



LUFHERENG AS A PERIPHERAL LOCATION: AN ANALYSIS OF TRANSPORT AND EMPLOYMENT OPPORTUNITIES

By

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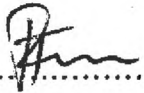
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requirements for the degree of Master of Science in Development Planning.**

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DECLARATION

I declare that this research report is my own work. It is being submitted for the Degree of Master of Science in Development Planning, in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other university.


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ABSTRACT

Convenience, affordability and efficiency of transportation are critical aspects of accessibility in urban areas. Through the development of integrated transport systems, cities are able to increase accessibility to economic and employment opportunities that exist within a city. Development of efficient public transport systems is viewed as a method that could be used to alleviate poverty and unemployment in marginalized areas.

New housing developments in urban areas over the last decade have occurred rapidly in the peri-urban fringe with often limited access and mobility to facilities and opportunities. The development of the megaprojects located on the periphery is usually associated with poor infrastructure and unreliable public transport systems which isolates residents from the cities. This study seeks to explore the extent to which Lufhereng is peripheral in terms of connectivity to public transportation systems, mobility and access to employment opportunities and services.

Through the use of documents about the study area, interviews with project managers, household interviews and maps, the study was able to reveal that efficient access to employment opportunities and services is important for the social well-being of residents located on the periphery, particularly in the west of Johannesburg.

Recommendations regarding improving accessibility and mobility in low income households were made. These recommendations were based on the findings, literature and the research conducted for this study.

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Acronyms

BNG	Breaking New Ground Policy
CBD	Central Business District
CoJ	City of Johannesburg
BRT	Bus Rapid Transit System
GCRO	Gauteng City Region Observatory
GDRT	Gauteng Department of Roads and Transport
TOD	Transit Orientated Development

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CHAPTER 1: AN INTRODUCTION TO THE STUDY

1.1 BACKGROUND

Peripherally located residents often spend more time in a day commuting to access places of employment, schools and services, which usually results in social exclusion of the poor (Brown and Lloyd-Jones, 2002). Access is usually problematic for the urban poor located in peripheral areas, services, resources and job opportunities are often too far or expensive to reach (Brown and Lloyd-Jones, 2002). The Lufhereng housing development project was intended to provide housing for previously the disadvantaged group, with the intention to rid people of poverty and to create a healthy environment, while countering social injustice (Gauteng Department of Human Settlement, 2015). It is for this reason that this research explores Lufhereng development as a peripheral area, which may serve to negate the achievement of some of the objectives which were behind its inception as highlighted above.

Convenience, affordability and efficiency of transportation are a critical aspect of accessibility in urban areas. Through the development of integrated transport systems, cities are able to increase accessibility to economic and employment opportunities that exist within a city. Development of efficient public transport systems is viewed as a method that could be used to alleviate poverty and unemployment in marginalized areas. Spatial disparities continue in Johannesburg post-apartheid, dividing people by income and class, resulting in low income residents placed on the periphery, far from economic hubs and services.

Development trends over the last decade have occurred rapidly in the peri-urban fringe. These areas often have limited access to urban amenities, poor infrastructure and public transport systems.

The Lufhereng housing development project is one of the largest mixed-use housing development projects in Soweto. Lufhereng, previously known as Doornