, or a person, running errands and distributing mails. *Optional activities* are recreational and fun activities. They include taking a walk to get a breath of fresh air, standing around to get fresh air or sitting and sun bathing. However, optional activities take place only when exterior conditions are optimal and when weather and place invite them. *Social activities* include all types of contacts between people and take place everywhere people go in city space. These include activities such as children at play, greetings and conversations, communal activities of various kinds and passive contacts such as seeing and hearing other people.

Compact city development

The term “compact city” broadly refers to development planning of urban land with a focus on higher density and better accessibility which reduces automobile dependency (Nallathiga, 2008). The compact city concept was seen as an approach that could end “the evil of urban sprawl” in developed countries. The concepts describing the paradigm of the compact city are: Density (activities and floor space are concentrated rather than dispersed), mix of uses (different activities are mixed vertically or horizontally, and activities could be different uses, facilities or land uses and facilities) and intensification (this is related to the process of achieving compactness; development in existing areas rather than in suburbs or exurbs; and results: a positive growth rate for density).

However, Dantzig and Saaty (1974) were the first to make efforts to define a compact city with a major focus on the components such as urban form (high dense settlements, less dependence on automobile and clear boundary from surrounding areas); spatial characteristics (mixed land use, diversity of life, clear identity) and social functions (social fairness, self-sufficiency of daily life and independence of government) (Kaji, 2004; Nallathiga, 2008).

The compact city development aims to control urban sprawl and reduce vehicle kilometres by influencing the spatial structure of locations in the urban environment; to support a high transit share; and to keep walking and cycling (the most environmentally friendly transport modes) attractive (Petersen, 2002 Nallathiga, 2008). However, studies suggest that the compact city would be effective if used with mixed land use planning. The mixed land use development will reduce the distances to various destinations from households, thereby encouraging people to walk or ride the bicycles, or take public transport. Litman (2003) argues that the compact city model is needed in the urban areas that are experiencing strong economic and population growth and are already being implemented in some cities like Curitiba (Brazil), Singapore, Hong Kong (PRC), Freiburg (Germany), and Portland (US). If implemented the compact city development is likely to improve walkability in urban areas as the basic facilities and services will be in proximity to the residential households.

However, with regard to developing countries, the author is of the opinion that it may be difficult to achieve sustainability through the compact city policy as the population growth in these cities is very rapid compared to developed countries and mostly coupled with weak leadership in policy implementation.

The New Urbanism

The “New Urbanism” is an American urban design movement that arose in the early 1980’s. The New Urbanism, which is also known as ‘traditional neighbourhood design’ and ‘neo-traditional neighbourhood design’ is a planning principle that provides for more livable and walkable neighborhoods in a more pedestrian friendly environment (Hikichi, 2003). The main goal of the New Urbanism is to reform many aspects of real estate development and urban planning, from urban retrofits to suburban infill. According to Hikichi, the New Urbanism advocates sidewalks, grid network, an integration of housing, retail and office, a neighbourhood or town centre within walking distance to residents, and bicycle paths. The New Urbanism emphasizes creation of diverse, compact, and mixed neighbourhoods; everyday activities, such as housing, work, schools and shops. It also emphasizes that other amenities are within a walking distance from each other. Generally, the New Urbanism aims to provide a pleasant, comfortable, interesting, and safe environment for pedestrians, and to provide alternatives to car use such as public, transit and cycling facilities. Rahnama et al., (2012:198) advocate that the main principles of New Urbanism include the following:

Walkability: According to the New Urbanism, most of uses need to be located in distances suitable for walking (e.g. from house to office, shopping places, schools, markets, health facilities and recreational places). Street design should be appropriate for pedestrians (i.e. buildings adjacent to sidewalks,

streets having greenbelt around them, street lots, hidden parking spaces and lots, low speeds of cars and where possible making pedestrian streets without the presence of automobiles.

Connectivity: This aspect refers to the connected street networks that distribute traffic and make walking easy; hierarchy of narrow streets, bolivars and lanes as walking network and public realm with high quality make walking more satisfactory.

Mixed Use & Diversity: The terms imply a mix of shops, offices, apartments and houses around design, mix use in quarters: Diversity of people from different ages, classes, cultures and races.

Mixed Housing: Different models, sizes and costs of housing units need to be closer to each other.

Quality Architecture & Urban Design: Emphasis is on beauty, aesthetic, human welfare and creates location scence; determine place of use and civil places in the community in a special way, architecture with humanistic scale and beautiful environment is caused to make human spirit convenient.

Traditional Neighbourhood Structure: Distinctive and distinguishable edges; Public space in centre; Importance of designed public realm and open space quality as civic art, including a variety of uses and congestions in walking distance.

Transect Planning: The most and least densities in city centre and gradual reduction of densities toward suburbs.

Increased Density: This can be achieved through building of residential units, shops and mire and closer services that caused to make walking easy, in order to enhance resources and services, and to create convenient, desired and satisfied place for living.

Smart Transportation: A high quality network of railway systems connecting cities, towns and neighbourhoods, which encourage using bicycle and walking and the design which support pedestrian and the emphasis on walking as a way for daily use are highly recommended.

Sustainability: With the New Urbanism transport modes that utilize environment friendly technologies and that respect environments and natural system values; Energy efficient, less use of fossil fuels and more walking, less driving are highly encouraged.

Quality of life: neighbourhood units with the ability to walk are likely to make better quality of life and this can be achieved by reducing single use and make it more efficient (ibid).

Generally, the key features emphasised by the new Urbanism principles include: streets, blocks, buildings and public open spaces and thus the principles of “new urbanism” support *compact development, mixed use, accessibility, and public transit*. Rahnama at el., (2012: 198) argue that the design principles of the New urbanism are organized around the idea of the Traditional Neighbourhood Development unit (or TND), a unit of development scaled to the 5-minute or one-quarter-mile walk. This is the distance most people are willing to walk to obtain their daily life needs. Ideally, residents living in a traditional neighbourhood development would be able to easily reach a variety of public amenities and civic spaces, as well as places to shop, work, or go to school than those living in car dependent neighbourhoods (ibid).

It is argued that if the new urbanism principles are implemented, urban residents would have been expected to gain more benefits. These include: better quality of life, work and play, more value of properties and their sustainability, traffic and less driving, healthy life with more walking and less stress, less distance with main streets which service and retail shops, closer distance to bicycling paths, parks and nature (Rahnama et al., 2012: 202). Furthermore, the new urbanism principles help local communities that support pedestrians to know other people in society in quarter and cit; more freedom and independence for children and elderly, provide job fortunes for different income classes, recreations and services without the need to automobile (ibid). Nevertheless, financial savings for schools and residents are also highly expected. This is due to the fact that with the use of bicycles or

walking by the school children, the transport costs incurred for going and coming back by the students are most likely decreased.

The concept of Smart Growth

Litman (2003) claims that “smart growth” is a general term for land use practices that create more accessible land use patterns which reduce the amount of travel needed to reach goods and services. Broadly defined, it refers to what can be termed as ‘guided growth’ of the cities towards efficiency, equity and sustainability. Nallathiga (2007) and Richmond (2000) argue that the concept of “Smart growth” did not start as a new concept, as it has been in place for a long time. Initially, it based on the land preservation movement and it has been renamed over time from, ‘carrying capacity’ in the 1970s, ‘growth management’ in 1980s to sustainable development in 1990s. The main elements of Smart Growth policies promoted in the US from land use planning and transportation point of view include: mixed land uses, increased density, street connectivity, alternative/ innovative infrastructure and systems, public facilities planning, pedestrianization, facilities for bicycling, and public transit promotion (Ye et al, 2005; Nallathiga, 2007).

Similarly, Ewing (1999) in his publication on Pedestrian and Transit-friendly Design, a primer for Smart Growth describes a design checklist for pedestrian-friendly features. The checklist recommended by Ewing consists features at the urban design level, which are classified into three categories, namely; essential, highly desirable, and nice additional features. According to Ewing, essential features include: medium-to-high densities, a mix of land uses, short to medium length blocks, transit routes every half-mile, two- or four-lane streets (with rare exceptions), continuous sidewalks wide enough for couples, safe crossings, appropriate buffering from traffic, street-oriented buildings and comfortable and safe places to wait. He further recommends that highly desirable features need to include: supportive commercial uses, grid-like street networks, traffic calming along access routes, closely spaced shade trees along access routes, little dead space, or visible parking, nearby parks and other public spaces, small-scale buildings (or articulated larger ones) and classy looking transit facilities. He finally recommends for additional Features to include: street-walls, functional street furniture, coherent, small-scale signage, special pavement and lovable objects especially public art.

Both the concepts of compact cities and smart growth assumed importance in the background of declining quality of the urban environment, i.e. increasing the volumes of road traffic, traffic congestion, air pollution, noise, and accidents, in the suburbs of the American cities and the European cities, which saw the flourishing of suburbanization in the 1960s. While suburbanization of these cities is attributed to the rising real income, greater use of cars and trucks, widespread desire for living in relatively new and low density settlements, economic advantages of home ownership, and strongly entrenched tendencies for people to segregate themselves socio-economically and racially by neighbourhoods.

Transit Oriented Development (TOD) and Traditional Neighbourhood Design (TND)

Supporters of the New Urbanism has continued to advocate walkable neighbourhoods by implementing design concepts commonly known as Traditional Neighbourhood Design (TND), Transit Oriented Development (TOD), Pedestrian Pockets, Transit Villages and Urban Villages (Duany and Plater, 2009; Calthorpe and Fulton, 2001; Kelbaugh, 1989) as cited in (Moudon et al., 2006). The key individual in the definition, branding, and initial implementation of TOD was Peter Calthorpe, a founding member of the Congress of New Urbanism through his 1993 book “The Next American Metropolis”. The Concept of Transit Oriented Development (TOD) seeks to develop compact neighbourhoods with housing, parks, shops, offices, jobs and civic and community facilities within a 5-10 minute direct walk of public transport stops (Calthorpe, 1993).

Similarly, Andres Duany and Elizabeth Plater- Zyberk who live in Florida were the pioneers of this movement of walkable neighbourhood concepts (Rahnama et al, 2012). Their approach at first was known as "developing traditional neighbourhood units" (TND) which is used in recreation living units, restructuring malls and suburban environments (ibid). The main unit of this approach is a neighbourhood which its size is 40-200 acres with radius more than 1/4 mile and designed in a way that its houses have a distance at least 3 minutes walking to local parks and 5 minutes walking to square or central mutual space (ibid). A meeting hall, child care center, bus station, place for keeping the cleaning stuffs and public toilets were located in the local Square (ibid). This implies that neighbourhoods were designed to accommodate various income groups and residual. Duany and Elizabeth Plater- Zyberk believed that designs focusing on mixed use, pedestrian priority in the designs, areas with appropriate location, functional and beautiful corridors can cohere natural environments and human made quarters in a sustainable and permanent generality.

Mixed use development

As cited in Drummond (2011:14), Niemira (2007) defines a mixed-use development as a real estate project with the planned integration of some combination of retail, office, residential, hotel, recreation or other functions. It is a pedestrian-oriented and contains elements of a live-work-play environment. It maximizes space usage, has amenities and architectural expression and tends to mitigate traffic and sprawl (ibid). Similarly, Lynch (1984) claims that mixed-use development encourages urban planners and developers to form the compact, walking-friendly and mixed communities by mingling together different functions such as commercial, residential, and recreational land uses, so as to improve the economic and social vitality at the community level. Whether it is the Congress for the New Urbanism, Smart Growth, the Compact City, Transit Oriented Development (TOD), Traditional Neighbourhood Design (TND) or any other movement relating to the improvement of the built environment, mixing land uses has gained more popularity and is a ubiquitous component of the underlying visions and ideals (Drummond, 2011). The mixed-use development concept has been widely accepted as a strategy in urban planning to address the problems resulting from the traditional zoning in the West, and it has also been increasingly adopted in some cities of developing countries like many Chinese cities.

Morris (1994) explains that the mixed land used development concept can be traced as far as the beginning of human civilization. Historically, walking was tightly fused with the spaces required to house the essential functions of the built environment such as places to reside, socialize, and produce and distribute goods and services as walking was the mainly means of transport. By those days, public facilities and services were limited to the distances that people could reasonably travel on foot and within a short period of time that was available between sleeping and working. As a result, both the overall size of the city/towns and the amount of space that was available for each necessary function were limited to the reasonably walking distance and time. The argument put forth by Morris is supported by Jackson (1985) cited in Drummond (2011:3) that prior to the early 19th century, almost every urban area in the world shared the following set of attributes: "the primary means of transportation was walking; uses were mixed both throughout the city and within individual buildings; the population density curve was very steep, with high densities in the cities and low densities in the surrounding areas; and there was a clear, physical distinction between city and country".

As Argued by Drummond (2011), if implemented, the mixed land use development is likely to reduce automobile dependence in the rapidly sprawling city and also the concept can support public transit within urban areas, combat sprawl, preserve public open spaces, promote economic development and limit the expense of providing and maintaining infrastructure in low density areas. Therefore, there is a need of city planners in developing countries to rethink about the idea of mixed use development as it's a pedestrian friendly design concept and potential in reducing the automobile dependence.

Inclusive Design

Inclusive design (which is sometimes called universal design or design for all) means designing products, services and environments that as many people as possible can use, regardless of age or ability (Burton and Mitchell, 2006). According to these authors, an inclusive design concept has grown out of two major trends, namely: The ageing of the population and the desire to bring disabled people into mainstream society. The most well-known examples of inclusive design is the Lifetime Homes concept, developed in United Kingdom by the Joseph Rowntree Foundation in 1991. The concept was developed because of concern about the quality of British housing and lack of accessibility for older people, disabled and those with young children (Brewerton and Darton, 1997) as cited in (Barton and Mitchell, 2006). The inclusive urban design concept aims at creating environments that maximise people's quality of life and well-being. Streets that are inclusive are easy and enjoyable to use by all members of the society, including the elderly, children and people with disabilities. However, the work of Burton and Mitchell (2006) has recommended six key principles for achieving the inclusive design concept. These are namely; *Familiarity*, *Legibility*, *Distinctiveness*, *Accessibility*, *Comfort and Safety*. However, Burton and Mitchell (2006) have defined these principles as follows:

Familiarity: Familiarity refers to the extent to which streets are recognizable to older people and easily understood by them. Familiar streets are hierarchical and long established with forms, open spaces, buildings and features in designs familiar to older people (ibid).

Legibility: Legibility refers to the extent to which streets help older people understand where they are and to identify which way they need to go. Legible streets have an easy to understand network of routes and junctions with simple, explicit signs and visible, unambiguous features (ibid).

Distinctiveness: Distinctiveness relates to the extent to which streets give a clear image of where they are, what their uses are and where they lead. Distinctive streets reflect the local character of the area and have a variety of uses, built form, features, colours and materials that give the streets and buildings their own identity within the overall character of the neighbourhood (ibid).

Accessibility: Accessibility refers to the extent to which streets enable older people to reach, enter, use and walk around places they need or wish to visit, regardless of any physical, sensory or mental impairment. Accessible streets have local services and facilities, are connected to each other, have wide, flat footways and ground level signal-controlled pedestrian crossings (ibid).

Comfort: Comfort refers to the extent to which streets enable people to visit places of their choice without physical or mental discomfort and to enjoy being out of the house. Comfortable streets are calm, welcoming and pedestrian-friendly with the services and facilities required by older people and people experiencing temporary or permanent incapacity (ibid).

Safety: Safety refers to the extent to which streets enable people to use, enjoy and move around the outside environment without fear of tripping or falling, being run-over or being attacked. Safe streets have buildings facing onto them, separate bicycle lanes and wide, well-lit, plain, smooth footways (ibid).

According to Burton and Mitchell, these principles can be considered as early on in the development process as possible. They can be used in the development of whole new settlements, retirement villages or urban villages, regeneration and redevelopment of urban areas, development of private and social housing, or could be used to make improvements to any urban area without the need for a major development project (ibid). Generally, these principles are meant for various expert professionals involved in producing street environment (Architects, Urban designers, Planners, Highways engineers, Access officers, Private developers, Housing associations and Manufacturers of street furniture) and users of street environment (Older people and people with disability, Carers of people with limited

mobility, Groups representing older people and people with disabilities, and Anyone interested in their local environments and streets) (ibid).

3.4 Concepts for improving walkability in the built up area

New Zealand Transport Agency in 2009 announced a summary of 4 concepts for improving the pedestrian environment: These were named as living streets, pedestrian precincts, shared zones and sharing the main street. The next section briefly describes the mentioned concepts so as to understand the different ways and methods for enhancing pedestrian friendly urban environments:

Living streets

According to the New Zealand Transport Agency (2009) 'Living streets' are streets designed to accommodate a range of transportation options (i.e. driving, walking, bicycling, and transit-and emphasize moving people, not just cars). They are active public spaces that serve the needs of all community residents, irrespective of age, income, or disability. The concept of 'living streets' recognizes that, as a priority, streets should be designed with living and community interaction. The New Zealand Transport Agency points out that the living streets need to be designed in such a way that drivers are aware that they are in an area where pedestrians and other street users are important; and thus cars are not excluded from the street. A living street aims to balance the needs of residents, businesses, pedestrians and cyclists with cars. To achieve the living streets in place, the following design aspects are highly recommended: Traffic-calming measures, hard and soft landscaping areas; places for social activities, children's play areas, seating, lighting improvements, public art, a better interface between street & housing (ibid).

The living streets are characterised by the presence of streetscapes (i.e. the area between the building and the street is attractive and inviting to pedestrians), wide designed sidewalks, crosswalks and where appropriate, include segregated bike lanes, street parking and transit lanes. Furthermore, pedestrians are separated from moving traffic by planning strips or on-street parking. Street lights and signs are sized and placed for pedestrians and not cars. There are plazas, fountains, and other outdoor public spaces where people can congregate. Generally, the living streets support compact and mixed-use development, which often combines residential, office, retail, and other compatible activities (ibid).

According to the New Zealand Transport Agency (2009) the living streets concept can be applied in theory to imply any road (new or existing roads). There is no one solution; instead, the community is involved in identifying problems for which specific solutions are developed. This means that the living streets concept is particularly worth considering for all new roads where good design costs little, and for existing roads that require reconstruction or major alterations for other reasons. The concept is most useful for roads without a predominant through traffic function, but can be applied in part to a minor arterial road (ibid).

If fully implemented, on one hand, the living street concept can improve safety and security for pedestrians, enhances economic vitality, promotes quality housing, supports community networks, creates a sense of place and identity, promotes cultural activities, creates a sustainable environment, maintains ease of access, creates an aesthetically pleasing environment and it also improves social interaction. Not only that, but also because they are public spaces and public investments, livable streets add value to adjacent properties, maximize public investment and benefit, and provide places like shops, parks, and plazas for people to congregate (ibid). On the other hand, the living streets concept can delay the motorised traffic and be costly. However, the positive advantages of the concept surpass the disadvantage side.

Pedestrian precincts

Pedestrian precincts refer to pedestrian-only streets that are created by restricting traffic access or closing roads to traffic (New Zealand Transport Agency, 2009). According to the New Zealand Agency, there are four types of pedestrian precinct: These are namely:

- *Modified street precinct*: where one block is closed for pedestrian-only use.
- *Plaza*: whereby several blocks are closed, but the cross-streets stay open to all traffic:
- *Continuous precinct*: several blocks and the cross-streets are closed and
- *Displaced precincts*: Walkways are developed away from the usual roadside footpaths, making use of lanes and alleys (ibid).

According to the New Zealand Transport Agency, pedestrian precincts concepts can be adopted in streets characterised by heavy pedestrian activity, retail or mixed development and a high number of pedestrian/vehicle conflicts. While implementing the aspect of pedestrian precincts, motorised traffic can be accommodated elsewhere, access for emergency services must be maintained at all times. Delivery vehicles can be allowed access during the early morning or evening, or be prohibited completely as long as servicing arrangements can be maintained. Public transport may also be permitted as long as vehicles operate slowly within a narrow corridor, although pedestrians may not favour this. The cyclists can usually be permitted as guests in a pedestrian space. Extra parking areas may be needed to replace on-street spaces lost (ibid).

If implemented, on one hand, pedestrian precincts concepts may create the best possible conditions for pedestrian freedom of movement and road safety (ibid). Nevertheless, the pedestrian precincts can create not only aesthetic and social benefits but also can reduce pedestrian congestion, improve access to retail opportunities, can improve air quality and noise levels and have economic benefits in shopping areas. Putting pedestrians first in shopping areas can improve retail performance and competitiveness. on the other hand, the New Zealand Transport Agency (2009) claims that pedestrian precincts may result to inconvenience traffic movement; be difficult to sell to retailers despite their proven benefits; involve diverting bus routes, which can result in longer travel times; passengers may also be required to walk further to bus stops; involve closing routes to cyclists; become deserted during the evenings (this can be overcome with closures during set times, e.g. during daylight only); reduce on-street parking spaces, so convenience parking provision may be needed (ibid).

Shared space

The Department for Transport UK (2011: 6) defines a shared space as: “*A Street or place designed to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clearly defined rules implied by more conventional designs*”.

A shared zone is a residential or retail street that has been designed to give priority to residents and pedestrians while significantly reducing the dominance of motorised vehicles. In the United Kingdom, shared zones are called “home zones” and in The Netherlands they are referred to as a “Woonerf”. A woonerf is often of a higher quality and more expensive than a home zone (the New Zealand Transport Agency, 2009). “shared space” is a novel approach to street design which minimizes demarcations between vehicles and pedestrians (the New Zealand Transport Agency, 2009). The shared space is a European project and a part of the IIIB North Sea program. The objective of the project is to develop new policies and ideas in the approach of the planning of *integrated multipurpose zones* in which man and his environment are prominent. This philosophy is based on seven pilot projects which have been implemented in the most developed European countries like the Netherlands, Belgium, France, Denmark, Germany, Austria and Great Britain. In the vision of “Shared Space” it is necessary to create more space for human beings, for the benefit of individuals and the survival of our democratic constitution.

According to the New Zealand Transport Agency (2009), in a shared zone/space, motorised vehicles, including removal vans, refuse and service vehicles, still have access, but must give way to pedestrians; and conversely pedestrians should not hinder vehicles. The route is physically constrained for vehicles by landscaping, structures and tight turning radii, with no delineation between the footpath and roadway. This slows vehicles to very low speeds. *The only requirement is that within the zone there is the rule of speed, and that pedestrians and vehicles operate in harmony, respecting each other and without disturbing each other* (the New Zealand Transport Agency, 2009).

The shared zones are most suitable for streets and compact areas with a low demand for through traffic movement. Their maximum size is restricted by the need to maintain response times for emergency services and to limit the extent of roadway that must be negotiated at low speeds by motorists accessing their properties. Parking places should be designated. Success requires full and active community participation and consensus. The treatment is more costly to fit to existing roads than to new developments (ibid).

If well implemented, the result is an 'environment of care' where motorised traffic has a specific reason for travelling through the street. This concept reduces the number of vehicles and that means the drivers of the remaining vehicles take care of. Environmental conditions and road safety also improve to the benefit of residents and shoppers, and streets become open spaces for walking, sitting, playing and talking. The shared zones can enhance environmental conditions through better air quality, lower noise levels and visual amenity from landscaping; shared zones have fewer crashes and less severely injured casualties; improve social interaction and provide a greater sense of community when streets are used for walking, playing and talking and improve security from increased natural surveillance. On the other hand, shared zones may be expensive to create as existing roads need to be converted; may push traffic to adjacent roads and can cost more to maintain (the New Zealand Transport Agency, 2009).

Sharing the main street

'Sharing the main street' means adapting the main street - or a centre along a sub-arterial road - to improve the safety and the quality of the road environment to all its users (the New Zealand Transport Agency, 2009). It is argued that the main streets of rural towns, and minor arterial roads in cities that are straddled by strips of retail, commercial and community activities, have conflicting traffic and pedestrian needs that need to be managed. Pedestrian crashes cluster at such locations. The traffic function is impeded by the activities along the frontage – particularly in areas where there are high levels of parking turnover or many parking manoeuvres, turning movements and crossing pedestrians. The activities along the frontage suffer from the impact of traffic noise and air pollution, access to sites and difficulties for pedestrians who want to cross. People using these areas have a range of needs including the following:

- Pedestrians need to be able to cross safely and conveniently;
- Visitors need to be able to park;
- Motorists and cyclists need to be able to move safely through the centre;
- Businesses need to attract customers;
- Transport operators need space for loading and unloading;
- People with impairments need to be able to use the area safely and comfortably;
- The community needs an attractive and safe centre to visit and to meet; and
- Public authorities need to keep costs down (the New Zealand Transport Agency, 2009)

Adaptation to the main streets is recommended for strip shopping centres alongside the existing roads. With respect to pedestrian safety they represent better value for money than residential area traffic calming. Implementing this concept, on one hand, it can reduce conflict between pedestrians,

cyclists and vehicles; can increase the safety of all road users, can improve the quality of the road, environment for all users, and maintain/enhance the economic performance of the commercial functions along the frontage. On the other hand, the concept has some disadvantage as it may be expensive to create as existing roads need to be converted and create modest delays to traffic when it is slowed through the area (ibid).

3.5 Design guidelines for walkable communities

The design guidelines for walkable community are clearly summarized in the work of McNally (2010) in which this study benefited. McNally argues that before design a neighbourhood, certain aspects of creating a walkable community must either be well thought out, or have the necessary pieces in place to make the transformation easier. He adds that certain characteristics of existing neighbourhoods may lead to creating walkable communities, while others may prove to be a hindrance. Some of these aspects can be adopted easier than others. According to McNally, a walkable street has to be designed based on the following design guidelines: *Density, mixed use, neighbourhood scale, designed and sized sidewalks, block length, crosswalks, traffic calming measures and buffers* (either planted trees or on-street parking). Likewise, Handy (2005) claims that certain characteristics of the built environment can influence people to walk either for leisure or for transport. These include: land use patterns, urban design features and transportation system. Next section gives a detailed discussion about the design considerations for walkable communities.

A number of studies (Gehl, 1980:2010; Jacobs, 1961; Handy, 2005; Ewing, 1999; Lawrence and Peter, 2000; McNally, 2010) show that certain characteristics of the land use patterns, design fetures and transport system in place can influence walking in urban areas. These include:

Density (high to medium density)

Density (particularly high densities) is one of the most important characteristic of creating a walkable neighbourhood (McNally, 2010). The higher density levels, reduce trip distances, theoretically increasing the incentive to walk and bike and its measurement is simple, while low density can increase the distances between origins and destinations (Lawrence and Peter, 2000). Higher densities mean more residents or employees within walking distance of transit stops and stations (Ewing, 1999). High densities compress enough activities into a small area to allow people to walk to almost everything. They mean more street life and the added interest and security that go with having more people around. They mean a greater propensity to walk or use transit, and lower auto ownership rates (ibid). Higher densities in an area encourage more residents to walk to various land use destinations to access services, and increase the willingness to walk instead of driving. Studies (Saelens et al, 2003; Giles-Corti et al., 2009; Van Loon and Frank 2011) argue that a density of housing, people and land uses allows for a large number of activities within walking distance of a large number of people. Such a concentration of people and activities not only reduce the trip distance, but also provides a feeling of safety within the area as they are associated with what Jane Jacobs calls “eyes-on-the street” (Jacobs, 1961). According to Jacobs, concentration of activities offers a critical mass of people to monitor activity and also creates a sense of community.

On the contrary, the low density and sprawling development patterns lead to a growing dependence of automobiles as the main means of transport. McNally (2010) claims that the use of low-density development creates a disconnection between pedestrians and neighbourhood cores, thereby creating neighbourhoods that expand outside of residents’ walking zone comfort. As the time goes on, the low density and sprawled areas then begin to cater for accessibility and safety needs of motorists, which in turn can create a dangerous and unfriendly atmosphere for pedestrians. Van Loon and Frank (2011) add that it is easier for children to walk or bike to a friend’s house in higher density environments than in lower density environments.

Land use mix

Handy (2005) argues that if a city wants to promote walkability, creating mixed use development opportunities is a key component of the process. Land use mix refers to the degree to which different land uses like commercial, residential, schools, offices, recreational, retail, parks, transit stations, restaurants, and cafes among others are intermixed in the urban landscape (Lynch, 1984; Jacobs, 1961; Hand, 2005; Ewing, 1999; Niemira, 2007; McNally, 2010; Drummond, 2011). A mix of land uses goes hand-in-hand with density to create proximity to destinations and activities, putting a number of different amenities all within walking distance of one another, and creating an environment in which it is much easier to walk for transport. The relative mix of land uses in a given area affects the distance between trip origins and destinations (Lawrence and Peter, 2000). Similarly, Saelens et al, (2003) argue that sprawling developments tend to have a separation of land uses, with a few to no amenities within the walking distance. The separation of uses into residential, commercial, institutions and industrial zones increases travel distances, with similar dampening effects on non-motorized travel behavior. McNally (2010) argues further that by creating destinations within the 5-minute radius of housing, the streets become more lively and active because people have less need to use automobiles to travel to and from stores, entertainment, and recreation areas. This creates opportunities for people to live in places where services are accessible by bicycle or on foot in the one place.

Connectivity

Connectivity is one of the essentials in creating walkable cities and prosperous streets (Ewing, 1999; Matchett, 2010; Southworth, 2005; UN-Habitat, 2013b). A community's pedestrian connectivity is based on two factors: the availability of walking routes and the availability of destinations (Matchett, 2010). According to Matchett, the key pedestrian routes in walkable cities need to be direct and convenient to enable pedestrians get into various destinations within a short time and distances. Walking routes should not be blocked by obstructions such as fences, informal vending activities, freeways or large parking lots. Pedestrians' routes in a walkable city should be navigable by people of all ages and ability including the elderly, children, and people with disabilities. Likewise, the Institute of Transportation Engineers (2010) claims that in order to create a walkable environment, the pedestrian network should be as continuous as possible so as to enable street users to choose the most direct routes and access urban property. Pendakur (2005) argues that due to poor connectivity and lack of pedestrian infrastructure, the only resources the poor have (i.e. time and physical energy) are depleted due to long walking distances.

When it comes to availability of destinations, Matchett adds that Walkable cities need to provide as many destinations as possible and which are within walking distance (quarter to one mile) of residences. Such destinations should link pedestrians with basic public facilities and services such as markets, health clinics, jobs, public transit stops, schools, worshipping places and recreational areas. However, Pedestrian connectivity is closely related to safety, and hence many of the elements that improve pedestrian safety (such as sidewalks, pedestrian crossings and other pedestrian paths) also improve connectivity (Southworth, 2005; Matchett, 2010). To achieve connectivity to various destinations means a pedestrian network must be designed at the same time as the road network and with the same priority.

Block size

The most important element of streets to promote walkability is the block length (McNally, 2010). Small block size (especially in the high density designed areas) plays a large role in making a community walkable as they allow for more direct routes and provide a larger number of potential route options than larger disconnected blocks (Southworth, 2005; Giles-Corti et al, 2009). Shorter blocks reduce travel speeds, increase safety of pedestrians and break up the street into more manageable and

enjoyable portions. Longer blocks can create monotony and boredom. To promote walkability, block lengths ranging between 300 and 400 feet are highly recommended (Ewing, 1999). Blocks lengths ranging between 500 and 600 feet should provide mid-block crossings with connected pass-throughs on every block (Ibid). If implemented, shorter block lengths can increase accessibility for pedestrians and crossings opportunities; can provide more direct routes for pedestrians; can limit the time automobiles have to accelerate after intersections, and also tend to disperse traffic, resulting in fewer roads that are heavily congested by automobiles. A study by Tira and Daudén (2010) adds that both young and adult pedestrians seem to prefer more small blocks and small buildings in a block, than long continuous façades. According to these authors, older people feel comfortable and secure when a continuous built façade can help prevent unexpected attacks from “coming from around the corner” (ibid).

Gridiron pattern streets

The gridiron pattern refers to a simple street design system where two sets of parallel streets cross at right angles to form square or rectangular blocks. Gridiron pattern streets are theoretically capable of increasing walking trips in a particular neighbourhood. This is due to the fact that the gridiron patterns have a large number of intersecting streets, thereby reducing the distance between trip origin and destination. Nevertheless, gridiron patterns also provide for a large number of alternative trip routes, allowing pedestrians to vary their routes for variety, safety, and convenience (Southworth and Owens 1993; Frank 1999). In contrast to grids, hierarchical, curvilinear street networks, loop system or cul-de-sacs are lower in connectivity. These networks are characterized by a low number of blocks and intersections per unit of area. Theoretically, they discourage walking and by increasing trip length and decreasing both route and modal choice (ibid). Therefore, when implemented, the gridiron pattern system can lead to a more resilient system as they create shorter travel distances and more route options; and can act as a solution for the congested streets in especially low income countries. This is because a gridiron pattern, with its frequent intersections, may reduce the proportion of trips made by car, thereby encouraging walking and cycling due to the directness of routes that it offers to pedestrians (UN-Habitat, 2013b).

Accessibility

Accessibility refers to the ease of getting to destinations by all the user groups, including those with impaired mobility. To create a walkable place, people of all ages and ability must be able to access businesses and activities along the street with ease, that is, easy to find and easy to get to (Jacobs 1993). Accessibility allows people to reach the desired destinations, goods and services (Montgomery and Roberts, 2008). This implies that an accessible walking environment can provide mobility for people of all ages and ability, thereby simplifying transport between common origins and destinations and can also make appropriate use of the built environment. Montgomery and Roberts (2008: 9) and Roberts et al., (2006) argue that “an accessible pedestrian network should be inclusive (or universal) and connect all types of users (women, children, and disabled) to all modes of transport, especially public transit”. Design with accessibility in mind can provide pedestrians with the widest opportunity to participate in society by giving them modal choice, as they are enabled to make efficient, uninterrupted, non-circuitous trips by focusing on the continuity of the pedestrian network.

However, many countries all over the world are focusing on improving the pedestrian accessibility in urban areas. Montgomery and Roberts (2008) point out that several European cities have given much attention to improving pedestrian access and mobility. For instance, the United Kingdom, through the Department for Transport promotes the concept of “accessibility planning” as an avenue to bolster *social inclusion* (UK Department for Transport, 2006) as cited in (Montgomery and Roberts, 2008). Similarly for developing countries, various cities and governments like Kenya and Tanzania have begun to place priority on mobility and accessibility planning for pedestrians (Wilson, 2002 cited in Montgomery and Roberts, 2008). According to Wilson, the Kenyan and Tanzanian Non-Motorized

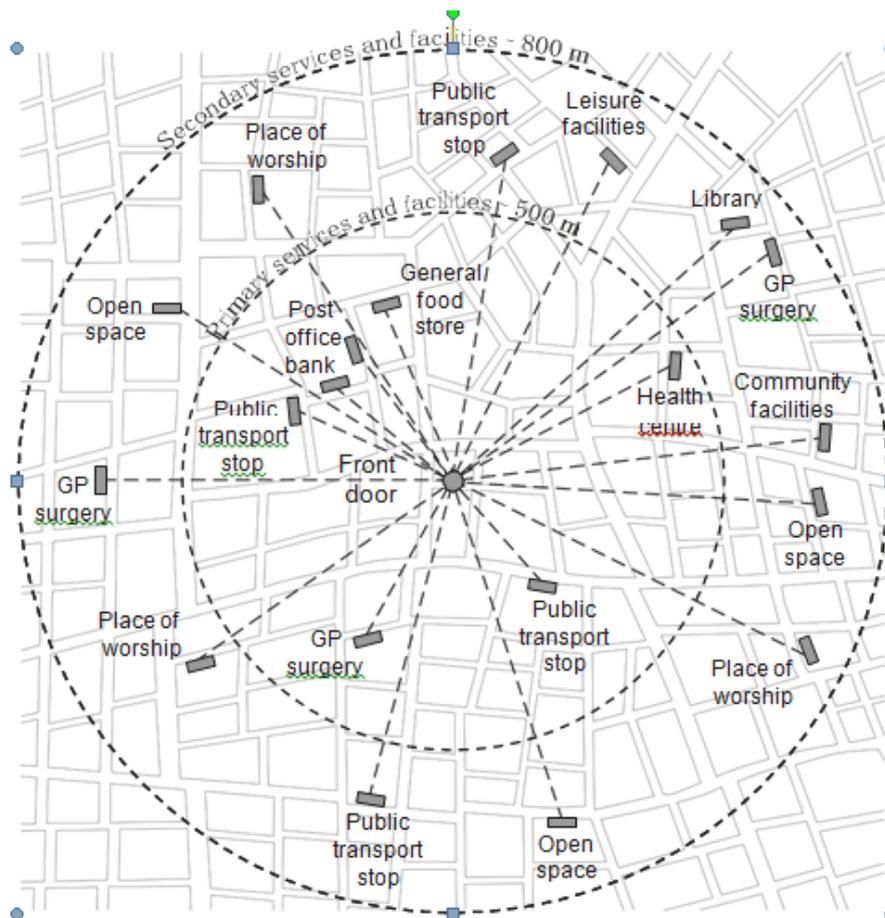
Transport Program emphasizes “mobility planning” with its primary goal being to “improve mobility and accessibility at a lower overall cost, catering to non-motorized traffic” so as to balance the needs of motorized and non-motorized traffic and hence meeting the needs of all sections of the population.

Apart from inclusion, indicator for measuring accessibility of a particular neighbourhood is the average walking time per trip, that is, proximity of urban function (Montgomery and Roberts, 2008). Studies (Southworth, 2005; Burton and Mitchell, 2006; Funihashi 1985; Handy 1996; Komanoff and Roeffs 1993; Perry, 1929) indicate that distance to destinations is the single factor that most affects whether or not people decide to walk or to take a car, and is more of a determinant than weather, physical difficulty, safety or fear of crime. Burton and Mitchell (2006) add that features of the outdoor built environment should be designed with the average healthy young adult in mind. Burton and Mitchell (2006) and the Department of Transport, Local Government and the Regions (DTLR) (2001) point out that the UK government had stated that 10 minutes is a comfortable walking time to reach services and facilities and this is the time it takes to walk about 800 metres.

Similarly, Tira and Daudén (2010) argue that a walkable neighbourhood public facilities and services are designed in such a way that one can reach most local-serving uses on foot within 10 to 20 minutes or $\frac{1}{4}$ to $\frac{1}{2}$ mile (i.e. 400m to 800m respectively). The types of activities that fall within this “neighbourhood access” category include shops, cafes, banks, laundries, grocery stores, day care centers, fitness centers, elementary schools, libraries, and parks. Maurizio further argues that the density around public transport stations should be increased when planning the networks, thereby generating a capital gain for developers through an increase in land value and using part of the capital gain to develop better services and pedestrian facilities.

Moreover, a study by Burton and Mitchell (2006:98) highlights that older people need to live no further than 125 metres from a telephone and post box, and no further than 500 metres from essential services and facilities such as a general food store, post office, bank, general practitioner’s (GP) surgery or health centre, green space (such as village green, green street edges), public toilets, seating and a bus stop. They further argue that in-case it happens that secondary services and facilities like a park or other form of open space, library, dentist, optician, places of worship, and community and leisure facilities, cannot also be located within 500 metres should be not further than 800 metres, again with public toilets and seating (ibid). The entrances to these services and facilities should be obvious and easy for older people to recognize. They should be at ground level wherever possible with flush thresholds. Moreover, public seating should ideally be positioned every 100 metres to 125 metres (ibid). Generally, locating the *primary and secondary facilities and services within 500 metres and 800 metres respectively* gives people a chance to walk a little further away from the motorised traffic travelling alongside on the road.

The non-location of public facilities and services in proximity locations can lead to increased substantial travel time to pedestrian journeys, thereby depleting the only resources the poor residents have, that both time and energy the poor have are depleted. For instance, a study by Pendakur (2005) in Morogoro, Tanzania revealed that 49% of walkers spend between 30 and 75 minutes on average per walking trip. This means the time and energy walkers had to spend on productive activities of a day, were depleted.



Source: Adapted from Burton and Mitchell, 2006:99

Figure 3.1: Primary and secondary services located within 500 and 800 metres

Linking pedestrian routes with public transit stops

A walkable city links pedestrian routes with the public transit stops so as to have a complete pedestrian network that offers full connectivity to all modes of transport, thereby enabling people to navigate from foot to another mode of transport. This is because every transit passenger is a pedestrian for at least a short distance before boarding and after departing the bus or train. Following this fact, transit facilities need to be situated adjacent to work, residential areas, shopping, and recreational facilities to encourage pedestrian trips (Southworth, 2005). Southworth further argues that it is important to provide accessible links to other modes such as bus, streetcar, subway, or train within a reasonable time-distance because every day many people depend on public transit as their main means of transport to get into the workplace, shopping, recreation, and schools. According to Southworth, transit stations need to be spaced frequently enough in the areas of supporting densities to allow pedestrian access for residential and commercial zones, usually $\frac{1}{4}$ to $\frac{1}{2}$ mile, or a 10 to 20 minute walk (ibid). To ensure safety of pedestrians at the public transit stops, crosswalks should be placed as close to bus stops or station entrances as possible, for pedestrian convenience and to discourage passengers from jaywalking.

Studies by Frank et al., (2003) and Ewing et al., (2011) point out that public transit facility as part of a street network can facilitate walking. This is due to the fact that a transit user is generally required to walk on at least one end of the trip. Therefore, urban planners, designers and other actors involved in implementing land use and transport related programs need to ensure that public streets, public transit stops and public buildings are accessible by people of all ages and ability including wheelchair users, mobility impaired and visually impaired pedestrians. When streets are multi-modal (i.e. when they accommodate pedestrians, bicycles, and transit in addition to automobiles), they provide the greatest

amount of flexibility in route and trip planning for the pedestrian (Institute of Transportation Engineers, 2010).

Nevertheless, efficient and convenient public transport can improve urban mobility and enhance pedestrian safety. For instance, Bogota, the capital of Columbia, in the period of 1995-2001, developed a high capacity bus system at a cost of US\$ 300 million that carries about 700 people a day. The bus system together with other measures taken, contributed to reducing the number of road traffic fatalities from 1387 in 1995 to 697 in 2002 and also improved access to jobs and created a more livable urban environment (WHO, 2009: 17). Similarly, Lagos, Nigeria, the six largest cities in the world with population of 17 million people, for years the city has grown rapidly and had no reliable public transport. In 2002, the state government created an agency called the Lagos Metropolitan Transport Authority (LAMATA) with the mission to “Transform the state transport system by facilitating an enabling environment”. As cited in WHO (2009), Mobereola (2006) reports that LAMATA in collaboration with the state, developed a Bus Rapid Transit system that was completed and launched in March 2009. This transport system provided Lagos with a clean, affordable, reliable and safe means of getting around the city that encourage public transport as an alternative to car transport (ibid).

Pedestrian-oriented design elements

Pedestrian-oriented urban design elements, specifically street width, building height-width ratio, and site design are among the essentials that contributor to walkable cities (Frank et al., 2003). These elements can be operationalized both at the street and site levels to create a comfortable environment for pedestrian travel. These pedestrian oriented urban design elements are likely to influence pedestrians’ perception of the built environment, and ultimately their decisions to walk for transport. The next section provides a brief discussion on each of the pedestrian oriented urban design elements identified.

- Wider Streets/ inclusive streets

Streets as public spaces are assets for urban dwellers livelihoods and city development in general. The Streets are usually regarded as mere links in a road network, enabling travel between two or more destinations. Streets connect space, people and goods; and thus, the planning and design of streets need to accommodate the needs of all users, that is, age-groups, gender, economic status and modal means (UN-HABITAT, 2013b). A good street pattern boosts infrastructure development, enhances environmental sustainability, supports higher productivity, enriches quality of life, and promotes equity and social inclusion (ibid). Despite the roles played by streets, yet streets and the notion of public space are often overlooked, especially developing countries cities where the multiple functions of streets are poorly integrated and, in the worst cases, are neglected. In cities of developing countries, the needs of street users, particularly pedestrians are inadequately accommodated and managed. As a result, the continuity of the walking routes in cities of developing countries is blocked by packed cars, and sometimes crowded by street vendors leading to increasing pedestrian fatalities and crashes.

Citing the experience from Indian cities, Tiwari (2005) as cited in WHO (2009) argues that, Delhi, in India, had in 2009 completed the first phase of the BRT corridor with segregated pedestrian, bicycle and bus lanes on a major arterial road of the city. The pedestrian network has been designed with due concern for the needs of the elderly, children and physically challenged persons. Tiwari adds that since street vendors are an integral part of urban streets, Delhi, had decided to accommodate street vendors in the main streets by providing space for them without disturbing the flow of pedestrians and bicycles. According to Tiwari, in the First 10 months of operation there were no car, motorcycles or bicycle fatalities in the corridor (Ibid). Although it does already happen today, but it has been proved that businesses have higher sales when more people are using the streets. This is beneficial for the whole economy, as employment rates, income, property value increases and with that the tax revenues (UN-HABITAT 2013b, p. 38). Hence, urban planners need to allocate enough land for street space

that will accommodate the needs of all users. Considering pedestrians during street designs, means encouraging people to walk for everyday life activities.

- *Human scale – (Building height-street width ratio)*

In the walkable streets, building heights as well as the street widths need to cater for the scale of people and not automobile (American Planning Association, 2006). This implies that not only do sidewalks need to be sized right for pedestrians, but also building heights, street widths, and building details need to be thought of from the perspective of pedestrians. When buildings are in scale with the width of the street, a pleasant, enclosed pedestrian space can be achieved. If the street is too wide for the scale of the buildings, it will feel open and difficult to traverse for the pedestrian. If the buildings are too tall for the scale of the street, the street may begin to feel cramped and constricted (Jacobs 1993, Institute of Transportation Engineers 2010). A defined street edge helps to define the pedestrian realm and enhances the pedestrian experience. As cited in McNally (2010), American Planning Association (2006) argues that in order to create spaces and travel ways that feel comfortable spatially, this ratio should range from 1:1 to 1:4 and should not exceed 1:6. Building enclosure, or the relationship of building height to building separation, is probably one of the most important of these concepts. This ideal range for building enclosure creates the perception of an enclosed space that is more comfortable and scaled correctly to pedestrians and creates better cross street connections.

- *Site design (i.e. spacing between buildings, building orientation and building setbacks)*

Like street design, at site level, spacing between buildings, building orientation and building setbacks along are believed to impact the propensity to walk and bike. When designed along with other aesthetic considerations, these design elements create environments that are either attractive or unattractive for non-motorised travel, and can also increase or decrease the quality of the pedestrian and bicycling environments (Jacobs, 1961; Frank et al., 2003; Tira and Daudén, 2010; Institute of Transportation Engineers, 2010; McNally, 2010). To achieve a walkable city, it means buildings along the street should be built as closely as possible to create a more perceptible and defined street edge for pedestrians. A study by the Institute of Transportation Engineering, (2010) noted that buildings and facades oriented to the street help create an inviting pedestrian oriented space, but also creates eyes-on-the street (Jacobs, 1961). The positioning of buildings adjacent to pedestrian paths is also important in terms of typology, morphology, length and continuity of façades and maintenance among others (Tira and Daudén, 2010). In a walkable street, the building should be set back as little as possible from the right of way, preferably, setback backs should be zero; and also off street parking should never be located between the building and the street (Frank et al., 2003).

Pedestrianisation Schemes

Iranmanesh (2008) argues that pedestrianisation is a great necessity in urban designing to create a walkable and sustainable city in developing countries. This is in line with the fact that vehicular access is overcoming in cities more and more, while the attendance of the vulnerable pedestrians in urban spaces is becoming less and less (ibid). Studies (Jacobs, 1993; Iranmanesh, 2008; New Zealand Transport Agency, 2009) have defined pedestrianisation as simply the removal of vehicular traffic from city streets to achieve pedestrian only spaces. In Hong Kong, pedestrianisation is defined by the transport department as “to restrict vehicle access to a street or area for exclusive use of pedestrians” ((Iranmanesh, 2008). Pedestrianisation schemes aim to promote walking as a transport mode by making the walking experience more enjoyable as they create a pleasant environment that people can involve in different social, cultural and tourism activities as well. Additionally, pedestrianisation schemes are implemented so as to improve pedestrian’s safety and mobility and help to reduce both noise and pollution by discouraging or restricting access of non-essential vehicles (ibid).

According to Iranmanesh (2008), three forms of pedestrianisation exist: First is *Full time Pedestrian Street*, where arrival of vehicles into the street is fully forbidden and usually services are in the back of street. In most cases only emergency service vehicles are allowed to enter. Secondly is *Part-time Pedestrian Streets* where vehicular access is allowed only in specific periods and on-street parking is not allowed, though the loading bays are available. Thirdly is the “*traffic calming streets*” that aims to reduce the dominance and speed of road vehicles. In the traffic calming designed streets, there are no restrictions to vehicle access, but footpaths are widened and parking spaces are reduced. Various traffic calming measures are used to slow down the speed of vehicles. They include speed tables, narrower traffic lanes and use of different road textures and colors to remind drivers that they are within traffic calming zones. Pedestrianisation schemes have been implemented in many developed countries like Norway, England, Italy, Germany and Sweden (Iranmanesh, 2008).

However, in developing countries pedestrianisation schemes have been implemented in Tehran, capital of Iran, where two large squares, “Vanak square” and “hafe tir square” have been allocated to pedestrian and become a commercial and cultural complex (ibid).

Traffic Safety

Scholarly works (Jacob, 1993; Southworth, 2005, Burton and Mitchell, 2006; Montgomery and Roberts, 2008; Bicycle Federation of America, 1998; Giles-Corti et al. 2009; Institute of Transportation Engineers 2010) indicate that walkable cities need to invest in pedestrian infrastructure to enhance pedestrian safety. Despite the fact that walking captures a much larger mode share than motorized vehicles in many developing cities, investment in facilities for pedestrians is inadequate and comparatively low as these cities have made little or no investment to develop pedestrian facilities (Montgomery and Roberts, 2008). According to Montgomery and Roberts, the negligence of pedestrian infrastructure is also evidenced by the encroachment of the pedestrian space and failure to maintain its condition, both of which severely reduce its capacity and utility. Continued disregard of planning for pedestrian network has led to pedestrians being exposed to road accidents and insecure from crime. To improve walkability in cities of developing countries, the pedestrian network should be safe for people of all ages and ability, both from traffic hazards and crime (Southworth 2005, Jacobs 1993, Brown et al., 2007, Giles-Corti et al., 2009, Institute of Transportation Engineers 2010). Therefore, in order to enhance the pedestrian safety in cities of developing countries, investing in pedestrian infrastructure is inevitable and hence the design of the urban environment needs to include the following essentials:

Sidewalks and walkways

To enhance pedestrian safety, sidewalks should be designed and constructed to create a safe and comfortable walking environment for pedestrians, and connecting them to neighbourhood amenities while providing buffers from vehicular traffic (Jacobs, 1961; American Planning Association, 2006). Sidewalks should be designed in a way that responds to their specific locations in community. This means sidewalks in residential neighbourhoods should be different from sidewalks designed in commercial neighbourhoods. Sidewalks need to be a minimum of 5 feet wide to accommodate room for two people to walk side by side. If the sidewalk is aligned with a building facade, wall, or fence an additional 1 to 2 feet should be added; this area is known as the “shy space” (ibid).

Segregated lanes for pedestrians

To improve pedestrian safety, the experience from other countries indicates that some cities have started to redesign their streets by *building separate lanes for pedestrians and cyclists*. For example, *Delhi, India*, has recently completed the first phase of a corridor with segregated pedestrian, bicycle and bus lanes on a major arterial road of the city. The pedestrian lane has been designed with due concern for the needs of the elderly, children and physically challenged persons (Tiwari, 2005) in

WHO (2009). In addition, Bogota, the capital of Columbia, in the period of 1995-2001 implemented land use and transport measures by building specific cycling and pedestrian only routes, including a free route for cars (that is excluding cars from the city centre at pick times in the morning and afternoon) and developing a high capacity bus system at a cost of US\$ 300 Million that carries about 700 people a day (WHO, 2009:17). These measures contributed not only to reducing the number of road traffic fatalities in Bogota from 1387 in 1995 to 697 in 2002, but also improved access to jobs and created a more livable urban environment. As cited in WHO (2009), Mobereola (2006) argues that the Lagos Metropolitan Transport Authority (LAMATA) in collaboration with the state, had developed a Bus Rapid Transit system that was completed and launched in March 2009. This transport system has provided Lagos with a clean, affordable, reliable and safe means of getting around the city that encourage public transport as an alternative to car transport.

Crosswalks

Most injuries and fatalities involving pedestrians occur as pedestrians attempt to cross streets. Ewing (1999) argues that the accident rates are significantly lower where marked crosswalks are provided and crossings are lighted. This argument is supported by Krambeck (2006) who argues that when there are no opportunities provided for crossing streets, pedestrians tend to jaywalk, increasing their risk of injury or harm. He further argues that “fear of fatal road accidents has curtailed walking along the major corridors because of difficulties associated with crossing the road at various intersections”. Ideally, crossing opportunities, when in the form of pedestrian bridges or subways (less desirable for elderly and the disabled), signalized crossing, or other form, there should be crossings at least every 300 meters to be considered acceptable. Ewing (2009) citing Untermann (1984) recommends that crosswalks be placed every 100 feet, and in some areas this may mean the addition of mid-block crosswalks. Well marked crosswalks, mid-block crosswalks, sidewalk flares, and smaller corner radii can all lead to safer and more walkable streets (Ewing, 2009; McNally, 2010). Mid-block crosswalks help to improve walkability by providing greater access to areas for pedestrians, while limiting the amount of pedestrians crossing without a crosswalk.

Traffic calming measures

These refer to the different methods to decrease automobile speeds or reduce high speed in a neighbourhood. According to McNally (2010) one of the best ways to control automobile speeds is to create more narrow lanes (That is, decreasing the perceived space for drivers). This can be achieved through mainly two ways: *the use of flares or bulbouts* (which widen street corners, narrow driving lanes, and create shorter crosswalk lengths) and *the use of chokers or neckdowns* (These are used to narrow streets at major intersections, forcing automobiles to slow down when turning onto or off of major intersections, and become more aware of pedestrians) (ibid). Other easy traffic calming methods with low costs include: creation of bike lanes on roads after narrowing roadways; formation of a landmark at the entrance of a neighborhood or district (Gateways) inserting a large median and narrowing traffic lanes. Gateways contribute in making automobiles aware of the community they are entering (McNally, 2010). However, Gateways are most effective when a new design scheme is used for sidewalks and buildings, creating a contrasting environment for passing motorists who are forced to take notice (Burden, 2000:30) cited in McNally (2010).

Landscaping treatments is another design element that is believed to be effective in slowing down vehicular speeds in communities. This is due to the fact that, trees planted along the edges of roadways and in medians not only provide barrier for pedestrians, but also narrows the perceived amount of space for automobiles. They also can create a more pleasant environment for both pedestrians and motorists, at the same time creating the image of the roadways as a part of a place or destination, not just a vehicular route (Burden, 2000:32) and McNally (2010).

Medians

Medians can help slow traffic by creating a narrower travel way; they are ideally used on multilane streets to separate directions of travel. They can also serve an aesthetic purpose on a wide street. The medians should not exceed a width of 18 feet in order to keep the streets from becoming too wide to traverse on foot; and installation of a median should not occur if it will compromise sidewalk width. A median may be landscaped or planted with street trees. The road median should be wide enough to accommodate pedestrians safely and comfortably (McNally (2010).

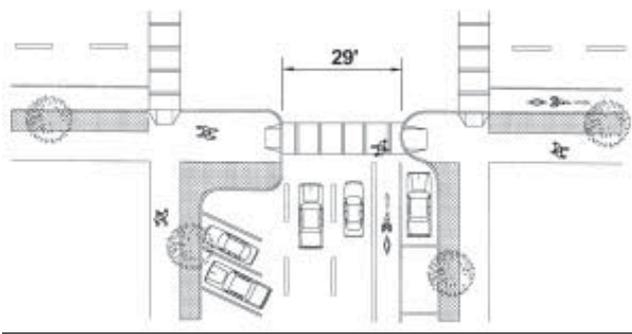
Southworth (2005) argues that across USA there has been “traffic calming,” techniques for making streets more pedestrian friendly by slowing down traffic through a variety of devices: chokers, chicanes, speed bumps, raised crosswalks, narrowed streets, rough paving, traffic diverters, roundabouts, landscaping, and other means. Ideal automobile speed limits in neighbourhoods that wish to promote walkability are around 20 to 25 miles per hour, with busier and more heavily trafficked street speed limit set at 35 miles per hour (American Planning Association, 2006: 181). Anything greater than these speeds, create an environment that caters too much to automobiles and scares away potential pedestrian street traffic.

Buffering

To ensure pedestrian safety in a walkable city, sidewalks should be accompanied with a “buffer zone” to create separation between pedestrians and automobiles (Ewing, 1999; American Planning Association, 2006; McNally, 2010). These buffer zones can be achieved through mainly three options, namely: *Planted strip, furniture zone and on-street parking* (American Planning Association, 2006). A brief detail on each option is explained here under:

- *Planted strip*: According to the American Planning Association, pedestrians in residential and smaller commercial zones need to be separated from the roadway by a 6 to 7 feet wide planted strip. The planted strip can provide trees that line the street, decreasing the perceived space automobiles have (American Planning Association, 2006 cited in McNally, 2010).
- *Furniture zone*: the second option is to include a furniture zone, ranging anywhere from 4 to 8 feet wide, which creates a similar separation from vehicular traffic.
- *On-street parking*: Both options for buffer zones (Planted strip and furniture zone) can be supplemented with *on street parking* in order to further increase the zone between pedestrians and vehicular traffic. A lane of parking between the travel lane and the sidewalk provides a buffer between pedestrians and traffic. It can also help to slow traffic, providing a safer, more pleasant pedestrian experience (McNally, 2010). These various buffer options tend to increase pedestrians’ perception of safety while also providing shade and other amenities to them.

Therefore, to ensure pedestrian safety in walkable neighbourhoods, the road designs should separate motorists from pedestrians. Traffic calming designs, pedestrian crosswalks, speed islands, and proper street designs should be provided to guarantee safety of pedestrians (Sebastian et al., 2011). The mix of uses should be ensured to shorten distances to access facilities and services (Burton and Mitchell, 2006).

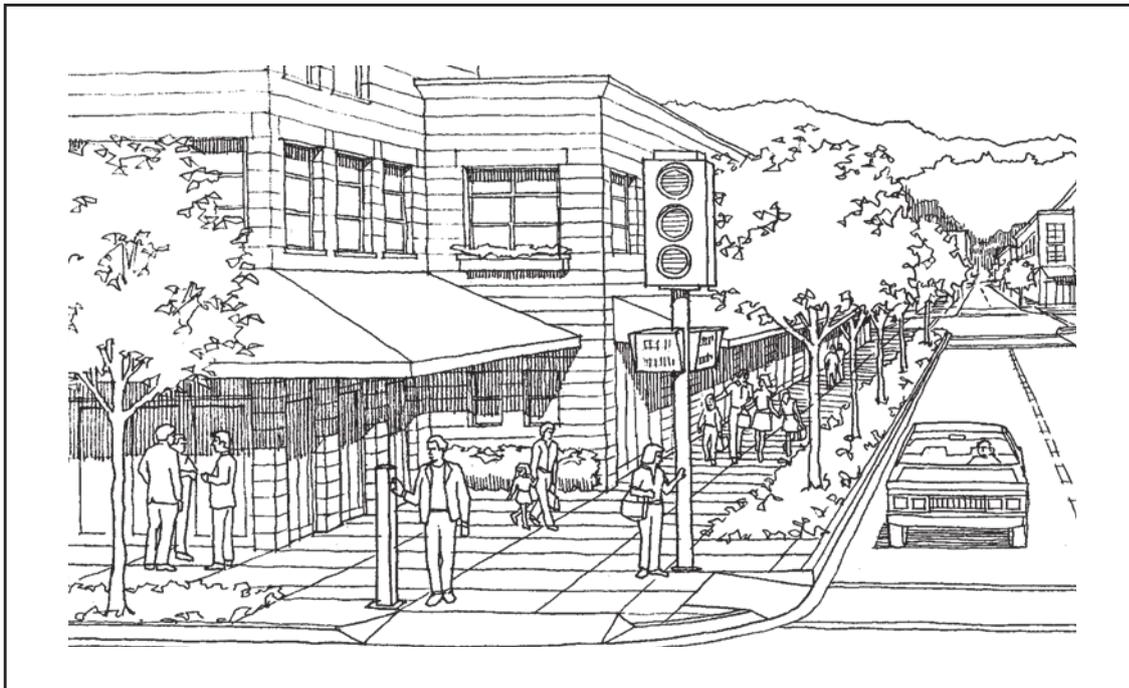


Source: Otak, (2003: 134)

On-street parking design is recommended in inner residential areas since it slows the speed of vehicles and separates pedestrian walkways and the road (Otak, 1997). However, these should be avoided at intersections where they can block the view of pedestrians (ibid); instead, pedestrian designs that reduce crossing distances and installation of safety measures like traffic lights and crosswalks are encouraged.

Figure 3.2: Traffic calming burb outs and extension

Otak adds that one-way street design improves safety of a pedestrian since they have only to concentrate on one side of the road when crossing (ibid). Highway designs should consider pedestrian facilities like bridges, underpasses and overpasses. Pedestrian ways should be incorporated alongside the carriage way to ease their movement and flow (Ann et al., 2013). Pedestrian walkways, lighting and street furniture are crucial design elements in recreational areas to enhance their comfort and safety (Lester, 2010).



Source: Otak, (2003: 21)

Figure 3.3: Pedestrian separation and design of buildings facing the streets

Literature (Burton and Mitchell, 2006) has also shown that many pedestrians lack awareness of their safety. To achieve this, it is important to understand peoples' perceptions to walking environment (ibid). People may choose to avoid walking if they sense danger and personal insecurity in the environment they walk in. Similarly, pedestrians will tend to avoid using unfamiliar streets, deserted public spaces, and dark underpasses if they sense they will be under attack and assault in these areas (ibid). They may decide to cross the road at a section of high traffic risks than the using pedestrian infrastructure which is not safe.

Legal provision

The rapid motorization has brought about inexperienced and careless drivers to urban streets, thereby jeopardizing pedestrians and other non-motorized transport. To reduce urban traffic crashes in cities of developing countries, establishment of road safety laws that reflect pedestrian needs in using the streets and sidewalks is a key step forward in achieving a walkable city (Montgomery and Roberts, 2008). This implies that cities of developing countries need to enact traffic rules, laws and regulations that force motorists to stop at crosswalks and consistently give pedestrians the right-of-way or priority at crosswalks. China, for example, in 2004 enacted traffic management legislation that benefits pedestrians by regulating motorists. The 2004 national Road Traffic Safety Law holds motorists responsible for any traffic accident involving pedestrians, regardless of the party in fault. Furthermore, the State can require drivers to obtain third party insurance, which, if priced by driver accident rate, can dramatically improve traffic behaviour (ibid). By designating slower vehicle speeds on local streets and ensuring that these routes receive proper administration of road safety laws; cities will be improving the quality of life of walkers, which often make up the largest mode share in developing countries (ibid).

Disability infrastructure

A walkable city needs to be designed in such a way that it meets the needs of people of all ages and ability. That means public spaces, public transport and buildings need to be inclusive (Burton and Mitchell, 2006; Roberts et al (2006). An accessible pedestrian network should be inclusive/ universal in such a way that it connects all street user groups (women, children, the elderly and disabled) to all modes of transport, especially public transit. Accommodating the needs of street users, including disabled pedestrians (i.e. people using wheelchairs and other mobility aids, and those with low vision and the blind) is a critical design element towards achieving walkable cities, and some countries have started initiating some regulations to assure accessibility to all. Muhlbach (2012) citing PBIC (2011) reports that, in 1990, American states signed The American with Disability Act (ADA) that seeks to ensure that all Americans including those with disabilities have full access to public facilities and services. The ADA prohibits state and local governments from discrimination against people with disabilities in all programs, services, and activities. Moreover, Krambeck (2006) argues that disability infrastructure typically services all pedestrians, not just those who are disabled. For example, curb ramps are convenient not just for wheelchair access, but also for persons with baby carriages, shopping carts, or luggage. Similarly, for wheelchair access, effective walking path width (net of obstructions or portions of disrepair) should be at a minimum, 1 meter wide. This minimum width services all pedestrians, alleviating bottlenecks; easing access for those with small children, parcels, or walking canes; and improving the overall convenience of the walking path.

Street security

Street muggings, pick-pocketing, and other forms of pedestrian-directed crime can influence the ability and willingness to walk (Montgomery and Roberts, 2008; 11). According to these authors, urban walking without fear of crime or physical harm influences the life of the city, particularly at night and for vulnerable users, such as women, children, and the elderly. Montgomery and Roberts (2008) observe that in Wuhan (the capital of Hubei Province, China) “women were keenly aware of security issues as they felt more vulnerable to theft and assault, especially at night because of poor street lighting. It is argued that security is particularly a critical issue for women and children who may choose alternate modes (use a taxi to cross the street, rather than walk) or may be forced to eliminate trips due to a perception of dangerous pedestrian conditions (Montgomery and Roberts, 2008). Jacobs (1961) adds that without ‘*eyes upon the street*’ people will always feel insecure to walk in the streets as the walking environment becomes unfaithful for everyone, including men. Therefore, in order to under-

stand the state of the pedestrian environment and be in position to improve walkability in cities of developing countries, surveying the public perception of security during walking is of great significance.

Pedestrian amenities

Kramback (2006) argues that pedestrian amenities, such as benches, street lights, public toilets, and trees greatly enhance the attractiveness and convenience of the pedestrian environment, and in turn, the city itself. Street lights enhance pedestrian safety, especially at night hours. Besides, trees protect pedestrians from traffic, improve air quality, provide some degree of shelter from the elements, and improve the attractiveness of the pedestrian environment. Provision of benches, public toilets, pedestrian signage and other amenities reflect the degree to which city respects the pedestrian environment's role in the smooth functioning of the city. Street trees and landscaping can provide a natural barrier between pedestrians and faster-moving traffic, but can also make walking a much more enjoyable experience by providing visual stimulation as well as protection from the elements (Jacobs 1993, Giles-Corti et al., 2009). In addition, pedestrian-scale elements like benches, kiosks, and signs can help orient the pedestrian and provide an inviting, leisurely, pleasant walking experience (Jacobs, 1993). Therefore, to ensure convenience and attractive walking environment, pedestrian paths need to be well designed in terms of width, paving, landscaping, signing, and lighting Tira and Daudén (2010).

It is further argued that, in most cities of developing countries, transportation and land use policies have made walking inconvenient, unpleasant, and dangerous to the vulnerable road users (i.e. the urban poor, children, the elderly and people with disability). From the review of literature, the next section provides a summary of parameters relevant towards achieving a walkable city, particularly in developing countries.

3.6 Summary regarding the parameters of a walkable city

Insofar as design for walkable city is concerned, the land use patterns (i.e. density, land use mix and accessibility), urban design features (i.e. street patterns, block size, pedestrianisation schemes, wider/inclusive streets, building height-street width relationship, orientation of buildings, building setbacks and pedestrian amenities) and transport system (i.e. connectivity, linking pedestrian network with public transit, traffic safety, street security, traffic calming measures, crosswalks, buffering, sidewalks and walkways, separated lanes for pedestrians, legal provisions, provision of disability infrastructure and sharing space concepts) are believed to be the key parameters for a walkable city.

However, the parameters thus far discussed have in most cases been tested and adopted in the developed countries (i.e. in the global north). Ever since the requirements of pedestrians are almost equal all over the world, it is believed that the walkability parameters adopted in western countries can also be applied in cities of developing countries. Tira and Daudén (2010) argue that the environmental and social implications of urban sprawl and “zoning” in land use planning are still the predominant in cities of developing countries. In the U.S, the same sprawling practice has been dominant since the sixties. To address such challenges, new ideas such as “New Urbanism”, “Growth Management”, “Smart Growth”, “Transit-oriented Developments” and “Car-free cities” illustrate new possibilities for integration of transport and land use planning (ibid). In most of these new design concepts, the key primers for pedestrian-oriented urban land use are: linking urban development to transit provision, maximizing metropolitan accessibility by public transport and designing land use and activities in close proximity to one another.

Therefore, the researcher is of the opinion that these reviewed design guidelines, can also improve the walking environment in cities of developing countries. The following parameters were used to conceptualize the operational variables of the study.

Table 3. 1: Parameters of a walkable city

S/n	Parameter	Definition	Indicators
1	High-medium density	The number of residential dwelling units per unit of land area (e.g., acre).	-More residents /employees per unit area -Activities closer together -Public bus tops close to residential area
2	Proximity to services	Refer to services located within a walking distance (i.e. 5 to 10 minutes walk time or ¼ to ½ a mile or 400m to 800m)	-Traveling time to destinations reduced -Automobile dependent reduced - Access to public facilities improved
3	Land use mix	Refers to the degree to which different land uses like commercial, residential, schools, offices, recreational, retail, parks, transit stations, restaurants, cafes, etc. are intermixed in the urban landscape.	- Different types of land uses per block (i.e. residential, commercial, office, schools, public spaces, restaurants, recreational & industrial within same Neighbourhood/ an accessible centre
4	Diversity	Refers to a multidimensional phenomenon that promotes further desirable urban features, including a greater variety of housing types, building densities, household sizes, ages, cultures, and incomes	A mixture of land uses; building and housing types, architectural styles, and rents.
5	Compact development	Refers to urban land use planning with a focus on higher density and better accessibility, which reduces automobile dependency:	High density and mixed land use, either in horizontal or in vertical form
6	Connectivity	The directness or ease of travel between origins and destinations, which is directly related to the characteristics of street design.	Distance between intersections or cross block passages; Short Block length; and grid-iron pattern
7	Accessibility	The ability to reach or enter a destination (e.g. home, shops, offices, school, public transit, recreational and public spaces.	Destinations reached by pedestrians of all ages and abilities (e.g. wheelchair users; handicapped, and visually impaired pedestrians.
8	Urban design features	-A profession that makes decisions about how natural (topography, vegetation) and built (buildings, streets, roads, plazas) elements in a particular space will relate to one another. -The opportunity for all individuals to utilize the pedestrian environment as fully as possible.	-Human scaled streets/ street enclosure (i.e. building height- street width ratio 1: 1 to 1:6 Street parking, on street parking / buffering, facades designs, building orientation, setbacks and space between buildings, Street vendors accommodated in public space
9	Pedestrianisation schemes	The removal of vehicular traffic from city streets	-Increased pedestrian safety -Increased accessibility to shopping streets and other public spaces
10	Pedestrian infrastructure	Refer to the infrastructures planned and designed for pedestrians of all ages and abilities	-Sidewalk, pavements, walkways and footpaths -Disability infrastructure (i.e. handicapped, blind, wheelchair users and visually impaired. -Amenities (Benches, public toilets, street lights and shade trees)
11	Linkages to public transit	Refers to connection between various destinations with public transit (e.g, home, schools, shopping, work etc)	Availability of bus lanes and transit stops

12	Pedestrian safety and security	Refers to the relative safety and security of pedestrians on the walking environment. The elements to be addressed include: Crossing safety, motorists behaviour, pedestrian signals, buffering, on-street parking, medians and curbs, traffic calming measures and modal path conflicts	<ul style="list-style-type: none"> - Pedestrian crossings and signs -Pedestrian lanes -On street parking/ Buffering -Muggings, pick-pocketing, crimes, simple theft and assault minimized -Legal measures for pedestrians encouraged -Traffic calming measures in place
13	Sharing space/zones	Shared space is a novel approach to street design which minimizes demarcations between vehicles and pedestrians. It gives priority to residents and pedestrians while significantly reducing the dominance of motorised vehicles.	<ul style="list-style-type: none"> -Fewer crashes and less severely injured casualties; -Improved social interaction and a greater sense of community -Improved security from increased natural surveillance
14	Sharing main street	Means adapting the main street - or a centre along a sub-arterial road - to improve the safety and the quality of the road environment to all its users.	<ul style="list-style-type: none"> -Modal conflict reduced -Increased safety of all road users -Economic functions enhanced
15	Living streets	Refer to streets designed to accommodate a range of transportation options; they are active public spaces that serve the needs of all community residents, irrespective of age, income, or disability.	<ul style="list-style-type: none"> -Traffic-calming measures -Places for social activities -Children's play areas

Source: Own construction, July 2014

3.7 Concluding summary

This chapter has presented an overview of a walkable city, particularly the characteristics of a walkable city, pro-walking philosophers, urban visions and various design concepts for promoting and improving the pedestrian (walking) environment, and design guidelines for walkable communities. Lastly, the Chapter has provided a matrix table summarizing parameters relevant for walkability in cities of developing countries. These parameters were reflected in the conceptual framework presented in Figure 4.3 as variables of the study. The next chapter focuses on a conceptual framework that guided the study.

CHAPTER FOUR

4. CONCEPTUAL FRAMEWORK

4.0 Introduction

Conceptual frameworks may be described as tools of thinking which illustrate basic ideas relating to something abstract. Scientists begin the process of research, by developing concepts as short hands for describing the empirical world. According to Nachmias and Nachmias (1976: 15) *a concept is an abstract symbol representing an object, a property of an object or a certain phenomenon*. Studies have shown that in order to facilitate research and communication, each scientific discipline develops its own set of concepts to communicate with each other or the public on experiences gained through research. However, Nachmias and Nachmias argue that a concept is valid if and only if it fulfils two basic requirements namely, clarity and precision. All the two requirements are obtained through definitions. In their work, two main types of definitions are highlighted to include conceptual and operational definitions (ibid). Conceptual definition describes concepts by using other concepts, while operational definition provides a series of instructions detailing the operations that the researcher must carry out in order to demonstrate empirically the occurrence represented by a concept (ibid:18).

Rapoport (1985:256) argues that conceptual frameworks are neither models nor theories. Rapoport claims that models and theories are often used in many contradictory ways and suggests that models describe how things work, whereas theories explain phenomena. According to him, conceptual frameworks neither describes how things work nor explains a phenomenon, rather, *they help to think about phenomena; to order material, revealing patterns and pattern recognition typically leads to models and theories (ibid)*.

Based on the above explanations, it was necessary, therefore, to develop a conceptual framework that could guide the study. In the next section, walkability concept, the right city concept, the concept of exclusion and safer city approach are reviewed, and a conceptual framework for improving walkability in rapidly urbanizing cities in developing countries developed.

4.1. The concept of Walkability

Walkability is “the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network” (Southworth, 2005:148). A walkable network comprises six important attributes namely: connectivity of path network (both locally and in the larger urban setting); linkage with other modes (bus, streetcar, subway, train); Fine grained and varied land use patterns (especially for local serving uses); safety (both from traffic and social crime); quality of path (including width, paving, landscaping, signing, and lighting); and path context (including street design, visual interest of the built environment, transparency, spatial definition, landscape, and overall explorability) (ibid). However, walkability is considered in differently in developed and developing countries:

Cervero and Kockelman (1997) argue that the concept of “walkability” arose out of researches on transportation in USA in the late 1990s in which dimensions of the built environment related to ‘walking for transport⁴’ were considered. These were thought to include: *Street connectivity; residential density and mixed land use*. Street connectivity meant the number of intersections in a given area; while residential density referred to the number of people living close together in a given area and

⁴ Walking for transportation includes walking to or from school or work, and walking for errands such as shopping

mixed land use, simply meant a mixture of residential, commercial, retail and recreational land uses in such a way that individuals could walk for multiple purposes like going for errands, for school and work (Moudon et al., 2006). The typical examples of walkable cities include: New York in the USA, Hong Kong in China and Paris in France. Since its inception in the transportation field, the concept of walkability has been adopted by physical activity and public health researchers, practitioners and policy makers. As walkability was adopted on the worldwide stage, features like bicycle lanes, public transit and foot paths become more important. However, transportation researcher focused mostly on built up environment features mapped with Geographical Information Systems (GIS), while physical activity, researchers developed tools like Neighbourhood Environment Walkability Scale which assessed about perceptions about the built environment to include components such as aesthetics and safety that would be related to overall physical activity (Saelens, Sallis & Frank, 2003).

Paulo (2012) has also argued that “walkability” has been probably brought to the debate by Chris Bradshaw, a city planner expert in 1993 following a property tax rise in Ottawa (1992) in connection with the road infrastructure improvements. Following such changes the landlords and local shop owners claimed that most people in their neighbourhood walked in their daily trips instead of driving (Paulo, 2012; Ghidini, 2011; Bradshaw, 1993). Owing to the fact that the majority walked instead of driving, the landowners and local shop owners felt had less need for the road infrastructure expansion and therefore should not pay extra tax. By that time, Bradshaw had then proposed an index to rate the “walkability” of the neighbourhoods. It was believed that such index could be used not only to calculate the tax rates applicable to each neighbourhood, but also could prove itself useful for homebuyers, providing a reading on the walking conditions of a neighbourhood that included the assessment of the local safety conditions, and transit coverage. From a conceptual point of view, Bradshaw (1993) defined walkability as a “*quality of place*” that constituted four basic characteristics:

- i. A "foot-friendly" man-made, physical micro-environment: wide-levelled sidewalks, small intersections, narrow streets, lots of litter containers, good lighting, and an absence of obstructions;
- ii. A full range of useful, active destinations within walking distance: shops, services, employment, professional offices, recreation, libraries, etc;
- iii. A natural environment that moderates the extremes of weather - wind, rain, sunlight - while providing the refreshment of the absence of man's overuse. It has no excessive noise, air pollution, or the dirt, stains, and grime of motor traffic; and
- iv. A local culture that is social and diverse. This increases contact between people and the conditions for social and economic commerce.

It is further argued by Paulo (2012) that assessment of Bradshaw’s index was suggested to bear a qualitative ranking of 1 (best situation) to 4 (worst situation) in 10 different categories, which were in fact very different in terms of their nature. These included: the population density; the number of parking places; the chances of meeting someone while walking; the age at which a child would be allowed to walk alone; the women's rating of neighbourhood safety; the responsiveness of transit service; the number of neighbourhood "places of significance"; the area covered by parks and the sidewalk availability. The final score was to be divided by 20, producing an index between 0, 45 (best) and 2, 00 (worst).

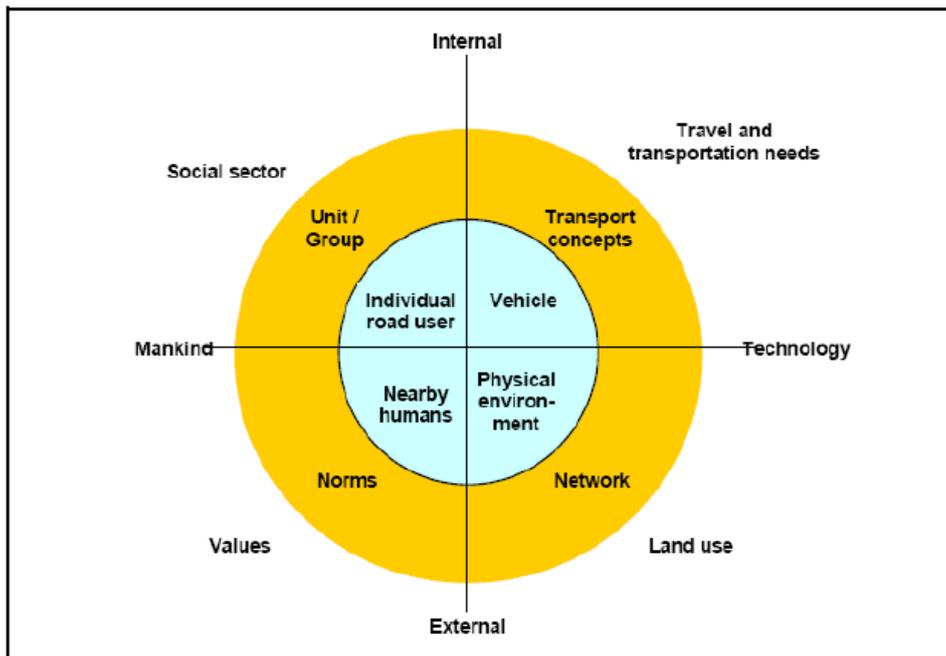
From these inspiring efforts to define and measuring walkability, many researchers have been “grappling with the concept of walkability – what is it, how to measure it and what it might mean for the design of the cities” (Forsyth and Southworth 2008). As a result, walkability’ and ‘walking’ are the terms that have become common in the fields of engineering, planning and health, partly because walking is widely recognised as having benefits for the social, health and economic well-being of a

society (Abley and Turner, 2011:11). Despite having emerged as a popular topic in forums related to transportation, urban planning and public health, yet there has been a generalized lack of consensus on the meaning of walkability. Lo (2009) argues that a wide range of researchers has been involved in evaluating the relations between the urban environment and the pedestrian behaviour, and all have a different definition of how to measure walkability.

Leslie et al., (2007:91) conceptualized 'walkability' as "*the extent to which characteristics of the built environment and land use may or may not be conducive to residents in the area while walking for either leisure, exercise or recreation, to access services, or to travel to work*", or in simpler terms, "...*the extent to which the built environment is walking friendly*" (Abley, 2005) as cited in (Abley and Turner 2011). The latter definition was found to suit the scope of this study, as it seeks to answer and give clarification of what constitutes a 'walking friendly' environment. Understanding what constitutes a 'walking friendly environment' could help to identify the pedestrians' requirements and the way are being considered and implemented in in cities of developing countries.

This question regarding what constitutes a 'walking friendly environment' has been addressed in the work by Transport for London (COST 358, 2010), where the *Pedestrians' quality needs* were interpreted into five main basic requirements (connectivity, conspicuity, comfort, convenience and conviviality) that need to be satisfied in order to ensure the walkability of a specific area. These factors have been referred to as the 5Cs, meaning that walking networks and facilities should be connected, convivial, conspicuous, comfortable and convenient. The 5Cs reflects the pedestrians' desire to make their journeys in the shortest and most convenient way possible, as a safe, pleasant and comfortable journey experience (ibid). In addition, the (COST 358 2010) have developed a qualitative approach to assess the pedestrian environment, neglecting the possibility to perform a quantitative analysis.

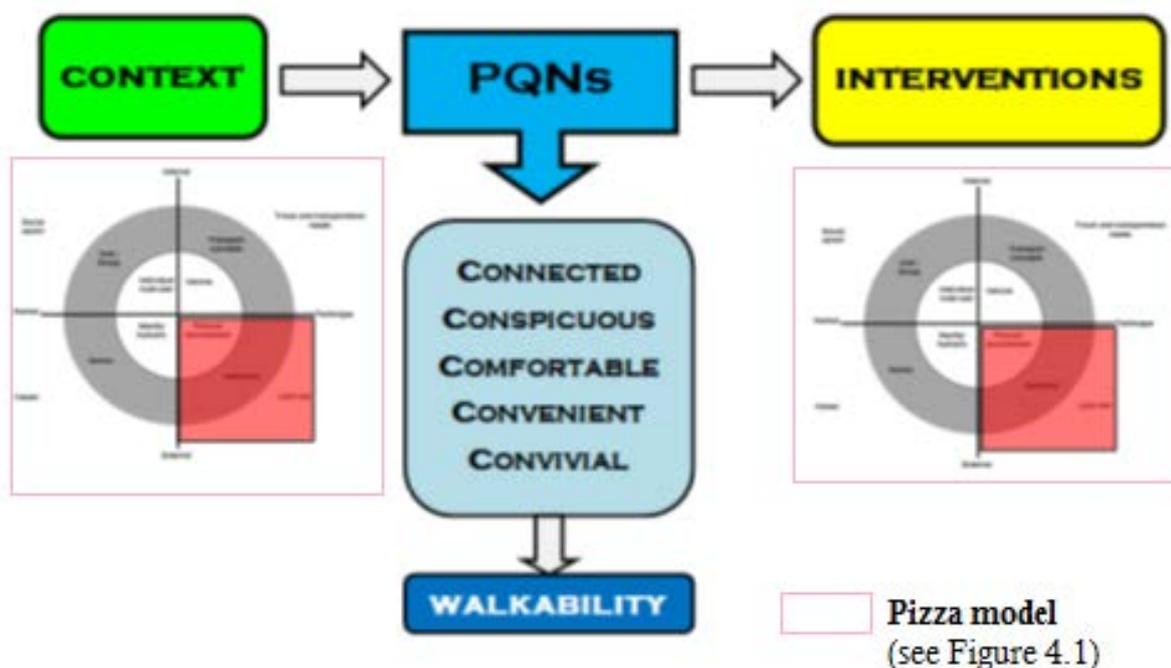
The pedestrian qualitative assessment framework (5Cs) is derived from the Pizza Model, a visual checklist that summarizes the four components of the pedestrian system, namely: *person, vehicle, organisation* and *environment* (Methorst, 2003). The Pizza-model was developed as a means for policy development to form a source of inspiration for devising comprehensive transport and road safety interventions. This means that the pedestrian environment cannot successfully be improved if policy makers do not include pedestrians in transport planning and urban development. Additionally, walkability has to be related to the need for quality, a rather neglected issue in the pedestrian system. Figure 4.1 presents the Pizza model through which the qualitative framework for assessing the pedestrian needs was developed:



Source: Methorst (2003).

Figure 4. 1: Pizza model summarizing the four components of the pedestrian system

As figure 4.1 shows, the level of performance of the transport system and road safety depends on the sum of the qualities of the four components, namely: person, vehicle, environment and organisation / social context. However, the qualitative temperate for assessing the pedestrian system (5Cs) was confined to one portion of the Pizza model, namely the “physical environment” dimension, and hence the 5Cs seeks to improve the knowledge on pedestrians’ quality needs with regard to the spatial environment. Having introduced the Pizza model, figure 4.2 presents the qualitative temperate to assessing the pedestrian system and its level of quality is based on three aspects: context, pedestrians’ quality needs (PQNs) and interventions:



Source: COST 358, 2010:25

Figure 4. 2: The qualitative framework and pedestrians’ quality needs (PQN) matrix

The framework presented in Figure 4.2 only takes into account the connection between pedestrians' needs and the physical environment, whilst neglecting the other three components of the pedestrian system (i.e. person, vehicle and organisation).

The 5Cs are here defined in succession (COST 358, 2010):

1. *Connected*: The extent to which the pedestrian network links to key trip origins and destinations, as well as the extent of linkages between different routes on the network. *Indicators*: Undisturbed route between origin and destinations, absence of obstacles and obstructions and access to public transport nodes (bus stops, railway stations) (ibid).
2. *Convivial*: The extent to which walking is a pleasant activity, in terms of interaction with people, the built and natural environment, and other road users. *Indicators*: Absence of conflicts with other means of transportations (car, bicycle, moped, segway) and absence of threats and assaults, absence of rubbish, potholes, roots, damaged surfaces and adequate street furniture, benches, "places to stop" (ibid).
3. *Conspicuous*: The extent to which walking routes and public spaces feel safe and inviting for pedestrians, in terms of clear and legible signing and information. *Indicators*: lighting and visibility, delineation and legibility and traffic signs (information and orientation).
4. *Comfortable*: The extent to which walking is accommodated to the competencies and abilities of all types of pedestrians. *Indicators*: Well-maintained footpaths of adequate widths, smooth surface and with few obstacles (steps, mud, etc), attractive landscape design and architecture, and provision of rest place opportunities, and absence of noise and fumes from motor traffic.
5. *Convenient*: The extent to which walking is possible and able to compete with other modes of transport in terms of efficiency (time, money and space). *Indicators*: Road crossing opportunities (location, type, waiting time), walkable distances between key destination and directness, absence of barriers, changing level (steps and slopes) and discomfort.

For the purpose of this study, the above five 5Cs were adapted to meet the walkability concept and definition. However, as Paulo (2012), two other dimensions were added to suit the scope of the study. These are namely, coexistence and commitment.

6. *Commitment*: The extent to which there exists engagement, liability and responsibility towards the pedestrian environment (Paul, 2012). This dimension captures the engagement of the policy makers, spatial and transport planners in promoting pedestrian friendly environments. As argued by Paulo (2012) the dimension of 'commitment' does not relate solely to the built environment, as it may include programs or initiatives to encourage walking or the degree of enforcement of laws and regulations. The governance plays an essential role in the factors that affect travel behaviour. Therefore, the dimension of commitment is taken into consideration due to the fact that the built environment in most cases is a result of *policy maker's decisions* and *planning standards* (ibid). It is clear that much of what results from the usage of the built environment relate to the community behaviour and attitude, and these finally can be influenced by the *initiatives and regulations*. To in create a walkable city and maintain a pedestrian friendly environment, these reasons are valid.
7. *Coexistence*: It implies the extent to which pedestrians and other transport modes can exist at the same time and place with order and peace (Paulo, 2012). The role of motorized means of transport in influencing the attitude towards walking is felt at different levels. Firstly, motorized vehicles need space to circulate, a situation that results into the encroachments of the pedestrian walking space. Secondly, as a number of accidents and conflicts occur daily in the urban public space and hence understanding the motorists' behaviour is of great significance

as pedestrian safety is concerned. From the literature, motorized vehicles have been identified as a major factor contributing towards pedestrian fatalities, injuries, road traffic deaths and less people walking in the cities. Thirdly, cars consume energy and produce noise and gas emissions that make the urban environment less attractive to enjoy on foot (ibid). To improve walkability in rapidly growing cities in developing countries where pedestrians share same space with other street users such as cars, motorcycles, Tri-cycles, bicycles, three wheelers and public transport, considering the coexistence of pedestrians and other modes of transport modes is of great significant as a walkability dimension on its own is concerned.

Having added the two factors (commitment and coextended), the walkability dimensions used in this study comprise 7Cs layout, instead of 5Cs. These are namely; connectivity, convenience, comfort, conviviality, conspicuous, commitment and coexistence. Similar remarks were also made by Paulo (2012).

4.2 The Right to the City

The right to the city concept was developed in 1968 by Henri Lefebvre, a French Marxist sociologist and philosopher through his book titled “Le droit à la Ville”. The concept is about the rights of all urban dwellers (inhabitants), regardless of citizenship, ethnicity, ability, gender and so forth, to participate in shaping the city. Lefebvre’s concept involves two central rights for urban inhabitants: *the right to participation* and *the right to appropriation*. The right to participation upholds that citizens⁵ should play a central role in any decision that contributes to the production of urban space. Participation allows urban inhabitants to access decisions that produce urban space. Besides that, the right to appropriation according to Lefebvre refers to the right of inhabitants to physically access, occupy, and use urban space. He further adds that appropriation is not only the right to occupy already-produced urban space, but also the right to create new spaces that meets people’s needs (Lefebvre 1968 in Kofman and Lebas, 1996: 174). The emphasis on appropriation is based on Lefebvre’s opinion that everybody has the inalienable right to use all space of the city in order to provide themselves with the necessities of daily life. Because appropriation gives inhabitants the right to ‘full and complete usage’ of urban space in the course of everyday life (Lefebvre, 1996:179), space must be produced in a way that makes that full and complete usage possible.

Lefebvre’s idea of the right to the city has been developed further by many scholars. For instance, Marcuse (2009) argues that this right to the city is both a cry and a demand. To Marcuse, the right to the city presents a demand for resources that should be justly accessible to the excluded and a cry by the alienated for the right to determine how these resources are produced. This understanding demonstrates a plea for genuine change that not only enables urban residents to access resources, but also empowers them to determine how these resources are produced.

Brown and Kristiansen (2008) perceived the right to the city as a vehicle for urban change as it creates a space in which citizens can define their needs. The World Charter on the Rights to the City has defined the right to the city as the equitable usufruct of cities within the principles of sustainability, democracy, equity, and social justice. It is the collective right of the inhabitants of cities, in particular of the vulnerable and marginalized groups, conferring upon them the legitimacy of action and organization, based on their uses and customs, with the objective to achieve full exercise of the right to free self-determination and an adequate standard of living. According to the world Charter on the rights on the rights to the city, the concept is about the rights of the excluded and marginalised groups to be part of the production of the city, for their needs and aspirations, rather than exclusively those of capital as has been the case of most urban development, to be met in the process. The right to the city

⁵ Citizenship according to Lefebvre refers to all urban inhabitants

denotes fundamental challenges existing in power relations and the deep roots of the capitalist system that drive urban development and the production of urban space, including social, political and economic relations.

Lefebvre's concept on the right to the city aim at challenging the philosophical and scientific ways of understanding how spaces are produced (UnWin (2000:14). Lefebvre rejects the dominant philosophical and scientific conception of space by developing a critical knowledge of space, which overcomes the separation of concepts and reality, is instead based on the joint concept and reality of the production of space (Kerr, 1994: 23-24) cited in Babere (2014). Furthermore, Lefebvre argues that social relations are spatial and are connected to social space; but the science of space has failed to incorporate social relations. Within the social world, of which physical space is a part, socio-economic characteristics of human agency illuminate the physical place and show how it is lived (ibid). Therefore, according to Lefebvre's theory the "Right to the City" would restructure the power relations which underlie urban space, transferring control from capital and the state over to urban inhabitants. In addition, the right to the city reframes the arena of decision making in cities: it reorients decision-making away from the state and toward the production of urban space (Purcell, 2002). Instead of democratic deliberation being limited to just state decisions, Lefebvre imagines it to apply to *all* decisions that contribute to the production of urban space. The right to the city stresses the need to restructure the power relations that underlie the production of urban space, fundamentally shifting control away from capital and the state and toward urban inhabitants

The concept of right to the city is being explored at an institutional level by various municipalities around the world, enshrined in the *European Charter for Human Rights in the City* and most explicitly in *Brasil's 2001 City Statute* (Brown and Kristiansen (2009). These scholars add that UN-Habitat and UNESCO have held conferences and organised forums to discuss, and debate the concept of the right to the city in practice. It has also been engaged by non-governmental and non-profit organisations and alliances through civil society spaces such as the *World Urban Forum* and the *World Social Forum*. At the latter, in 2004, the *World Charter for the Right to the City* was developed by a set of international, national and local civil society organisations. With regard to pedestrian mobility, Article xiii of the world charter for the right to city emphasises on the right to public transportation and urban mobility. The word charter states that:

- Cities should guarantee to all persons the right to mobility and circulation in the city, in accordance with an urban and interurban circulation plan and through an accessible public transportation system, provided at a reasonable cost and adequate for different environmental and social needs (gender, age, capacity, etc.)
- Cities should stimulate use of non-polluting vehicles and establish areas reserved for foot traffic, permanently or during certain times of the day.
- Cities should promote removal of architectural barriers, installation of the necessary facilities in the mobility and circulation system, and adaptation of all public or public-use buildings and work and leisure facilities to guarantee access for persons with disabilities.

Lefebvre's idea of space is categories into three groups what he calls; *perceived space*, *conceived space*, and *lived space*. Perceived space refers to the relatively objective, concrete space people encounter in their daily environment. Conceived space refers to mental constructions of space, creative ideas about and representations of space. Lived space is the complex combination of perceived and conceived space. It represents a person's actual experience of space in everyday life. Lived space is not just a passive stage on which social life unfolds, but represents a constituent element of social life (Lefebvre, 1991:39; Soja, 1996). Social relations and lived space are inescapably hinged together in everyday life. Producing urban space, for Lefebvre, necessarily involves reproducing the social rela-

tions that are bound up in it. The production of urban space therefore entails much more than just planning the material space of the city. It involves producing and reproducing all aspects of urban life. For Lefebvre (1996: 158), “the right to the city is like a cry and a demand... a transformed and renewed right to urban life.”

In spatial terms, Lefebvre describes the perceived, conceived and lived triad as: *spatial practice*, *representations of space* and *representational spaces* respectively (Lefebvre, 1991: 38-40). The following section provides Lefebvre outlines of the conceptual triad of space as summarized by Kerr (1994:26):

1. *Spatial practice*: The spatial practice of a society secretes that society's space; it propounds and presupposes it, in a dialectical interaction; it produces it slowly and surely as it masters and appropriates it. Spatial practice embraces production and reproduction, and the particular locations and spatial sets characteristic of each social formation. Spatial practice ensures continuity and some degree of cohesion (Kerr, 1994: 26).'

2. *Representations of space*: This is conceptualised space, the space of scientists, planners, urbanists, technocratic subdividers - all of whom identify what is lived and what is perceived with what is conceived. This is the dominant space in any society and is tied to the relations of production and to the 'order' which those relations impose, and hence to knowledge, to signs, to codes, and to 'frontal' relations. Particularly important is the spatial ordering of towns and cities, as well as the individual buildings (ibid).

3. *Representational spaces*: This is a space as directly lived through its associated images and symbols, and hence the space of 'inhabitants' and 'users'. This is the dominated, and hence passively experienced-space which the imagination seeks to change and appropriate; it overlays physical space, making symbolic use of its objects. Representational spaces need obey no rules of consistency or cohesiveness. Redolent with imaginary and symbolic elements, they have their source in history-in the history of a people as well as in the history of each individual belonging to the people. Representational spaces thus may be said to tend towards more or less coherent systems of symbols and signs, sometimes coded, sometimes not, linked to the clandestine or underground side of social life, as also to art (ibid).

For Lefebvre, then, the conceptual triad of spatial practice, representations of space and representational spaces contribute in different ways to the production of space. This is according to their qualities and attributes, according to the society or mode of production in question and according to the historical period. Kidder (2009) argues that spaces can be appropriated by users against their intended conception and emphasises how space is better understood as it is lived. As cited in Kidder (2009: 309), Gieryn (2002) argues that space is shaped by those who use it, but space also shapes the actions of those within it. Following Lefebvre's conceptualisation of the social production of space, an emphasis is directed towards the material dimension as useful in defining the historical emergence and political/economic function of urban space. Space is not only a determinant factor, but also can be determined.

The preceding explanation indicates that the production of space permits three different worlds of discourse and knowledge systems to simultaneously claim the future of a piece of land. For pedestrians and the other marginalized groups, space is of vital importance for their everyday life activities, whereas for the government (municipalities and cities) the same space is a planning area, an abstract space according to Lefebvre, which is ready to be transformed in order to accomplish political goals. Both pedestrians and the municipalities view the need for space differently, and hence create conflicting rationalities in terms of the logic of survival and the logic of governing (Watson, 2009a; Babere, 2014). In this study, the logic of survival is reflected on the side of those who are poor and marginal-

ized groups like pedestrians whilst the logic of governance is reflected on the side of the municipalities. The pedestrian representational space is based on everyday experience and practices, which provide a different meaning from the representation of space as dictated by the municipalities. For the pedestrians, the experience of losing such space becomes a matter of contestation with the municipality. Beyond this tension, there are other stakeholders involved, including the land developers, informal vendors, local shopkeepers and the shoppers themselves, all of whom contributing towards production of spaces in prime locations.

The municipal representation of the lived space of the pedestrians and other marginalized groups like pedestrians and street vendors is usually framed against the political reality of aesthetic issues, public health concerns, land values, competitiveness and congestion. Babere (2014) adds that the municipal plans un-veil a political, economic and legal construction of space, regardless of the involvement of different actors in creating its meaning. In order to produce the space used by pedestrians and other non-motorised means of transport, the municipality is obliged to abstract it from the pedestrians' domain of experience and represent it in terms of pedestrian walkways, zebra crossings, traffic calming measures, parks, recreational areas and proximity to common facilities and public transit connections. This approach underlies spatial practice on the issues pertaining to pedestrian mobility for everyday life activities, and hence becomes a form of knowledge understood by practitioners and other people within society who lack any personal experience of pedestrian mobility practices.

The preceding conception forms the basis for my account of the current indifference to pedestrian concerns among urban and transport planning through underlying structural relations in the society. The conception of the right to the city raises awareness as to whether pedestrians can also claim to have a right to urban streets. This awareness poses the question about the users for whom urban streets in cities of developing countries are created. Similarly, this conception raises awareness of the extant use of street spaces by pedestrians, even though the outside formal recognition could be a basis for urban and transport planning.

The underpinning of the crises that inspired Lefebvre's call for the right to the city remains relevant in cities of today. Contemporary researchers have expressed the current urban issues within the purview of socio-economic polarisation, skewed access to basic services and the withdrawal of the state from social service provision (Harvey, 2003; Schmid, 2012; Watson, 2009a). These factors have led to increased fragmentation, segregation and inequality (Harvey, 2003; Schmid, 2012; Watson, 2009b). At the same time, the preoccupation of the modernist planning regime with 'homogenising lifestyles and engineering the daily life' to match the ideal global city has also exacerbated urban exclusion by discounting the relevance of unique traits of places, locations and activities therein (Hobson, 1999; Schmid, 2012; Watson, 2009b). This disconnect between state interventions and social needs, together with the on-going commodification of the city under neoliberalised economy (Harvey, 2009; Purcell, 2002; Schmid, 2012) makes the plea for the right to the city even more relevant today. Commodification of the city attaches economic value to space, making it an object of the production and formation of surplus (Lefebvre, 2003). Under this arrangement, social encounter and other factors that embody the quality of urban spaces become part of the economic logic that is to be exploited for economic gains (Lefebvre, 2003; Schmid, 2012).

The logic that underlies considerations of pedestrian requirements in cities of developing countries is analysed within the above context. To understand this logic, I examine the priorities of the state in urban and transport planning and other urban development programmes in relation to pedestrian concerns; how street spaces are allocated to various travel modes and the policies that underlie urban and transport planning.

To understand the relevance of the 'right to the city' to the current study, the Lefebvre's conceptualisation of urban space is set off in its correct perspective. To begin with, Lefebvre conceives the city as an *oeuvre* rather than a simple material product (Lefebvre, 1996). This conception projects the city as a piece of art that is produced by different interest groups. The city is thus the arena where the struggle against injustice takes place (Alando, 2017). This presentation of the city as an *oeuvre* not only demystifies the dominant role of the state in producing the city; it recognises that there are other actors in the process as well (ibid). The researcher draws from this demystification of the role of the state to consolidate the question raised earlier regarding the validity of the right of pedestrians to produce the city alongside the state.

Furthermore, the presentation of urban space as an entity (perceived, conceived and lived) that transcends material and geographical confines that define the typical conception of the city allow to appreciate the totality of urban space as the geographical unit, the inhabitants (actors), and the spatial (social) processes therein (Alando, 2017). With this understanding, the tensions identified by the social exclusion concept to question the power relations between different actors in urban and transport planning have to be considered, and also how this power is exercised and its implications for producing (or not producing) spaces that accommodate the requirements of pedestrians of all ages and ability.

Therefore, this concept is relevant in this research as the study aimed to understand the pedestrian mobility patterns for everyday life activities, and how pedestrians perceive the walking environment. This will provide their actual experience of access and utilisation of public space (lived space) for their everyday life activities. Hence, the Lefebvre's concept on the right to the city is examined by assessing whether pedestrians in cities of developing countries play a central role in any decision that contributes to the production of urban space (the right of participation) or have the right to access, occupy and use the urban space (the right of appropriation).

However, several critiques regarding the right to the city have emerged. First is a critique related to the conceptual foundations of the right to the city (or on the local scale) (Purcell 2002, 2006). A major challenge lies in the difficulty of defining the 'city' and 'urban inhabitants'. The concept it is not clear about the limits of the city and who can be considered as an urban inhabitant. In liberal democracies, individuals are entitled to certain rights on the basis of a liberal-democratic conception of citizenship within the framework of the nation state. The concept of the Right to the City, however, questions this conception and claims that individuals and groups are entitled to the Right to the City as inhabitants of a city rather than as citizens of a nation state. In that sense, the Right to the City privileges the urban scale over other scales of political community (Purcell 2002: 105). Purcell further argues that scales defining political membership (such as the urban scale) "are not pre-given or self-evident, rather they are socially produced through political struggle" (ibid). According to Purcell, the concept suggests determining who is entitled to the Right to the City and who is not will have to be defined through a process of political struggle. Purcell perceives that conflicts regarding eligibility for the Right to the City could emerge where a political decision made in the city impacts individuals beyond the city. Conflicts could also occur when a political decision would affect certain inhabitants of the city more than others (Purcell 2002: 104).

Furthermore, the concept of the right to the city primarily reflected Euro-American realities and neglected the priorities and challenges of other parts of the world, particularly in Asian and African context whereby "city" sometimes has an 'exclusionary' connotation. In Asia for example, the city often refers to the formal territorial space where middle and upper classes live and evokes rejection of popular settlements and evictions (Ortiz 2010: 119). In addition, the majority of the population in Asia and Africa live in rural areas. It appears that the Right to the City diverts attention from the social problems faced by rural communities.

The second major critique relates to the perceived loss of radicalism in current approaches to the Right to the City in comparison with the Lefebvre's original concept (Lopes de Souza 2010; Mayer 2009, Unger 2009). While Lefebvre conceived the Right to the City as a political tool for the radical transformation of capitalist urban society, some of its current proponents see it as a legal tool and demand its institutionalisation in existing human rights documents. Lopes de Souza 2010 (315–16) and Mayer (2009) 369–70) argue that the original Right to the City as a transformative movement has been diluted. Marcelo Lopes de Souza adds that, given the heterogeneity of the actors advocating the Right to the City, including social movements from both North and the South, local governments, UN agencies and NGOs; the concept has become an 'umbrella phrase' encompassing claims for affordable housing, democratic participation and environmental sustainability. From that perspective, the Right to the City has become a banner or a rallying cry for struggles against the harmful effects of neoliberalism.

4.3. The concept of social exclusion

The concept of "social exclusion" can be traced back to include the work of Henri Lefebvre (the right to the city concept) of 1968, and later supported by the World Social Summit in Copenhagen in 1995. Following completion of the World Social Summit, a number of multilateral development agencies, particularly the World Bank and the International Labour Organisation, adopted social exclusion as a multidimensional framework to be used in development activities. This concept served to broaden poverty analysis and focus attention on both the causes and impact of social disadvantage (Beall and Piron, 2005). For over a decade in Europe, the concept of social and economic exclusion has been used to understand the complexity of poverty and the multi-dimensional manner by which individuals and groups are deprived in participating in and contributing fully to community life.

However, Beall and Piron (2005) define social exclusion as a process and a state that prevents individuals or groups from full participation in social, economic and political life and from asserting their rights. It derives from exclusionary relationships based on power. The concept of social exclusion recognizes that particular groups within communities face greater degrees of exclusion.

According to them, the concept is more about exclusion from *economic, social and political* participation. Exclusion from social life means the exclusion from access to infrastructure and services, social security and protection, public safety and social cohesion; exclusion from political life is referred to the restricted access to organisation, decision-making and the rights and responsibilities of citizenship; and exclusion from the economy depicts exclusion from labour markets, employment and enterprise opportunities and a wide range of livelihood strategies. This implies that there are thousands of residents/groups in cities who are not enjoying equal benefits of quality of life. They are "pushed away" or "excluded" from participating and contributing to their full potential in many aspects of social, political and economic life. It should be made clear that a city which does not address exclusion, obviously, cannot maintain a high quality of life.

The social exclusion concept was found to be relevant in this study as the study aimed to investigate how the National level comprehensive documents, National sectoral policies, local level planning documents, urban design concepts, planning standards planning concepts and various development programs implemented consider pedestrian infrastructure including disability infrastructure. This is because many of the outcomes of exclusion (such as the exclusion of pedestrian requirements) can be addressed through inclusive policies, inclusive neighbourhood design concepts, inclusive planning standards and inclusive roads designs, inclusive public transport and buildings. These policy tools can reduce the impact of exclusion and address the processes of exclusion. With a growing interest in neighbourhood planning processes, it is important to understand how these initiatives intersect with the dynamic of exclusion. Nevertheless, this study aimed to understand the characteristics of people

living in the neighbourhoods (formal planned and upgraded informal settlements) with respect of social exclusion (the exclusion from access to infrastructure and services, social security and protection, public safety, attractive green spaces and social cohesion). This is in line with Goal 11 of Sustainable development that aims to “make cities and human settlements inclusive, safe, resilient and sustainable.

4.4 The Safer Cities Approach

The Safer Cities Approach focuses on capacity building of local authorities to prevent crime and insecurity in urban areas and at the same time build a culture of crime prevention (Tanzania National Strategy on Urban Crime Prevention, 2008). The approach focuses on three areas of intervention: safer design, planning and management of public spaces to encourage interaction of people, social crime and violence prevention and, institutional enforcement to ensure justice (www.unhabitat.org/safercities). The approach recognizes that public safety is a common good that requires joint effort of different stakeholders including government, municipalities and the community (UN Habitat, 2007). Municipalities are required to develop strategies and how to ensure citizen are safe in urban areas (ibid). A joint effort of the municipalities and other actors is required to implement the strategies developed aimed at addressing insecurity and crime in urban areas.

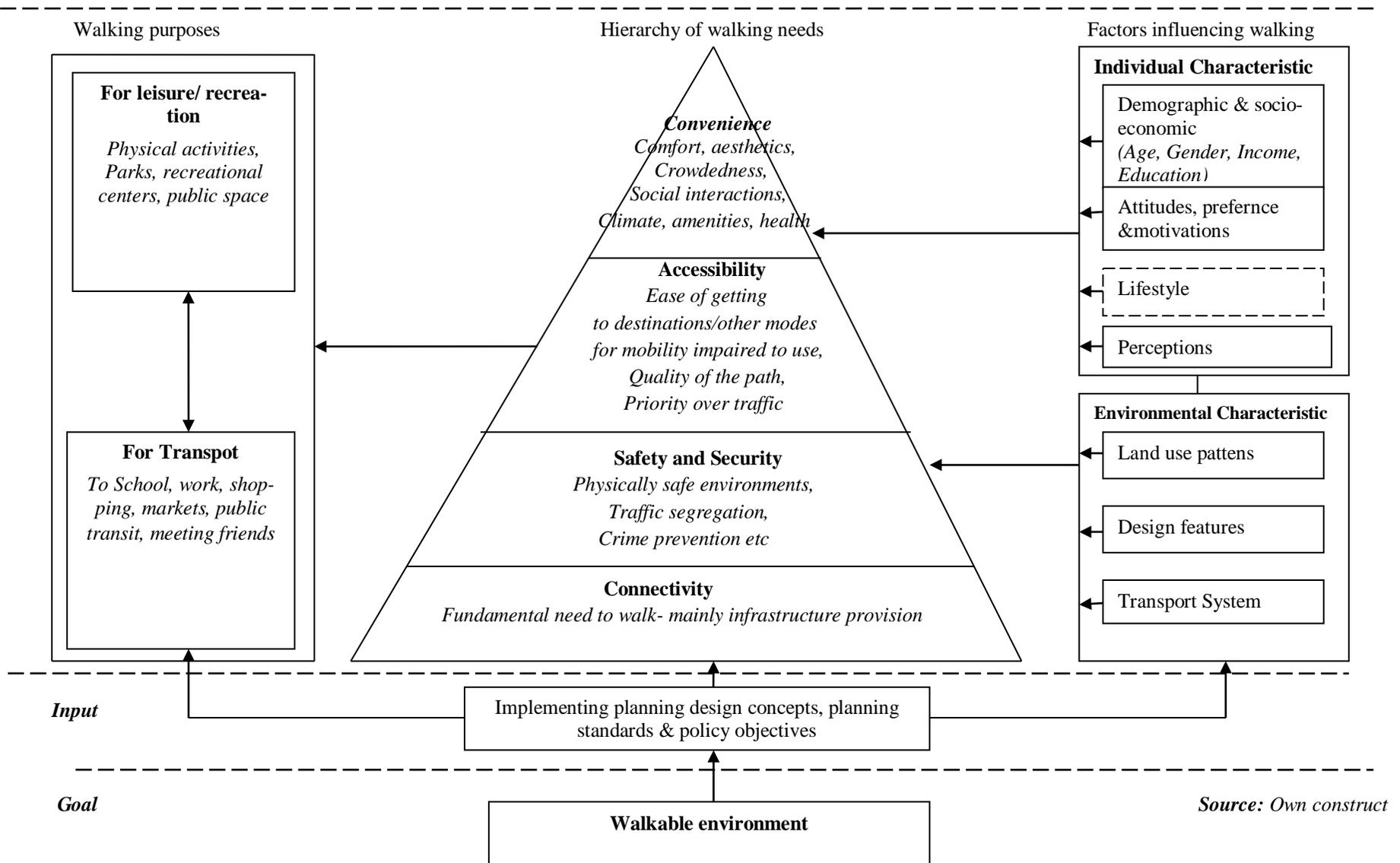
Addressing crime and insecurity are part of a good governance system. This requires consultations and inclusion of citizen in the decision making process (UN, 2007). *The overall goal for the approach is to have sustainable urbanisation which is supported by good governance, urban planning and management and social inclusiveness.* This considers three components of social, environmental and economic dimensions (Tanzania National Strategy on Urban Crime Prevention, 2008).

The three components of safer cities approach are crucial with regard to walkability in a neighbourhood. Urban planning and design will affect the manner in which neighbourhoods are designed to accommodate accessibility and safety needs of a pedestrian. Properties designed to face streets are safer than those shadowing them (Newman, 1996). The designs must include social aspects like facilities for the physically challenged and social interactions. Additionally, the community should also be included in the process. When it comes to good governance, the planning process should be transparent and participatory. This ensures that pedestrian needs are holistically considered.

The pertinent questions arising from the elements of safer cities that the study sought to answer include: how are the safer cities components being implemented in the study areas to improve pedestrian accessibility and safety needs? What is the capacity of local authorities to manage pedestrian safety?

Aggregating from theoretical and conceptual debate, walkability is influenced by five key variables, namely; *land use patterns* (i.e. proximity to services, land use mix and density), *design features* (i.e. street patterns, orientation of buildings, setbacks, building height-width ratio and parking) and *transport system* (i.e. traffic separation, traffic calming measures, pedestrian infrastructure), individual behaviour (i.e. income, gender and age), *institutional and legal provisions* (i.e. policies and laws, regulations, planning standards, by laws and norms) and *attractiveness and convenience* of the walking environment (street lights, public toilets, dust bins, shade trees). The relationship of factors is summarized in conceptual framework presented in Figure 4.3.

Figure 4. 3: Conceptual framework for improving walkability in rapidly urbanising cities



Description of the conceptual framework (Figure 4.3)

Figure 4.2 is the conceptual framework that guided this study. This framework was developed to guide the investigation of the research questions stated in section 1.5. As explained earlier, in this study, walkability was conceptualized as the extent through which the characteristics of the built environment and land use may or may not be conducive to residents in the area while walking for either leisure, exercise or recreation, to access services, or to travel to work (Lesile et al., 2007:91). As can be noted from Figure 4.2, the framework is thus divided into three parts, namely: Walking purposes on the left hand side, hierarchy of walking needs at the centre of the framework, and factors influencing people to walk on the right hand side. At the bottom, implementation of the urban design concepts, planning standards and relevant policies are considered as inputs towards improving walkability in cities of developing countries. A brief description of each part is given below:

Walking purposes: The literature has revealed that walking is demanded for two main purposes: First purpose is to reach a destination (i.e. walking for transport or utilitarian purposes) such as going to school, work, shopping, grocery store, parks, meeting friends, etc. Second, is walking for leisure or recreational purposes. This pillar was considered of great importance so as to understand the walking purposes in cities of developing countries. Is it for leisure/recreational or for reaching a destination?

Hierarchy of walking needs: The derivation of this hierarchy was inspired by the work of Southworth (2005: 148) whereby connectivity of path network, linkage with other modes, fine grained and varied land use patterns, safety, quality of path and path context including street designs and visual interest of the built environment constitutes the attributes of a walkable network. The essence of deriving the hierarchy of walking needs is to establish a relationship that can help to appreciate why does one choose to walk along a certain route when it is sunny, but this other route when it is raining, or completely stop from walking the time when he/she manages to own a car after which he/she resorts to drive instead of walking. Therefore, the variables of the hierarchy of walking needs presented in Figure 4.3 helped the researcher to capture the perspectives of pedestrians on the walking environment. To develop the triangle of hierarchy of walking needs, the study assumed that walking is demanded in four different tiers (see Figure 4.3).

The first level of walking and which is the base and fundamentally required is *connectivity*, as people need to stay connected. This means that the basic need to travel is first influenced by the continuity/connectivity of the route (i.e. without barriers in between). As discussed in Chapter One, walking in cities of developed countries is considered in terms of providing mobility for the poorest residents who normally walk to reach various destinations as they cannot afford public transport (UN-Habitat, 2013b: viii). The literature shows that, in many cities of developing countries, particularly in Sub-Saharan African cities, dis-connectivity of pedestrian routes is a genuine problem. As motorization increase, pedestrians in cities of developing countries are often neglected in infrastructure provision. Due to the fact that walking provides mobility for the poorest residents, pedestrians in cities of developing countries often detour to overcome any barriers unless they are really overwhelming. Pedestrians in cities of developing countries are traced going through low lying areas which are sometimes impassable during rainy days. Unlike developing cities, in developed cities, a lack of connectivity will not cause pedestrians to detour or overcome barriers via walking, instead they give up and hop straight into their cars or taxis to gain 'accessibility' which is the third tier of the walking needs and which is discussed in the next sections. This is because people in developed cities (high-income countries) have an alternative choice other than walking, a situation that is contrary to developing countries. Therefore, it was necessary to assess the perspectives of pedestrians in relation to connectivity of pedestrian network.

The second level is about the *safety and security* of the walking route. Having satisfied that there is a connected path to walk on, the next one can start worrying about the threat of vehicles or other danger

along a particular walking route. This implies that safety is a second level to the first connectivity tier, that is to say, without being connected, safety is not an issue. This second tier of safety and security is inspired by the literature regarding walking in cities of developing countries where the key improvement measures involve traffic segregation, pedestrian crossings and other traffic calming measures so as to enhance the pedestrian safety. In cities of developing countries street muggings, pick pocketing and other form of crime influence the desire to whether walk or not. For developed cities, pedestrians can also be victims of crime issues and bad driving habits, and hence pedestrian safety and security are always important variables to be considered. Through this tier, the study aimed to investigate how people in cities of developing countries perceive the safety and security of the walking environment.

The third level is accessibility: that is the ease of getting to destinations and to the other modes and for mobility impaired to use. This tier of accessibility is of great significance to the vulnerable groups (i.e. children, the elderly and the people with disabilities) who simply do not have a choice to switch from walking. This third level is derived from the fact that having improved the connectivity, safety and security of walking routes, people's expectations and mobility increase and hence are likely to demand getting to various land uses destinations or connect to other transit nodes quicker and easier. Furthermore, the accessibility level is also associated with the accessibility for the mobility-impaired and the demand for better quality walkways. This tier implies that cities of developing countries should not end by just connecting pedestrians to a certain not, pedestrians will not be happy. They will tend to demand these connections to be accessible and usable by all, short and direct with least physical and mental effort to use. From the literature, it was argued that people are willing to walk when destinations are reached within 5 to 10 minutes or 400 to 800 metres distance. Therefore, this study assessed how people perceive the access to public facilities (i.e. schools, commercial, health, religious, public transit and recreational facilities) including disability infrastructure.

The final level of the hierarchy of walking needs is the convenience and attractiveness of the walking routes where comfort and aesthetics of the walking environment come in to derive the best walking experience. While many cities of developing countries are taking time and resources to beautify the streetscapes and landscaping, little is known about what cities of developing countries do to make the walking routes attractive and inviting. Although this tier seems abstract since it is psychologically and contextual too, the researcher is of the opinion that enjoyment and comfort of the walking routes have the ability to influence the accessibility to various destinations both positively and negatively. The author is of the opinion that given any urban walking environment where connectivity, safety and security needs are fulfilled, still convenience, attractiveness, and enjoyment of the route are the key factors that can influence walking behaviour with a reasonable level of accessibility needs being met.

Factors influencing walking

The literature shows that walking is influenced by the built environment (land use patterns, design features and transport system) and individual behaviour (demographic and social economic characteristics, attitudes, perceptions and lifestyle). Details on the individual behaviour and the built environment are discussed in chapter two and four respectively.

At the bottom of the framework, urban design concepts, planning standards, policy measures are considered as inputs towards improving walkability in cities of developing countries. This is simply because; the built environment in most cases is a result of policy maker's decisions and planning standards. Much of what results from the built environment relates to the community behaviour and attitudes and finally can be influenced by the initiatives and regulation.

This conceptual framework influenced the methodological design and approach so as to answer the research questions and variables of the study. The next chapter is a research design and methodology where the variables presented in Figure 4.3 were reflected to guide the study.

CHAPTER FIVE

5. RESEARCH DESIGN AND METHODOLOGY

5.0 Introduction

In this chapter, the methodological approach, detailed procedures and sequence of activities which were carried out to operationalize the study from the beginning to the end are presented. In addition, the chapter describes the research strategy, research design and process, the procedures for sampling, case study selection procedures and how data (both qualitative and quantitative) were collected, processed and analysed. The research methodological approach, research design and strategy and research process are discussed before embarking on the underlying paradigms of research and the choice of the study design. Furthermore, the variables presented in the conceptual framework (Figure 4.3) as well as the research questions influenced the methodological approach and data collection methods.

5.1 Selecting a methodological approach

Traditionally, there are two known distinct research approaches of collecting and analysing research information. These are namely quantitative and qualitative inquiries. Studies (Creswell 2007, 2009; Yin, 2003, 2011) offer three main methodological research approaches commonly used. These include qualitative, quantitative and mixed methods approaches. The use of one of the three methodological approaches depends much on the nature of the study. Although a research study can employ both methods (mixed methods), there are significant differences in the assumptions underlying methodological approaches as well as the methods used in the collection and analysis of the data.

Qualitative research approach

Bryman (2012) argues that qualitative research approach is an approach or strategy that emphasises words rather than quantification in the collection and analysis of data. Creswell (2007: 37; 2009: 4) terms qualitative research as a process of studying the research problem in its natural setting by exploring and understanding the meaning that individuals or groups impute to a social or human problem rather than studying the subjects in a laboratory. The researchers collect information themselves using multiple sources of data and they aim to understand the meanings of the problem from the participants' or subjects' view. The data collection in qualitative procedures is not constrained by predetermined categories of analysis and this contributes to the data depth and detail of qualitative data (Patton, 1987:9). Therefore, qualitative studies aim to provide an enlightenment and understanding of complex psychosocial issues and are most useful for answering humanistic "why?" and "how?" questions (Marshall, 1996: 522; Yin, 1994; Yin, 2011). The qualitative research according to Yin (2011: 3-4) is useful in studying a real-world setting, discovering how people cope and thrive in that setting, and capturing the contextual richness of people's everyday lives. Therefore, qualitative research approach focuses primarily on human perception and understanding (Dawson, 2009: 14; Stake, 2010: 11). In other words, qualitative research methods are built around experiential understanding (Stake, 2010: 20).

According to Creswell (2009: 12-13), qualitative research approaches comprise mainly five strategies. These are namely; *ethnography*, *grounded theory*, *case studies*, *phenomenological* and *narrative*. However, when and how to use each strategy depends on *inter alia* the type of research questions posed and how the researcher controls behavioural events. According to Creswell, in ethnography study, the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting primarily observational and interview data. Regarding the grounded theory, the researcher derives a general, abstract theory of a process, action or interaction in the view of partici-

pants, whilst case study strategies are time and activity bound, the researcher explores in depth a program, event, activity, process or one or more individuals. Phenomenological strategy enables the researcher to inquire and identify the essence of human [lived] experiences [histories] about a phenomenon as described by participants. Lastly, in narrative research, the researcher studies the life trajectories [life stories] of one or more individuals in a chronological order (ibid).

Regarding the data collection methods in qualitative research approach, Patton (2002: 4-5) and Stake (2010: 20) argue that interviewing (in-depth, open-ended), observation and written documents (artifacts) are the main three kinds of qualitative data collection methods. According to these scholars, interviews yield direct quotations from people about their experiences, opinions, feelings and knowledge. Observations consist of detailed descriptions of people's activities, behaviours, actions, and the full range of interpersonal interactions and organizational processes that are part of observable human experience. Document analysis includes studying excerpts, quotations or entire passages from organizational or program records, memoranda and correspondence; official publications and reports, personal diaries and open-ended written responses to questionnaires and surveys (ibid).

In relation to sample sizes, small samples and in most cases purposive or snowball sampling techniques are usually involved (Marshall 1996: 523). Small samples are preferred because methods used such as in-depth interviews are time and labour intensive but also because a large number of people are not needed for the purposes of statistical analysis or to make generalizations from the results. Hence, qualitative research approaches are approaches that enable researchers to collect data themselves using multiple sources with the aim of understanding realities and the meanings of the problem from the participants' or subjects' views.

Quantitative research approach

Quantitative research is an inquiry into research problem that tests a theory, where the problem is reduced to specific variables and hypothesis. Analysis is often done using statistical methods and the results are used to generalize or make claims about a population (Creswell, 2003, 153-154). Unlike qualitative research approaches, in quantitative research, numbers are useful in deriving relationships between or among research variables. Thus, quantitative approach provides data guides in understanding the magnitude and scale of a phenomenon by providing a numeric picture of its impact upon affected communities. It addresses the questions "how many" and "how much" suggesting measuring or counting. (Dawson, 2009: 15) adds that quantitative research generates statistics through the use of large-scale survey research, using methods such as questionnaires or structured interviews and measurements.

Creswell (2009: 12) argues that quantitative research approach (deductive or theory testing approach) is highly associated with scientific investigation (experimental design) although non-experimental designs such as surveys are involved in this approach as well. Experimental research seeks to determine if a specific treatment influences an outcome (Keppel, 1991), whereas survey research provides a quantitative or a numeric description of trends, attitudes, or opinions of a population by probing a (statistical) sample of that population with the intent of generalizing from a sample to a population (Babbie, 1990). In this case, the researcher studies what others have done, reviews existing theories of whatever phenomenon s/he is studying and then tests whether the results support the theory propositions or do not.

Regarding the sampling techniques, Marshall (1996: 522) and Creswell (2009) recommend large sample sizes representative of the population being studied and randomized and non-randomized techniques being normally employed. Furthermore, Creswell (2009: 148, 217) cautions the use of a non-random and appraises a random or probability samples. Creswell applauds random sampling over

non-random because of its ability to provide an equal chance for each individual in the population being studied to be a representative of that population.

Mixed research approach

This is an approach to inquiry that combines various methods i.e. may associate both qualitative and quantitative approaches. The distinction between qualitative and quantitative research approaches is not straight forward. This is because the studies that have broad characteristics of one research strategy may have a characteristic of the other (Bryman, 2012:35). Many writers argue that, the two can be combined within an overall research project, leading to what is known as “mixed methods research” (ibid). According to Creswell (2009: 4), the mixed methods research approach refers to research that combines both quantitative and qualitative research approaches. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study. In other words, the mixed method research approach is used when a research project may not exactly fit into either quantitative or qualitative paradigms, but would perhaps require the use of a mix of methods to reap the benefits that are inherent in both methods. Howe (2004: 54) considers the quantitative methods component as playing an auxiliary role in a mixed methods framework. The mixed methods approach is more than simply collecting and analysing both qualitative and quantitative data, and involves the tandem use of both approaches, so that, the overall strength of the study is greater than using either qualitative or quantitative approach in isolation.

The mixed method is useful because of four main reasons: Firstly, it serves as a neutralizer or canceler of the biases resulting from the use of any single method due to its limitations. Secondly, it is a means of seeking convergence across both methods (triangulation of data sources). Thirdly, it integrates or connects qualitative and quantitative data e.g. using the results from one study to help identify participants to study or questions to ask for another method. Lastly, it is used to reinforce results from both approaches e.g. qualitative quotes to support statistical results.

Greene et al., (1989) provide five specific reasons that researchers should consider when using mixed methods. These include: *methods triangulation, complementarity, research project development, initiation and expansion*. With regard to triangulation, Jick (1979: 602), Niehof (1999) and Yin (2011: 81-82) insist on the use of more than one method while studying the same research question in order to examine the same dimension of a research problem. Complementarity allows the researcher to gain a full understanding of the research problem, to clarify a given research result as well as cross-validate research findings. In connection to the research development project, results from one methods helps to improve or inform the other method, and initiation is useful when a study’s findings may raise questions or contradictions that will require clarification, thus initiating a new study. Lastly, expansion is intended to spread the breadth and range of the inquiry (further researches).

Creswell (2009: 14-15) highlights three strategies of mixed methods, namely; Sequential mixed methods, Concurrent (parallel) mixed methods and Transformative mixed methods.

- Concerning the sequential mixed methods, the researcher seeks to elaborate on or expand on the findings of one method with another method. According to Creswell, the approach may begin with a qualitative interview for exploratory purposes and following up with a quantitative, survey method with a large sample so that the researcher can generalize the results to a population.
- Regarding the concurrent (parallel) mixed methods research design, the researcher converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem (Yin, 2011: 292). In this case, the researcher collects both types of data at the same time and then integrates the information in the interpretation of the overall results.

- Transformative mixed methods: the researcher uses a theoretical lens as an overarching perspective within a design that contains both quantitative and qualitative data. The lens provides a framework for topics of interest, methods for collecting data and outcomes or changes anticipated from the study. Within this lens could be a data collection method that involves a sequential or a concurrent approach.

Deducing from the preceding explanation and the nature of the research questions for this study, a mixed method approach (sequential mixed methods) was preferred than pure qualitative or pure quantitative. The basis for the selection of this approach over the rest was as follows:

This study had two parts; on the one hand, it aimed to understand the pedestrian movement patterns for everyday life activities, the reasons why people in cities of developing countries walk more often, including their perspectives on walking environment. The perspectives of pedestrians were explored based on the hierarchy of the walking needs presented in the conceptual framework (Figure 4.3). On the other hand, the study aims to examine how the existing urban design concepts, planning standards, relevant policies and planning documents consider pedestrian requirements in a situation of increased motorised means of transport. Lastly, was to examine how the existing design concepts and planning standards are implemented.

Based on this, the first part required both qualitative and quantitative. This is largely because understanding where people go more often per week and the reasons why they walk more often than use of other means of transport, the end it involved the question ‘how many’ which leads to the generation of quantitative data, whereas exploring how people perceive the walking environment implied capturing people’s experience, attitudes and opinions generate qualitative data and information. The most suitable way of understanding *how* and *why* people walk more often for everyday life activities is to get in-depth views and information from the people themselves. This suggests a qualitative approach because the collection of data could be done by obtaining their stories or narratives, other than by assuming a limited number of possible variables or conducting a survey in the field through a questionnaire to prove the assumptions and later predict/explain the phenomena as it is often done in qualitative researches.

The qualitative approach was important because it facilitated the researcher to obtain information which would further expand his understanding of the walking environment in selected study areas. The qualitative approach allows the richness of people’s experiences to be captured in their own contexts (Patton 1987:10). Likewise, for the second part, understanding how the pedestrian requirements are considered required review of documents, observations and people’s perspectives which is also a qualitative approach, where else implementation of design concepts and planning standards sometimes required measurements.

This being the case, this study adapted both qualitative and quantitative research approaches (i.e. mixed methods). The mixed methods approach led to a broad understanding of the status of the walking environment in Dar es Salaam City. Bryman (2012:633) argues that “the mixing of the two also creates an opportunity for method triangulation”.

5.2 Research design and strategy

Research design is a logical plan of how to conduct a research. Yin (1994) defines research design as “the logical framework that links data to be collected and the conclusions to be drawn to the initial questions of the study, study propositions that provide direction to the data to be collected and the unit of analysis which defines what the case is. In the same vein, Nachmias and Nachmias (1992) as quoted Yin (2003:21) describe a research design as a plan that guides the investigator in the process of collecting, analyzing, and interpreting the observations. It is the logical model of proof that allows the researcher to draw inferences concerning causal or contingent relations among the variables under

investigation. Based on the nature of the study problem and the main research objectives, exploring the perspectives of pedestrians on the walking environment is apparent that the expected explanations are essentially “causation connections⁶”. There are five possible social science research strategies, namely surveys, histories, experiments, archival, and case studies (Yin: 2003:5). These strategies may be relevant to different context and issues.

Among the five research strategies (surveys, histories, experiments, archival, and case studies) as described by Yin (1994), *a case study* was preferred, and a *multiple case study design* was employed. The reasons for selecting a case study research strategy are discussed in the next section. According to Yin (2003:21), for the case studies, five components of a research design are especially the most important. These are namely; the research questions, propositions (if any), units of analysis, logic in linking the data to the propositions and the criteria of interpreting the findings. Yin further clarifies that the research questions help the researcher to select the appropriate research strategy, the propositions provide directions to type of data to be gathered and the Unit of analysis defines what the case is (Yin, 1994: 21). In the next section, I present the rationale for selecting the case study strategy.

5.3 Choice of research design and strategy

Though all the possible social science research strategies, such as experiments, surveys, archival (documented) analysis, histories and case studies can be used to explore, describe, and explain a phenomenon. However, this study employed a case study research strategy. According to Yin (2003: 5) the selection and the use of each depends on three conditions, namely; the type of research posed; the extent of control an investigator has over actual behavioural events; and the degree of focus on contemporary as opposed to historical events (Yin 2003:5).

Table 5. 1: Relevant situations for different research strategies

Strategy	Form of research question	Requires control of Behavioral events?	Focuses on contemporary event?
Experiment	How, why?	Yes	Yes
Surveys	Who, what, where, how many, how much?	No	Yes
Archival analysis	Who, what, where, how many, how much?	No	Yes/No
History	How, why?	No	No
Case study	How, why?	No	Yes

Source: Yin 2003: 5

Though Table 5.1 distinguishes when to use each research strategy, still Yin (2003:9) argues that these research strategies are not mutually exclusive, and hence a researcher can use multiple strategies in any given study depending on the situation.

Therefore, the decision to use a case study research strategy follows Yin’s criteria for selecting a research strategy. As Table 5.1 shows, Yin argues that a case study design can be used when the study aims at achieving the mainly three aspects:

- When the research questions focus on answering the ‘how’ and ‘why’ questions;
- When the study takes place in a situation where the researcher has no control over the phenomenon he is studying
- When the study focuses on contemporary issues.

The choice of a case study strategy in this work was influenced by five main criteria. Firstly, since the research questions of this study aim at answering *why and how* questions, a case study research strategy was preferred. A case study research strategy was adopted because of a need to understand why

⁶ As cited in Kombe (1995), Peattie (1993) argues that for causal researches, cases constitute the origin of reliability. In a similar vein, Uphoff (1973:63) adds that unique case context (including actors perceptions and intentions) constitutes the basis for tracing the casual connections and generalisations.

people in cities of developing countries walk more often for everyday life activities, how people in Dar es Salaam perceived the walking environment, and how the pedestrian requirements were considered and implemented by the legal and planning instruments.

Secondly, since the nature of the research problem is of real life situation, the researcher had no control over the phenomenon and the events that take place in the study area as opposed to experiments (Yin, 2002). In other words, it was not possible to separate pedestrian mobility patterns and the perspectives of pedestrians from the natural setting in which they occur. A study on walkability is a social science study that requires empirical evidences from the actual undertakings of the people in their daily lives (Patton, 1987). Thus, the researcher had no control over the behaviour.

Thirdly, the issues being studied (i.e. pedestrians mobility patterns, perspectives of pedestrians on the walking environment and considerations and implementations of pedestrian requirements) are contemporary phenomena taking place in a particular context; which call for an in-depth study (Yin, 2003, 2009, 2011; Hancock and Algozzine, 2006; Denscombe, 2010). The rest of the strategies would not fit because of being unable to investigate contemporary issues.

Fourthly, the issues being studied were in the context of a city fragment with defined spatial and time boundaries (Yin, 2003: 21; Hancock and Algozzine, 2006: 15). Hence it was necessary to emphasize the role of the context in which they occur at a particular time in order to relate the issues with the theoretical background and the reality. Yin (2003:13) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and the context are not clearly evident”.

Lastly, because Dar es Salaam is a metropolitan City in the country with overlapping urban and transport planning processes, issues and challenges; the sub-cases selected for this study are typical of all cases of certain types within the City and in other urban centres. Therefore, through intensive analysis, generalizations can be made and may be applicable to other cases of the same type (Kumar, 2005: 113).

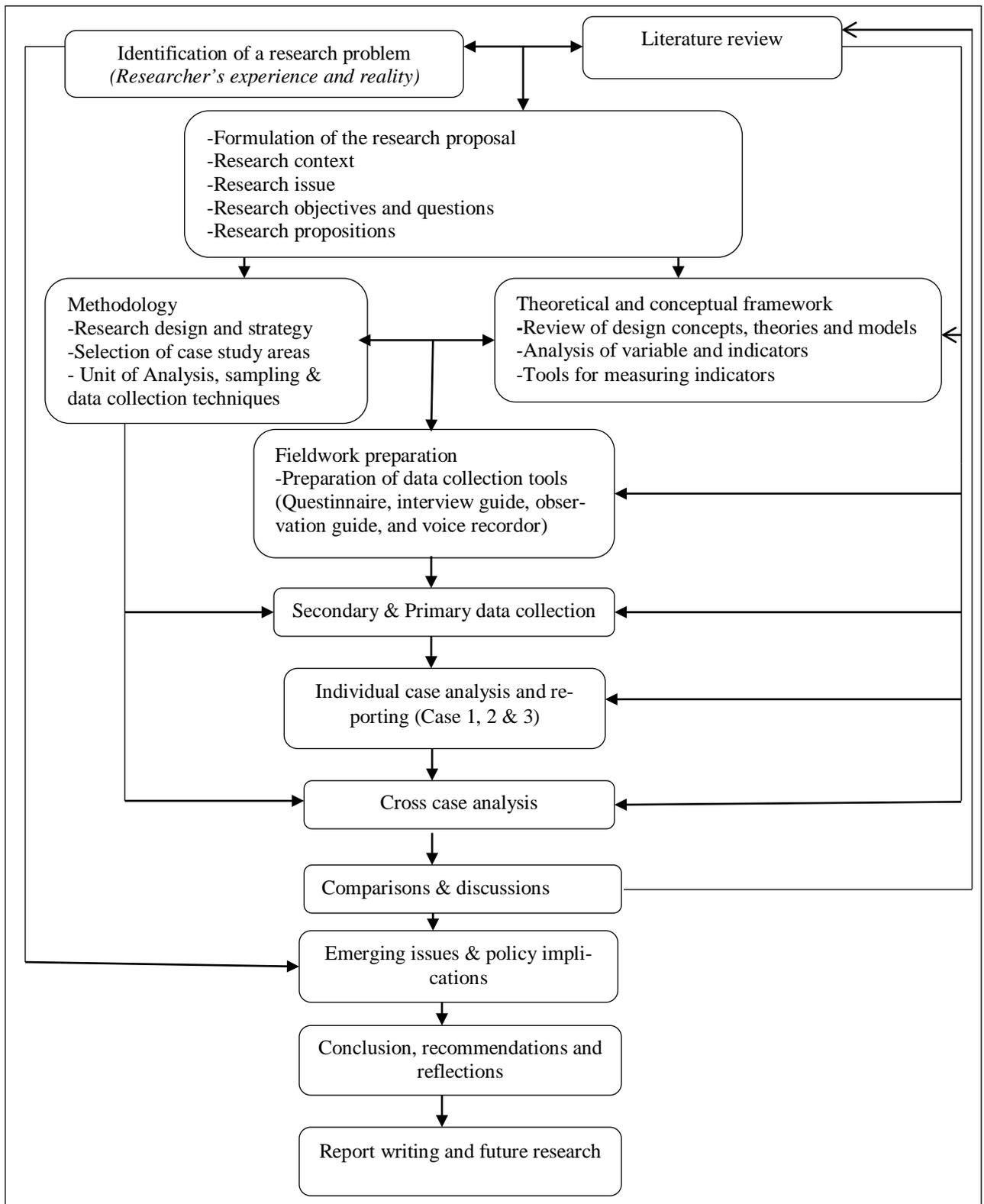
Moreover, a case study research strategy can be applied either as a single or multiple case studies. Despite the existence of the two possibilities, Yin (2003:19) argues that “multiple-case study designs are likely to be stronger than single case designs”. Bryman (2012: 72-75), in his book on social research methods notices an exciting link between multiple-case design and comparative research design. A comparative design according to Bryman is “a design involving the studying of two or more contrasting cases using the same methods”. He further argues that, “When comparative research design is applied in relation to qualitative research strategy, it appears in the form of multiple-case study”. This implies that a researcher who is engaged in a multiple-case study in other words he/she is inevitably engaged in a comparative research design.

Following this argument, a multiple case study design was selected in order to make comparisons within an analysis. This follows the researchers intention to subscribe to Eisenhardt’s assertions (1989) cited in Bryman (2012:74) that “because of the comparison logic, researchers using multiple-case study stand a better chance of establishing the circumstances in which a theory will or will not hold”. Based on this understanding, three sub-cases in Dar es Salaam City, Tanzania were selected. Mainly, there are four reasons that motivated selection of the three-Sub-cases. Firstly, over 70.0% of the urban population in Dar es Salaam lives in the unplanned settlements, only a few live in the planned settlements. Therefore, the author wanted to understand how the physical environment in the planned and unplanned settlements supports/discourage walking. Secondly, the author wanted to analyse how the resident households in the formally planned (residential and commercial) perceived the walking environment. Thirdly, the study intended to analyse the implementation of design concepts

and planning standards in the formally planned and upgraded informal settlements and finally make a comparison within an analysis.

5.4 Research process

Having selected the research design and strategy, Figure 5.1 presents the research process followed to accomplish this study. The research process describes all the procedures that were undertaken from the initial stage to the finalization of the thesis. The study began with the establishment of the research theme from the reality and researcher's over ten years' experience in Dar es Salaam. The experience was enriched by literature, particularly in terms of conceptual and methodological contexts within which this study was undertaken. The methodological framework consisted of the choice of research strategy, initial selection of the three sub-cases as well as the design of data collection methods and instruments. Again, with the aid of the methodology the data were collected from secondary and primary sources. Primary data collection was preceded by secondary data collection whereby official documents relevant in this study (National comprehensive documents, sectoral policies and local level planning documents) were collected and sub-cases were validated. As data collection was being carried out; initial data analysis, from which preliminary findings for individual sub-cases were devised, was concurrently on-going. After fieldwork activities, data organization, cleaning and analysis were carried out before reporting findings from the individual sub-case (see Yin, 1994: 49). Later on, the summary of the major findings from the three sub-cases were made before conclusions, recommendations and methodological reflections were generated.



Source: Own construct, October 2014.

Figure 5 .1: Research process and design

5.5 Selection of Dar es Salaam City

Selection of the cases to be investigated is not just a straight forward exercise where a case is simply picked, but rather a process that has been carefully guided by key research issue. It is argued that, in selecting a case, one should consider information rich cases that will generate enough information and where one can learn a great deal about the issue under investigation. Other factors to consider include cases that are interesting i.e. those which answer what one wants to explore, or fit the purpose of the study, accessibility to the case location and accessibility to case data (Patton, 1987; Flyvbjerg, 1999). Based on this argument, before selecting Dar es Salaam as a case study area, other cities and Municipalities like Mwanza, Arusha, Mbeya, Tanga, Dodoma, Morogoro, Moshi and Iringa were considered. Dar es Salaam was chosen because of the following reasons:

- Population: Dar es Salaam is not only one among the rapidly urbanising cities in the country, but also in the sub-Saharan region. Dar es Salaam is the largest sea port, industrial, commercial and administrative centre in Tanzania with a fairly long history of urban planning and settlement development. In terms of population size, Dar es Salaam is six times larger than the second city (Mwanza City). The growth rate for Dar es Salaam has been more remarkable than the rest of other cities. In this case, the highly populated city was considered as an information rich case. The more the population the high the mobility of people.
- Dar es Salaam has been rated as one of the un-safest cities in the country with a crime rate of 24-28 per cent of all crime incidents recorded by the police countrywide (DCC, 2004). The more the city is un-safe, the more the city was preferred since this gave an interpretation that intervention measure was necessary. Since this study aimed to investigate how people perceived the walking environment in terms of safety and security from crime, Dar es Salaam was thought to be an information rich case in this aspect than other cities in the country.
- High number of upgraded informal settlements. Since the study aimed to analyse implementation of design concepts and planning standards in the formally planned and upgraded informal settlements, Dar es Salaam had by 2012 a total of 31 upgraded informal settlements, which was the highest compared to the other cities.
- Rapid housing cityscape transformation: Dar-es-Salaam city represents a critical case of rapid housing cityscape transformation that calls for a comprehensive approach for redevelopment control. It presents a good ground to investigate how the pedestrian requirements are considered in the redeveloping inner cities where the transformation of buildings from single storey housing units to high-rise buildings are highly remarkable compared to the other cities and municipalities.
- Faced with the high rate of traffic congestion and urban sprawl, Dar es Salaam is already implementing a number of strategies to minimize traffic congestion. These are such as improving the capacity of roads in terms of increasing the number of lanes, proposing new overpasses and underpasses at the main road intersections and improving public transport. Therefore, Dar es Salaam was the right place where the researcher could observe how the requirements of pedestrians are being considered, in a situation of increased motorised traffic.
- Selection of Dar es Salaam also was motivated by the growing number of studies relating to the study topic. These include, for example Pendakur (2005) Non-Motorized Transport in African Cities: Lessons from Experience in Kenya and Tanzania; Mosha and Mosha (2012) Walking in Transforming Housing Cityscapes; and (UNHABITAT, 2013b) Streets as public spaces and drivers of urban prosperity also contributes to the available literature. However, none of these studies had analysed how the pedestrian requirements are considered in policy making, planning and implementation of plans (i.e the institutional frameworks in place).

- Dar es Salaam was chosen because of the rich experience about the city. The researcher's over ten years' experience in Dar es Salaam since he was a student (2003-2007), and later a University academic member of staff to date. Being a resident of Dar es Salaam, the author had experienced many people walking within the city, and cases of pedestrians being knocked down by motor vehicles and motorcycles. For instance, in 2014, about 197 pedestrians were killed because of road accidents, and 1540 pedestrians were injured (Traffic police headquarters, Dar es Salaam).
- Further being a resident in the city gives a better opportunity, particularly accessibility to data and information sources. Unlike other towns, because of its status and the role it plays both at the National and international level, obviously there is more data available than in other cities.

Table 5. 2: Selection of Dar es Salaam City

City \ Criteria	Population increase	Rapidly housing transformation	Traffic congestion	Accessibility	The number of implemented upgrading projects	Crime rate	Score
Dar es Salaam	5	5	5	5	5	5	30
Mwanza	4	4	3	2	3	3	19
Mbeya	2	2	2	2	2	3	13
Arusha	3	3	3	3	2	3	17
Tanga	1	1	1	4	1	2	10

Ranking score: Very high=5; High=4; Moderate=3; Low=2; very low=1

5.5.1 Selection of three sub-case settlements: Kariakoo, Sinza and Buguruni

In order to investigate the objectives of this study, the three sub-case study areas were purposefully selected. Limbumba (2010) citing Patton (1987:52) points out that the strength of purposeful sampling lies in selecting *information rich cases*, which are “cases where one can learn a great deal about issues pertinent to the research”. Patton’s argument concurs with Stake (1995) who argues that it is useful to select a case from which one can maximize what can be learnt from it. So long as there are two predominant forms of settlements in the city of Dar es Salaam (i.e. planned and unplanned settlements) and in accordance with the major research questions, it was considered important to draw a distinction of the walking environment between formal planned and informal settlements, though only upgraded informal settlements were considered. To select the three sub-cases, the author *used Maximum variation sampling* to represent diverse cases and to full describe multiple perspectives about the cases as discussed by Craswell (2007).

The selection of the three sub-cases to represent both planned and unplanned settlements was based on the concept of the City being divided into three zones, namely; the Inner City, Intermediate and Peri-urban/ Peripheral settlements, according to location in relation to distance and accessibility from the city centre or CBD. The author is not the first to use this approach; other studies (Kombe and Kreibich, 2000; Kyessi 2002; Kombe, 1995; Hakuyu, 1995; Limbumba 2010) have used this residential zone categorization of the city in order to select the rich information cases. According to these researchers, the location characteristics of the residential zones in Dar es Salaam are:

- Inner City: Walking distance from CBD, about 3km radius.
- Intermediate zone: About 3 km to 10 km from the CBD.
- Peri-urban: More than 10 km from the CBD.

Limbumba (2010) discusses that, concentric zones of Dar es Salaam City is distorted by infrastructure and topography. For instance, in the eastern part, the idea of concentric zones is constrained by the Indian Ocean. As a result, the intermediate zone stretches out along the main roads and shrinks where the topography creates an obstacle to accessibility. To better understand how pedestrians move for

their everyday life activities in both planned and unplanned settlements, this study focused only on the Inner City and Intermediate zones. The peri-urban zone was not considered.

The rationale for choosing inner city and intermediate zones

The rationale for choosing the two zones based on both physical distance and density. Being in proximity to the CBD and due to high densification, residents in these zones are likely to generate more walking trips to various designations than those in Peri-urban zone. According to Kombe and Kreibich (2000) inner settlements depict excessive densification (over 200 people per hectare) and high demand for rental accommodation while areas in the intermediate and peri-urban zone depict densities much lower than in the inner city. Kyessi (2002) adds that urban residents are attracted to informal settlements that are located close to the city centre, especially with the urban poor due to on-foot access to urban services and facilities, as well as looking for and attending to their jobs. A study by Limbumba (2010) noted that in peri-urban areas, households prefer home ownership to renting because plots are bigger and one can engage in economic activities e.g. farming. Therefore, the inner city and intermediate zones were chosen with the assumption that people living in these zones walk more often compared to those in peri-urban zone who had to connect by public transport.

The selection of the three sub-cases to cover the Inner city and Intermediate zones presented possible avenues of understanding the pedestrian mobility patterns, and how pedestrians in the two zones perceived the physical walking environment. In addition, the three cases presented a variety of data because of the differences in location and functions, which the author hoped would strengthen the cases when it comes to a general understanding of pedestrian movement patterns and their associated challenges. Therefore, within the Inner City and Intermediate zone three sub-cases, namely; Kariakoo (inner city-planned settlement), Buguruni (inner city-unplanned settlement) and Sinza (formal planned settlement in the intermediate zone) were selected. The next section explains the selection criteria adopted in each settlement.

Selection of Kariakoo commercial Center: Inner city planned settlement

Kariakoo was selected to present the inner city formally planned settlements, because from the very beginning the main purpose was to conduct the study in *an old settlement planned before the 1970s*. The author assumed that the selection of an old planned settlement offers better possibilities of selecting areas where plans have been fairly well being or fully implemented, and hence the author could learn more how the pedestrian requirements were considered from the planning stage to the implementation. Based on this assumption, a total of seven neighbourhoods (Kariakoo, Upanga, Magomeni, Osterbay, Ilala, Temeke and Chang'ombe) were considered. Therefore, the selection of Kariakoo was subjected to the following criteria:

- Population: The Settlements which is highly populated was considered as an information rich case. This is simply because the higher the population, the higher the movement patterns made to reach various destinations. According to NBS (2012), Kariakoo area is highly populated (49, 391) compared to the other old settlements.
- Kariakoo is under pressure for redevelopment: These remarkable developments represent a critical case of rapid housing cityscape transformation whereby it was possible to learn more how the pedestrian requirements are being considered.
- Mixed use & activities: From the literature mixed used development was mentioned as one of the parameters for a walkable city. Being a major commercial centre in Dar es Salaam and within the country, Kariakoo is comprised of mixed developments and functions ranging from commercial, residential, institutional etc, which attracts people in the area. The mixed development motivated the author to investigate whether walking in this important commercial

centre was comfortable, safe and secure from crime and public services were easily accessible.

- Kariakoo is frequently crowded with high volume of pedestrians and street vendors compared to other old settlements planned before 1970s. The public space in Kariakoo is highly contested compared to other settlements. Hence, it was an opportunity to learn how pedestrian movements were being considered in a situation of contested public space.
- The age of the settlements: Being one of the oldest neighbourhood planned since 1920s to 1940s, it is possible to learn how the colonial neighborhood considered Walkability:
- Proximity to the CBD: the closer proximity a settlement is to CBD the more preferable it is. Kariakoo being part of the CBD, and due to high densification, residents in this area are likely to generate more walking trips to various designations than in other settlements of 1970s.

Table 5. 3: Selection of Kariakoo-inner city-planned settlements

Criteria Settlement	Rapidly transforming	Population	Crowded with high volume of pedestrians and street vendors	Mixed land uses, and high level of Services and goods)	The age of settlement (i.e. before 1940s)	Proximity to CBD	Score
Kariakoo	5	5	5	5	5	5	30
Upanga	5	3	3	4	5	5	25
Magomeni	3	3	4	3	4	4	21
Oysterbay	1	2	1	1	5	4	14
Ilala	1	4	4	3	4	4	20
Temeke	1	3	3	2	3	3	15
Changómbe	1	3	3	2	3	3	15

Ranking score: Very high=5; High=4; Moderate=3; Low=2; very low=1; none=0

Based on these criteria and some background information collected by previous researchers (Lupala, (2002; Mosha and Mosha, 2012), **Kariakoo** settlement was selected to represent the inner city planned settlements.

Selection of Buguruni ward: Inner City-Informal Settlement

The interest in this study was to analyse how people perceive their walking environment in an informal settlement area that has been upgraded. In addition, the aim was to examine how the pedestrians requirements were considered in the planning and implementation of CIUP Phase I projects. CIUP Phase I projects were implemented in five wards, namely; Buguruni, Vingunguti, Manzese, Sandali and Changombe. In order to identify, quantify and select an appropriate case study area from which data/information to answer the research questions would be collected, a preliminary rapid settlement appraisal of the existing situation was done. With the background knowledge on Dar es Salaam and in order to select an information rich case, physical observations and preliminary interviews with key informants were made. At this preliminary stage, key informants comprised of CIUP coordinators, local leaders and urban planners. The criteria for selecting Buguruni ward as an Inner City upgraded informal Settlements were as follows:

- Population: Buguruni is highly populated compared to the other wards in which CIUP-Phase I projects were implemented. Having the high population, it means that the settlement is likely to generate more trips to various destinations. Additionally, Buguruni is very densely built, over 200people per hectare (Kombe and Kreibich, 2000)
- Severity of environmental problems and outbreaks of epidemic diseases: Since Buguruni ward is characterized by floods during rainy season, the author, though to learn more about how pedestrians move when it rains. This criterion was also used by the World Bank during selection of CIUP Phase I projects.

- High volume of pedestrian traffic: Buguruni ward is passed through by two highways (i.e. Uhuru and Mandela Road). That being the case, Buguruni is the leading informal settlement with the highest pedestrian traffic along Mandela and Uhuru road. Due to its location and due to its high population, the author found it information rich case in relation to pedestrian mobility.
- Availability of people with disabilities: Since the National office of people with disabilities (CHAWATA) is located in Buguruni Ward; it was an opportunity to capture the perspectives of people with disabilities living in Buguruni and those from other parts of Dar es Salaam as they kept on visiting CHAWATA offices.
- Proximity to CBD: compared to other wards in which CIUP-Phase 1 projects were implemented, Buguruni is about 3 Kilometers distance from the CBD. Thus, many people make their daily trips on foot to the CBD:
- Mixed land uses: An upgraded informal settlement with mixed land uses and activities was given high consideration. This is because mixed activities generate a lot of traffic both human and vehicular which are directly associated with pedestrian mobility and safety needs.
- Income: Housing area with the most vibrant income and employment generating opportunities.

Table 5.4: Selection of upgraded informal settlement in the inner city

Criteria \ Settlement	Highly populated Settlement	Severity of environmental problems and outbreak of epidemic diseases	Availability of people with disabilities	Proximity to CBD	Income and employment generating opportunities	Mixed land use and activities	High volume of pedestrians	Score
Buguruni	4	4	4	4	5	5	5	31
Vingunguti	5	5	2	3	2	4	4	25
Manzese	4	3	2	2	5	5	5	26
Chang'ombe	1	2	2	2	2	3	3	15
Sandali	3	1	2	2	2	3	3	16

Ranking score: Very high=5; High=4; Moderate=3; Low=2; very low=1

In order to operationalise studies at a lower scale level in Buguruni Ward, Mtaa /Sub-wards constituted the unit of analysis. Having discussed with the key informants at the preliminary stage and after applying the criteria above, *Bugurni- Mnyamani and Madenge* Sub-wards were selected for investigation.

Selection of Sinza - planned residential in the intermediate zone

The selection of an area located in the intermediate zone of the city focused on projects that were implemented under the Sites and Services Schemes of the 1970s. Goldie (1979) as quoted in Ndunge, (2014) observes that the sites and services projects had typical housing types, similar neighbourhood designs with identical street layout patterns and considered infrastructure provision like water, sewer and electricity. Lupala (2002) adds that the sites and services projects aimed at meeting the needs of people in the low-income category. In Dar es Salaam, Phase I of the Sites and Services projects were implemented in Sinza, Kijitonyama and Mikocheni under the World Bank program to accommodate the displaced families from Manzese. While Sinza and Kijitonyama were earmarked for low-income working class, Mikocheni (low-density area) was designed and developed as a residential area for high class or high-ranking government employees and business people, after the sites and services project were undertaken presumably to cater the needs of the low-income group (ibid). With these projects, the government provided the necessary infrastructure such as roads, electricity, water, drainage, waste disposal and basic services such as schools, health centres and markets on public govern-

ment-purchased and subdivided plots (Kombe and Kreibich, 2000). Despite the aim of creating planned settlements by taking into account the need of poor people, most plots ended in the hands of the rich (Draft national housing policy, 2007 cited in Vedasto and Mrema, 2013).

This approach to urban planning is considered crucial in tracking how the pedestrian requirements were considered in the project implementation. Since Sites and Services Scheme designs were implemented with funds from the World Bank as compared to other planned settlements which may take longer to be implemented due to financial constraints, the researcher chose these projects as they offer the opportunity to observe changes over time. Patton (1990) argues that in selection of case studies, information rich cases need to be considered. Therefore, the Sites and Services Schemes are information rich cases which provided the researcher with the information required to analyse the implementation of design concepts and planning standards in the formal planned residential neighbourhoods. In order to select the information rich case, the settlements in which Sites and Services projects took place (i.e. Kijitonyama, Mikocheni and Sinza) were subjected to the following criteria:

- Mixed development: Neighbourhoods with a lot of activities and mixed uses were given the higher consideration. This is because the mixed activities generate a lot of traffic both human and vehicular which are directly associated with pedestrian accessibility and safety needs. Therefore, Sinza was selected because it has mixed residential developments, ranging from commercial, residential, commercial cum residential, institutional etc which all attract people in the neighbourhood. Sinza comprised detached, semi-detached, row housing, bungalows and maisonettes/step up housing types. This mix gives an opportunity to study degree of the walking environment within such settlements.
- Extent of land use changes: Sinza settlement was planned in the 1970's under Sites and Services; it was therefore possible and easier to note changes in the design of the neighbourhood over time. Vedasto and Mrema (2013) argue that, with rapid urbanisation, the Sinza layout plan has been overtaken by time. Car ownership has increased, high rise buildings have emerged, and more income generating activities have been initiated in the neighbourhood. These activities have accelerated mobility in the area, and hence it seems to be an information rich case.
- Plot Sizes: Settlements with small plot size were highly considered. The plots sizes gave an interpretation of increased densities which generate high human traffic as compared to plots with less housing density. According to Lupala (2002), Plot size in Sinza and Kijitonyama are 288meter square while those in Mikocheni comprises 1000 meter square, and therefore Mikocheni was disqualified.
- Accessibility: This criterion considered connectivity within the neighbourhood, level of access from the main road and public vehicle accessibility of the settlement. The less accessible the settlement is, the higher the consideration was. This is simply because poor accessibility connotes a mobility problem, meaning that pedestrians in this settlement are most likely to be challenged by these situations. In addition to that, a settlement not well serviced by public transport was considered because having a public transport far from home requires more walking as opposed to those located near public transport means.
- Population: Settlements which are highly populated were considered as information rich cases. The more the population, the higher the mobility of people. According to the 2012 National Housing and Population Census, Sinza ward has 40, 546 inhabitants, while Kijitonyama has 58, 132 and Mikocheni has 32, 947 inhabitants.

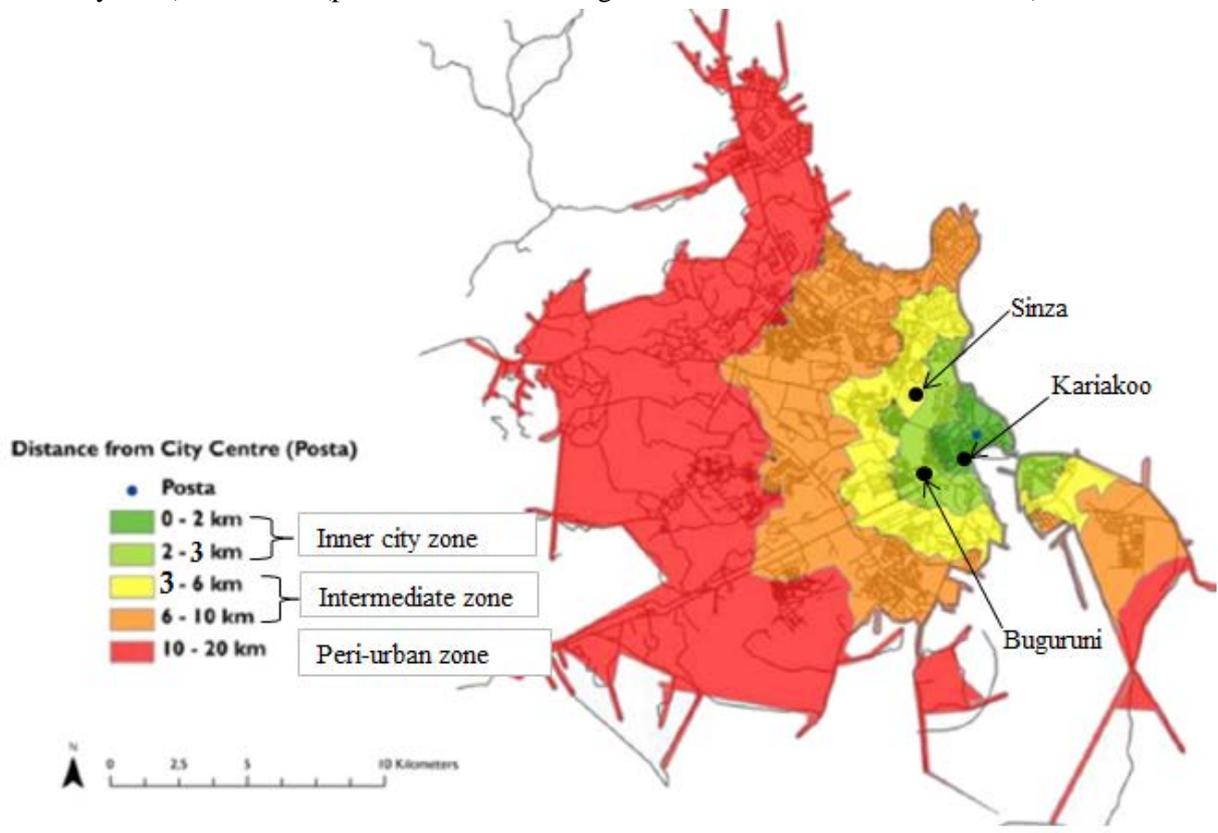
- Pedestrian accident figures: pedestrian accident figures: Pedestrian accident figures within the neighbourhoods were obtained from the Osterbay Police Station. The higher the figure, the more the neighbourhood was preferred since this gave an interpretation that an intervention measure was necessary. According to 2012 road accident figures, the pedestrian accident figures in Sinza, Kijitonyama and Michocheni were 31, 24 and 12 respectively.

Table 5. 5: Selection of Sinza ward (Planned Settlement in the intermediate Zone)

Criteria \ Settlement	Population	Mixed development	Densification (Plot size)	Extent of land use changes	Inaccessibility from the main road and to public bus stops	Pedestrian accident figure	Score
Kijitonyama	5	5	5	2	3	4	24
Sinza	4	5	5	5	2	5	26
Mikocheni	3	3	2	2	1	3	15

Ranking score: Very high=5; High=4; Moderate=3; Low=2; very low=1

Figure 5.2 shows the three sub-cases in the urban continuum. These were namely: Kariakoo (planned settlement and part of CBD in the inner city zone), Buguruni (Upgraded-informal settlement in the inner city zone), and Sinza (planned residential neighbourhood in the intermediate zone).



Source: Melbye et al., 2015: 183 and modified by the author to suit the study, 2017

Figure 5. 2: Location of Sinza, Kariakoo and Buguruni in the urban continuum

5.6 Unit of analysis

A unit of analysis is the individual unit to which the study is to focus (Yin, 2009). It can be defined as a person, group or an object from which the social researcher collects data. Data from such units can only describe that unit, but when combined with similar data collected from a group of similar units provide an accurate picture of a group to which that unit belongs (Bless and Smith, 1995). Kothari (1992) and Nachimias (1997) argue that when formulating the research problem, one must give serious considerations to the unit of analysis as the elementary part of the aspect to be studied, since it influences research design, data collection and data analysis decisions. Patton's (1987) specifies that "the key aspect in making decisions about appropriate units of analysis is to decide what it is that you want to be able to say at the end of the study". The main concern of this study is to understand why people in cities of developing countries walk more often for everyday life activities, how people perceive their walking environment, and how the urban design concepts and planning standards and their implementation considered pedestrian requirements in a situation of increased motorized transport. This task involved analysis of data from the various resident households, pedestrians, the school children, review of legal and planning documents and interviews with land use and transport related institutions/organizations. Thus, pedestrians and walkways constituted the unit of analysis for this study. The resident-households, the school children, institutions/ organizations were interviewed as well as the legal and planning documents were reviewed in relation to pedestrians and walkways.

5.7 Selection of sample size

Patton (1990: 184) argues that there are no rules for sample size in qualitative inquiry. The sample size depends on what one wants to know, the purpose of the inquiry, what's at stake, what will be useful, what will have credibility, and what can be done with available time and resources (ibid). Since this research aimed to capture people's attitudes, experience, opinions on the walking environment and due to limited resources, including time, the optimum small sample size of qualitative research on 30 interviews per settlement as defined by (Kothari, 2004: Creswell, 1994: Denzin and Lincoln, 2005, Morse, 2000) was considered. This is also supported by *the rules of thumb based on data collection method*, that is, for in-depth interviews an approximately of 30 people is recommended⁷. The sample size of 30 interviewees comprised of the *resident households and pedestrians* who were found walking, standing, sitting, or doing businesses within the study area. Thus, for pedestrian interviews, only pedestrians outside the study area were interviewed. Since the study aimed at in-depth interviews with "captive walkers", that is, for those who walk because cannot afford an alternative, particularly the urban poor, the elderly, children and people with disability, a purposeful sampling strategy, particularly, a Snowball or chain sampling approach was used.

5.7.1 Selection of interviewee: *The resident households*

- Before the interviews commenced, a reconnaissance tour was conducted in the selected sub-cases by making transect walks and casually posing questions to the persons encountered. This helped to establish rapport and contacts with the local community, including leaders and facilitated permission to work in the area.
- Discussions with the Mtaa/Subward leaders preceded the household interviews. The aim of these preliminary discussions was to find ways through which the thirty (30) captive walkers (those who walk because have no alternatives) could be selected in their areas. Based on the criteria established by the author, a snowball or chain sampling strategy was applied to select

⁷ The value of choosing a small small sample (30 interviews per settlements) was to enable the reacher to conduct in depth interviews which are time and labour intensive. In this study, a large number of people was not needed for the purposes of statistical analysis or to make generalizations from the results.

respondents (Patton, 1990; Creswell, 2009: 178; Denscombe, 2010; Yin, 2011: 88; Bryman, 2012). According to Patton (1990: 182), snowball sampling approach identifies cases of interest from people who know people who know what cases are information-rich, that is, good examples for study, good interview subjects. This implied also to those who would be good interview participants by asking for the names of other respondents who might be willing to talk, to respond, and to be interviewed. Therefore, the researcher began by asking the local leaders to nominate resident households who were thought of being captive walkers in their settlement until the nominations snowball got to saturation.

- Since it was observed in the literature that walking provides mobility to a high proportion of the urban population, particularly, the poorest, the elderly, school children and people with disability, the author established the following selection criteria to select the resident households for interviews:
 - Lower income households: To determine the lower income households, the physical appearance of the house was considered. For instance, condition of walls, roofing material, windows, floor material and fencing. However, the lower income households located along the congested streets, highway/collector roads, unpaved access roads and footpaths, flood prone areas and those located in the inner and the periphery of the settlements were considered;
 - Physical appearance and clothing of the resident household: A person's physical appearance or clothing was directly observed. Thus, a resident respondent whose physical appearance seemed to belong to the lower income earners was requested to take part in the interview;
 - The households headed by the elderly aged 60+, female headed households or people with disabilities (handicapped and visually impaired) based on information of the local leader were given priority;
 - Resident households involved in walking activities such as street vending and other informal vending activities.
 - Based on the above criteria, either a landlord or tenant living in a household was considered for interviews provided that he/she was a resident of that area (i.e. he/she had lived there over a year).
- Based on the preceding selection criteria and with the help of Sub-ward leaders, 72 resident households (25 in Sinza, 20 in Kariakoo, and 27 in Buguruni) were selected. This total was later on combined with the number of pedestrians interviewed in each settlement to meet the targeted minimum sample size of 30 respondents per settlement (Table 5.2). Out of 72, six were people with disabilities.
- In order to facilitate the interviews, the Mtaa/Sub-ward leaders (local level leaders) appointed a person among the members of the Sub-ward Development Committee to accompany the researcher around the streets and to introduce him to the specific respondents. During the selection of the resident households for an interview, the author tried as much as possible not to cluster interviews in one area. The local leader, who accompanied the author throughout the fieldwork, assisted him in selecting the relevant resident households based on the selection criteria set by the researcher. Since the local leader was a member of the community, he/she was familiar with many of the respondents. It is part of their official duties to know their constituency. Despite the fact that walking with a local leader was an asset during the fieldwork, but there were times when the author had to guide the local leader because he/she tended to take him to those resident households that he/she was most familiar or friendly with for various reasons. Some members of the community sometimes saw being interviewed as a token

of honour. The influence of a local leader was overcome by asking the respondent to mention someone who depends on walking in his/her everyday life activities. The local leader remained with the role of introducing the researcher to the respondent.

- Interviews were conducted with only resident households who could be assumed to be most knowledgeable about the issues pertaining pedestrian mobility in the city context. Interviews with the resident households were conducted in an investigative manner with intention to probe their experiences, attitudes and perceptions about the walking environment.
- The resident household was assumed eligible to participate if he/she had lived in the respective settlement at least for one year, and had walked at least 5 to 10 minutes in the previous two days.

In order to validate the perspectives of the households on the walking environment, a total of 28 pedestrians were interviewed in Buguruni, Karikoo and Sinza, making a total of 100 respondents (72 resident households and 28 pedestrians). A procedure used to select the 28 pedestrians is described in the next section:

5.7.2 Selection of pedestrians for interviews

To validate the perceptions of the households, walking interviews with 28 pedestrians were held. These interviews were designed to be short, and in a relaxed casual discussion with pedestrians who were met walking along the streets. Because of limited time and because they were new to these settlements, pedestrians were not asked to respond to questions about accessibility to services within the settlement and those related to their daily activities from wake-up in the morning up to sleeping time in the night. The questions were designed to gauge the pedestrian movement patterns per week and how they perceived/rated the walking environment and to suggest what matters for their walking trips so as to identify specific pedestrian needs for improvements. These interviews provided a range of opinions about the quality, connectivity, safety, security from crime and attractiveness of the walking routes. In each of the three settlements, between six and 14 pedestrians were *purposefully selected*. The selection criteria included:

- Physical appearance and clothing: A person's physical appearance or clothing was directly observed. Thus, a pedestrian whose physical appearance seemed to belong to the lower income earners was requested to participate in the interview;
- The elderly pedestrians (aged 60+) and people with disabilities (including 3 wheelers) were stopped for interviews; and
- Pedestrians waiting for public transport and those involved in walking activities like street vending, and other informal vending activities were also considered. Because in some cases it was difficult to stop pedestrians for interviews, pedestrians waiting for a public transport, or those conducting businesses in the study area were also interviewed. However, only pedestrians from outside the study settlement were considered for interviews.

In total, 28 pedestrians were interviewed across the three sub-cases (8 in Buguruni, 14 in Karikoo and 6 in Sinza). Out of 28 pedestrians 6 were people with disabilities. Completion of the household and pedestrian interviews, made a total of 100 respondents (72 households, and 28 pedestrians) ranging between 31-35 respondents per settlement. Table 5.2 provides more details

Table 5.6: Summary of respondents interviewed in Sinza, Kariakoo and Buguruni

	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Male	14	7	14	13	12	3	40	23
Female	13	1	6	1	13	3	32	5
Sub-total	27	8	20	14	25	6	72	28
Grand Total	35		34		31		100	

Source: Fieldwork, March-April 2015

Note HHs=Resident households; PDs=Pedestrians

7.8. The fieldwork process

Phase I of this research was conducted from February to June 2015. In chronological order, the activities held during fieldwork consisted of the following:

Acquiring the research permit: Before getting into the fieldwork, the researcher was required to obtain a research permit from the responsible local authorities. The author was given a letter at each relevant municipal authority, which introduced the research aims and the researcher himself to the prospective Sub-ward officials. At the Sub-ward offices he was introduced to one of the members of the Sub-ward committee, who guided him throughout the fieldwork.

Desk research: Having acquired the research permit, the next step was to review various documents to see how the pedestrian requirements were considered by the National level comprehensive documents, the National sectoral policies, and the local level planning documents, urban design concepts and planning standards adopted in the planned and unplanned Settlements in Dar es Salaam City. These included the review of Dar es Salaam Master plans, National level comprehensive documents, Urban and Transport related policies and Acts, Urban planning and space standards, CIUP reports, DART reports, Kariakoo Redevelopment scheme, Sites and Services reports and government circulars. (The results from the review of documents are presented in Chapter nine of this report).

Preliminary discussions with professional experts: Having finished the review of documents, the researcher held preliminary discussions with professional experts (Urban and transport planners, CIUP Coordinators) on the information-rich cases in the inner city and intermediate zones. After long discussions and consultations Buguruni, Kariakoo and Sinza neighbourhoods were identified as potential case study areas.

Reconnaissance tour: The researcher made a reconnaissance tour in the selected settlements to have an overview of the physical environment, socio-economic activities, housing densities and major land uses. Other activities included; transect walks along the major highways, collector and access roads and footpaths. The aim was to observe the pedestrian infrastructure in place, the connectivity of the walking paths and conflicts on the use of public space. These helped the researcher to select information rich streets for further observations, and information to validate the peoples' perspectives.

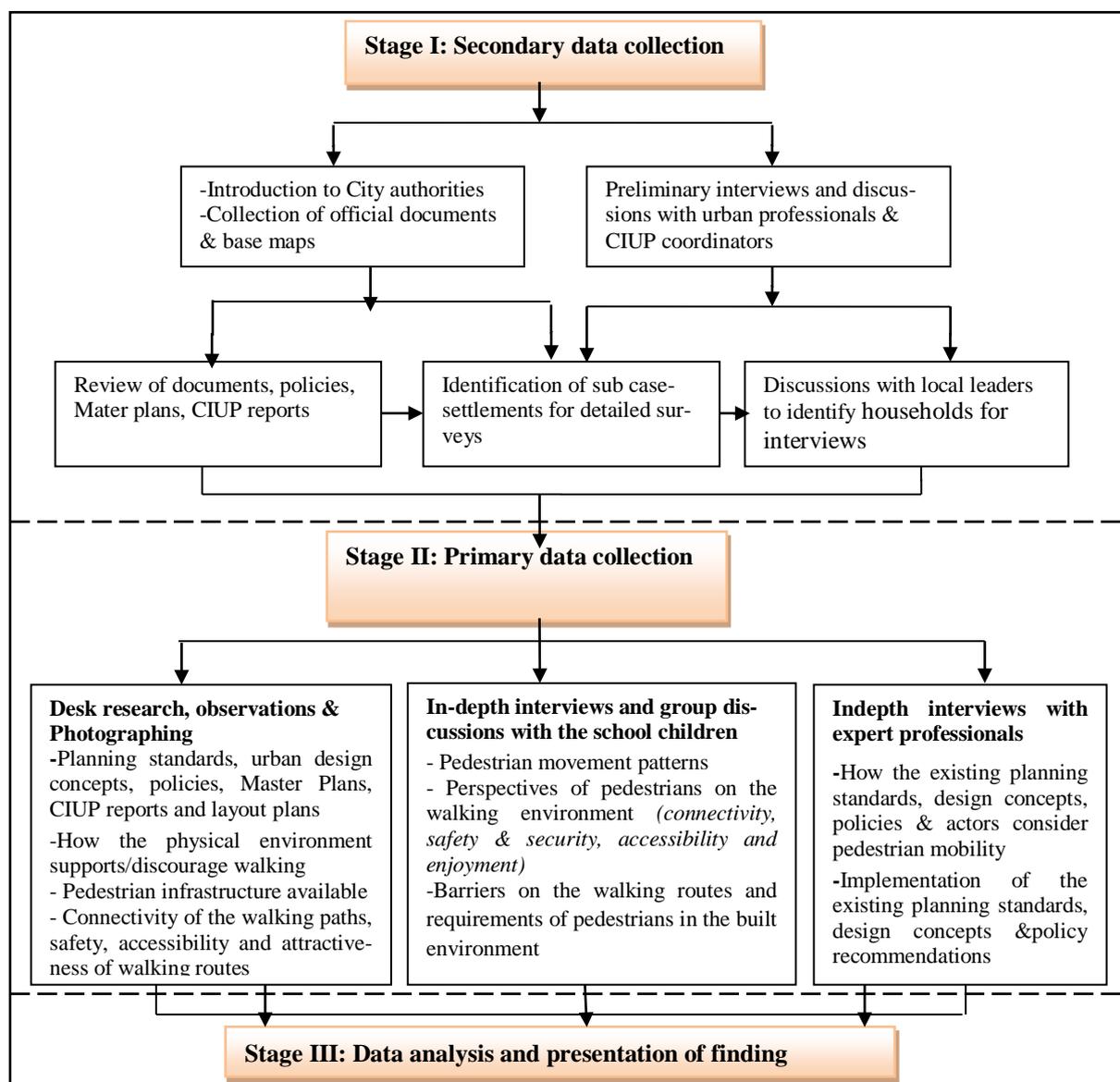
Selection of interviewee: Having finished the reconnaissance tour in the selected sub-cases, the next task was discussions with the local leaders on how to select the 25-30 households with regard to their vulnerability. Basing on the criteria set by the researcher (i.e. gender, age, income, occupation and willingness to participate), the selection procedure was purposive sampling as discussed in part 5.7.1.

Households and pedestrian interviews: With the effect from 15th February 2015 to 30th April 2015 the households and pedestrian interviews were conducted under the guidance of the local leaders. Since the local leaders were generally respected community members, their introductions helped allay any suspicions that the people might have about intentions of his study. After a several visits, the author was at times able to visit the resident households that he had visited before even without a local leader escorting him because he had already developed a rapport with the respondent. The interviews were conducted with the resident households (Landlords and tenants) whom were thought to have more experiences on the issue of pedestrian mobility within their settlements and within the city. In order to accomplish the interviews, the questionnaire (see appendix i & ii) had been designed to guide the interviews with a combination of closed and open-ended questions. This exercise went hand in hand with direct observations to see how the physical environment supports or hinders pedestrian mobility (Appendix iii).

Pre-structured group discussions: Prior to an end, the researcher conducted pre-structured group-discussions which had a narrative story with 22 primary school children at Hekima, Uhuru Mchanganyiko and Sinza primary school in Buguruni, Kariakoo and Sinza respectively. These discussions

came into being just after the researcher had realized that it was not possible to interview the school children without parents' permission. Therefore, a possible way of capturing their attitudes and perceptions on the walking environment was to conduct pre-structured group discussions which had a narrative story through their head teachers. However, the researcher was given a limited time of not more than 20 minutes during break-time to discuss with the school children.

Interviews with professional experts: Finally, from 02nd May to 08th June 2015, in-depth interviews with 22 urban professionals were conducted. These were from the public and private urban professionals including the transport agencies. In this case, interviews were done with heads of departments/sections of urban planning and works/engineering departments at Ilala and Kinondoni municipality; expert professionals at DCC, MLHSD and the Police Force, TANROADS, DART, CHAWATA and SUMATRA were also interviewed. The essence was to get the opinions of the expert professionals regarding considerations of pedestrian requirements in policy making, planning and implementation of plans with regard to their respective departments/sections. To accomplish this task, an interview guide (Appendix iv) was prepared.



Source: Author's construct, July 2015

Figure 5 3: Stages during data collection phase

5.9 Field data collection techniques

As mentioned earlier, this study adopted a multiple case study design. According to Yin (1981:58) case study approach is not restricted to any specific data collection method. In this case, data for this study were collected using qualitative and quantitative methods. The author tried as much as possible to use multiple sources of information (methodological triangulation was applied). Secondary data were collected through the review of documents, while primary data were gathered through interviews, on-site observation, discussions, cartographic/ measurements and photographing. The case study strategy recommends the use of multiple sources of information because it allows an investigator to address a broad range of issues (Yin, 2003).

5.9.1 Direct-observations

Marshall and Rossman (1999:107) cited in Sheuya (2004: 61) define observation as “the systematic noting and recording of events, behaviour and artefacts (objects) in the social setting chosen for study”. There are mainly two types of observations, namely; participant and non-participant observation. The latter is sometimes referred to as direct observation. The distinction between the two is clearly discussed in the work of Sheuya (2004: 62) that in participant observation, the researcher spends a reasonable amount of time living and working in a community to experience the realities of life in the same manner as the community members, whereas in non-participant observation, the researcher is not as immersed in the community ways of life as in participant observation. That being a case, a non-participant observation was adopted, and a checklist for recording fieldwork observations was established (see appendix iii).

This was carried out to see physically how the walking environment in the study area supported the pedestrian movements. The direct observation more focused on: the existing pedestrian infrastructure and their conditions, connectivity to services and other modes of transport; disability infrastructure; walking path modal conflicts, crosswalks, motorist behaviour, amenities (benches, public toilets, shade trees and street lights among others), conflicting interests on the use of contested public space and how the urban environment supports pedestrian mobility. Direct-observations were made as the author moved around the study settlements and some were carried out during leisure time when he was just walking around the city or going out for different errands. The author tried to be observant everyday on things happening as he walked through, and they were carried out on a daily basis during the five months of fieldwork. For instance, observations on the way pedestrians were struggling to cross the busy roads, encroachment of walkways by parked cars, and the way pedestrians were forced to share same carriageway with motorised traffic were noted, documented and photographed. Whenever the author saw something interesting it was noted and documented. At the same times the author had the company of a person living and working in the area (he usually walked with one of the local leaders), giving him information about how it worked. This went hand in hand with other activities like:

Photography: In order to capture the context and status of the walking environment, photographs were taken. For instance, interaction of pedestrians and other road users, utilization of pedestrian facilities, state of pedestrian infrastructure, housing types and road junction designs were all captured by photography. These complemented what was physically observed and recorded on the observation sheet.

Sketching: Sketches were made to illustrate a particular situation on the ground. Some of these included road intersections, street network, pedestrian accident hot spot areas, and commercial areas, distribution of community services, and orientation of building towards the street.

Measurements and cartographic work: Measurements were used to capture data related to the sizes and distances. They were done both physically on the ground and digitally from the layout plans. The-

se included: measurements of road widths, setbacks (distance of the building from the road), and distance covered to access public facilities like schools, health services, and shopping centres.

5.9.4 Interviews

Households and walking interviews

In order to guide the interview, questions to guide the interview with the resident respondents and walking interviews (appendix i and ii) had been drafted. This comprised of both open and close-ended questions in which the researcher filled out the answers given by the respondents. To avoid skipping some essential components in this study, the two questionnaires were organized into sections which adopted the variables of the study. These included: socio-economic characteristic, pedestrian movement patterns, perspectives and requirements of pedestrians on the walking environment.

The questions were set based on the hierarchy of walking needs presented in the conceptual framework (Figure 4.3). Thus, the perceptions of pedestrians were assessed based on: accessibility to public facilities (commercial, education, health, religious, recreational, and access to public transit stops). Other components included: connectivity of the walking paths, convenience and attractiveness of the walking paths, security from crime, degree of safety, barriers on the walking path, pedestrian amenities, motorist behaviour, crosswalks, disability infrastructure, walking modal path conflicts and competing interests in the use of contested public space. Not only that, but also Pedestrians were asked to describe what matters for their walking trips so as to identify specific needs for improvement. As such pedestrians were asked to rate the walking environment in their specific areas and suggest what matters for them to walk⁸. Though, in some cases it was difficult to stop pedestrians for an interview (Walking interviews), in these cases, other people in the area, such as pedestrians waiting for a public transport, or those conducting their business in the study area were interviewed.

Having completed the face to face interviews, 6 resident households per settlement were selected for in-depth interviews. The in-depth interviews led to better understanding the attitudes, opinions, and experiences of the respondents on the walking environment, especially those who have been victims of road accidents and mugging issues. Moreover, the in depth interviews helped to capture the daily and weekly activities from wake-up in the morning to sleeping at night, and also to get more details on the challenges of the walking environment especially for those who have been victims of road accident and mugging issues.

Apart from the conceptual framework (Figure 4.3), preparation of the interview questions presented in (Appendix i and ii) was also influenced by the walkability concepts, the right to the city, social exclusion concepts and safer city approached. The essence was to how people perceived the walking environment in regard to the issues of inclusion, the connectivity of the walking path, safety and security, convenience and attractiveness. These variables in one way or another are covered by the named concepts.

In-depth interviews

In addition to household and walking interviews, a series of in-depth interviews with Professional experts were held. The professional experts were purposefully selected to include only those in urban and transport related fields and associations of people with disability. The essence was to understand how these actors implement the existing planning standards, design concepts and policy objectives recommended for improving Walkability in planned and unplanned settlements. To accomplish this task, a checklist questionnaire to guide the interviews was prepared and administered to the expert professionals (see appendix iv). These interviews were conducted as open-ended and free-flowing conversations based on the checklist questionnaire as a guide throughout the interview, and as many

⁸ The scale used to rate the walking environment comprised of five levels: strongly agree, agree, neutral, disagree and strongly disagree.

probing questions were asked as appropriate. Mailed or distant questionnaires were avoided because the researcher required an interactive conversation with the officials, whereby clarification of questions was made and more information outside the questionnaire was obtained. The answers from respondents were recorded using a voice recorder, and some were recorded on field notebooks. The author is very grateful for the generosity of the many policy-makers and practitioners who made time to talk with him about considerations of pedestrians in their day to day activities. Generally the interview guide for expert professionals was based on the characteristics of the built environment (land use patterns, design features and transport system) as presented in the conceptual framework (Figure 4.3). Also, the walkability concept, the right to the city, social exclusion concept and safer cities approach influenced the preparation of the interview guide.

Pre-structured group discussion

From the literature, children were earmarked as one of the vulnerable groups. While proceeding with fieldwork, the author realized that it was difficult to conduct interviews with the school children while at home without parents' permission. In order to capture their experiences, attitudes and perceptions regarding the walking environment, a possible way was to conduct pre structured discussions with school children that had a narrative approach. As a result, three pre-structured group discussions were possible. Through their head teachers, a total of 22 school children were interviewed (9 in Buguruni, 7 in Kariakoo and 6 in Sinza). To finish these discussions, a limited time of not more than 20 minutes was provided and these were possible only during break time.

Challenges during the fieldwork studies

Non-availability of household heads during workdays: This was overcome by collecting the household data during weekends and public holidays or interviewing other persons who could be assumed to be most knowledgeable about the issues pertaining pedestrian mobility in the city context.

Data collection during rainy seasons: This was a bit challenging for the researcher, particularly when conducting interviews in Sinza case study and during official interviews (April-May 2015). During this time most of the roads were quite muddy due to the poor drainage system. This made movement difficult for pedestrians to move around as well as making driving dangerous. As a result rain disrupted some of my fieldwork, especially when the author had to cancel interview appointments due to the impassability of roads. However, this challenge was overcome by utilizing effectively the non-rainy days and by doing proper timing to collect data before it rains.

Interviewing school children: This was also a challenging issue as it was noted that it is difficult to interview the school children without parents' permission. This was overcome by changing the data collection technique, instead of conducting interviews with school children, the researcher had to conduct pre-structured group discussions with school children which had a narrative approach.

Financial resources: The author faced financial challenges due to the fact that DAAD-MoEVT scholarship does not cover fieldwork research costs. As a result, it was difficult to work with field assistants through the entire period of fieldwork. This was overcome by working sometimes alone, the situation that consumed more time.

Limited time: Having selected a multiple case study research design under limited financial resources, the author had limited time for in-depth interviews in the three settlements. This was overcome by working till late in the evening, including Sundays, which is normally a worshipping day.

Discrepancy in data collection: A month after completing the direct observation and household interviews in Karikoo, Msimabazi road/street which passes through the central Kariakoo area became under construction following the implementation and completion of BRT phase I project. This situation made a discrepancy from what was observed before and after reconstruction. This was overcome by repeating the observation during phase II of fieldwork that took place between July-September 2016.

Table 5. 7: Data collection matrix table

S / N	Objective	Data required	Source of data	Data collection methods	Type of data
1	To explore the pedestrian movement patterns, the reasons for walking, perspectives of pedestrians on the walking environment and how the physical environment supports walking in the study areas	<ul style="list-style-type: none"> - The reasons why people walk more often for their everyday life activities. -- Daily and weekly mobility patterns in the study area -The means of transport used to get to various destinations - Perspectives of pedestrians on the walking paths, specifically connectivity of the walking paths, safety and security, access to public facilities, convenience and attractiveness of the walking paths 	<ul style="list-style-type: none"> -Resident households (purposefully the low income earners, women, the elderly and people with disabilities). Walkers (pedestrians) in the study area School children Local leaders 	<ul style="list-style-type: none"> -Household interviews -In-depth interviews -Walking interviews -Direct observations Photographing Transect walk Pre-structured group discussions 	Qualitative & quantitative
2	To examine how the existing urban design concepts , planning standards, and relevant policies consider pedestrian requirements in a situation of increased motorized transport	-Considerations of pedestrian requirements by the existing urban design concepts, planning standards and the National policies/laws adopted in Tanzania.	<ul style="list-style-type: none"> - MLHSD; -DCC; - Ilala & Kinondoni Municipal Councils; -Transport agencies (TANROADS, DART) - SUMATRA; - Police Force, - CIUP coordinators; -CHAWATA 	<ul style="list-style-type: none"> -Review of documents (i.e. national and local level planning documents). -In-depth interviews with professional experts. -Cartography works, measurements and sketching 	Qualitative & quantitative
3	To assess how the urban design concepts and planning standards adopted in the planned and upgraded informal settlements are implemented	<ul style="list-style-type: none"> -Mechanisms for implementation of urban design concepts and planning standards with regard to pedestrian requirements - Opportunities and challenges of implementing urban design concepts and planning standards for improving the walking environment. 	<ul style="list-style-type: none"> - MLHSD; -DCC; - Ilala & Kinondoni Municipal Councils; -Transport agencies (TANROADS, DART) - Police Force, - CIUP coordinators; 	<ul style="list-style-type: none"> -Review of documents (i.e. national and local level planning documents) -In-depth interviews with the professional experts -Observations -Cartography Photographing 	Qualitative & quantitative

Source: Own construct, November 2014

5.10 Data analysis

According to Yin (2003) data analysis consists of examining, categorizing, tabulating, testing or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of the study. The aim of data analysis is to discover patterns among the data patterns that point to a theoretical understanding of social life (Babbie, 2005:394). This aim, points out an interesting relation that exists between our empirical data and established theories. He defines theory as “representation of our best understanding of how life operates”. On the relation between data and theory, he indicates that “the more our empirical data conform to a particular set of relationships among concepts, the more confident we became that our understanding corresponds to social reality” (Babbie (2005:388).

Creswell (2007: 148) summarizes three phases of data analysis in qualitative research. These include: preparing and organising the data, reducing the data into themes through coding and representing the data in figures, tables and discussions. Using this method, the data collected was retrieved, processed and analysed in line with the themes of the study. Data processing involved; editing, coding, classifications, tabulation and converting into simple graphics, amenable for interpretation.

The findings were presented in text, tables, figures, quotes, sketches and maps. The quantitative data obtained from the field were processed and analysed using computer software such Ms Excel for statistical data, tables, charts and graphs. These illustrations were used only to supplement the discussions. In order to ensure that data were accurate, consistent with other facts gathered, uniformly entered and as complete as possible, every questionnaire form was scrutinized on a daily basis or a day later. Therefore, preliminary editing of data was part and parcel of data collection. This went in hand with checking and cleaning all interviews administered by the field assistants before being accepted and stored for further analysis. Data cleaning involved removal of unwanted information or personal information, for instance, the names of respondents were changed to other false names.

5.11 Validity and reliability

Bryman (2012) asserts that validity is the degree at which the research instrument measures or records what it is intended to cover. According to Yin (2011: 78), a study is valid only if has properly collected and interpreted its data so that the conclusions accurately reflect and represent the real world (or laboratory) that was studied. Besides that, reliability is concerned with the research instruments to yield similar results if the same tool and protocols employed in conducting one research are used further under similar conditions (Yin, 1994: 33). In this study, validity and reliability of the research instruments were ensured in various ways. Firstly, intensive literature on different data collection techniques and the type of data (qualitative or quantitative) that can be used to collect was held. This study employed the use of several data collection methods such as interviews; observations, documentary review, pre-structured discussions, photographing and measurement were employed. Interview guides, recorders and notes were used to capture the conversations, while observation sheets and sketching were also useful during physical surveys. The various methods used also facilitated methodological triangulation.

Secondly, prior to fieldwork, a number of consultative meetings with the supervisors regarding the study methodology (including data collection tools) were held. The consultative meetings also helped consolidate the validity and reliability of the tools. Also the matrix of the research questions and data collection methods were prepared to direct data collection (Table 5.7). Thirdly, through PhD colloquium seminars got deeper insights into qualitative and quantitative data collection methods and tools. Later I presented the research design and methodology before the PhD peer group. The PhD seminars to a large extent generated another substantial assurance about the validity of the data to be collected. Fourth, to ensure that the data collected was valid informal discussions with fellow students on the research variables and tools I intended to use in data collection were conducted and were quite useful. In this case, I could freely test my views against others’ opinions as well as develop deeper insights on

the instruments. Lastly, piloting and pre-testing of questions, which was done during the first stage of data collection before the actual interviews in the field, helped to check and ensure the appropriateness of the issues raised in the interview questions as well as the relevance of the research instruments. Where the instruments, particularly interview guides, failed to collect the intended data types, slight changes were made.

5.12 Concluding summary

This chapter has presented discussions regarding the research design and methodology that guided this research. Multiple case study research strategy and mixed methods research approach directed the sampling procedure, data collection techniques and instruments, analysis and presentation of finding results basing on research questions and variables of this study. Before embarking on the empirical findings for the three sub-cases study areas, next chapter presents the study context, whereby an overview of Dar es Salaam City in terms of location, administrative structure, population and the, trips modal share within the City and spatial expansion of the City are described. The chapter ends by describing the three cases (i.e. Sinza, Kariakoo and Buguruni) in the urban continuum.

CHAPTER SIX

6. THE STUDY CONTEXT

6.0 Introduction

This chapter describes the city in which the study was conducted. It highlights the context of the study, administrative and urban structures, land coverage and density, population trends, employment status, land use changes and city growth trends of the Dar es Salaam metropolitan City.

6.1. Location, size and climatic condition

Dar es Salaam is the commercial City and main port of Tanzania with a total surface area of 1,800 square kilometres, comprising of 1, 393square kilometres of land mass (DCC, 2004:6). The City is characterized by hot and humid climate throughout the year. The average temperature of the City is 29°C with 35°C as maximum temperature and 25°C as the minimum temperature of the City (URT, 2004). The city often receives an average rainfall of 1000 mm, 800 mm being the lowest and 1300 mm the highest (ibid). Dar es Salaam is located on the Eastern part of the country and thus bordered by the Indian Ocean on the East and by four districts of the Coast Region. Bagamoyo borders the City to the North, Kibaha and Kisarawe to the West and Mkuranga to the South. The City stretches along the coast of the Indian Ocean for about 100km from South to North.

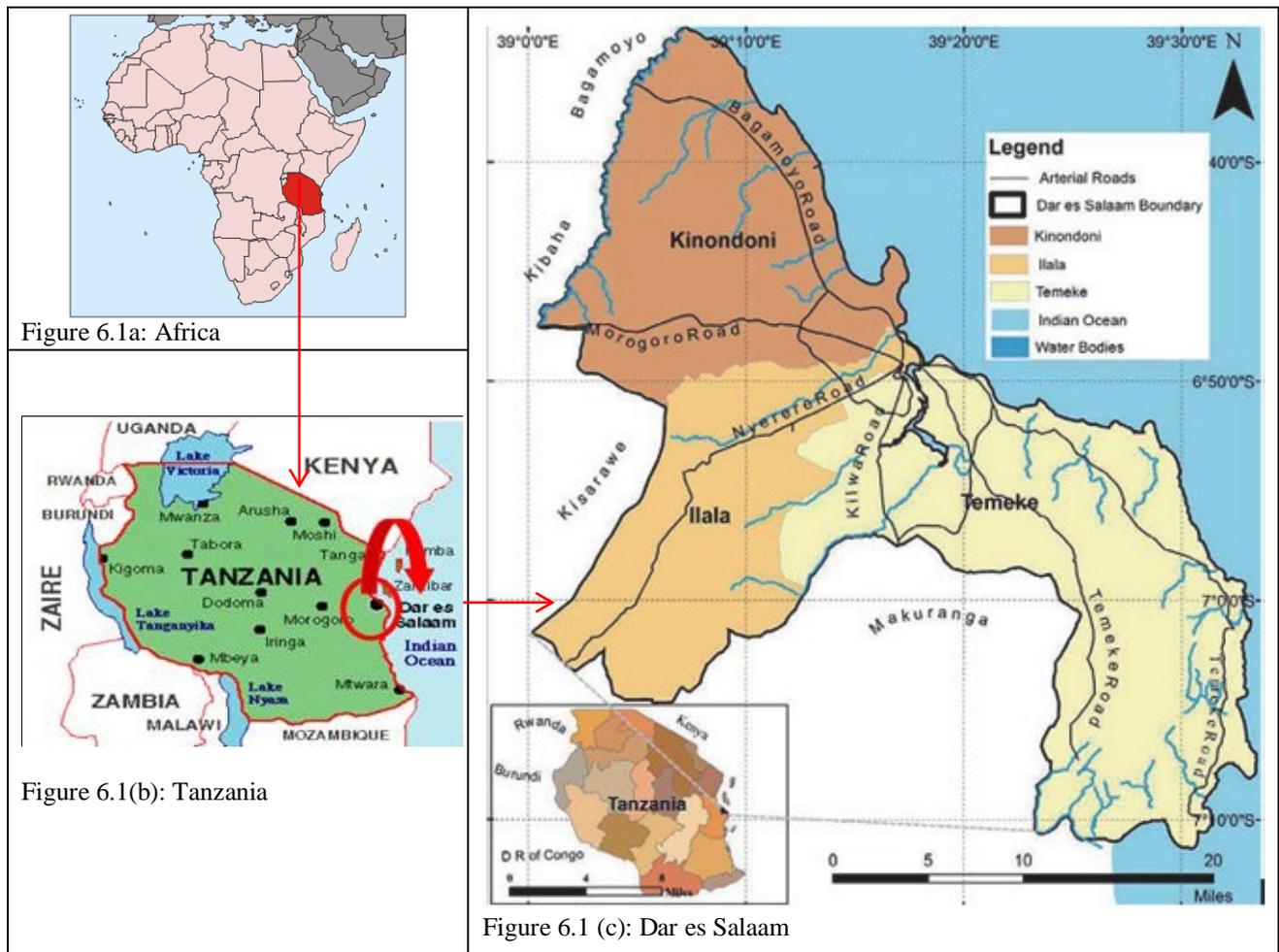


Figure 6.1(a) Geographical location of Tanzania in Africa, (b) Dar es Salaam in Tanzania, and (c) Municipalities and topographical distribution of Dar es Salaam.

Figure 6. 1: Location of Dar es Salaam city and its three municipalities

6.2 Administrative structure

Dar es Salaam is one of the 31 regions in the country comprising five municipalities, namely, Ilala, Temeke, Kinondoni, Ubungo and Kigamboni. However, the two municipalities (Ubungo and Kigamboni) have been established recently (i.e.2016). Following the decentralisation of City Council operations in 2000, the municipalities were given full policy and legislative implementation authority. The structure, powers and functions of urban councils⁹ are clearly stated in section 19 (3) of the Local Government (Urban Authorities) Act of 1982. According to this Act, Municipal and City Councils are presided by a Mayor who is elected from among the elected Ward Councillors. The Chief executive of a Town/Municipal or City Council is the Director. Directors are secretaries to the Council, but without voting power. Therefore, each Municipality in Dar es Salaam is headed by a District Commissioner and its own Municipal Council, headed by a Mayor and an Executive Director. There are five Municipal Directors appointed by and accountable to the Presidents' Office, the Ministry of Regional Administration and Local Government. At the lower administrative levels, there are ward and Subward (Mtaa) leaders, all appointed by and accountable to the Municipal Director (DCC, 2004; (UN-Habitat, 2009; Flanary 2012).

At the apex of the municipalities, a City Council (DCC) has been created to deal with overarching issues. A mayor and an Executive Director/City Director, head the City Council. The city director is in charge of the following departments: Waste Management and Sanitation, Engineering and Fire Services, Urban Planning, Transportation, Environment, Health, and Finance and Administration (ibid). The City Council is responsible for generating strategic city framework and for formulating city legislation. However, its resources are very limited and it can only advise municipalities on their own matters but not direct them. The major sources of finance include property taxes, city service levies and market duties. The Public Finance Management Act and the Procurement Act provide guidance on the use and reporting of public funds. Financial accountability has previously been undermined, as different legislation has applied to different entities and has been narrowly focused on expenditure control (Flanary, 2012).

6.3 Population growth

Dar es Salaam, the largest and economic city in Tanzania is growing at a higher rate. It was established in 1862 as a port and trading centre to support new caravan routes opening into the interior of Africa. It became the national capital in 1891, acquired municipal status in 1949, and achieved City status in 1961 (UN-Habitat, 2009). The population increased from 3,500 inhabitants in 1867 to 4, 364, 541 in 2012 (DCC, 2004:8; NBS, 2013). By 1891, Dar es Salaam was just a small seaport and trading centre of 4,000 inhabitants (Kombe, 1995:10; Lupala 2002:31). Lupala adds that because of increased trade and importance, that is the establishment of port facilities and administrative activities in the city more migrants were attracted and consequently the population kept on increasing up to 10,000 inhabitants and 20,000 inhabitants by the year 1894 and 1900 respectively. By 1913, the population of Dar es Salaam had reached 34,000 inhabitants and 43,000 inhabitants in 1943 (UN Habitat, 2010).

However, during the war periods (that is World War I and II in 1914-1918 and 1936-1945 respectively) a slowed population growth was notable. Following the recovery from the war periods, by 1948 the population of Dar es Salaam had increased from 69, 227 inhabitants (Lupala, 2002:31). A steady increase was notable after the 1950s where by the year 1957 the population had reached 128, 742 inhabitants. As soon as Tanganyika was self-independent (in 1961), a faster population growth was noted as a result of abandonment of the colonial policies that restricted Africans from migrating. As a

⁹ The Council is the governing body. It is responsible for policy formulation, decision making, including by-laws and monitoring implementation of its resolutions. The Council Directors heads the management team, coordinates and supervises the functional heads (Kombe, 1995:12).

result, the population of Dar es Salaam grew to 272,821 inhabitants. This implies that in the period of ten years (1957-1967), the population of Dar es Salaam had more than doubled. By 1978, the population had tripled to 843,000 inhabitants (Lupala, 2002; DCC, 2004). The census reports recorded the City's population to be 1,360,850 inhabitants; 2, 487, 288 and 4,364,541 inhabitants in 1988, 2002 and 2012 respectively (NBS, 1988; 2002 and 2013).

The increased birth rates coupled with rural-urban migration rates are the two main drivers of the rapid population growth in the City. These factors make the growth rate of Dar es Salaam as one of the highest in Sub-Saharan Africa. The population of Dar es Salaam as a metropolitan City is two times larger than the second City (Mwanza) (NBS, 2013: 2). This is confirmed by the results of the recent national population and housing census of 2012 the time when Dar es Salaam had 4,364, 541 inhabitants with an annual growth rate of 5.6%, Mwanza had 2, 772, 509 inhabitants with an annual growth rate of 3.0%. Nonetheless, Dar es Salaam City population is estimated to double amounting to nine million by 2017 (IPP Media, 2014). The population size and City's growth rates from 1948 to 2012 are summarized in the following Table:

Table 6. 1: Population increase in Dar es Salaam City (1867-2012)

Year	1891	1900	1948	1957	1967	1978	1988	2002	2012
Population	4000	20,000	69,227	128,742	272,821	843,000	1,360,850	2,487,288	4,364,541
Growth rate	-	-	8.6	11.2	11.8	17.8	4.8	4.3	5.6

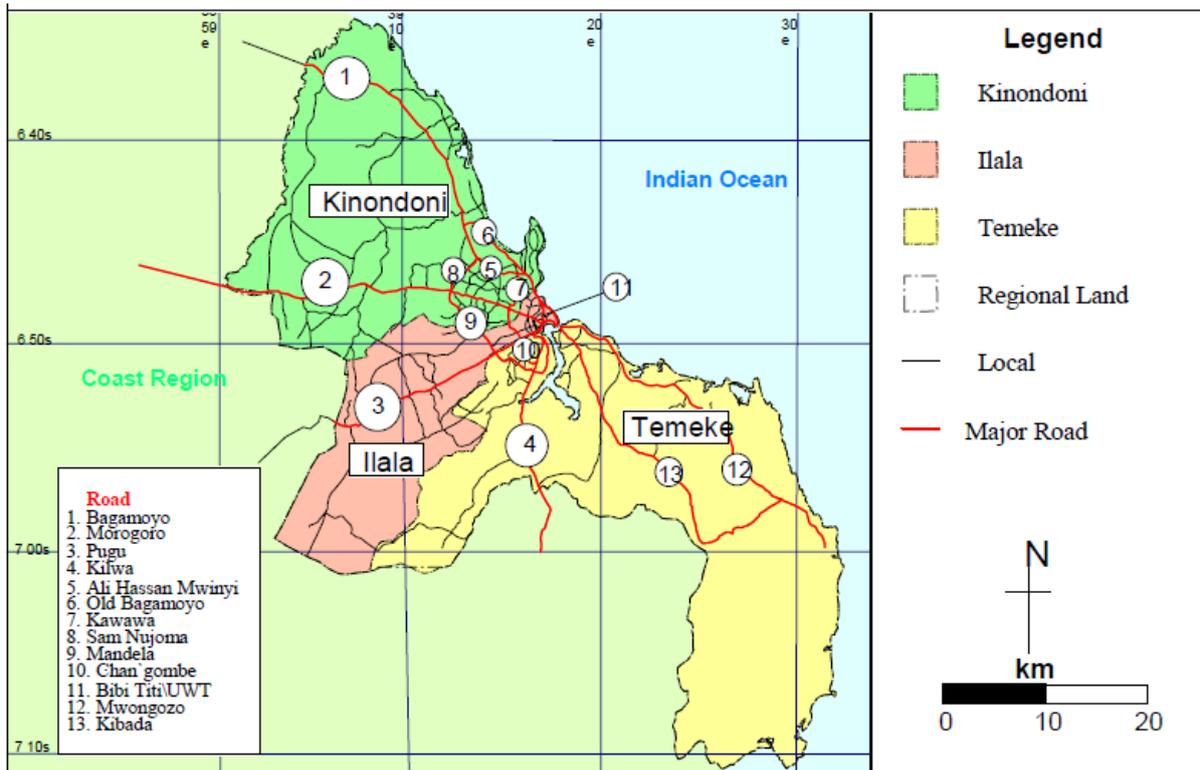
Source: (Kombe, 1995; Lupala, 2002; DCC, 2004; UN-Habitat, 2010; NBS, 1948, 1957, 1978, 1988, 2002 and 2012)

As Table 6.1 shows, it is evident that Dar es Salaam, the metropolitan City, is experiencing rapid urbanization rates. In 2012, the City had 4.36 million inhabitants, which is almost 10% of the country's total population of 44,928,923, and is growing at 5.6% per annum. The increase in population has also led to the declining capability of the governments to provide basic infrastructure, including pedestrian infrastructure.

6.4 Urban structure of Dar es Salaam

The urban structure of Dar es Salaam City is mono-centric radial development pattern. The City has only one Central Business District (CBD) comprising the City Centre and Kariakoo areas. It has four major arterial roads (Bagamoyo, Morogoro, Nyerere and Kilwa) and one ring road radiating from the City Centre (Nelson Mandela road). With mono-centric city structure, it means a lot of services; institutions and functions within the city are located at one major point, a situation which has resulted in traffic flow to predominantly from residential areas to the CBD in the mornings and vice versa in the evenings. The dominance flow of traffic along the four spines contributes to congestion in the mornings and evenings along the main roads and intersections (Kiunsi et al., 2006; Lupala and Kiunsi, 2011; Kiunsi 2013).

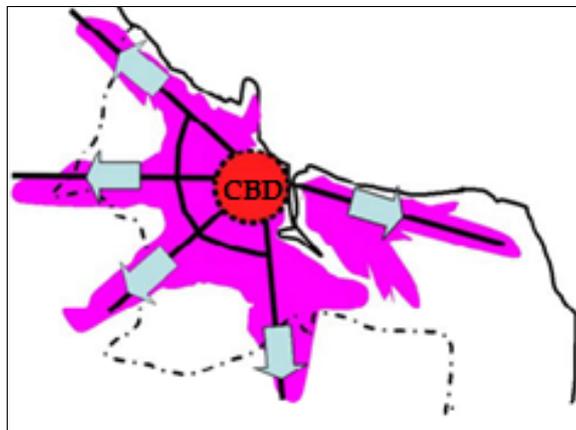
Dar es Salaam has a road network of a total length of about 1,950 kms of which only 1120 kms are paved (DCC, 2004). The majority of these roads are of poor surface conditions caused partly by lack of maintenance due to, among other factors, financial constraints. Moreover, most of these roads do not have walkways and bicycle-ways, leading to non-segregation of traffic. The existing road network in the city is inadequate to satisfy the city's densification and expansion. Furthermore, the city has a total of about 1100 kilometres of open lined ditches and 600 kilometres of piped storm water drainage (ibid). Lack of regular maintenance and the habit of dumping refuse into the drains has destroyed the proper functioning of the drains. This has been one of the causes for flooding in the city, thereby destroying road pavements, bridges and other road furniture. Figure 6.2 shows the road network in Dar es Salaam City.



Source: DCC, 2004

Figure 6. 2: Road network in Dar es Salaam City

As Figure 6.2 shows, the Indian ocean limits growth to the East. As a result, the city continues to expand inland with respectively higher densities along the major arterial roads (Bagamoyo, Morogoro, Nyerere and Kilwa) and one ring road (Nelson Mandela road) that radiate out from the city centre. The major urban functions and activities are concentrated in the central area (CBD, Kariakoo and surrounding areas) and along the major arterial roads radiating from the city center.



Source: JICA 2008

Figure 6. 3: Urban structure of Dar es Salaam

Figure 6.3 also shows that the concentration of urban developments along the major four arterial roads has resulted into a finger-like spatial structure and corridor development along the major roads. However, density along these corridors is relatively high decreasing as one moves away from the major roads. In recent years, the mono centric city structure of Dar es Salaam has resulted into serious traffic congestion or jam on the main roads of Dar es Salaam, especially during the pick hours. The increase in the number of vehicles contributes to traffic congestion problems within the city. To make the situation worse, the motorcyclists and try-cyclists also use the same city roads (Kiunsi, 2013).

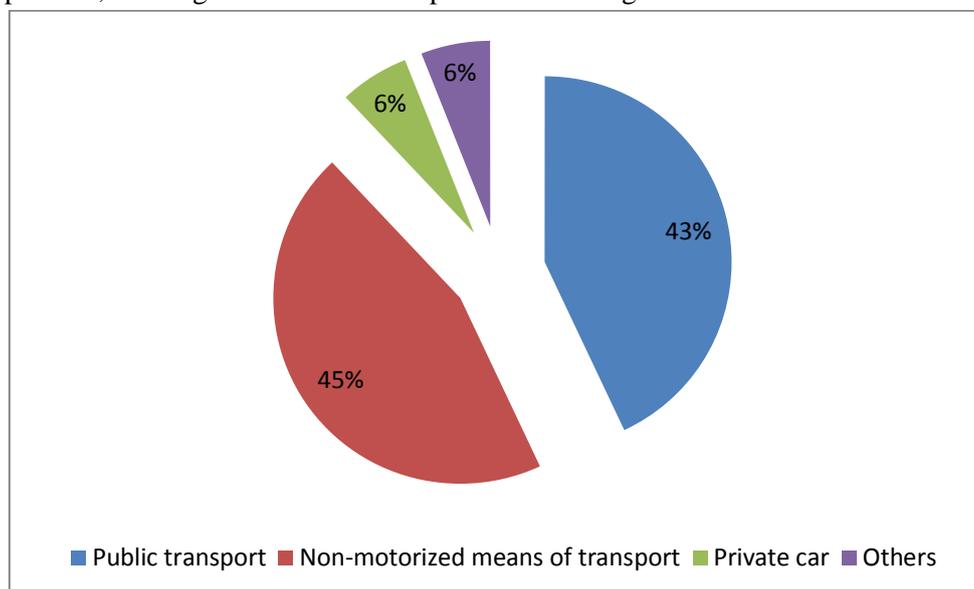
A study by JICA (2008) shows that vehicles in Dar es Salaam often spend up to 2 hours to cover a 16-kilometre trip, a distance that could have been covered in 15 minutes if more roads and intersections were provided. Additionally, because of high traffic congestion, many people opt to walk, especially for short distance trips so as to save time that could have been lost while waiting for vehicles to move.

A study by URT and Ukaid (2011) cited in Lupala and Bhayo (2014) estimated that traffic jams in Dar es Salaam were costing about 20 percent of the annual profits of most businesses. According to Kiunsi (2013), the rapid increase in the number of vehicles in Dar es Salaam is contributed by the increase in population (natural births and rural urban migrations), increase in incomes of the city dwellers, the removal of restrictions on importation of cars and availability of bank loans for buying cars. The number of cars in the city has increased from 24, 600 in 1979 to between 606, 439 to 707, 521 in 2011 Marshal and (Macklin Monaghan Ltd., 1979; Elinaza, 2012).

According to the draft Dar es Salaam Master Plan 2012-2013, the motor traffic problems in Dar es Salaam are in most cases attributed to lack of proper land use planning, a situation that had led to the concentration of the main socio-economic activities in the City Centre and Kariakoo area. Nevertheless, the poor quality and uneven distribution of social services such as schools, health facilities and markets generates unnecessary long distance traffic (i.e. there is no hierarchical organization of services). Similarly, the poor public bus/rail transport encourages the use of private transport. Besides, motor traffic problems are also contributed by the road network structure that obliges the traffic to unnecessarily go through the City Centre when heading to other parts of the City; the rapid increase of private car ownership without a corresponding expansion of city road network capacity and poor transport infrastructure in terms of roads, water sewerage and associated infrastructure.

6.5 Travel patterns

The majority of the inner City trips in Dar es Salaam are made by public transport or by non-motorized transportation modes. According to DCC (2007:17), 43% of the urban trips in the City are made by public transport (Daladals) and 45% of trips are made by non-motorized transport. Only 6% of trips are made by private cars. This figure shows that walking and public transport are the major means of transport in the City, and hence deserves special consideration. Despite increasing pedestrian travel patterns, walking as a mode of transport has been neglected.



Source: DCC, 2007: 17

Figure 6. 4: Dar es Salaam Modal split

As Figure 6.4 shows, there is a clear indication that non-motorized means of transport and public transport are major mobility means in Dar es Salaam. However, faced with the rapid increase of cars, the City is preoccupied by strategies regarding reduction of traffic congestion without considering other road user groups like pedestrians and the other non-motorized means of transport. The city is already implementing a number of strategies such as increasing the road capacity by increasing the number of lanes, construction of new overpasses (flyovers) and underpasses at the road intersections

and improving public transport (BRT system). However, these strategies are unlikely to fully overcome congestion problems in the City unless efforts are made to redistribute services and community infrastructure and also to improve walking and cycling infrastructure. These can be achieved through integrating transport planning and physical planning, which has the potential of influencing trip generation and travel patterns and traffic volume in specific roads (Kiunsi, 2013). Therefore, to minimize traffic congestion in the City both strategies for improving road capacity, public transport, walking, cycling, and physical planning solutions ought to be deployed.

6.6 Economic activities

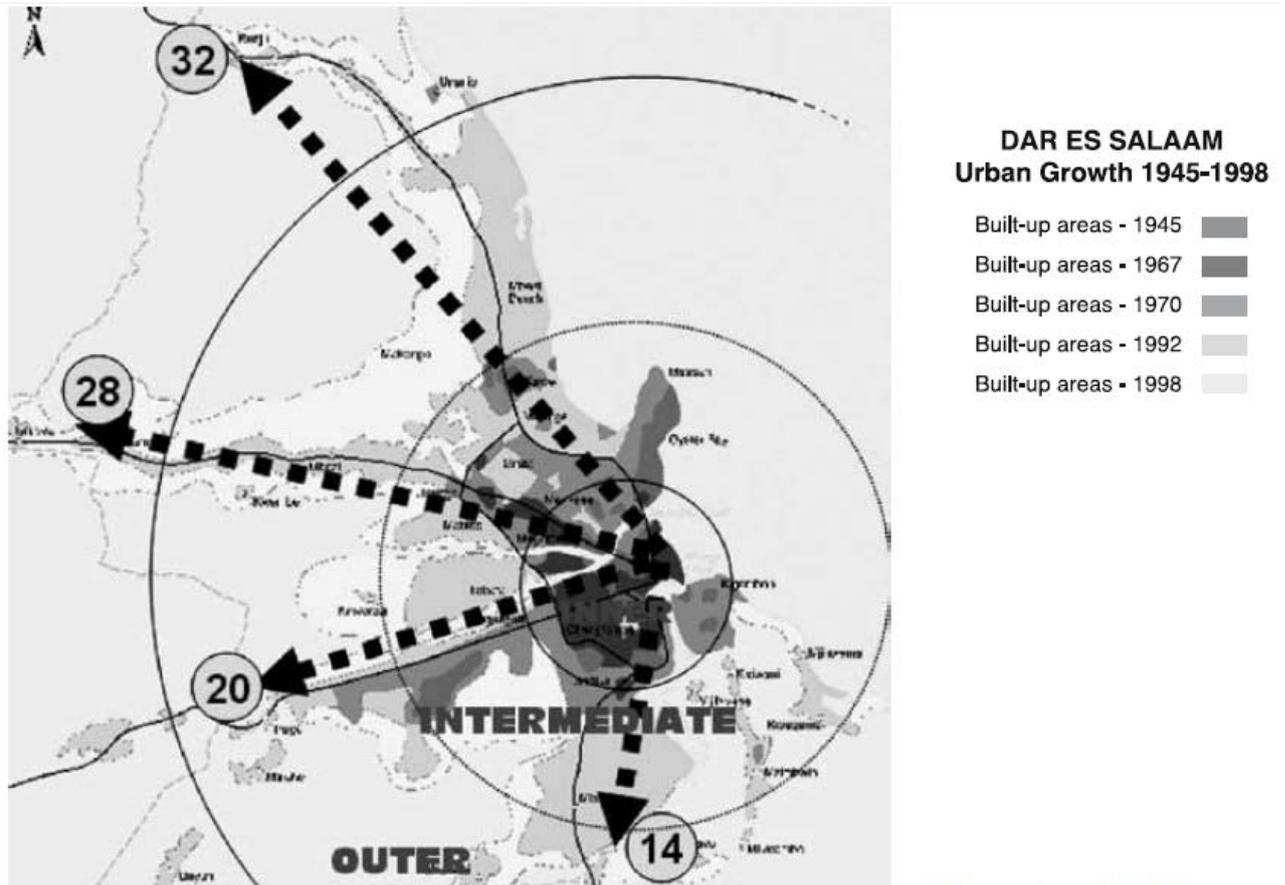
According to Dar es Salaam City profile, (2004:48) about 95% of the city residents depend on the informal sector for their livelihood strategies. The remaining 5% are employed in the formal sector, including the government and public corporation. URT (2006) adds that 66% out of those working in the urban informal sector depend entirely on informal vending activities for a livelihood, while 16% use these activities as a secondary activity. This figure implies that the majority have low and irregular incomes to afford their basic needs including transport expenses. That explains, at to some extent the reasons why the majority of the low income earners in Dar es Salaam depend on walking as their means of transport to get into various land use destinations either for the whole journey or connecting to public transport. The production of informal products, including retail of informal products and employment in the formal sector through informal arrangements constitutes the mainly informal activities to which the largest population is engaged. At household level, 62% of the households in Dar es Salaam are engaged in informal sector activities (URT, 2001) cited in Magina, 2016:46).

6.7 Spatial expansion and land use coverage

The history of Dar es Salaam can be traced back to the second half of the 19th century, the time when Dar es Salaam was established as a port and trading centre by Sultan Sayyid Majid in 1862. Later, when the German administration took over the country in 1891, Dar es Salaam became an administrative headquarter of the German administration instead of Bagamoyo. By this time, Dar es Salaam was just a small settlement with a population of about 4,000 inhabitants (Kombe 1995:10).

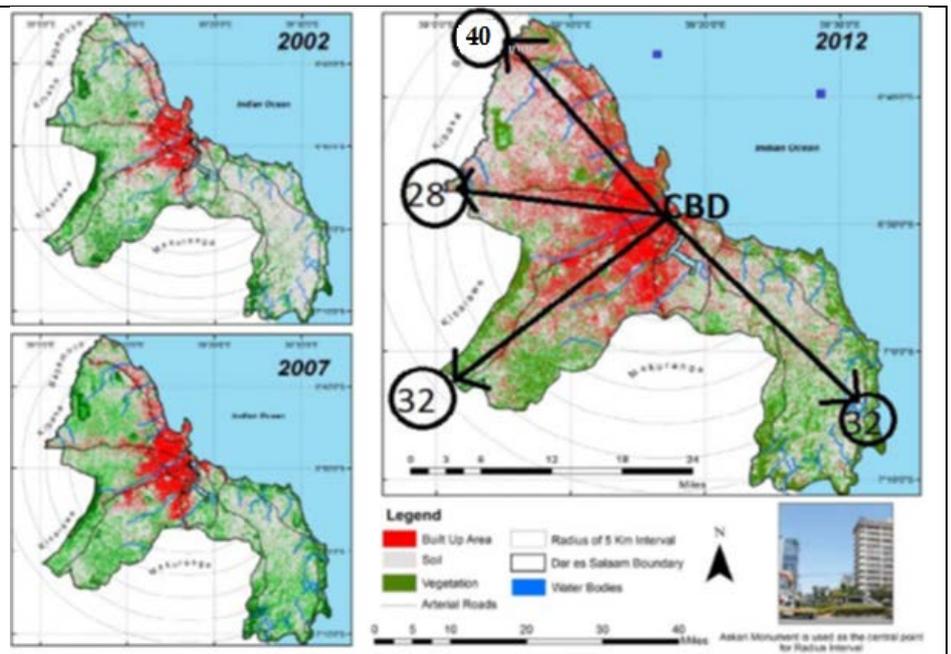
Spatially, Dar es Salaam City has been physically expanding outwards. This is evidenced by its spatial coverage from the colonial era to date. By 1891 the extent of the built up area was confined to only 2 kilometre radius from the city centre and cover 122 hectares of land and a population density of 45 persons per hectares (Lupala, 2002:32). By 1913, the extent of spatial expansion was estimated to range between 2 and 2.5 kilometres. In 1941, the built up area had expanded to between 3 and 4 kilometres and the built up land of the city had more than tripled in 1945 to 463 hectares and a gross density of 130 persons per hectare. A dramatic increase in the built-up area was noted between 1945 and 1963, when the built up area reached 3,081 hectare limited in a 6 kilometre radius. When the city population tripled from 272,821 in 1967 to 843,000 in 1978, the radius reached 14 kilometres within a built up land of 11,331 hectares. By 1991, the built up land increased to 18 kilometres radius covering 19,879 hectares. The spatial expansion kept on increasing to 30 kilometres radius in 2001 within a built up land of 57,211 hectares (Kombe, 1995:11; Lupala 2002: 32; Lupala, 2003:7-9; Lupala and Bhayo, 2014:30).

By the year 2002, the radius had extended 32 kilometres northwards along Bagamoyo Road, 28 kilometres eastwards along Morogoro Road, 20 kilometres along Pugu Road and 14 Kilometres southwards along the Kilwa Road (UN-Habitat 2010:14 citing Lupala, 2008).

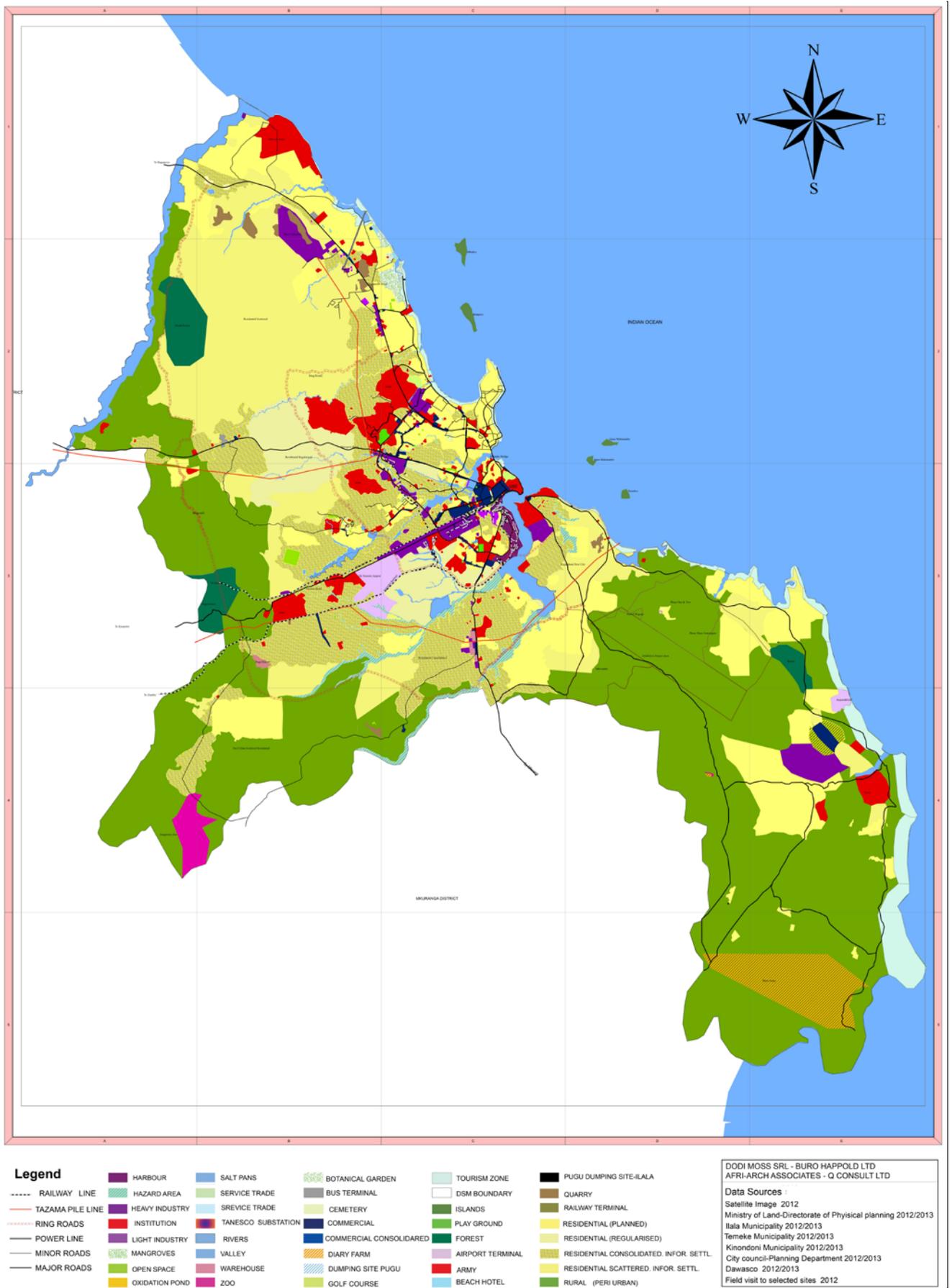


Source: Lupala 2008 in UN-Habitat 2010:14
Figure 6. 5: Spatial expansion trends in Dar es Salaam city (1945-2002)

By the year 2012, the built up land had stretched over 40 km from North to South, and 35km from East to West (Draft Dar Salaam Master Plan, 2012-2033). Lupala and Bhayo (2014:30) argues that by 2012 the City had expanded over 30 Kilometres northwards along Bagamoyo Road, 28 kilometres westwards along Morogoro Road, some 32 kilometres southward westwards and south eastwards along Pugu and Somanga Roads.



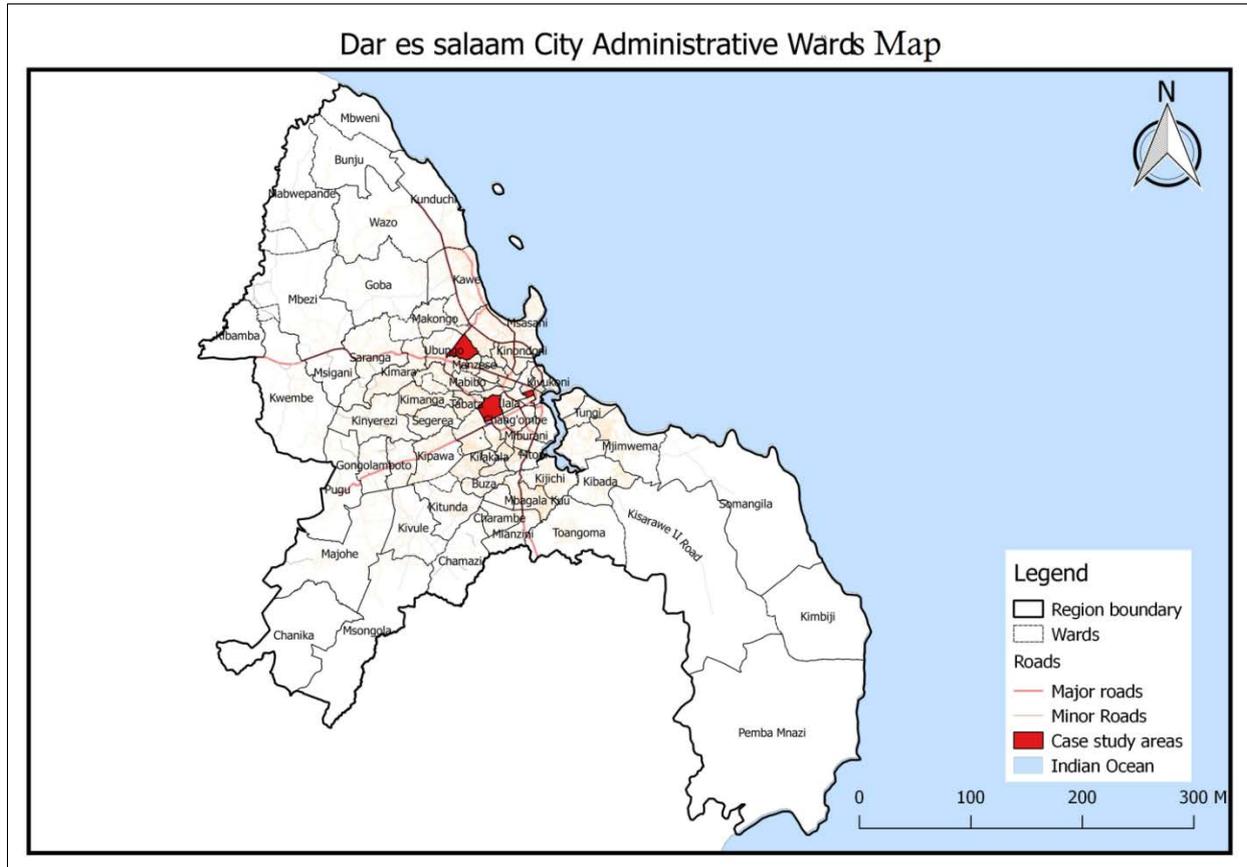
Source: Adopted from Lupala and Bhayo (2014:31) and modified to suit the study.
Figure 6. 6: Spatial expansion trends in Dar es Salaam City (2002-2012)



Source: Dar es Salaam Master Plan 2012-2032 (Draft)
 Figure 6. 7: Dar es Salaam existing land use by 2013

6.8 A brief introduction to the three case study areas:

In Dar es Salaam, formal planned and informal settlements are the two predominant forms of settlements with the City. Over 70% of the urban population in Dar es Salaam live in unplanned settlements. Only a few reside in the formally planned settlements. Hence, it was important to investigate the walking environment in both the planned and unplanned settlement. This being the case, the study was conducted in three sub-cases, namely *Sinza*, *Kariakoo* and *Buguruni*. Sinza and Kariakoo are the formally planned settlements, while Buguruni is an informal settlement (Figure 6.8). All the three sub-cases are located within the inner city zone (about 3kilometers radius from the CBD), and intermediate zone (about 3-10 kilometres from the CBD). The closer one may be to the CBD, the more the walking trips are likely to be generated.



Source: Google shapefile modified by the author to suit the study

Figure 6. 8: Location of case study areas in the City administrative map

6.9 Concluding summary

This chapter has discussed about the context of the study in terms of location, administrative structure, population growth, and the City structure of Dar es Salaam, the trip modal share split within the City, the spatial expansion and land use coverage of the City. Generally, the chapter has underscored that Dar es Salaam City, in which the study was conducted, has rapidly been growing up. The City accommodates 10% of the country's total population, which grows at 5.6% per annum. Economically, 95% of its residents depend on the informal sector for their livelihood, only 5% are employees in the public sector. This means that the majority have low and irregular incomes to afford their basic needs, including transport expenses. Spatially, the City has expanded beyond 40 kilometers from the CBD thereby increasing the travelled time and transport cost, especially among the vulnerable groups.

The next chapter presents the empirical findings regarding the pedestrian movement patterns in the three sub-case study areas (Sinza, Kariakoo and Buguruni) as per the research questions formulated in section 1.5 (see question 1.1 and 1.2).

CHAPTER SEVEN

7. PEDESTRIAN MOBILITY PATTERNS

7.0 Introduction

Travel movement patterns refer to the movement of traffic from trip origin to destinations (Mchome, 2014). These patterns constitute several components, including: trip origin-destination, trip purpose, and means of transport used (Dewanti, 2007; Giuliano, Hu & Lee, 2003; Ortúzar & Willumsen, 2002). Travel movement patterns (diaries) can be categorized into three main types: *Activity based travel patterns*, *trip based travel patterns*, and *place based travel patterns* (Behrens & Masaoe, 2009a, b). According to Timmermans & Axhausen (2002), the main focus of activity-based travel patterns is to examine the movement of people with respect to a specific activity, such as home-work- home or home - school - home movement. Besides that, the trip-based travel patterns examine the movement of people from home to different destinations for different purposes while the place-based travel patterns focus on examining the movement of people from one place to another (Behrens & Masaoe, 2009a, b; Lynott & Figueiredo, 2011). However, this research concentrated on the trip based and activity based travel patterns. The reason for choosing such type of travel patterns was to capture the various destinations where people in selected settlements in Dar es Salaam City go more often for everyday life activities.

7.1 Sub-case 1: Sinza Neighbourhood

7.1.1 Profile of Sinza ward

Sinza is an administrative ward in the Kinondoni Municipality, Dar es Salaam City. It is located in the west, about 9 kilometres from the City Centre and about 2 kilometers off Morogoro road. The local administration at the Ward level is under the Ward Executive Officer (WEO), while at *Mtaa* (Subward) level the leadership is headed by the Mtaa Executive Officer (MEO). According to NBS (2012), the ward had a total population of 40, 546 people and average household size of 4.1. Out of these 18, 892 were male, while 21, 654 were female (www.nbs.go.tz/sensa). Sinza Ward gained about 4, 223 people in a span of ten years that is, from a population of 36,323 in 2002 and a gross density of 153 persons per sq.km. Sinza ward is organized into five sub-wards namely; Sinza A, B, C, D and E. According to the 2012 National Population and Housing Census, Sinza A, B, C, D and E had the following population: 6,676; 5, 660; 12, 198; 6, 658 and 9, 354 people respectively.

Sub-ward/Mtaa	Population
Sinza A	6,676
Sinza B	5, 660
Sinza C	12, 198
Sinza D	6, 658
Sinza E	9, 354
Total	40, 546

Source: NBS (2012)

7.1.2 Walking frequencies in Sinza Neighbourhood (at least 5 to 10 minutes per day)

Prior to conducting interviews, it was necessary to examine the level of walking activities over a two days period. To accomplish this task, a total of 31 respondents (25 resident households and 6 pedestrians) were asked whether they had ever walked for at-least 5 to 10 minutes or 400 to 800meters over the previous two days. In this study, only pedestrians from outside the study area were considered for interviews. The essence was to capture the mobility patterns and perspectives of walkers from other parts within Dar es Salaam, and make a comparison with those of the resident households. The results from finding are summarized in Table 7.1.

Table 7. 1: Walking frequencies in Sinza

Walking frequency	Resident Households	Pedestrians	Total
At least 5 to 10 minutes in the previous two days	25	6	31
Never walked	-	-	-
Total	25	6	31

Source: Fieldwork in Sinza, April 2015

Table 7.1 indicates that all the 31 respondents had walked at least 5 to 10 minutes during the two days period. None of the respondents said that he/she had not walked. Although the results do not establish the exact walking distance covered in the period, it was revealed that all of the respondents had walked more frequently for their everyday life activities. This is in line with the observations by WHO (2013) and Krambeck (2006) that everyone is a pedestrian, either directly to a destination or to another mode of transport as all trips begin and end with walking trips.

Additionally, almost all the respondents interviewed in Sinza neighbourhood added that it is not a matter of just 5 to 10 minutes; rather, they walk more often and beyond 10 minutes per day. One of the resident households interviewed, Alex Busanda¹⁰, 38 years old and who is a Street vendor, said: *“It is not a matter of just 5 to 10 minutes, rather, I walk throughout a day, and throughout a week. This is simply because I cannot afford the costs of public transport every day, and also it is because of the nature of my business. As a Street vendor, I must walk throughout a day to reach as many customers as possible. Sometimes I walk from Sinza - Tandare – Mtogore – Magomeni – Kinondoni- Makumbusho - Mwenge then back to Sinza. I walk not because I like, it is because of poverty, I cannot afford the transport costs”*

According to the author’s experience in Dar es Salaam, the route described by Mr. Alex Busanda (from Sinza- Tandale – Magomeni-Kinononi-Makumbusho-Mwenge –Sinza) is about 15 Kilometers walking distance, which takes one more than three hours to cover the route on foot.

7.1.3 Reasons for walking more often

Having confirmed that all the 31 (100%) respondents were pedestrians in one way or another, the next step was to explore the reasons why they walked more often. To answer this question, the respondents were allowed to choose more than one answer from a given list of attributes. The results show that, the respondents in Sinza walked more often for mainly five reasons: low household income, a form of physical exercise, proximity to services, transport problems within the city (i.e. traffic jam, unreliable public transport, and inadequate parking spaces), and the nature of business/work undertaken, particularly street vending activities. The summary in the Table 7.2 is for more details:

Table 7. 2: Reasons for walking trips

Reason for walking	RHHs	PDs	Total
Income/affordability	16	5	21
Proximity to services	9	0	9
Transport problems	7	1	8
Nature of Work	6	1	7
A form of physical exercise	9	1	10

Source: Fieldwork in Sinza, April 2015 *Note: HHs=Households; PDs=Pedestrians*

Table 7.2 shows, the majority (21 out of 31) walked because of low household income; they cannot afford for the other means of transport. Walking as a form of physical exercise was ranked second, while proximity to services was ranked third. Transport problems were ranked fourth, and nature of occupation was the lowest ranked.

To justify the reason that they walked more often because of failure to afford the public transport costs, one of the pedestrians interviewed, Halima Ally, aged 32, a shopkeeper at a medical store, and a resident of Mbezi-Mtoni noted: *“I live in Mbezi-Mtoni (which is beyond Mbezi Beach) while my workplace is in Sinza C. I always come to my workplace from Monday to Saturday, starting at 9:00 to 21 hours. I walk more*

¹⁰ This is not the actual name of the respondent, all names were changed for ethical purposes

often so as to reduce the transport costs. This is because my income per month is very low. I earn only TZS100,000 per month and still I have family members depending on me. Therefore, in order to minimize the transport cost expenses, I opt to walk from Sinza-Madukani to Mawasiliano daladala terminal where I can take public transport (daladala) to Mbezi-Beach-Bondeni. In case I don't find any daladala at Mawasiliano terminal, I continue walking up to the Sam-Nujoma road where I board a daladala to Mbezi beach-Bondeni. At Mbezi Beach-Bondeni, I have to walk for another 20 minutes to get into my home place. If I don't walk from Mbezi Beach-Bondeni to my house, I will be forced to use a motor-cycle (Bodaboda) which costs about TZS 1500 per trip. Therefore, because of the low income I earn per month, it is impossible for me to stop from walking. However, it should be clear that I walk not because I like walking. It is simply because I have no any other alternative”

Figure 7. 1: Transport chain used by Ms. Halima Ally

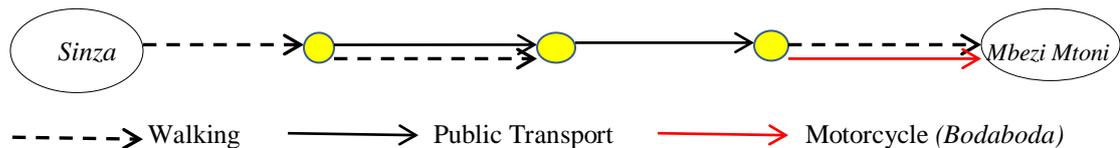


Figure 7.1 shows that Ms. Halima Ally starts her journey by walking from Sinza-Madukani to Mawasiliano public transit terminal. Because of the unreliability of the public transport, sometimes she continues walking from Mawasiliano to SamNujoma road where she could boarder a public transport to Mbezi- Bondeni. Thereafter, she walks for about 20 minutes from Mbezi Bondeni to her house (Mbezi-Mtoni); otherwise, she had to hire a motorcyclist (Bodaboda) which costs her TZS 1,500 per trip.

Furthermore, Table 7.2 indicates that 10 out of 31 respondents walked just as a form of physical exercise, but in reality, this was not true. It appears so simply because the respondents were asked to choose more than one answer from a list of attributes. According to the analysis, only three respondents walked for their recreational activities (i.e. a form of physical exercise) and they had no other reasons. The majority, a form of physical exercise has been just an added reason justifying the main reasons (i.e. affordability/low income, proximity to service, nature of occupation, and transport challenges). One of the pedestrians interviewed, Rukia Said, 24 years, a food vendor by occupation confirmed this argument as she said: “I do not walk for leisure; rather, it is because of my low income, the nature of my business and traffic jam problems. In order to avoid delays, I decide to walk so as to arrive earlier to my destination”

In essence, only three respondents out of the 31 walked primarily for recreational purposes/ as a form of physical exercise) and not otherwise. When asked to respond to the question why they walked often, one of the elderly resident households in Sinza B, Ngasa Malunde, 68 aged, a retired officer and a landlord said: “Despite the fact that I am aged 68, I always walk just for physical health and not otherwise. Everyday starting at 5:30 to 6:30, I normally do cycling exercise along Igesa road - SamNujoma road - University road – Ardhi University-Mlimani City then back home (Sinza D). Again, on Tuesdays, Wednesdays, Thursdays and Fridays starting from 17:00 to 18:30, I often go for jogging at the University of Dar es Salaam’s playgrounds, and I normally do my jogging exercises under a qualified sportsman trainer. Moreover, over the weekend, I prefer watching football matches at Mashujaa Primary School playgrounds and sometimes I go to the Taifa National stadium in case there is a football match”

Apart from the low income, physical exercise and nature of occupation, some respondents said that they walked not because they cannot afford public transport costs, rather it is just because transport problems (i.e. traffic jam, unreliable public transport and inadequate parking spaces) and also for their own health benefits. One of the resident households, Happiness Mushi, 48 years old, a nurse by profession, a resident household in Sinza D and whose income per month is over 750, 000 TZS¹¹ (over US\$ 397) replied that: “though I live in Sinza D, my workplace is at the Temeke Hospital. By car it takes me more than an hour to arrive. Though I can afford for public transport costs and the fact that sometimes I can

¹¹ The time this data was collected (April 2015), 1 US\$ was equivalent to 1891 TZS

drive in my own, but I walk more often because of transport problems/traffic jam, unreliable public transport and inadequate parking space, and for physical health benefits. If I opt to drive, then I will be taxed a total of TZS 300 per hour as a parking fee; besides the parking spaces are inadequate. For instance, today, I have already paid a total of TZS 1800 as six hour parking fees and still I had to come on foot up to this Mtaa office. It is not only because of inadequate parking spaces, but also the continued traffic jam along the busy roads. That means, when I am in a hurry, I cannot tolerate such traffic jam, and instead, I walk so that I can save time. In addition to that, public transport in Dar es Salam is also not reliable and convenient. It can take one more than an hour waiting for public transport, and hence for me, the only solution is to walk to where I want to reach”.

7.1.4 Mobility patterns in Sinza

This study aimed to understand where pedestrians/ walkers visit most for their everyday life activities in the study areas. To explore this issue, the trips were categorized into daily and weekly trips. The daily trips were considered to include trips made during workdays (Monday to Friday), while weekly trips involved trips made once per week or 2-3 days a week, including weekends. With regard to this question, all the 31 respondents were interviewed. The next section analyses daily and weekly trips in Sinza neighbourhood.

The daily mobility patterns

To understand where people go more often per day, all the 31 respondents were allowed to choose more than one answer from a list of destinations. The results show that, from Monday to Friday, the majority i. e. 25 out of 31 respondents commuted to workplaces. Trips to commercial services (i.e. shops and markets) were ranked second, and trips to community facilities (i.e. going to school, health services and religious facilities) were ranked third. Social activities (i.e. visiting friends, relatives and personal trips) were ranked fourth, and recreational purpose trips (i.e. going to bars, restaurants/cafes, beaches, sports grounds, entertainment places, exercise, and fitness studio) were ranked the lowest.

Table 7. 3: Daily mobility patterns in Sinza Neighbourhood

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Workplace	20	5	25
	Commercial services	13	3	16
	Community services	6	2	8
For leisure	Social activities	4	0	4
	Recreation	3	0	3
Milestone	Public transit stops	6	5	11

Source: Fieldwork in Sinza, April 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.3 shows that only the minority i. e. 3, 4 and 8 respondents of 31 had their daily trips associated with accessing recreational places, social activities and community facilities respectively. The majority had their daily trips made to access workplaces and commercial services (shops and markets).

However, on the one hand, a similarity in ranking the trips to workplaces, commercial service and community services between the resident households and the pedestrians can be observed. This implies that the majority of the residents in Dar es Salaam had their daily trips to the workplace, commercial and community services regardless of their residential locations. On the other hand, Table 7.3 shows that pedestrians did not engage in social and recreational activities on a daily basis. This is due to the fact that the pedestrians interviewed were non-residents of Sinza neighbourhood, while such social and recreational activities are normally conducted late in the evening (i.e. at the time when pedestrians are travelling back to their respective settlements).

Furthermore, Table 7.3 shows that the majority of the pedestrians (five out of six) access public bus stops on a daily basis, while for the resident households only the minority (six out of 25) go to the public bus stops on a daily basis. This is also because the pedestrians interviewed were from outside Sinza neighbourhood, a situation that forced them to use a combination of walking and public transport. The six pedestrians interviewed in Sinza were from far settlements that are between 4.5-13 kilometers away from Sinza neighbourhood.

Weekly mobility patterns in Sinza

As explained earlier, the weekly trips included those made once per a week or 2-3 days a week, including weekends. As for the daily trips, all the 31 respondents (25 HHs and 6 PDs) were asked to choose more than one answer from a given list of attributes. The results show that, the majority of the respondents had their weekly trips associated with social activities. Trips to community services were ranked second, and recreational activities were ranked third. While trips to commercial services were ranked fourth, trips to workplaces were least ranked. Summary in Table 7.4 is for more details.

Table 7. 4: Weekly mobility patterns in Sinza neighbourhood

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Workplace	2	1	3
	Commercial services	9	1	10
	Community services	19	4	23
For leisure	Social activities	20	6	26
	Recreation	11	4	15
Milestone	Public transit stops	14	0	14

Source: Fieldwork in Sinza, April 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.4 shows that there are similarities in ranking the weekly trips between the residents and pedestrians interviewed. Both the resident households and pedestrians had most of their weekly trips on social activities, community services and recreational activities. In each group (i.e. the resident households and pedestrians), only an insignificant number had their weekly trips made to access workplaces.

Comparing Table 7.3 and 7.4, a slight difference can be noted on access to public transport between the resident households and pedestrians interviewed. The results show that the number of resident households using public transport increased from six to 14 during the daily and weekly trips respectively, while for pedestrians the number dropped from five to zero during the daily and weekly trips respectively. Such a remarkable difference is due to the fact that the pedestrians interviewed were non-residents of Sinza. This means that, during workdays (Monday to Friday) pedestrians had to connect by public transport to reach their workplaces in Sinza, while over the weekends the majority of the pedestrians spent most of their time in their respective residential neighbourhoods. Unlike pedestrians, the number of the resident households using public transport over the weekend has risen because most of the social and recreational activities (which are among the leading activities over the weekends) took place outside their residential areas. Therefore, to get into such places they had to use a combination of walking and public transport.

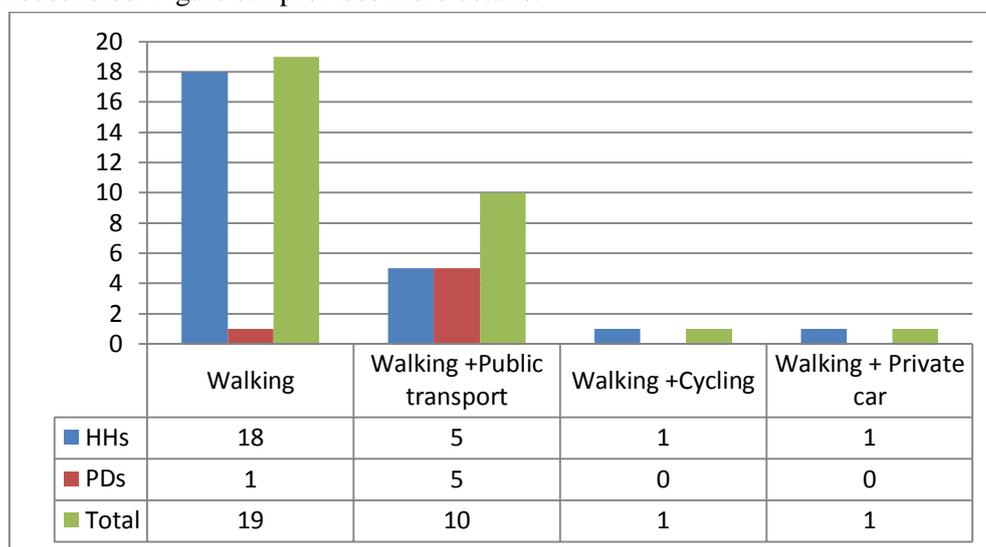
When asked to explain their daily and weekly activities from the morning to the evening, Bushiri Hamad, a 35 years aged, food vendor at Mawela Bar, and resident of Sinza D narrated as follows: *“Every day from Monday to Sunday, I often wake-up early in the morning, normally at 5:30am to prepare myself. From 6:00 to 7:30 I always go to the market places, normally at Shekilango, Tandale, Mabibo or Vingunguti depending on the needs of a day. Having finished my purchases at the marketplace, I go to the nearby shops to purchase some items which cannot be found at the market. I normally arrive at my workplace around 9: 30, and thereafter I work up to midnight. However, every Saturday around 16:30-19:30 I always attend football matches at TP grounds in Sinza E, thereafter; I come back at Mawela Bar and continue working up to midnight. On Sundays from 6:30 to 9:30am, I normally go to church, during which I also meet with my friends. After church service, I go directly to Mawela Bar and continue working, from about 11:00 to midnight”*

The quote above depicts Mr. Bushiri’s daily and weekly mobility patterns from the morning to evening. He spends much of his time working at an open Bar from 9:30 to midnight, except over the weekends when he gets time to go to church, chatting with friends and attending football games, especially Saturdays. However, Bashiris’ mobility patterns show that some of the public facilities such as local markets are accessed outside Sinza neighbourhood, and sometimes beyond the adjacent set-

tlements. Further analysis regarding access to public facilities is presented in chapter eight. Next section analyses the means of transport used in Sinza neighbourhood.

7.1.5 Means of transport used

The study has revealed that walking is the first means of transport used by the lower income households and the pedestrians in Sinza. A combination of walking and use of public transport is ranked second. The use of private car is ranked third, and cycling is the least means of transport used by the resident households. Figure 7.2 provides more details.



Source: Fieldwork in Sinza, April 2015 Note: HHs=Households; PDs=Pedestrians

Figure 7. 2: Means of transport used in Sinza neighbourhood

Figure 7.2 shows that there is a notable difference regarding the means of transport used by the resident households and pedestrians. The majority of the residents interviewed i.e. 18 out of 25 depended on walking to get into various land use destinations. Unlike the resident-households, the majority of pedestrians (five out of six) used a combination of walking and public transport. Such a slight difference is due to the fact that only pedestrians outside Sinza neighbourhood were interviewed. The next section presents further analysis on the means of transport used in relation to income groups, sex, age and ability.

Trips Modal share by income groups in Sinza

As explained earlier, the respondents of this study were purposefully selected to include the low income earners, the elderly, school children, and people with disabilities. Out of the 31 respondents the majority earned less than 300,000 TZS (US\$ 159) income per month. Only a few earned more than TZS 750,000 (US\$ 397) per month. Summary in Table 7.5 is for more details.

Table 7. 5: Respondents' monthly income per months in Sinza

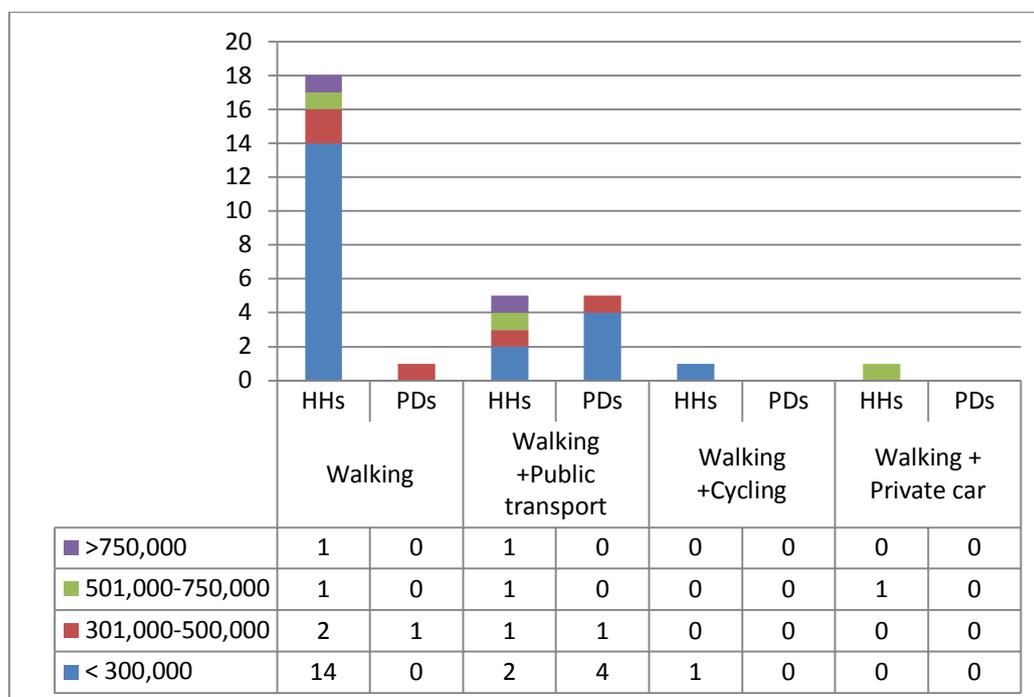
Income per Month (in TZS)	HHs	PDs	Total	Percentage
< 100,000	6	3	21	67.7
101,000-200,000	6	1		
201,000-300,000	5	0		
301,000-500,000	3	2	5	16.1
501,000-750,000	3	0	3	9.7
>750,000	2	0	2	6.5
Total	25	6	31	100

Source: Fieldwork in Sinza, April 2015 Note: HHs=Households; PDs=Pedestrians

Table 7.5 shows that most of the respondents (i. e. 21 out of 31) earned less than 300,000 TZS (US\$ < 159) per month. These income estimates are almost in line with a study by Lupala (2014:253) conducted in eight major urban centres in Tanzania, where it was found out that the household incomes were far below the cost of living. Thus, while the average household income across the eight urban

centres was TZS 282,753 (US\$ 177), the average cost of living was TZS 491,250 (US\$ 307). These figures provided a ratio of 0.58 of income to cost of living. In other words, the average incomes of households were nearly a half of the actual costs of living.

Regarding the trips modal share by income groups, the study has revealed that the majority of lower income households depended on walking to get to various destinations. A combination of walking and public transport was the second most common means of transport used by lower income households. Only a few used a combination of walking and cycling or private car as Figure 7.3 shows.



Source: Fieldwork in Sinza, April 2015 Note: HHs=Households; PDs=Pedestrians

Figure 7. 3: Modal share by income groups in Sinza neighbourhood

Figure 7.3 depicts that the majority of the resident households earning less than 500,000 TZS (< US\$ 264) per month, depend most on walking for their everyday activities. Unlike the resident households, only one pedestrian belonging to this income group depend on walking. The majority (five out of six) use a combination of walking and public transport despite their low incomes. This difference is simply because only pedestrians outside Sinza settlement were interviewed. They were from far places such as Kimara, Mabibo, Mbezi Beach, Makongo Juu and Tabata that are located between 4.5 and 13 kilometers away from Sinza. Hence, they had to connect by public transport though walking remained as the first and last mile of these public transport trips.

Trip modal share by sex

This section analyses the trips modal share, according to sex groups. The essence is to make a comparison between men and women interviewed on the means of transport commonly used. Thus, out of 31 respondents, 15 were men and 16 were female (Table 7.6).

Table 7. 6: Trip modal share by sex in Sinza

Sex	Resident households	Pedestrians	Total
Male	12	3	15
Female	13	3	16
Total	25	6	31

Source: Fieldwork in Sinza, April 2015

Owing to imbalance between the number of men and female, to establish the frequencies of walking among men and female each sex group was dealt independently to avoid bias (i.e. the percentages of trip modal share by sex were established based on the total number of the respondents in each sex

group). However, the finding results show that the majority of women depend more on walking than men. They walk most because of gender roles as they are responsible for many family matters, including taking children to school, going to market places, shops and also taking children to dispensaries/clinics etc. Summary in Table 7.7 is for more details.

Table 7. 7: Trip modal share by Sex – Sinza neighbourhood

Means of Transport used	Male		Female		Total	
	No	%	No	%	No	%
Walking	8	53.3	11	68.8	19	61.3
Walking +Public transport	5	33.3	5	31.2	10	32.3
Walking +Cycling	1	6.7	-	-	1	3.2
Walking + Private car	1	6.7	-	-	1	3.2
Total	15	100	16	100	31	100

Source: Fieldwork in Sinza, April 2015 *Note:* HHs=Households; Pds=Pedestrians

Table 7.7 shows that a share of walking trips in Sinza tends to be higher in the female group than the men's group. This is justified by the fact that out of the 16 women interviewed in Sinza, 11 depended on walking to get into various destinations. Only five used a combination of walking and public transport. None of the women used either a private car or cycling.

Trip modal share by age

Regarding the modal trips by age, out of 31 respondents 15 were the youth (19-35 years), 12 were the adults (36-59 aged), and 4 were the elderly persons (60+aged). Table 7.8 is for more details.

Table 7. 8: Number of respondents by age groups

Age group	HHs	PDs	Total	%
Youth (19-35 years)	11	4	15	48.4
Adults (36-59 years)	10	2	12	38.7
The elderly (60+ aged)	4	-	4	12.9
Total	25	6	31	100

Source: Fieldwork

As the number of respondents was not equally balanced, the share of walking by age groups was calculated independently to avoid bias. The study has revealed that the elderly were more vulnerable than other age groups. Table 7.9 presents the means of transport used by different age groups.

Table 7. 9: Trip modal share by age groups- Sinza neighbourhood

Means of Transport used	Age group			Total
	Youth (19-35 years)	Adults (36-59 years)	The elderly (60+)	
Walking	8	7	4	19
Walking & Public transport	6	4	-	10
Walking & Cycling	1	-	-	1
Walking & Private car	-	1	-	1
Total	15	12	4	31

Source: Fieldwork in Sinza, April 2015

Note: Hhs=Households; Pds=Pedestrians

Table 7.9 shows that, the elderly (60+aged) depended more on walking than the other age groups. The finding results show that, all the 4 elderly persons interviewed travel on foot for their everyday life activities. This group is followed by adults (36-59 years) of which seven out 12 (58.3%) depended on walking, and the youth were least ranked. Out of the 15 young persons, only 8 (53.3%) travelled on foot to access various destinations. Despite there are some variations, still walking remains the main means of transport to lower income households. The share of walking in each age group accounts for more than 50 percent.

Trip modal share of the school children

Apart from the 31 respondents, six school children (7-13 years aged) were interviewed to capture the means of transport commonly used by this group. In this study, only the primary school children were considered. The secondary school children (14-18 years) were excluded as their walking needs are not far from the primary school pupils. To accomplish this task the school children were interviewed differently from the 31 respondents. The author organised a kind of pre-structured group discussions that involved a narrative story through their head teacher at Sinza Primary School. This happened just after realizing that it was difficult to interview the school children prior to getting permission from their parents.



Source: Fieldwork in Sinza, August 2015

Figure 7. 4: School children walking along Shekilango road, a highly frequented road by cars

Table 7. 10: Modal share of school children

Means of Transport used	No	%
Walking	5	83.3
Walking + Public transport	1	16.7
Walking + Cycling	-	-
Walking + Private car	-	-
Total	6	100

With regard to trips modal share, the majority of the school children interviewed in Sinza depend more on walking to get into the school and back home. Out of the six school children, five (83.3%) depended on walking to get into school and back home. Only one pupil used a combination of walking and public transport (Table7.10). The one who combines walking and public transport was from the adjacent settlements.

Source: Fieldwork in Sinza, April 2015

Trip modal share of people with disabilities

Out of the 31 respondents, one of them was a person with a physical disability (handicapped), Nelly Edwin, 52 years old, resident of Sinza D. According to her, she depends mostly on walking to move to various destinations, particularly going to the workplace and local shops. When it comes to the reach far places like trips to church on Sundays and visiting friends and relatives over the weekend, she normally uses a combination of walking and tricycles as the privately operated public min-buses are not friendly to the people with disabilities.

7.1.6 Summary of the pedestrian mobility patterns in Sinza

The study has revealed that the majority (21 out of 31) walked more often because of low income/affordability. Regarding the daily mobility patterns, trips to the workplace were ranked first, and trips to commercial services were ranked second. While trips to community facilities were ranked third, trips to social activities were ranked fourth. Recreational purpose trips were least ranked.

The results from finding indicate that walking and public transport are the main means of transport used by the low income households. Furthermore, though walking is the main means of transport by the vast majority, the elderly, school children, women and lower income households are the vulnerable groups of the walking trips.

With regard to modal share by income groups, the majority of the respondents earning less than 500,000 TZS (US\$ < 264) per month depend on walking to get into land use destinations. Only a few, particularly the walkers use a combination of walking and public transport. The next section is the analysis of mobility patterns in Kariakoo City Centre, which is a Sub-case 2.

7.2 Sub Case 2: Kariakoo City Centre

7.2.1 Profile of Kariakoo

Kariakoo is located in Ilala municipality, in Dar es Salaam City. According to the 1979 Dar es Salaam Master Plan, Kariakoo was earmarked as the second part of the Central Business District (CBD) covering about 196 hectares of land. Kariakoo area is organized into four Wards¹² namely; Jangwani, Kariakoo, Mchafukoge and Gerezani. According to the 2012 National Population Census, Kariakoo area had a total population of 49, 391 distributed in the named four Wards. However, this study focuses more on the central part of Kariakoo area, which comprise the Kariakoo Ward. The summary in Table 7.11 is for more details.

Table 7.11: Population of Kariakoo area

Ward	Population	Male	Female	Average Household size
Jangwani	17,647	9,174	8,473	4.2
Kariakoo	13,780	7,306	6,474	4.3
Mchafukoge	10, 688	5,422	5,266	3.9
Gerezani	7, 276	3,767	3,509	4.4
Total	49, 391	25,669	23,722	4.2

Source: (NBS, 2013: 76)

In terms of mobility, Kariakoo is serviced by the privately operated public buses nicknamed 'daladala'. To improve the public transport in Kariakoo, in May 2016, the government launched the newly BRT system along Msimbazi Road, covering 1.6 kilometer distance from the Morogoro Road.

7.2.2 Frequency of walking in Kariakoo area

Similar to Sinza neighborhood, interviews in Kariakoo were preceded by an assessment of whether the respondents had walked at least 5 to 10 minutes or between 400 and 800 metres distance during the previous two days. A total of 34 respondents (20 resident respondents and 14 pedestrians) were interviewed. The results from findings indicate that all the 34 (100%) respondents had walked during the previous two days, and had walked beyond 10 minutes. However, like in Sinza neighbourhood, only pedestrians outside Kariakoo area were considered for interviews. Table 7:12 summarizes the walking frequencies in Kariakoo in the previous two days.

Table 7. 12: Walking frequencies in Kariakoo

Walking frequency	HHs	PDs	Total
At least 5 to 10 minutes in the previous two days	20	14	34
Never walked	-	-	-
Total	20	14	34

Source: Fieldwork in Kariakoo, March 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.12 shows that none of the 34 respondents had not walked during the previous two days, rather, they added that they always walk for more than the specified period of between 5 and 10 minutes.

7.2.3 Reasons for walking in Kariakoo

The results from finding show that, in Kariakoo, the majority of the respondents i.e. 21 out of 34 walk primarily because of being close to services. This is due to the planning of Kariakoo area which is a kind of mixed use urban development. The low income/affordability was ranked as a second reason for walking accounting for 18 out of 34 respondents. Besides, 11 respondents walked just as part of their physical exercise, while 10 respondents walked primarily because of transport problems, particu-

¹² A Ward is the third level in the Local Government Administrative structure structure. First is the City Council such as the Dar es Salaam City Council (DCC) followed by Municipalities (such as Ilala, Kinondoni, Temeke, Ubungo and Kigamboni). Below Municipalities are the Wards areas (such as Kariakoo, Sinza and Buguruni) and lowest are the Sub-wards/Mtaa.

larly inadequate parking spaces in central Kariakoo area. Only a few said that they walked because of the nature of their work that required them to move around. Table 7.13 helps to illustrate the findings.

Table 7.13: Reasons for walking in Kariakoo city center

Reason for Walking	HHs	PDs	Total
Income/affordability	8	10	18
Proximity to services	16	5	21
Transport problems	6	4	10
Nature of work	3	1	4
A Form of physical exercise	7	4	11

Source: Fieldwork in Kariakoo, March 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.13 shows that there is a slight difference in ranking the first and second reasons for walking between the resident households and pedestrians. For pedestrians, income/affordability was ranked first while for the resident respondents the same was ranked second. Likewise, proximity to services was first ranked by the majority of the residents, but for pedestrians it was ranked second. Such a slight difference is due to the fact that only pedestrians outside Kariakoo area were interviewed. The original places where these pedestrians live in most cases lacked basic services. As a result, people from various places within the City commute to Kariakoo area to access goods and services on a daily basis. Due to a kind mixed use development, the resident respondents found themselves located closer to basic services compared to pedestrians who were from far places outside Kariakoo area.

As mentioned earlier, parking in Kariakoo is a serious issue that makes some residents decide to walk instead of driving for fear of finding their parking spaces being encroached by other users. When asked why people in Kariakoo walk more often, Mahmud Sarehe, a 45 years a cargo carrier, and resident of Tandanti/Congo Street had this to say: *“Though I own a car, I always walk so as to safeguard my parking space. If I opt to drive, I will find the parking space occupied by other motorists and then I will suffer the consequence”*

7.1.4 Mobility patterns in Kariakoo

Like in Sinza, the pedestrian movement patterns were analysed based on daily and weekly trips. The following section describes the destinations where people in Kariakoo go most often per day and on a weekly basis.

The daily mobility patterns

Regarding the daily mobility patterns in Kariakoo, the respondents were free to choose more than one answer from a list of destinations. The study has revealed that the majority of the respondents in Kariakoo i.e. 33 out of 34 walk more often primarily to access their workplaces. The trips made to access commercial service centres (local shops and markets) were ranked second, and trips associated with access to community services such as going to schools, health and worship places were ranked third. Only a few had their social and recreational activities trips made on a daily basis and these were in most cases made over the weekends. Summary regarding the daily mobility patterns in Kariakoo is presented in Table 7.14.

Table 7.14: Daily mobility patterns in Kariakoo (Monday to Friday)

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Workplace	19	14	33
	Commercial services	11	5	16
	Community services	6	4	10
For Leisure	Social activities	4	2	6
	Recreation	3	-	3
Milestone	Public transit stops	-	12	12

Source: Fieldwork in Kariakoo, March 2015

Note: Hhs=Households; PDs=Pedestrians

As can be noted from Table 7.14, there is almost a similarity in ranking the daily trips between the resident households and the pedestrians. A remarkable difference can be observed in the use of public

transport whereby the majority of pedestrians i.e. 12 out of 14 accessed public transit stops on a daily basis, while none of the resident respondents accessed public transit stops on a daily basis. The reason for such a notable difference is that the pedestrians interviewed were only those from outside Kariakoo. As pedestrians lived far from Kariakoo area, they had to connect some of their urban trips by public transport. Unlike pedestrians, all the 20 residents had most of their everyday life activities located within a convenient walking time. This is because of mixed land use development within the area. Furthermore, a slight difference can be noted regarding access to recreation areas. It seems pedestrians do not engage in recreational activities on a daily basis. This is because the recreational activities were normally conducted after work hours, the time when pedestrians are travelling back home.

Weekly mobility patterns in Kariakoo

With regard to weekly trips, social activity trips were ranked first and trips to community services (particularly going to worship places) were ranked second. While recreation purpose trips were ranked third, trips made to access commercial service centres were the lowest ranked. Neither residents nor pedestrians accessed workplaces on a weekly basis. Figure 7.15 further elaborates.

Table 7. 15: Weekly mobility patterns in Kariakoo area

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Workplace	-	-	-
	Commercial services	7	7	14
	Community services	13	10	23
For Leisure	Social activities	17	11	28
	Recreation	9	11	20
Milestone	Public transit stops	14	1	15

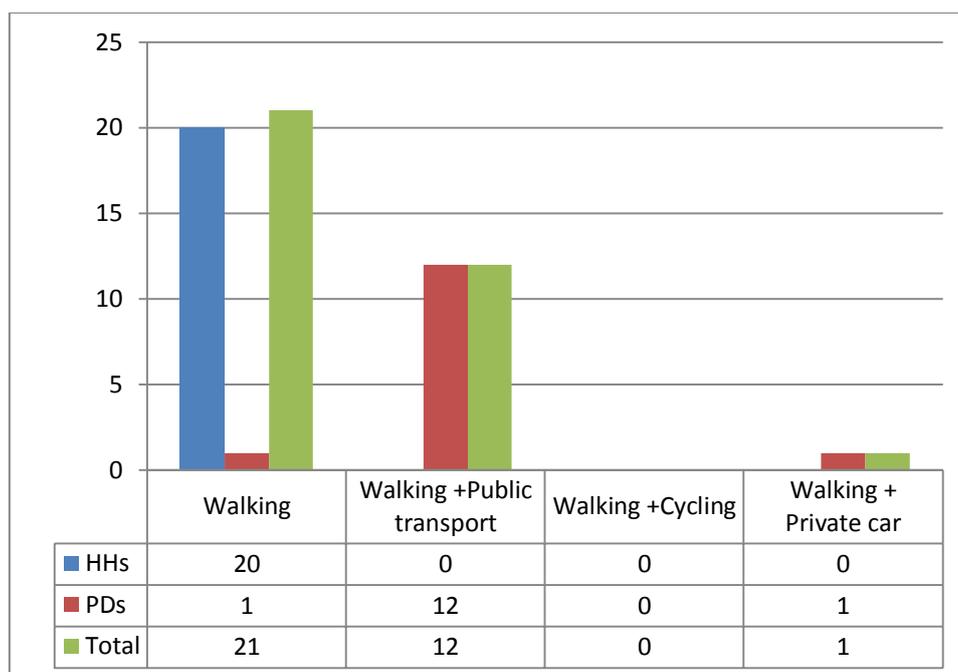
Source: Fieldwork in Sinza, April 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.15 shows that, there is a similarity in ranking the weekly trips among the resident respondents and pedestrians. Across the two groups, social activities were ranked first and trips made in order to access commercial and workplaces were lowest ranked. However, access to public bus stops is highly remarkable among the resident households than pedestrians. This is due to the fact that most pedestrians spent their weekends with their families and visit friends and relatives within their neighbourhoods. Besides, the majority of the resident respondents spent almost the whole week within Kariakoo area, but over the weekends they had their social and recreational activities conducted outside Kariakoo area. These included visiting friends, relatives, personal trips and going to beaches and football playgrounds.

7.1.5 Means of transport used in Kariakoo

In Kariakoo, the majority i. e. 21 out of 34 respondents depend on walking to meet their everyday life activities; whereas a combination of walking and public transport was ranked second. Only one pedestrian used a combination of walking and private car, though never own it. Figure 7.5 is for more details.



Source: Fieldwork, 2015

Figure 7. 5: Means of transport used in Kariakoo

Figure 7: 5 shows that there is a pattern depicting differences regarding the means of transport used among the resident respondents and pedestrians. While all the 20 resident respondents walk to get to various destinations, the majority of the pedestrians used a combination of walking and public transport. This remarkable difference is due to the fact that Kariakoo area is a commercial hub of Dar es Salaam City and other parts within the country and neighbouring countries. That being the case, the resident respondents had most of their everyday life activities accessed in proximity locations. Unlike residents, the walkers were from outside Kariakoo area where higher level services are inadequately accessed. They were from other settlements such as Vingunguti, Magomeni, Kigogo, Kigamboni, Manzese, Karakata, Kiwalani, Mburahati and Tabata. These areas are located between 2.5 and 13 kilometers from Kariakoo. Only one pedestrian said that he uses a private car, but did not own it.

Trip Modal share by income groups

The profile of the respondents interviewed in Kariakoo revealed that out of 34 respondents, 53% were involved in informal vending activities, 24% were engaged in business (formal), 18% were private sector employees, and 5% were government employees.

Regarding the income earned per month, the majority i.e.22 out of 34 respondents earned less than 300,000 TZS (US\$<159) per month. Only one respondent earned more than 750,000 TZS (US\$ >397) per month. Summary regarding the income earned per month in Kariakoo is presented in Table 7:16.

Table 7. 16: Estimated monthly income in Kariakoo area

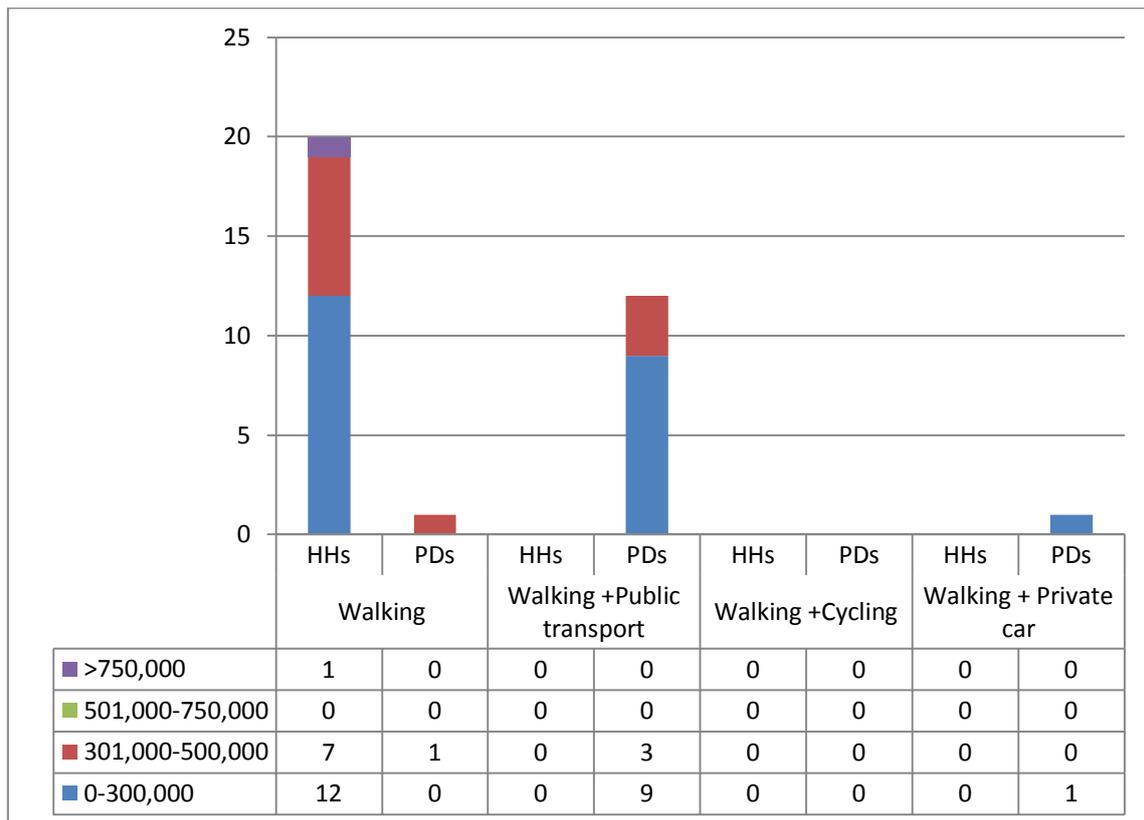
Income per Month (in TZS)	HHs	PDs	Total	Percentage
< 100,000	5	4	22	64.7
101,000-200,000	5	2		
201,000-300,000	2	4		
301,000-500,000	7	4	11	32.4
501,000-750,000	-	-	-	-
>750,000	1	0	1	2.9
Total	20	14	34	100

Source: Fieldwork in Kariakoo, March 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.16 shows that there are similarities regarding the income earned per month between the resident respondents and the pedestrians interviewed in Kariakoo. In each group, the majority (i. e 19 out of 20 residents and 10 out of 14 pedestrians) earned less than 300,000 TZS (US\$<159) per month.

With regard to the trips modal share by income, across the two groups (i.e. residents and pedestrians) the share of walking is higher among the respondents earning less than 500,000 TZS (US\$ < 264) per month except for the far related trips that required a combination of walking and public transport. In this income group, only one pedestrian used a combination of walking and private car, however he did not own it. Figure 7.6 is for more illustrations.



Source: Fieldwork in Kariakoo, March 2015 Note: Hhs=Households; Pds=Pedestrians

Figure 7. 6: The trip modal share by income groups in Kariakoo.

Figure 7.6 shows a significant difference between the means of transport used by the resident respondents and the pedestrians. Although most of the respondents earning less than 500,000 TZS (US\$ <264) per month walk most often, it appears that the residents depend most on walking than the pedestrians. This difference is caused by the fact that the walkers interviewed in Kariakoo area were only those from different settlements within the City, but outside Kariakoo area. As the pedestrians lived somehow far from Kariakoo area, they had to use a combination of walking and public transport to reach their everyday life activities in Kariakoo area.

Though single resident earns more than 750 TZS (US\$ >397) per month owned a car, but he walks more often for fear of finding his parking space encroached upon by other users. During interviews, Mahmud Sarehe, a 45 years old, a cargo transporter, and a resident of Kariakoo area noted: “*Though I own a car, I always walk so as to safeguard my parking space. If I opt to drive, for sure I will find it already encroached upon by other motorists and then I will suffer the consequence*”

The means of transport used by men and women in Kariakoo

To understand the means of transport commonly used by men and women in Kariakoo, 27 men and 7 women were interviewed. Summary in Table 7.17 is for more details.

	Male	Female	Total
HHs	14	6	20
PDs	13	1	14
Total	27	7	34

Source: Fieldwork in Kariakoo, March

Owing to the unbalanced number between men and women respondents, each group was dealt upon independently. Table 7.18 presents the means of transport commonly used by male and female.

Table 7. 18: Trips modal share by Sex – Kariakoo

Means of Transport used	Male		Female		Total	
	No	%	No	%	No	%
Walking	15	55.6	6	85.7	21	61.8
Walking +Public transport	11	40.7	1	14.3	12	35.3
Walking +Cycling	-	-	-	-	-	-
Walking + Private car	1	3.7	-	-	1	2.9
Total	27	100	7	100	34	100

Source: Fieldwork in Kariakoo, March 2015 Note: HHs=Households; PDs=Pedestrians

Table 7.18 shows that the women interviewed in Kariakoo walk most often than men. Out of seven women, six (85.7%) depend on walking. Only a single woman (14.3%) used a combination of walking and public transport. Unlike women, out of 27 men only 15 (55.6%) walk to reach their destinations while about (40.7%) use a combination of walking and public transport. Moreover, none of the women used either a private car or cycling, while in the men's group one respondent used a combination of walking and private cars. Women walk most often because of gender roles, particularly family matters that expose them to more walking trips than men.

Trip modal share by age

Based on the age, out of the 34 respondents interviewed, 8 were young persons aged between 19 and 35 years. 21 were adults (36-59 aged), and 5 constituted the elderly persons 60 or more years (Table 7:19).

Table 7. 19: Number of respondents by age groups –Kariakoo

Age group	HHs	PDs	Total	%
Youth (19-35 years)	3	5	8	23.5
Adults (36-59 years)	14	7	21	61.8
The elderly (60+ aged)	3	2	5	14.7
Total	20	14	34	100

Source: Fieldwork in Karriakoo, 2015

Regarding the use of means of transport by age groups, the results from finding indicate that most of the adults i. e. 15 out of 21 (71.4 %,) walk more regular than other age groups. This was followed by the elderly people accounting for about (60%), while the young person's seem to depend more on a combination of walking and public transport. The reason why the youth group in Kariakoo walks least is that most of the young people interviewed were from different parts of Dar es Salaam (walkers), but had their everyday life activities conducted in the commercial area of Kariakoo. Table 7.20 shows the trips modal share by age in Kariakoo area.

Table 7. 20: Trips modal share by age groups-Kariakoo

Means of Transport used	Age group			Total
	Youth (19-35 years)	Adults (36-59 years)	The elderly (60+)	
Walking	3	15	3	21
Walking + Public transport	5	5	2	12
Walking + Cycling	-	-	-	-
Walking + Private car	-	1	-	1
Total	8	21	5	34

Source: Fieldwork in Kariakoo, March 2015

Table 7.20 shows that only one adult person uses a combination of walking and private car, though did not own it. It can be concluded that regardless of the age groups, walking and public transport are the main means of transport in Kariakoo area.

Trip modal share of the school children

To understand the means of transport commonly used by school children in Kariakoo area and their perspectives on the walking environment, seven school children aged between 7 and 13 years were interviewed at Uhuru-Mchanganyiko Primary School. To capture their views, through their head teacher the author organized for pre-structured group discussion that involved narrative stories by the school children.



Source: Fieldwork, 2015

Figure 7. 7: The researcher discussing with the school children at Uhuru Mchanganyiko Primary School.

Table 7. 21: Means of transport used by the school children in Kariakoo area

Means of Transport used	No	%
Walking	2	28.6
Walking + Public transport	5	71.4
Walking + Cycling	-	-
Walking + Private car	-	-
Total	7	100

Source: Fieldwork in Kariakoo, March 2015

The study has revealed that the majority of school children interviewed in Kariakoo area depend on a combination of walking and public transport. Only two pupils got into school on foot (Table 7.21). This is due to the fact most of the school children i. e. six out of seven pupils were from faraway places, particularly Buguruni, Vingunguti, Tengeta and Bunju which are about 3.5Kms, 6Kms, 12 Kms and 40 Kilometers from Kariakoo respectively.

These results imply that there is a limited access to primary schools in some neighbourhoods within Dar es Salaam City as some children have to travel long distances to school. Therefore, there is a need of rethinking about the planning standards for provision of public facilities like primary schools.

Trip modal share of people with disabilities

Out of the 34 respondents interviewed in Kariakoo, 4 were people with disabilities i.e. two handi-capped, and two visually impaired persons. The visually impaired were residents, while the handi-capped were pedestrians from other settlements (Kigamboni and Kiwalani), which are about 7 and 15 Kilometers from Kariakoo respectively. With regard to walking, the results from finding show that two out of the four challenged persons usually walk to get into various destinations, whilst the other two use a combination of walking and public transport as they were from far places.

One of the visual impaired residents, Nahum Jephy, 45 years old and a teacher by profession observed: *“I walk more often because the public transport buses in Dar es Salaam are not friendly to people with disabilities. Not only that, but also the public transport service is in most cases not accessible in all places I wish to go. For instance, personally, every Sunday I must go to worship at EAGT Mito ya Baraka Church, which is located in Jangwani ward, but yet there is no public transport passing through that direction. As such I have no alternatives rather than walking though it is very dangerous for a person like me. The roads are full of motorcyclists who never care about pedestrians and also the roads in Dar es Salaam are always provided with open side drains, a situation which is dangerous for the visual impaired”*

7.1.6 Summary on pedestrian mobility patterns in Kariakoo

The study has empirically demonstrated that people in Kariakoo walked more often mainly for five reasons: proximity to services, low household income, for their physical exercise, transport problems, and the nature of their occupation/business, particularly vending activities.

Regarding the daily mobility patterns, the majority of the respondents had their daily trips made to access workplaces, commercial services and community services. Social and recreational activity trips were inadequately conducted on a daily basis, mostly were conducted over the weekends.

Furthermore, walking and public transport were the main means of transport used by the majority of the respondents in Kariakoo area. Though the majority (i.e. 21 out of 34 respondents) depended on walking, the adults, the elderly and women seem to be the vulnerable to walking trips. Owing to long distances lived, the young persons and school children interviewed in Karikoo areas depend more often on a combination of walking and public transport.

7.3 Sub case 3: Buguruni Ward - (Upgraded Informal Settlements)

7.3.1 Profile of Buguruni -Ward

Buguruni is one of the 26 wards in Ilala Municipality within Dar es Salaam City. It comprises three sub-wards namely; Madenge, Mnyamani and Malapa. The Ward is located in the eastern part of Dar es Salaam Region, about 3 Kilometres from the City Centre, within the inner city zone. During the German colonial rule, Buguruni grew out from a Zaramo village into an unplanned settlement on the outskirts of Dar es Salaam. According to the Housing and Population Census (2012), the Ward had a total population of 70, 585 where 34, 547 were male and 36, 038 were females. The residential parts of Buguruni are largely unplanned settlements with high housing density and a relatively poor socio-economic background characterized by poor housing quality.

7.3.2 Walking frequency in Buguruni

As in Sinza and Kariakoo, to qualify for interviews the respondents had to confirm whether they had walked at least 5 to 10 minutes during the previous two days. However, in Buguruni settlement 35 respondents (27 resident households and 8 pedestrians) were involved. The results from finding show that all the 35 (100%) respondents said that they had walked during the previous two days also.

Table 7. 22: Walking frequencies in Kariakoo

Walking frequency	HHs	PDs	Total
At least 5 to 10 minutes in the previous two days	27	8	35
Never walked	-	-	-
Total	27	8	35

Source: Fieldwork in Buguruni, February 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.22 also shows that none of the respondents interviewed asserted that he/she had never walked during the two days past. The reasons as to why people in Buguruni walk most often are explained in the following section.

7.3.3 The reasons for walking in Buguruni settlements

To explore peoples' mobility patterns in Buguruni case study, the respondents were free to choose more than one answer from the list of factors for walking. The results from finding show that the majority of the respondents (i . e. 27 out of 35) walked primarily because of low household income. Proximity to services was mentioned as the second reason for walking. A form of physical exercise was ranked third, while transport challenges were ranked fourth. Only an insignificant number walked due to the nature of work, i.e. street vending. Summary in Table 7.23 is for more detail

Table 7. 23: Reasons for walking in Buguruni settlements

Reason for Walking	HHs	PDs	Total
Income/affordability	22	5	27
Proximity to Work/School	13	2	15
Transport problems	1	3	4
Nature of Work	1	0	1
A form of physical exercise	5	3	8

Source: Fieldwork in Buguruni, February 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.23 shows there is a similarity in ranking the major reasons for walking among pedestrians and resident households. The two groups rank low household income as the first reason for walking. However, a slight difference can be noted in ranking the second reason for walking. While proximity to services was ranked second by the residents, for the pedestrians it was ranked fourth. This difference is due to the fact that Buguruni area is a mixed informal land use development area whereby the resident households live closer to services, especially local shops. Unlike resident households, the walkers interviewed in Buguruni were from far places where basic services were sometimes not conveniently located.

7.3.4 Mobility patterns in Buguruni settlement

Regarding the walking patterns of the respondents in Buguruni, the trips were considered to include: daily trips (Monday to Friday), and weekly trips (i.e. trips made once per week or 2-3 days a week, including weekends). The next section presents the analysis of the daily and weekly trips in Buguruni.

Daily mobility patterns in Buguruni

The results from findings show that the majority of the respondents in Buguruni i. e. 31 out of 35 had their daily trips made to reach their workplaces. These were followed by trips made to access commercial services and community services. Only a few had their daily mobility patterns associated with social and recreational activities as Figure 7.24 indicates.

Table 7. 24: Daily mobility patterns in Buguruni settlements

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Workplace	24	7	31
	Commercial services	18	3	21
	Community services	6	2	8
For Leisure	Social activities	5	0	5
	Recreation	2	1	3
Milestone	Public transit stops	2	5	7

Source: *Fieldwork in Buguruni, February 2015* *Note: HHs=Households; PDs=Pedestrians*

From Table 7.24 it can be noted that pedestrians had limited daily trips related to social and recreational activities compared to the resident households. This is due to the fact that social activities (i. e. visiting friends, relatives and personal trips) and recreational activities were in most cases conducted after work hours, the time when pedestrians were struggling to get back to their homes. The 8 pedestrians interviewed in Buguruni were specifically from far places such as Mbagala, Tandika, Gongo la Mboto, Kiwalani, Vingunguti, Chanika and Manzese settlements that are between 3 and 33 kilometers from Buguruni. Furthermore, the daily access to public transport stops tended to be higher among the pedestrians compared to the resident households. Such a slight difference was due to the fact that the pedestrians interviewed were from outside Buguruni, but had their everyday life activities conducted in Buguruni. Hence, in order to arrive at their workplace, they had to connect by public transport.

Weekly trips in Buguruni settlements

Most respondents in Buguruni i.e. 27 out of 35 made their weekly trips to access social activities; and these were related to visiting friends, relatives and personal trips. Trips to community services, particularly to worship places were ranked second and recreational purpose trips were ranked third. However, only few accessed commercial and workplaces on a weekly basis.

Table 7. 25: Weekly mobility patterns in Buguruni settlements

Trip Purpose	From home to	HHs	PDs	Total
For reaching a destination	Work	2	0	2
	Commercial services	6	1	7
	Community services	16	4	20
For Leisure	Social activities	20	7	27
	Recreation	14	3	17
Milestone	Public bus stops	7	1	8

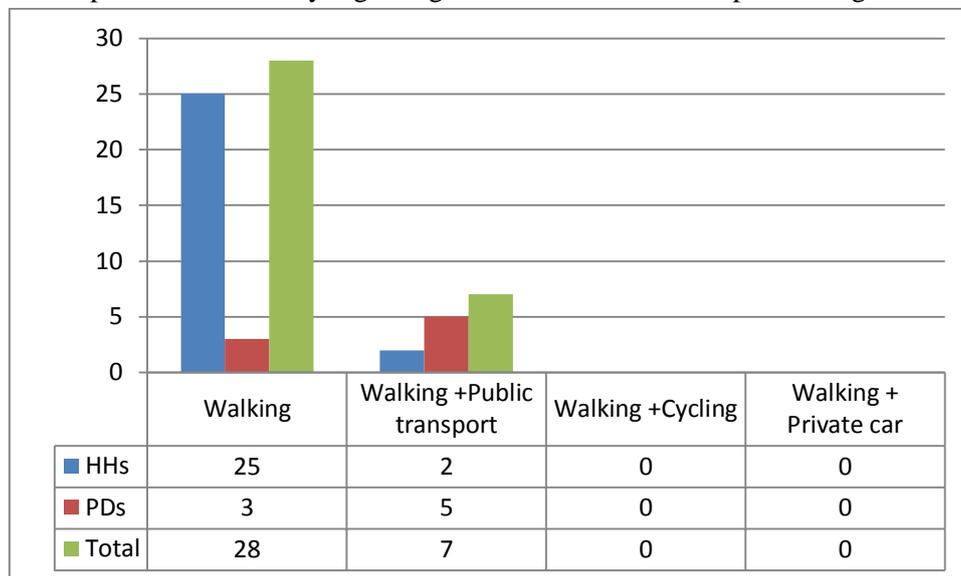
Source: *Fieldwork in Buguruni, February 2015* *Note: HHs=Households; PDs=Pedestrians*

Table 7.25 indicates that there is almost a similarity between the weekly trips among the residents and the pedestrians. While social activities were ranked first by the two groups, trips made to access community services, particularly worship places were ranked second. While trips to recreational activities were ranked third, trips to commercial and workplace were the lowest ranked. This means over the weekends the majority of the respondents in Buguruni spent most of their time on visiting friends, relatives, personal trips, attending worship services and going to recreational areas.

However, with regard to accessing public bus stops a remarkable difference can be observed. It seems that many residents access public bus stops on a weekly basis in comparison with the pedestrians. The reason behind is that the majority of pedestrians normally spent their weekends in their respective neighbourhoods, while some of the resident households had many of their weekly trips made outside Buguruni, especially visiting friends, relatives, personal trips.

7.3.5 Means of transport in Buguruni

The study has revealed that walking is the main means of transport by the majority of the respondents in the Buguruni settlement, whereas a combination of walking and public transport was ranked second. Figure 7.8 presents a summary regarding the main means of transport in Buguruni



Source: Fieldwork in Buguruni, February 2015 Note: HHs=Households; PDs=Pedestrians

Figure 7. 8: Means of transport used in Buguruni settlements

Figure 7.8 shows a notable difference between the means of transport used by resident respondents and pedestrians. The share of walking tends to be higher among the resident respondents than the pedestrians. As explained earlier, such a notable difference is attributable to the fact that the walkers who were interviewed in Buguruni were only those from far places within Dar es Salaam City, and hence they were forced to use public transport to reduce the walking distance. The essence was to have a comparison regarding the mobility patterns among the residents and people from other settlements within Dar es Salaam, including their perspectives on the walking environment.

Trips Modal share by income groups

With regard to income, the majority of the respondents in Buguruni settlements i.e.30 out of 35 earned less than 300,000 (US\$ 0-159) per month. Summary in Table 7:26 is for more details.

Table 7. 26: Monthly income in Buguruni settlements

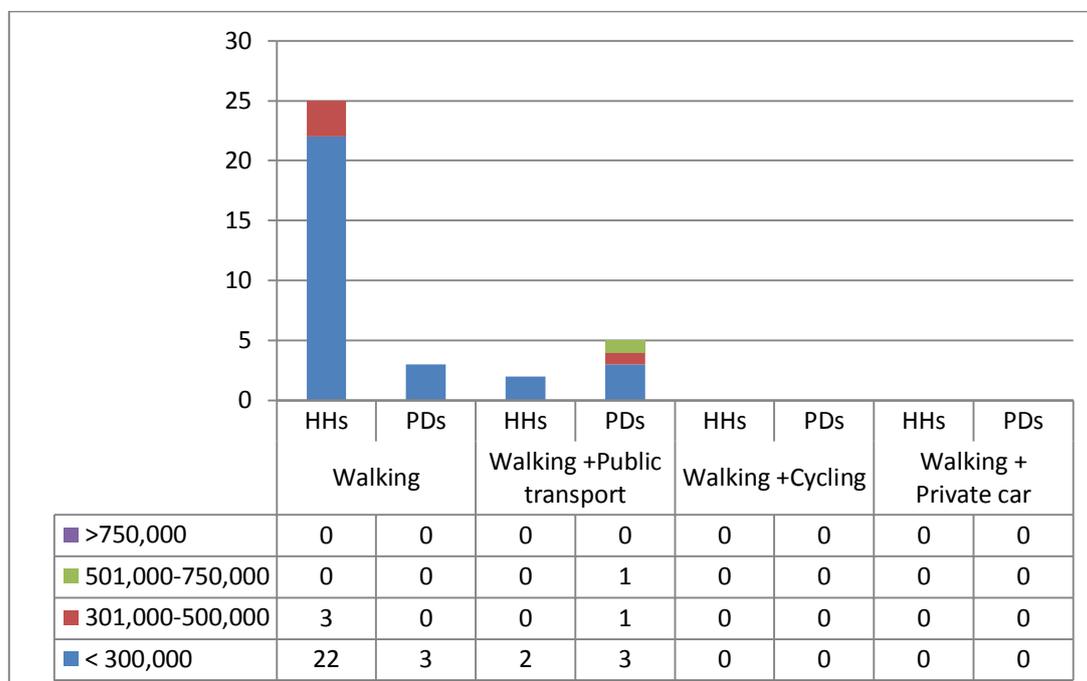
Income per Month (in TZS)	HHs	PDs	Total	Percentage
< 100,000	19	5	30	85.7
101,000-200,000	1	0		
201,000-300,000	4	1		
301,000-500,000	3	1	4	11.4
501,000-750,000	-	1	1	2.9
>750,000	-	-	-	-
Total	27	8	35	100

Source: Fieldwork in Buguruni, February 2015

Note: HHs=Households; PDs=Pedestrians

Table 7.26 shows a pattern depicting similarities regarding the income earned per month between the resident households and pedestrians. Across the two groups, the majority earned almost all the respondents earned less than less than 300,000 TZS (US\$ < 159) per month, which is almost equivalent to the minimum wage (i.e. 265,000 TZS) paid to the government employees in Tanzania. However, while one respondent earned more than 500,000 TZS (US\$ >264), none of the resident respondent earned such an amount. Buguruni is an informal settlement characterized by poor socioeconomic background and poor housing condition. Therefore, no wonder why the majority have low incomes earned per month.

With regard to trips modal share by income groups, the results from finding shows that the majority of the respondents depend on walking to access their everyday life activities. Owing to their low income, only a few respondents use a combination of walking and public transport. Figure 7.9 further illustrates:



Source: Fieldwork in Buguruni, February 2015

Note: HHs=Households; PDs=Pedestrians

Figure 7. 9: Modal share by income groups in Buguruni settlements

Figure 7.9 shows a similarity regarding the means of transport used by the majority of residents and pedestrians earning less than 500,000 TZS (US\$ < 264) per month. It appears that this income group is more on vulnerable as the majority depend on walking to reach their destinations.

Trip modal share by sex-Buguruni settlements

Out of the 35 respondents interviewed in Buguruni, 21 were men, and 14 were female (Table 7.2). As stated earlier, all respondents were purposefully selected so as to capture the walking related issues suffered by the vulnerable users of public space.

Table 7. 27: Number of respondents by sex-Buguruni

	Male	Female	Total
HHs	14	13	27
PDs	7	1	8
Total	21	14	35

Source: Fieldwork in Buguruni, February 2015

Since the number of men and women was not equal, to establish the percentages of trips modal share by sex, each group was dealt upon independently. In Buguruni settlements, the study has revealed that women walk more frequently than men. Only a single woman used a combination of walking and public transport. The majority of the women noted that walking was their main means of transport to access their everyday life activities. They had no better options or alternative.

Table 7. 28: Trip modal share by sex-Buguruni settlements

Means of Transport used	Male		Female		Total	
	No	%	No	%	No	%
Walking	15	71.4	13	92.9	28	80.0
Walking +Public transport	6	28.6	1	7.1	7	20.0
Walking +Cycling	-	-	-	-	-	-
Walking + Private car	-	-	-	-	-	-
Total	21	100	14	100	35	100

Source: Fieldwork in Buguruni, February 2015

Note: HHs=Households; PDs=Pedestrians

Table 7:28 clearly shows that most men depended on a combination of walking and public transport than women. This difference is caused by gender roles whereby women in Tanzania are in most cases responsible for family matters, especially accessing the domestic needs from various market places, shops and taking children to school, health services, etc.

Trip modal share by age

Out of the 35 respondents, 11 were the youth (19-35 aged), 18 were the adults (36-59 aged), and 6 were the elderly persons (i. e. 60+aged). Summary in Table 7.30 is for more details

Table 7. 29: Number of respondents by age groups

Age group	HHs	PDs	Total	%
Youth (19-35 years)	10	1	11	31.5
Adults (36-59 years)	14	4	18	51.4
The elderly (60+ aged)	3	3	6	17.1
Total	27	8	35	100

Source: Fieldwork in Buguruni, February 2015

Regarding the trips modal share by age groups, the analysis has revealed that the majority of the youth, i.e. (10 out of 11) 90.9% depended most on walking than other age groups. This was followed by adults whereby 14 out of 18 i.e. (77.8%) walk to get to various destinations, and those who walked least are the elderly where 4 out of 6 (66.7%) were involved. However, although a slight difference can be noted in ranking the means of transport by the different age groups in Buguruni settlements, walking remains as the mainly means of transport within the area as it accounts for over 50% in each of the age groups. Table 7.30 presents modal share by age groups in Buguruni settlement.

Table 7. 30: Trip modal share by age groups-Buguruni settlements

Means of Transport used	Age group			Total
	Youth (19-35 years)	Adults (36-59 years)	The elderly (60+)	
Walking	10	14	4	28
Walking + Public transport	1	4	2	7
Walking + Cycling	-	-	-	-
Walking + Private car	-	-	-	-
Total	11	18	6	34

Source: Fieldwork in Buguruni, February 2015

Table 7.30 shows that across the three age groups, only a few respondents use a combination of walking and public transport. Owing to the increasing unemployment within the country and the fact that Buguruni is a low income settlement, the youth being among the productive groups seem to walk most to meet their livelihood strategies. As they are unemployed, they have no better options than walking.

Trip modal share of the school children in Buguruni

In Buguruni settlement, 9 school children at the Hekima Primary School were interviewed through a pre-structured group discussion that had a narrative story. The essence was to capture the means of transport used by the school children and their perspectives on the walking environment. To capture the mainly means of transport used by the school children in Buguruni, the author conducted pre-structured group discussions with 9 school children (7-13 years aged) at Hekima Primary school in Madenge Sub-ward.

In Buguruni settlement, 9 school children at the Hekima Primary School were interviewed through a pre-structured group discussion that had a narrative story. The essence was to capture the means of transport used by the school children and their perspectives on the walking environment. However, the study has revealed that the school children suffer most given the condition of the walking environment observed in Buguruni.



Source: Fieldwork, March 2015

Figure 7. 10: The researcher discussing with the school children at Hekima Primary School

Table 7. 31: Modal share of school children

Means of Transport used	No	%
Walking	9	100
Walking + Public transport	-	-
Walking + Cycling	-	-
Walking + Private car	-	-
Total	7	100

Source: Fieldwork in Buguruni, February 2015

Despite the fact that all the 9 school children were from Buguruni-Mnyamani, an area which completely lacks a primary school service and which was about 1.2 Kilometer to the Hekima Primary School, all students depended on walking to get into school. On their way to school, they had to cross two or three busy roads per day (i.e. Mnyamani, Mandela and/or Uhuru Roads) depending on where they decide to cross.

These results imply that, the school children are among the most vulnerable road users in Buguruni as they had to walk Monday to Friday regardless of the road safety and quality of the walking environment.

Trip modal share of people with disabilities in Buguruni

It should be made clear that out of the 35 respondents interviewed in Buguruni settlements, 7 were people with disabilities (six handicapped and one visually impaired person). Regarding the trips modal share of people with disabilities in Buguruni, the majority i.e.six out of seven of the people with challenging abilities said they depend on walking. These results imply that the people with disabilities in Dar es Salaam are among the vulnerable groups.

7.3.6 Summary about the pedestrian mobility patterns in Buguruni

The results from finding show that the majority of respondents in Buguruni settlements walk most often because of the limited low income. The other reasons were related to: proximity to services, a form of physical exercise, transport problems, and also because of the nature of their occupation especially informal vending activities. Regarding where they go more often, the results show that the ma-

jority had their daily trips made to access workplaces, commercial services, community services, social activities, and on their recreational related activities. Furthermore, walking and public transport are the main means of transport used by the low income group. However, school children, the elderly, women and people with disabilities are the most vulnerable groups. These results imply that walking and public transport in Buguruni settlements need to be improved and given special attention as are the mainly means of transport by a vast majority.

7.4 Concluding summary

This chapter empirically investigated the mobility patterns in the three Sub-cases (i.e. Sinza, Kariakoo and Buguruni). The focus was to understand the reasons why people in cities of developing countries walk more often for everyday life activities, to understand the places they go more often per week, and also the means of transport used. Generally, across the three sub-cases the reasons for walking include: low household income, proximity to service, a form of physical exercise, transport problems and nature of business/occupation carried out. Across the three cases, the majority had their daily trips from home to the workplace, commercial services, community facilities, social activities, and to the recreational places. The means of transport mainly used by vast majority were mentioned to include walking and a combination of walking and public transport. However, a cross case analysis regarding these questions is discussed in chapter eleven of this report.

The next chapter presents perspectives of pedestrians on the walking environment across the three sub-cases. The essence is to capture the opinions, attitudes and experiences of pedestrians on the walking environment, and also to examine how the physical environment supports/discourages pedestrian movements in the study areas. The key variables addressed in the next chapter include: connectivity of the walking paths, safety and security, accessibility to public facilities, inclusion of all street users, and convenience and attractiveness of the walking routes. In other words, the next chapter aims to explore perspectives of pedestrians in relation to the hierarchy of walking needs presented in the conceptual framework (Figure 4.3).

CHAPTER EIGHT

8. PERSPECTIVES OF PEDESTRIANS ON THE WALKING ENVIRONMENT

8.0 Introduction

This chapter aimed to understand how pedestrians perceived the walking environment in Dar es Salaam City. To respond to this objective, pedestrian opinions, attitudes and experiences were explored. The author believes that pedestrians being among the vulnerable users of public space had a story and in-depth information to explain regarding the status of the walking environment. To accomplish this task, a total of 100 respondents (72 resident households, and 28 pedestrians) and 22 schoolchildren were interviewed. The essence of these interviews was to gauge the perceptions of pedestrians with regard to the basic pedestrian requirements (i.e. connectivity to walking routes, accessibility to services, safety and security needs, and convenience and attractiveness of the walking routes). The scale used to rate the walking environment comprised of five levels: strongly agree, agree, neutral, disagree and strongly disagree. The next section will focus on presenting the empirical results emanating from the three case studies:

8.1 Sub-case 1: Sinza neighbourhood

This study aimed to understand how people perceived the walking environment in terms of connectivity to the pedestrian network, safety and security, accessibility to public facilities and public transit stops, and convenience and attractiveness of the walking routes. These variables are critical attributes of the conceptual framework presented in Figure 4.3. To capture the perspectives of pedestrians in Sinza, a total of 31 respondents were interviewed, of which 25 were the resident households and 6 were pedestrians. The next section presents the way the respondents perceived the walking environment in Sinza.

8.1.1 Lack and blockage of pedestrian routes

All the 31 (100%) respondents in Sinza perceived that the pedestrian networks in the area were lacking. Even where the pedestrian space was provided, it is usually encroached by informal vending activities, building extensions and parked cars. This perception was supported also by all the 6 school children who were of the same opinion that the pedestrian networks in Sinza were lacking and where they exist, they were often blocked. When asked to respond whether the existing pedestrian network in Sinza is continuous/ connected from home to various land use destinations, all the 31 respondents strongly disagreed.

During household interviews, Kaniki Dilunga¹³, 71 aged, a retired officer and who is a resident household of Sinza B said that: *“Here in Sinza, do not expect to walk from home to your final destination without barriers in between. First of all, these Shekilango and Tandare-Uzuri roads completely lack pedestrian walkways. Even where the walking space was provided, already is encroached by parked cars, Bodaboda, street vendors, food and fruit vendors and building extensions. Land developers have narrowed the pedestrian walking spaces. The majority of land developers never adhere to building setbacks, especially when it comes to construction of fences and building extensions. Despite the plot sizes in Sinza are too small normally 12x24 (288meter square), still developers force to erect fence walls surrounding their buildings. This practice has led to the encroachment of pedestrian space. As a result, we are forced to walk on the same carriageway with motorists, a situation which is very dangerous tor our lives”*.

Through direct observation, the author witnessed the lack of pedestrian infrastructure and also encroachment of walking space along the collector and residential access roads in the area. Both the residential access and collector roads had no pedestrian walkways, except some parts along the busy Sam

¹³ This is not the actual name of the respondent; all names of the respondents were changed to pseudal names

Nujoma road, opposite to the Mlimani city complex shopping mall. The researcher also confirmed the finding that even where some kind of sidewalks or shopping facades were provided, still they were also encroached by parked cars and vending activities. As a result, pedestrians were walking along the unpaved streets, and along shoulders of the road, thereby mixing up with other means of transport, particularly cars, motorcycles (bodaboda), tri-cycles (bajaji), cyclists and handcarts) and subsequently subjected to the road accidents. Figure 8.1 shows the encroachment and lack of pedestrian walkway in Sinza neighbourhood.



Source: Author's observations in Sinza, April 2015

Figure 8.1: Barriers and lack of pedestrian walkways in Sinza

As can be observed in Figure 8.1, the collector roads without sidewalks and where pedestrian walkways were little provided, already are encroached by informal vending activities. This implies that the public space in Sinza is contested; it is competed for various uses. When the public space is contested, the weaker groups like pedestrians are normally the loser in struggle for such contested spaces. This is evidenced by figures where pedestrians are being pushed out of their walking space, and low priority is given in developing the pedestrian walkways. The question to be asked is, if the pedestrian network is completely lacking, and where provided it is blocked. Then how do pedestrians perceive safety of the walking environment? This question is answered in the next section.

8.1.2 Dangerous walking environment

All the 31 respondents interviewed in Sinza perceived the walking environment as not safe. In their opinion, the dangerous of walking environment is contributed by the lack of pedestrian facilities, particularly sidewalks, zebra crossing, disability infrastructure, pedestrian signals at traffic intersections, speed limit and other traffic management measures. Even where the zebra crossings were provided, the motorists rarely obeyed to the rules, and sometimes zebra crossing paints had faded away. On whether the walking environment in Sinza is safe from danger, all the 31 respondents strongly disagreed. Likewise, all the six school children interviewed at Sinza Primary School felt that the walking environment in Sinza and Dar es Salaam City as a whole were unsafe and dangerous for pedestrians. The lack pedestrian facilities and the uncontrolled motorists' behaviour were reported to be the main cause of pedestrians being hurt by other modes.

Through direct observation, pedestrians were sharing the same carriageway with motorized traffic, walking along the shoulders of the road, and also pedestrians were observed crossing the busy Shekilango road while cars were not at a complete stop as Figure 8.2 shows.



Source: Fieldwork in Sinza, March 2015

Figure 8. 2: Pedestrians walking on and crossing the busy Shekilango Road in Sinza

As Figure 8.2 shows, pedestrians in Sinza often walked on the shoulders of the road and sometimes they share the same carriageway. Nevertheless, pedestrians were crossing the busy Shekilango road while cars were still on the road. The next section explains how people in Sinza perceived the crossing safety.

Crossing safety in Sinza

When it comes to crossing safety, all the 25 resident households, the six pedestrians as well as the six school children interviewed expressed fear of crossing the busy roads, particularly, at the road intersections and crossing points. The intersections of the primary and secondary distributor roads pose the highest risk to pedestrians as they lack traffic flow signage. Crossing the busy roads like Shekilango, Sam Nujoma and many other busy roads within Dar es Salaam was reported to be very challenging. Even where pedestrian crossings were provided, the pedestrians complained about being disrespected by the other road users at this crossing point.

When asked to rate the degree of safety at road crossing, Ashura Sarah, 57 aged, resident of Sinza, a shop owner selling fabrics narrated: *“Crossing a busy road is so dangerous, unless you do not value yourself. There are no specific points earmarked for pedestrians to cross. Even at the traffic lights, it is very rare to find pedestrian signals that allow us to cross. The traffic police operating at such junctions normally are there to facilitate the motorists and not pedestrians. There is no single phase given to pedestrians to cross. One day, I questioned the traffic police why they do not give time for pedestrians to cross the road? The traffic police replied: I am here just for cars; pedestrians have to use their common sense to cross the road. Sometimes I request for someone else to assist me to cross the busy road. Motorists (especially bodaboda and daladala drivers) never bother about pedestrians; they are always in hurry to struggle to get the daily amount of money required by their boss”*.

It was further reported that, on average, pedestrians wait for about 10 to 20 minutes to cross the busy roads like Shekilango, especially during the peak hours that are normally early in the morning and evening when many people are commuting back home. During the busy hours, most motorists especially *bodaboda* (motorcyclists) never obey traffic laws and rarely give way to pedestrians to cross. Suleiman Abdallah, 73 aged, a retired officer who was now just a peasant and who was a resident household of Sinza B was quoted saying: *“Crossing the busy roads like Shekilango is very challenging and time consuming. Sometime once can wait for 15 to 20 minutes to cross the busy road, especially the elderly like me, the school children, child mothers and people with disabilities. Most motorists never give way to pedestrians to cross; only a few can do. Personally, in the past years when the number of vehicles was relatively small, I used to watch football matches on the other side of Shekilango Road, but today I never tamper to go there for fear of be knocked down by the motorists”*

The respondents went on complaining that due to fear of crossing the busy roads, sometimes parents are forced to accompany their children to cross the busy roads while going to school. When explaining his daily routines activities from morning to evening, Mzee Idd Shaban, 76 years aged and who is a resident of Sinza D complained: *“Owing to the difficult and uncomfortable walking environment, I am forced to accompany my grandsons to school four times a day, and this is now my daily routine. I always wake-up around 7:30 to prepare myself; thereafter, I accompany my grandsons to school. Again, every day at 13:00 hours, I always go to pick them up for lunch at home. Having finished eating, around 14:00, I have to accompany them back once again to school for the evening sessions, which goes up to 17:00 hours. Having completed their classes, around 17:15, I normally go to pick them back at home”*

Similarly, Khadija, a 38 year aged, a housewife and a resident of Sinza D complimented the foregoing noting argument: *“My child has to cross this road (Shekilango road) every morning (Monday to Friday) to pick a daladala to school. I am forced to accompany her to cross the road, because vehicles are always moving at high speed and do not stop for pedestrians to cross. We simply cross at our own risk.*

Through direct observation, the author witnessed parents assisting the school children to cross the busy Shekilango road at Mugabe Primary School. The zebra crossings at this important crossing point were lacking as Figure 8.3 shows. Generally, the busy collector roads in Sinza completely lacked zebra crossings. The hot spot danger areas to cross were observed to include; crossing points at Mugabe Primary School, Sinza Madukani Bus Stop, Kijiweni, Palestina Hospital, Sinza-Makaburini, Mori, Lion and Vatikani.



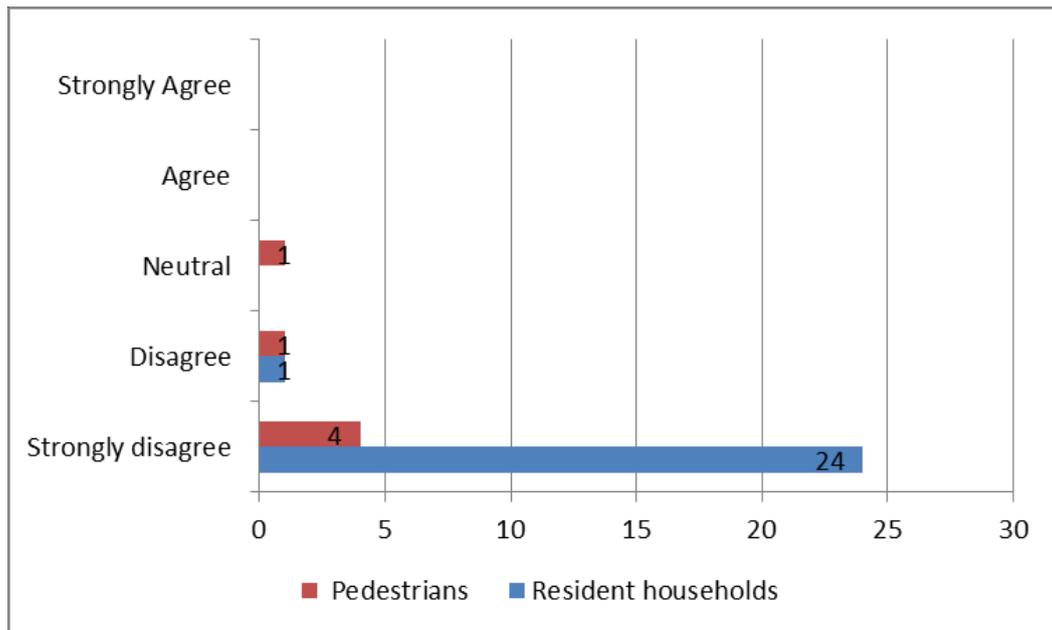
Source: Fieldwork in Sinza, April 2015

Figure 8 .3: Far left and right parents/adults assisting the school children to cross Shekilango Road

Figure 8.3 shows that there are no zebra crossings at important crossing points, despite the fact that only one tin of white oil paints is required. In situations like these, there is a need for pedestrians to reclaim their rights to walk and demand for safe crossing points, especially in a situation of increased motorized transport.

8.1.3 Disrespect by motorists

The majority of the respondents in Sinza i.e 30 out of 31 felt that they were not respected by the motorists. When asked whether the motorists value pedestrians, the majority of the respondents strongly disagreed (Figure 8.4). Based on their opinions, most motorists, especially motorcyclists (*bodaboda*) cannot be expected to obey traffic laws, and rarely stop when pedestrians are crossing even at zebra crossings. The motorists were blamed for not giving way for pedestrians to cross the busy roads, and sometimes splashed dirty water on the pedestrians. In addition to that, the respondents complained that motorists drive and park on the existing walkways, thereby forcing pedestrians to share the same carriageway with the vehicular traffic. These events made pedestrians feel not respected and valued by motorists. The rating levels on whether motorists respect pedestrians are presented in Figure 8.4.



Source: Fielwork, 2015

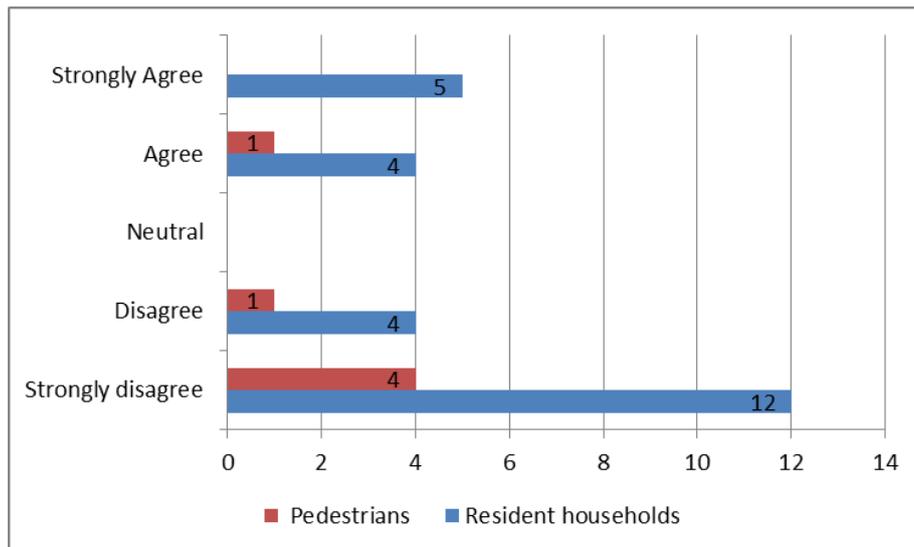
Figure 8. 4: Agreement levels by the respondents towards the respect by Motorists

As Figure 8.4 indicates, only one pedestrian was of the opinion that motorists neither respect nor disrespect pedestrians. The majority are not satisfied with the motorist behaviour. One of the pedestrians interviewed, Aidan Waziri, 45 years old, a tailor who lives in Makongo Juu complained that: *“Motorized travel in Sinza and Dar es Salaam City in general is chaotic. Most motorists never give way/respect to pedestrians. One does not expect a motorist to give him/her a way at crossing even when there is a zebra crossing. If you value yourself, you better wait for cars and motorcyclists to stop, otherwise you may find yourself injured. Sometimes I do ask these motorists, why ringing a gang for me? Can you show me where am I supposed to walk? Is this road made for motorists only?”*

The disrespect of motorists was also supported by Mr. Kilale, 34 years old, an artist, a resident of sinza C, one of the walkers splashed with dirty water added that pedestrians in Dar es salaam City lack representatives and organizations to fight for their rights to walk. He narrates: *“Generally, pedestrians in Dar es Salaam City are never respected by the other road users. Unlike the motorists, we pedestrians lack representatives and organizations to fight for our rights to walk. As a result, pedestrians are always exposed to road accidents and no one claims for their rights. For instance, personally, I remember it was in December 2014 when I had all my clothes splashed with dirty water by a motorist. As I was walking along the edges of the Shekilango road, besides, there was an open side drainage channel whereby it was too difficult for me to escape from the moving vehicles. Suddenly, a Motorcyclist came at high speed and then splashed dirty water on me, and yet he did not stop or even said sorry”*

8.1.4: Insecure walking streets

The majority (67.7%) of the respondents complained about crime issues in their residential neighborhoods, especially during the night. When asked whether the walking environment in Sinza neighbourhood is secure from crime, the majority (21 out of 31) disagreed. Most respondents felt insecure to walk at night in the residential streets, especially in the streets without street lights. They seemed to have a consensus that mugging is rare during day time, but some are witnessed during the night. Petty theft is more common along the busy roads and dark streets, especially along the congested roads. Items such as mobile phones, wallets, laptops, hearings and chains are often snatched. The most dangerous areas were Sinza Madukani, Kumekucha, Palestine, Kwa Tumbo, Kwa-Mtogore, Popo-Bawa, Yemeni and Daybreak. Figure 8.5 shows the rating levels by the respondents on whether the walking environment in Sinza was secure from crime.



Source: Fieldwork in Sinza, March 2015

Figure 8. 5: Attitudes of the resident households and pedestrians towards secure from criminal gangs

Figure 8.5 indicates that there are almost similarities in rating the security of the walking environment between the resident households and the pedestrians. In each group, the majority were of the opinion that the walking environment in Sinza was not secure from vulnerability to crime.

When asked to respond whether they had been the victims of crime, one of the residents of Sinza D, a 46 years and who is a shopkeeper said: *“Pick-pocketing of mobile phones, wallets and jewels is very common here in Sinza and sometimes happens while one is in daladala trips (i.e. the privately operated public transport). Personally, I have been a victim twice. Firstly, it was in April 2014 when I was sitting in a daladala at Kwa-Mtrogore Bus Stop; suddenly unknown person outside the window pocked my neck-chain and ran away. The second time was in February 2015 around 20:30 hours when I was walking along the same street (i.e. Kwa-Mtrogore Street). Suddenly my new chain was once again snatched from me”*

Likewise, one of the pedestrians interviewed, a resident of Tabata and who was a street vendor in Sinza underscored the pick-pocketing was a serious problem in the area, especially during the night along the poorly lit streets. She lamented: *“Muggers in Sinza are very common, especially in the poorly lit streets. I remember it was in January 2015 when I was walking around Sinza Primary School. Suddenly, I came across a group of young men who were smoking just along the street. As I was approaching them, they stopped me asking irrelevant questions. As I was very busy to respond to their questions one of them tempted to ambush me, but I managed to escape. When I reached at home, I realized that my mobile phone had already been stolen”*

It was further reported that muggers tend to collaborate with motorcyclists (*bodaboda*). Tatu Sarehe, a 30 years and who was also a member of Sinza ‘C’ Sub-ward Committee on administrative and financial matters explained that there was a new mugging style, whereby some of the thieves hire the motorcyclists nicknamed ‘*bodaboda*’ who normally transport muggers as passengers. When they suspect anyone who may have something valuable such as mobile phones, money wallets, laptop bags or long hearings, they start following him/her stealthily and suddenly grab the victim, start pick-pocketing the belongings. As soon as they manage taking away the bag or wallet, the motorist speeds up to the extent that it is difficult to catch them.

Although Tatu Sarehe has not been a victim, she knows two of her friends who have lost mobile phones. She said: *“Currently, thieves are so clever and you cannot realize them while walking. The simple theft of mobile phones, wallets and laptops nowadays is done through bodaboda, especially along this Shekilango road. Though I have never been victimized, but I know two of my friends whose mobile phones were stolen using this technique. The first event happened in January 2014 and the second one was in July of 2014. All these events happened along the busy Shekilango road”*

The argument regarding the new technique of pick pocketing was also supported by Halima Ally, a resident of Mbezi Beach, a 32 years aged and a nurse. Halima has been victim, she narrated her story: “It was in 2012 around 19 hours when my money wallet was stolen by a motorcyclist. As I was negotiating with a bajaji driver in Loyola-Mabibo, I had my wallet held in my right-hand. Suddenly, I saw a bodaboda coming from my rear side and carrying a passenger. The time I was adjusting myself to let the bodaboda pass through, the bodaboda’s passenger snatched my wallet and the motorist ran away. I do not think that he was a genuine passenger but a thief”

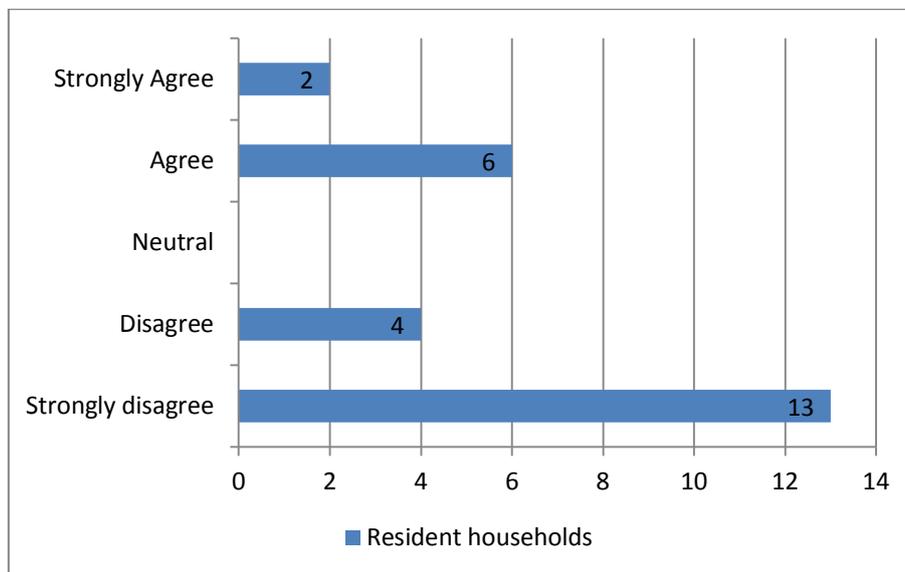
Similarly, Monika Gerard, 34 aged, who works in a hair salon in Sinza C said she has been a victim two times. Firstly, it was along the Shekilango Road in Sinza, the time she was walking along this road at the same time receiving a call from her friend, she had her mobile phones robbed by motorcyclists. The second time was in Manzese-Kilimani; her money was snatched by a *bodaboda*.

With these quotes regarding the walking environment and safety, the motorists’ behaviour and the existence of crime issues, it can be concluded that the walking environment in Sinza is not pedestrian friendly. The next section focuses on how people in Sinza perceived the access to public facilities.

8.1.5 Inconveniently location of public facilities

Regarding accessibility to public facilities, 25 resident households were interviewed. The pedestrians were excluded from this variable as they might not be aware of where such public facilities are. The 25 resident households were asked to respond whether the public facilities (i.e. commercial, education, health, religious, and public bus stops) were accessed within 5-10 minutes walking time or between 400 and 800 metres distance. This is normally the time people are willing and ready to walk (Perry, 1929; Burton and Mitchel, 2006).

In connection with this variable, the majority of the respondents perceived that the public facilities in Sinza are inconveniently located, except local shops, bars and restaurants/cafes. When asked to respond whether the public facilities such as markets, schools, health services and religious facilities were located on a conveniently accessible distance, 17 out of 25 respondents disagreed. Figure 8.6 summarizes the views of the resident households regarding accessibility to public facilities.



Source: *Fieldwork in Sinza, April 2015*

Figure 8. 6: Attitude of resident households in accessing public facilities in 5-10 minutes

Figure 8.6 shows that only the minority (eight out of 25) perceived that the public facilities in Sinza are in proximity locations. Analysis about the time taken to access the public facilities is further discussed in the following section.

Accessibility to commercial facilities

In this study, the commercial services were considered to include local shops¹⁴ and markets¹⁵. According to the respondents, daily shopping facilities in Sinza are conveniently located. Most local shops are within a walking distance. Out of the 25 respondents, 23 said they had their daily shopping in a 1-10 minutes. Only a few accessed local shops in 11-20 minutes. The majority, however, complained residing far away from market facilities. They had to cover over a kilometer to access the market facilities in the adjacent settlements. Table 8.1 shows the time taken to access local shops and market facilities in Sinza.

Table 8.1: Time taken to access commercial facilities in Sinza

Time taken (in minutes)	Local Shops		Local Markets	
	Respondents	%	Respondents	%
1-10	23	92	5	20
11-20	2	8	4	16
21-30	-	-	4	16
31-45	-	-	8	32
46-60	-	-	3	12
>60	-	-	1	4
Total	25	100	25	100

Source: Fieldwork in Sinza, April 2015

Table 8.1 shows that the majority of respondents accessed local shops in less than ten minutes. Besides, almost half of the respondents over half an hour, and at a time in more than 60 minutes.

When asked to explain the average time taken to get into the nearest shops and marketplaces, one of the resident households in Sinza C, Kilale, 34 aged, and who is an Artist by occupation, narrated: *“In Sinza, we have no problem with access to the local shops, except for goods that must be bought from the marketplaces. As you go around you will notice that Sinza is rapidly changing from residential to include commercial activities like shops, bars, restaurants, cafes and guest houses. Thus, at least after every 3-5 houses there is a shop or a small kiosk located. Hence, I often access my domestic needs just in 5 Minutes, but when it comes to market related goods it takes me about 30-45minutes depending on the nearest market I decide to go”*

According to the Sub-ward/Mtaa Chairperson of the Sinza D area, the whole Sinza Ward with a total population of 40,546 people has only one market place located at Sinza Makaburini in Sinza A. The rest i.e Sinza B, C, D and E lack market facilities (Figure 10.1). These present inconveniences adversely affecting access to common facilities. The resident households in Sinza B, C, D and Sinza E may also access market facilities in far places like Shekilango, Mabibo, Big Brother/Mahakama ya Ndizi, Manzese, Tandare, Vingunguti and Tandika, which are over 1kilometer from Sinza.

One of the resident households, Bushiri Hamad, a 35 aged, food vendor by occupation, and a resident of Sinza D said: *“As there is no any market located in Sinza D, I often go to the nearby marketplaces such as Shekilango, Manzese, Mabibo and sometimes to Vingunguti depending on the type of items I want to purchase. Normally, it takes me 20-30 minutes to get into Shekilango market, 30-45 minutes to Manzese and 45-60 minutes to reach at Mabibo Sokoni. I walk just because I have no alternatives, otherwise I could always go by daladala”*

¹⁴ A shop is a retail store, especially a small one (www.dictionary.com/browse/market). According to the Urban Planning and Space Standards Regulations of 1997 of Tanzania, shops at neighbourhood level cover 250 - 500sq.meter with 0.8-1.0 gross area/person (sq.m). However 5-10 plots are supposed to be provide within the centre and others at corner plots.

¹⁵ A market in this study refers to an open place or a covered building where buyers and sellers convene for sale of goods, including vegetables, fruits, etc. (www.dictionary.com/browse/market). According to the Urban Planning and Space Standards Regulations of 1997 of Tanzania, a market at neighbourhood level occupies 1200-2500sq.meter.

Accessibility to education, health and religious facilities

In this study, community facilities included primary schools, dispensary/clinic and worship places. According to the respondents, the primary schools, health and religious facilities are inconveniently located. For instance, despite the large population ranging between 5, 660 and 12, 198 in Sinza neighbourhoods (NBS, 2012), the study found out that with the exception of Sinza C, the rest (i.e. Sinza A, B, D and E) had neither dispensary nor clinic. Though the majority accessed health services at Palestina Hospital, which is located in Sinza C, only few resident accessed health facilities within 10 minute time. The majority spent 11- 60 and a time in more than one hour.

Though primary school services and religious facilities were provided, it was reported that these facilities are not centrally located. For instance, the Mugabe Primary School in Sinza ‘C’ is located at the periphery of the neighbourhood. Due to peripheral of schools and religious facilities, the majority of the respondents noted that they spend 11- 60 minutes, and at a time in more than one hour (Table 8.2).

Table 8. 2: Time taken to access education, health and religious facilities in Sinza

Time taken (in minutes)	Primary School		Health facilities		Religious facilities	
	No	%	No	%	No	%
1-10	9	36.0	5	20.0	10	40.0
11-20	9	36.0	4	16.0	7	28
21-30	2	8.0	8	32.0	4	16.0
31-45	3	12.0	6	24.0	2	8.0
46-60	1	4.0	1	4.0	1	4.0
>60	1	4.0	1	4.0	1	4.0
Total	25	100	25	100	25	100

Source: Fieldwork in Sinza, April 2015

Table 8.2 shows that only 9, 5 and 10 out of 25 respondents accessed primary school, health services and religious facilities within 10 minutes time respectively. The majority spent more time to access the same. The respondents complained that the long walking distances increased residents’ vulnerability to road accidents as they had to cross busy roads to reach these services and facilities. The further the facilities are located, the more inconveniences they create and vice versa. This mostly affects the school children.

Access to public bus stops

The majority of the residents were satisfied with the location of the public transit stops. When asked whether the public bus stops were located within convenient walking distance, 16 out of 25 respondents strongly agreed. Figure 8.7 is for more details.

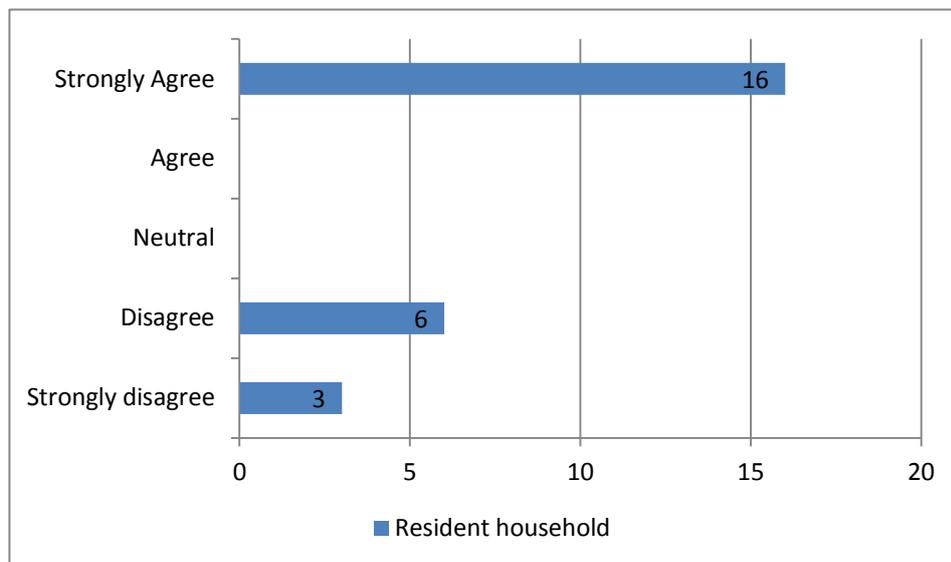


Figure 8.7 shows that only nine respondents were of the opinion that the public bus stops in Sinza are inconveniently located. The time taken by the resident to get to the public bus stops are further analysed in the following section.

Source: Fieldwork in Sinza, April 2015

Figure 8. 7: Attitudes of resident households regarding accessing bus stops in 5-10 minutes

Time Taken to access transit stops in Sinza

The finding show that the majority of the respondents (15 out of 25) accessed public bus stops within convenient walking time. Nevertheless, none of the respondents spent over half an hour to get into the nearest public bus stop.

Table 8. 3: Time taken to access public transit stops in Sinza

Time taken	No of respondents	Percentage
1-10	15	62.5
11-20	7	29.2
21-30	3	8.3
Total	25	100

Source: Fieldwork in Sinza, March 2015

Despite the fact that the public transit stops in Sinza were conveniently located, it was reported that the privately operated public transport are not user friendly to people with disabilities. This was confirmed by Nelly Edward, 52 years aged, the handicapped, and a resident of Sinza D: “*I always walk to get into the nearby locations like to my workplace and shops. For the far place trips such as going to market places, worshipping, visiting friends and relatives, and other personal trips I normally hire tricycles as the public buses are not friendly to people with disabilities like me*”.

The resident households further complained about the lack of sitting, standing and shade amenities at the public bus stops. In most cases zebra crossings were also not provided at the public bus stops. The respondents added that the public transport in Sinza is sometimes not reliable as it takes 30 minutes or more waiting for such public transport.

Through direct observation, the author observed 13 Public Bus Stops (*daladala stops*) located along Shekilango and Tandare-Uzuri Road. The interval from one public bus stop to another ranged between 150-550 meters length. However, across the 13 min-bus stops, the walking environment was not convenient and comfortable. The sitting benches, standing and shade instruments were lacking. Passengers had to trespass and stand under a tree (in a privately owned area) while waiting for the public buses to come. Not only that, but also parking spaces were not clearly earmarked, and zebra crossings at these important points were missing.



Source: Fieldwork in Sinza, April 2015

Figure 8. 8: Passengers waiting for public min-bus transport along Shekilango Road

8.1.6 Exclusion from urban mobility

To understand how people perceived the issue of inclusion, all the 31 respondents were interviewed (25 resident households and 6 pedestrians). All the 31 respondents perceived that pedestrians in Dar es Salaam are excluded from the urban mobility. When asked whether the street patterns and the road networks in Sinza are inclusive (including people with disabilities), all the 31 respondents strongly disagreed. According to the respondents, lanes segregated for pedestrians and other non-motorised means of transport are lacking. As a result, the road space is usually shared by different means of transport including cars, motorcyclists (bodaboda), try-cycles (bajaji), pedestrians, cyclists, three wheelers and pushcarts. The infrastructure facilities for people with disabilities like the visually impaired were also lacking. The respondents further complained that the public mini-buses operating in Sinza and in other parts of the Dar es Salaam City are not friendly to people with disabilities.

One of the resident households interviewed, Mr. Kisale, a 34 years aged, an artist noted: *“We always walk in the same roads with cars, bodaboda, bajaji, bicycles, three wheelers and pushcarts. We are sometimes forced to walk along the edges of the roads bordering the open side drainage systems. This situation makes us vulnerable to road accidents. For instance, in January 2015, when I was cycling along the busy Shekilango road, I was badly pushed aside by a motorcyclist. I was almost about to fall down into the side drainage system which was full of dirty water”*

Through observations, the author noted exclusion manifested by lack of non-motorized infrastructure in Sinza neighbourhoods. The collector/distributor roads as well as the residential access roads lacked sidewalks. Pedestrians were using the same carriageway with vehicular traffic or walking along the shoulders of the road, thereby mixing up with the other means of transports. In some places, pedestrians were forced to walk very close to the open storm water drains (Figure 8.9). The roads were being constructed without regards to pedestrians’ needs.



Source: Fieldwork observations in Sinza, April 2015

Figure 8. 9: Exclusion of pedestrian infrastructure along collector and access roads in Sinza

Figure 8.9 illustrates that the infrastructure for pedestrians and other non-motorized residents are completely excluded. This includes lack of sidewalks along the collector/primary distributor and access roads. This implies that pedestrians (including people with disabilities) seem to escape the attention of the spatial and transport planners in the designs. The designs of areas like Sinza do not seem to augur well with the SDGs, Goal 11 which aims to make cities inclusive, safe, resilient and sustainable.

8.1.7 Uncomfortable and un-attractive walking environment

All the 31 respondents in Sinza consider the walking environment to be in poor condition. When asked whether the walkways/access roads and footpaths in Sinza are passable throughout the year, all the 31 respondents strongly disagreed. None of them was satisfied with the conditions of the access roads and footpaths. It was reported that with an exception of the collector/ primary distributor roads like Shekilango and the busy Sam Nujoma Road, the rest of the residential access roads are unpaved and subsequently lacked walkways. Walking in Sinza was reported to be uncomfortable due to poor road condition, and the lack of pedestrian infrastructure including disability infrastructure. The residential access roads and pedestrian footpaths generally are muddy, rugged and dusty, narrow and full of pot holes. Similar findings were also observed by Dunge (2014).

During household interviews, one of the residents interviewed, Happyness Mushi, a 48 aged, a nurse by professional explained the situation like this: *“It is not only in Sinza where access roads and walkways are in poor condition, but almost the whole of Kinondoni Municipality the situation is the same. The Access roads in our settlement are narrow, muddy, rough and full of pot holes. We are used to walk on muddy roads*

which are always flooded with water even during dry season resulting from waste water released from Individual plots. When it rains, the area is difficult to walk on, but as soon as it stops raining all the water get dried up. This is due to the nature of the soil in Sinza; normally it doesn't retain water for a longer time".

Furthermore, haphazard disposal of garbage and the uncontrolled discharge of liquid waste litter the access roads and footpaths in Sinza, a situation which further aggravates the walking inconvenience and may expose pedestrians to health hazards. The haphazard discharge of both solid and liquid waste together with the rugged and muddy state of the roads pose many challenges to pedestrians, including being sprinkled with dirty water by motorists and also the physically challenged persons fail to use their three wheelers due to the accumulated garbage and hence delays to destinations. Ally Mshana, 42 years old, a street vendor and who is a resident of Sinza D explained as follows: "When it rains, it is an opportunity for some of the Hotel owners, operators of open air bars/pubs and the food vendors to discharge their liquid waste direct on the access roads and footpath. These situations often expose pedestrians to health related risks. If you walk along Mawela Road to Skyway Hotel, you will witness a lot of waste water flowing along the road".

Through direct observation, the researcher witnessed the poor condition of the access roads. With an exception of the collector roads, all the residential access roads and footpaths were unpaved, dusty, narrow, full of pot holes and muddy, especially when it rains.



Source: Fieldwork in Sinza, April 2015

Figure 8. 10: Conditions of the walking environment in Sinza Streets

Figure 8.10 shows that both the residential access roads and footpaths are in poor condition and exclude pedestrian requirements. During the time fieldwork was being conducted (i.e. April 2015), the road to the right (Lion Road) was under construction. Despite the growing challenges, especially among pedestrians in Sinza and Dar es Salaam City in general, yet this road section was implemented without consideration of pedestrian walkways (Figure 8.10).

To make walking easier within the settlement, Sinza residents have devised coping strategies. Since the existing drainage channels along the busy roads like Shekilango road have not been adequately provided with crossing platforms, residents have erected temporary plate form (Figure 8.11.).



Source: Fieldwork, April 2015

Figure 8. 11: Improvised temporary pedestrian crossing platform along Shekilango Road in Sinza

It is not only the poor road condition, but also the pedestrian amenities like dust bins, street light to facilitate night walking, sitting benches and public toilets were also lacking. One of the Subward/Mtaa leaders in Sinza 'D' confirmed this by noting: *"I have never seen a public toilet in any residential neighbourhood of Sinza and Kinondoni Municipality in general. I have seen neither benches nor street lights installed along the streets and Daladala stops. I often think these facilities may be are only essential in the Central Business District. I do not think if we really need them in residential areas like Sinza"*

However, according to the Ministry of Infrastructure Development annual report of 2011 only 180 kilometers (32.5%) out of 553 kilometers is paved within the Kinondoni Municipality. These comprise largely the national roads which fall under the jurisdiction of TANROADS. Local roads which are under the Kinondoni Municipal Council, including those in Sinza ward are unpaved. It appears that the government has concentrated on paving/tarmacking primary and secondary distributor roads within or surrounding residential neighbourhoods, but giving little attention to residential access roads and footpaths which are rugged, muddy and dusty.

8.2 Sub-case 2: Kariakoo City Centre

Introduction

This section analyses the way people perceived the walking environment in Kariakoo City Centre. The analysis is based on similar variables, namely; connectivity of the pedestrian network, safety and security, accessibility to public facilities and convenience and attractiveness of the walking routes are used. The scale used to rate the walking environment constitutes five levels: strongly agree, agree, neutral, disagree and strongly disagree). To understand people's perceptions a total of 20 resident households, 14 pedestrians and 7 school children were interviewed. However, with regard to accessibility to public facilities, only the resident households were interviewed. The respondents interviewed in Kariakoo had the following perspectives.

8.2.1 Lack and blockage of walkways

All the 34 (100%) respondents interviewed in Kariakoo perceived the pedestrian network as not connected/continuous. It is constrained by permanent and temporary barriers. When asked whether the pedestrian network in Kariakoo is continuous/ connected from home to various land use destination, all the 20 resident respondents strongly disagreed. According to them, all the commercial and residential access roads in Kariakoo lack sidewalks, except some parts along the distributor roads such as Uhuru, Msimbazi and Lumumba. Even where walkways exist, still they are often blocked by parked cars, street vendors and other informal vending activities. As a result, pedestrians compete for the same space with the car traffic flow, motorcycles, try-cycles, pushcarts and bicycles.

Likewise when asked to respond to the same question, both the 14 pedestrians and seven school children interviewed also strongly disagreed. They perceived the pedestrian networks as being disconnected. The combination of motorized and non-motorised traffic was reported to be a serious problem that makes walking difficult, uncomfortable and unsafe for pedestrians.

One of the pedestrians interviewed along Mkunguni/Swahili Street, Hamisi Kulangwa, a 40 years old, shoe shiner complained: *"The infrastructure development in the City never take care of pedestrian rights to walk. I always ask myself; are the animals in rural villages more valuable than pedestrians in urban areas? For instance, in my rural village, the cattle routes are separated from footpaths/access roads. Streets in Kariakoo completely lack separate lanes for pedestrians, except along Uhuru, Msimbazi and Lumumba roads. However, even where provided, already they are obstructed by parked cars, street vendors, informal vending activities and building extensions. As a result, we use the same carriage-way, thereby interfering with vehicular traffic, motorcyclists, cyclists and pushcarts. The pedestrian network in Kariakoo is not inter-connected at all. Besides pedestrians we are often also prone to road accidents"*

The researcher witnessed pedestrians sharing the same carriage-way with vehicular traffic and non-vehicular users such as motorcyclists, cyclists, pushcarts and street vendors (Figure 8.12). This was contributed by the lack of segregated lanes for pedestrians coupled with the encroachment of the existing walkways/pedestrian spaces by other land use activities like car parking and informal vending activities. The problem was common along the main distributor roads (Uhuru, Msimbazi and Lumumba) and along the commercial streets like Congo.



Source: *Fieldwork in Kariakoo, March 2015*

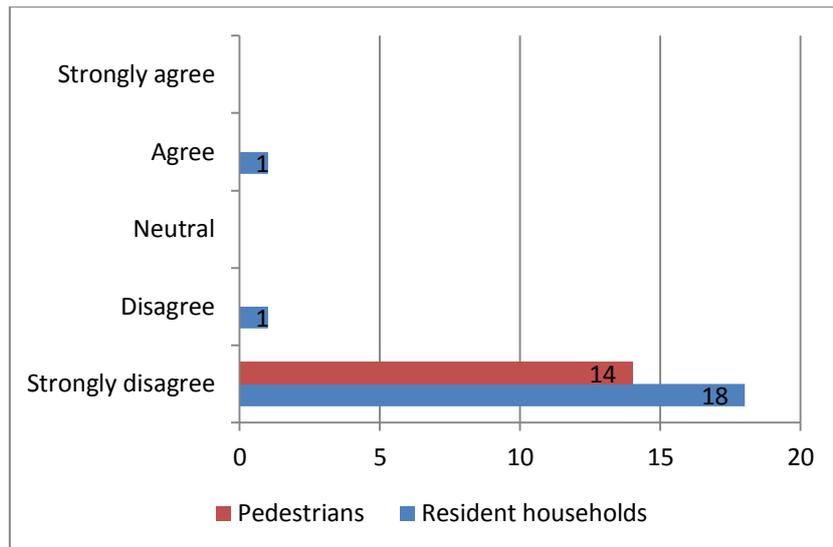
Figure 8. 12: Pedestrian mobility blocked by street vendors and parked cars along Congo and Uhuru Streets

As noted in the Streets, almost all the commercial streets in Kariakoo lacked walkways, and were invaded by street vendors. In some cases, the continuity of pedestrian walkways along shopping arcades was interrupted by developers who have closed the walkways fronting their shops. These activities led to overcrowding and traffic congestion along the street, making walking difficult and unsafe for pedestrians. Because of high population in these streets, pick-pocketing was also reported to be widespread.

When the public space is contested, certain land uses tend to dominate over the others, in such a way that the weaker users like pedestrians are pushed aside. This is what is happening in Kariakoo area and other settlements within the City.

8.2.2 Unsafe walking environment

Almost all the respondents (i.e. 33 out of 34) said they felt unsafe walking in Kariakoo. When asked whether the walking environment in Kariakoo was safe, the majority of the resident respondents strongly disagreed. Likewise, all the 14 pedestrians interviewed strongly disagreed; they felt it was dangerous to walk in Kariakoo streets due to high traffic congestion. Motorised and non-motorised traffic were forced to compete for the same narrow road space. Figure 8.13 shows the agreement levels by the resident respondents and pedestrians regarding safety on the walking environment.



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 13: Attitudes of the respondents on safety from danger

Crossing safety in Kariakoo

When asked to respond whether they had been victims of road accidents in Kariakoo, one of the pedestrians interviewed, Katambi Ally, a 30 years, resident of Vingunguti and a businessman selling tires at Mkunguni Street agreed that he has been a victim of road accidents: *“Crossing the busy roads like Msimbazi is challenging and dangerous to pedestrians, especially the elderly, school children and people with disabilities. I am among the victims of road accidents in Kariakoo. Just look at my arm and my tooth here, these are the actual signs remained after being injured by a motorcyclist (Bodaboda). It was in June 2014, when I was crossing the busy Msimbazi road to the other side of the road. As I was crossing the road, I was badly crushed and pushed aside by a motorcyclist (bodaboda) to the extent that my left arm was injured and I had my fore tooth broken. When was still lying down, a public mini-bus (daladala) was coming at high speed. It took me almost three months to recover and I remained jobless for three months. I incurred more than 50,000 TZS for treatment. Generally, the walking environment in Dar es Salaam is difficult and dangerous”*



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 14: A respondent demonstrating his body injured hand

Mr. John Charles, a 28 years, a street vendor added that though he had not been victimized, he knew three of his friends whose deaths were caused by road accidents in Kariakoo. He added: *“Though I am not one of the victims of road accidents, but I know three friends of mine who died because of the road accidents when they were crossing Msimbazi road. One of them was crushed by a motorist in 2013 when he was crossing the busy Msimbazi road and died on the spot. The other two friends died in 2014 after being crushed by the fast moving cars. In-fact, walking in Kariakoo and other parts within the City is very dangerous”*

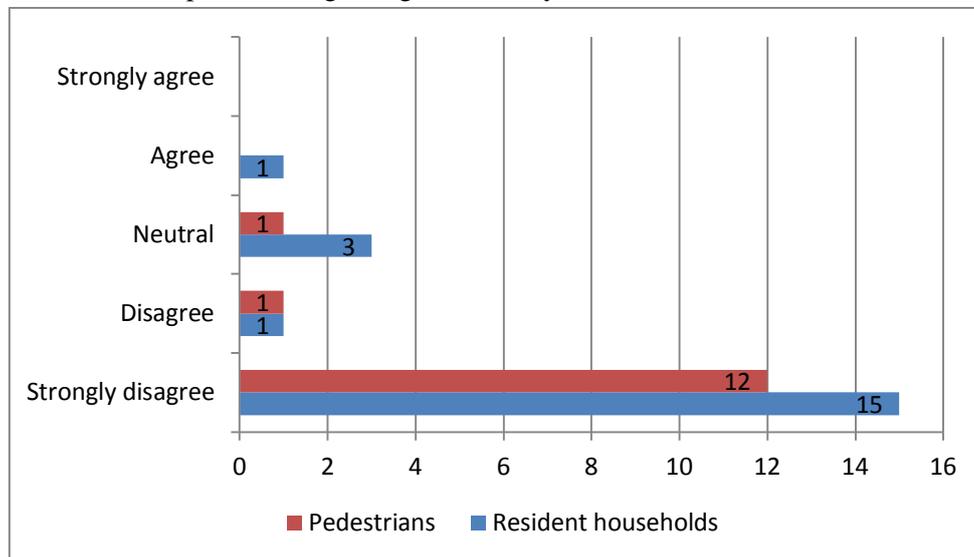
Mr. Maingu Haruna, a 46 aged shopkeeper in Kariakoo had this to say: *“Though I have not been victimized, but I know many people who have been injured and died because of road accidents. For instance, in 2012,*

I witnessed two school children who died of fatal road accidents along Kawawa road. Both of them were crushed and died on the spot by a fast moving car, while they were crossing to the other side of the road. The issue has been contributed by lack of crossing zebra and road bumps along the busier roads.”

The quotes above show that the walking environment in Kariakoo and Dar es Salaam City as a whole is poor and dangerous. Pedestrian infrastructure like sidewalks, zebra crossings and other traffic calming measures are not in place. The field observation also revealed that zebra crossings were not provided at all along Msimbazi and Uhuru Streets. For instance, from Morogoro road/Msimbazi junction up to the Nyerere road there is neither zebra crossings nor road median. Likewise for Uhuru road, starting from Lumumba/Uhuru junction to Karume traffic lights at Ilala Boma, zebra crossings were lacking as well.

8.2.3 Insecure from crime

When asked whether the walking environment in Kariakoo is secure from crime, 27 out of 34 respondents strongly disagreed. While two respondents disagreed to a certain extent, only one respondent to some extent agreed that the walking environment was secure from crime. Figure 8.15 summarizes the views of the respondents regarding the security from crime.



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 15: Views of the respondents on the extent of secure from crime in Kariakoo

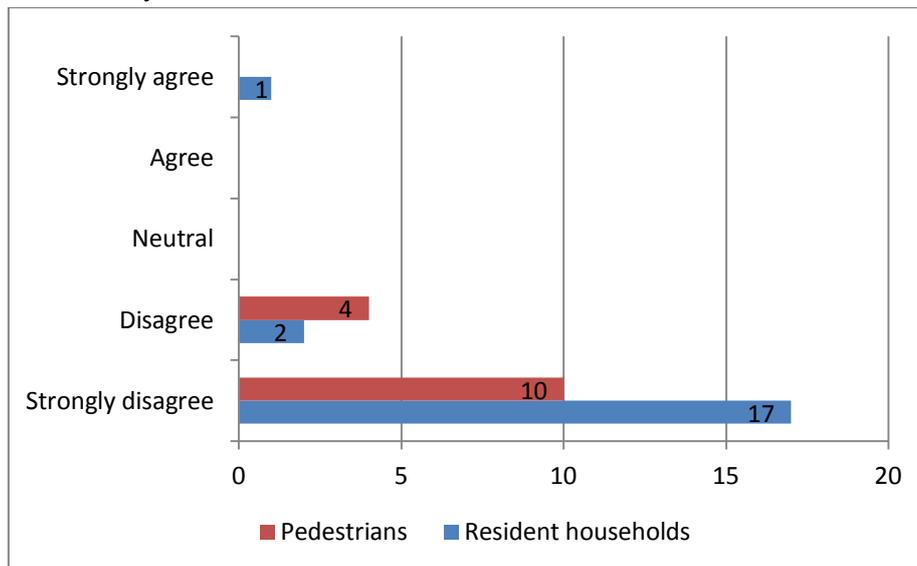
Figure 8.15 shows that the majority of both the resident respondents and the pedestrians interviewed felt insecure to walk in Kariakoo streets. According to them, one has to be quite conscious and careful of muggers while walking in the area. Pick-pocketing of items like mobile phones, hearings, wallets and snatching of handbags and laptops were reported to be very common in the area. The issue is attributed to the concentration and overcrowding in the streets; also street lights are lacking. The lack of street lights in the area was reported to have made protection against crime more pervasive especially during the night. In turn, this has rendered the quality of walking spaces to be poor.

When asked to justify whether they had been the victims of crime issues in Kariakoo, some of the respondents shared their real life experiences. One of the pedestrians interviewed, Hamis Ramadhan, a 35 years aged, a launder in Mzizima Street said that he has been a victim for two times. He explained as follows: *“It was in May, 2014 at Fire public bus stop (daladala stop) when I was scrambling to boarder a daladala to Ubungo. As I had just got into the bus, I had my mobile phone, my money wallet and a sum of 35,000 TZS already stolen. The second time was in August 2014 when I was walking around the Kariakoo Market. Suddenly, I felt like someone was beating my shoulder. When I looked around to see who has beaten me, already my mobile phone (Nokia) together with a sum of 55,000 TZS had already been pick-pocketed by unknown person”*

Moreover, Farida Salum, a 37 years old, a resident of Aggrey Street, and who was one of the Ten Cell leaders at Kariakoo-Magharibi sub-ward was quoted saying: “I am among the victims of crime issues in Kariakoo. One day in 2013, when walking along Congo Street (which is always congested by street vendors), my hearings and my mobile phones were stolen unknowingly. You need to be very careful with your bag, especially when walking along the overcrowded streets like Congo, Uhuru, Jangwani, and at the daladala stops (i. e Public Bus Stops). Nowadays the sale of fake mobile phones nicknamed ‘Kanyaboya’ has become very common here in Kariakoo”.

8.2.4 Un managed uses of roads by motorists

With regard to the respect of motorists, the majority noted that they had little regard to pedestrians but more to motorists. About 27 out of 34 respondents in Kariakoo strongly disagreed and ascertained this; while the other six respondents to some extent disagreed. Only one respondent strongly agreed that motorists in the area respected pedestrians. Figure 8.16 shows the agreement levels regarding the respect of pedestrians by motorists in Kariakoo.



Source: Fieldwork in Kariakoo, March 2015

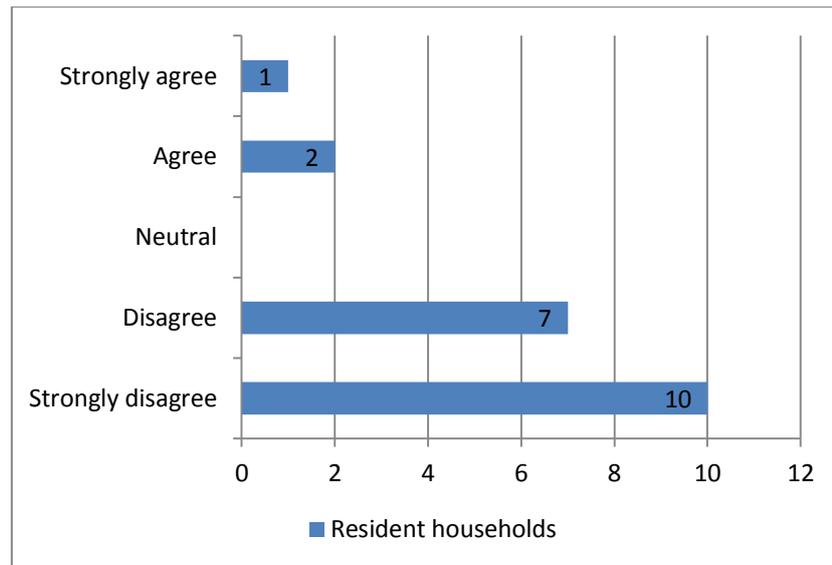
Figure 8. 16: Views of the respondents towards the respect by motorists in Kariakoo

Figure 8.16 indicates that the majority of the respondents are not satisfied with the motorists’ behaviour. According to the respondents, most road accidents in Kariakoo area and the City in general are often contributed by the unmanaged road use behaviour of motorcyclists (*bodaboda*), and the public bus drivers (*daladala*). The two cannot be expected to give way for pedestrians to cross the road; they are always in a hurry to meet their daily targets of making many commercial trips per day. In the busy roads like Msimbazi, the motorists normally tend to over speed with no respect of other road users and without considerations of the high volume of pedestrians using the same road.

8.2.5 Inconveniently located public facilities

Similar to Sinza, the accessibility to public facilities focused on the resident respondents. Pedestrians were excluded as they were thought to have little knowledge of where these facilities are located in the area. The essence was to understand whether the public facilities in Kariakoo were accessible within walking time and/distance (400 to 800 metres).

Out of 20 resident respondents, 17 perceived that most public facilities, but local shops were inconveniently located. Only three residents were of the opinion that the public facilities are conveniently located. The agreement levels regarding whether the public facilities in Kariakoo were accessed in 5 to 10 minutes are presented in Figure 8.17.



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 17: Agreement levels on whether public facilities are accessible within a convenient walking time

Figure 8.17 shows that half of the resident interviewed in Kariakoo i.e. 10 out of 20 resident respondents strongly disagreed, meaning that the public facilities were inconveniently located. Likewise, seven respondents disagreed to some extent. The next section presents the estimated time resident respondents (20) take to reach to public facilities.

Accessibility to commercial facilities in Kariakoo

Based on the household interviews, the majority of the respondents (i.e. 15 out of 20) accessed local shops within 10 minutes time. Besides, only seven resident respondents accessed market facility within a convenient walking time. Summary in Table 8.4 is for more details.

Table 8. 4: Time taken to access commercial facilities in Kariakoo

Time taken (in minutes)	Local Shops		Local Markets	
	Respondents	%	Respondents	%
1-10	15	75.0	7	35.0
11-20	5	25.0	8	40.0
21-30	-	-	2	10.0
31-45	-	-	3	15.0
Total	20	100	20	100

Source: Fieldwork in Kariakoo, March 2015

As can be noted in Table 8.4 the local shops are more accessible than market facilities. The majority of the respondents (13 out of 20) spent between 11 and 45 minutes to get into the market place. The Kariakoo market was the only market serving the four wards of Kariakoo. The resident-households living in the peripheral streets like Mzizima, Jangwani and Mhonda walk for about 1kilometers to access the market.

Accessibility to education, health and religious facilities in Kariakoo

Approximately, 17 and 18 resident respondents spend more than 10 minutes to accessed primary schools and health respectively. Only three and two residents accessed primary schools and health services within a period of 5 to 10 minutes respectively. Regarding access to religious facilities, the majority (13 out of 20) accessed worship places within 5 to 10 minutes; some especially the Muslims spend much less time because sometimes they have a prayer room within their houses. Seven spent more than 11 minutes to get into their worship places. Table 8.5 summarizes the time taken by the resident households to access social services (education, health and religious facilities) in Kariakoo area.

Table 8.5: Time taken to access community facilities

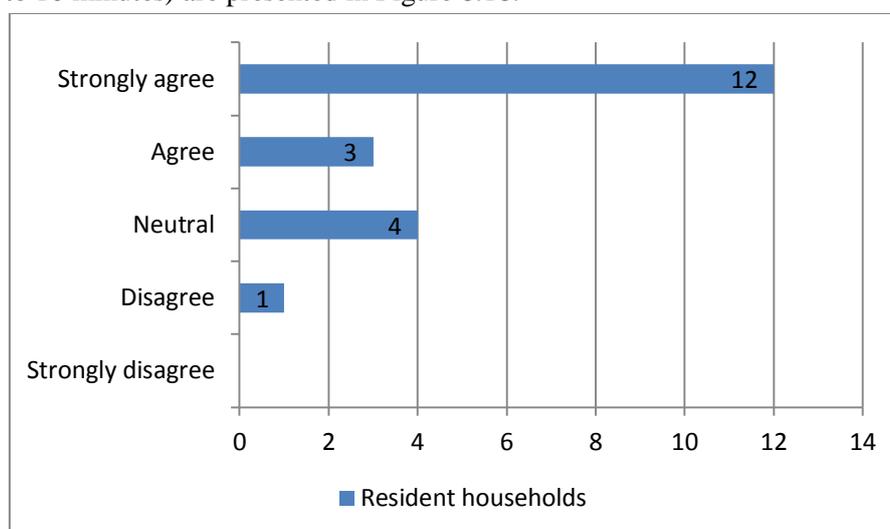
Time taken (in minutes)	Primary School		Health services		Worshipping places	
	No	%	No	%	No	%
1-10	3	15.0	2	10.0	13	65.0
11-20	9	45.0	3	15.0	4	20.0
21-30	-	-	1	5.0	2	10.0
31-45	5	25.0	10	50.0	-	-
46-60	1	5.0	2	10.0	1	5.0
>60	2	10.0	2	10.0	-	-
Total	20	100	20	100	20	100

Source: Fieldwork in Kariakoo, March 2015

Table 8.5 shows that access to health facilities seem to be more difficult than primary schools and worship places. Out of the 20 residents, 8 and 14 respondents spent more than 31 minutes to get into schools and health facilities respectively. It can be concluded that primary schools and health facilities in Kariakoo are not conveniently located. The school children from the central Kariakoo access primary schools in the adjacent settlements, specifically at Uhuru Mchanganziko, Lumumba, Mchikichini, Mtendeni, Kigogo and Kidongo Chekundu, which are located between 1 and 2 kilometer from the Kariakoo market.

Accessibility to public bus stops in Kariakoo

The majority of the resident respondents were satisfied with the location of public bus stops in Kariakoo. When asked whether the public bus stops are conveniently located (i.e. within 5 to 10 minutes walking time), 12 out of 20 respondents strongly agreed. Similarly, three residents agreed to a certain extent. Summary about the agreement levels on whether the public bus stops were conveniently located (within 5 to 10 minutes) are presented in Figure 8.18.



Source: Fieldwork in Kariakoo, March 2015

Figure 8.18: Attitudes of resident households towards accessing public bus stops in 5-10 minutes

As Figure 8.18 shows, the majority of the resident interviewed perceived that the public bus stops in Kariakoo were accessible within a walking time. Only four respondents could not tell whether they are conveniently or inconveniently located. All the 20 resident households were asked to estimate the time they take to reach the nearest public bus stop. Table 8.6 presents the responses.

Table 8.6: Access to Min-bus public transit stops

Time taken	No of respondents	Percentage
1-10	13	65.0
11-20	6	30.0
21-30	1	5.0
Total	20	100

Source: Fieldwork in Kariakoo, March 2015

Table 8.6 shows that out of 20 residents interviewed, 13 accessed public bus stops within a 10 minutes walking time. Only a few (seven out of 20) spend between 11 and 30 minutes to access the nearest public bus stop. These results to some extent are in line with their perception levels (Figure 8.5) where 12 of the respondents strongly agreed that the public bus stops are located within convenient walking time.

Following the field observations conducted in March 2015, six public bus terminals existed. These public bus stops were in most cases servicing the privately operated public buses (*daladala*). However, across the six public transport terminals, bus-bays, passengers shade devices, public toilets, standing and sitting amenities like benches and street lights were lacking (Figure 8.19).



Source: Fieldwork in Kariko, March 2015

Figure 8. 19: Passenger waiting for public buses at Congo/Uhuru Street and Simba Sports Club building
 At the time the researcher went for phase 2 fieldwork studies in Dar es Salaam, the newly BRT system was already operating in Kariakoo area. This increased accessibility to public transit stops as there were three BRT stops within Kariakoo i.e. at Fire, Msimbazi and Gerezani areas. Unlike the privately operated public buses, the new BRT system was very reliable, efficient and friendly to people with disabilities. The BRT stops were provided with pedestrian amenities such as dustbins, passengers shade devices, public toilets at the four BRT terminals (i.e. Kimara, Morocco, Kivukoni and Gerezani), and a few benches for the elderly and other physically challenged persons. Moreover, it should be made clear that together with the introduction of the newly BRT system in Kariakoo area, the privately operated public buses (*daladala*) were then still operating in the area. In Kariakoo, it is only the Msimbazi distributor road where the newly BRT system operates.

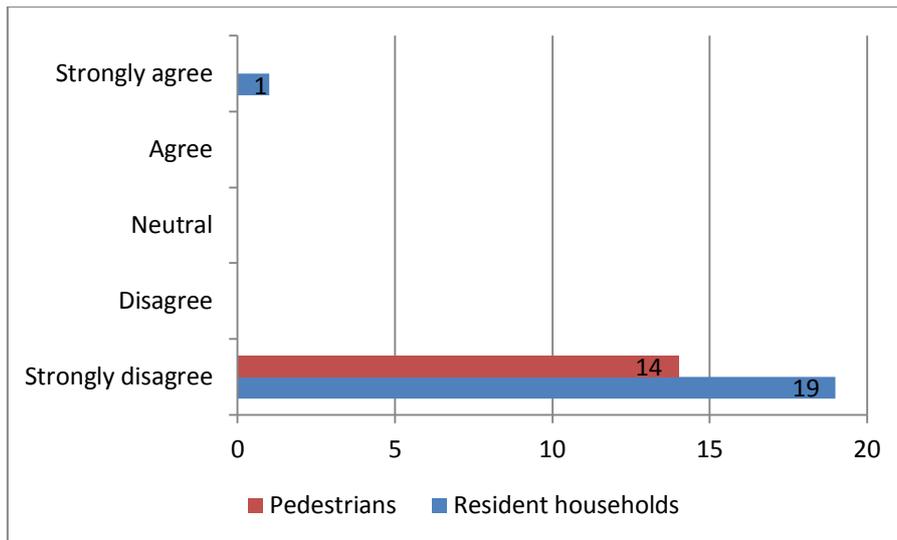


Source: Fieldwork in Kariakoo, August 2016

Figure 8. 20: BRT stop Msimbazi at Msimbazi Street.

8.2.6 Exclusion from urban mobility

The majority of the respondents interviewed felt that pedestrians, including people with disabilities are excluded from convenient access to the transport services. When asked whether the streets in Kariakoo are inclusive (including pedestrians and people with disabilities), 33 out of 34 respondents strongly disagreed. Surprisingly, one respondent strongly agreed that the streets in Kariakoo were inclusive to all users. Figure 8.21 shows the views of respondents regarding inclusive mobility in Kariakoo area.



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 21: Attitudes of the respondents towards inclusive mobility in Kariakoo

The majority of the respondents (i.e. 19 out of 20) and (all the 14 pedestrians) strongly disagreed. In their opinion, the area lacked lanes segregated for pedestrians only, including people with disabilities. Even where they exist, they are often encroached upon by motorists and street vendors. As a result, pedestrians, including the handicapped, visually impaired persons, three wheelers and other with challenging physical disabilities were suffering and exposed to road accidents. Also the privately operated public-buses and the increasing high-rise buildings located in Kariakoo are not user friendly, especially for people with disabilities. As a result, some cannot access their basic needs.

Giving her own experience suffered by people with disabilities, Salma Hoza, a 37 years primary school teacher and a resident of Gerezani area, and who is a visually impaired explained that she has fallen in drain and injured by a group of street vendors. She narrated her story: *“Initially, I used to live in Kijitonyama while working in Kariakoo. In 2012 when walking along Uhuru road in Ilala Boma, opposite to the Regional Commissioner’s Office, I was accused of hitting and breaking juice glasses of a certain food vendor who was operating in the pedestrian space. I do not see properly, I suffer from impaired vision. When I hit those glasses, suddenly a crowd of street vendors came closer and started beating me up. I was badly injured. After the incidence, I phoned my head teacher to inform her of what had happened. As we had finished our talk, the head teacher sent one of our staff members to come and assist me. The vendor required him to pay 20,000 TZS. Since on that day, the Headteacher decided to relocate me in a house within the school campus. In September 2013 I moved to Uhuru Mchanganyiko Primary School. The second incidence was in March 2015. When walking along Uhuru Road, during when the road was under construction, I fell in an open drainage which was full of dirty water. All these happened because of lack of segregated lanes for pedestrians and infrastructure for people with disabilities”*

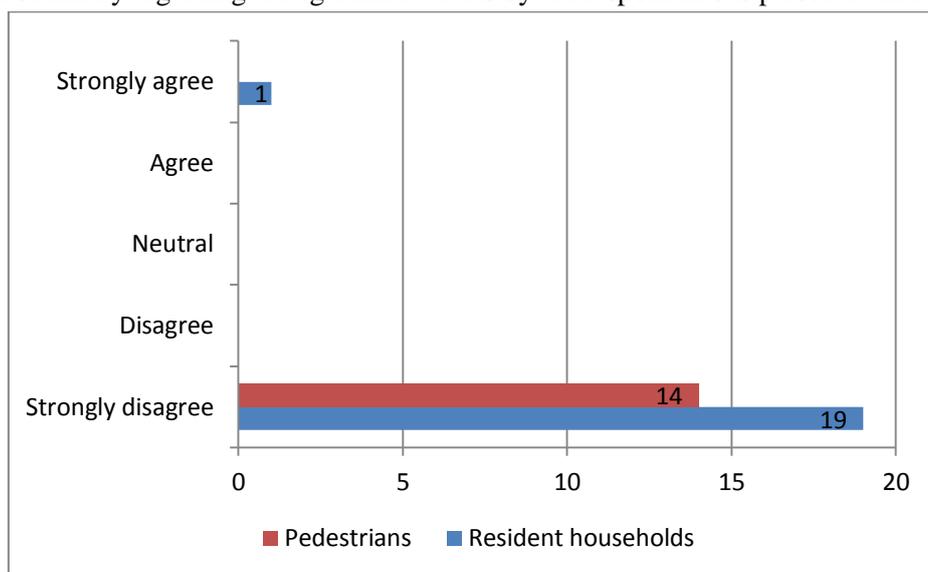


Source: Fieldwork in Kariakoo, April 2015

Figure 8.22: People with disabilities without space dedicated to such users

8.2.7 Poor condition of walking route

The majority (97.1%) of the respondents reported that the walking environment in Kariakoo is in poor condition, especially when it rains. When asked whether the walking routes (access roads and footpaths) were passable throughout the year, only one respondent strongly agreed, meaning that the walking environment in the area was pleasing. The majority i.e 33 out of 34 respondents strongly disagreed. The summary regarding the agreement levels by the respondents is presented in Figure 8.23.



Source: fieldwork in Kariakoo, March 2015

Figure 8.23: Attitudes of the respondents on whether the walking routes are passable throughout the year

Figure 8.23 shows that the majority of the respondents were not satisfied with the quality and condition of the walking environment. According to the respondents, Kariakoo streets are narrow, dusty and muddy with numerous potholes and stagnant water pools during the rainy season. The footpaths were also in poor condition and uncomfortable for walking. With an exception of some few sections along Uhuru, Msimbazi and Uhuru Street, the rest walkways/footpaths are generally in poor condition, especially when it rains. Almost all footpaths and the access roads are dusty during the dry season and muddy during rainy season. Some footpaths are too narrow and unsafe for walking. In some instances, they are less than a metre wide. In some spaces, garbage was haphazardly dumped or burnt, creating polluted and smoky environments despite the fact that each resident household pays 10,000 TZS per month for garbage collection services.



Source: Fieldwork in Kariakoo, March 2015

Figure 8. 24: Condition of access roads and footpaths in Mzizima Street, Kariakoo

As can be viewed from figure 8.24 above, access roads and footpaths in Kariakoo are generally in poor condition. In addition, the field observation revealed that that walking, standing and sitting activities were poorly promoted due to lack of standing and sitting facilities. Pedestrian amenities such as benches, public toilets, dustbins, shade tree, covered street arcades and street lights to facilitate night walking were also lacking. The next section presents the pedestrians' perspectives on the walking environment in Buguruni settlements.

8.3 Sub case 3: Buguruni - upgraded informal settlements

Like Sinza and Kariakoo, all the 35 respondents in Buguruni were asked the same question regarding their perceptions towards the walking environment. The focus was on the connectivity of the walking routes, safety and security needs, accessibility to public facilities including public bus stops and convenience and attractiveness of the walking environment. The ranking scale also was also maintained to include five levels: Strongly agree, agree, neutral, disagree and strongly disagree. Respondents' responses as follows:

8.3. 1 Lack and blockage of walkways

All the 35 respondents perceived Buguruni settlements as lacking pedestrian walkways. Even where provided, such as along Uhuru and Mandela Road, like in other case studies (i.e.Kariakoo and Sinza) they are blocked by street vending activities and used by cars/motorcycles. When asked whether the pedestrian network in Buguruni-Mnyamani/Madenge are continuous and free from obstructions, all the 27 resident respondents and the 8 pedestrians interviewed, strongly disagreed; implying that the pedestrian network in Buguruni is not smoothly interconnected.

The respondents further observed that the upgraded roads in study areas were not provided with sidewalks. Only carriageways for motorized traffic were improved despite being the lower income settlements, whereby walking is the mainly means of transport among the majority of the inhabitants. Pedestrians were often forced to use the limited space with motorised and other non-motorised users. In the areas that were not upgraded most people walk along the narrow and naturally meandering footpaths (most of which were less than one meter width) and along the railway-lines running through these settlements to the south.

One of the respondents interviewed, Tabu Njika, a 45years, handicapped person, and a vegetable vendor in the area explained about the lack of walkways and the encroachment of the existing ones noting: *"In Buguruni settlements, there are no segregated pedestrian lanes, except some parts along Mandela and Uhuru Roads. Even where they exist, they are often encroached upon by street vendors, parked cars, motorcycles and other informal sector activities. For instance, if you pass through the Uhuru and Kalemba Road junc-*

tion, opposite to Hekima Primary School, the walkways are completely blocked by parked motorcycles (Boda-boda) and carpentry activities. Despite the narrow width of the upgraded roads in areas along Mnyamani Road, it is still congested with cars, motorcyclists, try-cyclists, pedestrians, cyclists and pushcarts. We pedestrians have to use the same space with the vehicular traffic; which is very dangerous for us, especially for people with disabilities like me”

The quotation above implies that there were complaints regarding the non-consideration of pedestrian needs along the upgraded access roads as well as the encroachment of the few existing walkways along Mandela and Uhuru Roads by motorists and informal vending activities. A similar situation was observed in other areas (Figure 8.12 and 8.25).



Source: Field observation, February 2015

Figure 8. 25: Obstructed walkways at Uhuru-Karembu junction in Buguruni-Madenge

The situation was not different along Mandela and Mnyamani Road and other major internal access roads within Buguruni settlements. The explanations given by the respondents and problems facing pedestrians in the settlements were vividly clear during the field visits.

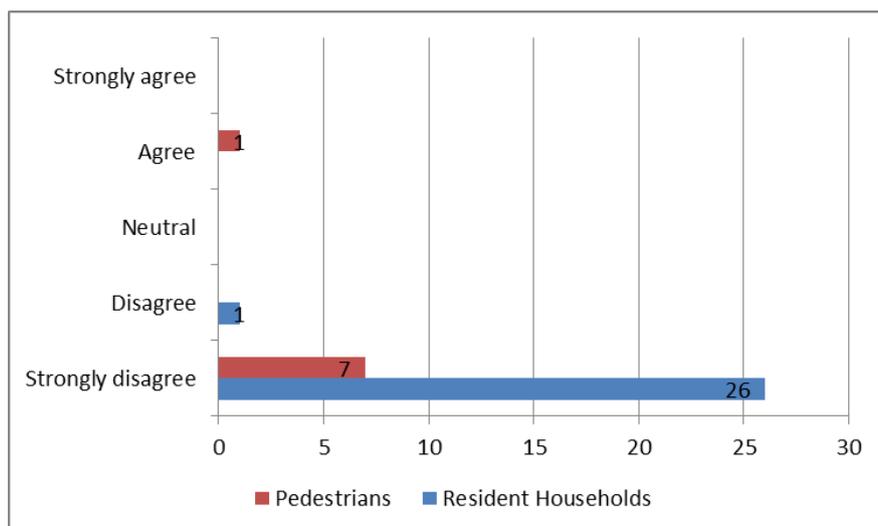


Source: Fieldwork in Buguruni-February 2015

Figure 8. 26: Pedestrians using the same space with motorized traffic and using an open area along the railway. From Figure 8.26 above, it is notable that the lack of pedestrian infrastructure is a serious problem in Buguruni settlements and other settlements within the City.

8.3.2 Dangerous walking environment

The majority of the respondents perceived the walking environment as very dangerous. When asked whether the walking environment was safe, almost all the respondents i.e. 34 out of 35 strongly disagreed. Figure 8.27 shows the views of the residents and pedestrians regarding the safety of the walking environment in Buguruni upgraded informal settlements.



Source: Fieldwor, February 2015

Figure 8. 27: Views of the respondents on safety of the walking environment

Figure 8.27 shows that the majority of the respondents were of the opinion that the walking environment in Buguruni is unsafe. According to them, the problem is attributed to the lack of segregated walkways and managed traffic, especially motorcyclists and drivers of the privately operated public buses. Due to the lack of walkways, pedestrians have to use the same lane with motorized traffic, thereby increasing the risk of being hurt by motorised traffic.

Safety crossing in Buguruni

Crossing along the busy roads in Buguruni such as Mandela, Uhuru and Mnyamani Roads was reported to be equally challenging and dangerous, especially school children, people with disabilities and the elderly. To depict the real situation, a respondent Athuman Shabani, a 43 years aged, resident and a security guard cum food vendor in the area, had this to tell: *“Walking along the upgraded Mnyamani Road is very dangerous, and many people have been injured and killed. I have also been one among the victims. In July 2014, when crossing the Mnyamani Road to the other side of the road, I was knocked down by a motorcyclist (bodaboda) who did not even stop but disappeared when I fell down. I lost my senses and became unconscious. People thought I was dead. My right-leg was badly injured and I was hospitalized for some days”*

The problem of lack of motor traffic safety at road crossing in Buguruni-Mnyamani was also reported by another resident household who witnessed his neighbour being hurt and killed by a motorist. Mr. Juma Seif, a 32 years old, a vegetable vendor who has lived in Buguruni-Mnyamani for over 15 years noted: *“I have lived in Buguruni-Mnyamani for more than fifteen years. My life experience of walking along the Mnyamani Road is that it is dangerous and challenging. In 2013, my neighbour, the late Said Mwinyi Mkuu was hit and killed by a motorcyclist while trying to cross the road. The problem here is that, despite the fact that the Mnyamani Road is very narrow to accommodate all the street users, it is used by many un-managed motorized and non-motorised users including pedestrians and street vendors. The upgrading program did not consider pedestrians at all, rather, motorists were favoured”*

Similarly, the school children interviewed at Hekima Primary School complained about safety at the road crossings in Buguruni – Mnyamani & Madenge settlements. They pointed out that it is difficult for them to walk and cross the busy roads like Mandela, Uhuru and Mnyamani on their own. They often request for adults nearby to assist them to cross the busy road. According to the interviewed school children, pedestrians are not given priority at these important crossing points. When asked to explain about the means of transport they use to get to school and the challenges they encountered, Salum Shaban, a 9 years old standard three pupils at the Hekima Primary School narrates: *“I live in Mnyamani, but there we do not have any primary school and that is why we are schooling here. In order for me to arrive at school, I always wake-up early in the morning and start my journey by walking through the natural*

meandering footpaths. Thereafter, I shift to the dusty and muddy roads before reaching the Mnyamani Road. At the Mnyamani Road, I walk to the Mandela Highway. Before I reach the school, I must cross the busy Mandela Road. At this crossing, I always stay longer waiting for motorists to stop or a passer-by adult to assist us to cross as we cannot risk crossing on our own”

The school children directed their complaints to the road contractors who did not provide pedestrian routes or walkways separated from the vehicular traffic so as to enhance the safety among school children. Furthermore, they blamed the local authority officials of not taking actions against the motorists and street vendors who had encroached upon the pedestrian walkways along Uhuru and Mandela Roads, a situation that made walking not only more complicated but also unsafe.

The researcher also observed parents/adults assisting the school children to cross Mandela Road. Nevertheless, despite the fact that pedestrians were crossing at zebra marked crossings and even on where there are no pedestrian traffic signals provided, often motorists do not stop to allow pedestrians to cross the road (Figure 8.28).



Source: Fieldwork in Buguruni, February 2015

Figure 8. 28: Adults assisting the school children to cross the busy Mandela Road

Figure 8.28 shows that the school children have to cross the busy roads, often assisted by adults. Furthermore, the figure also shows that poor enforcement and non-adherence to traffic rules by motorists compounds the problem. The motorists were always driving fast, even at zebra crossings. Most of the time the traffic managing the traffic were busy with the motorised traffic and hardly pay attention to pedestrians.

The respondents added that the lack of pedestrian safety in Buguruni area is sometimes attributed to the lack of zebra crossings, especially at the hot spot (crossings). The respondents complained about the lack of zebra crossing at the public bus stop to Ubungo, which is located opposite the Buguruni Filling Station. According the respondent crossing at this point is dangerous and many people have been injured and others killed.

The author inspected this crossing in February 2015 only to note that it has no zebra crossing marks. Again a visit was made in August 2016; then the author found an overhead pedestrian bridge under construction; but pedestrians were still crossing the highway without zebra crossing. Also, people with disabilities complained that the new overpass bridge is not user friendly to them and other people with physical challenges. The bridge is designed with sharp stairs which are too steep and difficult for the handicapped and the visually impaired to use. However, as Figure 8.29 shows crowds of pedestrians coming from Buguruni-Mnyamani and other surrounding areas such as Ilala, Tabata, and Vingunguti were crossing the road despite lack of zebra crossings. Figure 8.29 shows some of the hotspot pedestrian crossing points like this one at Buguruni Filling Station.

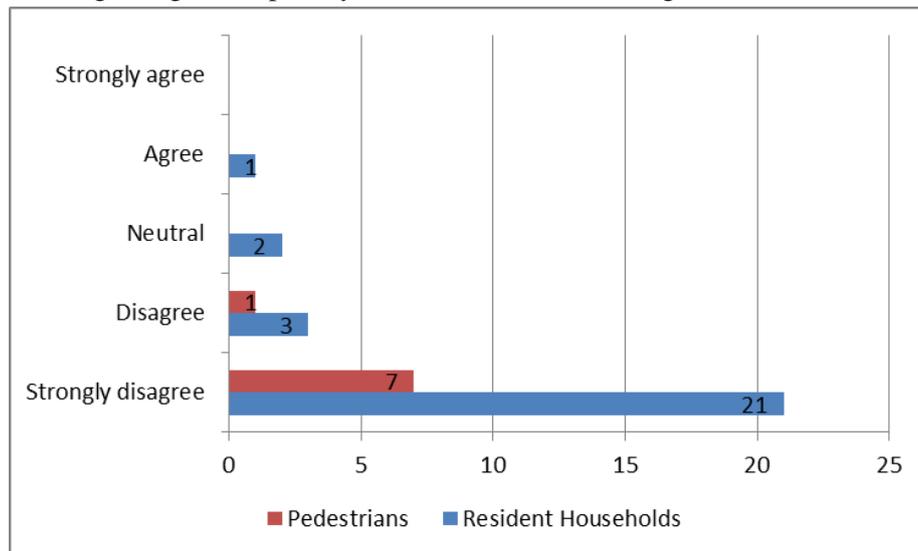


Source: Fieldwork in Buguruni, February 2015 and August 2016

Figure 8. 29: Pedestrians crossing at a non-zebra crossing point-Buguruni-Shell

8.3.3 Disrespect by motorists

When asked whether the motorists respect pedestrians who are walking or crossing the road, the majority of the respondents (28 out of 35) strongly disagreed. They perceived that motorists never respect pedestrians as fellow users of public space. Four respondents disagreed to a certain extent, while two resident respondents could not tell whether motorists do or do not respect pedestrians. The agreement levels regarding the respect by motorists are shown in Figure 8.30.



Source: Fieldwork in Buguruni, February 2015

Figure 8. 30: Attitudes of the respondents towards the respect by motorists

According to the respondents, the unmanaged road use and misconduct behaviour of motorists, especially the unruly motorcyclists (*bodaboda*) and public bus drivers (*daladala* drivers) are compounding the protections of pedestrians using the same lane. They added that often motorist tend to over-speed after escaping traffic jam with no respect of other road users and without consideration of the high volume of pedestrians using the same lane as well as roadside commercial activities. Besides that, drivers and cyclists complained of rough and muddy road condition which may accentuate the conditions leading to accidents and injury of pedestrians.

However, the motorists had different opinions from those raised by the respondents. They complained that pedestrians are not cautious when they share roads and footpaths with other users. It was argued by the motorists that normally pedestrians walk along and cross the roads without regarding the moving vehicles. Some pedestrians just move even at recklessly centre of the road without paying attention to motorists since they believe that drivers are the one who are expected see them well in advance.

When asked what role motorists play in enhancing safety of pedestrians, one of the cyclists responded: “Pedestrians are to blame many times of accidents. They just walk aimless without checking oncoming traffic. Many of them are cautious of cars and not bicycles and motorcycles. So when I’m riding, I always watch them”

According to the interview with a road engineer at the Ilala municipality, it was revealed that the traffic police are responsible actors for regulating flow of traffic along the roads, including the intersections like that at the Buguruni Filling Station. When it comes to enforcing traffic rules to ensure pedestrians safety, especially at zebra crossing and traffic lights, their impacts is not much visible. One of the pedestrians complained that: “why are you asking about the police? Are we not standing here with you waiting to cross this road? Don’t we have a right of way at this zebra crossing?”

Despite the Tanzania Police Force who is tasked to enforce laws and orders in the country are aware of this bad practice, still they have not effectively addressed. A police in-charge at police headquarter, narrated that: “We are aware of pedestrians and other road users breaking road rules, but the police force is incapacitated in terms of human, technology and financial resources to adequately address this problem, but when the law breakers are caught, they are brought into books”

In most cases, zebra crossing marking had faded out; also some pedestrian traffic signals at critical intersection points like that at Buguruni Filling Station were lacking. When pedestrians cross at busy roads, it was observed that generally other users, especially motorists do respect pedestrians as a result they do not stop even at zebra crossings (Figure 8.31).



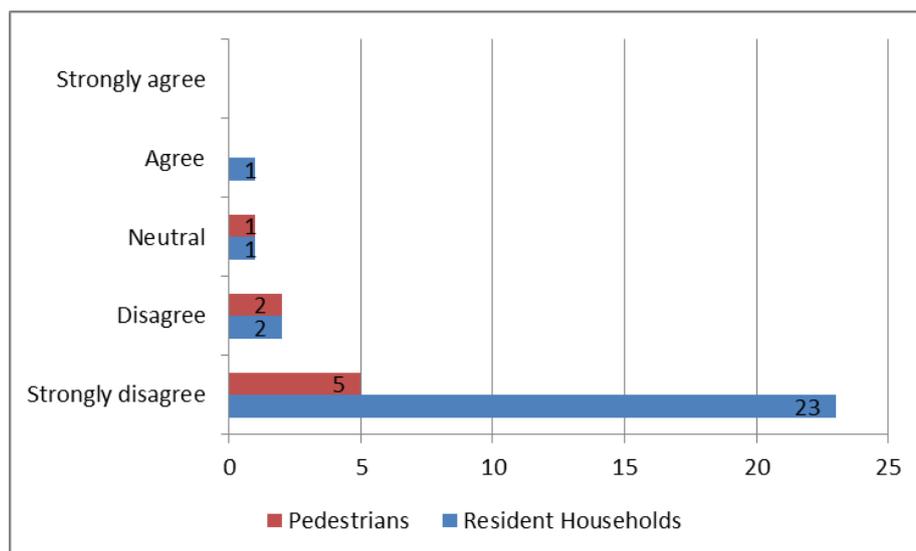
Source: Fieldwork in Buguruni, February 2015

Figure 8. 31: Pedestrians crossing at the Mandera-Uhuru Road junction

The traffic rules are generally poorly enforced by the traffic police. Due to the long waiting time of road crossings and delays to allow pedestrians to cross, often many opt to take risk and cross even when motorists are moving.

8.3.4 Insecurity and crime

When respondents were asked about their perception of the walking environment, 23 out of 27 resident respondents and the five pedestrians strongly disagreed. Four respondents noted that they disagree to some extent. Figure 8.32 is for more details.



Source: Fieldwork in Buguruni, February 2015

Figure 8. 32 Attitudes of the respondents towards insecurity and crime in Buguruni

Figure 8.32 shows that the majority of respondents were not satisfied with the current security situation of the walking environment. Petty thefts of mobile phones, wallets, hearings and chains were commonly reported. The most prone areas were mentioned to include streets like Kimboka, Madenge, Ghana, Big town, Chile, Mti-pesa, Mashemeji love, Ujamaa shari, Watoto wa safina, SUKITA, Buguruni market and at the public bus stops. The majority of the respondents were highly susceptible to crime issues, especially at night.

One of the respondents Tatu Hamis, a 25 years, resident of Buguruni-Madenge and a food vendor in the area noted: *“Walking at night ideally is not safe anywhere especially for women like me who are always vulnerable of night walks. Anything can happen. One can be mugged especially on these dark streets which lack lighting. I would rather board a tax when I am late or spend the night from where I am”*

When asked whether they have been the victims of crime issues, Juma Ramadhani, a 61 aged, a resident of Vigunguti and a food vendor in Mnyamani area replied: *“I am one of the victims of the crime issues you are talking about. It was around 21:30 hours in November 2014 when I was on my way back home. Suddenly, I came across a group of the young men standing close to the motorcyclists parking point at Mnyamani relini. They started questioning me whether I would like to hire a motorcyclist to take me home. Each one of them tried to convince me to boarder his bodaboda. As I continued walking, suddenly I came to realize that my mobile phone together with a sum of 22,000 TZS were already picked”*

Mariam Kassim, a 49 aged and who is a food vendor in Buguruni-Mnyamani said that even though she was yet to become a victim, her son was already been victimized. She said: *In June 2014, my son had his mobile phone stolen. This happened along the Mnyamani road in Vingunguti area when he stood beside the road to receive a mobile call. When talking, he came to realize that he had already been mugged by a group of unknown people. His mobile phones together with a sum of 30,000 TZS were stolen. In fact, the walking environment in Buguruni is not secure from crime”*

While continuing with the fieldwork in Buguruni, the author observed a drug abuse camp situated in Buguruni – Madenge (Figure 8.33) where they normally meet and prepare themselves to mug those walking in the area. According to the group leader, muggers comprise a collection of persons from different places who have different backgrounds and are largely unemployed.



When asked to explain what they do more often per day, the group leader narrated as follows: “Here we are a group of about forty people from various places in the country. Most of us have despaired, that is why we decided to engage ourselves in drug/alcohol abuse and mugging. During daytime, some of us operate as touts (wapiga-debe) at the daladala stops, but at night the majority of us are involved in robbery and mugging activities in the congested and dark streets. Sometimes, when we reach a certain house, we steal and pick valuable items through the window. We normally pick items such as mobile phones, wallets, chain and hanged clothes among clothes”

Source: Fieldwork in Buguruni, February 2015

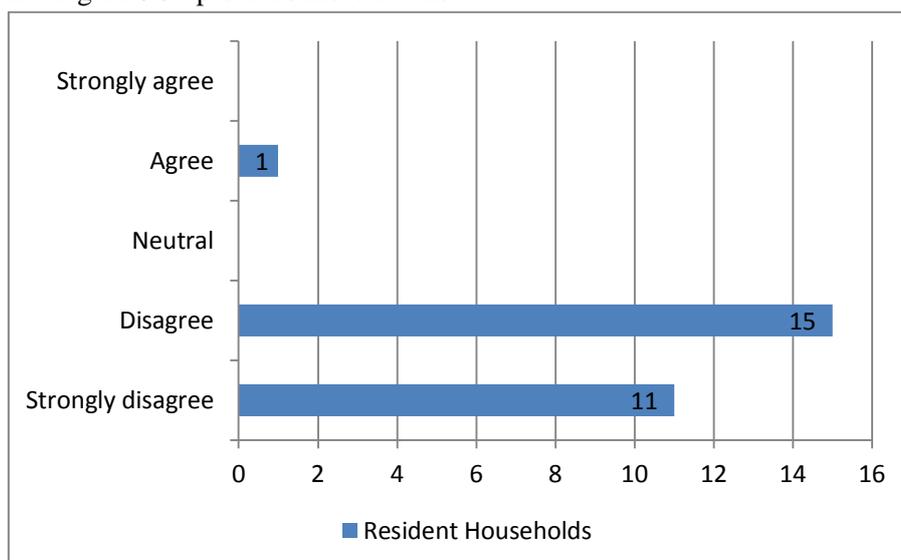
Figure 8. 33: Muggers meeting place in Buguruni- Madenge

The causes of crime issues such as mugging in the unplanned settlements like Buguruni-Mnyamani & Madenge include widespread unemployment, especially youth and poor public infrastructure including pedestrian needs. Often condition in informal settlements creates crowded and criminogenic areas that are favourable to criminals and/or criminal behaviours. Most people living and working in areas like Buguruni struggle to survive i. e. to access basic needs including social services such as health, education, shelter, etc.

8.3.5 Inconvenient access to public facilities

As explained earlier, the component of access to basic services aim at understanding whether the public facilities (commercial, education, health, religious, recreational facilities and public bus stops) were accessible walking time and distance (i.e. within 5-10 minutes walking time or 400 to 800meters distance). Like in Sinza and Kariakoo, in Buguruni also 27 resident respondents were covered. The pedestrians were not involved as they were just visitors to the three case studies.

When asked whether the public facilities were accessed within walking time (i.e. in 5 to10 minutes), 11 out of 27 resident respondents strongly disagreed. Similarly, 15 out of 27 respondents disagreed to a certain extent. Figure 8.34 provides more details.



Source: Fieldwork in Buguruni, February 2015

Figure 8. 34: Views of the residents towards accessing public facilities within a convenient walking time

According to resident respondents, apart from local shops, bars/cafes and restaurants, most public facilities were located slightly beyond the walking distances. The analysis regarding the time taken to access these public facilities is presented in the next section.

Time taken to access commercial services

The study has revealed that the majority (25 out of 27) of respondents accessed local shops within a period of less than 10 minutes. Local shops in Buguruni-Mnyamani and Madenge settlements were generally conveniently located and the majority people were satisfied. Besides, only five resident respondents accessed market facilities in less than 10 minutes. The rest had to spend more than 10 minutes to reach public facilities. Table 8.7 is for more details.

Table 8. 7: Time taken to access commercial facilities in Kariakoo

Time taken (in minutes)	Local Shops		Local Markets	
	Respondents	%	Respondents	%
1-10	25	92.6	5	18.5
11-20	1	3.7	11	40.8
21-30	1	3.7	3	11.1
31-45	-	-	6	22.2
46-60	-	-	1	3.7
>60	-	-	1	3.7
Total	27	100	2	100

Source: Fieldwork in Buguruni, February 2015

The convenient access to facilities like local shops is attributed to the kind of land use mix within the settlements. At least after every 3-5 houses, there was either a local shop or Kiosk located. The home based income generation activities were scattered all over settlements. Moreover, only few respondents i.e. 5 out of 27 accessed market facilities within 5 to 10 minutes walking time. Buguruni-Mnyamani does not have a market facility most inhabitants depend on the Buguruni market (located in Buguruni-Malapa) and Vingunguti market, which range between 1.1 and 1.8 kilometer from Buguruni Mnyamani respectively.

The time taken to access primary school, health and religious facilities

With exception of religious facilities, the majority of the resident respondents in Buguruni cannot access primary schools and health facilities within the walking time of 10 minutes. Only four respondents had access to primary schools and health facilities within the walking time of 10 minutes period. The majority of the respondents were spending between 11 and 60 minutes and at a time more than an hour to access primary school and health facilities. Besides that, the majority of the respondents accessed religious facilities within a convenient time. Table 8.8 provides more details.

Table 8. 8: Survey results on time taken from home to primary School and health services

Time taken (in minutes)	Primary School		Health services		Worshipping places	
	No	%	No	%	No	%
1-10	1	3.7	3	11.1	17	63.0
11-20	15	55.6	2	7.4	5	18.5
21-30	3	11.1	6	22.2	2	7.4
31-45	7	25.9	12	44.4	2	7.4
46-60	-	-	1	3.7	1	3.7
>60	1	3.7	3	11.2	-	-
Total	27	100	27	100	27	100

Source: Fieldwork in Buguruni, February 2015

According to the resident respondents, the problem of long walking distance is attributed to the lack of primary school within Buguruni-Mnyamani despite having a total population of 18, 077 people. One of the resident respondents, Amina Mussa, a 28 aged, food vendor in the area observed: “We need our own school in Mnyamani to safeguard our children from road accidents. As a parent, the time my children are still on their way from school, I always become so uncomfortable at all until I see them arriving back home. I always worry about the threat of being hit by motor vehicles while crossing the highway”

The problems associated with the lack of primary schools in Buguruni-Mnyamani were also reported by the 9 school children interviewed at Hekima Primary School. The school children were forced to access primary schools in the adjacent settlements like Vingunguti, Buguruni-Madenge and Kariakoo. These were between 1.1- 4.4 kilometres away. According to the school children, it takes them about 30 to 40 minutes to reach schools in these areas. This is due to the fact that the trip involves crossing the busy roads where one has to wait for some time before he/she can cross the road. For instance, pedestrians, including the school children have to wait for between 5 and 15 minutes to cross the road.



One of the school children noted: Hassan Juma, a 12 years old, standard 7 pupils at Hekima Primary school and a resident of Buguruni-Mnyamani (Bondeni) observed: *“It takes me about 40 minutes to reach my school. I spend about 10 minute to walk from home to the Mandela road junction. At this junction I normally visit for between 5 and 15 minutes before I can cross to the centre of the road. When I cross to the centre of the road, I still need another 5 to 15 minutes waiting for vehicles to stop before I can cross. Once I reach Buguruni Filling Station, I have to wait for other 5 to 10 minutes before I can cross Uhuru Road. Once I cross it I have to walk for about 3 minutes to get to Hekima Primary School. Sometimes several pupils miss the first sessions”*

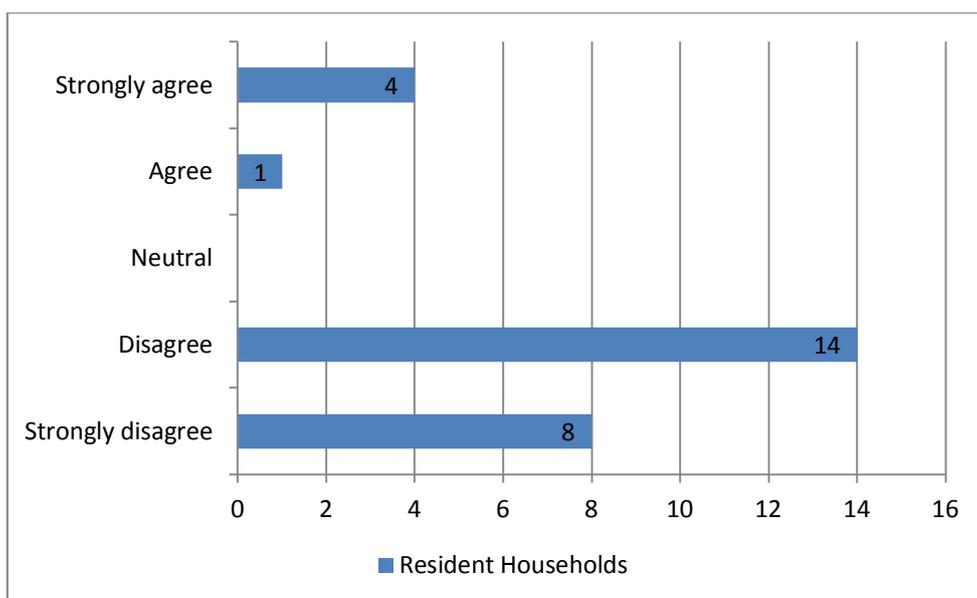
Source: Fieldwork in Buguruni-February 2015

Figure 8. 35: Pedestrians walking along one of the footpaths in Buguruni-Mnyamani

Moreover, Buguruni-Mnyamani and Madenge have neither a public dispensary nor a health centre. There is however a private hospital (Plan International Hospital) which is located in Mnyamani settlement, and about a Kilometer from Buguruni-Madenge. Generally, the majority of the residents access health services at the Amana Municipal Hospital, which is about 3.5 kilometres from Buguruni. The majority of inhabitants however, prefer to go the public hospital primarily because they cannot afford for the costs charged at the private hospital.

Access to public bus stops in Buguruni

When asked whether the public transit stops in Buguruni are accessed in a convenient walking time (i.e. 5 to10 minutes), the majority (22 out of 27) of the resident respondents strongly disagreed. Only five resident households were of the opinion that the public transit stops were conveniently located. Figure 8.36 presents the rating levels by the resident respondents about accessing public bus stops in a convenient time.



Source: Fieldwork in Buguruni, February 2015

Figure 8 :36: Attitudes of the resident households towards accessing public transit stops in 5 to 10 minutes

The time taken to walk to the public bus stops

The study has revealed that public bus stops in the upgraded parts of informal settlements like Buguruni-Mnyamani and Madenge are inconveniently located along the main roads. Most residents walk for more than 10 minutes to reach the bus stops. Only a few respondents accessed the public bus stops within 10 minutes. Summary of the time taken to walk to the bus stops is shown in Table 8.9.

Table 8. 9: The time taken to access to public transit stops in Buguruni

Time Taken	Respondents	Percentage (%)
1-10	5	18.5
11-20	15	55.6
21-30	3	11.1
31-45	3	11.1
46-60	1	3.7
Total	27	100

Source: Fieldwork in Buguruni, February 2015

Table 8.9 shows that 22 out of the 27 resident respondents walked for more than 10 minutes to access the public bus stops. According to the resident respondents, the existing public transit stops do not accommodate public buses for the entire City; instead they are limited only to specific routes. Therefore, the distance walked from home to the public bus stops differs depending on passengers' destinations. For instance, a person who wants to travel from Buguruni-Mnyamani to Sinza neighbourhood, he/she has to access the public transport at Rozana bus stop, which is about 40 minutes-walk from Buguruni-Mnyamani. Alternatively, if one travelling to Sinza cannot walk to Rozana public bus stop, then he/she must pay more as he/she has to take an alternative route. For instance, he/she would take a bus from Mnyamani to Rozana (400 TZS); and from Rozana to Sinza (500 TZS). That means for a return trip one would have to pay a total of 1800 TZS. This is too expensive for the majority inhabitants. Many, especially the urban poor would have no alternatives but to walk as they cannot afford to pay such high costs.

Despite the fact that there is a public transport route which runs through Buguruni-Mnyamani, still there are no public bus stops in Mnyamani settlement. As a result, passengers were boarding and come out of the public bus anywhere along the route.

8.3. 6 Pedestrians exclusion from urban mobility

All the 35 interviewed persons observed that the public transport system in Dar es Salaam, including the upgraded informal settlements such as Buguruni-Mnyamani and Madenge are not inclusive. They were of the opinion that pedestrians and the other non-motorized means of transport were not upgraded. When asked whether the road networks in the upgraded informal settlements were inclusive road users (including mobility and visual impaired), all 35 respondents (i.e. 27 resident respondents and 8 pedestrians) strongly disagreed, meaning that it was not inclusive. According to the respondents, the roads upgrading projects implemented in Buguruni-Mnyamani and Madenge did not consider all users groups. The implementation of CIUP paid more attention on circulation of vehicular traffic at the expense of pedestrians, including people with disabilities and other non-motorised users of roads. Pedestrian infrastructure, including the disability infrastructure was therefore not provided. All the respondents interviewed complained about problems associated with sharing the same carriageway with motorists. Figure 8.37 shows problems the visually impaired persons were enduring in such user unfriendly areas. According to the respondent (a visually impaired person), he prefers to walk on the side of the drain for fear of being hurt by motorcyclists along the roads.



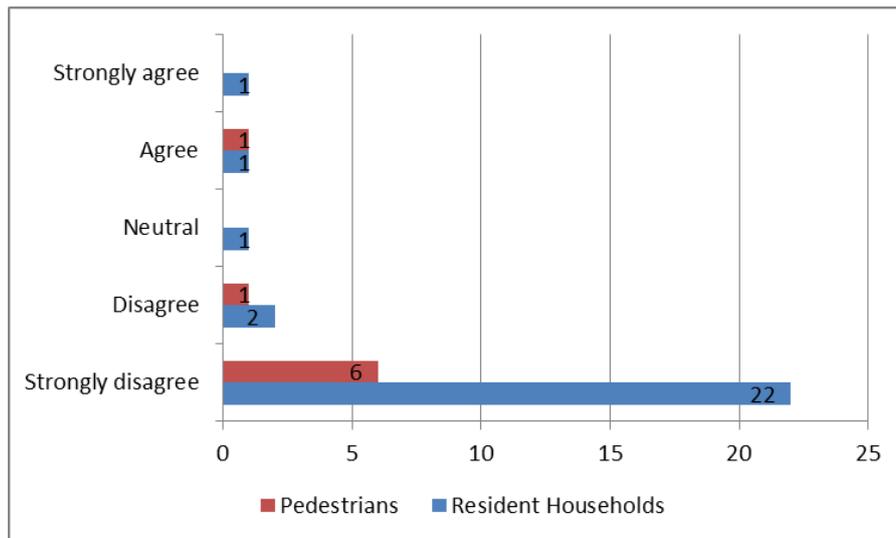
Source: Fieldwork, February 2015

Figure 8. 37: Exclusion of pedestrian infrastructure from the upgraded roads

As seen in Figure 8.37, pedestrian infrastructure is lacking in the upgraded roads implemented in Buguruni-Mnyamani and Madenge. Both the primary distributor and access roads did not consider pedestrian movements despite the area being densely built and predominantly occupied by low income households.

8.3.7 Poor condition of the walking environment

Most respondents i.e. 31 out of 35 consider walking environment in Buguruni settlement as being in poor condition. When asked whether the access roads and footpaths were in good condition and passable throughout the year, the majority of the respondents (28 out of 35) strongly disagreed. Figure 8.38 shows the views of the respondents about the passability of walking routes throughout a year.



Source: Household and walking interviews in Buguruni, February 2015

Figure 8. 38: respondents' attitudes towards passability of walkways throughout the year

The condition of the walking environment was not better even compared to the other two study areas. In fact, in some areas the walking environments in Buguruni were worse as suggested in Figure 8.39.



Source: Fieldwork, February 2015

Figure 8. 39: Pedestrians walking on muddy and narrow footpaths in Buguruni-Mnyamani & Madenge

The study noted that in Buguruni, pedestrian facilities like sidewalks, street benches, garbage collection receptacles, public toilets, and shade instruments are not provided. Many inhabitants of Buguruni use the footpaths on the low-lying areas which are sometimes impassable due to water ponds (wetness) along the path. Besides, some areas along the path are blocked street vendors, parked cars and motorcycles. No wonder why 31 out of the 35 respondents in Buguruni were not satisfied with the conditions and quality of the walking environment in Buguruni.

8.4 Concluding summary

This chapter has demonstrated empirically the perspectives held by pedestrians in the three case studies. Though a cross case analysis is discussed in chapter eleven, the results show that the respondents interviewed across the three sub-cases were not satisfied with the conditions, safety and security of the walking environment. The majority perceived that pedestrians are excluded and neglected from the urban mobility. The walking routes are in most cases blocked the temporary and permanent obstructions, and hence the majority perceived that the pedestrian network is disconnected (i.e. not continuous from destination to another). Furthermore, the respondents interviewed had a view that the walking environment in their respective settlements is both unsafe and also insecure.

Nevertheless, the resident households are of the opinion that the public facilities are not conveniently located, except the local shops and public transit stops in the formally planned neighbourhoods. They also perceived the walking routes as being in poor condition. The access roads and footpaths are dusty, muddy and floods making the walking difficult. The respondents also said that they were not respected by the motorists. Besides that, they opined that there was poor enforcement of traffic rules and regulations. Additionally, the respondents had negative perceptions towards pedestrian amenities such as street lights, public benches, public toilets, dustbins, and the passengers shade device at the public transit stops. Due to these shortcomings, pedestrians felt that they are not valued by city authorities as motorists.

The next chapter presents the analysis on how the pedestrian requirements are considered in Tanzania. The chapter provides a documentary review from the national, sectoral and local level documents as well as the urban design concepts and planning standards adopted in the formally planned and up-graded informal settlements.

CHAPTER NINE

9. CONSIDERATIONS OF PEDESTRIAN REQUIREMENTS IN TANZANIA

9.0 Introduction

Having analysed the perspectives of pedestrians on the walking environment, this chapter presents a documentary review on the subject from the national to the local levels. The essence is to see how these documents consider the pedestrian requirements. The criteria for selecting such documents included: their relevant and legality in enhancing the pedestrian mobility, accessibility and safety needs. That being the case, only policies related to land use and transport planning, policies focusing on the provision of public facilities and that can influence the travel distances (such as the national education and health policies), and those addressing the needs of people with disabilities were reviewed. Similarly, at national level, only documents aiming at improving quality of life and social wellbeing, safety and security of individuals were examined. Regarding the local level planning documents, the land use and transport related documents and those related to upgrading projects were considered.

9.1 Comprehensive documents at national level

The constitution of the United Republic of Tanzania (1977)

The Constitution of United Republic of Tanzania 1977 recognizes safety and security as everyone's right in the country. Article 14 of the Constitution recognizes the right of every individual to "live and to the protection of his life by the society in accordance with the law". Article 16 further recognizes the right of each individual to "respect and protect the privacy of his own person and his properties" (ibid). These clauses require that the state ensures that every individual is provided with security and safety. However, despite the fact that the constitution recognizes safety and security as everyone's right, walking does not seem to be considered as a means of transport that contribute towards the enhancement of pedestrian safety.

The Tanzania Development Vision 2025

One of the principal objectives of the Tanzania Development Vision 2025 is to achieve a high quality and a good life to all social groups (men and women, boys and girls, the young and old and the able-bodied and disabled persons). Despite the fact that the Tanzania Development Vision aims at achieving the high quality livelihood for all Tanzanians, still improvement of the walking environment does not seem to be recognized as one of the strategies towards achieving a quality life for every individual. According to section 3.1 of the Vision 2025 document, a high quality livelihood for all Tanzanians is to be achieved through: food self-sufficiency and food security, universal primary education, gender quality and empowerment of women in all socio-economic and political relations and cultures, accesses to quality reproductive health services for all individuals of appropriate ages, reduction in infant and maternal and mortality rates, universal access to safe water, life expectancy comparable to the level attained by typical middle income countries and absence of abject poverty. Walking is therefore not mentioned as one of the strategies for achieving a high quality life for all despite it is emphasized by the literature.

The National Strategy for Urban Crime Prevention in Tanzania (2008)

The primary objective of the National Strategy for Urban Crime Prevention of 2008 is to build safe local environments where citizens are assured of living in peace and harmony, without fear of crime or domestic violence and where there will be security for their property in order to achieve sustainable development. This strategy was developed as a tool for implementing the Safer Cities Programme initiated by the UN-Habitat in 1996 with the focuses on building capacities at Cities and Municipalities level to address crime and insecurity and on establishing a crime prevention culture. The strategy

was to be implemented diligently by involving all key actors and stakeholders. Despite the fact that the strategy aims at achieving safer and secure neighbourhoods, the document is silent on how the physical walking environment can be improved to achieve safer and secure cities.

The National Strategy for Growth and Reduction of Poverty (2010)

One of the focuses of the National Strategy for Growth and Reduction of Poverty (2010) outlined in section 2.3 is the improvement of quality of life and social wellbeing, particularly of the poorest and most vulnerable groups in the population, whereby safe and sustainable environment has been pinpointed as one area of attention. Section 2.3.5 also recognizes that people with disabilities find difficulty in accessing reliable transport, and building infrastructure. They suffer from limited information and social stigmatization. To improve transport infrastructure the document identifies urban transport system and safety improvement as one of the strategies to be pursued to achieve its objective. The document emphasizes improvement of urban mobility and reduction of traffic congestion, especially Dar es Salaam, Arusha and Mwanza. These strategies recognize the need for safe urban areas which are the commercial hubs for regional development. However, walking is not given special attention; rather, the emphasis is on the so called improving the urban transport network. Additionally, the document is silent about how people with disabilities would be facilitated to access public transport and high-rise buildings.

9.2 National sectoral policies

The Education and Training Policy (1995)

Section 3.2.2 of the Education and Training Policy of 1995 gives a policy direction of ensuring equitable distribution of educational facilities in the country. However, this is not linked to spatial planning to ensure harmony-space standards in the distribution. Education facilities when located proximity to residents can reduce the travelling distance covered by the school children and the risks of being hurt by motorists while walking to school can also be minimized.

The National Human Settlement Development Policy (2000)

The Vision of the National Human Settlements Development Policy 2000 is to have an “organized, efficient, healthy, safe and secure aesthetic sustainable human settlements”. Sections 4.1 and 4.2 of the Policy give directions on how human settlements are to be planned considering different components of livelihoods and pedestrian safety, yet policy directions for actions to be taken in neighborhood planning which is limited by space for public facilities are lacking. Similarly, section 4.3.6.2 acknowledges the importance of safe transport system in urban areas, but does not directly recognize walking as a means of transport which should be given separate policy directions.

The Tanzania National Transport Policy (2003)

This policy gives little attention to pedestrians and other non- motorized transport, road users, who are often the losers in the struggle for urban space and have little power to influence the urban transport agenda. The policy covers issues of urban road and other road infrastructure services, traffic flow and safety management issues, land use planning and transport for disadvantaged groups. Though the National Transport Policy (2003) recognizes the importance of neighbourhood design, directions given in section 5.0 do not adequately cover the complexity of pedestrian mobility and safety management, especially in the current situation of the increased motorized traffic where space is limited to locate pedestrian facilities.

The National Transport Policy 2011 (Draft)

A new National Transport Policy is currently being drawn up under the DFID supported technical assistance program within the Ministry of Transport. The draft policy gives more attention to public transport; BRT, land use planning and supports the establishment of DUTA as a central coordinating body on urban transport issues. However, it does not seem to address the funding gap and how to raise

sufficient finances to support the set objectives. There is also no acknowledgement of the role of municipalities, the City Councils, or the Ministry of Lands, Housing and Human Settlements Development (MLHHSD) in land use matters. Overall, the policy is weak in elaborating stakeholders' roles and responsibilities and the need for coordination between key stakeholders. Consequently, as with the previous national transport policy, recommendations contained within the document are likely to remain on the paper only, with inadequate attempts to be implemented. Like the National Transport Policy of 2003, the draft Policy of 2011 (draft) also has left out the issue of pedestrian movements.

The National Health Policy (2003)

In chapter 4 of the National Health Policy, the structures or levels of health care facilities are discussed to include: dispensaries, health centres, district hospitals, regional hospitals, national, referral and specialized hospitals; but what is missing is how they will be spatially distributed. The health services located in proximity to residents can reduce the travelling distance to access the service, as well as encourage walking.

The National Policy on Disability of 2004

The National Policy on Disability aims at providing conducive environment for people with disabilities to engage in productive work for their development, and the utilization of available resources for improved service delivery. With regard to accessibility needs, the policy recognizes that almost all public buildings in Tanzania are built to cater for the needs of the non-disabled. Stairs, narrow doors and toilets are inaccessible to the majority of disabled persons. Besides that, the road construction and transportation facilities are designed to suit the needs and lifestyle of non-disabled persons leaving a disabled person unable to relate favourably with his/her environment. To address this concern, section 3.11 of the National Policy on disability provides a policy statement that the government in collaboration with stakeholders shall take measures to ensure that public buildings and other facilities are accessible to people with disabilities. However, coordination mechanisms between the government and other stakeholders involved in the development of buildings is lacking. Thus, improvement of the physical walking environment is not considered as a strategy for improving the disability needs.

The National Road Safety Policy (2009)

Section 5 of the National Road Safety (2009) acknowledges that pedestrians and motorized and non-motorized wheelers are the most vulnerable groups in using urban roads. The non-recognition of non-motorized transport is pointed as one of the major issues causing conflicts between motorized and non-motorized transport movements. Moreover, the policy recognizes that the planning process in Tanzania does not give considerations to developing a functional hierarchy of roads in built up areas, a situation that cause the through traffic to mix with local access traffic and pedestrians. Additionally, the policy recognizes the effects of parked cars and petty traders on blocking the pedestrian walkways; and that the land use planning at present does not locate social services, industries and amenities in neighbourhoods of residential areas. According to this document, the planning process does not play the expected key role in reducing trips related to social services and amenities

Generally, section 5 of The National Road Safety Policy of 2009 provides policy directions regarding safety in urban roads, public awareness creation and the inadequate physical planning and poor implementation of master plans coupled with lack of enforcement of laws and regulations that had negative impacts on pedestrian mobility and accessibility needs in most parts in urban areas. However, though it is now about seven years since its formulation (i.e. 2009), yet its enforcement remains weak. Pedestrian accidents resulting from collisions with other road users are increasing. In addition, pedestrian safety education and awareness is lacking. Despite the fact that this policy recognizes the weakness of the planning systems in Tanzania that has inadequately played its role in reducing traveling

distances by providing the basic service in proximity locations, the policy does not show how the actors from the other ministries were to be coordinated to address the recognized shortcomings.

The Urban Planning Act No 8 (2007)

Spatial planning in Tanzania is a statutory function provided under the Urban Planning Act No 8 of 2007. Urban neighbourhood designs in Tanzania are therefore guided by the Urban Planning Act No 8 of 2007, where the Ministry of Lands, Housing and Human Settlements Development (MLHHSD) has overall and ultimate responsibility for urban land planning, including planning in the municipalities. However, the MLHHSD has delegated its planning mandate to LGAs. The Act seeks to ensure safe pedestrian movements in renewal and schemes by providing a road pattern and traffic networks designed to improve vehicular access and parking space and also facilitate segregation of vehicles and pedestrians in the renewed or redeveloped areas (URT, 2007: 50). Furthermore, the Act emphasises the planning process and the institutional framework without giving directions on the actions to be taken on the newly planned neighbourhoods to ensure safe pedestrian movement.

The Highway Code (2008)

The Highway Code is a set of rules and advice on how to use the urban roads. The Ministry of Works, Transportation and Communication has produced road safety rules and codes which are contained in the Highway Code of 2008 and every road user is expected to know them. The document provides rules to be obeyed by pedestrians, cyclists, passengers, drivers and motor-vehicles and rules for persons with animals. Enforcement of the provisions of the code is done by the Police Force. Despite the existence of the Highway Code, the rights of pedestrians on the urban roads remain unattended. Further, the High Code does not show how pedestrians concerns are to be prioritized when interacting with motorized means of transport.

The National Land Policy of 1997

The National Land Policy of 1997 guides all land issues within the country. Section 6.4 of this Policy makes it clear that the existing unplanned settlements which in other words, are referred to as informal settlements shall not be cleared but upgraded. In doing so, the policy in section 6.4.1 subsection (iv) emphasizes the role of community organizations in the preparation and implementation of the upgrading programs. This is due to the fact that informal settlements contain a considerable stock of houses and other buildings which must be preserved. The aim of the government was to ensure that all urban residents are provided with basic services that are essential to human health (URT, 1997:28; 29). However, the policy does not give specific provisions on how pedestrians as one of the road user groups will be considered in the upgrading schemes.

9.3 Local level planning documents

The reviews of the local level planning documents were traced from the colonial era to the year this study was conducted i.e 2015. That means that from the Germany colonial administration (1891-1920), the British colonial government (1921-1961) to post independence (i.e. 1961 to 2015). The motive behind was to trace how the pedestrian movements in Dar es Salam had been facilitated since the colonial period to the time the study was carried out, when the city was experiencing marked challenges associated with motorized transport.

The gridiron pattern of 1920s (Zoning concept)

In 1920s, the Germany colonial administration prepared the first Kariakoo *gridiron*¹⁶ *pattern* layout plan (Drg. No 1/339/561) to guide the urban development in Kariakoo. By this time, the design concepts were based on the urban residential land use zoning concept, where Dar es Salaam was divided into three zones:

¹⁶ The gridiron pattern is a simple system of two sets of parallel streets crossing at right angles to form squares or rectangular blocks

- Zone I was designed for Europeans covering area like the Oyster Bay area, Sea View and the low density areas surrounding the central area. The plot sizes were low density plots measuring 0.4 hectares where only one house per plot was allowed. In addition, abundant services and amenities in these plots were also provided;
- Zone II was designed purposely for Asians with medium plot sizes ranging between 1000-2000 square metres, with 20 to 26 persons per hectare and modest services were provided. This zone covered the central business district (CBD) including areas like Upanga, Kurasini and Upanga; and
- Zone III was designed for Africans with high density plots ranging between 300 -375 square metres and about 40 persons (8-12 families) per 0.4 ha and from 8-12 houses per 0.4 ha (Kombe 1995: 73). The zone for Africans included areas like Kariakoo, Ilala and Magomeni.

To maintain these residential zones, in the 1920s, the Germans prepared the first Kariakoo gridiron pattern. The layout plan comprised blocks of approximately 150 metres, plot size of 12 by 15 metres (180 square metres) and Swahili type of houses as the African residential zone (Lupala 2002). This was later followed by similar layouts for the adjacent settlements of Ilala and Magomeni with the similar purpose of accommodating the Africans. The gridiron plan prepared is a typical of European 19th century working class quarters (Lupala, 2002). Strict development guidelines on the type of buildings to be erected were stipulated in the planning and zoning regulations. For instance, the present Mnazimmoja Park was purposefully designed to serve as a buffer zone separating the European and Indian zones from the African settlement of Kariakoo (see figure 9.1). However, the Mnazimmoja open space was not developed during that time as it was still occupied by African buildings that were cleared in the 1940s by the British colonial government (Vestbro, 1975 cited in Lupala 2002:43).

These urban residential land use zoning concepts were later adopted by the British colonial administration (i.e. 1921 to 1961). Though these design concepts do not reflect the African context, still even after acquiring the full independence in 1961 these zoning concepts were inherited and have been used up to date i.e. 2015. Figure 9.1 shows the first Kariakoo gridiron pattern of the 1920s.



Source: Lupala, 2002 citing Kironde 1994:196

Figure 9. 1: Kariakoo gridiron layout plan of 1920s

Figure 9.1: shows the Layout plan for Kariakoo (a gridiron pattern design of 1920s). Between Kariakoo and the east is the buffer zone, the Mnazimmoja that was developed purposely to separate Kariakoo area from the City Centre areas that were designated for Europeans and Asians.

With regard to walkability, it seems that pedestrian needs were considered by the 1920s gridiron pattern. This is because by that time the layout plan was designed, there was not much vehicular mobility. Walking was the main means of transport within the area as the car oriented individual mobility was not so dominant. Therefore, specifications regarding segregation of pedestrian movements from car traffic were not required as the car traffic flow was so limited in those days. Nevertheless, the gridiron pattern had a great chance of increasing walking in the area due to a larger number of interesting streets, thereby reducing the distances between trip origin and destination. Southworth and Owens (1993) and Frank (1999) report that the gridiron patterns provide for a large number of alternative routes, allowing pedestrians to vary their routes depending on connectivity, safety and convenience of the route.

The 1949 Dar es Salaam Master Plan

Until the 1940s, the urban land development in Dar es Salaam was still guided by the zoning concepts adopted from the Germany colonial administration. In 1949, a British firm of Consulting Engineers under the leadership of Harry Ford prepared the first Dar es Salaam Master Plan. This Master Plan was prepared at a time when Dar es Salaam was experiencing rapid urbanisation and rapid spatial expansion. The population of Dar es Salaam had by 1945 increased to 60,000, and the fact that the town had reached a status of being a municipality in 1945, the British government decided to prepare the first master plan that could guide the urban development (Lupala, 2002). The 1949 master plan aimed to address mainly two issues: *land ordering* that was considered to be *ad hoc* and provide a *basis for the expenditure of funds* provided under the colonial development plans (*ibid*).

The design concept of the 1949 Master Plan was in line with the zoning concept of the Germany administration except that the zones earmarked for Europeans, Asians and Africans were replaced with low, medium and high density respectively to reflect zones where Europeans, Asians and Africans lived. Likewise, spaces that separated the three race zones (Europeans, Asians and Africans) continued to be reserved as buffer zones as it was during the German administration (Kironde, 1994; Lupala, 2002). This Master Plan again strengthened the segregation concept that separated the natives from Europeans and Asians. Through this Master Plan, areas for future industrial development along Pugu road and commercial centres within the proposed residential areas were earmarked. Moreover, directions for the preparation of planning schemes, land acquisition and the designation of the type of houses to be erected in certain areas and specifications on the type of building materials were also provided.

With regard to Kariakoo area, the 1949 Master Plan proposed for the redevelopment plan that aimed to *increase open spaces and reduce densities that could benefit pedestrians within the area*. Despite the fact that pedestrian requirements were considered by increasing the number of open spaces, the existing literature does not indicate how this objective could be achieved as the redevelopment guidelines were not provided. As the redevelopment guidelines were lacking, the development in Kariakoo continued unguided with little consideration of pedestrian movements. It was not until 1968 and 1979 when comprehensive Master Plans (i.e. the 1968 and 1979 Dar es Salaam Master Plans) were prepared therein stipulating redevelopment guidelines for Kariakoo.

However, it should be made clear that as the situation was during the grid iron pattern, by the time the 1949 Master Plan was prepared, still there was not much individual mobility by cars; walking was still the main mode and means of transport within the area. Therefore, the idea of segregating pedestrians from cars was not necessary and could hardly be conceived by then.

The Dar es Salaam Master Plan of 1968

The second Master Plan, which was also the first comprehensive plan, was prepared in 1968 under the Towns and Country Planning Ordinance of 1956. This Master Plan was prepared with the idea of seeing Dar es Salaam being developed as a Capital City as it was seven years past after independence (i.e. from 1961 to 1968). The design concept proposed by the 1968 Master Plan was to establish six development levels that could guide the urban development in Dar es Salaam. These included: *the house, ten-cell unit*¹⁷, *neighbourhood, the community, the sub-city metro and the metropolis*. At house level, housing organisation was recommended to be comfortable and convenient to the user. In this context, comfortable meant adaptation to the climatic elements while convenient was referred to functional organisation. To achieve these, the rooms were recommended to face the courtyards to allow maximum air circulation. The ten-cell unit formed the second level of urban development, while a combination of several Ten-Cell units had to form a neighbourhood level that was proposed to accommodate approximately 5000 people. A group of neighbourhoods organised together formed a community with a population ranging from 25,000 to 40,000 people. A combination of four to six communities was suggested to form a sub-city and when several sub-city units were organised together would form a metropolis. The whole idea of this Master Plan was to develop a modular settlement system ranging from a house as the smallest level of urban development to the metropolis level (URT, 1968; Lupala, 2002).

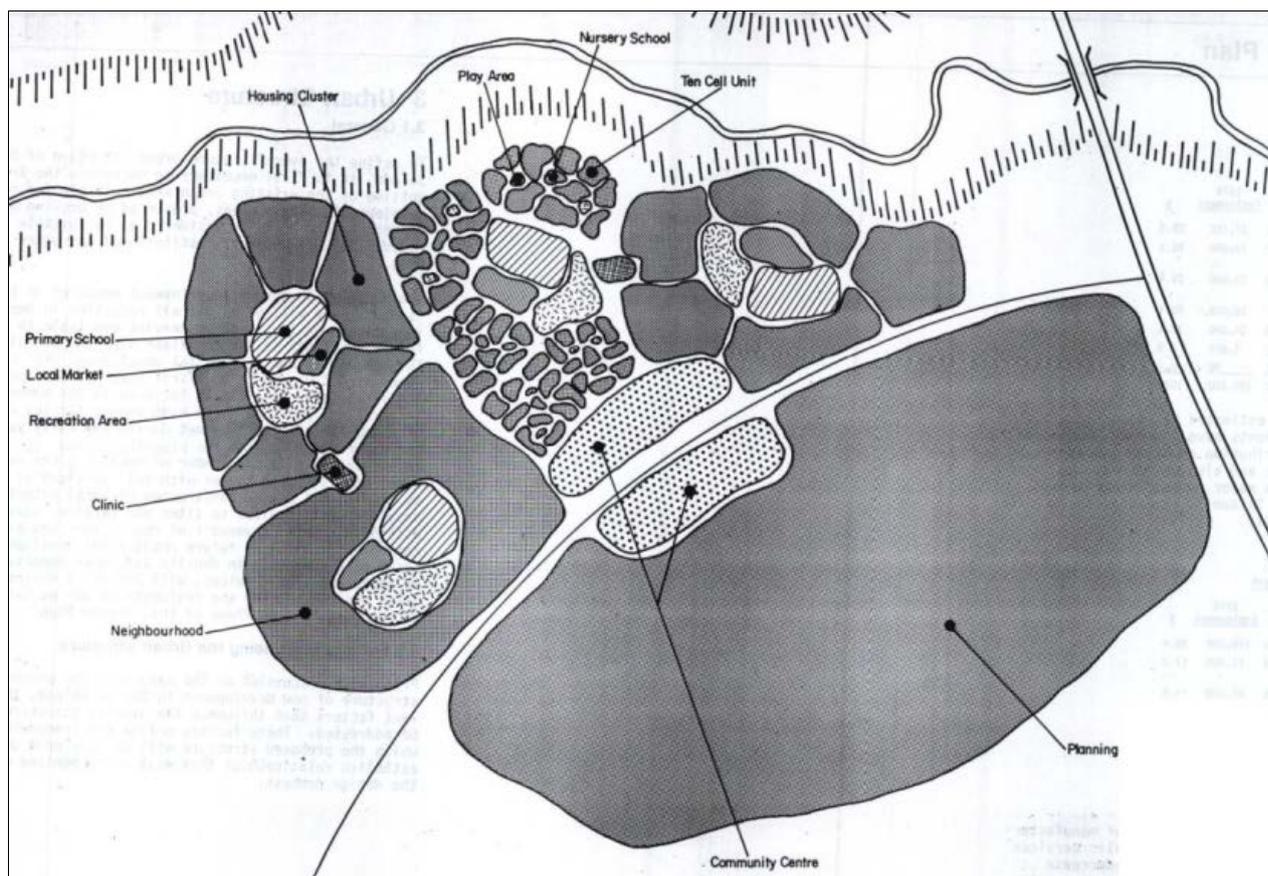
Under the 1968 Master Plan, Kariakoo was designated part of the city centre whereby about 30% of the built up land was to be converted to office and commercial development. A few institutional and commercial land uses were recommended along the present Lumumba and Mafia Streets.

With regard to pedestrian movements the 1968 master plan recommended that “*every second street running parallel to Lumumba Street was to be converted into pedestrian malls that would lead to the inner commercial link*” (URT, 1968:64-65). Despite the good planning proposals of the 1968 Master Plan in facilitating pedestrian movements in Karikoo, yet the implementation mechanisms to realise the pedestrian malls were not provided.

The 1979 Dar es Salaam Master Plan

The 1979 Master Plan proposed a neighbourhood unit concept as a lower scale level of planning. According to the 1979 Master Plan the city was to be structured with six main levels: *A plot, ten cell, housing cluster, neighbourhood, community and district*. The housing clusters were to be composed of 100 residential plots while a combination of four to eight housing clusters had to form a ‘neighbourhood’. Likewise, a combination of four to eight neighbourhoods was suggested to form a ‘Community’ while a group of at least two communities had to form a ‘district’ as figure 9.2 shows:

¹⁷ A Ten-cell unit was the smallest organisational unit of the ruling Party, the former TANU, now Chama Cha Mapinduzi (CCM), with a ten-cell leader as a head of the unit. It refers to approximately ten housing units although practically, often embrace more than ten housing units. In the 1970s until 1980s, ten-cell unit was employed as a planning concept in organising and designing new residential areas (Lupala 2002:48).



Source: 1979 Dar es Salaam Master Plan

Figure 9. 2: City structure model as per the 1979 Dar es Salaam Master Plan

The 1979 Dar es Salaam Master Plan aimed to ensure adequate distribution of facilities within the city that were within easy reach of all residents and in accordance with population thresholds (Table 9.1). The 1979 Master Plan clearly pointed out that if implemented such urban structure would reduce the daily need to travel to the city centre for common services. To achieve this goal, appropriate community facilities and services were to be provided at each level of the city structure. The types of facilities and services were proposed to increase as one moves to the higher level of the city structure. For instance, only a nursery school and play area were considered at a housing cluster level, while a primary school, local market, clinic/dispensary and recreational area were recommended at the neighbourhood level. At community level, the recommended facilities included; one major market and shopping area, one community hall, two religious sites and two major recreational areas were to be provided with. Finally, at the district level, it was recommended a higher order of facilities and services including commercial, public and private office space, institutions, District hospital, wholesale and retail shopping facilities, petro service and recreational areas were to be provided. Furthermore, the 1979 Master Plan also recommended standards for plot sizes to include 400, 800 and 1600 metre square for high, medium and low density plots respectively. The Master plan recommended for one unit per plot, and 130 persons per hectare as the average gross density.

Table 9. 1: City structure and population thresholds as per the 1979 Dar es Salaam Master Plan

City structure Levels	Size	Services
A plot	1 Unit per plot	-
Ten Cell Unit	10 dwelling units	-
Housing cluster	10 ten cell units (100 plots)	Nursery school, 2 playgrounds
Neighbourhood	4-8 housing clusters (5000 people)	Primary school with associated playing grounds, one local market, few small shops and one recreation area

Community	4-8 neighborhoods (40 000 People)	One major market and shopping area, one community hall, two religious sites and two major recreational areas
District	At least two communities (200 000 to 300 000 people)	Commercial, public and private office space, wholesale and retail shopping, petrol service, apartments, institutions, district hospital Fire protection services, secondary school, recreational component, a small exhibition area, a major recreational area; including playingfields, athletics tracks, practice fields, restaurants, offices, parking space and open space

Source: 1979 Dar es Salaam Master Plan

As Figure 9.2 and Table 9.1 show, the researcher is of the opinion that the 1979 Dar es Salaam Master Plan seems to have considered (albeit indirectly) the pedestrian requirements by locating the common facilities (*primary school, nursery school, market, play areas and recreation areas*) either at the centre of the neighbourhoods or within the housing clusters depending on type of the community facility to be provided. If fully implemented, the 1979 Master Plan could have indeed contributed to easy access to community facilities and services provided within a walking distance at the neighbourhood level and hence reducing the threat of pedestrians being hurt by motorists. The Neighbourhood unit concept recommended by the 1979 Master Plan corresponds to Perry's (1929) planning model that was developed following the increase of car traffic in American cities especially in New York. To ensure that residential areas were dominated by pedestrian traffic, Perry placed parks and communal facilities like schools in the centre of the neighbourhood units, while retail and commercial facilities were located along the arterial roads at the edges.

In the central area, the 1979 Master Plan proposed a Conceptual Zoning Plan. In this plan, redevelopment of Kariakoo was to be carried out incrementally on a plot-by-plot basis not as radically as was recommended in the 1968 Master Plan (Lupala, 2002: 49). In connection to this, the 1979 Master plan established eleven development zones, and each zone was assigned to specific redevelopment conditions. The recommended floor area ratio in the city centre ranged between 0.5 and 2.0, site coverage ranged between 30% and 70% and recommended building height ranged from 30 to 40 metres or 100 to 120 feet (ibid). The 1979 Master Plan proposed for the transformation of single storey building to high-rise buildings with a maximum of 8 storey buildings, but the relationship ratio between the building height and the width of the streets were not stated in the plan. The non-realization of the building height-street width relationship has a negative effect on the pedestrian movements as the streets may look narrow in such a way that it is hardly difficult to provide pedestrian infrastructure.

Strategic Urban Development Plan (SUDP) of 1992-2003

The SUDP was launched in 1990s, to replace the 1979 Dar es Salaam Master Plan, which had glaringly failed to solve urban land development problems in the City. The City Council in 1992 introduced the Environmental Planning and Management (EPM) as a new planning approach that aimed, among other things to increase the capacity of the city council to manage urban growth and development through participatory approaches of the communities, NGOs, central and local government and private sector. The EPM was successful in identifying specific environmental issues, including informal settlements upgrading programmes, but failed to deliver long term vision and comprehensive policies and guidelines for urban growth UNEP (2005) and Kiunsi (2013). SUDPs all fall short of explicitness in terms of future land use proposals to guide future urban growth. Consequently, the plan was abandoned in 2006. Following the cancellation of SUDPs, in 2007, the government prepared guidelines for the preparation and implementation of general planning schemes and detailed schemes. For new areas, urban renewal and regularisation were also prepared to bridge the gap between the 1979 Master Plans

and SUDPs. Currently, the Ministry of Lands, Housing and Settlements Development has commissioned an Italian cum British firms to prepare a new Master Plan for Dar es Salaam (2012-2032). Despite SUDP was not approved and implemented, still the plan was silent about the pedestrian concerns.

The Kariakoo Redevelopment Plan (2002)

The redevelopment plan of Kariakoo of 2002 recognizes the lack of pedestrian walkways and other pedestrian facilities in Kariakoo area. The plan acknowledges that most of the streets in Kariakoo lacked walkways, and where existed, they are occupied by street vendors or used as car parking. Pedestrian are thus forced to share the same carriageway with the flow of vehicular traffic, and consequently subjected to accidents. *To improve the pedestrian safety in Kariakoo area, the Kariakoo redevelopment plan of 2002 proposed for construction of pedestrian walkways and cycle lanes, Introduction of the pedestrian mall, provision of parking spaces in high-rise buildings and improvement of recreational areas (URT; 2002).*

The redevelopment plan also proposed space standards, building setbacks and building height guidelines whereby the maximum of eight floors was proposed. However, throughout the document mechanisms for implementing these strategies in terms of space allocation, financial resources, time to meet the desired goals were not realized. In addition, mechanisms to control violations of building setbacks are not stated, a situation that may end into blockage of the pedestrian walkways.

Similarly, despite the fact that the plan proposed for the transformation of single storey building to high-rise buildings with a maximum of 8 storey buildings, planning standards showing the building height-street width relationships were lacking. If this ratio is not taken into consideration, it may result into narrow streets that limit provision of pedestrian space and also it may lead into blocked air ventilation, blocked view/visitors and blocked sunlight. However, the implementation of the proposals of 2002 Kariakoo redevelopment plan to improve the pedestrian movements in the areas is discussed in Chapter ten.

Dar es Salaam Master Plan 2012-2032 (Draft)

The actual vision statement for the metropolitan area is to consider the City of Dar es Salaam as an entity that can reach the first place among the great cities of the east coast of the African continent and can compete on an international level with the great cities of equal rank, and, at the same time, to consider the metropolitan area as a habitat that can provide its residents with a platform for opportunities. In connection this vision statement for the metropolitan area, The 2012-2032 Dar es Salaam Master Plan proposal intends to translate the vision of Dar es Salaam as a *City of the Third Space*, a competitive environment which supports residents and attracts investors, into concrete answers in territorial terms by identifying a number of strategies, actions and projects that contribute to achieve the goal that the community of Dar has set itself. The First Space is the home and its social community is represented by the “clan” that lives in it. The Second Space is the workplace, with a closed social community, where a group of “colleagues” spend most of their time. The Third Space is a common space of community life, which facilitates broader creative interaction²⁹ and a community-oriented business development, like cooperatively-run spaces which includes commercial or non-commercial functions (Draft report of the Dar es Salaam Master Plan, 2012-2032: 53 & 56).

With regard to pedestrian movement, the draft master plan recognizes that the CBD lacks safe pedestrian walkways and services for the citizens. Motor vehicle pressure has reached a traffic jam endpoint that creates dangerous situations for pedestrians. The Master Plan aims to increase urban quality through pedestrian and bicycle routes, and through an easy access to public transports. To address the problem, the City Centre must be provided with adequate parking areas, located along the City

boundary; and for the vehicles entering the central areas, proper parking areas along the streets must be provided, that should not interfere neither with sidewalks, neither with lanes.

Despite the fact that the draft Dar es Salaam Master Plan 2012-2032 quite correctly recognizes the challenges of pedestrian movements in Dar es Salaam, yet low priority is given to improve the walking environment. With exception of the City Centre the new master plan is silent about how can the walking environment be improved in the formally planned and unplanned settlements in a situation of increased motorised means of transport. The draft document is also silent about the disability infrastructure considerations, particularly in the public transport systems and high-rise buildings. Recreational areas for pedestrians to rest are also inadequately discussed.

Dar es Salaam Rapid Transit (DART) Reports

Bus Rapid Transit (BRT) is high-quality, customer-orientated public transit system that delivers fast, comfortable and cost-effective urban mobility. BRT is also known by other names in various parts of the world. These names include High-Capacity Bus Systems, High-Quality Bus Systems, Metro-Bus, Express Bus Systems, and Bus-way Systems. BRT systems incorporate most of the high-quality aspects of underground metro systems, but at a fraction of the cost. BRT systems are thus also known as “surface metro” systems. The primary characteristics of BRT systems include: Segregated bus-ways; rapid boarding and alighting; clean, secure and comfortable stations and terminals; efficient pre-board fare collection; clear and prominent signage and real-time information displays; transit prioritisation at intersections; modal integration at stations and terminals; and clean bus technologies.

Confronted with high population growth rate where the majority of the population depended on public transport coupled with limited financial resources to develop car-based infrastructure, the city of Dar es Salaam faced a number of problems including inefficient urban transport services as well as increasing levels of air pollution from vehicle emissions. To address these problems, in 2002, the Dar es Salaam City Council resolved to adopt an innovative transport system. This is the “Bus Rapid Transit- BRT” that utilizes exclusive right-of-way bus lanes. The new system has proved to be swift, efficient, and cost-effective in moving people in various cities throughout the world where it has been implemented. It has proved to be a better system than the commonly practiced systems of traffic management where movement of cars is a primary concern. Examples of innovative and successfully implemented bus way systems are found in Bogota in Colombia and Curitiba in Brazil.

In order to improve the quality of the public service in Dar es Salaam City, the shifting from the present unorganized and the unsatisfactory public transport system and NMT facilities to the introduction of a more organized massive transportation system - the Bus Rapid Transit (BRT) system which incorporates all modes of transportation in Dar es Salaam was highly recommended. The BRT system was expected to bring about an innovative mobility strategy, which apart from improving the service it could also subsequently improve the quality of living of the city residents through improved mobility options. *The BRT vision* is to have a modern public transport system at reasonable cost to the users, safe and yet profitable to the operators using quality-high capacity buses which meet international service standards, environmentally friendly, operating on exclusive lanes and at less travel time. *BRT mission* is to provide quality, accessible and affordable mass transport system for the residents of Dar es Salaam, which will subsequently: contribute to poverty reduction, improve standard of living, lead to sustainable economic growth and act as a pioneer of private and public investment partnership in the transport sector in the City (Mlambo, 2012).

The BRT system was planned to include segregated and prioritized bus lanes constructed in the median, with boarding stations every 500-700metres, bus terminals at the end of bus lanes and at major intersections, pedestrian overpasses, bikeways, pedestrian walkways and local facilities. The road infrastructure, that was to be built into the existing carriageway, consists of, between bus stations, two

rigid pavement BRT (bus) lanes throughout, two or four flexible pavement ‘mixed traffic lanes’, ‘two bikeways’ and two foot-ways (Figure10.16).

Generally, the DART project aimed to provide mobility for all road users. Both motorized and non-motorized means of transport were considered. The BRT system was expected to cover a total of 137 Kilometer of bus-ways, with 200-220 Km of feeder roads that will be developed in six phases. The author is of the opinion that the DART project considered the pedestrian requirements and if implemented it can adequately improve the pedestrian mobility within Dar es Salaam (TANROADS, 2015).

9.4. Urban planning and space standards adopted in Tanzania

The urban population in Dar es Salaam City, as is the case in other Sub-Saharan African cities, lives in formal and informal settlements. Within this context, the highest proportion (about 70%) of the urban population in Dar es Salaam City lives in informal settlements (URT, 2000a). In terms of land coverage, about 61% of the built-up area in Dar es Salaam City is covered by informal settlements (URT, 2012). However, the residential living environment in informal settlements lacks basic service infrastructures such as paved roads, storm water drains, electricity, street lights, clean water and sewerage that call for upgrading. Due to this fact, there is a need to review the planning standards guiding the urban development in the formally planned and upgraded informal settlements. The next section presents the analysis regarding considerations of the pedestrian requirements by planning standards adopted in the formally planned and upgraded informal settlements:

9.4.1 Space standards for the formal planned settlements

In Tanzania, spatial planning is done in accordance to the requirements of the urban planning and space standards of 1993 amended in 1997, 2011 and currently are under revision. This document covers space standards for residential plots, health facilities, education, public facilities, recreational facilities and standards for the road network. Space standards for setbacks, plot coverage and plot ratio for detached and multi-storeys buildings, golf course, parking lot space requirements, and space standards for agricultural show grounds are also provided. However, the space standards differ from one level to another (i.e. neighbourhood level, community and District). This study reviewed only the space standards at a neighbourhood level: These include:

Space Standards for plot setbacks and coverages

The Urban Planning and Space Standards Regulations of 1997 and those of 2011 provide for minimum plot sizes and setbacks for detached residential buildings and multi-storey/block of flats buildings. Summary in table 9.2 is for more details.

Table 9 .2: Space standards for detached residential buildings

Type of plot	Plot size		Minimum setbacks (in metres)		
	URT, 1997 Space standards (in sq. metre)	URT, 2011 Space Standards (in sq. metre)	Front	Side	Rear
High density	400-800	300-600	3.0	1.5	2.0
Medium density	801-1600	601-1200	3.0	3.0	5.0
Low density	1601-4000	1201-1600	5.0	4.0	10.0
Super low	-	1601-2500	7.0	7.0	7.0

Source: URT, 1997and 2011

Table 9.2 shows the space standards proposed for high, medium and low density. As per the review of the Master Plans it appears the high, medium, and low density plots are designed for the low, middle, and high income earners. Chapter Ten shows the way this zoning concept was implemented in the study areas, particularly in Sinza settlement. Generally, if implemented, the low income earners would access most of their basic needs within the convenient walking distance.

For multi-storey/block of flats, high density plots were proposed to range between 400 -600 square metre, medium density plots cover 1000 square metre and 2500 square metre were recommended for

low density plots. Setbacks for multi-storey buildings in high density plots are 3.0 metres frontage and 1.5 metres for side and rear space (URT, 2011). Chapter Ten shows the space standards for multi-storey building are implemented in Kariakoo with regard to pedestrian movements.

Space standards for public facilities at neighbourhood level

According to URT (1997:2011), every neighborhood has to be provided with its own health facilities (dispensary or clinic); education facilities (nursery school and primary school); commercial facilities (market and shops, whereby 5-10 shop plots are to be located within the centre and others at corner plots). Other public facilities include: Public buildings/area; service trade site; cemetery; bar and restaurants. Table 9.3 summarizes the space standards for neighbourhood level public facilities.

Table 9.3: Space standards for public facilities at a neighbourhood level

Type of Facility	Gross area/ persons (sq.metre)	Recommended Area
Market	0.4-0.5	1200-2500 sq.m
Dispensary/clinic	0.5 sq.m	3,500-5,000 sq.m
Primary school	40	1.50 – 4.5ha
Nursery school	30	1,200-1,1800sqm
Shops	0.8-1.0	250 – 500 sq.m
Public areas/buildings	0.25-0.5	800-2500sqm
Service trade site	0.4-1.0	2000-5000 sq.m
Bar /restaurants	0.4	1, 200 +
Cemetery sites	-	0.5-1.5 ha

Source: URT, 1997 and 2011

Table 9.3 shows that the pedestrian requirements were considered (though indirectly). If implemented, the neighbourhood planning standards would reduce the walking distances covered by pedestrians to access the same. However, also, the review of planning standards shows that religious facilities and parking lots were not considered by the existing planning standards. The non-consideration of parking spaces at a neighbourhood level may lead to encroachment of pedestrian walkways. Similarly, the lack of religious sites may land to the encroachment of recreational open space or may result to change of residential plots to religious facilities. It is also most likely that it will increase the walking distance to access the same.

Space standards for recreational activities at neighbourhood level

The recreational facilities proposed at neighbourhood level include: open spaces, neighbourhood park, areas for active recreation (children play area, play fields and sport fields) and areas for passive recreation (picnicking, zoo and camping) as Table 9.4 indicates.

Table 9.4: Space standards for recreational activities at neighbourhood level

Type of facility	Gross area/1000 persons (sq.m)	Recommended areas
Open Spaces	5.0 -10.0	500 – 1500 sq.m
Neighbourhood Park	2.0 – 5.0	0.6 -2.5 ha
Children play area	0.2 - 0.4 ha.	1.0 – 2.0 ha
Play fields	0.5 – 1.0 ha.	2.5 – 5.0 ha
Sports fields	1.0 – 1.5 ha	5.0 – 8.0.ha
Picnicking	250 -500 sq.m	1.0 – 2.0 ha
Zoo or Arboretum	0.5 – 1.0 ha	2.5 – 5.0 ha
Camping	2.0 – 5.0 ha	10. 25.0 ha

Source: Urban Planning and Space Standards, 1977

Table 9.4 shows that the planning standards adopted in Tanzania consider pedestrian recreational areas for pedestrians to rest. If implemented, most pedestrians would have access to recreational public spaces where they can rest when walking in the area. However, Chapter Ten discusses how these standards were implemented in the study area (Sinza settlement).

Space standards for road network

With regard to road networks the Ministry of Lands, Housing and Human Settlements Development uses the British functional classification of road network in town planning. Roads are therefore classified in terms of the type and its corresponding planning and design space standards. Table 9.5 explains the types of roads in urban residential areas with their planning and design space standards in terms of right-of-way (RoW¹⁸) and carriageway (CW¹⁹).

Table 9.5: Space standards for roads used to plan urban residential areas

S/ N	Type of Road	Right-of-Way (Metre)	Carriage-way (Metre)
1	Local distributor roads	15.0 - 20.0	6.0 - 7.5
2	Local distributor roads (in residential areas)	10.0-20.0	6.0
3	Access roads (in shopping areas)	20.0	10.0
4	Access roads (in residential areas)	10.0 - 20.0	5.0 - 7.0
5	Pedestrian footpaths	10.0	2.0

Source: URT, 1997 and 2011

Table 9.5 shows that pedestrians were considered by the planning standards adopted in Tanzania, though the right of way for pedestrian footpaths seem wider. However, their implementation is discussed in chapter 10.

9.4.2 Space standards guiding the upgrading of informal settlements

The review shows that, in Tanzania, currently there are no official national planning standards to guide the upgrading informal settlements. In this case, the ‘communities led planning standards’²⁰ guide the upgrading of informal settlements. Through a consultative meeting, the local communities are mobilised to develop and agree about the conceptual regularization plan of the area. The agreed conceptual regularization plan shows the proposed plot subdivision and houses; proposed main road network/system; proposed public spaces and lands such as markets, schools, dispensaries, Mtaa offices, graveyards and cemeteries, way leaves for infrastructure lines, play grounds among others. Magigi and Majani (2006) report that, in 2002, the MLHSD approved for the first time the community agreed planning standards, specifically for the Ubungo-Darajani settlement (in Dar es Salaam) and Isamilo (in Mwanza). Having attained the approval by the ministry, the community agreed planning standards for Ubungo Darajani and Isamilo are now being used as a base for the various upgrading programs in Dar es Salaam. Next section presents the experience of space standards used in Phase I of CIUP projects:

CIUP space standards for roads improvements

Improvement of the road network in the upgraded informal settlements is currently carried-out by each upgrading program and/or upgrading project to develop its own space standards, according to the existing space (CIUP, 2002a; Magigi and Majani, 2006). The intention of using the existing space on the ground is to avoid demolition of houses required in roads widening and thus minimize compensation costs (CIUP, 2009; Mchome 2014). This is due to the fact that uncoordinated individual land subdivisions and uncontrolled housing development in informal settlements lead to encroachment of the available space for the road network. Thus, the widening of roads according to the approved space standards as reported by Nnkya (2002) means massive demolition of houses.

¹⁸ Right-of-Way (RoW), which is also called road reserve, is defined as the entire area included by the boundaries of roads (URT, 2000b).

¹⁹ Carriageway (CW) is defined as that part of the road that is normally used by vehicular traffic (URT, 2011a).

²⁰ The community led planning standards refers to communities agreed land use planning space standards guidelines for infrastructure facility and utility provisioning, which are then endorsed and approved by local and central governments.

With reference to CIUP projects implemented in informal settlements in Dar es Salaam, the space standards for roads widening were established after the review of similar cases of roads widening and roads improvement projects carried out in informal settlements in Tanzania, such as Ubungo-Darajani in Dar es Salaam, Isamilo and Ibungilo informal settlements upgrading project that were implemented in Mwanza in 2002 through Mwanza Sustainables Program, Sites and Services projects and other informal settlements upgrading projects that were implemented in 1970s by the ministry of lands (CIUP, 2003c). The review of roads widening space standards also included the urban planning and space standards that were established by the MLHSD in 1997 for planning of urban areas in Tanzania. This review covered also the pavement and materials design manual of 1999 that was issued by the Ministry of Works for road design CIUP (2003c) and Mchome (2014).

The experience of the Ubungo-Darajani and Ibungilo upgrading project shows that, before preparing the detailed land use plan, a community general assembly meetings to prepare a general planning scheme of a respective settlement were held. In this general assembly, various standards for allocations of infrastructure facilities and utilities location were presented by the planning team and agreed upon. It was through this meeting, where all decisions on land use plan, space standards and subsequent activities for implementation were put in place. Equally important, the community agreed planning standards were endorsed by local authorities and approved by the MLHSD (Magigi and Majani, 2005). Unlike the National Planning Standards, Ubungo-Darajani and Ibungilo communities agreed their plots to range between 150 and 4000 square metres in Ibungilo and between 12 and 2000 square metres in Ubungo-darajani informal settlements. These were far below the national plot sizes for residential areas that ranged between 400-4000 square metres. Table 9.6 shows a comparison between the national planning standards and the community agreed standards.

Table 9. 6: National planning standards for residential plots versus community agreed space standards

S/ N	Type of Road	The national planning standards (in sq.metre)	The community agreed standards, for implementation approved by MLHSD	
			Ibungilo (RoW)	Ubungo Darajani (RoW)
1	High density plots	400-800	150-800	12-800
2	Medium density plots	801-1600	900-1600	900-1600
3	Low density plots	1601-4000	1601-4000	1601-2000

Source: URT, (1997) and Magigi and Majani, 2005)

The community agreed planning standards presented in Table 9.6 shows that the minimum plot size in Ubungo-darajani was 12 square metres, while the maximum plot size amounted to 2000 square metre. Magigi and Majani (2005) note that, the maximum plot size (2000sq.m) was assigned to garages within residential areas. In Ibungilo, the minimum plot size was 150 square meters while the maximum had 4000 square meters, and these were in most cases located on steep slopes. The minimum plot sizes do not conform to the national planning space standards (i.e. 400 metres for high density plots) though they were approved by the central government. This showed recognition of informal settling in policy reforms and institutional support, which facilitated community involvement in decision making in determining planning standards in line to land availability.

Likewise for road improvements, through the community assembly, various standards for road networks and utilities were agreed as presented as Table 9.7 shows.

Table 9. 7: National space standards for road networks versus community agreed space standards

S/ N	Type of Road	The national planning standards (Formal) (RoW)	The community agreed Standards for implementation approved by MLHSD	
			Ibungilo (RoW)	Ubungo Darajani (RoW)
1	Trunk road	60.0-70.0	60.0-70.0	60.0-70.0
2	Primary distributors	30.0-40.0	30.0-40.0	30.0-40.0
3	District distributors	20.0-30.0	20.0-30.0	20.0-30.0
4	Local distributor roads	15.0 - 20.0	7.0-12.0	7.0-12.0

5	Local distributor roads (in residential areas)	10.0-20.0	10.0-12.0	12.0
6	Access roads (in residential areas)	10.0 - 20.0	6.0-8.0	8.0-10.0
7	Pedestrian footpaths	10.0	2-4	2-3

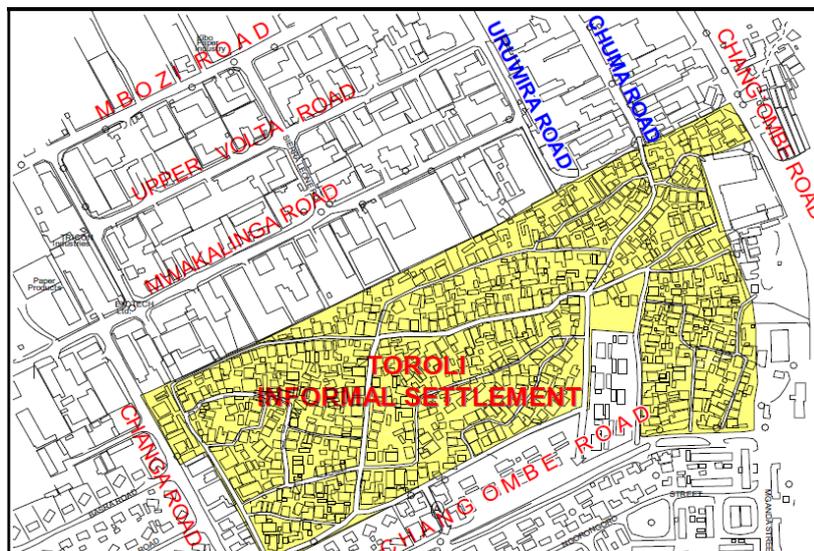
Source: URT, (1997) and Magigi and Majani, 2005)

Comparison of the national standards, Table 9.7 shows that the community agreed planning standards regarding the local distributor and access roads (in residential areas) and pedestrian footpaths were far away from the formal planning standards. However, the district, primary and trunk roads were the same as the national standards. These existed available at the time when the community agreed standards were developed.

Having completed the review of the community agreed planning standards adopted in other projects, and finally, CIUP established the following space standards according to CIUP (2003a, c):

- Local distributor roads (primary access roads), 10.0-12.0 metre RoW with 5.0 metre CW paved bitumen/asphaltic concrete - two way traffic, and 0.5 metre shoulder on both sides of carriageway;
- Local distributor roads in residential areas (secondary access roads), 10.0- 12.0 metre RoW with 5.0 metre CW gravel - two way traffic, and 0.75 metre shoulder on both sides of carriageway;
- Access roads (tertiary access roads), 6.0-8.0 metre RoW with 1.8-3.0 metre CW gravel - one way traffic and 0.5 metre shoulder on both sides of carriageway; and
- Footpaths are 2.0-4.0 metre RoW with 1.0-2.0 metre CW gravel/earth (CIUP, 2003a, c).

Comparing the community agreed planning standards from the formal national space standards, it appears that the communities agreed planning standards are inconsistent with formal planning standards, but reflect settlement existing socioeconomic land development realities. Magigi and Majani (2006) and Mchome (2014) argue that such inconsistencies lead to lack of links and continuity of the same types of road between the formal and informal settlements due to the difference of space standards in terms of right-of-way. For instance, Table 9.7 shows that the local distributor roads with 15.0-20.0 metres RoW in planned settlements has no link with the same type of road with 7.0-12 metres RoW in the upgraded informal settlements. As a result, the link and continuity of the same road passing through the formally planned and upgraded informal settlement cannot be realized. Figure 9.3 shows the break of continuity of a road linking planned and unplanned settlement.



Source: Adopted from Mchome, (2013:5)

Figure 9. 3: Break of continuity of Uruwira and Chuma Road in Toroli upgraded informal settlement

Owing to non-realization of link and continuity of road network between the formally planned and upgraded informal settlements, attempts of using different names of the same types of roads in the upgraded informal settlements to differentiate with those in the formally planned settlements is being made. For instance, URT (2012b) cited in Mchome (2014) made an attempt to establish a new road network for informal settlements namely; *primary access roads* instead of local distributor roads, *secondary access roads* instead of local distributor roads (in residential areas), *tertiary access roads* instead of access roads and last are footpaths. In this regard, primary access roads range between 12.0 and 15.0 metre RoW and 5.0 metre CW; secondary access roads are 10.0-12.0 metre RoW and 5.0 metre CW. Furthermore, URT (2012b) established space standards for tertiary access roads (one way) with 6.0-8.0 metre RoW and 1.8-3.0 metre CW; and footpath with 4.0-6.0 metre RoW and 2.0-3.0 metre CW (ibid). Summary in text table is for more details (ibid).

Table 9. 8: Road network classification in the informal settlements

Road hierarch	RoW in metres	Carriageway
Primary access	12.0-15.0	5.0
Secondary access	10.0-12.0	5.0
Tertiary access (One way)	6.0-8.0	1.8-3.0
Footpath	4.0-6.0	2.0-3.0

Source: URT, (2012b)

However, the road network classification presented in Table 9.8 does not exist in the British-English functional classification of road network adopted in town planning practice in Tanzania that was published in the Government Notice Number 157 on 16th May, 1997 by the same Ministry. The results of using the proposed types of roads are creation of dead end roads between the adjacent formal and informal settlement and lack of link and continuity of the road network.

With regard to pedestrians, there is a need of having approved standards to guide the upgrading of informal settlements, through which the pedestrian requirements can be considered. The way these space standards were implemented in Buguruni settlements is discussed in Chapter Ten.

9.5 Concluding summary

In this chapter, a review of relevant documents, sectoral policies, local level planning documents, design concepts and planning standards adopted in the planned and informal settlements in Tanzania has been made. Besides that, issues/gaps requiring either a policy or planning interventions for addressing the pedestrian concerns have identified. These include:

- Walking is not recognized as a mode of transport;
- Inadequately considerations of disability infrastructure;
- Lack of policy and planning provisions for actions;
- Lack of implementation mechanisms;
- Lack of coordination mechanism among actors;
- Non-realization of the building height-street width ratio;
- Lack of national planning standards to guide the upgrading informal settlements;
- Non consideration of parking lots and religious facilities at a neighbourhood level, and
- Lack of comprehensive policy document covering pedestrian requirements.

The next chapter discusses how the existing urban design concepts and planning standards adopted were being implemented in the case study areas with a view to improving the pedestrian movements in such settlements. Worth-noting, the national planning standards were only evaluated in the planned settlements (Sinza and Kariakoo), while the CIUP adopted planning standards were evaluated in the upgraded informal settlements (Buguruni).

CHAPTER TEN

10 IMPLEMENTATION OF DESIGN CONCEPTS AND PLANNING STANDARDS

10.0 Introduction

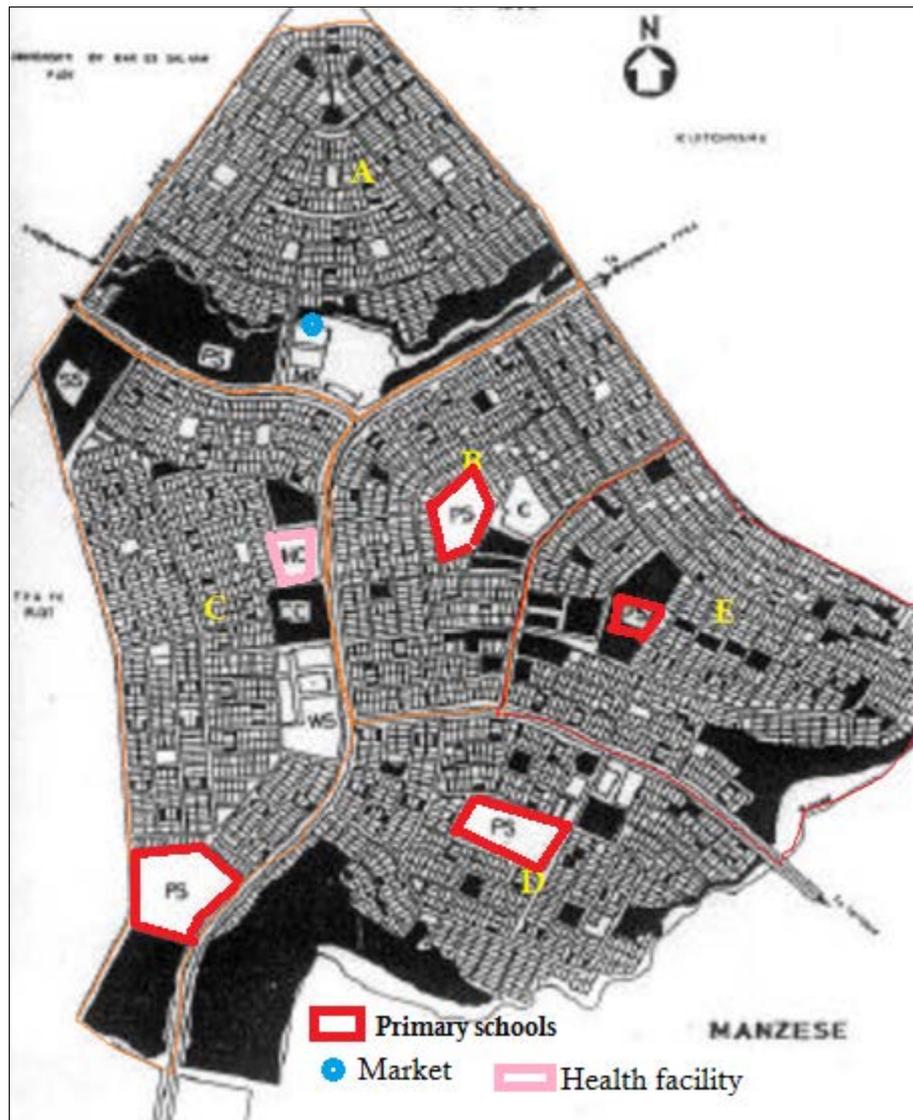
This chapter examines how design concepts and planning standards adopted in Tanzania were implemented in the case study areas of Sinza, Kariakoo and Buguruni. The underlying motive was to evaluate whether the design concepts, planning standards and document objectives proposed to improve the pedestrian concerns in the case study areas were implemented and achieved. In Sinza, the evaluation was based on the neighbourhood level planning standards, while in Kariakoo, it was based on the redevelopment plans for Kariakoo area. In Buguruni, the evaluation was based on the CIUP space standards for road improvements.

10.1 Sub-case 1: Sinza neighbourhood

10.1.1 Planning of Sinza ward

Sinza neighbourhood was planned in the early 1970s under "Sites and Services projects"²¹ that were funded by the World Bank programs. Sinza was planned as a residential area for the lower income groups with small plot sizes of 288 square meters (Lupala, 2002), while the plot coverage for this size of plots was restricted to 40% of the plot area (URT, 1997 and 2011). In 1974, the Ministry of Lands, Housing and Human Settlements Development, prepared the layout plan, drawing No.1/73/174 which was approved by the Director of Urban Planning on 5/5/1974 (Mng'ong'o, 2004). One of the objectives for planning Sinza as observed by Kironde (1990) was to overhaul the congested Manzese informal settlement (nicknamed as "Soweto" by that time because of the level of criminality which was equated to match with what was by then happening in apartheid South Africa) that was very insecure to live in. Selection of Sinza for the World Bank projects was influenced by its location. The area is located in the outskirts of the city. Apart from that, by that time the population distribution was so scattered. Thus, planning and laying out the infrastructure would not destroy many physical properties. The Sites and Services projects had typical housing types, similar neighborhood designs with identical street layout patterns and considered infrastructure provision like water, sewer and electricity (Goldie, 1979). However, the plan was not fully implemented by the Kinondoni Municipal Council due to lack of sufficient financial resources which is linked to failure to link the plan with the local budgets (UN Habitat, 2010).

²¹ Sites and Services approach to planning was a system whereby the state provided land, planned it and provided essential infrastructure like roads, water and electricity to beneficiaries (citizens). The plans were typical in terms of design and sizes (Goldie, 1979).



Source: Modified from Lupala, (2002) to suit the study

Figure 10. 1: Sinza sites and services layout plan of 1974

Figure 10.1 shows that, the Sinza sites and services layout plan of 1974 took into consideration provision of various land uses like residential plots, public facilities, road circulation and open spaces (in black spots). The design concept adopted is more similar to the neighbourhood unit concept proposed by the 1979 Dar es Salaam Master Plan (Figure 9.2). The planning of Sinza aimed to accommodate the low income class and hence it was a pure residential neighbourhood. The implementation of the urban design concept as well as the planning standards adopted in Sinza will be discussed in the next section:

10.1.2 Implementation of zoning concepts in Sinza

Implementation of zoning residential plots according to income groups

Planning of Sinza comprised of relatively small (288sq. m) as it was anticipated that smaller housing units that are self-contained would be built by the low-income people. On the contrary, the higher and middle-income group bought of the low income plots and built larger houses resulting into densely built area and higher plot coverage.

According to URT (1997 and 2011), the proposed plot sizes (288 square metres) falls under high density plots. However, current high density plot sizes vary between 300-600 square metres, and are largely intended for the lower income households.

Table 10. 1: National Space Standards for residential plots versus actual implementation in Sinza

Type of plot	Plot sizes as per URT, 1997 (in sq. metre)	Plot size as per URT, 2011 (in sq. metre)	Actual plot size in Sinza (in Sq.m)
High density	400-800	300-600	288
Medium density	801-1600	601-1200	-
Low density	1601-4000	1201-1600	-
Super low	-	1601-2500	-

Source: URT, (1997; 2011) and Lupala, (2002)

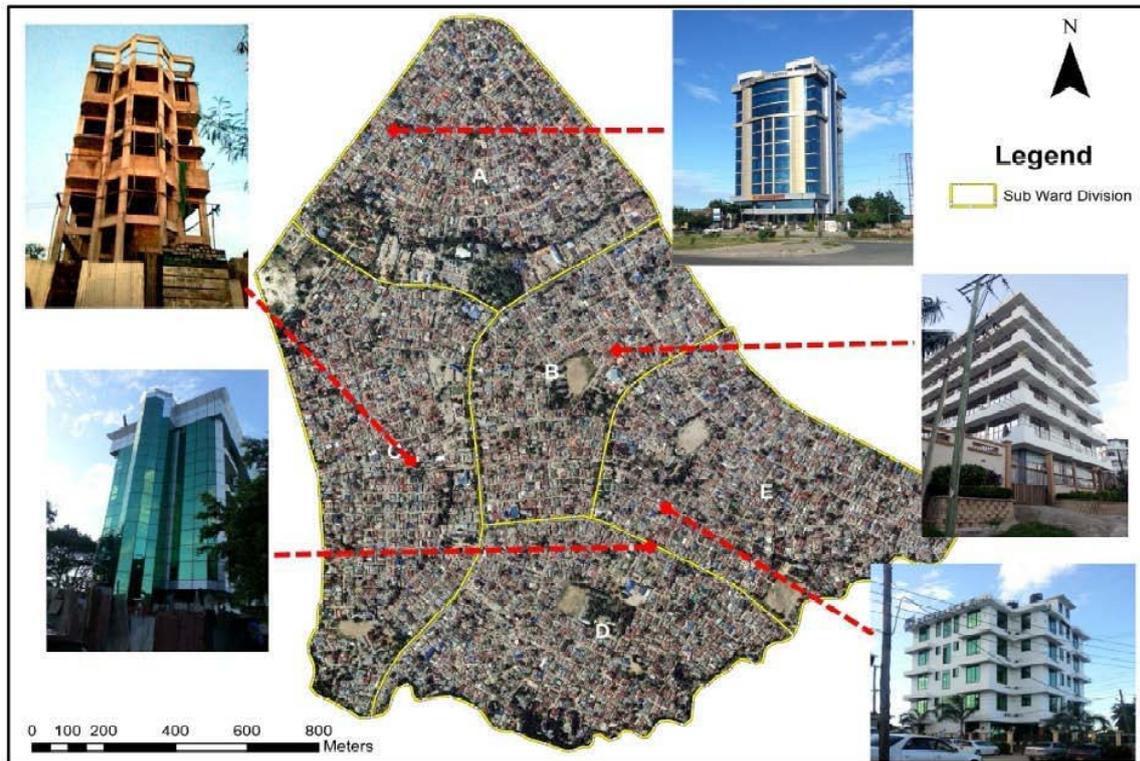
Table 10.1 shows that noted that the plot sizes adopted in Sinza (288sq. m) are below the national planning standards for high density plots. As the plot sizes were relatively small, currently, one could expect to find most of these plots owned by the low income class as the middle and higher class prefer larger plots. However, this has not been the case in Sinza. The middle and higher income earners had occupied the high density plots and in some cases these plots are used for commercial activities. This shortfall is admitted by the National (Draft) Housing Policy of 2007 that “*though Sites and Services project was meant for low income households; it has transpired that most of the land developers are within the middle to high-income brackets*”. Kironde (1991) cited in Vedasto and Mrema (2013) makes it clear that only 30% of the owners in Sinza belong to the low income group.

The researcher opines that the zoning concepts which are in most cases inherited from the colonial administration resulting into plot density categories of high, medium and low density plots to be developed by the low, medium and higher income earners respectively do not have strong impact on the settlement development today. In practice, it is hard to find any planned residential settlement in Dar es Salaam that has been developed for purely low-income groups only. The middle and higher income groups often occupy the high density plots designed for the low income class and some cases these plots are used for commercial activities.

However, with regard to pedestrian movements the study has found out that the design of high density plots in Sinza in a gridiron pattern coupled with the informal land use mix has contributed to easy access of local shops, public bus stops, cafes, restaurants and bars/grocery. Out of the 25 resident households interviewed, 23 (92.0%) and 15 (60.0%) accessed local shops and public transport respectively within 10 minutes walking time. This finding supports Ewing (1999) who argues that the higher density plots increases the willingness to walk instead of driving. They compress enough activities into a small area to allow people to walk to almost everything.

Implementation of the concept of fixed land use per area

Though the Sinza layout plan (Drawing No. 1/73/174) of 1974 had most of its plots designated for residential use, in reality this concept is no longer upheld. Currently, Sinza is rapidly changing from residential to accommodate other land uses like commercial activities. Several guest houses, hotels, restaurants, shops, small groceries, service industries, social hall, boutiques and multi-story buildings have emerged in the neighbourhood leading to mixed use within the area. Single storey buildings are being transformed into multistory buildings (Figure 10.2). These land use changes have not only increased densities which have not been compromised due to competition of space but also exposed pedestrians to insecure environments.



Source: Adopted from Lupala and Bhayo, (2014) and field observation, March 2015

Figure 10. 2 : Sinza settlement and the emerging high rise buildings

As Figure 10.2 shows, it is evident that Sinza neighbourhood is no longer a pure residential neighbourhood but rather a kind of land use mix. Together with the negative effects brought by the ongoing housing transformations and frequent change of use, on the other hand, the new emerging concept (land use mix) has contributed to easy access to local shops, cafes, restaurants and bars due to the mushrooming of home based income generating activities such as small shops /kiosk, pharmacies, workshops, tailoring shops and leisure activities like bars, restaurants and cafes. The commercial activities were mainly located along the main roads (Shekilango and Uzuri Road) and at the fringe of the settlements. Locational preferences of commercial activities along the main roads are associated with the desire by operators to ensure accessibility and proximity to customer flow.

The land use changes observed in Sinza have increased densities which have not equivalently been supplied with additional infrastructure. The comfort of a pedestrian has been compromised due to competition of space by these activities which have not only increased densities, but also exposed pedestrians to insecure environments. The increase of activities and motorization without infrastructure has constrained pedestrian safety management in the rapidly growing settlements like Sinza.

To understand whether the emerging land uses are legal or illegal, the researcher approached the expert professionals at the Kinondoni Municipality for interviews. During interviews, it was reported that the change of land use is done formally by the responsible authority (for this case, the Kinondoni Municipal Council) though in turn does not increase infrastructure provision in the affected areas. One of the urban planners at the Kinondoni Municipal Council acknowledged this: *“The Municipal Council approves multifamily dwelling houses and commercial uses in Sinza due to the higher demand for such services in the area. However, Sinza neighbourhood is in the Council’s plan to re-plan so as to strengthen development control in the settlement²²”*.

²² Interview with a Town Planner at the Kinondoni Municipality on 20th March 2015.

He further added that though the Municipal Councils are empowered to approve the building plans and endorse land use changes within their area of jurisdiction, scrutiny of building plans and change of use plans does not take pedestrian requirements as a consideration for approval. He said that “*Pedestrians’ needs are not usually a consideration for approving building plans and change of use plans*”²³”

With these quotes, it seems there are no pedestrian circulation conditionalities that are put forward prior to the approval of building plans and change of use. Furthermore, it appears there is no clear concept for the distribution and localisation of these emerging commercial and service related activities. This situation had resulted in the new activities being haphazardly spread in the entire settlements without any planning concept. The retail shops and workshops are located in the buildings along the main collector roads like Shekilango and Uzuri Roads: This contradicts the official neighbourhood design concept proposed by the 1979 Dar es Salaam Master Plan with communal services and commercial uses located at the centre of the neighbourhood (Figure 9.2).

Newman (1996) recognizes the importance of designs which allow buildings to face streets to guarantee natural surveillance of the streets (keeping eyes on the streets). About 67 percent of the respondents in Sinza felt safe walking in streets faced by multifamily high rise buildings than single detached houses. One pedestrian confirmed this as saying: “*I feel safe walking in a street faced by high-rise building or where many families are living in because I am assured of safety. If I am attacked, for sure many family members will rescue me and the possibility of catching the attacker is high as opposed to streets which are faced by only one family building*”

Though the rapidly changing neighbourhood is seen as a constraint to pedestrian safety management, this trend of development can be regarded as potential. With increased movement within the neighbourhoods, this can be used as a bait to push and advocate for pedestrian safety agenda in the development process.

Results and discussions

With regard to these findings, it seems that the concept of zoning density plots according to incomes (i.e. high, medium and low density to accommodate the low, middle and high income earners respectively) was not fully implemented and it is out dated. The concept had just remained on the papers only, but not reflecting the reality. The experience shows that it is very rare to find any planned residential settlement in Dar es Salaam that has been systematically developed for low-income earners only and implemented. Although most of the layout plans in Dar es Salaam were planned and designed to accommodate the urban poor in the high density plots, often such targeted group is not reached. The middle and high income class occupy high density plots either because the urban poor could not afford the prices of land the time plots were allocated or they were overseen in the official allocation procedures. Sometimes, the rising land prices and speculation force the lower income earners to sell their plots (high density plots) and move to the other unplanned settlements where land is somehow cheaper and with flexible developmental conditions. In this case, the town planners ought to re-think about the land use planning standards adopted in order to revitalise coherent urban land development and support the urban poor to access affordable buildable land and to release financial assets for the urban economy.

Likewise, the concepts of designating special land use per area such as pure residential, commercial, residential cum commercial, institutional or industrial areas, where no other uses are allowed are inappropriate today as they do not reflect the urban reality. The urbanisation taking place in cities of developing countries like Dar es Salaam is in most cases referred to as ‘urbanisation under poverty’ characterized by rural-urban migration and limited capacity of the government to guide the urban de-

²³ Interview with a Town Planner at the Kinondoni Municipality on 20th March 2015.

velopment. This kind of urbanisation requires planning standards and design concepts that reflect the livelihood strategies of poor settlers such as home-based income generating activities. The zoning concepts adopted in most neighbourhoods in the City cannot respond to the livelihood strategy of the urban poor residents rather a kind of mixed land use development is likely to suit the needs of the poor settlers. Hence it can be concluded that rigid concepts like those of zoning based on fixed land use categories per area are outdated as they do not reflect the contemporary urban reality. Worse still, the concepts do not address the pedestrian requirements and other needs, including flexible livelihoods options commensurate with the changing employment and income generating activities.

10.1.3 Space standards for plot setbacks coverage versus actual implementation in Sinza

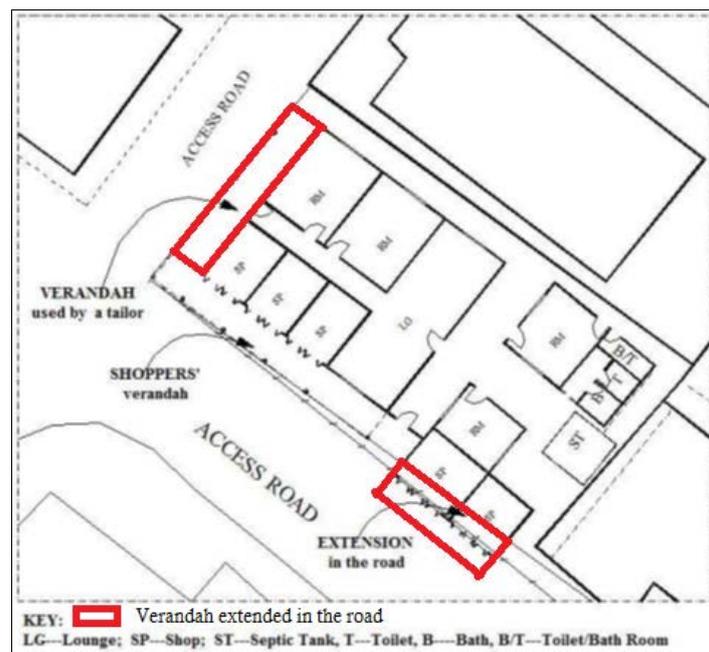
To avoid development beyond the plot boundaries, URT (1997 and 2011) provided for minimum building lines and setbacks presented in Table 10.2.

Table 10. 2: Minimum building lines and setbacks adopted in Tanzania

Type of plots	Plot Sizes as per URT, 1997	Plot Sizes as per URT, 2011	Setbacks		
			Front	Side	Rear
High density	400-800	300-600	3.0	1.5	1.5-2.0
Medium density	801-1600	601-1200	3.0	3.0	3.0-5.0
Low density	1601-4000	1201-1600	5.0	4.0	5.0-10.0
Super low	-	1601-2500	7.0	7.0	7.0

Source: URT, (2002 and 2011)

Despite the existence for minimum space standards for building lines and setbacks, yet the plot coverage and setbacks have been ignored. The plot coverage in high density plots was limited to 40% according to URT (1997). The field study however observed the resulting plot coverage in most plots in Sinza B and D ranging between 70% and almost 100% and hence exceeding the building lines and setbacks. This is far above the recommend plot coverage of not more than 40% in high density areas. The observation made on Plot 79 located in Sinza D found out that the landlord had his main and rear house transformed to include shops fronting the two access roads bordering the plot. The shops in the main and the rear building were making good business. As a result, many landlords had introduced verandas on the front and on the sides to provide shade against direct sun and rain. Consequently, the extension went beyond the permitted setbacks of 1.5 and 3.0 meters. Figure 10.3 provides further illustration:



Source: Modified from Vedasto and Mrema, (2013:167)

Figure 10. 3: Violation of plot setbacks and coverage on Plot No. 79 in Sinza D

Figure 10.3 shows that the veranda fronting the two shops in the rear building is extended encroaching upon the right of way. Likewise, the shoppers' verandah that front the main building are also constructed almost up to the edges of the plot meaning no setbacks are provided. This contradicts the proposed frontage as well as blocks the continuity of pedestrian walking paths.

This observation is in line with the complaints of the resident interviewed in Sinza B that many extensions of buildings had blocked the connectivity of the walking paths. Kaniki Dilunga, an 71 elderly and a retired officer complained that: “Land developers in Sinza never adhere to setbacks, especially during fence construction and other building extensions. Despite the small plot sizes (12x24meter), still developers force to erect fence walls surrounding their buildings This practice has resulted in the encroachment of pedestrian space, and therefore we pedestrians end-up mixing-up with the motorists, which is very dangerous for our lives”.



Source: Field observations in Sinza, March 2015

Figure 10. 4: Violations of plot setbacks in Sinza



Source: Fieldwork in Sinza, April 2015

Figure 10. 5: High fencing walls in Sinza settlement

In connection with the building fences , Mng'ong'o (2004) argues that the Sites and Services Plan of 1974 recommended plot fences in Sinza to be made of transparent materials.

However, this study observed that almost all the fences in Sinza were built of solid block walls instead of transparent materials as (Figure 10.5). The extension of erection of wall fences not only had narrowed the access roads, but had also blocked the 'eyes on the street', concept which Jacobs (1961) emphasises to enhance safety and encourage walking in streets. The effects of building extensions were largely felt in the narrow streets which are already under competition from the other motorized and non-motorized means of transport like cars, motorcycles, tricycles (*bajaji*), bicycles, pushcarts and pedestrians.

Due to continued building extensions, sizes of road in Sinza neighbourhood are generally too narrow to further accommodate new developments, which have led to densification of the neighbourhood beyond its carrying capacity. The streets in Sinza are narrow (6-10 meters right of way) with neither pedestrian walkways nor parking lots provided. The motorists park on the 6 meters road, thereby reducing the carriage way to 3- 4 meters. These observations are in line with Mng'ong'o (2004) who reports that almost all the residential access roads in Sinza have been narrowed to 4 to 7 meters wide carriageway. Scholz et al., (20011) Vedasto and Mrema (2013) Lupala and Bhayo (2014) and Dunge

(2014) also made the similar observations, i.e. housing development in Sinza is done without respecting the plot setbacks and coverage. The violations of planning standards observed in Sinza are resulted from weak development control by the responsible authorities.

The results from finding have revealed violations of minimum setbacks and plot coverage in Sinza. The violation of planning standards observed in Sinza is a result of the weak development control. Furthermore, the violations of fencing material (i.e. from transparent materials to solid block) have resulted into the narrowness of access roads, blockage of pedestrian access, blocked ventilation and fear of crime by pedestrians. Though mugging was reported to be very rare during daytime, the majority of the resident households interviewed (16 out of 25) felt unsafe and uncomfortable to walk in poorly lit and isolated streets. The taller and solid fencing posed fear to pedestrians of being mugged especially at night hours since they are potential hiding places for muggers. A woman interviewed in Sinza 'B' expressed fear of them: *“Walking past some disused buildings like those ones there creates fear to us pedestrians, especially at night because a thief may be hiding there to attack pedestrians”*

All in all, the violation of building lines, especially along the main road reserves increases congestion in the public space within the area. Some land uses and urban development activities tend to dominate over other used. When the public space become contested, normally the weaker groups like pedestrians are often pushed out of their right of way by the dominant land uses, a situation that forced pedestrians to share the same carriage way with motorised traffic. Therefore, planners need to pay more attention to protect the rights of pedestrians, especially in a situation of increased motorized transport and urban activity functions.

10.1.4 Space standards for public facilities versus actual situation in Sinza neighbourhood.

Regarding implementation of space standards for public facilities in Sinza, the study has noted a deviation between the planning standards and actual implementation of the standards. As discussed in Chapter Nine, the Urban Planning and Space Standards Regulations of 1993 which were amended in 1997 and 2011 require every residential neighborhood to have a dispensary/clinic, nursery school, primary school, market, shops, public buildings and service trade site. The 1979 Dar es Salaam Master neighborhood unit concept also suggested a primary school, market, dispensary/clinic, children play area and recreational areas be provided at the neighbourhood centre and within housing clusters to ease access to these public facilities.

The field observation however, observed that these planning standards were not fully implemented in Sinza. As a result, public facilities were inconveniently located and people had to walk a distance to access some of the public facilities. That could be the reason sufficient to explain why 17 (68.0%) out of 25 residents interviewed in Sinza perceived the public facilities to be inconveniently located, except small shops, bars, cafes and restaurants. Table 10.3 summarizes a comparison between the planning standards and actual implementation.

Table 10. 3: National Space Standards for Public Facilities versus actual situation in Sinza

S/N	Type of Facility	Gross area/1000 persons (sq.m)	Recommended areas at Neighbourhood level	Actual situation in Sinza	Remarks
1	Market	0.4-0.5	1200-2500 sq.m	Only provided in Sinza A. The rest Sinza B, C, D and E lack market places	Most residents cover over a Kilometer to access the market service
2	Dispensary/Clinic	0.5 sq.m	3,500-5,000 sq.m	With exception of Sinza C, Sinza A, B, D and E lacked health facilities	Most residents cover over 1.0Km to access a health facility

3	Primary school	40	1.50 – 4.5ha	Provided, except in Sinza A	School children in Sinza 'A' attend primary school at a distance of about 2-14 Kilometer away -Mugabe Primary School is not centrally located
4	Nursery school	30	1,200-1,1800sq.m	Spaces were provided, but not implemented. They are encroached upon by other land use activities	Nursery schools are operated within primary schools
5	Shops	0.8-1.0	250 – 500 sq.m	Conveniently located, though most of the shops were not initially planned just emerged informally.	The majority of the residents accessed local shops within 10 minutes.
6	Public buildings	0.25-0.5	800-2500sqm	Provided, though some are constructed on public recreational open spaces	Encroachment of public open space like CCM office in Sinza D
7	Service trade site	0.4-1.0	2000-5000 sq.m	Not provided	Vendors encroached upon the pedestrian space

Source: URT, 1977 and field observations, April 2015

Table 10.3 shows that that the planning standards for public facilities proposed by URT (1997) together with the neighbourhood unit concept suggested by the 1979 Master Plan were not fully implemented. These spatial inconveniences are affecting access to common facilities due to long distances covered as people had to walk a distance to access some services. However, the planning concept adopted in Sinza seems to reflect the neighbourhood unit concept proposed by the 1979 Master Plan.

10.1.5 Space standards for road networks versus the actual implementation in Sinza

Regarding the space standards for road networks, the actual situation was also different from the planning standards. Table 10.4 summarizes the implementation of space standards for road network as revealed in Sinza neighbourhood.

Table 10.4: Implementation of Space Standards for road widths in Sinza

S/ N	Type of road	Standard width in Meters as per URT (1997)		The Situation in Sinza		Remarks
		Right of way	Carriage-way	Right of way	Carriage-way	
1	Access roads (in residential areas)	10.0-20.0	6-7	6-12	3-6	Encroached upon by parking and petty traders
2	Access roads (in shopping areas)	20	10	6-15	6-7.5	Encroached upon by small scale business activities encroaching
3	Local distributors	30.0	7.0-7.5	20-25	7	- Temporary structures obstructions by building extensions and informal vending activities - Pedestrian space was not organized
4	Pedestrian Access	2-3	2	None	None, except	Pedestrian walk on the

					Sam Nujoma road (1.5)	shoulders of the roads and using the same carriage-way with motorists
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Source: URT, 1997 and field observation in April 2015

The non-implementation of space standards for road networks had led to limited pedestrian space both along the local distributor/collector roads and in residential streets which are usually too narrow and without pedestrian walkways. Most of the access roads (in residential areas) were between 6 and 7 meters wide instead of 10 to 20 meters spelt on the national standards. This road sizes seemed insufficient to accommodate vehicles and pedestrian facilities. To make the matter worse, motorists park on the 6 metres road, thereby reducing the carriage way to 3 metres, which is competed by all means of transport (vehicles, motorcycles, *bajaji* (three wheeled vehicles), cyclists, hand carts and pedestrians.

Moreover, though the distributor/collector roads in Sinza are 20-25 metres right of way (RoW), still the pedestrian space is not organized and sometimes they are encroached by the informal vending activities. As a result, pedestrians were forced to to walk at the road shoulders or share same carriage-way with motorists as figure 10.8 shows, a situation which endanger the pedestrian safety. Figure 10.6 shows the actual situation as observed along the local distributor/collector roads in Sinza neighbourhoods.



Source: Fieldwork in Sinza, March 2015

Figure 10. 6: Pedestrian space encroached by parked cars and Tricycles

Figure 10.6 shows the lack of public parking areas in Sinza neighbourhoods (not considered in 1974 Plan). This means that parking activities are taking place in the walking space.

When asked why the pedestrian walkways in Sinza are inadequately provided, the Acting Municipal Engineer at the Kinondoni Municipality said that the non-provision of pedestrian walkways is due to financial constraints facing their day to day operations. He claimed: *“Every year we budget wisely for infrastructure provision, but, the allocation is usually half the amount budgeted. How can we then effectively provide for pedestrian infrastructure²⁴”*

For instance, in the financial year 2013/2014, Kinondoni Municipality was budgeted for 5.2 billion TZS (US\$ 2, 749, 868) for road improvements. Out of this, 980,000,000 TZS (US\$ 518,244) was budgeted for Sinza Ward. The municipal however, received a total amount of 618, 333, 333 TZS (US\$ 326, 987) for road improvement in Sinza Ward, which was 361, 666,667 TZS (US\$ 191, 257) less than the budgeted amount. The source of fund is the central government, municipal revenues and Local government Capital Development Grant.

²⁴ Interview with the Acting Municipal Engineer at the Kinondoni Municipal Council on 10th March 2015

Table 10. 5: Financial statement of Sinza road improvement programme 2013/2014 financial year

Financiers	Amount Budgeted (in TZS9)	Amount Received (in TZS)	Difference
Local Government Capital Development Grant		-	
Municipal revenues		595,000,000	
Central government		23, 333,333	
Total	980,000,000	618, 333, 333	-361, 666,667

Source: Kinondoni Municipal Council, March 2015

There are no specific budgets made for pedestrians. This affects the manner in which priorities are set for development with pedestrians not been given the first attention. The Municipal engineer argued that the inadequate fund provided for road improvements in Sinza neighbourhoods and the Kinondoni Municipality as a whole has led to the failure to implement all components of the road cross-sections, pedestrian walkways inclusive. When asked whether pedestrian walkways were considered in the 2013/2014 financial year, the Municipal engineer added that: *“Despite the fact that we take time to prepare road cross-sections with all necessary components (i.e. carriage way, road shoulder, drainage systems and walkways), often we do not achieve what we planned for. Owing to financial constraints, we normally pay much attention to implementing carriage way, road shoulders and drainage system to facilitate vehicular movements. Remember, the priority of Dar es Salaam City is to reduce traffic congestion. So when we present our departmental budgets to the Municipal Councillors, the most likely component to be eliminated is walkways, and this is what can be observed along Shekilango and Tandale-Uzuri Road in Sinza Ward”*

Apart from financial constraint, pedestrian concerns are not a priority in neighbourhoods design and approval of plans. This situation has contributed to inadequate of pedestrian infrastructure in Sinza settlement and the Kinondoni Municipality as a whole. The urban planner in-charge of Sinza neighbourhoods attested to this as he said: *“While preparing residential neighbourhood plans, we do not have pedestrians in mind. Very little consideration is made when doing detailed plans in the busy commercial areas”*²⁵.

10.1.6 Space standards for recreational facilities versus actual implementation in Sinza

Although public recreational open spaces were provided in the Sinza sites and services layout (see black spots on Figure 10.1), most of them are already converted into other land uses. This implies that the public recreational open spaces in Sinza are contested, where the weaker groups like pedestrians have been pushed out of the public recreational areas. Vedasto and Mrema (2013) and Mngong’o (2004) studies also made similar observations.

The encroachment of public recreational open spaces was evidenced by one of the elderly residents Mr Msabi, a76 aged and resident in Sinza D who said: *“We had many open spaces in 1970s scattered all over our settlements. These were places where the public water tapes were installed. They also served as playgrounds for our children and area where people used to meet to discuss issues. Surprisingly, by 1994 already seven open spaces were invaded and transformed into other uses. In-fact, by that time (i.e 1994) we had our houses connected with water tapes in such a way that the daily access to these public spaces started to disappear. From that time onwards, the communal value of these public spaces disappeared and they were unprotected. It was indeed very easy to invade and develop anything on these public open spaces”*

The inability of the Kinondoni Municipal Council to sustain these green spaces proposed by Sites and Services implies weak development control by the responsible authority. It was reported by the expert professionals that the open spaces provided in Sinza were legally and politically converted to other uses. This was evidenced by one of the Urban Planners at the Kinondoni Municipality as he said:

²⁵ Interview with the urban planner (in-charge of Sinza neighbourhoods) at the Kinondoni Municipal Council on 20th February 2015

“The open spaces in Sinza, Mikocheni and Kijitonzama which had earlier been planned for residential areas were politically and legally converted to other uses. As a result, these neighbourhoods lack recreational places as space for social gathering are lacking which is an outcome of these malpractices²⁶”

The researcher observed two recreational open spaces which had been transformed into religious (social groups) and political institution where a mosque had been built, and also an area used as a political party office. According to the resident households who had their plots close to these public recreational open spaces, the encroachment was facilitated by “politicians²⁷ and social groups²⁸”.

One of the biggest public recreational open spaces in Sinza D was no longer existing. The permanent and temporary structures in this public recreational open space were observed. This open space was being transformed into a permanent office building of the ruling party, Chama Cha Mapinduzi (CCM). The ruling party claimed to own the plot simply because the area was planned during the single party supremacy despite the fact that Tanzania is now under a multiparty political system and the public recreational open spaces are to be utilized by the community. Apart from office use, some spaces in the office building had been rented to individuals.



Source: *Fieldwork in Sinza, April 2015*

Figure 10. 7: Temporary and permanent structures erected on the public open space in Sinza D

Figure 10. 7 shows the office building and other temporary structures developed on a public recreational open space in Sinza D. However, the people who had their temporary structures developed in this open space believed that their structures could not be demolished by the government, and in-case it reaches such a point the government would be supposed to start demolishing the buildings owned by the ruling part Chama Cha Mapinduzi (CCM).

With regard to pedestrian concerns, most resident in Sinza and other settlements within the City do not have adequate access to public recreational open spaces within their neighbourhoods. In Sinza for example, it was only the district playground popularly known as ‘TIP’ grounds, and those within primary schools. As a result, most residents walked a distance to access the same. The childrens` play areas were also inadequately thought about and provided by the Sinza sites and services layout plan. This means there is non-conformity between the planning standards and the actual land use situation.

²⁶ Interview with a Town Planner at the Kinondoni Municipality on 20th March 2015.

²⁷ Politicians in this context refers to an open space which owned by a son of a councillor

²⁸ Social groups refers to one open space was changed to accommodate a mosque, some believe that they constructed the mosque forcibly under religious umbrella

10.2 Sub-Case 2: Kariakoo City Centre

10.2.1 Planning of Kariakoo

The Planning of Kariakoo area adopted the gridiron pattern layout of 1920s, with small plot sizes ranging between 250 and 300 square metres. This was followed by the preparation of various Master Plans (the 1949, 1968 and 1979 Master Plans) and redevelopment plans that were proposed as part of the Master Plans. The plots in Kariakoo are either 14 metres width by 18 metres long or 14 metres width by 24 metres long (Kombe, 1995: 98; Lupala, 2002: 103; Magina 2016: 111). Kombe adds that most of the plots in Kariakoo vary between 140 and 270 square metres except a few corner plots that were about 300 square metres.

Table 10. 6: National planning standards for residential plots versus actual plot sizes in Kariakoo

Type of plot	Plot size according to URT, 1997 Space standards (In sq. metres)	Plot size according to URT, 2011 Space Standards (In sq. metres)	Actual plot size in Kariakoo (In sq. metres)
High density	400-800	300-600	140-300
Medium density	801-1600	601-1200	-
Low density	1601-4000	1201-1600	-
Super low	-	1601-2500	-

Source: URT, (1997; 2011); Kombe, (1995) and Lupala, (2002)

Comparing with the Urban Planning and Space Standards Regulations of 1997 and 2011 presented in Table 10.5, it can be noted that the plot sizes adopted in Kariakoo are far below the national standards. Despite the proposed minimum standards for plot sizes range between 400 and 300 square metres, in Kariakoo area only a few corner plots were about 300 square metres. The majority of the plots ranged between 140 and 270 square metres (Kombe, 1995). Nevertheless, the Kariakoo redevelopment scheme of 2002 as well as the Urban Planning and Space Standards Regulations of 2011 had also provided for the minimum plot sizes and setbacks of Multi-storey buildings. In this category, high density plots were recommended to range between 400 -600 square metres, medium density 1000 square metres and low density plots were proposed to cover 2500 square metres as Table 10.5 shows.

Generally, Kariakoo is one of the oldest settlements in Dar es Salaam that was earmarked urban African migrants. The area is characterized by a mixture of land uses, including residential, commercial, institutional and service trade. Initially, the buildings in Kariakoo were predominantly of one and two storeys, but since 1950s, the structures have been gradually rebuilt ranging from three to four storeys (Kariakoo Redevelopment Plan, 2002). The idea was to develop Kariakoo as a high density area for low-income earners particularly the Africans living in *Swahili house* type.

10.2.2 Urban design concepts versus actual implementation in Kariakoo

The urban land development in Kariakoo was initially guided by the grid iron pattern of 1920. Later; this was followed by preparation of various Master Plans (the 1949, 1968 and 1979 Dar es Salaam Master Plan). Within these Master Plans, various redevelopment schemes for Kariakoo area were proposed. However, the way these planning documents were implemented is discussed in the next sections.

Implementation of the gridiron pattern of 1920s

As discussed earlier, in 1920s the Germany administration prepared the first Kariakoo gridiron pattern layout for the African. The plan was implemented and subdivided into residential blocks of approximately 150 metres and plot size of average 12 by 15 metres (Lupala, 2002). By this time, the buildings in the area were made of small huts (simple traditional houses) within a coconut plantation that existed before. The construction of simple traditional houses was possible due to the fact that areas in the periphery of the town, including Kariakoo were left with no specified building regulations and the majority of the occupiers of this part of the city were Africans. As discussed in chapter nine, under the

guidance of the German zoning and building regulations of 1891, Kariakoo and Gerezani were earmarked in Zone III where 'native buildings' with flexible standards were allowed. The building regulations in this zone allowed all types of materials to be used. Unlike in Zone I and II, where only 'European type of houses' were allowed, the Africans developed small huts that came to be improved in the future decades.

Therefore, it should be noted that since the 1920s (before redevelopment processes), the area was dominated by the Swahili house type of six to eight rooms with a central access corridor. These houses had fairly small plot coverage and the walling materials were mud and poles, while the roofing materials mainly comprised thatch and corrugated iron sheets. As Kariakoo was the only area where simple temporary structures were allowed, the majority of the migrants from other parts of Tanzania were accommodated in this settlement.

However, the zoning concept of making Kariakoo as an area of high density plots for low-income Africans population with *Swahili house* type was not maintained due to the increasing demand for housing. Initially, buildings in Kariakoo were mostly of one and two storeys, but since 1950s, the old 1-2 structures have been redeveloped into three to four storey buildings (Kariakoo redevelopment plan, 2002). Kariakoo has been transformed from the typically Swahili type of houses to blocks of apartments that accommodate commercial, office and residential requirements of the city centre and hence the house layout has changed.

Therefore, the Kariakoo gridiron layout of 1920s was implemented and was later replicated in the adjacent settlements of Ilala and Magomeni with the similar purpose of accommodating the Africans. By this time walking was still the main means of transport there was not much individual mobility by car. The concept of separating pedestrians from cars by that time was not necessary. Nevertheless, the gridiron pattern was an opportunity for increasing walking in the area as it comprised a large number of intersecting streets, thereby providing easy connectivity from trip origin and destination. Later on in 1949, the British administration prepared the first Dar es Salaam Master plan. The next section summarizes the way it was implemented.

Implementation of the 1949 Dar es Salaam Master Plan

Despite the good objectives of *increasing open spaces for pedestrian to rest and reduce densities within the area*, however, it is not apparent how this would be achieved. As a result, the plan was not implemented and development in the area continued more or less unguided (URT, 2002; Lupala, 2002). The plan lacked implemented mechanisms, particularly the guidelines for redevelopment.

Implementation of the 1968 Dar es Salaam Master Plan

Although the 1968 Master Plan proposed that *every second street running parallel to Lumumba Street was to be converted into pedestrian malls* to improve the pedestrian movements within the area, however, the plan was not fully implemented due to lack of fund (URT, 2002). Lupala (2002) observes that the non-implementation of the 1968 Master Plan was due to resistance by the local community, particularly because they did not want to be resettled. The residents of Kariakoo rejected the plan as they thought that the government wanted to push them out of their area of the origin under the umbrella of redevelopment. They believed that the government was in a position to facilitate the colonial racial segregation policy by replace Africans from their land (*ibid*). The residents of Kariakoo were aggrieved because they thought that despite the support they gave the government during the struggle for independence, the same government wanted to push them out of their land. It was because of these concerns that the government decided to postpone the redevelopment program of Kariakoo. As a result, the idea of improving the pedestrian movement in Kariakoo area remained on paper only.

Implementation of the 1979 Master Plan

Despite the 1979 Dar es Salaam Master Plan aimed to ensure adequate distribution of facilities within the city that were within easy reach of all residents and in accordance with population thresholds, the plan was not fully implemented (URT, 2012). The plan was comprehensive in nature, resulting in optimal, but unaffordable infrastructure and social service development proposals and budgetary requirements; the plan lacked the participation of stakeholders and also was characterized by exclusion of environmental aspect. The plan lacked clear resource mobilization (the government was assumed to be the main provider of resources, but things did not happen in that way). Systematic reviews were also lacking. Kiunsi (2013) observes that the 1979 Master Plan was not reviewed during the whole period of its existence (20 years) apart from the City Council in 1992 introducing a new planning approach, the Environmental Planning Management (EPM) to replace the 1979 Master Plan.

Regarding Kariakoo area, the 1979 Master Plan aimed aimed to control land uses and building height within the area, where a total of eight storeys was proposed to be the maximum allowable building height. A total of eight storeys was the maximum allowable building height. Following this development conditions, Kariakoo area was divided into mainly five zones:

Table 10. 7: 1979 Kariakoo redevelopment zones and their building conditions

Zone	Boundary coverage	Development conditions		
		No of storeys	Floor area ratio	Plot coverage
I	The area west of Msimbazi Street	Single storeys	0.5	50%
II	Bordered with Msimbazi, Morogoro, Mafia and Lumumba Streets.	3 storey buildings	1.0	50%
III	A stretch along Mkunguni Street in which Kariakoo market is located	8 storey buildings	1.5	60-70%
IV	Bordered by Msimbazi, Uhuru and Livingstone Streets including two blocks east of Livingstone and a linear stretch facing Uhuru Street	5 storey buildings	1.0	50%
V	Covered the Southern strip, which borders the railway sidings of Msimbazi presently accommodating the small-scale industrial activities of Gerezani.	2 storey buildings	1.0	60%

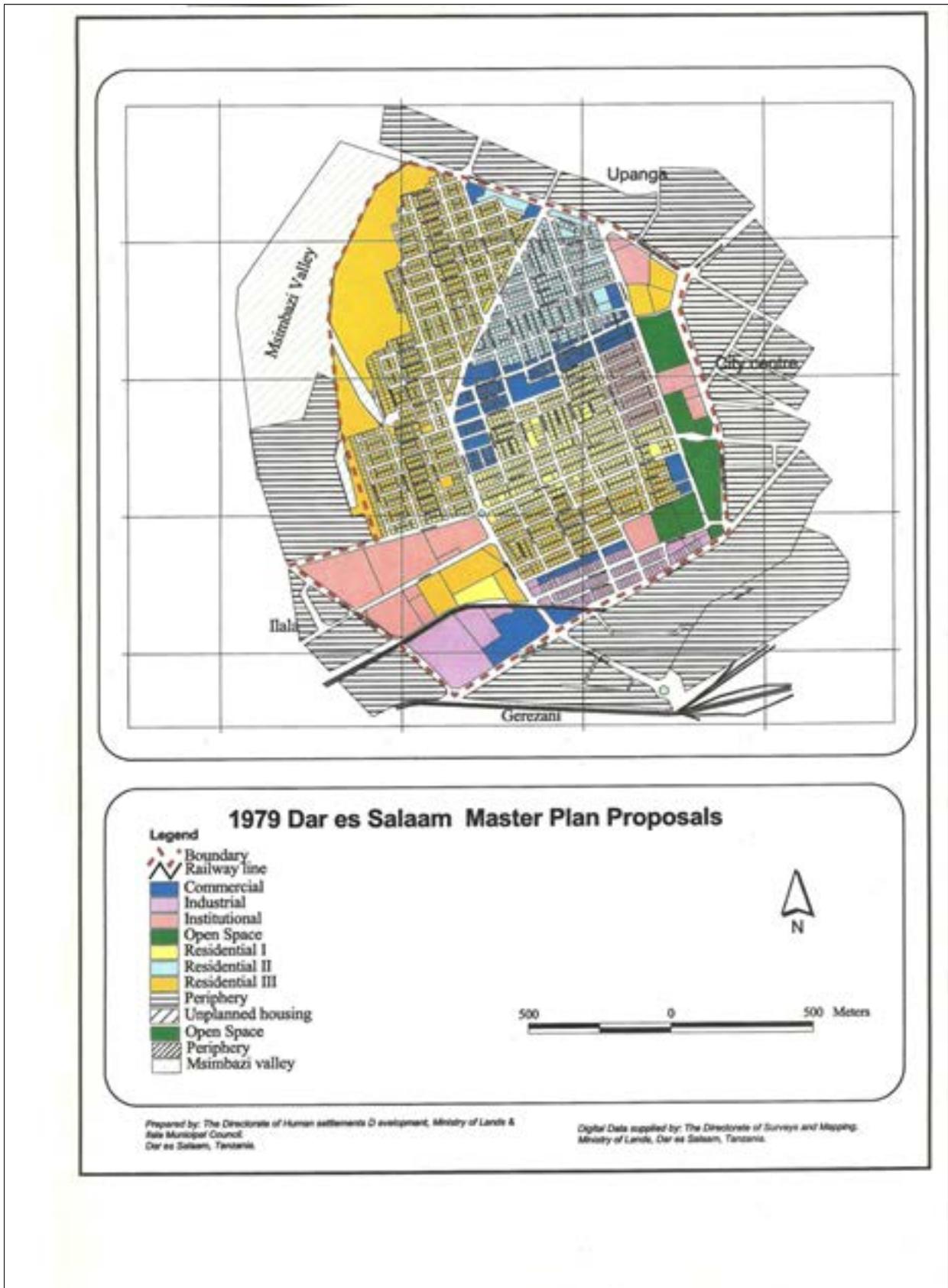
Source: Own construction after reviewing Lupala, (2002)

However, the development condition shown in Figure 10.6 was not fully implemented and achieved. Developers of high-rise buildings who in most cases are individuals buying off old occupiers of this area, tended to maximize use of plots both in terms of plot coverage and building height. Mosha and Mosha (2012) Magina (2016) Lupala (2002) observe such violations of the building height conditions. The weak government machinery to guide market-led redevelopment trends in Kariakoo and who are the guardians of the rules and regulations in cities contributed to the violations of the development conditions in the area.

With regard to Walkability, if the 1979 Master Plan was fully implemented, it could have indeed contributed not only to the reduction of distances travelled by pedestrians to access the community facilities and services, but also reduction of the current traffic congestion in the city. This is because at each level of the city structure proposed (ten cell, housing cluster, neighbourhood, community and district) appropriate services and community facilities were to be provided.

It can be concluded that, the proposals by the 1949, 1968 and 1979 Master Plans to improve pedestrian movements and access to services at various were not fully implemented due to lack of implementation mechanisms. The plans could not come up with a clear analysis to uncover what would be the

implementation obstacles. It was of no need to spend money on master plan while you do not have money to put it into reality.



Source: URT, (2002)

Figure 10. 8: The 1979 Dar es Salaam Master Plan proposals for Kariakoo area

Implementation of Kariakoo Redevelopment Scheme of 2002

Section 5.2 of the Kariakoo redevelopment scheme of 2002 proposed for *improvement of pedestrian circulation through construction of pedestrian walkways and cycle lanes*. According to this section the plight of pedestrians were to be addressed through the introduction of routes exclusively for pedestrians, introduction of one way streets and other traffic management measures like provision and improvement of traffic signs, traffic calming and traffic segregation in favour of pedestrians.

However, these redevelopment proposals were not implemented except the introduction of one way streets. With exception of some parts along the arterial roads (Lumumba, Msimbazi and Uhuru), most of the internal streets lacked pedestrian walkways and cycle lanes. Likewise the zebra crossings, road bumps, speed limit, traffic signs and traffic calming measures along the arterial roads were lacking.

One of the pedestrians interviewed in Kariakoo, Ahmad Khasim, a 35 aged, resident of Tabata and a driver by occupation, complained about the lack of speed limit along the arterial roads, he noted: *“The main problem here in Dar es Salaam is the non-enforcement of rules and regulations. For instance, although the speed along Msimbazi and Uhuru roads is limited to 20 or 30 km per hour, surprisingly, I normally exceed this speed and no serious measures are taken against me. Do you know why? Drivers and traffic polices are permanent friends as they depend on each other. Traffic police survive because of drivers and drivers survive because of the traffic polices. Therefore, the traffic rules are violated for survival of both of us”*.

Though it was 13 years past the time this study was conducted, across the arterial and the internal access roads in Kariakoo pedestrian and cycle lanes were not realized. The researcher observed pedestrians sharing road space with motorists. Pedestrians were sometimes crossing at areas with no zebra crossings, which was reported to be dangerous to their lives (Figure 10.9).



Source: Field observation in Kariakoo, in March 2015

Figure 10. 9: Pedestrians sharing same carriageway with vehicular traffic in Kariakoo

Figure 10.9 shows that neither the walkway nor the cycle lanes were constructed in most of the internal streets despite the fact that 13 years had already passed (i.e. from 2002 to 2015). That could help explaining why 33 (97.1%) out of 34 respondents in Kariakoo felt being excluded from the urban road designs and that, more attention was been paid to motorized means of transport.

Introduction of pedestrian mall

Section 10.3 of the redevelopment plan of Karikoo of 2002 aimed to transform part of the Mchikichi Street (between Msimbazi and Nyamwezi Street) and also the section of the Congo Street (between Aggrey and Tandanti Streets) to pedestrian streets (Figure 10.11).

However, the field study observed that the mentioned street sections were not opened up to accommodate pedestrians. On the contrary, these street sections were still contested by street vendors and car traffic. The encroachment of these streets by street vendors is contributed by lack of areas earmarked for petty trading in the prime locations like Kariakoo area.



Source: Fieldwork observation in Kariakoo

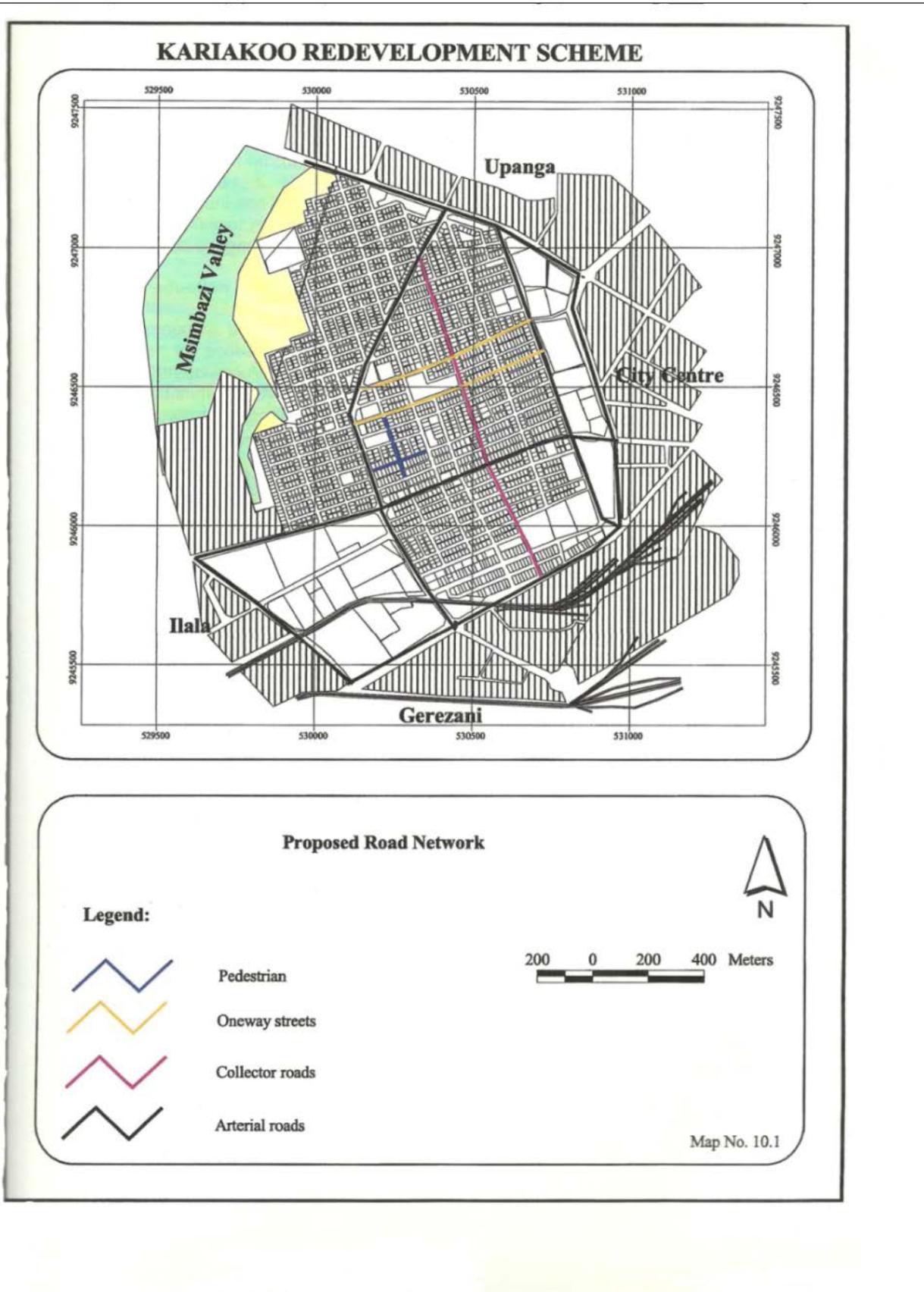
Figure 10. 10: Congo Street closed by street vendors

As it can be viewed from Figure 10.10 it is evident that walking in these streets (Congo Street) is not comfortable and secure. The concentration of street vendors, pushcarts and hawkers along the driveway has resulted in almost total blockage of pedestrian movements as well as for motorized traffic.

In view of the street vendors, they had decided to operate on road space due to lack of public spaces reserved for informal vending activities in the prime locations like Kariakoo. They further pointed out that, the best spaces for their activities are usually along the busy streets and around parking spaces where the loading and unloading of passengers takes place. In Kariakoo areas, Streets like Congo, Mchikichi, Swahili, Nyamwezi, Aggrey, Msimbazi and Uhuru were found to be attractive to the street vendors. One of the street vendors interviewed in Kariakoo said that *they were willing to use restricted spaces like Congo and Mchikichi without fear, provided they could sell their goods.*

Principally, it is the municipality's responsibility to facilitate street vendors and other informal operators' access to working space. Political decisions are influenced mostly by the need for political support from the working poor when it comes to elections. For instance, it was noted that in May 2016 and December 2016, the new President issued a statement allowing street vendors to operate on any public space within the city. The Regional and Municipal authority were ordered not to remove the street vendors from the prime spaces, the reason being that the informal vendors voted for him during the 2015 general election. Initially, from the time of evictions, the street vendors used to come back to the prime area from 4:00pm to around 10.00pm.

Following the president's order, the researcher observed street vendors operating around 6.00am to 10.0pm and sometimes they go beyond this time. Therefore, street vendors and other informal operators make use of the desperation existing in the political sphere to advance their claim on prime locations. Ultimately the business location is decided by its operators; but their decision will be deemed either legal or illegal, depending upon how the municipality ascribes their choice. As a result, the pedestrian movements along the existing walkways, including the road spaces in prime locations such as the Congo Street is more congested.



Source: URT, (2002:40)

Figure 10. 11: Streets proposed for pedestrian malls and one-way streets in Kariakoo

Provision of parking spaces in high-rise buildings

To address the challenges of parking demand, section 5.3 of the Kariakoo redevelopment proposed to have 11,000 parking spaces. To achieve this goal, section 8.5 of the Kariakoo Redevelopment Plan of 2002 proposed that in every high rise building, potential developers would be required to provide parking spaces corresponding to the usable floor space of the buildings within the plot concerned. Furthermore, the plan recommended that the buildings with more than five storeys should be installed with a lift system and staircases to enable access to people of all ages and ability.

However, the field study noted the lack of lift systems in most high-rise buildings. About 99% of the high rise buildings in Kariakoo lack the lift system; thereby limiting the people with disabilities from accessing services in such building. The researcher also observed parking activities in most of the high-rise buildings taking place on walkways fronting the buildings (Figure 10.12). As a consequence, the pedestrian routes were blocked by parked cars and hence lack of connectivity from one destination to another destination, thereby forcing pedestrians to share carriageway with motorized vehicles.



Source: Fieldwork in Kariakoo, March 2015

Figure 10. 12: Parking situation in the high-rise building along Uhuru and Lumumba Streets

Despite the challenges of walking paths in Kariakoo, the City Council has officially legalized the existing walkways to parking spaces as a source of revenue. The parking fee was TZS 500 (0.3 US\$²⁹) per hour and TZS 35,000 (19.0US\$) per month. During field surveys, the researcher observed some of the walkways fronting shops along Uhuru road being reserved for some individuals. Having paid the monthly fee, the City Council erects billboards which are often in red colour indicating the name of the occupier of the space. In this situation, other people are not allowed to park in the reserved space



Source: Fieldwork, 2015

Figure 10. 13: Pedestrian walkways converted into legal parking spaces - Uhuru Street

²⁹ The time this study was carried out (in March 2015) 1US\$ was equivalent to TZS 1851

Figure 10.13 shows that the walkways fronting shops were blocked by parked cars leading to discontinuity of the pedestrian routes. The pedestrians were using the same space with motorised traffic, while the City council is collecting revenues from such walking spaces.

During the interviews, one of the property owners claimed to own these parking spaces provided he had paid the monthly parking fee. He responded like this: “.....provided I have paid the monthly parking fee to the City Council, this space enclosed by these billboards is mine. Nobody is allowed to park here, except me and my customers. In 2015 we used to pay only TZS 35,000 (19.0US\$) per month, but with an effect from December 2016, the time a new contract with a Kenyan company will start operating the parking fee is expected to raise to TZS 126, 000 (58.0US\$9 per month).

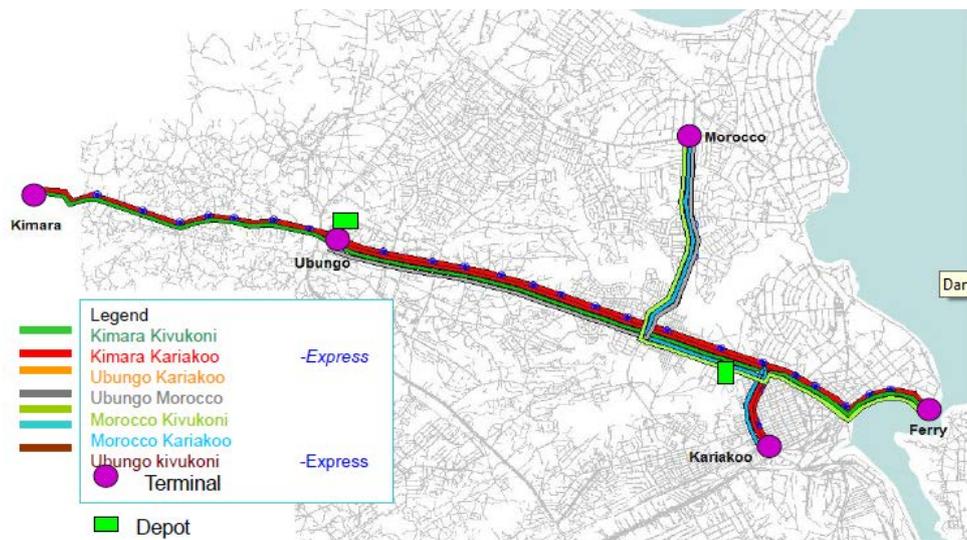
The action of parking on walkways fronting commercial and office buildings had resulted in disconnectivity of the pedestrian routes. The continuity of pedestrian walkways under shopping arcades had been interrupted by developers who had closed the walkways for car parking or commercial use. That is why, when asked whether the pedestrian route in Kariakoo is continuous from one destination to another, all the 34 (100%) respondents interviewed strongly disagreed.

Improvement of public recreational areas in Karikaoo

To improve these recreational areas in Kariakoo, section 3.6 of the Kariakoo redevelopment scheme of 2002 proposed to improve the recreational areas in Kariakoo area. However, despite the good proposals by the 2002 Kariakoo redevelopment, proposals were not implemented. With exceptions Mnazimmoja open space where a few public benches existed, the rest of the existing recreational areas were not furnished with pedestrian amenities. The public toilets, dust bins, public benches and street lights were still lacking. However, the lack of public recreational area was more serious in Karakoo area. The play areas for children were also lacking. The majority of residents accessed public recreational areas at longer distance. It appears that the housing transformations of converting single storey buildings to multi-storey buildings had inadequately taken into consideration of recreational areas for pedestrian to rest.

Implementation of the Bus Rapid Transit (BRT) project

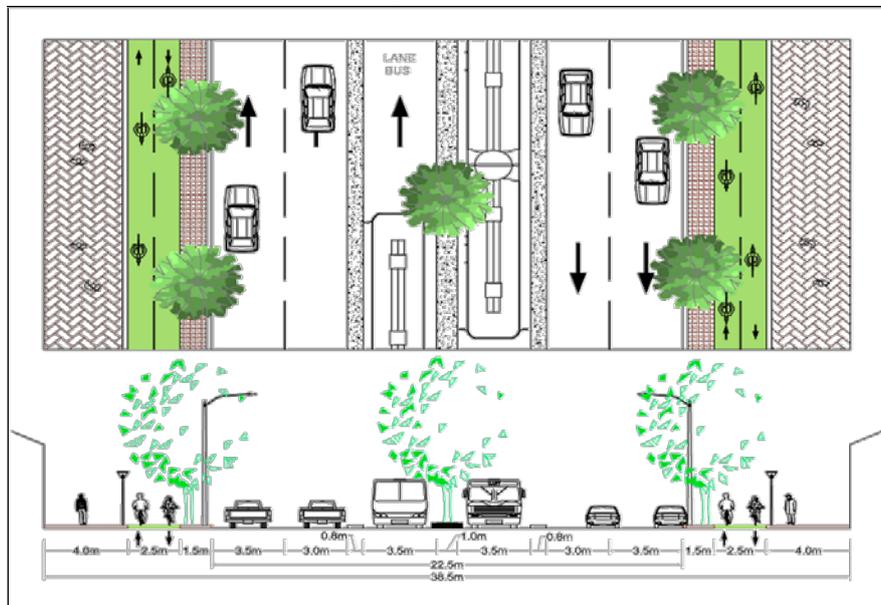
To improve the quality of the public service in Dar es Salaam City, the government of the United Republic of Tanzania through the Tanzania National Roads Agency (TANROADS) has already implemented Phase 1 of BRT project covering the length of 20.9 kilometers of road network along the first DART corridor. Out of the 20.9 Kms of BRT phase project, 1.6 Kilometer had been implemented in Kariakoo areas (Figure 10.14).



Source: DART reports

Figure 10. 14: Dar es Salam BRT Phase 1 project

With regard to pedestrian mobility within the City, the separate pedestrian lanes (2.5m width), Zebra crossings and installation of boulevards at Zebra have been implemented. The BRT system has also provided three pedestrian bridges friendly to people with disabilities at the three terminals (Kimara, Morocco and Ubungo). In addition, the public toilets at the three terminals (Kimara, Morocco and Kivukoni-Ferry) and public benches at some of the bus stations have been provided³⁰. Figure 10.15 presents a cross-section of the BRT system implemented in Dar es Salaam.



Source: DART project reports

Figure 10.15: A typical cross-section of the Dar es Salaam Bus Rapid Transit (BRT)

Despite the efforts by DART to provide pedestrian walkways, already they are invaded by street vendors and motorists. This situation has blocked the continuity of the pedestrian routes in Kariakoo area and other places along the BRT corridor such as Ubungo, Manzese, Magomeni and Kimara.



Source: Field observation in Kariakoo, July 2016

Figure 10.16: Parking and vending activities on the newly constructed BRT walkways

Figure 10.16 shows the encroachment of walkways along the BRT roads in Kariakoo. Pedestrians were observed walking using the same carriageway with motorised transport. However, it was not clear which Department at Municipal level is responsible for functioning of these walkways.

³⁰ Interview with Chief Executive, DART on 12th June 2016

10.2.3 Space standards for plot setbacks versus actual implementation in Kariakoo

With regard to transformation of single storey building into multi-storey/block of flats buildings, the Kariakoo redevelopment scheme of 2002 and the Urban Planning and Space Standards Regulations of 2011 provided for the minimum plot sizes and setbacks to be adhered by developers.

Table 10. 8: Space Standards for Multi-storey/block of flats buildings

Type of plots	Multi-storey/block of flats (Plot Size in sq.m)	Setbacks		
		Front	Side	Rear
High density	400-600	1.5-3.0	1.5	1.5
Medium density	1000	3.0	3.0	3
Low density	2500	4.0	4.0	5

Source: URT, (2002 and 2011)

Despite the fact that Kariakoo is transforming from single storey to high-rise buildings, the plot sizes were not widened to reflect the new space standards. Plot sizes had remained same as those of the gridiron pattern of 1920s. Exceptions were noted only in a few cases where developers agreed to combine plots in order to create enough space for constructing large buildings. In comparison with approved planning standards presented in Table 10.7, the plot sizes (140-300sq.m) are far below the approved standards for multi-storey buildings/block of flats.

Like in Sinza, in Kariakoo violation of building lines and setbacks were also common. Section 11.2.1 of the Kariakoo redevelopment plan proposed for the building setbacks to be 1.5 to provide space for future expansion of streets and roads, still the land developers had their buildings extended beyond the recommended standards. The study found out that because of the limited plot sizes (140-300square metres), most of the buildings have been developed beyond the approved plot setbacks³¹. The majority of developers struggle to maximize space use with expectations of creating more spaces for front shops and stairs, and hence earn more returns from their investments. The front setbacks by the majority of developers were 1.0 metre or less (Figure 10.17).

However, with the exceptions of a few cases, the majority of land developers did not comply with such building regulations. The land developers had not only violated the minimum setbacks, but also encroached upon the pedestrian walkways through extension of shop fronts and stairs. Other studies which made a similar observation include Lupala (2002) Mosha and Mosha (2012) and Magina (2016).

When asked to respond whether the building lines and plot coverage stipulated in the URT (2002 and 2011) are adhered or not, one of the Urban Planners replied: *“The majority of developers in Kariakoo have violated the building lines and setbacks in general. Most of the buildings in Kariakoo have occupied more than ninety per cent of the plot area and there are some cases where almost the entire plot space (100%) is occupied by buildings, which is obviously exceeding the building lines and plot coverage”*³².

The violations of building lines and plot coverage had resulted in narrowing of the existing walkways into 1.0 metre or less. In some-cases the internal streets completely lacked shopping arcades for pedestrian movements. Even where the pedestrian shopping arcades existed, were blocked either by packing cars or informal vendors. As a result, the continuity/connectivity of pedestrian routes was blocked and hence pedestrians had to compete for same carriageway with motorized means transport as plate 9.6 shows. That could help explaining why when asked whether the pedestrian paths in Kariakoo were continuous, all the 34 (100%), strongly disagreed. Figure 10.17 below shows violations of building lines in Kariakoo area.

³¹ Setbacks refer to the minimum or maximum distances which must be left between the edges of a plot on all four sides of the building (i.e. front, rear, left and right sides).

³² Interview with Senior Town Planner at the Ilala Municipality on 20th February 2015



Source: Fieldwork in Kariakoo, March 2015

Figure 10. 17: Encroachment towards boundary lines along Msimbazi and Uhuru Streets

The violation of planning standards like building lines and plot coverage in Kariakoo is contributed by a kind of piecemeal plot-by-plot housing transformation which is coupled with poor development control by the local authorities, who seemed to depend mostly on the out-dated rules and regulations. The non-enforcement of rule and regulations has provided much freedom to the housing developers to maximize plot space at the expense of pedestrian movements and other public requirements.

Furthermore, the Kariakoo redevelopment plan of 2002 does not provide specifications and types of pedestrian shopping arcades to be adopted by developers. Although the minimum standards for building setbacks are defined, clear specification on how these spaces would be designed were not provided. It seems that developers are left free to decide the specifications at a plot level in isolation, a situation that has resulted into chaotic and uncoordinated emerging frontages of shopping arcades and entrances like stairs. This situation has hindered the continuity of the pedestrian routes along the shopping streets. Attesting to that all 34 respondents were of the opinion that the pedestrian network in Kariakoo is blocked.

10.2.4 Space standards for building heights versus the actual implementation in Kariakoo

With regard to Kariakoo, the field study conducted in March 2015 observed the non-consideration of the building heights-street widths relationships. The on-going housing transformations of converting single storey buildings to high-rise buildings had inadequately taken into consideration the height-width relationship. According to URT (2002), decisions on building heights in a particular zone were to be established based on two factors: *adequate pressure in water pipes to guarantee water supply in upper floors*, and *street widths*. It was argued that Streets had to be wide enough to accommodate the anticipated traffic (URT, 2002: 30-31).

However, although street widening was one of the criteria to be met before reaching the decision about the building height of a particular zone in Kariakoo, this development condition was not grasped. The building heights were determined based on the *plot sizes* and *land uses* of a specific zone. Other factors included: Townscape characteristics and capacity of the existing infrastructure and public utilities. As a consequence, the building height differed from one zone to another in proportion to the size of the plots and not in accordance with the building heights-widths relationship. Table 9.4 shows the proposed building heights in relation to plot sizes:

Table 10. 9: Proposed building heights in relation to plot sizes

Building height	Plot sizes (in sq.m)
1-2	200-300
3-5	301-600
6-8	601-900
8-10	901 and above

Source: URT, 2002: 31

As it can be noted from the preceding Table 10.9, the building heights were determined based on the plot sizes and not in accordance with the street widths. In reality, since most of the streets in Kariakoo had their street width ranging from 12 to 15 metres right of way (RoW), it means the tallest building could have a maximum of 5 storeys which is equivalent to 15 metres street width. However, the 1979 Master Plan proposed the tallest buildings in Kariakoo to have a maximum of 8 storeys (Table 9.5), which is equivalent to 24 metres height. Likewise, the Kariakoo redevelopment scheme of 2002 also recommended for a maximum of 8 storeys or more, though at present the height of 10 storeys (which equivalent to 30 metres height) is an average. Comparing the present building height of 10 storeys (30 metres height) with the existing street widths in Kariakoo (12 to 15 metres), it can be concluded that the present building height in Kariakoo is not proportional to the street widths. Implementing the proposed building height of 8 to 10 storeys means a call for widening of many streets in Kariakoo and streets widening means acquiring more space from private developers for public use so as to achieve at least the minimum height-width ratio (1:1). Therefore, the permission of 10 storeys indicates the streets in Kariakoo were to be widened to 30 metres width, but at present the streets have remained with the same 12-15 metres width.



Source: Field work in Kariakoo, March 2015

Figure 10. 18: Building height-width relationships in Kariakoo

Figure 10.18 shows that the building heights in Kariakoo are not proportional to the street widths. The recommended minimum building height-street width relationship of 1:1 is not realized. The researcher opine that implementing the proposals of 8 storeys or more without widening the existing streets implies that the planning authority (in this case the Ilala municipality) has compromised for the poor walking environment within the area as the streets are too narrow to accommodate both motorized and non-motorized means of transport. The existing street widths of 12 to 15 metres right of way can no longer handle the increased urban functions and the emerging informal livelihood activities and hence becoming unfavourable to the walking environment. This situation makes pedestrians feel uncomfortable while walking along the narrow streets. Combining with the chaotic mix with motorized traffic and street vendors, pedestrians feel as if they are walking under the cave. The non-compliance to building heights-street widths relationship not only had jeopardized the pedestrian movements, but also the negative spatial quality within the areas was noted. These included; blocked cross air ventilation, blocked sunrays (light) between neighbouring buildings, and blocked view and vistas. Similar results on decreased spatial qualities were also reported by Lupala (2002) Mosha and Mosha (2013) and Magina (2016). However, Magina added that many buildings in Kariakoo seem to graze each other; metaphorically explaining the situation as “the kissing buildings”.

10.3 Sub case 3: Buguruni-upgraded informal settlement

10.3.1 Characteristics of Buguruni settlements

Buguruni is one of the former suburbs of Dar es Salaam City Council, located about 3.5 from the city centre. Spatially, Buguruni area is informally developed (i.e. outside the sphere of the current urban land use planning procedures and paradigms adopted in Tanzania. The residential parts of Buguruni are largely unplanned settlements with high housing density and a relatively low socio-economic background, characterized by small plot sizes. The few relatively large plots are industrial areas, belonging to the police and churches, or are used for agricultural purposes. The plot sizes in Buguruni-Mnyamani for example, range between 119 and 448 square metres. However, the most frequent plot sizes range between 251 and 300 square metres, followed by plots that ranging between 151 and 250 square metres. Only a few plots are below 150 and above 350square metres (Nguluma and Kachenje, 2015). These areas are characterized by haphazardly constructed buildings, insecurity of tenure, and lack of basic urban services (UN-Habitat, 2010).

10.3.2 Upgrading of Buguruni -Mnyamani and Madenge

To improve the poor accessibility in the unplanned settlements like Buguruni, in 2002-2008, the City Council under the sponsorship of Word Bank implemented phase 1 of Community Infrastructure Upgrading Programs (CIUP). Phase I was implemented in 16 settlements constituted in five wards (Manzese, Buguruni, Vingunguti, Chang'ombe and Sandari). In Buguruni, three settlements were upgraded. These were namely; Mnyamani, Madenge and Malapa. However, based on the selection criteria, two settlements were studied (i.e. Mnyamani and Madenge) based on the selection criteria.

The infrastructure improvement involved construction of access roads, street lights, storm water drainage, public toilets and footpaths. Such construction works resulted in the demolition of some existing houses and other structures which necessitated the displacement of residents (Magembe, 2011, DCC, 2012).

With regard to pedestrian concern, this study focused only on space standards only for road network improvements. The essence was to make a comparison between the CIUP planning standards and actual implementation in Bugurni settlements.

10.3.3 CIUP planning standards versus the actual situation in Buguruni

Despite the fact that CIUP established the minimum planning standards for roads widening in informal settlements, still they were inadequately implemented in Buguruni (Mnyamani and Madenge subwards). The local distributor roads (primary access roads) and local distributor roads in residential areas (secondary access roads) were not opened to cover the agreed planning standards. Thus, the existing local distributor roads (primary access roads) were improved with 5.0 metre carriageway according to the available space on the ground, without considering the proposed 10.0-12.0 metre RoW. Similarly, the local distributor roads in residential areas (secondary access roads) were also upgraded with 5.0 metre carriageway according to the available space, and not according to the proposed standards of 10.0-12.0 metre RoW. Furthermore, the existing access roads (tertiary access roads) were improved with 1.8-3.0 metres carriageway according to the available space on the ground, without consideration of the proposed 6.0-8.0 metre RoW (CIUP, 2009). Table 10.9 shows a comparison between CIUP space standards for road networks and actual situation in Buguruni-Mnyamani and Madenge.

Table 10 .10: Space Standards for road widths in urban areas of Tanzania

S/ N	Type of road	CIUP Standard width in Meters		Situation in Buguruni Mnyamani & Madenge		Remarks
		Right of way	Carriage-way	Right of way	Carriage-way	
1	Local distributor roads (primary access roads)	10.0 - 12.0	5.0 paved bitumen	None	5.0	The RoW and road shoulders were not realized. Only a 5 meter carriageway was improved according to the available space
2	Local distributor roads in residential areas (secondary access roads)	10.0 – 12.0	5 gravel	None	5.0	The RoW and road shoulders were not realized. Only a 5 meter carriageway was improved according to the available space
3	Access roads (tertiary access roads)	6.0 – 8.0	1.8 – 3.0 gravel	None	1.8-3.0	Only a 5 meter carriageway was improved according to the available space. The proposed 6.0-8.0 RoW was not considered
4	Footpaths	2.0 – 4.0	1.0 – 2.0 gravel	None	< 1.0	Natural meandering footpaths are being used

Source: CIUP, 2003c and Field observations in Buguruni, February 2015

Table 10.10 shows that the space standards for roads network improvements in Buguruni were not implemented and realized. The overall CIUP coordinator argued that the reason for non-implementation of the proposed planning standards in Buguruni (Mnyamani and Madege) was the lack of fund for compensation to the houses that were to be demolished during roads widening. For that reason, only carriageways were improved to minimize demolition of houses required in roads widening and thus minimize compensation costs (Figure 10.19). It was very expensive for the CIUP project to pay compensation for both partial and total demolitions caused by the project implementation. In that case demolition was minimized by providing flexible planning standards.



Source: Fieldwork in Buguruni, February 2015

Figure 10. 19: Housing development, limiting roads widening in Buguruni-Mnyamni & Madenge

When asked about the planning standards adopted in infrastructure provision of roads and footpath in Buguruni- Mnyamani, one of the Community Planning Team (CPT) members, and who was one of the zone representatives during the project implementation explained the procedures used to identify,

evaluate and demolish the houses that were earmarked for total or partial demolition that: *“During the project implementation, flexible planning standards were set for provision of various infrastructures to avoid costs of demolition. Thereafter, surveys were done to identify properties which were totally or partially falling within the proposed infrastructure. These properties were marked with an ‘x’ indicating that such properties would have to be demolished to provide more space for the proposed infrastructure.*

Owing to the limited funding, the Municipal Councils of Dar es Salaam established a cost ceiling for road construction. With this framework, the unit cost for construction of carriageways, including culverts and bridges in each settlement was provided. The communities in each settlement were given an opportunity to decide about the type of road to be improved together with the length of the road that has to fit within the budget ceiling CIUP (2004a, b) and Mchome (2014).

For instance, the cost of ceiling for improvement of road network infrastructure in Mnyamani settlement, including the Mnyamani local distributor road (primary access road) was T.Shs. 313,341,866/= (CIUP, 2004c, Mchome, 2014). The community therefore, decided to improve the carriageways (CW) of all types of roads without widening of the roads in terms of right-of ways (RoW) according to the approved planning and design space standards. This was done to avoid demolition of houses as there was a lack of funds for compensation.

Consequently, the improvement of the Mnyamani local distributor road resulted into problems of traffic mobility after increase of traffic volumes. Mchome (2014) argues that the local distributor roads in informal settlements accommodate more than 1,000 motorized traffic flows, and more than 30,000 non-motorized traffic flows per day. This high traffic volume is accommodated along the same carriageway, which is narrowed by uncontrolled housing development towards the road to about 5.0-6.0 metre wide with roadside commercial activities on both sides.

Results from finding clearly show that the CIUP planning standards different from the actual situation. The exclusion of pedestrian concern was similar across the two settlements (i.e. Buguruni-Mnyamani and Madenge). The researcher is of the opinion that the Municipal Councils minimized costs of demolition at the expense of pedestrian lives. Neither the distributor roads nor the residential access roads were provided sidewalks and other footpaths despite the fact that it's a low income unplanned settlement. For instance, out of 27 resident respondents 24 earned less than 300,000 TZS (US\$ <159) per month. The majority of the respondents i.e. 25 out of 27 residents interviewed also depended on walking to access their everyday life activities. That being the case, the city authority could have focused on improving pedestrian mobility instead of improving only carriageways, depending on the available space. Connected to that, all the 35 (100%) respondents in Buguruni perceived that pedestrians in Dar es Salaam are excluded from the urban mobility.

10.4 Concluding summary

This Chapter has examined the implementation of urban design concepts and planning standards across the three cases. Across the three cases, it has been demonstrated that there is a mismatch between the urban design concepts and the actual situation implementation. This means the existing design concepts do not reflect the reality. The central objectives of most local level documents were inadequately implemented and the mechanisms for their implementation were lacking. In the planned settlements, violations of planning standards were also common, thereby limiting the pedestrian movements. Across the three case studies, the existing walkways were converted into parking and informal vending activities. In Sinza, most public recreational open spaces were transformed into residential, commercial, religious, office and commercial activities.

The Next Chapter presents a cross case analysis regarding the pedestrian movement patterns, perspectives held by pedestrians on the walking environment and the actual implementation of urban design concepts and planning standards in the three case studies.

CHAPTER ELEVEN

11. CROSS CASE ANALYSIS

11.0 Introduction

Chapter seven, eight and ten examined and discussed the pedestrian mobility patterns, their perspectives and implementation of design concepts and planning standards in the three sub cases. In this chapter, the major issues emerging from the case studies regarding pedestrian mobility patterns, their perspectives and implementation of planning standards are combined, compared and contrasted. This is done based on the research questions and propositions outlined in the first chapter of the study. Though the aim is not to draw generalised conclusions, the results drawn from these case studies are re-interpreted so as to establish whether patterns of the issues discussed can be related to each other for all the cases. For the purposes of consistency and clarity, the major themes used to analyse the three case study settlements are revisited.

11.1 Pedestrian movement patterns

Travel pattern information has been used in different parts of the world for the purpose of improving transport network. For instance, the study by JICA in 2008 established the pattern of people’s movement in the city of Dar es Salaam (Tanzania), while Zegras and Srinivasan (2006) carried out a study in the cities of Chengdu (China) and Santiago (Chile) to establish travel patterns of people living (Mchome, 2014). Therefore, with regard to pedestrian mobility patterns, the study aimed to understand why people in cities of developing countries walk more often, where do they go more often and by which means of transport.

Walking frequencies of the respondents

Prior to conducting interviews, all the 100 respondents (72 resident households and 28 pedestrians) were asked to respond whether they had ever walked at-least 5 to 10 minutes or 400 to 800meters during the previous two days. The motive was to see whether they would qualify for interviews or not. Table 11.1 shows the walking frequencies of the respondents in the previous two days.

Table 11. 1: Walking frequencies in Buguruni, Sinza and Kariakoo

Walking frequency	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
At least 5-10 minutes in the previous two days	27	8	20	14	25	6	72	28
Never walked	-	-	-	-	-	-	-	-
Total	35		35		31		100	

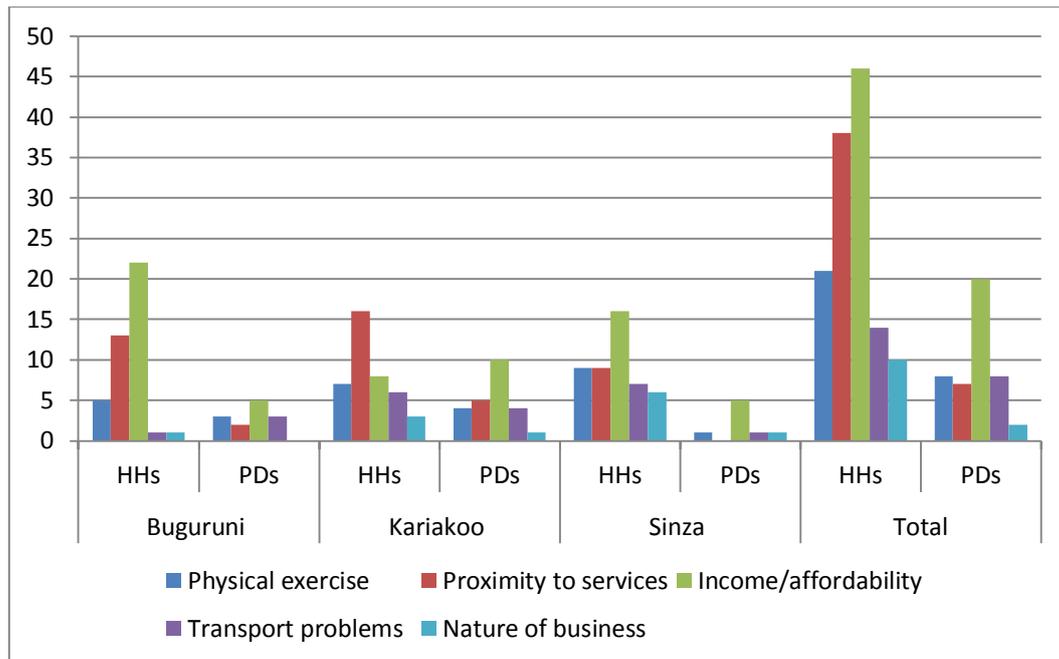
Source: Fieldwork, February- April 2015

Note: HHs=Households, PDs=Pedestrians

Across the cases, all respondents had walked in the previous two days. None of them said that he/she had never walked. On the contrary, they added that they even had walked beyond 10 minutes per day. This result is in line with WHO (2013) and Krambeck (2006) who established that all human beings are pedestrians as every journey starts and ends with walking.

Reasons for walking

The analysis has shown that across the three case studies, the majority of the respondents i.e 66 out of 100 walk more often because of low income/affordability. Other reasons include: proximity to services (45 out of 100), a form of physical exercise (29 out of 100), transport problems (22 out of 100) (i.e. unreliable public transport, traffic jam and inadequate parking spaces), and nature of occupation (12 out of 100), particularly informal vending activities. Figure 11.1 provides more illustrations.



Source: Fieldwork, February-March 2015 Note: HHs=Resident households, PDs=Pedestrians

Figure 11.1: Reasons for walking in Sinza, Kariakoo and Buguruni

Figure 11.1 shows that there is a pattern depicting similarity in ranking of the first reason for walking (i.e. low income/affordability) among the respondents (residents and the pedestrians).

However, across the three cases, a slight difference in ranking the low income and proximity to services can be observed. While the majority of the residents in Sinza and Buguruni ranked the low income as the first reason, in Kariakoo it was ranked second. Similarly, while proximity to services was ranked first in Kariakoo, in Sinza and Buguruni it was ranked second. These differences are attributable to the fact that Kariakoo is the commercial hub of Dar es Salaam characterised by mixed land use development, while Sinza and Buguruni are predominantly residential areas whereby some of the basic services are not available within the area.

On the one hand, these results support Krambeck (2006) Montgomery and Roberts (2008) and UN-Habitat (2013b) that many people in cities of developing countries are “captive walkers”, meaning that they walk because they have no better option or alternative. On the other hand, the finding in Kariakoo is in line with studies by Southworth (2005); Burton and Mitchell (2006); Funihashi (1985); Handy, (1996); Komanoff and Roelofs (1993); Perry (1929) which found that distance to destinations is the single factor that influences people’s decision to walk or take a car. The results confirm further that the compact and mixed land use developments are the key parameters to a walkable city. Handy (2005) argues that if a city wants to promote walkability, creating mixed use development is a key component of the process.

Although low income/affordability was ranked first in Sinza and Buguruni, vulnerability of the respondents was higher in Buguruni than in Sinza. This is due to the fact that Buguruni is a low income unplanned settlement characterised by relatively poor socio-economic background and poor housing quality. The majority of the respondents (i.e. 25 out of 35) were engaged in informal sector activities such as selling vegetables, cold drinks, running food kiosks, cosmetics, shoe shiners and repairs, tailors and masons. Besides that, Sinza is a planned settlement that accommodates both the low, middle and high income earners, though initially it was planned to accommodate the low income earners. Only 14 out of 31 respondents interviewed in Sinza were engaged in such informal activities.

Moreover, despite the fact that 29 out of 100 respondents reported to have been walking for physical exercise, only three respondents walked primarily because of their physical exercise and not other-

wise. The rest (i.e. 26 out of 29) walking as a form of physical exercise was just an addition to the main reasons. These results confirm the difference of walking purposes in developed and developing countries. In the developed countries walkability discussions focus on encouraging the shifts from motorized to non-motorized means of transport for short trips or as a healthy leisure activity (Krambeck, 2006). In cities of developing countries, walking is considered in terms of providing mobility for the poorest residents who normally walk to reach their basic needs including places of work because they cannot afford the cost of public transport (UN-Habitat, 2013b: viii).

Daily mobility patterns in Buguruni, Sinza and Kariakoo

The study has revealed that the majority (89 out of 100) had their daily trips to the workplace, to commercial services (53 out of 100), to community facilities (26 out of 100), to social activities (15 out of 100), and to recreational places (8 out of 100). The summary indicating the daily mobility patterns across the three case studies is provided in Table 11.2.

Table 11. 2: Daily trips in Buguruni, Sinza and Kariakoo

Purpose	Home to	Buguruni		Kariakoo		Sinza		Total	
		HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
For reaching a destination	Workplace	24	7	19	14	20	5	63	26
	Commercial services	18	3	11	5	13	3	42	11
	Community services	6	2	6	4	6	2	18	8
For leisure	Social activities	5	0	4	2	4	0	13	2
	Recreation	2	1	3	0	3	0	7	1
Milestone	Public transit stops	2	5	0	12	6	5	9	21

Source: Fieldwork, February-April 2015

Note: HHs=Resident households, PDs=Pedestrians

Table 11.2 shows that, overall there is a similarity in ranking of the daily trips among the residents and the pedestrians interviewed can be observed. Across the three cases, trips to the workplace were ranked first, and trips to commercial services (shops and markets) were ranked second. Trips to access community facilities are ranked third, and social activities trips were ranked fourth. Across the three cases, only a few had their daily trips associated with recreational purposes.

These findings are more or less similar with the results of a travel survey study undertaken by JICA in 2008 in Dar es Salaam City whereby working trips were ranked first, contributing to about 48.6% of all household trips (URT, 2008b). Therefore, working is not only the main purpose of making trips at the City level, but also at the settlement level as depicted in the three case studies. Similarly, a study by Mchome (2014) found almost similar results that most trips in informal settlements in Dar es Salaam comprise going to work, commercial, community facilities, social welfare and going to farm. In this study, trips to farms were not considered in design of questionnaire because farming is not the main activity in Dar es Salaam. Approximately, 95% of the city residents depend on the informal sector for their livelihood strategies, while 5% are employees in the public sector (DCC, 2004:48).

The majority of pedestrians (i.e. 21 out of 28) accessed public transit stops on a daily basis, while only nine resident households access public transit stops on a daily basis. The reason for such a slight difference is that only pedestrians outside the study areas were interviewed. As pedestrians were from far places, sometimes they had to connect by public transport to reach their final destination.

Furthermore, it can be observed that walking for social and recreational activities tends to be minimal among the pedestrians compared to the resident households. As already hinted above, the pedestrians interviewed were non-resident of these settlements. Based on the resident respondents, the social activities (visiting friends, relatives and personal trips) and recreational purpose trips (i.e. going to bars, restaurants/cafes, beaches, sports grounds, entertainment places, exercise and fitness studio) were in most cases conducted after the work hours, when the pedestrians are on their way back home.

Weekly mobility patterns in Buguruni, Sinza and Kariakoo

Overall, trips to social activity were highly ranked, while trips to attending religious services were ranked second. Recreational trips were ranked third, and trips to commercial activities were ranked fourth. Only a few accessed workplaces on a weekly basis. Table 11.3 provides more details.

Table 11.3 : Weekly trips in Buguruni, Kariakoo and Sinza

Purpose	Home to	Buguruni		Kariakoo		Sinza		Total	
		HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
For reaching a destination	Work	2	0	0	0	2	1	4	1
	Commercial services	6	1	7	7	9	1	22	9
	Community services	16	4	13	10	19	4	48	18
For leisure	Social activities	20	7	17	11	20	6	57	24
	Recreation	14	3	9	11	11	4	34	18
Milestone	Public Min-bus stops	7	1	14	1	14	0	31	2

Source: Fieldwork in Buguruni, Kariakoo and Sinza, February-April 2015

Table 11.3 shows that there is a similarity in ranking the weekly trips among the residents and pedestrians. Across the three cases, the ranking of weekly trips seems comparable. Most of the resident respondents had their weekly trips connected with social activities. This was followed by trips to community facilities, particularly accessing worship places. While trips to recreational purposes were ranked third, commercial purpose trips were ranked fourth.

However, across the three cases, a slight difference in ranking the workplace can be noted. While two and three respondents in Buguruni and Sinza respectively accessed workplaces on a weekly basis, in Kariakoo, none of the respondents had his/her weekly trip made to the workplace. This difference is simply because most of the commercial activities/workplaces in Kariakoo area rarely operate on Sundays, while in Sinza and Buguruni there are no such limitations, and hence people are free to work up to Sundays though only a few can do. The majority use Sundays to attend religious services, social and recreational activities.

Besides that, a remarkable difference regarding trips to public stops among the resident household and the pedestrians interviewed can be noted. While only two pedestrians accessed public transit stops on a weekly basis, 31 resident households accessed public transit stops on a weekly basis, especially over the weekends. Such a remarkable difference is due to the fact that the pedestrians interviewed were from other settlements outside the study areas. In view of the pedestrians, they spend most of the weekend with their families and visiting friends and relatives within and in the adjacent settlements where they simply walk.

Though community facilities include educational facilities, health facilities, central facilities such as banks, police post and primary court; and religious facilities, yet the majority said that most of their weekly trips are to worship places (i.e. going to church and mosque). Although a travel survey study made by JICA in 2008 in Dar es Salaam could not categorise the trip purposes into daily and weekly trips, yet social welfare trips (that combined both the social and recreational activities) were ranked second, contributing to about 23.7% of all household trips (URT, 2008b). Trips to community services were ranked third as per this study, while commercial purpose trips were least ranked.

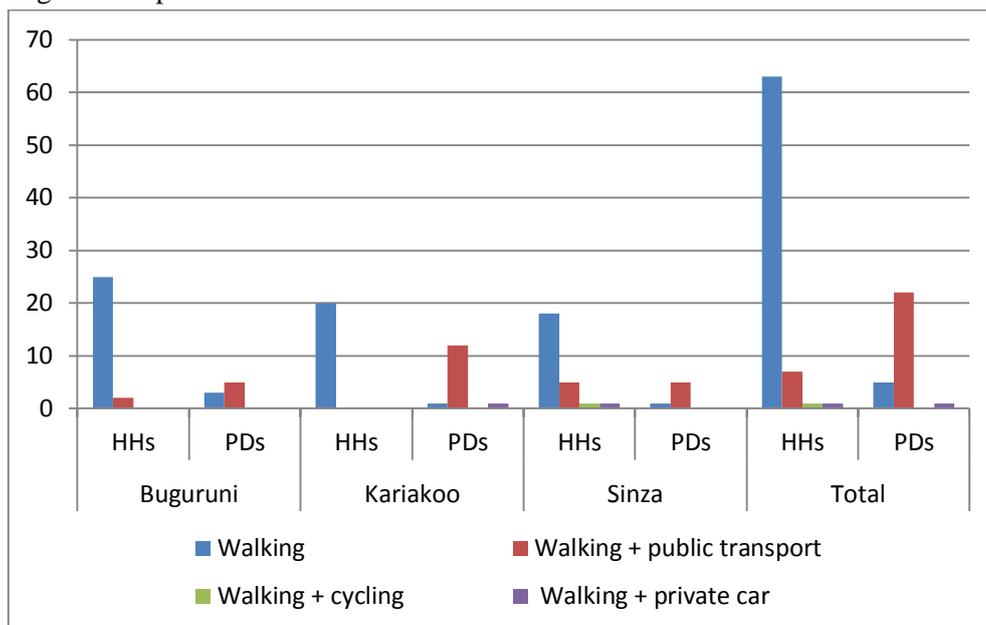
The results from finding imply that the social and recreational activities play an important role on linking settlements and in enhancing social ties network connectivity. The high rates of unemployment among the economically active population in both the formal and informal settlements increases the rate of trips for social activities.

The means of transport used

Of the three study areas, walking was the main means of transport among the resident respondents. This is justified by the fact that 25 out of 27, all the 20 residents and 18 out of 25 residents respondents in Buguruni, Kariakoo and Sinza respectively, depended on walking to access various destinations. A combination of walking and public transport was ranked second across the three cases.

Unlike in Sinza and Buguruni, In Kariakoo, all the 20 resident responded said that they depended on walking for their everyday life activities. The reason why all residents in Kariakoo depended on walking was associated with the locational characteristics of the settlement. Kariakoo area is the largest commercial centre within the City dominated by mixed land use and compact development, the concepts that are believed to promote walkable cities. Conversely, Sinza and Buguruni are predominantly residential areas where only the lower level community facilities and services are provided in accordance with population thresholds (i.e. neighbourhood level requirements).

Furthermore, across the three cases, cycling was not mentioned as the commonly means of transport except only one resident in Sinza said he depended on walking and cycling. This is because of the low income by the majority, in such a way that they would not afford to purchase a bicycle. The lack of non-motorised infrastructure within the City was also reported to hinder the use of cycling. The majority worried of being hurt by motorists. Likewise for private car, across the three cases, only one resident in Sinza used a combination of walking and private car, though did not own it (it was the office car). Figure 11.2 provides more illustrations.



Source: Fieldwork, February-April 2015

HH=Resident households, PDs= Pedestrians

Figure 11. 2: Means of transport used in Buguruni, Kariakoo and Sinza

Figure 11.2 shows patterns depicting similarities and differences regarding the means of transport used by the residents and pedestrians. It is notable that across the three cases, walking is the main means of transport among the resident households. Only few resident respondents had their trips associated with the use of public transport. Moreover, a combination of walking and public transport tends to be higher among the pedestrians. This difference is caused by the fact that only pedestrians outside the study areas were interviewed. So long as they commuted from far places, they had to connect by public transport, though walking was the first and last mile of the public transport trips. From these findings, it is obvious that walking and public transport ought to be given much more priority and improved as the main means of transport, especially for the low income households in Dar es Salaam City.

These findings concur with the results of a study conducted by JICA in 2008 in Dar es Salaam City (URT, 2008b), which established that commuter minibuses public transport is the first main mode of transport in Dar es Salaam that contributes about 61% of all modes of transport used by household members in the City. JICA observed that walking was the second main mode of transport in Dar es Salaam City that contributes about 26% of all modes of transport used by household members. Use of private car was ranked third as it contributes to 12% of all means of transport used, while cycling was the least preferred means of transport. It was ranked fourth contributing to about 1% of all modes of transport used by household members in Dar es Salaam (URT, 2008b; Mchome 2014).

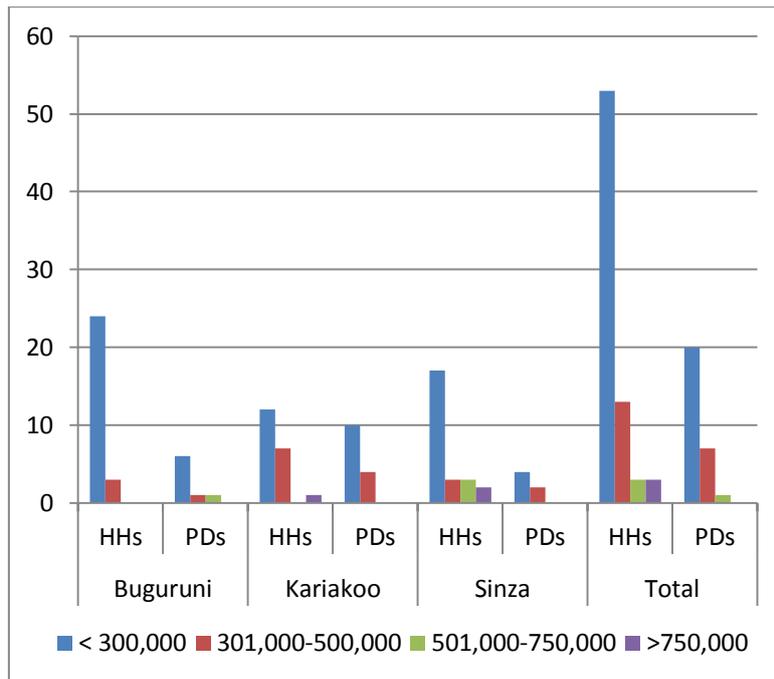
However, the results from this study and those established by JICA shows that there is a slight difference in ranking the first and second means of transport used in Dar es Salaam City. This difference is possibly due to the fact that, the respondents in this study were purposefully selected to include; only the low income earners, the elderly, people with disabilities and the school children. In the study conducted by JICA, most likely the high and middle income earners played much role in terms of using public transport and private cars from home to various destinations.

All in all, findings from this study are in line with UN-Habitat (2013b) where it was noted that walking in cities of developing countries is often considered in terms of providing mobility for the poorest residents who normally walk to reach their places of work because they cannot afford the cost of public transport. This makes a difference from the developed countries where walking is promoted as a healthy leisure activity (Krambeck, 2006).

Trips modal share by income groups

Before analysing the trips modal share by income, first was to assess the income earned per month. Across the three cases, similarities about the incomes earned per month were depicted. In all the three cases, the majority of the respondents (30 out of 35), (22 out of 34) and (21 out of 31) in Buguruni, Kariakoo and Sinza respectively, earned less than 300,000 TZS (US\$ <159) per month. This figure implies that the majority have low and irregular income to afford their basic needs including transport expenses. Most of the respondents depended on informal vending activities for a livelihood. That explains to some extent the reasons why 63 out of 100 respondents depended on walking to get to different destinations

In Buguruni, none of the respondents earned more than 750,000 TZS (US\$ > 397) per month. On the contrary, one respondent in Kariakoo and two in Sinza earned more than this amount. As explained earlier, Buguruni settlement is a low income settlement characterized by relatively poor socio-economic background compared to the other two settlements. Figure 11.3 provides further illustrations.



Source: Fieldwork, 2015 HHs=Resident household, PDs=Pedestrians

Figure 11. 3: Households income per month in Buguruni, Karikoo and Sinza

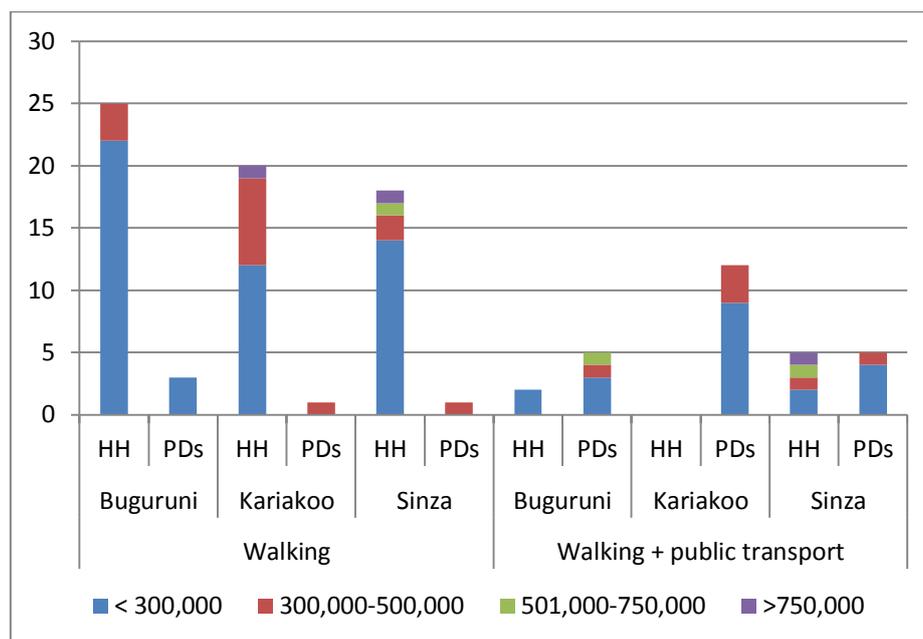
Figure 11.3 shows similar patterns across the three cases regarding the incomes earned per month. Similar patterns are also reflected among the resident respondents and the pedestrians. Across the three cases, only the minority earned more than 500, 000 TZS (US\$>264) per month. These incomes estimate almost concur with Lupala (2014: 373) who observed that the average household income in Dar es Salaam (Ilala, Temeke and Kinondoni) was between 286, 176 and 350,000 TZS (US\$ 179 and 219) per month, while the average cost of living ranged between 461,250 and 642,500 TZS (US\$ 288 and 402) per month (ibid).

Comparison regarding the trips modal share by income in the three areas depicts some similarities among the resident respondents and the pedestrians. For instance, in all the three settlements walking was the main means of transport used by resident respondents earning less than 500,000 TZS (US\$ <264) per month. Only two respondents in Buguruni and three in Sinza said that they used a combination of walking and public transport. The respondents argued that affordability was the main reason for their everyday walking as they had no better option other than walking (Figure 11.4).

Furthermore, across the three case studies the analysis shows that the share of walking among the pedestrians is very low compared to the residents. Across the three cases, a combination of walking and public transport tends to be higher among the pedestrians regardless of their income groups. This is due to the fact that only pedestrians from far places were considered for interviews. They were from other settlements within Dar es Salaam, but outside the study areas. Their settlements of origin were about (4.5-13), (2.5-13) and (3-35) kilometers from Sinza, Kariakoo and Buguruni respectively. Hence, to reach their final destinations they had to connect by public transport at least to reduce the walking distance, though walking remained the first and last mile of the public transport trips.

It can be concluded that walking and public transport are the major means of transport used by the low income households in Dar es Salaam. These results almost coincide with a travel survey study conducted by JICA in 2008 in Dar es Salaam City, where the walk trip and use of buses were observed to be higher in the lower income groups earning 10,000-500,000 TZS per month, while cars were mainly used by the groups of over 500,000 TZS (URT, 2008b). This result is also in line with Pendakur (2005) who argues that the vast majority of the urban poor in Sub Saharan Africa depend

on non-motorized means of transport. Figure 11.4 presents a summary regarding the trips modal share by incomes across the three sub-cases.



Source: Fieldwork, February-March 2015

Figure 11. 4: Trips modal shares by income levels across the three cases

Trip modal share by sex

Out of 100 respondents, 63 were males (40 HHs and 23 PDs), 37 were females (32 HHs and 5PDs).

Table 11. 4: Number of men and women interviewed

	Buguruni		Kariakoo		Sinza		Total	
	Males	Females	Males	Females	Males	Females	Males	Females
HHs	14	13	14	6	12	13	40	32
PDs	7	1	13	1	3	3	23	5
Total	21	14	27	7	15	16	63	37

Source: Fieldwork in Buguruni, Karikoo and Sinza, February-April 2015

Owing to the imbalance between the number of males and females, each sex group was dealt with independently to avoid bias. Overall, the majority of the women interviewed i.e 30 out of 37 depended on walking for their everyday life activities. Only seven women used a combination of walking and public transport. None of the women interviewed use a private car or a bicycle. Table 11.5 presents the overall trip modal share by sex

Table 11. 5: Trip modal shares by Sex

Means of transport used	Male		Female		Total	
	No	%	No	%	No	%
Walking	38	60.3	30	81.1	68	68
Walking+Public transport	22	34.9	7	18.9	29	29
Walking + Cycling	1	1.6	-	-	1	1
Walking + Private car	2	3.2	-	-	2	2
Total	63	100	37	100	100	100

Source: Fieldwork in Buguruni, Kariakoo and Sinza, February-April, 2015

However, a similar pattern regarding the trips modal share by sex in all the three case studies was revealed. Across the three cases a share of walking tended to be higher in the female group than men. The majority of the women (13 out of 14), (6 out of 7) and (11 out of 16) interviewed in Buguruni, Kariakoo and Sinza respectively said they had no better options other than walking (Figure 11.6). But, a combination of walking and public transport was higher in the males group than females. These results imply that may be more vulnerable than men if the walking paths are not friendly to walkers as the case was in all the three case studies.

Table 11. 6: Trip modal share by sex in Buguruni, Kariakoo and Sinza

	Walking						Walking + Public transport					
	Buguruni		Kariakoo		Sinza		Buguruni		Kariakoo		Sinza	
	M	F	M	F	M	F	M	F	M	F	M	F
Total (by sex)	21	14	27	7	15	16	21	14	27	7	15	16
Involved	15	13	15	6	8	11	6	1	11	1	5	5
Percent	71.4	92.9	55.6	85.7	53.3	68.8	28.6	7.1	40.7	14.3	33.3	31.2

Source: Fieldwork, February to April 2015

Note: M=Male, F=Female

Table 11.6 shows that, across the three cases, only few women used a combination of walking and public transport compared to men. The reasons why women walked more are often are in most cases connected with affordability and the gender roles. Women are responsible for many family matters such as accompanying children to school, accessing local shops and market on a daily basis, and many other trips to access social service. The majority of women interviewed were engaged in informal vending activities and some were just house wives. These results almost coincide with the results of a travel survey study by JICA (2008), where it was also revealed that the share of walk trips in each age group is higher in the female group.

When interviewed about the security of the walking environment from crime issues; women were keener than men. However, women in Buguruni and Kariakoo were keener to crime issues that those in Sinza, where mugging issue were rare during day time though a few were witnessed at night. One of the women interviewed in Buguruni noted: “Walking at night ideally is not safe anywhere especially for women like me. Anything can happen. One can be mugged especially on these dark streets which lack lighting. I would rather board a tax if I am late or spend the night where I am”.

Trip modal share by age

Out of 100 respondents, 51 were the adults (36-59 years), 34 were the youth (19-35 years), and 15 were the elderly (aged 60+) persons. Among the 100 respondents, 12 were people with disabilities (nine handicapped and three were the visually impaired persons). However, to understand the trip modal share by age and because of the unbalanced number among the age groups interviewed, each group was analyzed independently. Table 11.7 summarizes the trip modal share by age groups across the three cases.

Table 11. 7: Means of transport used by age groups

Means of Transport	Buguruni			Kariakoo			Sinza			Total		
	Yth	Adt	Eld	Yth	Adt	Eld	Yth	Adt	Eld	Yth	Adt	Eld
Walking	10	14	4	3	15	3	8	7	4	21	35	11
Walking + Public transport	1	4	2	5	5	2	6	4	-	12	13	4
Walking + Cycling	-	-	-	-	-	-	1	-	-	1	-	-
Walking + Private car	-	-	-	-	1	-	-	1	-	-	2	-
Total	11	18	6	8	21	5	15	12	4	34	51	15

Source: Fieldwork, February-April 2015

Note: Yth=Youth;

Aldt=Adults;

Eld=Elders

Overall, the elderly were more vulnerable to walking compared to the youth and adults. This is justified by the fact that out of the 15 elderly (60+ aged) interviewed across the three cases, 11 (73.3%) out 15 said they depend on walking to get into various destinations. This was followed by the adults 35 (68.6%) out of 51 and the young person i.e. 21 (61.7%) out of 34 were least ranked. Though a slight pattern among the age groups exists, over 50% in each group depend on walking for their daily activities.

In Sinza however, all the elderly interviewed (four) said walking was their main means of getting to various places. But, in Buguruni and Kariakoo (two out of six) and (two out of five) depended on a combination of walking and public transport. This slight difference is due to the fact that all the four elderly in Sinza had their everyday activities accessed within a walking distance, while in Buguruni

and Kariakoo some of elderly interviewed were walkers from far places, but had their livelihood activities conducted in these settlements. When asked to say the means of transport used to travel from home to workplace, one of the elderly interviewed in Buguruni- Mnyamani, Hassan Abdalah, a 75 years old, mosque attendant in Kisutu³³ said: “I cannot afford the public transport costs, I have no alternatives than walking. I always walk from Buguruni - Mnyamani to Kisutu, three days a week; normally it takes me about 1:30 hours to reach the mosque. That means, for a return trip I need at least 3 hours per day”

Furthermore, in Buguruni the youth walked most than those in Sinza and Kariakoo. Most of their daily activities conducted within a walking distance and mostly within the area. In Kariakoo the majority of the youth were walkers from other places, but had their livelihood activities conducting in Kariakoo. Therefore, to reach their workplace they had to connect by public transport. The situation in Sinza was more similar to Kariakoo, some were from outside the settlement and some had their workplaces conducted outside Sinza, particularly the employee.

Though a slight difference can be noted among the youth and the adults, across the three cases, over half of these age groups depend on walking. Despite the fact that the youth and the adults are among the productive groups within households and within the national, these groups spent most of their time on walking, thereby reducing the time to participate in the productive activities of a particular day. Pendakur (2005) argues that the only resources the poor have (i.e. time and physical energy) are depleted because of long walking distances.

Trips modal share of school children

Table 11.8 presents a summary about the means of transport used by the school children across the three cases.

Table 11. 8: Trip modal share of the school children in three sub-cases

Means of transport used	Buguruni (Hekima p/school)		Kariakoo (Uhuru p/school)		Sinza (Sinza p/school)		Total	
	No	%	No	%	No	%	No	%
Walking	9	100	2	28.6	5	83.3	16	72.7
Walking + Public transport	-	-	5	71.4	1	16.7	6	27.3
Walking + Cycling	-	-	-	-	-	-	-	-
Walking + Private car	-	-	-	-	-	-	-	-
Total	9	100	7	100	6	100	22	100

Source: Fieldwork in Buguruni, Kariakoo and Sinza, February-April 2015

Table 11.8 shows a remarkable pattern depicting differences on the means of transport used by the school children across the three cases. The number of school children using a combination of walking and public transport is higher in Kariakoo than in Buguruni and Sinza settlements. This is due to the fact that the majority of the school children interviewed in Kariakoo were from other settlements outside Kariakoo such as Buguruni, Vingunguti, Tengeta and Bunju which are about 3,0km, 5.5km, 25km and 30 kilometers from Kariakoo respectively. This implies that public primary school facilities in some residential neighbourhoods are lacking or not accessed by the school children within the settlement.

Also, none of the school children in Buguruni used a combination of walking and public transport primarily because the school in Buguruni, particularly Madenge settlement was within manageable walking distance. The only challenge was on competing with motorist while travelling to school and back home, especially along the busy roads.

³³ Kisutu is about 6.8 kilometers from Bugurni-Mnyamani

Comparing the analysis among age groups across the three cases, the elderly and school children depend mostly on walking to get into various places. Table 11.9 provides more details.

Table 11. 9: The share of walking by age groups

	School children (7-14 yrs)	The youth (19-35 yrs)	The adults (36-59yrs)	The elderly (Aged 60+)
Total (by age)	22	34	51	15
Walking	16	21	35	11
Percentage	72.7	61.8	68.6	73.3

Source: Fieldwork, February-April 2015

Table 11. 9 shows that a pattern depicting differences in vulnerability of walking among the age groups. Even though the share of walking trips tends to be over 50% across the age groups interviewed, the elderly and the school children were more vulnerable than the adults and the youth groups. This is because most of the elderly and the school children had no alternatives of getting to various places rather than walking; and because most of the walkways was not conducive to walking they were more exposed to encounter problems such as accidents, mugging, unruly motorists, boda-boda, daladala and bajaji drivers, and sometime the pupils complained of missing the first class sessions because waiting for the roads to clear before they cross the busy roads.

Trip modal share of people with disabilities

As mentioned earlier, out of 100 respondents 12 were people with disabilities. Table 11.10 presents a summary about the means of transport used by people with disabilities.

Table 11. 10 : Trip modal share of the school children in three sub-cases

Means of transport used	Buguruni	Kariakoo	Sinza	Total
	No	No	No	No
Walking	6	2	1	9
Walking + public transport	1	2	-	3
Walking + cycling	-	-	-	-
Walking + Private car	-	-	-	-
Total	7	4	1	22

Source: Fieldwork, February to April 2015

Figure 11.10 shows that across the three study areas, the people with disability had limited options regarding the means of transport used. Across the three cases, walking was the main of transport to the majority. However, a slight difference can be observed in Buguruni and Sinza whereby three respondents used a combination of walking and public transport. The reason is that most pedestrian interviewed in Buguruni were from other settlements, but they visited a national office of people with disability (CHAWATA) located in Buguruni-Madenge. Similarly for Kariakoo, the two respondents using public transport were pedestrians outside Kariakoo. They were from Kigamboni and Kiwalani, which are about 7 and 13 kilometres from Kariakoo. The only person with disability person interviewed in Sinza, had most of her daily activities conducted within the area, except she attends worship places and visiting friends. This group was observed to be among the vulnerable group as the walking environment, including the privately operated public transport is not pedestrian friendly.

Summary regarding the mobility patterns across the three cases

The study has demonstrated empirically that, across the three cases, the majority (68 out of 100) depend on walking for their everyday life activities. While 29 respondents used a combination of walking and public transport across the three cases, only three respondents use a combination of walking and either cycling or private car. These results imply that walking and public transport need to be prioritized and improved as the main means of transport used by particularly low income households within the City. Additionally, the elderly, school children, women and people with disabilities have

little or no option to walking given the nature of the poor condition of the walking environment. It is apparent that these are the social groups which suffer most in case of problems associated with say mugging, poor walking area, expose to accidents, unruly motorists, *bodaboda*, *daladala* and *bajaji drivers*.

11.2 Perspectives of pedestrians on the walking environment

Rapoport (1987) argues that the pleasure of walking is inspired by the perceptual characteristics of the urban environment as it stimulates exploratory activity and is related to the latent functions of pleasure, delight, interest, exploration, behaviour and the like. People's perceptions can influence the travel behaviour (Handy, 2005). This study, aimed to assess how people in Dar es Salaam perceive the walking environment in terms of connectivity, safety from danger, security from crime, access to public facilities, and attractiveness and convenience of the pedestrian network. For the purposes of consistency and clarity, common themes were used to analyse the perspectives of pedestrians across the three cases. The next section is a comparison regarding the way people in the three sub-cases (Sinza, Kariakoo and Buguruni perceived the walking environment.

Disconnected pedestrian routes

Across the three cases, all the respondents perceive that the pedestrian network in Dar es Salaam City is not continuous from one destination to another. When asked whether the pedestrian network was continuous/ connected from one place to another, across the three cases, all the respondents strongly disagreed. Across the three cases, the pedestrian walkways were lacking. Where existed they were encroached by motorists and informal vending activities.

The author observed pedestrians in the three cases competing for road space with many other motorised and non-motorised means of transport. These results from finding are in line with a study by Assum (1998) who reported that in many urban areas of the Sub Saharan African cities pedestrian infrastructure is missing and those existing have been poorly maintained leading to less safety in walking.

With this finding the study has shown that the public space in Dar es Salaam is contested. Across the three cases, the public space was competed for various land uses to the extent that some of the uses seemed to dominate over the other uses. The dominant uses like car parking and street vending activities had encroached upon the walking public space in such a way that the weaker groups like pedestrians were pushed out of their walking space, thereby forcing them to walk along the shoulder of the road or on the same carriageway with motorised and other non-motorised traffic. It was as if the rights of the weaker groups, particularly pedestrians are not a priority in road design. Consideration for pedestrians in Dar es Salaam City seems to be an afterthought. When the public space is contested, the weaker groups like the elderly and the handicapped pedestrians have a little chance of accessing and effectively utilizing the public space. It was interesting to observe the contestation of public space between different marginalised groups: on the one hand the pedestrians and on the other the street vendors – both pursuing their livelihoods.

Dangerous walking environment

Across the three cases, the majority (98.0%) of the respondents perceive walking environment in Dar es Salaam to be dangerous. When asked whether the walking environment was safe from danger, the majority (96 out of 100) strongly disagreed. Two respondents disagreed to some extent. They perceived that the walking environment in Dar es Salaam is dangerous. Summary in table 11.10 is for more details.

Table 11. 11: Attitudes of the respondents about safety from danger

	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Strongly disagree	26	7	18	14	25	6	69	27
Disagree	1	-	1	-	-	-	2	-
Neutral	-	-	-	-	-	-	-	-
Agree	-	1	1	-	-	-	1	1
Strongly agree	-	-	-	-	-	-	-	-
Total	27	8	20	14	25	6	72	28

Source: Fieldwork, February to May 2015 HH=Resident households PDs=Pedestrians

Table 11.11 shows, both the residents and the pedestrians had similar perspectives on the walking environment in Dar es Salaam that it is not safe from danger. A pattern depicting a slight difference opinion can be noted in Buguruni and Kariakoo, where two respondents were of the opinion that the walking environment is safe from danger. They perceived this way simply because they had most of their livelihood activities done within convenient walking distances.

Most of the respondents in the three sub-cases said that the problem is contributed by the lack of pedestrian infrastructures such as sidewalks, zebra crossings, pedestrian signals at traffic lights, road bumps, uncontrolled road use behaviour, lack of street lights for night walking, and the lack of infrastructure for people with disabilities. The respondents across the case studies complained about sharing the same carriage-way with the other motorized and non-motorized means of transport, a situation which exposed them to road accidents. Crossing the busy roads in the three case studies was also reported to be very challenging, especially for the elderly, the school children, the people with disability, and the child mothers. In all the three cases, zebra crossings were not provided and where provided marks seemed to have faded off the paint making it impossible for road users to visualize them.

Furthermore, some of the respondents confirmed that they had been the victims of road accidents. Some of them were hospitalized while others were killed on the spot. At City level, the argument of the pedestrians being exposed to road accidents is supported by the road traffic records collected by the researcher at the traffic police headquarter. According to the road traffic records on road injuries and fatalities, the pedestrians in Dar es Salaam are more vulnerable to road traffic deaths than any other single road user group as Table 11.12 shows:

Table 11. 12: Road traffic deaths and injuries by road user groups in Dar es Salaam (2008-2015)

Year	Drivers		Passengers		Motorcyclists		Pedalcyclists		Pedestrians	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
2008	27	318	63	2221	30	407	23	364	257	2363
2009	25	539	58	2593	45	692	16	336	273	2412
2010	8	254	27	1178	31	402	12	114	129	1104
2012	56	608	83	2173	158	2555	23	340	244	1938
2013	38	698	84	2258	161	3024	33	418	224	2005
2014	32	456	92	1670	160	1852	19	198	197	1540
Jan-Mar 2015	12	60	23	304	32	325	4	12	43	315

Source: Traffic Police Headquarter - Dar es Salaam zone, May 2015

Table 11.12 shows that pedestrians are more vulnerable to road traffic deaths than other road users. This finding result is in line with WHO (2015:8) that, the African Region has the highest proportion of pedestrian and cyclist deaths accounting for 43% of all road traffic deaths. Similarly, a study by Zimmerman et al., (2011) revealed that, in Tanzania pedestrian victims of road accidents stand at 55.1 per cent. Economically, such road traffic related deaths have negative impacts on the Tanzanian society at large. The road traffic injuries and deaths have negative impacts on the affected households as

they incur funeral expenses, costs associated with caring for the injured, and the loss of income that occurs when a household member stops working due to death or disability. Additionally, such deaths lead to the increased number of widows, widowers and orphans.

The perspectives of the respondents regarding the cause of road accidents in Dar es Salaam are in line with a study by Pendakur (2005); it was reported that the issue of road accidents in Dar es Salaam City were contributed by the lack of safe pedestrian ways, difficulties in crossing at various intersections, encroachment of the available pedestrian walkways by vehicles and petty traders, and also safety awareness to the public is inadequate.

Motorist not to obey traffic laws

With regard to the motorists' behaviour against pedestrians, across the three cases, the majority (95 out of 100) of respondents perceived that they are not respected by the motorists. When asked to respond whether the motorists respect the pedestrians, the majority strongly disagreed. Summary in table 11.13 is for more details:

Table 11.13: Attitudes of the respondents about respect by motorists

	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Strongly disagree	21	7	17	10	24	4	62	21
Disagree	3	1	2	4	1	1	6	6
Neutral	2	-	-	-	-	1	2	1
Agree	1	-	-	-	-	-	1	-
Strongly agree	-	-	1	-	-	-	1	-
Total	27	8	20	14	25	6	72	28

Source: Fieldwork, February to May 2015

Table 11.13 shows that, across the three cases, the majority in Buguruni, Kariakoo, and Sinza case studies were not satisfied with the behaviour of motorists in Dar es Salaam. The respondents opined that motorized travel in Dar es Salaam is so chaotic. The unruly road users such as *bodaboda*, *bajaji* and *daladala* drivers were particularly a matter of concern.

Insignificant number across the three case studies agrees that motorists respect pedestrians, while almost all the respondents disagree. Across the cases suffering life of pedestrians in the areas were threatened by motorists. Across the cases, the respondents noted a common attitude for drivers to over-speed after escaping traffic congestion and traffic jam with no respect of other road users like pedestrians, and without consideration of the high volume of pedestrians and the roadside commercial activities.

Insecure from crime

Across the case studies, the respondents noted that the walking environment is not secure from crime. When asked whether the neighbourhood streets were secure from crime, the majority of the respondents across the three cases strongly disagreed. The summary in table 11.14 provides more details.

Table 11.14: Attitudes of the respondents about secure from crime

Agreement levels	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Strongly disagree	23	5	15	12	12	4	50	21
Disagree	2	2	1	1	4	1	7	4
Neutral	1	1	3	1	-	-	4	2
Agree	1	-	1	-	4	1	6	1
Strongly agree	-	-	-	-	5	-	5	-
Total	27	8	20	14	25	6	72	28

Source: Fieldwork, February-April 2015

In Table 11.14, a slight difference can be observed in rating the security from crime among the resident households across the three case studies. While 9 resident households in Sinza agreed that the walking environment was secure from crime, only 2 resident households in Buguruni and Sinza (i.e.

only one respondent in each of the two cases) agreed. The marginal difference is due to the high population and concentration human activities in Kariakoo and Buguruni compared to Sinza, where mugging issues were rare during day time though a few were witnessed during night times. Across the three cases, petty theft cases were reported to be widespread. Similar patterns can also be observed among the pedestrians. Across the three case studies, the majority of the pedestrians interviewed i.e 25 out of 28 strongly disagreed as well. Only one pedestrian in Sinza agreed while two could not tell whether the walking environment was secure or insecure.

The respondents reported that there was lack of segregated lanes for pedestrians across the cases force pedestrian to compete for the limited road space with other motorized and non-motorized means of transport, including passengers waiting and disembarked from public mini-buses making these areas a zone of confusion. It is in this zone of confusion where most crimes take place. It is in this congested zone where pedestrians lose their belongings to thieves. Lupala (2002) and Dunge (2014) studies also note the widespread of pick-pocketing in Kariakoo and Sinza. In Kariakoo, pick pocketing is most common apparently resulting from congestion (high population densities). This finding is in line with Montgomery and Roberts (2008) who argue that in cities of developing countries, street muggings, pick-pocketing and other forms of pedestrian-directed crimes influence the ability and willingness to walk. A report by the UN Habitat (2000) revealed similar results that 61 per cent of people in Dar es Salaam feel unsafe in residential areas after dark.

In addition to that, across the three cases, women were aware and sensitive to security issues, especially when walking in the congested and poorly lit streets. They felt more vulnerable to petty theft and assault. The findings of this study are in line with McNeil et al., (2003) and Montgomery and Roberts (2008) that women are keenly aware of security issues compared to men. Montgomery and Roberts (2008) and McNeil et al., (2003) noted that women were keenly aware of security issues compared to men; they feel vulnerable to theft and assault, especially at night because street lighting is poor. Montgomery and Roberts (2008) citing conversation with Shomik Menhdiratta (2006) adds that security is particularly relevant for women and children who, may not choose alternate modes (use a taxi to cross the street, rather than walk) or may be forced to eliminate trips due to a perception of dangerous pedestrian conditions. This result implies that urban walking without fear of intimidation or physical harm influences the life of the city, particularly at nighttime and for vulnerable users, such as women, children, and the elderly.

Public facilities are inconveniently located

Public facilities were thought to include commercial, education, health, religious, recreational facilities and access to public bus stops. However, under this variable only the resident households were interviewed. Pedestrians were excluded as they were non-residents in the study areas. In this case, only 72 residents were interviewed. The main indicator for assessing accessibility to services was *the time taken to reach these facilities*.

In this regard, all the resident households in the three sub-cases were asked whether the public facilities were accessed in 5 to 10 minutes or 400 to 800 metres. Overall, the majority of the respondents across the three cases 26(96%), 17(85%) and 17(68%) in Buguruni, Kariakoo and Sinza respectively disagreed. They perceive that the public facilities in their residential areas were inconveniently located, except local shops, bars, cafes and restaurants. Table 11.15 summarizes the views of the residents, cross the three settlements.

Table 11. 15: Attitude of the resident households on accessing public facilities in 5-10minutes

	Buguruni	Kariakoo	Sinza	Total
Strongly disagree	11	10	13	34
Disagree	15	7	4	26
Neutral	-	-	-	-
Agree	1	2	6	9
Strongly agree	-	1	2	3
Total	27	20	25	72

Source: Fieldwork, February- April 2015

Table 11.15 shows that across the three cases, only 12 out of 72 resident households agreed that the common facilities are accessed within 5 to 10 minutes. Across the the three case studies, patterns depicting similarities and differences were noted. Almost 50% of the respondents across the three cases strongly disagree, meaning that more public facilities are not within a convenient walking distance.

A high significant difference is noted is Buguruni; where (15 out of 27) disagree to some extent while only a few respondents in Kariakoo and Sinza disagree to some extent. The reason for such difference is that Buguruni is unplanned settlement that lacks most basic services. For instance, the whole Buguruni-Mnyamani settlement 18,077 populated had neither market no public health centre. Similarly to Buguruni-Madenge, there is neither a public dispensary nor clinic despite its 12, 230 populated. The majority of the residents in Buguruni area felt that they are more vulnerable to the walking challenges are services are far from their neighbourhoods. School children in Buguruni-Mnyamani for example, had to cross the busy roads on a daily basis to access primary schools in the adjacent settlements.

Furthermore, one (3%), three (15%) and eight (32%) of the respondents in Buguruni, Kariakoo and Sinza respectively agree that the public facilities are accessed within a convenient walking time and distance. However, the number seems to be high in Sinza compared to Buguruni and Karikao. The reason here is that Sinza is provided with primary schools in all its neighbourhoods, except Sinza A. The problem regarding access to schools, some are not centrally located. Also, there is one health centre facility in Sinza though not centrally located.

Time taken to access commercial facilities

With regard to the commercial services (i.e. shops and market), across the three cases, the majority accessed local shops in less than 10 minutes. Insignificant number across Buguruni, Kariakoo and Sinza cases access local shops between 11 and 30 minutes. The good accessibility to the local shops is contributed by the housing transformations taking place within the planned and unplanned settlements. The house owners had transformed their housing in order to earn income from renting. Almost after every three or five houses there is a local shop or kiosk providing the households daily needs, leading to a kind of mixed use development. This in turn seems to facilitate easy to shopping facilities. The time taken to access commercial facilities across the three cases is presented in the following Table.

Table 11. 16: Time taken to access commercial facilities (Shops and Markets)

Time (In minutes)	Buguruni		Kariakoo		Sinza		Total	
	Shop	Mkt	Shop	Mkt	Shop	Mkt	Shop	Mkt
1-10	25	5	15	7	23	5	63	17
11-20	1	11	5	8	2	4	8	23
21-30	1	3	-	2	-	4	1	9
31-45	-	6	-	3	-	8	-	17
46-60	-	1	-	-	-	3	-	4
>60	-	1	-	-	-	1	-	2
Total	27	27	20	20	25	25	72	72

Source: Fieldwork in Buguruni, Karikooa and Sinza, February to April 2015

Unlike the local shops, across the three cases, market facilities were inconveniently located. Only the minority (i.e. 5 out of 27, 7 out of 20 and 5 out of 25 residents in Buguruni, Kariakoo and Sinza respectively) accessed market facilities a convenient walking time (i.e. 5 to 10 minutes). Overall, the majority (55 out of 72) spent between 11 and 60 minutes, and at a time to more than 60 minutes to reach market places.

Comparing the three cases in terms of access to market facilities, a slight difference can be noted. In Kariakoo, only three out of 20 resident respondents accessed market place in between 31 - 60 minutes, while in Bunguruni and Sinza, seven out of 27 and 11 out of 25 resident households respectively, accessed marketplaces between 31-60 minutes. Furthermore, insignificant number in Buguruni and Sinza settlements, at a time they access market facility in more than 60 minutes. As explained earlier, there is no market facility in Buguruni-Mnyamani despite it is 18,077 population. Likewise, the whole Sinza had only one small market facility located at Sinza A. The rest (Sinza B, C, D and E) lacked the market facility. Likewise for Kariakoo, the majority of the residents were far from the Kariakoo market. This market was not designed for Kariakoo residents, but initially for the entire Dar es Salaam City. This was the main market of Dar es Salaam until early 1990s. Therefore, the residents from the peripheral Kariakoo accessed the facility at a longer distance. The results from finding show that the market facilities in both planned and unplanned settlements are inconveniently located. Due to these inconveniences, across the three cases, the majority had to cover a distance between 1.4 -12.6 kilometers to access market facilities (Chapter Eight).

Time taken to access primary schools, health and religious facilities

Across the three cases, primary schools and health facilities were inconveniently located. Out of 72 residents, only 13 and 10 accessed primary schools and health facilities within 10 minutes respectively. The majority (59 out of 72) and (62 out of 72) accessed primary schools and health services between 11 and 60 minutes, and sometimes in more than 60 minutes. Table 11.17 shows the time taken by the residents interviewed to access primary schools, health and religious facilities.

Table 11. 17: Time taken to access primary schools, health and religious facilities

Time taken (In minutes)	Buguruni			Kariakoo			Sinza			Total		
	P/sch	HF	RF	P/sch	HF	RF	P/sch	HF	RF	P/sch	HF	RF
1-10	1	3	17	3	2	13	9	5	10	13	10	40
11-20	15	2	5	9	3	4	9	4	7	33	9	16
21-30	3	6	2	-	1	2	2	8	4	5	15	8
31-45	7	12	2	5	10	-	3	6	2	15	28	4
46-60	0	1	1	1	2	1	1	1	1	2	4	3
>60	1	3	-	2	2	-	1	1	1	4	6	1
Total	27	27	27	20	20	20	25	25	25	72	72	72

Source: Fieldwork, 2015

P/sch= Primary school; HF=Health facilities; RF=Religious facilities

Table 11.17 shows a pattern depicting similarities and differences across the cases.

- Across the three cases, only a few residents (i.e one out of 27, 3 out of 20, and 9 out of 25 resident respondents in Buguruni, Kariakoo and Sinza respectively) accessed primary school within 10 minutes. The majority of the resident households across the three cases accessed primary school facility in hardly half an hour. Furthermore, insignificant number across the cases spent more than 60 minutes to access a primary school. However, across the three cases, access to primary school seems to be better in Sinza than in Buguruni and Kariakoo. This is justified by the fact that only 4 residents in Sinza accessed a primary school between 31 and 60 minutes, while in Buguruni and Kariakoo, 7 and 6 residents spent between 31 and 60 minutes to access a primary school respectively. The reason for this difference is that in Sinza at least each neighbourhood is provided with a primary school school service, except Sinza A. The only challenge is that some of the schools are not centrally located.

- With regard to health services, across the three cases only few accessed health services within a convenient walking time (i.e. less than 10 minutes). However, the access to health services seemed to be convenient in Sinza compared to Buguruni and Kariakoo. The majority i.e. 17 out of 25 residents in Sinza accessed the health facility in hardly half an hour, while in Buguruni and Kariakoo, only 11 out of 27 and six out of 20 respectively accessed the health facility in hardly half an hour respectively. Conversely, seven out of 25 residents interviewed in Sinza accessed a health facility between 31 and 60 minutes, in Buguruni and Kariakoo (13 out of 27 and 12 out of 20) respectively accessed a health facility between 31 and 60 minutes. This difference is due to the fact that, in Sinza, there is a public health center (Palestine Health Centre) though not centrally located. In Buguruni-Mnyamani and Madenge there is neither a health centre nor a dispensary. The residents had to go to the Municipal Hospital (i.e. Amana hospital), which is about 2 kilometers from Buguruni. In Kariakoo areas as well, there was only one health centre (the Mnazi Mmoja Health Centre) which is somehow located far from the residential neighbourhoods. Across the three cases, insignificant number of residents accessed a health facility in more than 60 minutes.
- Across the three cases, accessibility to religious facilities seemed better in Kariakoo and Buguruni than in Sinza. Approximately, 17 out of 27, 13 out of 20 and 10 out of 25 resident respondents in Buguruni, Kariakoo and Sinza respectively, accessed religious facilities within 10 minutes. However, a similarity here is that across the three cases, the majority accessed religious facilities in hardly half an hour. Furthermore, while 3 out of 27 and 3 out of 25 residents in Buguruni and Sinza respectively accessed religious facilities between 30 and 60 minutes, in Kariakoo only one resident accessed worship place between 30 and 60 minutes. Across the three cases, only one resident in Sinza accessed religious facilities in more than 60 minutes. The reason why the access to religious facilities is better in Kariakoo and Buguruni than Sinza is that, most of the respondents in Buguruni and Kariakoo are Muslim; hence some had worshipping rooms at their home. In Sinza, the majority of the respondents were Christians, but the religious facilities were inadequately provided within the residential neighbourhood. Therefore, residents were forced to walk longer to access religious facilities.

The inconvenient location of public facilities adds vulnerability to school children, the elderly, the people with disabilities and women across the three cases.

Access to public transit stops

When asked whether the public transport stops were accessed within 5 to 10 minutes, half of the respondents across the three cases agreed. The other half were of the opinion that the public bus stops are inconveniently located. Table 11.18 provides more details.

Table 11. 18: Attitudes of the resident households towards accessing public transit stops in 5-10 minutes

	Buguruni	Kariakoo	Sinza	Total
Strongly disagree	8	0	3	11
Disagree	14	1	6	21
Neutral	-	4	-	4
Agree	1	3	-	4
Strongly agree	4	12	16	32
Total	27	20	25	72

Source: Fieldwork in Buguruni, Kariakoo and Sinza, February-April 2015

Table 11.18 shows a significant difference in perception of accessibility to public bus tops among the residents in the planned and unplanned settlements. The residents in the planned settlements (Sinza and Kariakoo) had positive perceptions than those in the unplanned settlements of Buguruni. This is justified by the fact that out of the 36 resident households who agreed that the public bus stops were conveniently located, 15 were from Kariakoo (planned settlement), 16 were from Sinza (planned set-

tlement) and only 5 from Buguruni (unplanned settlement). This implies that public bus stops in the planned settlements were better located than the unplanned settlements. This is understandable given the relatively better road conditions in planned areas unlike in informal settlements at least there are clearly known major roads.

A significant difference can be noted among the residents who disagreed to some extent. The majority of the residents in Buguruni 14 (51%) disagreed to some extent, only 1(5%) and 6 (24%) in Kariakoo and Sinza disagree to some extent respectively. This high significance is because public transport in the unplanned settlement like Buguruni is limited due to poor infrastructure within the area. The privately operated public buses are widely accessed in better condition road streets. There is only one bus route within Buguruni-Mnyamani and which do not accommodate the public buses for the entire City.

Time taken to access public transit stops

Comparing the three cases, the public bus stops were inconveniently located in Buguruni than those in Sinza and Kariakoo. Table 11.19 presents a summary regarding the time taken to access public transit stops across the three cases.

Table 11. 19: Time taken to access min-bus stops in Buguruni, Kariakoo and Sinza

Time Taken (In minutes)	Buguruni	Kariakoo	Sinza	Total
1-10	5	13	15	33
11-20	15	6	7	28
21-30	3	1	3	7
31-45	3	-	-	3
46-60	1	-	-	1
Total	27	20	25	72

Source: *Fieldwork, February-April 2015*

Table 11.19 shows that there is pattern depicting the differences in time taken to access public bus stops across the three cases. While 13 (65%) and 15(60%) residents in Kariakoo and Sinza accessed public transit stops within 10 minutes respectively, in Buguruni only 5 (18%) reached to public stops in a convenient walking time. Moreover, while all resident respondents in Kariakoo and Sinza spent hardly half an hour to reach the public stops, in Buguruni 23 out of 27 residents respondents accessed public bus stops in hardly half an hour. Furthermore, in all the three case studies the results show that it is only in Buguruni residents accessed public bus stops between 31 and 60 minutes. This difference is simply because informal settlements in Dar es Salaam are characterised by poor and narrow roads, a situation that limits the operation of public buses in such area. The informal settlements in Dar es Salaam are in most cases serviced by motorcyclists, a service that seem to be expensive to the majority and dangerous to pedestrians, especially the vulnerable groups.

Across the three cases, the public bus stops had neither clearly defined bus bays nor shade/standing instruments. Pedestrian amenities like passengers shade devices, benches, dust bins and street lights at the public bus stops to facilitate night walking were also lacking. Most public bus stops lacked zebra crossings and where existed, some were invisible.

Exclusion from urban mobility

With regard to exclusion, when asked to respond whether the roads/streets in the study area were inclusively designed for all road/street users, almost all the respondents interviewed across the three cases strongly disagreed. Only one resident in Kariakoo was of the opinion that pedestrians are considered in the urban streets. Across the three cases the respondents were of the opinion that pedestrians are excluded from the urban mobility.

Table 11. 20: Attitudes of the respondents regarding inclusion of all the roads/streets users

	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Strongly disagree	27	8	19	14	25	6	71	28
Strongly agree	-	-	1	-	-	-	1	-
Total	27	8	20	14	25	6	72	28

Source: Fieldwork, February to May 2015

Table 11.20 shows that, there is a similarity in perceptions of exclusion on urban roads among the pedestrians and the residents. Across the three cases, all the pedestrians and all the residents interviewed (except one) perceived that pedestrians were excluded from urban transport in Dar es Salaam. Across the three cases the people with disabilities complained of the lack of disability infrastructure and signs along the urban road, and also in the public buses and in the high raised buildings.

Across the three cases, the pedestrian infrastructure in most residential and commercial streets was lacking. Even for the upgraded informal settlements (Buguruni), more emphasis was put on improving carriageway for motorized means of transport at the expense of the other road users like pedestrians. Since pedestrians are an afterthought, space to provide facilities is usually inadequate. The researcher is of the opinion that there was misconception regarding pedestrians' accessibility when implementing the upgrading projects like those in Buguruni-Mnyamani and Madenge. The municipal authority saved cost related to compensation costs at the expense of pedestrian lives. This is contrary to the Goal 11 of the SDGs that aims at making cities inclusive, safe, resilient and sustainable.

Across the three cases, the researcher observed pedestrians competing for road space with many other motorized and non-motorized transport users, including passengers waiting and being dropped by public min-buses and hence making this area a zone of confusion. The congestion not only exposed them to road accidents, but also it was in this zone of confusion that attracts criminals to take advantage. Overall, pedestrian needs were not adequately considered in neighbourhood planning. The motorized transport was given more attention than walking. Pedestrians are usually an afterthought. The space to locate pedestrian facilities is usually inadequate due to the fact that the earlier planning did not consider them. The exclusion of pedestrians from urban roads/streets forced them to the chaotic mix of various modes of transport which are unsafe. Across the three cases, pedestrians were observed sharing the same carriageway with the vehicular traffic; thereby mixing up with cars, motorcyclists (*bodaboda*), tri-cyclists (*bajaji*), cyclists, three wheelers, pushcarts. This situation exposed pedestrians to the road accident and hence the pedestrian safety is jeopardized.

In view of one of the road engineers at TANROADS, the exclusion of pedestrian infrastructure in most cases is linked to the fact that pedestrian infrastructure does not generate any revenues to the government and hence it is given low priority. This means that private investors and international lending agencies are not very keen to providing funding for such project, which will not have financial returns. UN (2013) notes that the space to accommodate different modes of transport in developing countries is inadequately considered compared to developed countries where streets are designed to accommodate various modes of transport including walking, cycling and driving. Likewise, the empirical findings concur with Dimitriou and Banjo (1990) who found out that the needs of pedestrians in developing countries are inadequately addressed due to lack of prioritization in urban design.

Uncomfortable and inconvenient walking environment

Across the three cases, the majority perceived that the walking environment in Dar es Salaam is of poor condition and inconvenient for walking. When asked to respond whether the walking routes were passable throughout the year, 92 out of 100 respondents strongly disagreed. Table 11.21 summarizes the views of the residents and pedestrians on the condition of the walking environment.

Table 11 21: Views of respondents on whether walking routes are passable throughout a year

	Buguruni		Kariakoo		Sinza		Total	
	HHs	PDs	HHs	PDs	HHs	PDs	HHs	PDs
Strongly disagree	22	6	19	14	25	6	66	26
Disagree	2	1	-	-	-	-	2	1
Neutral	1	-	-	-	-	-	1	-
Agree	1	1	-	-	-	-	1	1
Strongly agree	1	-	1	-	-	-	2	-
Total	27	8	20	14	25	6	72	28

Source: Fieldwork, February to May 2015

Table 11.21 shows that the majority of the respondents across the cases were not satisfied with the condition of the walking routes, particularly footpaths and access roads. The analysis of empirical findings has demonstrated that the walking environment is in poor condition. The respondents commented that the neighbourhoods are uncomfortable and inconvenient for walking. The neighbourhood streets are narrow, unpaved, covered with uncollected garbage and flooded with water when it rains. Sidewalks in most commercial and residential streets were lacking. In the unplanned settlements like Buguruni Mnyamani and Madenge, footpaths were too narrow. The poor state of the streets led to uncomfortable walking, especially during the rainy season when they are muddy. At night, the situation was reported to be worse since the street lighting to facilitate night walking were not provided. The mixing up with the other motorised and non-motorised traffic also made walking along this space unsafe for pedestrians the consequences of which are poor quality of the space to function as a walkway. Across the three cases, walking, standing and sitting activities were noted to be poorly promoted due to the lack of standing and sitting facilities such as benches, standing supports like shade devices at the bus stops. The lack of street lights in all cases makes protection against crime and the sense of insecurity more pervasive especially during the night. Furthermore, across the three sub-cases, pedestrian facilities like garbage bins and public toilets were also lacking. Across the three cases, in some spaces, garbage was haphazardly dumped or burnt creating polluted and smoky environments. The haphazardly disposal of solid waste creates difficulties for people with disabilities to walk on. In all the three cases, the dusty and muddy conditions of spaces during the dry and rainy season have rendered walking in these spaces uncomfortable.

11.3 Issues emerging from the implementation of design concepts and planning standards

Across the three sub-cases, there is a mismatch between the proposed urban design concepts, planning standards and actual implementation of plans. The urban design concepts and planning standards proposed to improve the walking environment are inadequately implemented. The driving factors were mentioned to include: limited financial resources, poor coordination among actors, low priority given to the pedestrian concerns and lack of political support. Furthermore, exclusion of pedestrian infrastructure during plan implementation was commonly observed across the three case studies. Across the three sub-cases, most of the existing walkways were converted into car parking and informal vending activities, and in some cases the building extensions had encroached upon the walking space. Both in Sinza, Kariakoo and Buguruni case studies, the public space seem to be contested in such a way that pedestrians are pushed out of their walking spaces. In areas like Sinza, the existing public recreational open spaces were also converted into residential, religious, office and commercial activities.

The main issues emerging are attributed to the inappropriate and out dated urban design concepts, lack of mechanisms for implementing plans, lack of planning standards for parking lots and religious facilities at a neighbourhood level, the lack of national planning standards to guide the upgrading of informal settlements, weak development control, lack of urban design and planning provisions to address the pedestrian needs and limited awareness on planning regulations and standards. Across the three case studies, there are exclusive road designs. The road networks in the planned and upgraded

informal settlements are not in line with the recommended planning standards. Across the three cases, there is neglect of pedestrian needs (i.e. safety, security and accessibility needs). Table 11.22 presents a summary of the issues emerging from implementation of urban design concepts and planning standards across three cases.

Table 11. 22: Issues emerging from implementation of design concepts and planning standards

Parameter Settlement	Issues emerging from implementation of urban design concepts	Issues emerging from implementation of planning standards	Remarks
Sinza	<ul style="list-style-type: none"> -Urban design concepts adopted (zoning concepts) do not reflect the reality; they are inappropriate and outdated. -Exclusive road designs 	<ul style="list-style-type: none"> - Space standards for public facilities were not fully implemented, leading to longer walking distances. -Violations of building setbacks, leading to narrowing of walkways. -Public recreational open spaces were provided, but encroached upon by other land use activities. Hence, recreational areas for pedestrians to rest are lacking. - Limited space for residential access roads; insufficient to accommodate pedestrian walkways. - Space standards for parking lots and religious facilities are inadequately provided at neighbourhood level. - Lack of urban design and planning provisions to address the pedestrian needs - Weak development control by the planning machinery - Limited awareness on planning regulations and standards 	<ul style="list-style-type: none"> -Congestion and contested public space. Pedestrians are pushed out of their walking space -Neglect of pedestrian needs (safety, security and accessibility needs). -Existing walkways encroached upon by parked cars and street vendors.
.Kariakoo	<ul style="list-style-type: none"> The urban design concepts and objectives of the 1949, 1968, 1979 and 2002 Kariakoo redevelopment plans to improve the pedestrian environment were inadequately implemented. -Inadequate parking spaces and lift systems in high rise buildings for people with disabilities. -Exclusive road designs 	<ul style="list-style-type: none"> -Space standards proposed by the Kariakoo redevelopment plan of 2002 were inadequately implemented. -Violations of building setbacks and plot coverage, thereby narrowing and blocking the continuity of the walking paths - Non-realization of the building height-street width relationships. - Weak development control by the planning machinery -Lack of mechanisms for implementing the Kariakoo redevelopment plans -Lack of urban design and planning provisions to address the pedestrian 	<ul style="list-style-type: none"> -Congestion and contested public space along main arterial and commercial streets. -Neglect of pedestrian needs(safety, security and accessibility needs) -Existing walkways encroached upon by parked cars and street vendors

		needs -Limited awareness on planning regulations and standards	
Buguruni	-Exclusive road designs	<ul style="list-style-type: none"> - A mismatch between CIUP space standards for roads improvements and actual implementation. - Exclusion of pedestrian walkways during plan implementation. - Lack of national planning standards to guide upgrading of informal settlements 	<ul style="list-style-type: none"> Congestion and contested public space -Neglect of pedestrian needs (safety, security and accessibility needs) -Existing walkways encroached upon by parked cars and street vendors -Poor accessibility within the area

Source: Own construction

11.4 Concluding summary

This chapter has provided empirical findings provided from the cross case comparison/synthesis of the three sub-cases. In this chapter the pedestrian movement patterns, perspectives of pedestrians and implementation of the urban design concepts and standards were analysed and compared. The reasons for walking, places where walkers visit more often, the means of transport used in the study areas as well the implementation of the urban design concepts and planning standards were discussed and compared. The next chapter presents the summary of the main findings and policy implications.

CHAPTER TWELVE

12 SUMMARY OF MAIN FINDINGS AND POLICY IMPLICATIONS

12.0 Introduction

This chapter presents the major findings drawn from the study, focusing particularly on the pedestrian mobility patterns, the reasons for walking more often, perspectives of pedestrians on the walking environment, considerations of pedestrian requirements in Tanzania and how the existing urban design concepts and planning standards are being implemented. The chapter also presents planning and development issues that require policy attention to enhancing and supporting the walking environment in Dar es Salaam City.

12.1 Summary of the main findings

This study has examined the pedestrian movement patterns in planned and unplanned settlements; the reasons why people in Dar es Salaam walk more often, perspectives of pedestrians on the walking environment; and how the physical environment supports pedestrian movements with regard to their vulnerability. Furthermore, the study has examined how the national level sectoral policy and other documents in Tanzania considered or provide considerations for pedestrian requirements in the formally planned and upgraded informal settlements. Lastly, the study examined how the existing design concepts and planning standards adopted in the formally planned and upgraded informal settlement were implemented. The summary of the main findings highlighted earlier include the following:

Walking and public transport are the mainly means of transport used by low income households in Dar es Salaam City. Despite the majority depended on walking to get into various destinations, however, the elderly, school children, the people with disability and women were increasingly vulnerable due to poor consideration and non-development of pedestrian friendly infrastructure. The respondents repeatedly complained that sidewalks were lacking, and thus they had to walk on dusty, muddy, flooded access roads and footpaths. In the upgraded informal settlements like Buguruni-Mnyamani and Madenge, sometimes people walked along the Railway line, and along the naturally meandering footpaths, which were sometimes less than one metre wide.

With regard to the reasons for walking, most of the respondents walked more often because of low income/affordability. Other reasons were mentioned to include proximity to service, a form of their physical exercise, transport challenges, especially traffic jam, unreliable public transport and inadequate parking space. The nature of work, particularly street vending was the lowest ranked. The majority of the respondents had their daily trips connected with access to workplaces, commercial services, community services, social activities and recreational purpose trips.

Regarding safety and security from crime, almost all of the respondents perceived that the walking environment in Dar es Salaam is very dangerous and insecure from crime. Pick-pocketing was reported to be a serious problem within the City, especially in the congested streets. Accessibility to public services for the majority of the resident respondents was also inconvenient. Overall, pedestrians felt that they are not respected by motorists. Pedestrian rights are therefore ignored.

Pedestrian requirements are inadequately considered in most sectoral national level policies and documents. Where considered, still there are gaps that require policy attention. These include: the non-recognition of walking as a means and mode of transport; the inadequate considerations of disability infrastructure; the lack of policy provisions regarding what mechanisms to achieve the set objectives, the lack of coordination mechanisms among the policy makers and implementing authorities and agencies, the non-adherence of the building height-street width ratio in the redevelopment projects

whereby the high rise buildings are emerging, and the lack of approved planning standards to guide the upgrading of informal settlements.

Regarding the urban design and planning concepts and standards, it was observed that the concepts are inappropriate, outdated and inadequately implemented. They were inherited from the colonial era; hence they do not reflect the contemporary requirements of pedestrians. They are also no consideration for exclusive pedestrian routes in designs and implementation of urban roads. Almost all respondents across the three cases observed that pedestrians (including the people with disabilities) are excluded from the urban transport system in Dar es Salaam City. Other challenges include: inadequate parking lots in commercial and residential streets, lack of priority on pedestrian needs, lack of implementation mechanisms and financial resources, lack of approved planning standards to adequately guide the upgrading of informal settlements. Violation of planning standards and encroachments of the existing walkways also seem to constrain continuity of pedestrian movements.

12.2 Policy implications

It has been empirically established in this study that though the urban policies, comprehensive documents and planning standards consider the requirements of pedestrians; also policy gaps that require attention were identified. This section discusses planning and development issues requiring policy attention that can be essential for improvement of pedestrian mobility in Dar es Salaam City and that should be supported. Based on the analyses and findings of this study and on walkability experiences from other countries, seven main policy gaps are discussed. These are:

- Lack of policy provision/consideration;
- Lack of comprehensive policy objectives on pedestrian requirements;
- Lack of mechanism for implementation;
- Poor coordination among actors;
- Non-recognition of walking as a mode and means of transport;
- Inadequate considerations of disabilities infrastructure; and
- Lack of a unit or department for non-motorized in LGAs.

Lack of policy provision/consideration for action

Despite the fact that most of the urban policies reviewed considered pedestrian requirements, the provisions for action are lacking and sometimes the objectives regarding pedestrian needs are not integrated in urban spatial planning frameworks. The issue here is that planning standards and policies do not consider the specific needs of pedestrians, including the people with disabilities, the elderly, children etc. For instance, although the National Education and Training Policy of 1995 and the National Health Policy of 2003 aimed to ensure equitable distribution of education and health care facilities respectively, these policies do not indicate mechanisms pertaining to education and health facilities and their spatial distribution in order to ensure easy access by people of all ages and ability.

Similarly, the Urban Planning Space Standards and Regulations of 1997 and 2011 requires that every neighbourhood to have its own primary school, nursery school, market, local shops, dispensary or clinic, children play areas and recreational areas, regulations to guide the location of these facilities were lacking. As a result, most resident households and school children walk long distance to access some of the facilities.

This policy gap was also observed by the professionals interviewed at the MLHHS and at the Ilala and Kinondoni municipalities that currently there are no planning guidelines on where to locate the public facilities, instead, special planners decide on their own basing on the site characteristics. One of the professional experts at the MLHHS (The in-charge of urban design) acknowledged the gap regarding policy provision. She said: *“We have space standards for neighbourhood level design, but a challenge remains on where to locate such facilities within a neighbourhood. So far there are no guidelines regarding specific locations of public facilities. Being the responsive Ministry, we keep on insisting Town Planners to*

accommodate all the public facilities as stipulated in the Urban Planning and Space standards of 1977 and now 2011. The layout should not exceed 1250 x 1500metres. In other words, it implies 5grids to the North and 6 grids to the East. However, the Ministry is now in the process of approving regulations implementing planning the Urban Act No 8 of 2007 and standards³⁴”

Likewise, the review of policies specifically the National Road Safety Policy of 2009 showed a gap regarding the inadequate education and public awareness on pedestrian needs and the importance of providing the same. In order to ensure that the public is adequately aware of their road safety rights, there is need to consider a policy provision that will not only make them aware, but also ensure that understand their rights to walk and demand/fight/reclaim for it. Hence, the policy provisions have to ensure equitable distribution and location of public facilities in order to address pedestrian accessibility needs. When located in appropriate locations, public facilities can reduce the travel distances and the risks of being hurt by motorists.

Lack of comprehensive policy objectives on pedestrian requirements

Despite the fact that pedestrian needs were considered in most of the sectoral policies and other documents reviewed, there exists no comprehensive policy or any other document that pulls together all issues and objectives regarding pedestrian requirements. Proposals’ ideas and policy related issues regarding pedestrian needs are scattered in different sectoral policies and legislations. As a result, in handling pedestrian concerns often professionals concentrate on the laws within their sectoral fields, thereby ignoring other provisions outside their field. One of the Town Planners at the Kinondoni Municipal Council raised concern about the pedestrian policies and laws: *“As a planner, I only concentrate on laws and regulations within my field while planning for neighbourhoods, I do not consider what other laws say about pedestrians”*

Similar gap regarding scattered policies and laws was confirmed by the professionals interviewed at the Ilala Municipal Council. One of the urban planners was quoted as saying: *“the main challenge we have in planning for pedestrian needs is the lack of a comprehensive document. There is no one solid document on pedestrian needs. We as Town planners normally deal with the requirements stipulated in the National Human Settlement policy and laws, sometimes without knowing that some of the pedestrian requirements are included in other policies like the national transport policy, education training policy, health policy etc. Personally, would prefer that an exclusive policy be formulated for pedestrians only³⁵”*

Lack of implementation mechanisms

The review of the sectoral policies has also revealed a policy gap regarding mechanisms for implementing the policy provisions. Some sectoral policies are weak in providing implementation mechanisms despite good policy statements. For instance, although section 5.2 (c) of the National Road Safety Policy of 2009 requires the road authorities to design, construct and maintain their roads to provide facilities for all road users so as to minimize conflicts and crashes; and that the road authorities shall ensure that the design and construction of all road facilities take into account the needs of the vulnerable and physically disadvantaged in an appropriate manner, still the policy document does not show how this objectives could be implemented as policy regulations were not provided. Similarly, section 16 (4) (h) (1) (b) of the Urban Planning Act No. 8 of 2007 seeks to provide the road pattern and traffic networks designed to improve vehicular access and parking space and also facilitate segregation of vehicles and pedestrians, but the mechanisms for implementing this are not provided.

In addition, though section 5.1.2.5 of the National Transport Policy of 2003 requires segregating pedestrians from other road users in residential neighbourhoods, this provision is often not implemented. The newly built BRT system is a living example. Across the three case studies, pedestrians were found sharing the congested carriageway with the other motorized and non-motorized users such as

³⁴ Interview with the Assistant Director, Urban Design Section at MLHHSD on 27th May 2015

³⁵ Interview with the Senior Town Planner at the Ilala Municipality on 20th February 2015

cars, motorcycles, bicycles, *bajaji*, wheelers and pushcarts. Therefore, there is a need for a mechanism to ensure that traffic is segregated in residential neighbourhoods of urban areas.

Poor coordination among actors

The review of policies also indicates that there was a gap related to poor coordination among the actors involved in policy making and in policy implementation. Section 5.2.6 (a) of the National Road Safety Policy of 2009 provides for issues regarding the road capacity, which in the case studies were in most cases reduced by informal road side parking and petty trading activities compelling pedestrians to walk on the carriageways as most of the walkways are full of parked vehicles and petty traders. The National Road Safety Policy further recognizes that the negative impacts of the inadequate physical planning, and poor implementation of master plans coupled with lack of enforcement of laws and regulations on mobility and accessibility in most parts of the urban areas. To address these challenges, section 5.2.6 (c) gives policy provision that the implementing agencies will be influenced to conduct good land use planning and urban settlement patterns in order to discourage the habit of parking vehicles along road carriageways in urban centres, and also should encourage the construction and use of parking facilities in built up areas.

Additionally the policy provision suggests that, the Prime Minister's Office, Ministry of Regional Administration and Local Governments in collaboration with the Ministry of Lands and Human Settlements Development should design and develop urban areas and residential areas in tandem with provisions of adequate transport infrastructure. The Regional Administrations and Local Governments required addressing and facilitating the planning and approval process for construction of private parking facilities. However, despite the good policy provisions regarding involvement of various actors to address the issues of parking spaces, the policy does not show how the various actors like the MLHSD; the Prime Minister's Office, Regional Administration and Local Government would be coordinated.

Sections 3.11 and 3.17 of the National Policy on Disability of 2004, acknowledges the urban transport and safety challenges for people with disabilities. The policy highlights the issues that disabled persons experience difficulties in the use of transport facilities. Most facilities, particularly public buses, and roads are not easily and conveniently accessible to disabled persons. Construction and provision of public buildings, roads, playgrounds and services such as public phones and water tap do not take into consideration differing needs of people with disabilities thus making these facilities inaccessible. To address these challenges, the policy provides that the government in collaboration with stakeholders shall take measures to ensure that transport facilities are accessible to people with disabilities. Furthermore, the government in collaboration with other stakeholders shall ensure that roads have necessary facilities to allow for convenient use and passage by disabled persons. The government in collaboration with stakeholders shall take measures to ensure that public buildings and other facilities are accessible to people with disabilities. Despite the good intention to collaborate with other stakeholders to enable access to the public buildings, public buses, roads and recreational areas by people with disabilities, the mechanisms through which the key stakeholders will be coordinated is not outlined.

Poor coordination among actors is an issue which was also confirmed by the professional experts during official interviews. In their opinions, the inadequate consideration of pedestrian needs in Dar es Salaam City sometimes results from the poor coordination among the responsible actors. For instance, the Works (Engineering) and the Urban Planning Departments of LGAs do not often consult with each other in their routine operations. When asked whether Engineering and Urban Planning Department cooperate in ensuring pedestrian needs are considered, the Kinondoni Municipal Engineer said: *"We are working under the same Municipal Council, but surprisingly, as engineers we do not work together with physical planners in development projects. Physical planners do not involve us in the planning of neighbourhoods. This is one of the reasons why there are insufficient pedestrian facilities in the Municipality"*. The

Municipal engineer added that: *“The urban planners like doing things in their own way. They do not involve all other actors responsible for the provision of pedestrian infrastructure, especially in the initial planning of neighbourhoods and that is where things start going wrong³⁶”*.

Likewise, the road engineers interviewed at the Ilala Municipal Council acknowledged the lack of coordination among the responsible actors. When asked whether the Works (Engineering) Department consider pedestrian walkways in road design and construction, one of the road engineers observed *“... in most cases we do not provide walkways due to limited space. Spatial planners often do not consult us while designing neighbourhood plans. As a result, they allocate a little space for road circulation, something which is not fully achieved in some cases. This view can be questioned or considered not quite true because normally urban planners and designers use standards and regulations that have taken pedestrian needs into account. What could be the right explanation is that in the actual construction/implementation, engineers often reduce the road width specification to cut down costs.*

Besides, the urban planners interviewed blamed the Works Department for not involving them in implementation of road construction works. When asked whether the Urban Planning Departments corroborates with the Works (Engineering) Department to ensure adequate consideration of pedestrian facilities, one of the urban planners at the Kinondoni Municipal Council replied: *“The road engineers do not involve us during road construction. That can be the reason why the lack of walkways is observed in most of the urban roads”*

Similarly, the Municipal Planner of Ilala Municipality also raised a concern regarding manner the other professionals provide services in the residential neighbourhoods where land/building development has already taken place without involving the land use planners. He gave an example of the utility agencies and the road engineers who often provide for motorised transport facilities without considering space availability for the pedestrian facilities. He said: *“This practice has made it difficult for physical planners to adequately ensure that space is allocated and utilised efficiently without conflicts”*.

Apart from these municipal officials, the poor coordination was also confirmed at the ministerial level where it was reported that sectoral ministries do not consult with each other when formulating strategies. One of the road engineers at TANROADs said: *“some ministries formulate strategies and directives without involving others which may conflict with other ministries’ directives. This practice is very common here in Tanzania, especially at the local government level, the latter which has a tendency of not consulting other ministries in its operations. They only contact them when things seem not to work³⁷”*.

The study has also found that transport and land use planning are done separately irrespective of the fact that Dar es Salaam City is a beneficiary of Safer Cities movements, which advocates for coordination of actors to ensure safety within urban neighbourhoods (PMO-RALG, 2008).

Non-recognition of non-motorized means of transport

Section 5.2.1 (a) of the National Road Safety Policy identified the non-recognition of non-motorized transport as one of the major issues causing conflicts between motor vehicle and non-motorized transport movements. The policy further makes it clear that the non-recognition of non-motorized means of transport has resulted in the non-provision of necessary non-motorized facilities for non-motorised users. Such facilities include walkways, bicycle ways, zebra crossings, footbridges, signs and markings. Furthermore, although section 4.3.6.2 of the National Human Settlements Policy of 2000 recognizes the importance of safe transport system in urban areas, the policy does not explicitly recognize walking as a mode and means of transport that should be given specific policy provision.

³⁶ Interview with the Acting Municipal Engineer at the Kinondoni Municipal Council on 10th March 2015

³⁷ Interview with the road Engineer at TANROADS Regional office on 18th May 2015

Inadequate considerations of disability infrastructure

The review of policies also identified a gap regarding the infrastructure for people with disabilities. With the exception of the National Road Safety of 2009 and the National Policy for People with Disabilities of 2004, most of the urban policies related to land use and urban transport planning are silent on this issue. As a result, the urban roads, public buses and most of the public buildings are not easily and conveniently accessible to disabled persons.

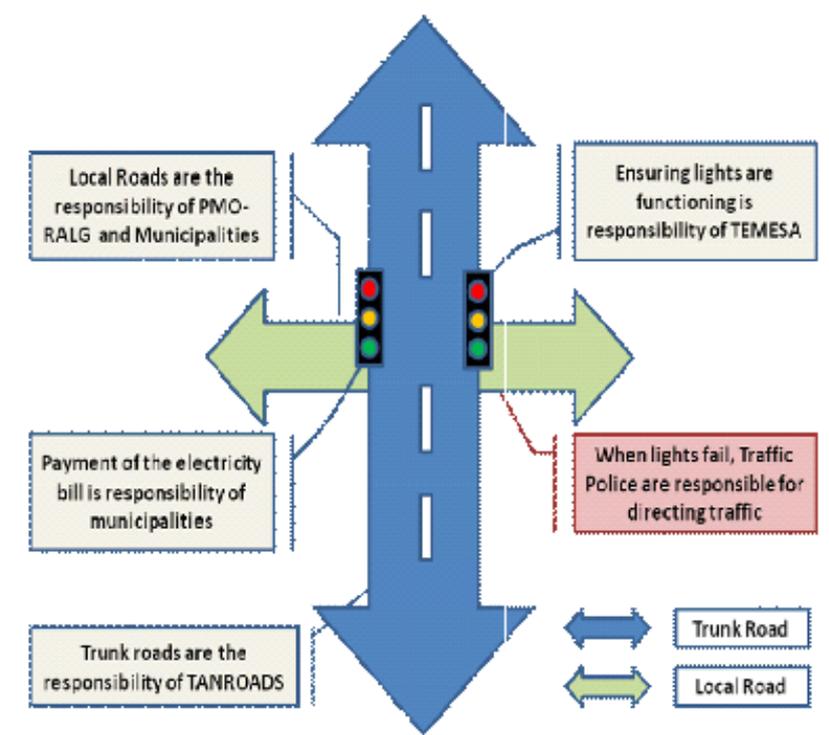
Lack of a unit/department dedicated to non-motorized needs

Despite the existence of various national sectoral policies aiming at achieving sustainable urban transport and the fact that pedestrian safety is recognized as a multidisciplinary field, there is no department that has full responsibility for achieving sustainable urban transport and ensuring that the requirements of pedestrians and other non-motorized means of transports are taken into consideration. In other words, there are several actors responsible for pedestrian requirements but it seemed there was no effective leadership. Possibly, that could be the reason why the pedestrian facilities are not adequately considered in the urban policies as well as not effectively implemented. This gap was also confirmed by the professional experts interviewed at the Ilala and Kinondoni Municipal Councils, DCC, TANROADS, Traffic police headquarter and the MLHSD.

For example, from the central government side alone various ministries were found to be interested in the concept of sustainable urban transport and pedestrian safety management. These includes: the Ministry of Transport (MOT); the Ministry of Works (MOW); the Ministry of Lands, Housing and Human Settlements Development (MLHSD); the Prime Minister's Office-Ministry for Regional Administration and Local Governments (PMO-RALG); the Dar es Salaam Rapid Transit Agency (DART) under PMORALG; the Tanzania National Roads Agency (TANROADS) and the Tanzania Electrical and Mechanical Services Agency (TEMESA) under MOW, the Ministry of Education and Vocational Training; the Ministry of Health and Social welfare; Surface and Marine Transport Regulatory Authority (SUMATRA) and the Traffic Police under the Ministry of Home Affairs. However, none of them bear ultimate responsibility regarding the mobility of the non-motorized means of transport and for almost all of them, pedestrian requirements is a relatively peripheral issue. In theory, the Ministry of Transport (MOT) should be the one to lead on the policy, strategic direction and planning for the sector, but there has so far been little evidence of this. As a result, there is inadequate consideration and implementation of the pedestrian requirements.

When asked about the responsible actors in facilitating pedestrian movements at the intersection points like that at Buguruni Filling Station, the respondents who are experts in the area made it clear that the functioning of intersections is a multi-sectoral task as it involves various actors. One of the road engineers at TANROADS had this to say:

“In Tanzania, we have two types of roads: Local and Trunk roads. The local roads fall under the jurisdiction of PMO-RALG and Municipalities while the Trunk roads are taken care of by TANROADS under the Ministry of Works (MOW). When it comes to the management of the intersections and traffic lights in general, there is no single Ministry/institution/section responsible for functioning of these intersection points. For instance, TAMESA is responsible for ensuring the functionality of the traffic lights, including the pedestrian crossing signals. In case the traffic lights fail, the traffic police are responsible for directing the traffic flow. Payments of electricity bills at these intersection points, is the responsibility of Municipalities. Construction and maintenance of local roads are the responsibility of PMO-RALG and Municipalities while construction and Maintenance of Trunk roads like Mandela Road in Buguruni are under TANROADS. Hence, the management of intersection points is scattered and not centralized into a single Ministries/Institutions”. Figure 12.1 is for illustrations.



Source: Maintained from Flanary (2012) and field observations, 2015

Figure 12. 1: Actors responsible for the functioning of an intersection point

Like at the ministerial level, there is neither single department nor section/unit tasked with needs of non-motorised transport. Responsibilities regarding pedestrian needs are not assigned to a specific department/unit. As a result, they are just scattered in various Municipal Departments, Sections or Units. The Municipal Councils of Dar es Salaam City do not have a specific Transport Department that could deal with movements of both motorized and non-motorized means of transport. When asked about the actors responsible for ensuring pedestrian needs at the Municipal level, the experts interviewed at Ilala and Kinondoni Municipalities responded as per Figure 12.2:

Task	Responsible actor
Planning for pedestrian space	Urban planning Department
Construction of sidewalks and marking of zebra crossing	Works (Engineering) Department
Pedestrian safety and security	Police Force
Planting of trees along walkways	Forestry section
Provision of public benches and street lights	Works (Engineering) Department
Provision of public toilets and dust-bins	Health Department
Removal of street vendors and other misusers of public spaces	Legal officer/ Trade officer/ Security guards
Provision of pedestrian signals at Traffic intersections	TAMESA under MOW

Source: Author's construction after interviewing the professional experts

Figure 12. 2: Responsibilities in facilitating pedestrian needs at municipal level

Despite the involvement of the various Departments and sections in facilitating the pedestrian movements and safety needs, there is no single department that coordinates the other Departments and sections to effectively provision and management of pedestrian infrastructure. The fact that there are many actors involved in pedestrian safety management is a potential; only if these actors are properly coordinated. If this is done, it will contribute towards the pedestrian planning and walking safety. However, if it does not chaos will prevail, possibly with negative outcomes consequently harming the urban poor, including persons with disabilities most.

12.3 Concluding summary

In this chapter, the summaries of major findings and gaps that require policy attention to address the pedestrian concerns have been presented. Overall, walking is not recognized as a means of transport despite the fact that the majority of the low income earners, the elderly, and people with disability and school children have no better options than walking. Generally, pedestrians have perceptions that they are excluded from the urban transport system, and not valued by the motorists. The next chapter draws the conclusion of the study, recommendations to address the issues emerging and finally conceptual and methodological reflections are discussed.

CHAPTER THIRTEEN

13 CONCLUSION, RECOMMENDATIONS AND REFLECTIONS

13.0 Introduction

This chapter draws conclusions regarding the pedestrian mobility patterns, including the means of transport commonly used, perspectives of pedestrians on the walking environment, considerations of the pedestrian requirements by the legal and planning documents and the implementation of urban design concepts and planning standards adopted in the case study areas. The chapter also presents recommendations for improving walkability in rapidly urbanizing cities in developing countries. The methodological reflections on the results and conclusions are also made and finally further research areas are highlighted.

13.1 Conclusion

This study has demonstrated empirically that walking is the main means of transport used by the vulnerable groups (i.e. low income households, the school children, the elderly, women and people with disabilities) in Dar es Salaam City. A combination of walking and public transport was ranked second, though walking remained the first and last mile of these public transport trips. The reasons why people in Dar es Salaam walked more often include: low income/low affordability, proximity to services, a form of physical exercise, transport problems (unreliable public transport, traffic jam and inadequate parking spaces) and nature of occupation i.e. vending activities. The majority of the respondents had their daily trips to mainly workplaces, commercial services, community facilities, social activities, i.e. visiting friends, relatives and friends, and recreational purpose trips.

The study has shown that majority of the respondents opined that pedestrians in Dar es Salaam are excluded from the urban mobility. According to one of the road engineers at TANROAS, the exclusion of pedestrian infrastructure is in most cases due to the fact that pedestrian infrastructure does not generate any revenues to the government and hence it is given low priority. This means that private investors and international lending agencies are not very keen to provide funding for such project, which will not have financial returns. UN (2013) notes that the space to accommodate different modes of transport in developing countries is inadequately considered, while in cities of western countries streets are designed to accommodate various modes of transport including walking, cycling and driving. This conclusion is also in line with Dimitriou and Bajo (1990) who observed that the needs of pedestrians in developing countries are inadequately addressed due to lack of prioritisation in urban design.

The respondents further added that the walking environment is unsafe, insecure from crime, uncomfortable, unattractive and inconvenient. Additionally, with the exception of local shops, cafes/bars and restaurants, the resident respondents noted that most public facilities are inconveniently located, a situation that forces them to walk longer distances to access public facilities. People in Dar es Salaam City also felt that pedestrians are not respected by motorists. Most motorists do not obey traffic rules and do not give way for pedestrians to cross at busy road junctions, even when they were at zebra crossings. Traffic regulations are also inadequately enforced. According to the respondents, the access roads and footpaths are in poor condition. Often pedestrians walk on dusty, muddy, flood and narrow footpaths sometimes measuring less than one metre width.

The study has also shown that most of the national level documents, including sectoral policies, local level planning documents, design concepts and the planning standards adopted had inadequately considered the provision of pedestrian friendly environment. Even where considered, their implementations were not realized. Walking is also not recognized as a means and mode of transport. In addition,

infrastructure facilities for people with disability were also inadequately considered. The City authorities seemed to continue using the design and planning concepts inherited from the colonial administration that do not reflect urban reality and also do not reflect the contemporary requirements of pedestrians including their livelihood needs.

Across the three cases, the urban design and planning concepts, document objectives regarding improvement of pedestrian movements, as well as the proposed planning standards were inadequately implemented. The driving factors were mentioned to include poor coordination among actors, financial constraints, inadequate space for providing pedestrian facilities, the low priority given to pedestrian infrastructure, weak development control and limited awareness on planning regulations.

Finally, this study has also confirmed the two propositions that the pedestrian requirements in cities of developing countries are inadequately considered and are given low priority. Even where they were considered, they are inadequately implemented and little attention is paid on effective mechanisms to ensure the utilization of the infrastructure.

13.2 Recommendations

This section presents the recommendations for improving the walking environment in Dar es Salaam and similar Cities in developing countries. These recommendations are organized into five main parts: Policy recommendations; Planning or spatial recommendations; Transport related recommendations; Implementation recommendations, and Institutional recommendations.

13.2.1 Policy recommendations

Need for the formulation of a stand-alone solid Pedestrian Policy (to MoT)

The study found out that the pedestrian requirements are scattered in different ministerial policies and legislation, a situation that makes the policy implementers fail to capture the pedestrian requirements suggested in the other sectoral policies out of their fields. In order to comprehensively address pedestrian concerns, it is recommended that a separate policy directed at pedestrians be formulated. This has been successfully applied in some developing cities such as New Delhi in India and Bogota in Colombia. Grouping of pedestrian elements in one document will even make it easy for decision makers and service providers to make informed decisions on this often neglected group. Therefore, it is hereby recommended that all the provisions regarding pedestrian requirements proposed in the various urban sectoral policies such as the National Transport Policy, the National Education and Training Policy, the National Health Policy, the National Human Settlement Policy, the National Road Safety Policy, the Urban Planning Act No 8 and the National Policy on People with Disability be organised in a stand-alone Pedestrian Policy. It is recommended that the Ministry of Transport (MOT) takes the responsibility of formulating the comprehensive Pedestrian Policy.

13.2.2 Spatial recommendations

➤ *Review of design concepts (to the MLHSD)*

To address the issue of out-dated urban design concepts and planning standards regulations, particularly those related to zoning concept of single land use categories per area (such as purely residential, commercial, and residential cum commercial) i.e. where other land uses are not allowed, there is a need to adjust the urban design concepts towards more practical and implementable design concepts that allow more rich and mixed land uses including incorporation of small scale income generation activities and meet the pedestrian accessibility needs. Therefore, *the mixed land use and compact development concepts* are highly wanting. Spatial planners need to design neighbourhoods that accommodate a mix of different land uses like commercial, residential, schools, offices, health facilities, religious, recreational areas, social hall, retail, parks, public transit stations, restaurants, bars, cafes and many others while taking care of compatibility of land uses to avoid disturbing land use conflicts.

Implementing mixed land use and compact city including development design concepts will engender sustainable human settlements and reduce the distance covered to access public facilities. The public facilities need to be located within a walking time. In addition, the mixed use and compact city development concepts may minimize the frequent requests for change of use, need for redevelopment, and also minimize urban sprawl.

Therefore, there is a need to review the urban design concepts and the planning system in general towards suitable practical and implementable regulations which accommodate design and planning needs associated with the livelihood strategy needs of the residents.

➤ *Review of the National Planning Standards (to the MLHSD)*

The study has revealed that the current neighbourhood level space standards do not adequately cover some land uses, particularly the emerging commercial investments (such as Mlimani City complex shopping mall and supermarkets), parking lots, religious facilities and sites for vending activities. Furthermore, the neighbourhood level planning standards provide limited space for the residential access roads (10.0 metres RoW) resulting in exclusion of pedestrian infrastructure and other non-motorized facilities. As a result, the informal vending activities and car parking activities encroach the pedestrian walkways/space and public recreational open spaces. Similarly, the non-consideration of religious facilities at neighbourhood level also result into residential plots, and public open spaces being converted into religious facilities. A typical example was observed in Sinza neighbourhood whereby a public recreational open space was changed into a religious institution (Mosque). The study has also revealed that the size of the access roads (residential areas) is too small to accommodate motorised and non-motorised means of transport, including pedestrian infrastructure. The road engineers could only provide a 5.5 metre carriageway, two shoulders of the road (2.0 metres) and storm water drains (1.2 metres on each side). As a result, the pedestrian walkways along the local distributor access roads (in residential and commercial areas) were lacking.

Therefore, there is a need to review the minimum space standards for access roads (residential areas) from 10.0-20.0 metres ROW at least to 15.0-20.0 metres ROW and review the space standards to capture the pedestrian requirements, especially at the neighbourhood level.

➤ *Implement redevelopment schemes (Municipal Councils, DDC, MLHSD)*

The study has revealed the mismatch between the proposed design concepts and the urban reality in the formal planned residential neighbourhoods like Sinza. Informality in the planned neighbourhoods was increasing. To address the informalities and improve the pedestrian accessibility and safety needs, the researcher supports the redevelopment plan of Sinza neighbourhood and other planned settlements with similar characteristics. However, the redevelopment schemes need to consider the following design concepts:

- *Promote mixed land use and compact development*

Urban designers/spatial planners out to change their mind-set from zoning residential areas based on fixed land use categories to the *mixed land use* and *compact city* concepts with planned integration of some combination of residential, retail, office, hotel, multi-story building, home based income generation activities, recreational areas and other similar functions. This implies that when implementing the redevelopment schemes in Sinza and other planned neighbourhoods within Dar es Salaam City, all land use functions required, should be considered within (mixed land use and compact development). Encouraging mixed land use development will help to create destinations within short walking distances, and hence reduce the burden of crossing in busy roads and intersections. This will also promote walking as opposed to motorised trips which are expensive and sometimes time consuming due to traffic jams.

- *Provide for segregation of pedestrians from motorists road users*

Regarding the existence of mixed means of transport on the same carriageway, separation of non-motorized from motorized means of transport is required. The author recommends that pedestrians be separated from other road users, especially at the local distributor/collector roads (30 metres ROW) passing through the neighbourhoods such as the Shekilango Road in Sinza. This can be achieved through provision of sidewalks along side carriages, and safe zebra crossing areas as are important in these busy roads. However, within the neighbourhood where the existing residential/commercial access roads are already narrow, separation can be achieved by converting some roads to become pedestrian streets only or make them one way drive to reserve space for pedestrian walkways. The walkways should be made friendly and safer by separating them from the main roads by encouraging on-street parking or use of planted trees which calm traffic flow. These measures will complement the grid street layout plan earlier used which is favourable for pedestrian movement from one block to another. Additionally, the sidewalks provided within the residential blocks need to be connected to the public bus stops, and other land uses destinations, particularly to public facilities like schools, markets, health facilities, religious facilities and recreational areas within the neighbourhood. If implemented, the pedestrian safety needs will be improved.

- *Improve pedestrian safety measures*

The study has found out that safety measures are lacking in the study areas and access roads and footpaths are not passable throughout the year. The neighbourhood roads should be improved to make them useable and user friendly. Improvements on the roads should be done in line with traffic management measures to control the speed of vehicles which is likely to increase once the roads are in good condition. These may include use of speed bumps, narrowing road in residential areas, on-street parking and use of road speed islands and curb extensions to shorten crossing distances across a road. Street lighting should be provided to light the streets, especially during the night. At the intersections, proper designs should be done, which provide pedestrian facilities like traffic lights, zebra crossing, refuge islands and pedestrian signals/messages. Pedestrian underpasses and pedestrian bridges can also be an option for long term solution, especially along the highways, like Sam Nujoma Road in Sinza and Madera Road in Buguruni.

- *Provide pedestrian amenities*

Comfort and convenience of pedestrians depend on the pedestrian amenities provided within a neighbourhood. It is recommended that the redevelopment schemes need to consider the pedestrian amenities like resting benches, public toilets, garbage receptacles, shelters, lighting and landscaping.

➤ *Provision of planning standards and guidelines for action*

Despite the fact that the URT (1997 and 2011) define the space standards for various public facilities appropriate at each planning level (i.e. neighbourhood, community and district level), however mechanisms for facilitating them were lacking. For example, the existing planning standards require that each neighbourhood should have a nursery school, primary school, shops, markets, dispensary/ clinic, public buildings, cemetery site, neighbourhood park, open spaces, children play areas, play fields and sport fields and site for service trade, directions regarding where to locate these facilities are not provided. It seems spatial planners (i.e. the urban planners and designers and implementers) are left free to decide where to locate these facilities. As a result, some residents accessed these public facilities over a kilometre. That may help explaining why about 60.0% of the respondents interviewed perceived that the public facilities are inconveniently located. Furthermore, currently there are no official national planning standards approved to guide the upgrading informal settlements. As a consequent, pedestrian walkways are inadequately considered during implementation of the upgrading pro-

grammes. To address these planning gaps and improve walkability in residential neighbourhoods and upgraded informal settlements, the following planning issues are recommended:

- Prepare planning guidelines to guide the location of public facilities at neighbourhood, community and district levels. At the neighborhood level, the researcher suggests that the public facilities have to be located at *the neighbourhood center*. The local shops and other home based income generating activities should be evenly distributed within the neighbourhood. If implemented, it means the public facilities will be located in not more than 800 metres distance from the farthest dwelling unit, hence improving the pedestrian accessibility needs.
- Institute requirements/prerequisites for pedestrian considerations to be met in layout plans before approval of neighbourhood layout and change of use plans is granted. Prior to approval of layout plans, the Ministry of Lands, Housing and Humana Settlements Development should ensure that the proposed layout plan will consider enough space to accommodate the pedestrian sidewalks. In this case, the minimum space standards for access roads (in residential areas) should be increased from 10.0 metres to 15.0 metres ROW.
- Likewise for the Municipalities and other agencies responsible for approval of building plans, there should be a condition that high-rise building plans of five floors and above be scrutinized for development if and only if the plan considers a lift system, to facilitate the vertical movement for people with disabilities.
- The Ministry of Lands, Housing and Human Settlements Development need to formulate planning standards to guide the upgrading of informal settlements, with a view of providing pedestrian walkways during implementation of the upgrading programmes such as those of CIUP. In streets where space to separate pedestrians from motorised traffic is inadequate, some upgraded roads should be made one way drive to reserve space for pedestrian walkways. The actors of roads upgrading programmes should ensure that pedestrian walkways are provided at least on one side of the road, depending on the available space.

➤ *Promote pedestrianisation schemes*

The study has revealed that the street vendors encroached upon many existing pedestrian walkways including the road space the prime locations like Congo Street in Kariakoo area. Initially, the street vendors used to operate only on the existing walkways, but of late they were found operating on the road space as well, leading to almost total blockage of pedestrian movements and driveways (Figure 10.12). As a consequence, walking in the congested streets like Congo Street is uncomfortable and insecure.

To improve pedestrian accessibility, safety and security needs in the congested streets like Congo Street in Kariakoo, the researcher recommends that the municipal councils need to promote and enforce the pedestrian precinct concept (pedestrianisation schemes). For instance, with regard to the Congo Street, the author recommends the following:

1. In order to make Congo Street exclusively for pedestrian the building blocks bordered by Msimbazi, Uhuru, Nyamwezi and Mkunguni Roads be subdivided into four segments.
 - Segment A: The section of Kongo Street (between Aggrey and Mkunguni Street)
 - Segment B: The section of Nyamwezi Steet (between Uhuru and Mkunguni)
 - Segment C: Section of Mchikichi Street (between Msimbazi and Nyamwezi Street)
 - Segment D: The section of Aggrey Street (between Msimbazi and Nyamwezi).
2. The study recommends transforming of segment A (i.e. Congo Street) into a pedestrian free zone from 8.00 to 17.30 hours. Thereafter (starting from 17.30 to 22.00 hours), a strip of 2.5 metres width on both sides can be turned into a street vending area and the remaining 5.0 meters at the centre of the road be left for pedestrian movements and customers. If implemented

it will solve the current problem of street vendors occupying main commercial streets in front of the legal shops that are committed to the laws and regulations and pay taxes imposed by the state, which is reflected on its high prices compared to those of the street vendors.

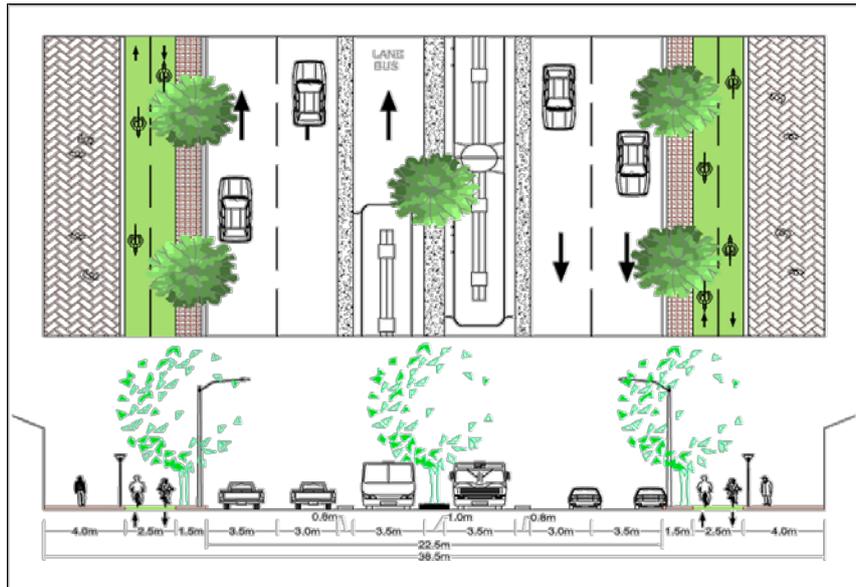
3. Segment C should operate as a one way street from 6.00 to 17.30 hours to provide a link between Msimbazi and Nyamwezi Street, and allow pedestrians and shoppers to utilize the other side of the road. Thereafter, segment C should be converted to vending activities (i.e. starting from 17.30 to 22.0 hours).
4. As segment A, segment D should be reserved as a pedestrian free zone from 8.00 to 17.30 hours, Monday to Saturday. Thereafter, starting from 17.30 to 22.0 hours; including Sundays this segment should be turned to street vending activities.
5. Transforming segment A into a pedestrian free zone Monday to Saturday from 8.00 to 17.30. Thereafter (starting from 17.30 to 22.00 hours), a strip of 2.5 metres width on both sides can be turned to street vending activities and the remaining 5.0 meters at the centre of the road be left for pedestrian movements and customers. If implemented, it will solve the current problem of street vendors occupying main commercial streets in front of the legal shops that are committed to the laws and regulations and pay taxes imposed by the state, which is reflected on its high prices compared to those of the street vendors.
6. Transforming segment A and D into street vending activities for the whole Sunday starting from 8.00 a.m. to 22.0 hours. So long as the legally operated shops are often closed on Sundays, then street vendors can occupy and use the entire road space for vending activities.
7. Providing a parallel vehicle access road while transforming segment A into a pedestrian free zone: This should be done by using segment B (Nyamwezi Street) as an alternative route for the pedestrian free zone segment A.
8. Enforcement of laws and legislations: This should be done in order to make sure that the street vendors would obey the system which prevents them from coming on these streets on Monday to Saturday from 8.00-17.30 hours; instead they should utilize these road spaces only from 17.30 to 22.00 hours and during Sundays as described in section 2-5 above.

These schemes may create the best possible condition for pedestrian freedom of movement and road safety. It can reduce pedestrian congestion and improve access to shopping.

13.2.3 Transport related recommendations

➤ *Replication and expansion of the BRT system: (To DART, DCC, TANROADS)*

Across the three sub-cases the exclusion of pedestrians from the urban mobility, including people with disabilities were observed. In order to ensure inclusion of pedestrians, including people with disabilities, the study recommends for the replication and improvements of the Bus Rapid Transit (BRT) system, which incorporates all modes of transportation as Figure 13.1 shows. The BRT system comprises pedestrian walkways, pedestrian overpasses friendly for people with disabilities, public benches at the boarding stations, public toilets at terminal points and bikeways. Moreover, it is also recommended that the replication and improvement of BRT system should go hand in hand with the provision and construction of parking spaces at the BRT terminals like Kimara, Morocco, Kariakoo and Kivukoni. When the public transport is improved, it is expected that the majority will shift from using private cars to the Bus Rapid Transit (BRT) system. The provision and construction of parking spaces at the BRT terminals will encourage private car owners to leave their cars at these terminals and then travel by public transport to the city center and other places reached by the BRT system. When fully implemented, the project is likely to improve the public transport service, pedestrian mobility and safety needs and can also minimize encroachments of pedestrian walkways by parked cars, and improve the quality of living of the city residents through improved mobility options.



Source: DART reports, 2016

Figure 13. 1: A typical on-station cross section of BRT system in Dar es Salaam

➤ *Promote the concept of sharing space*

The study noted that across the three cases, almost all the residential and commercial access roads/streets had no pedestrian walkways and the space to accommodate lanes segregated for pedestrians was limited. The Municipal governments' capacity to compensate the demolished houses so as to widen roads in the upgraded informal settlements is also limited. The improvements of roads in the upgraded informal settlements seem to have considered only carriageways (5metres width). As a result, pedestrian had to use the same carriageway with many motorized and non-motorised traffic/road users.

In order to improve pedestrians' rights of belonging and protect them from the increasing road accidents, it is recommended to promote the concept of *sharing space*³⁸. The shared space is the concept of urban design and traffic engineering that integrates pedestrian, vehicles and other road users through the removal of traditional street elements such as signs, traffic lights, pedestrian barriers, road markings and kerbs.

If implemented, the concept of sharing space will enable people and vehicles to share the whole of the road space safely, and on equal terms, thereby improving the quality of living of the vulnerable groups (the poor residents, the elderly, the school children, people with disability and women). Based on this concept, the sharing between vehicle users and pedestrians need to take place in the street's carriageway area/ road space. The sides of the street should mainly be preserved for pedestrians. The concept of shared zone/space has been used more commonly in Netherlands, Denmark, Sweden, Germany and UK.

To facilitate the concept of sharing space, especially in the streets where space to separate pedestrians from the motorised traffic is inadequate, the study recommends the following:

- Introduce physical and psychological features along the street's carriageway that encourage lower vehicle speeds
- Remove any implied priority of vehicles over pedestrians in the carriageway;

³⁸ The Department for Transport UK (2011: 6) defines a shared space as: "A Street or place designed to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clearly defined rules implied by more conventional designs"

- Reduce demarcation between pedestrians and vehicular traffic on the street's carriage way;
- Introduce features not necessarily limited to the sides of the street, such as seating, public art and cafes, which encourage pedestrians to use the space.
- Reduce design speed to not more than 20 meters per hour is recommended.
- Establish a set of national shared space design guidelines specific to the shared space streets. The establishment of the design guidelines should take into consideration the inclusive design principles.
- Introduce and implement shared space zones hand in hand with awareness creation regarding the rationale behind the concept among the roads/streets designers and all the street users living in such shared streets. The public awareness campaigns will help to inform the users about the intentions of the concept of *shared space* and how the priority is shifting from the car oriented towards a more shared environment where all users have equal rights regarding the use of public space.

If implemented, the tangible indicators of sharing space may include: Pedestrian access and use the carriageway/road space without fear; increased levels of social interaction and leisure activity; people spending longer time in the street as an indication of enhanced sense of place; drivers and cyclists giving way to pedestrians; pedestrians crossing streets at locations, angles and times of their choosing; and drivers and cyclists giving way to one another.



Source: Department for Transport UK, (2011)

Figure 13. 2: An example of a shared space concept in UK

13.2.4 Recommendations for plan implementations

- *Establishment of a steering committee for effective implementation of plans & coordination*

The study has found out that one of the constraints in the provision of pedestrian facilities is poor implementation of plans and development control. In order to monitor implementation of pedestrian concern in neighbourhoods, in the short term, it is recommended that a steering committee be formed that will be composed of both community members and the government. The steering committee will bring together actors who are responsible for pedestrian requirements within the City such as DCC, municipalities, Police Force, TAMESA, DART, TANROADS), and hence overcome poor coordination. The committee will also advocate for implementation of road safety rules and regulations in neighbourhoods. Public awareness and education concerns will also be addressed through this committee. Additionally, the committee will monitor implementation of the action plans prepared to implement the objectives regarding improvements of pedestrian requirements. The researcher recommends that the steering committee should be coordinated by the Dar es Salaam City Council (DDC). To make the committee more effective at lower levels, a similar committee has to also be formed at

municipal but directly linked to the city level committee. In the long term, to enhance coordination and effective implementation of plans, the researcher recommends establishment of DUTA, which is discussed under section 13.2.5 below.

➤ *Formulation of action plans for implementation of legal and planning documents*

The study has revealed that most of the policy and planning objectives regarding improvement of pedestrian requirements were not implemented due to lack of implementation mechanisms. In order to facilitate the implementation of the policy and planning document objectives regarding pedestrian needs, the study recommends formulation action plans for implementing and achieving the targeted objectives. The Action Plan needs to include: strategic objectives, targets, activities, time frame, budget and responsible persons for implementing activities in the key result areas related to improvements of pedestrian requirements in urban areas. The action plans have to be approved by the by the responsible authorities as well. (e.g. action plans regarding the implementation of land related policy/master plan/redevelopment/ upgrading schemes have to be approved by the responsible ministry). After the action plan has been approved, it can be cascaded to the implementing authorities at lower levels. The action plan can as well be cascaded to the proposed steering committee or DUTA for regular monitoring and evaluation.

➤ *Promote corporate social responsibility initiatives*

The study found out that the provision of pedestrian facilities is challenged by financial and technical constraints. It was reported that due to financial constraints, the infrastructure for non-motorized means of transport are always eliminated from the main budgets. In order to overcome some of these impediments, corporate social responsibility should be promoted whereby by the Municipal Councils can partner with the private sector actors to provide pedestrian facilities in neighbourhoods. This is one way of giving back to community by private companies who benefit from selling their goods and services to the community (David and Guler, 2008). Additionally, the City Council needs to cooperate with international agencies like JICA, DFID and World Bank; which are currently more focusing on improving the public transport and strategies for reducing traffic congestion within the city to realize the need for improving the pedestrian mobility, especially in the current situation of increased motorized means of transport.

➤ *Effective development control*

The study has revealed the violation of plot setbacks, plot coverage and building heights in the planned neighbourhoods (Kariakoo and Sinza). As a result, the recent redevelopment schemes have destroyed arcades, and also the existing walkways are encroached by parked cars/motorcycles and vending activities. The violations of plot setbacks had not only limited the continuity of walking routes along the shopping arcades, but also had narrowed down the walking space which is already under competition from the parked cars and street vendors. To ensure effective development control, the study recommends the following:

- The Ministry of Lands, Housing and Human Settlements Development (MLHHSD) in collaboration with local authorities and professional boards in urban planning and the building industry should come forward with precise and responsive policies result rules to regulate, monitor and implement coherent and coordinated urban transformation cityscapes.
- On the enforcement of development control, the study observes little coordination of actors, particularly, the composition of the site-inspection team. It is not clear who is responsible for ensuring the walkways are not encroached by parked cars, and street vendors. This space is in most cases left under the security guards who operate under the municipal legal officers. The study recommends that the professionals responsible for road constructions, planning for public space and those who form the team to approve technical drawings and for issuing building

permits to form the site inspection team. The team should ensure that the building setbacks are adhered by land developers, and pedestrian walkways not encroached any more.

- Road engineers and urban planners need to closely collaborate to develop specifications to guide the development of shopping arcades, and utilization of setbacks spaces.
- The business operators in the commercial street need to provide bollards in front of shops to prevent vehicles from parking on the paved walkway (footpath). If implemented, the installation of the bollards can create convenient for the shoppers to enter the shops, while preventing motor vehicles from interfering with pedestrian access to the businesses.
- The private and civil society sectors, local leaders (i. e. Mtaa and Ward level leaders), including individuals should be empowered and encouraged by law to report on encroachment of public spaces, and building standards malpractices to the urban development control team or to the respective planning authority

13.2.5 Institutional recommendations

➤ Formation of pedestrian advocacy organizations/groups

The study has revealed the exclusion of pedestrian requirements in policy making, planning and implementation of urban development projects including upgrading of informal settlements. The existing walkways have been encroached upon by parked cars/motorcyclists, street vendors, woodworks and building setbacks. The privately operated public buses and most high rise buildings are pedestrian friendly.

To address the limited public awareness regarding the pedestrians' rights to walk, there is a need to encourage and facilitate establishment of pedestrian advocacy organizations/groups that will raise the voice of pedestrians to the decision makers, spatial and transport planners, urban designers, Architects, land developers and the implementers of the upgrading programs like CIUP. If the pedestrian advocacy group is established and operationalized, it will help in changing the mind-set of city authorities and other spatial and transport professionals who believe that transport and land use planning should prioritize vehicles over pedestrians. With respect to Dar es Salaam City, the study recommends establishment of *Dar es Salaam Association of Pedestrians (DAPE)*. The next section highlights the objectives and a number of activities to be accomplished by DAPE.

Specific objectives may include to:

- Reclaim the removal of encroachments and any obstructions into pedestrian spaces (such as street vendors, building extensions, unguided pedestrian shopping arcades, utilities, and parking activities). The organisation/group need to have the slogans: *“Let the walkways remain walkways, not parking and commercial spaces. Let roads remain be roads, not walking spaces and bazaars”*;
- Reclaim inclusive designed streets/roads such as installation of sidewalks, inclusive public transport friendly to people with disabilities, and also to reclaim lift systems in the high-rise buildings;
- Reclaim provision of pedestrian signals at intersection points, painting of zebra crossings, road signs for people with disabilities, pedestrian overpass bridges where necessary and other traffic calming measures so as to improve pedestrian comfort and safety;
- Reclaim pedestrian amenities (public toilets, public benches along the walking street and other public spaces, dust bins and street lights to facilitate night walking in the street);
- Lobby and convince the City and Municipal authorities establish specific Units or Section for dealing with the non-motorized transport within the city/municipal structure;
- Promote pedestrian friendly land use and transport related policies;

- Suggest and discuss pedestrian improvement proposals and present to the government officials; and
- Reclaim for relocation of street vendors within the city to minimize encroachment of walkways.

➤ *Establishment of Transport Department*

This study has revealed that there is no Department, Section or Unit within the municipalities that deal with the non-motorized means of transport. At the municipal level, urban mobility issues are being addressed by the Works (Engineering) Department, which is specifically responsible for the construction and maintenance of urban roads. As a result, pedestrian infrastructures are inadequately considered in road designs and in the municipal budgets. The existing pedestrian walkways have been encroached by other uses, such as parked car and street vendors, but there is no Department/Section or Unit that ensures smooth functioning of these walkways (Figure 12.2). To address this institutional gap, the author recommends for the establishment of a Transport Department at the municipal level. Within the Transport Department, a Section or Unit for non-motorised transport has to be introduced. The function of the Transport Department should focus on facilitating movements of both motorized and non-motorized means of transport within the City.

➤ *Establishment of Dar es Salaam Urban Transport Authority (DUTA)*

The analysis of the national sectoral policies indicates that, whilst there are a large number of actors with some responsibility assigned towards ensuring a functioning urban transport system, there is no one institution that coordinates or is accountable to achieving this and for almost all of them, urban transport mobility is a relatively peripheral issue. Principally, at the national level, the Ministry of Transport and Communication could lead in the policy making, strategic visioning and planning, but there so far little evidence towards realization of this. Some planning issues like current preparation of the Dar es Salaam Transport Master Plan goes on within the City Council (with support from the JICA team) and DART (in relation to BRT), but in both cases they face major challenges. Although DCC and DART are attempting to address the urban transport issues, their mandate, power and resources are too limited to enable them to do this. This has resulted in the overall inefficiency of the urban transport system, including little consideration of pedestrian requirements in the transport system.

Despite the fact that Dar es Salaam City is organised into five municipal authorities (Kinondoni, Ilala, Temeke, Ubungo and Kigamboni) with a City Council at the apex, planning in Dar es Salaam has been taking place without following comprehensive plans and regulations. Such situation has led to spatial disorder and dysfunctionality in the City. It also gives rise to the exclusion of pedestrians in the infrastructure design, development and maintenance. Furthermore, currently urban mobility issues are dealt upon by the Works (Engineering) Department, as the Transport Department at the Municipal level is lacking. As a result, people's movements are not adequately facilitated.

To address this institutional challenge, the author supports the establishment of the so-called Dar es Salaam Urban Transport Authority (DUTA) as suggested in the Draft Transport policy of 2011 as well as in the Draft Master Plan 2012-2032. The establishment of DUTA is expected to resolve problems of dispersal jurisdiction mandate between the various central and local institutions, and to improve coordination of decisions on urban transport policy, with the vital participation of the local authorities. A board of management should include the heads of the following organisations: PO-RALG, MOW, MOT, MOHA, PMO, MOF, DSM-RAS, TANRODS, Traffic Police, MLHSD, RFB, SUMATRA, DCC, DART, and the three municipalities Ilala, Kinondoni and Temeke. With regard to improving the walking environment, the mandate for DUTA would include:

- To develop a pedestrian policy, and its supporting budget proposals;
- To manage and capture financial resources for development of pedestrian infrastructure;
- To provide guidance, management and oversight of the implementing agencies and monitor the outcome of improved pedestrian infrastructure;
- To monitor the performance of the implementing agencies/operators like DART, TANROADS, the three municipalities and the actors responsible for upgrading programs like CIUP;
- To scrutinize pedestrian requirements in the final road designs to be implemented in the formally planned and upgraded informal settlements before approval by the responsible authority; and
- To control the budget for pedestrian works and operation. The budget can be approved by the Regional Commissioner and channeled via DUTA and other parallel agencies with similar responsibilities in other areas of planning.

13.3 Conceptual and Methodological Reflections

13.3.1. Reflections on the conceptual framework

The framework that guided this study was formulated from the literature, various urban design concepts and planning approaches related to pedestrians, particularly the walkability concept, the social exclusion concept, Lefebvre's concept on the right to the city and the safer cities approach. Having reviewed the theoretical framework used in this study, the main finding is that due to the different contexts, the framework is partially relevant in the context of developing countries. For instance, the 5Cs developed for assessing the quality needs of pedestrians do not adequately cover the components regarding enforcement of policies, laws, regulations and planning standards which are the basis for ensuring considerations of pedestrian requirements. The 5Cs adopted in the western countries, focus more on the quality of the built environment, while in practice, the built environment is a result of *policy maker's decisions* and *planning standards*. The walkability concept is also silent about the co-existence of pedestrians and motorised means of transport. The motorist behaviour which is a major challenge in cities of developing countries is not adequately captured.

Despite these gaps, the walkability concepts, social exclusion concepts and safer cities approach helped to assess how people perceive their walking environment and how the policy makers, planners and public official document including, planning standards and regulations considered walkability in formal and informal settlements. The right to the city concept helped to examine how the pedestrian space in formal and upgraded informal settlements is produced. It also helped to examine how Dar es Salaam City and other cities of developing countries ensure the pedestrians' rights to access and use public spaces, and the way they are involved in decisions regarding production of public spaces.

Furthermore, the hierarchy of walking needs presented in Figure 4.3 (i.e. connectivity; safety and security; accessibility, convenience and attractiveness) was very useful in exploring peoples' perspectives on the walking environment. However, the time used to assess the accessibility to public facilities (i.e. 5 to 10 minutes walking time or 400 to 800 metres distance) is not realistic in an African poor country like Tanzania. This is a western standard for highly developed and compact design, which means that with 400-800 metres there enough people threshold to sustain a public facility. The availability of resources to provide these facilities (so many) in western countries is also not really a big issue. The private sector has often been providing these public facilities. In poor countries like Tanzania, the situation is different. Therefore, accessing public facilities in 400 to 800 metres is a standard which will be achieved gradually not immediately. Walking a kilometre or 1.5 kilometres cannot really be regarded as long distance in most African context.

13.3.2 Methodological reflections

Regarding the research methodology, this study adopted a multiple case research design. The multiple case approaches are very demanding as they require extensive resources and time which are beyond the means of a single student or independent research investigator. Based on this fact, the author had limited time for in-depth interviews in the three settlements, a situation that was overcome by working till late in the evening, including in Sundays, which are normally his worship days. The school children were also not interviewed as it was planned before. This was due to the fact that it was difficult to interview them prior to getting permission from their parents. This limitation was overcome by conducting pre-structured interviews with the school pupils through their head teachers. The interviews were essentially narrative in form. Despite the methodological challenges, the results of the fieldwork provide the required answers regarding the pedestrian movement patterns, perspectives of pedestrians and the way pedestrian requirements are considered and implemented in formal and informal settlements. Guided by the nature of the phenomenon being investigated, the researcher employed the combination of qualitative and quantitative instruments of data collection. These included observations, household and walking interviews, documentary review and official interviews which facilitated data collection allowing the researcher to arrive at the topic under investigation.

Furthermore, the case strategy was the best strategy given the nature of the problem. Through this strategy the researcher managed to explore in-depth of issues, planning and legal documents and come up with statistics, qualitative and quantitative information. The case study used in this research has proved appropriate and effective in capturing various dynamics of the study phenomenon. For instance, because the perceptions of various respondents on walking/pedestrian infrastructure were particularly context specific, the use of mixed methods within case study strategy was quite instrumental in understanding the issues. In this respect, other methodological strategies such as statistical or historical approach would not be appropriate or would not yield the results as presented in this work. This does not however underestimate the importance of the statistical computations which were variably used to quantify the trends. This is the strength of the mixed method used in this study.

Areas for further research

This study did not exhaust all aspects pertaining pedestrian concerns in the urban neighbourhoods of the rapidly growing cities in developing countries. To complement to what this study has explored, the following areas are identified for further study:

1. The research into walkability has two common approaches to the variables: one approach depends on *measuring the spatial configuration of street networks* and the other depends on *operationalizing urban design qualities*. This study has been able to investigate only how the physical environment supports or does not support walking in rapidly urbanizing cities in developing countries. Therefore, a study on measuring the spatial configuration of street networks would add another important value to the work and is highly recommended.
2. This study has observed the contested public space in Dar es Salaam, whereby street vendors had invaded the pedestrian walkways for their everyday life activities. Since the two groups seem to be closely related, the author recommends another study focusing on investigating how street vendors can be integrated along the pedestrian routes.
3. In order to effectively address the requirements of pedestrians and implement the proposed projects in a sustainable manner, institutional arrangements for pedestrian needs is another area recommended for further research. This study proposes the establishment of non-motorized transport Department/Section/Unit at the municipal level, and DUTA at City level. A study on exploring the most appropriate institutional arrangement is recommended. The proposed study has to clarify how such institutional arrangements can be operationalized in such complex settings such as those observed in Kariakoo, Sinza and Buguruni.

4. A study in a typical high and middle income area, especially low density house areas such as Msasani and Mbezi Beach residential areas would offer an important comparative finding.

13.4 Concluding remarks

The study concludes that in a situation of increased motorized transport the pedestrian requirements in the rapidly growing cities are inadequately considered in policy making, planning and in the implementation of plans. Even where they are considered, their implementation is generally poor. In a few cases where pedestrian infrastructures are adequately provided, their protection and maintenance are given little or no attention by the respective authorities. The reason for low priority given to pedestrian infrastructure is that the pedestrian infrastructure does not generate revenues to the government. Hence the study has proven true its two major propositions stated in Chapter one. There is a need to reclaim inclusive mobility to enhance the pedestrian concerns in cities of developing countries, especially given the situation of increased motorized transport where pedestrian needs are ignored. This conclusion supports Dimitriou and Banjo (1990) that the needs of pedestrians in developing countries are inadequately addressed due to lack of prioritization in urban design. Furthermore, the study has observed that the public space in Dar es Salaam is contested, whereby the weaker groups like pedestrians are pushed out of the walkways and other prime public spaces.

However, when asked whether they can stop from walking in case the walking environment is not improved, all the 100 respondents strongly disagreed. Owing to the limited income, the majority of the respondents felt that they have no better options other than walking. That being the case, there is a need to reclaim inclusive mobility to enhance the needs of the vulnerable users of public space. Walking is not a favour, but a necessity. People have the right to walk access and use public spaces. If such rights are not realized in a particular city, pedestrians have the right to reclaim through pedestrian advocacy groups.

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APPENDICES

APPENDIX I: QUESTIONS FOR RESIDENT HOUSEHOLD INTERVIEWS

PART ONE: SOCIO-ECONOMIC CHARACTERISTICS

1. Are you a residence of this Sub-ward? Yes/No.. If yes, for how long have you been living here?.....If No where do you live?.....
2. Which education level have you attended?
Primary education () Secondary education () Vocational Training () University () Postgraduate () none ()
3. In which sector are you employed / engaged?
Government employee () private sector employee () Business () Informal sector activities () Student/Pupil ()
Do not work () others (specify).....
4. Place(s) of Employment/business (Location).....
5. What hours do you usually work/study and on which days of the week? *The author wants s to get an idea when you work and how often.*

Working Days (check all that apply)	Working hours (e.g. 7:00-3:30 pm)	Type of work/occupation	Location of working place
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Saturday			
Sunday			

6. What is your weekly/monthly income (in Tshs)?
Less than 100,000 () ; 100,000-200,000 () ; 300,000- 500,000 () 500,000-750, 000 () ; >750,000 ()

PART TWO: PEDESTRIAN MOVEMENT PATTERNS

A: WALKING AS A MEANS OF TRAVEL TO WORK

7.0 Have you ever walked to any place in the last two days? (*at least 5 to 10minutes or 400-800m*)Yes/ No

7.1 If yes what were the reasons for opting walking as part of your daily routine of getting to work/school?

- It is a form of physical exercise
- I only walk because it is a short distance/time from home to work/school, so it doesn't matter
- There are no public transit from home/work/school
- The walk *is* pleasant because there shade trees
- The walk is pleasant because there are adequate pedestrian infrastructure/Disability infrastructure
- The walk network is connected/accessible from my home to work place/school and other modes
- The walk is safe from traffic danger
- I felt safe from physical attack/ secure
- It is costless
- No other alternatives
- Others (specify).....

7.2 If No, why don't you like the walks that form part of your daily routine of getting to work/school?

- It is a long distance/time from home to work/school/other services, so it matters
- I feel unsafe from traffic danger and unsecure
- I felt unsafe from slips and falls/ safe from falling, especially when it rains
- The walk is unpleasant because there are no shade trees, street lights, benches and public toilets
- Obstructions on the footpath (permanent and temporary, including parked cars)
- High traffic congestion and crowding on the walking path

- The walk network is not connected from my home to workplace/school
- I'm not interested in walking
- I have to transfer between public transport which are not reliable
- The public transit stop is a long distance from home/work/school
- I have my own car
- The walk is unpleasant because of inadequate pedestrian infrastructure /Disability infrastructure provided
- I prefer other alternatives
- Others (specify).....

8. Which means of transport do you use mostly to get from home to work/school/business?

S/n	Means of transport used	From home to (Tick the appropriate means of transport used)			Average Time taken (consider only one way) insert A-G
		Work	Business	School	
1	Walk				
2	Bicycle				
3	Motor cycle (Bodaboda)				
4	Tricycle (Bajaji)				
5	Two Wheeler				
6	Private car (self drive)				
7	Private Car (as Passenger)				
8	Taxi				
9	Walk + Daladala (Public transit)				
10	Walk + Motorcycle (Bodaboda)				
11	Walk + Tricycle (Bajaji)				
12	Walk + Bicycle				
13	Walk+ private car (self drive or passenger)				
14	Walk + Try-cycle+ Daladala				
15	Walk+ Motorcycle + Daladala				
16	Walk + Bicycle + Daladala				
17	Walk + Taxi				
18	Motorcycle (Bodaboda)+ Daladala				
19	Tricycle +Daladala				
20	Bicycle+ Daladala				
21	Private Car +Daladala				
22	Others (Specify).....				

Average Time: A=1-5 min; B=5-10 min; C=10-20min; D=20-30 min; E=30-45 min ; F=45-60 min ; G>60 mininutes

9. On average, how long does it take you to get from your home to the nearest businesses or facilities listed below if you WALKED to them? Please put **one** check mark (☐) for each business or facility.

The nearest...	1-5 min	6-10 min	11-20 min	21-30 min	31 -45min	46-60 min	>60min
Local shops: grocery shop, bakery, butcher etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local market /Shopping mall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local services such as a bank, post office or library, ...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restaurant, café, pub or bar ; Fast-food /takeaway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Daladala stop or train station	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sport and leisure facility such as a swimming pool, parks, sports field or fitness centre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreation area such as a park or other open space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worshipping places	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Health services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Apart from travelling to work/Business/school, where do you go most often? The author wants to figure out how you get to where you need to go.

S/N	Where do you go most often per week	How do you get there								
		Walk	Bike	Motor-cycle	Tri-cycle	Public Transit	Private Car	Taxi	Two wheeler	Others (specify)
1	Work /offices									
2	Pre-school/Nursery									
3	School									
4	Vocational training									
5	Shops/shopping malls									
6	Market									
7	Other places of business									
8	Public Transit stops /daladala									
9	Taxi stops									
10	Health/ Dental care									
11	Worshiping place									
12	Library									
13	Meeting family/ friends									
14	Entertainment places									
15	Leisure places									
16	Restaurant/cafes/ Bar									
17	Sport/recreation									
18	Parks									
19	Exercise and fitness									
20	Other place, within the city									
21	Other place, outside the city									
22	Don't go anywhere									
23										

11. Which activities did you do yesterday from wake in the morning to sleeping in the night? (*In this narration, include time, place, and means of getting to and from work place, that is, means of transport use and type/nature of activities done at work places*)

11.1 work routine for yesterday

Time(e.g 5.00am - 6.00am)	Activity	Destination	Means of transport used								
			Walk	Tc	Mc	Bk	Pt	Tw	Pr car	Tx	Others (Specify)

11.1(a) why did you prefer to use such a means of transport for yesterday? (*i.e. Walking, Try-circle, Motorcycle, Bike, Public Transport, two wheeler, private car, Taxi, others*)

Costless (); affordable (); convenience (); reliable (); comfort (); safety (); No alternatives () other reasons (Specify).....

.....

11.1(b) was yesterday an ordinary day/a specific day? Yes/ No. if yes how was your daily routine in the day before?

.....

11.2 Daily work routine during weekends (Saturday to Sunday)

Time(e.g 5.00am - 6.00am)	Activity	Destination	Means of transport used								
			Walk	Tc	Mc	Bk	Pt	Tw	Pr car	Tx	Others (Specify)

11.2 (a) Why do you prefer using such means of transport during weekends (*Walking, Try-circle, Motorcycle, Bike, Public Transport, two wheeler, private car, Taxi, others*)

Costless (); affordable (); convenience (); reliable (); comfort (); safety (); No alternatives () Others (Specify).....

.....

11.2(b) was the last weekend an ordinary day/a specific day? Yes/ No. if yes how was your daily routine in the weekend before?.....

.....

.....

B: WALKING FOR RECREATION AND RELAXATION.

12a. In which recreational activities/places do you engage after your sessions of productive work?

Type of recreational activity	✓ Tick appropriate box	Location (i.e. settlement where you get access to these activities)	How often (insert 1, 2, 3.....6)
Jogging			
Walking for leisure			
Entertainment			
Beaches			
Sport/recreation			
Meeting Friends			
Restaurants./cafes/ bar			
Public squares/open spaces			
Swimming			
Other place, within the city			
Other place, outside the city			

How often: 1= Daily; 2= 2-3days; 3= Weekly; 4= Monthly; 5= rarely; 6=Never

12 b. If you don't engage in any recreational activities what are the reasons (explain)

.....

PART THREE: PEDESTRIAN PERSPECTIVES

1: WALKING PATHS PERCEPTIONS

13a. How do you perceive the walking paths in your neighbourhood? Circle the right answer (note

S/N	How much do you agree with the following walking path perceptions?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Often blocked with obstructions					
2	Often congested with non-pedestrians					
3	Often inadequate for Blind or Disabled people					
4	Often poor light at night in my neighbourhood					
5	. Often covered with litter					
6	Often uneven and/or difficult to walk on					
7	Sufficient crossing opportunities					
8	Degree of convenience & attractiveness is pleasing					
9	Degree of crossing safety is dangerous					
10	Degree of security from crime is dangerous					
11	Motorists often fail to yield to pedestrians					
12	Motorists often drive too fast					
13	Motorists often drive Through stops					

13b. Other walking path perceptions if different from above?

.....

2. SAFETY AND SECURITY

A: Quality and Maintenance and of the Walking Routes

14. How do you rate/perceive the quality and maintenance of the walking routes?

- separate paved lanes for pedestrians not present
- Separate paved lanes for pedestrians present, but mostly constrained by obstructions such as vendors, Motorists and parked cars
- Separate lanes for pedestrians present, but not paved and are in poor condition
- Separate paved lanes for pedestrians present, but not well maintained
- There are separate paved lanes, smooth walking surface and well maintained

B: Disability Infrastructure

15. How do you rate/perceive the walking infrastructure provided for people with disabilities?

- No infrastructure for disable person is present
- Limited infrastructure for disable person is available, but is not in usable condition
- Infrastructure for disabled person is available, but in poor condition and not well placed
- Infrastructure for disabled persons is present, in good condition but poorly placed
- Infrastructure for disabled persons is present, in good condition and well placed

C: Walking Modal Conflict

16. To what extend do pedestrians in your neighbourhood mix with other modes such as motorcycles and cars?

- There are significance conflict that makes walking impossible
- There are significance conflict that makes walking possible, but dangerous and inconvenient
- There are some conflict- that means walking is possible, but not convenient
- There are minimal conflict, mostly between pedestrians and non-motorized vehicles
- There are no conflict between pedestrians and other modes

D: Crossing Safety

17. How do you rate/ perceive the exposure to other modes (*Are all other modes of transport at a complete stops when pedestrians are crossing?*)

- Very dangerous- there is significant risk of accident with other modes
- Dangerous-pedestrian faces some risk of being hurt by other modes
- Difficult to ascertain to dangers posed to pedestrians
- Safe- pedestrians are mostly safe from accidents with other modes
- Very safe- other modes present no danger to pedestrians

18. How do you rate/perceive the exposure time given to pedestrians (*i.e. the amount of time spent waiting and crossing the Street: the longer this time is, the less safe the environment is for pedestrians*)

- Maximum - extremely long waiting period, crossing time greater than 40 seconds
- Relatively long-Long waiting period, crossing time between 20 to 30 seconds
- Difficult to ascertain to dangers posed to pedestrians
- Relatively short, reasonable waiting period, crossing time between 10 and 20 seconds
- Minimal- virtually no time spent waiting, crossing time less than 10 seconds

19. How do you rate/perceive the degree to which sufficient time is allocated for pedestrians to cross at signalized intersections (*including persons with children, elders, people with disability*)

- Not enough time- No pedestrians suffer have sufficient time to cross

- No quite enough time- Barely enough time for most people, insufficient time for elderly and people with disabilities
- Sufficient time for most pedestrians to cross, not quite enough time for elderly, disabled and persons with children
- Just enough time- just enough time for elderly, disable and persons with children to cross
- Ample time-more than enough for elders, disabled and persons with children to cross

E: Motorists Behavior

20. How do you rate the behavior of Motorists in your Neighbourhood? (i.e. behavior of Driver of cars, Buses, Motorcycles, Try-circles to pedestrians)

- Motorized travel is totally chaotic; vehicles never give way to pedestrians
- Most Motorists cannot be expected to obey traffic laws and rarely give way to pedestrians
- Motorists sometimes obey traffic laws and may give way to pedestrians
- Motorists usually obey traffic laws and sometimes give way to pedestrians
- Motorists obey traffic laws and almost always give way to pedestrians

F: Secure From Crime

21. To what degree can you rate the walking environment to be secure from crime in your neighbourhood, particularly at night (i.e. pick-pocketing, mugging, unprovoked attack etc)

- Environment feels very dangerous- pedestrians are highly susceptible to crime
- Environment feels dangerous- Pedestrians are at some risk of crime
- Difficult to ascertain perceived degree of security for pedestrians
- Environment feels secure- pedestrians at minimal crime risk
- Environment feels very secure-pedestrians at virtually no risk of crime

3. ACCESSIBILITY/ CONNECTIVITY

22a. how much do you agree with the following perception s ideas? (The author wants to get an idea how you feel about access to services and public transit service in your neighborhood)

S/N	Perception ideas of accessibility and connectivity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The pedestrian network is continuous/connected (i.e. no obstructions in between) from home to work/schools/shops/markets/public transits/parks etc					
2	There are sidewalks/pavements linking homes services and public transit in my neighbourhoods					
3	Footpaths are passable throughout the year					
4	There are many road junctions in my neighbourhoods					
5	The pedestrian network is inclusive to all user groups including mobility & visual impaired					
6	Basic services like schools, shops, cafes, markets are accessed within 5 to 10 minutes (i.e. 400m to 800m)					
7	There are public transit stops in my neighbourhood					
8	It is only 5 to 10 minutes to reach the public transit stop					

22b. What are the other reasons that make you feel unhappy in relation to access to services?.....

4. CONVENIENCE AND ATTRACTIVENESS

23a. How much do you agree with the following perception ideas on convenience and attractiveness?

S/N	Perception ideas of accessibility and connectivity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	There sidewalks in my neighbourhood					
2	There are pedestrian zones in my neighbourhood					
3	Street lighting to facilitate nighttime walking present					
4	There benches, public toilets and shade trees along walkways in other public spaces					
5	buffer zones (i.e. Lined trees or on-street parking) separating pedestrian and vehicular traffic available					
6	No fear of falling when it rains					
7	The walkways are protected from sunshine and rainfall					

23b. What are the other attractive requirements (if any)

.....

.....

.....

PART FOUR: REQUIREMENTS OF PEDESTRIANS

23a. If given an opportunity, what improvement you would like to have in pedestrian services and facilities?

S/N	How much do you agree with the following pedestrian requirements?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	A mix of land uses & diversity of buildings including plenty of services and open space within one neighbourhood					
2	Services like shops, schools, markets, cafes/ Restaurants, post office, bank, health services, green spaces, transit stops, parks, public squares, recreational areas, library, worshipping places, community and leisure facilities should be within 5-10 minute walk distance same as 400-800m from homes					
3	Wide paved sidewalks/pavements, separated from driving lanes					
4	Smooth and non-slip footways					
5	Improved street lighting adequate for night walking					
6	Pedestrians shopping streets					
7	More and safe crossing points and pedestrian signs suitable for older people and disabled					
8	Better public toilets, public seating to every 100m to 125 m along walking paths and in other public spaces					
9	More or better litter bins					
10	Slowed traffic (calming measures)					
19	Buildings, doors and windows facing the street					
24	Sharing space (<i>equal rights to all road user s</i>)					
25	Sharing the main street					

23b. what are the other requirements would prefer to have in your Neighbourhood for everyday life activities (if different from above)

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

23 c. if the walking environment is not improved so far, do you intend to shift to other mode transport? yes/ No.
If yes , why?.....

.....
.....
If no, why.....
.....
.....

NAME OF INTERVIWEE..... SEX: MALE FEMALE
AGE.....MTAA..... WARD..... MUNICIPAL.....
NAME OF NAME OF INTERVIEWER..... DATE.....
PHYSICAL ABILITY: Handicapped () Visual Impaired () Able person () others

APPENDIX II: QUESTIONS FOR WALKING INTERVIEWS (PEDESTRIANS)

PART ONE: SOCIO-ECONOMIC CHARACTERISTICS

1. Are you a residence of this Sub-ward? Yes/No. If Yes, for how long have you been living here?.....If No where do you live?.....
2. Which education level have you attended?
Primary education () Secondary education () Vocational Training () University () Postgraduate () none ()
3. In which sector are you employed / engaged?
Government employee () private sector employee () Business () Informal sector activities () Student/Pupil () Do not work () others (specify).....
4. Place(s) of Employment/business (Location).....
5. What hours do you usually work/study and on which days of the week? *The author wants s to get an idea when you work and how often.*

Working Days (check all that apply)	Working hours (e.g. 7:00-3:30 pm)	Type of work/occupation
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Saturday		
Sunday		

6. What is your weekly/monthly income (in Tshs)?
0-100,000 (); 100,000-200,000 (); 300,000- 500,000 () 500,000-750, 000 (); >750,000 ()

PART TWO: PEDESTRIAN MOVEMENT PATTERNS

7.0 Have you ever walked to any place in the last two days? *(at-least 5 to 10minutes or 400-800meters)* Yes/ No

7.1 If yes, what were the reasons for opting walking as part of your daily routine of getting to work/school?

- It is a form of physical exercise
- I only walk because it is a short distance/time from home to work/school, so it doesn't matter
- There are no public transit from home/work/school
- The walk is pleasant because there shade trees
- The walk is pleasant because there are adequate pedestrian infrastructure/Disability infrastructure
- The walk network is connected/accessible from my home to work place/school and other modes
- The walk is safe from traffic danger
- I felt safe from physical attack/ secure
- It is costless
- No other alternatives
- Others (specify).....

7.2 If no, why don't you like the walks that form part of your daily routine of getting to work/school?

- It is a long distance/time from home to work/school/other services, so it matters
- I feel unsafe from traffic danger and unsecure
- I felt unsafe from slips and falls/ safe from falling, especially when it rains
- The walk is unpleasant because there are no shade trees, street lights, benches and public toilets
- Obstructions on the footpath (permanent and temporary, including parked cars)

- High traffic congestion and crowding on the walking path
- The walk network is not connected from my home to work place/school
- I'm not interested in walking
- I have to transfer between public transport which are not reliable
- The public transit stop is a long distance from home/work/school
- I have my own car
- The walk is unpleasant because of inadequate pedestrian infrastructure /Disability infrastructure provided
- I prefer other alternatives
- Others (specify).....

8. Where do you go most often? *The author wants to figure out how you get to where you need to go.*

S/N	Where do you go most often	How do you get there								
		Walk	Bike	Motor-cycle	Tri-cycle	Public Transit	Private Car	Taxi	Two wheeler	Others (specify)
1	Work									
2	Pre-school/Nursery									
3	School									
4	Vocational training									
5	Shops/shopping malls									
6	Market									
7	Other places of business									
8	Public Transit stops /daladala									
10	Health/ Dental care									
11	Worshiping place									
12	Library									
13	Meeting family/ friends									
14	Entertainment places									
15	Leisure places									
16	Restaurant/cafes/ Bar									
17	Sports/recreation									
18	Parks									
19	Exercise and fitness									
20	Other place, within the city									
21	Other place, outside the city									
22	Don't go anywhere									
23										

9. Among the means of transport you have indicated above, which one do you prefer and why? (*i.e. Walking, Try-circle, Motorcycle, Bike, Public Transport, two wheeler, private car, Taxi, others*)

Costless (); affordable (); convenience (); reliable (); comfort (); safety (); No alternatives () other reasons (Specify).....

PART THREE: PEDESTRIAN PERSPECTIVES

1: Walking Path Perceptions

10a. How do you perceive the walking paths in your neighbourhood? Circle the right answer (note

S/N	How much do you agree with the following walking path perceptions?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Often blocked with obstructions					
2	Often congested with non-pedestrians					
3	Often inadequate for Blind or Disabled people					
4	Often poor light at night in my neighbourhood					
5	. Often covered with litter					
6	Often uneven and/or difficult to walk on					
7	Sufficient crossing opportunities					
8	Degree of convenience & attractiveness is pleasing					
9	Degree of crossing safety is dangerous					
10	Degree of security from crime is dangerous					
11	Motorists often fail to yield to pedestrians					
12	Motorists often drive too fast					
13	Motorists often drive Through stops					

11b. Other walking path perceptions if different from above?

.....

.....

.....

2. Pedestrian accessibility/ connectivity

12a. how much do you agree with the following perception s ideas? *(The author wants to get an idea how you feel about access to services and public transit service in your neighborhood)*

S/N	Perception ideas of accessibility and connectivity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The pedestrian network is continuous/connected (i.e. no obstructions in between) from home to work/schools/shops/markets/public trans-its/parks etc					
2	There are sidewalks linking homes, services and public transit in my neighbourhoods					
3	Footpaths are passable throughout the year					
4	There are many road junctions in my neighbourhoods					
5	The pedestrian network is inclusive to all user groups including mobility & visual impaired					
6	Basic services like schools, shops, cafes, markets are accessed within 5 to 10 minutes (i.e. 400m to 800m)					
7	There are public transit stops in my neighbourhood					
8	It is only 5 to 10 minutes to reach the public transit stop					

12b. What are the other reasons that make you feel unhappy in relation to access to services?

.....

.....

.....

3. Convenience and Attractiveness

13a. How much do you agree with the following perception ideas on convenience and attractiveness?

S/N	Perception ideas of accessibility and connectivity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	There sidewalks in my neighbourhood					
2	There are pedestrian zones in my neighbourhood					
3	There are street lighting to facilitate nighttime walking					
4	There benches, public toilets and shade trees along walkways in other public spaces					
5	There are buffer zones (i.e. Lined trees or on-street parking) separating pedestrian and vehicular traffic					
6	No fear of falling when it rains					
7	The walkways are protected from sunshine and rainfall					

13b. What are the other attractiveness requirements on the walking paths?.....

PART FOUR: REQUIREMENTS OF PEDESTRIANS

22a. If given an opportunity, what improvement you would like to have in pedestrian services and facilities?

S/N	How much do you agree with the following pedestrian requirements?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	A mix of land uses & diversity of buildings including plenty of services and open space within one neighbourhood					
2	Services like shops, schools, markets, cafes/ Restaurants, post office, bank, health services, green spaces, transit stops, parks, public squares, recreational areas, library, worshipping places, community and leisure facilities should be within 5-10 minute walk distance same as 400-800m from homes					
3	Wide paved sidewalks/pavements, separated from driving lanes					
4	Smooth and non-slip footways					
5	Improved street lighting adequate for night walking					
6	Pedestrians shopping streets					
7	More and safe crossing points and pedestrian signs suitable for older people and disabled					
8	Better public toilets, public seating to every 100m to 125 m along walking paths and in other public spaces					
9	More or better litter bins					
10	Slowed traffic (calming measures)					
11	Buildings, doors and windows facing the street					
12	Sharing space/zone (<i>equal rights to all road users</i>)					
13	Sharing the main street (<i>all activities in main street</i>)					

22b. What are the other requirements (if different from above) would prefer to have in your Neighbourhood for everyday life activities?

22 c. if the walking environment is not improved so far, do you intend to shift to other mode transport? yes/ No.

If yes why.....

.....

.....

If No why?.....

.....

.....

.....

NAME OF INTERVIWEE..... SEX: MALE FEMALE

AGE.....MTAA.....WARD.....MUNICIPAL.....

NAME OF NAME OF INTERVIEWER..... DATE.....

PHYSICAL ABILITY: Handicapped () Visual Impaired () Able person () others

APPENDIX III: OBSERVATIONS CHECKLIST

Surveyed Settle-
ment.....Ward.....Municipal.....

Observers' name.....Date.....

Observation Time: 6: 00-9:00 () ; 9: 01-12:00 () ; 12:01-15:00 () ; 15:01-18:00 () ; 18:01-21:00 ()

PART ONE: TYPES OF RESIDENCES, DENSITY AND LAND USES

Guidelines

Observe the types of residences, densities and land uses in the study settlements

Observe the pedestrian infrastructure available and their conditions

Take measurements on the sidewalks/pavement width and the streets width

Take a photograph of all dominant activities in these spaces

1. Through observations, how common are the following types of residences in the study area? *Please put one check mark (☐) per answer that best applies to your view of the study settlement*

S/No	Type of residence	Observation results				
		None	A few	Some	Most	All
1	Detached houses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Semi-detached houses/terraced houses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Apartment buildings or blocks of flats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. How common are the following types of densities in the study area?

S/No	Type of plots	Observation results				
		None	A few	Some	Most	All
1	High density plots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Medium density	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Low density	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What are the common land uses in the study settlement (indicate the primarily use of land in the study area)
High-income residential () ; Medium-income residential () ; Low-income residential () ; Commercial/Retail ()
Institutions () Industrial () others (specify).....

PART TWO: PEDESTRIAN INFRASTRUCTURE

4. Observe the types of pedestrian infrastructure available in the study are, their conditions and barriers in between

S/No	Pedestrian infrastructure	Tick if available	conditions
1	Sidewalks		
2	Pavements		
3	Footpath		
4	Disability infrastructure (i.e. existence and quality of facilities for vision and mobility impaired)		
5	Pedestrian signs		
6	Zebra crossings		
7	Street lights		
8	Benches/Seats along walkways and on other public spaces		
9	Public Toilets		
10	Public Transit stops		
11			

Conditions:

3= **Very Good** (the infrastructure functions well/ fully utilized by pedestrians and well maintained)

2= **Good** (accessible/functions well but not well maintained)

1= **Poor** (not accessible/doesn't function and not well maintained)

PART THREE: WALKING PATH OBSERVATIONS

Guidelines:

- Using tape a measure or other measuring device, record the common width of the walking path (sidewalk, pavements and special pedestrian movement's lane if any. If no sidewalk/walking path, simply write "0"
 - Count the total number of people walking in the street and those walking on the walking path (stand at one place and mark this place on the map).
 - Count the number of pedestrians on one side of the street over a period of 5 minutes (Morning, noon and evening)
 - Record the number according to age, sex and Gender
 - Count the number of Street light and trees (public and private) on one side of the walking path
 - On map, mark stretches of road where there are no sidewalks or where there are sides walks
5. Observe the following parameters in relation to the walking path
- i. Width of sidewalks (most common occurring) in meters.....
 - ii. Street width (in meters).....
 - iii. People walking on the walking path (5 minutes counts)..... observation time.....hours
 - iv. People walking in the street and not on the walking path (5 minutes counts)..... observation time.....hours Morning/noon/evening
 - v. Trees (Total number on one side).....
 - vi. Street light (Total number on one side).....
 - vii. Cleanliness: Rubbish makes walking impossible, ruins environment (); Rubbish makes walking difficult, degrades environment (); Minor obstacle but degrades environment (); Degrades quality of environment, but not obstacle (); Walking path is clean ()
 - viii. Quality and Maintenance and of the Walking path
 - separate paved lanes for pedestrians not present
 - Separate paved lanes for pedestrians present, but mostly constrained by obstructions such as vendors, Motorists and parked cars
 - Separate lanes for pedestrians present, but not paved and are in poor condition
 - Separate paved lanes for pedestrians present, but not well maintained
 - There are separate paved lanes, smooth walking surface and well maintained
 - ix. Disability Infrastructure on the walking paths
 - No infrastructure for disable person is present
 - Limited infrastructure for disable person is available, but is not in usable condition
 - Infrastructure for disabled person is available, but in poor condition and not well placed
 - Infrastructure for disabled person is present, in good condition but poorly placed
 - Infrastructure for disabled person is present, in good condition and well placed
 - x. Walking Modal Conflict
 - There are significance conflict that makes walking impossible
 - There are significance conflict that makes walking possible, but dangerous and inconvenient
 - There are some conflict- that means walking is possible, but not convenient
 - There are minimal conflict, mostly between pedestrians and non-motorized vehicles
 - There are no conflict between pedestrians and other modes
 -

- xi. Motorists Behavior: (*i.e. behavior of Driver of cars, Buses, Motorcycles and Try-circles*)
- Motorized travel is totally chaotic; vehicles never give way to pedestrians
 - Most Motorists cannot be expected to obey traffic laws and rarely give way to pedestrians
 - Motorists sometimes obey traffic laws and may give way to pedestrians
 - Motorists usually obey traffic laws and sometimes give way to pedestrians
 - Motorists obey traffic laws and almost always give way to pedestrians
- xii. Coverage: Are there awnings or arcades that protect pedestrians from the sun and rain? If so estimate what proportionate of the surveyed walking path (one side of the street) has such coverings.
 Temporary awning, proportionate.....% (); Permanent awning, proportionate.....% ()
 Arcade (); Trees (); others (specify).....

6a. Having completed the observations on the s walking path, how much do you agree with the following statements?

S/N	How much do you agree with the following walking path perceptions?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Often blocked with obstructions					
2	Often congested with non-pedestrians					
3	Often inadequate for Blind or Disabled people					
4	Often poor light at night in my neighbourhood					
5	Often covered with litter					
6	Often uneven and/or difficult to walk on					
7	Sufficient crossing opportunities					
8	Degree of convenience & attractiveness is pleasing					
9	Degree of crossing safety is dangerous					
10	Degree of security from crime is dangerous					
11	Motorists often fail to yield to pedestrians					
12	Motorists often drive too fast					
13	Motorists often drive Through stops					
14	Poor accessibility from home to services & other modes of transport					

6b. Other observations on the walking paths (*if any different from above*)

.....

PART FOUR: BARRIERS ON WALKING PATHS (*Transect walk within the study area*)

7. Observe the personal and environmental barriers that limit pedestrians from walking more often? (*Tick one box per statement, you can also add some barriers if not listed*)

S/ N	Barriers observed	Tick barriers available	Remarks
1	Walking path modal conflict		
2	Crossing safety problems		
3	Security from crime		
4	Motorist behavior to pedestrians		
5	Vendors on Sidewalks/pavements		
6	Car Parking on sidewalks		
7	Driving on sidewalks/pavements/footpath		

8	Permanent obstructions (e.g. buildings, telephone poles, electric transformer, kiosk etc)		
9	Selling of building materials on walkways		
10	lack of shaded trees, public toilets and benches along walkways and other public spaces		
11	Lack of street lights for night walking		
12	Lack/inadequate pedestrian signs		
13	Non adherence to pedestrian signs		
14	Negative attitude of motorists to pedestrians		
15	Littering on walking routes		
16	Slip when it rains		

7b. Other barriers observed (if different from above)

.....

.....

PART FIVE: EFFECTS OF OBSTRUCTIONS ON WALKING PATHS

8. Observe the effects of permanent and temporary obstructions in the study area

i) Permanent Obstructions

(This refers to barriers permanently fixed on the walking paths like building extensions, telephone/electric poles planted direct on the walking paths, electric transformer etc that block pedestrian traffic)

- Pedestrian traffic is completely blocked by permanent obstructions
- Pedestrian traffic is significantly inconvenienced by permanent obstruction but can still walk on walking path. Effective width is <1m, preventing wheelchair access
- Pedestrian traffic is mildly is inconvenienced; Effective width is <1m or =1m
- Obstacle presents minor inconvenience. Effective width is >1m.
- There are no permanent obstructions

ii. Temporary Obstructions

(This refers to movable barriers on the walking path like parked cars/motorcycles/Try circles, vendors, building materials, shoe shiners, temporarily kiosk, that block pedestrian traffic)

- Pedestrian traffic is completely blocked by temporary obstructions
- Pedestrian traffic is significantly inconvenienced by temporarily obstruction but can still walk on walking path. Effective width is <1m, preventing wheelchair access
- Pedestrian traffic is mildly is inconvenienced by obstructions; Effective width is <1m or =1m
- Temporary obstacle presents minor inconvenience and may be welcomed by residents
- Obstruction is welcomed by most residents and enhance pedestrian activity

PART SIX: CROSSING SAFETY

9a. Types of crossings available

Zebra crossing (); Overpass (); underground subway (); No marking ()

9b. Traffic management used in the study

Regular Traffic signal (); pedestrian phase signal (); Traffic police (); none ()

9c. observe the exposure to other modes, the exposure time given to pedestrians Time allocated for pedestrians to cross at signalized intersections

- i. The exposure to other modes/safety from traffic accidents (*Are all other modes of transport at a complete stops when pedestrians are crossing?*)
 - Very dangerous- there is significant risk of accident with other modes
 - Dangerous-pedestrian faces some risk of being hurt by other modes
 - Difficult to ascertain to dangers posed to pedestrians
 - Safe- pedestrians are mostly safe from accidents with other modes
 - Very safe- other modes present no danger to pedestrians
 - ii. The exposure time given to pedestrians (*i.e. the amount of time spent waiting and crossing the Street: the longer this time is, the less safe the environment is for pedestrians*)
 - Maximum - extremely long waiting period, crossing time greater than 40 seconds
 - Relatively long-Long waiting period, crossing time between 20 to 30 seconds
 - Difficult to ascertain to dangers posed to pedestrians
 - Relatively short, reasonable waiting period, crossing time between 10 and 20 seconds
 - Minimal- virtually no time spent waiting, crossing time less than 10 seconds
 - iii. Time allocated for pedestrians to cross at signalized intersections (*including persons with children, elders, people with disability*)
 - Not enough time- No pedestrians suffer have sufficient time to cross
 - No quite enough time- Barely enough time for most people, insufficient time for elderly and people with disabilities
 - Sufficient time for most pedestrians to cross, not quite enough time for elderly, disabled and persons with children
 - Just enough time- just enough time for elderly, disable and persons with children to cross
 - Ample time-more than enough for elders, disabled and persons with children to cross
- 10. Observe the Secure from crime in the study (i.e. pick-pocketing, mugging, unprovoked attack etc)**
- Environment feels very dangerous- pedestrians are highly susceptible to crime
 - Environment feels dangerous- Pedestrians are at some risk of crime
 - Unsure- Difficult to ascertain perceived degree of security for pedestrians
 - Environment feels secure- pedestrians at minimal crime risk
 - Environment feels very secure-pedestrians at virtually no risk of crime

PART SEVEN: CONNECTIVITY/ACCESSIBILITY

- i. Observe whether the pedestrian network is continuous from home to work/schools/shops/markets/public transits/parks and other modes of transport
- ii. Observe the distance between cross-junctions in the study area
- iii. Observe the street pattern (is it Grid iron, cul-de-sac, etc)
- iv. Are the footpath passable throughout the year
- v. Is the pedestrian network is inclusive to all user groups including mobility & visual impaired
- vi. Are there any public transit stops in the study area
- vii. Can the basic services like schools, shops, cafes, restaurants , public transit, markets are accessed within 5 to 10 minutes (i.e. 400m to 800m)
- viii. Are the buildings oriented to the main street
- ix. Are there more shortcuts for walking

PART EIGHT: OBSERVATIONS ON USE OF PUBLIC SPACES

Guidelines:

- Record the number of people engaged in the listed number of activities for the whole period of observation
- The type of public spaces for observation include: street space, pavements/sidewalks, city squares, public parks and open spaces
- Categories of users broadly distinguished into male/female and grouped into five, children (under 18 years), Youths (18-35 years) and adults (above 35years), Elders (above 60 years) and people with disabilities.
- The observation time is divided *morning, noon* and *evening* (7am -6pm) at 10 minutes counts
- Take a photograph of all dominant activities in these spaces
- Indicate the location and size of the space under study in a map covering that area

Type of Public space.....

Location.....Size (m2).....

Dominant useObservation day and date.....

Time Interval.....

Main Activity	Age group									
	Children /Youth around 25 years		Adults around 26 to 64 years		Elders (Above 60 years)		People with Disability		Total	Activity Intensity
	M	F	M	F	F	M	F	M		
Playing (e.g. football)										
Jogging										
Meetings (no religion)										
Worshipping matters										
Selling items / vendors										
Sitting										
Sitting and talking										
Sitting and eating										
Walking										
Walking and talking										
garaging										
Vending kiosk										
Car parking										
Motorcycle/try-cycle parking										
Cycling										
TOTAL										

Others uses if any (specify).....

.....

.....

APPEBDIX IV: GUIDELINE FOR EXPERTS PROFESSIONAL INTERVIEWS

NAME OF INTERVIEWEE:.....DATE.....
 TITLE (DESIGNATION)ORGANISATION.....
 NAME OF INTERVIEWER.....

Guidelines:

- The interview should preferably be done having a map showing the types of pedestrian infrastructure provided in Dar es Salaam City
- The respondent should preferably be a senior Town planner, Transport Planner, urban designer, CIUP Project coordinators or architect with considerable planning experience or practice in the office.
- If allowed use a tape recorder

PART ONE: URBAN PLANNING AUTHORITIES

1: Planning Idea/Concepts

Town planning underwent through distinct planning *ideologies/concepts* (e.g. *Garden city concept, functionalism, Clarence Perry's N'hood unit, New Urbanism, Smart Growth, Mixed use and use mix development, Compact City and many others*)

1. What planning idea/concepts dominate the planning of settlements in Dar es Salaam City?
2. How do the adapted planning idea/concepts support and encourage more walking for everyday life activities within the city?
3. What is being offered by these planning ideas/concepts to meet the needs of vulnerable pedestrians? (*i.e. the urban poor, the elderly, Children and people with disabilities*)
4. Which types of pedestrian infrastructure would you associate with the above mentioned ideas/concepts viewpoints?

2: Existing planning standards, design concepts and implementation

5. Are there any planning standards and design concepts currently used when planning for pedestrians in newly planned areas, redeveloped and upgraded informal settlements? Yes or No. if yes describe them
 - Planning standards:
 - Urban design concepts:
6. How do the existing planning standards and design concepts consider walkability and requirements of vulnerable pedestrians (*i.e. the urban poor, children, the elderly and people with disabilities*) in formal and informal settlements like Sinza, Kariakoo and Buguruni?

3. Pedestrian infrastructure

7. Are pedestrian networks included in the current Dar es Salaam Master plan or Transportation plan? Yes/No.....
If yes, attached the pedestrian network map, if no why?
8. Are there any pedestrian- related infrastructure already established in planned and unplanned residential neighbourhoods? Yes/No. if yes Tick the appropriate infrastructure established in the table below:

S/N	Type of Pedestrian infrastructure established	Location (Name the settlements in your Municipality where already established)
1.	Sidewalks	
2.	Pavements	
3.	Disability Infrastructure	
4.	pedestrian crossing signs (zebra, traffic lights)	
5.	Road signs for people with disabilities	
6.	Street lighting	
7.	Amenities (i.e. Benches, , shade trees on walking paths)	
8.	Public toilets along walkways	

9. Is the pedestrian network in planned and unplanned settlements direct connected from homes to basic services like school, shops, work places and other modes of transport? Yes/No.
If yes how?
If No, why? Specify the barriers in between?

10. Are the building front guidelines adhered too? Yes/No. if no why? And what are the implications on the walking environment.
11. Are there any the financial, material, organizational and human resources made available by authorities as a basis for providing good walking conditions? Yes/No, if yes

How much funding is allocated to pedestrian planning and development per year? (at least 5 years)

Year	Fund allocated to pedestrian planning	Total percentage of Budget	Purpose
2011			
2012			
2013			
2014			
2015			

12. How can you rate the degree of Municipal/City council funding and resources devoted for maintenance/improvement of pedestrian infrastructure in Dar es Salaam? (tick the appropriate answer)
- Enough to sustain a high quality program in long term
 - Sufficient for short term, but not the long term
 - Neutral
 - Insufficient to achieve meaningful goal
 - Non-existence
13. If more funding is provided, which improvements/priorities would you make to improve walking requirements of vulnerable pedestrians in formal and informal settlements?
14. What plans/programs do you have that relate to pedestrian space? e.g. pedestrian master plan, pedestrianisation schemes, specific plans for vulnerable pedestrians etc

4. Policy Support and actors involved in pedestrian planning

15 How do the urban planning related policies/master plans consider walkability of vulnerable pedestrians?

16. Who are the actors/ agencies are responsible for pedestrian planning: (your answer may base on the following parameters)

S/No	Activity	Responsible Agency/Actor
1	Pedestrian network planning/ pedestrian space	
2	Removing obstructions along walkways	
3	Sidewalk construction	
4	Sidewalk infrastructure maintenance	
5	Sidewalk cleaning	
6	Street lighting	
7	Pedestrian amenities (e.g. Benches, public toilets	
8	Tree planting	
9	Road safety	
10	Licensing of street activities (e.g. vending)	
11	Requirement of pedestrians in their built environment	
12	Security from crime	
13	Disability infrastructure and signs	
14	Management of Traffic lights	

16. Are there any pedestrian advocacy groups representing the voice of pedestrians in urban policy making/planning?..Yes/ No.

If yes, who are these groups and which role do they play?

If No, who are the actors representing the interests of vulnerable pedestrians in urban policy making/ planning in Dar es Salaam City?

Implementation process (To be responded by expert professionals)

15. Are there any implementation mechanisms of planning standards, design concepts and policy objectives formulated for improving walkability and requirements of pedestrians? Yes/No. If yes,
16. Who are the actors involved in the implementation process?
17. How does the Municipal/city authority implement the planning standards, design concepts and policy objectives set for improving walkability of pedestrians for everyday life activities?
18. What are the opportunity and challenges of implementing planning standards and design concepts for improving walkability of pedestrians
19. How do you overcome these challenges?

PART TWO: AGENCY RESPONSIBLE FOR TRANSPORT PLANNING

1. How do the urban transport policies consider walkability of vulnerable pedestrians?
2. Is there a specific non-motorized program/department? Yes/No....
If yes, what programs does the department have to improve pedestrian walkability for everyday life activities?
3. How can you rate program funding
 - Enough to sustain a high quality program in long term
 - Sufficient for short term, but not the long term
 - Neutral
 - Sufficient only to meet very few program goal
 - Totally insufficient
4. Are pedestrian networks included in the current City Master plan or Transportation plan? Yes/No.....
if yes attached the pedestrian network map, if no why?.
5. How do you decide how to build/plan/operate pedestrian facilities?.
6. Are there design standards for sidewalks and crosswalks? Yes/No. if yes what are they and on what are they based?
7. What are the proportion of all trips (modal share split) in Dar es salaam (to work, shopping, school etc)
Public transport.....%; private car.....%; Cycling.....%; Walking.....%; others.....%
8. How were the above proportions derived (rough estimates based on visual observations/ traffic counts/ surveys etc)?.

PART THREE: AGENCY RESPONSIBLE FOR TRAFFIC SAFETY AND LAW ENFORCEMENT

1. Does the agency maintain data on pedestrian fatalities and injuries? Yes/No..... available
If yes, what data do you have in regard to pedestrians? e.g. counts, pedestrian modal share in the urban trips, accidents, facilities, maintenance
2. Is there any law/ by-law or regulations for any of the following item? Feel free to add any relevant laws or regulations that are not included in this list

S/n	Law or regulation available on removal of	Enforced?		
		Usually	Sometimes	Rarely
1	Vendors on sidewalks			
2	Parking on sidewalks			
3	Driving/motorcycle/riding on sidewalks			
4	Jaywalking			
5	Littering			
6	Removal of temporary and permanent obstructions on the walking path (e.g. buildings, shops, utilities, building materials)			
7	Penalties for violating pedestrian crossing signs			
8	Removal of encroachments (such as buildings, shops, utilities) from pedestrian space			
9	Removal of encroachments and obstructions into pedestrian space			

3. If these laws/ regulations are sometimes or rarely enforced, what are the reasons behind and what do you think can be done for effective enforcement?

4. Does the department maintain location data for pedestrian fatalities/road accidents in Kariakoo, Sinza and Buguruni? Yes/No... if yes describe and attach a sketch map for those areas

5. Does the department maintain location data for Street crimes in Kariakoo, Sinza and Buguruni? Yes/No... if yes pinpoint high crime locations on a map.....

PART FIVE: IDEAS FOR IMPROVING WALKING ENVIRONMENT

1. Please rate the relative importance of the provision of pedestrian infrastructure and services in your agency

- Very important-walking is a highly priority
- Somewhat important
- Neutral
- Somewhat unimportant
- Not important-walkability is almost never considered

2. In your own opinions, do you think pedestrian needs can be strengthened? Yes/ No.
If yes, what are the appropriate changes to be made for strengthening the walking environment? (*tick*)

- Change the planning standards and design concepts used
- Reflecting the needs of pedestrians in urban policy formulation
- Involving pedestrians advocacy groups in decision making process
- Change the procedures for producing pedestrian space
- Enforce pedestrian safety laws/regulations
- Improve public transport

Other changes (if any, different from above)

- 3. What are your key goals in relation to pedestrian planning?
- 4. Do you think how can decisions be changed to take into account the interests of pedestrians in the future? (*Experts' opinions on facilitating and sustaining pedestrian activity*)

APPENDIX V: LIST OF INTERVIEWEES (*Expert professionals*)

Organisation	Respondents	Date	Number of inter-views
MLHHS D	Seniour Town Planner (Development control section –MLHHS D (Walter Nnko) - Assistant Director, urban design section in the Ministry (Ms. E. Senje) - Assistant Director, Master Plan section in the Ministry (Mr. A.A. Mahenge) - Principal Town Planners at MHHS D (Ijukanne Smiton)	10/05/2015 11/05/2015 27.05.2015 06/052015	4
DCC	-Road Engineer at DCC (Mr. Swarehe M. Nyenye) - Coordinator, Safer City section (Japhert Christopher) -Senior Town Planner (Ms. Recho Katambi) - CIUP Coordinator/Community Development office (Magreth Mazwile)	23.04.2015 28.05.2015 28.05.2015 28.05.2015	4
ILALA MUNICIPALITY	-Seniour Town Planners (Richard Emmanuel, Dawi Lulu and A.Mbyopyo) -Roads Engineer (Eng. Mashashi)	20-22 /02/2015 25/02/2015	4
KINONDONI MUNICIPALITY	-Roads Engineers (Eng. Mbag a and Eng. Wamara) -Urban Planner, in-charge of Sinza neighbourhoods (Mr. Hussein) -Municipal Engineer (Engineer Ismail Mafita)	19/2/2015 20/2/2015 10/03/2015	5
TANROADS	Road Engineer at TANROADS (Eng. Kanyenye Alfred)	18/5/2015	1
DART	Roads engineer at DART (Eng. Nyoni) -Chief Executive, DART Agency (Asteria L. Mlambo)	27/04/2015 12/06/2016	2
TRAFIC POLICE	Inspector Mussa Mabula In-charge of all traffic cases- Zone Traffic Police-Dar es Salaam zone	04/05/2015	1
CHAWATA	Chairman, in-charge of Traffic Safety for people with disability (Jutram Kabatele)	26/01/2015	1
SUMATRA	-Person in-charge, directory of economic regulations (Makiri Ngangaji)	19/05/2015	1
		TOTAL	23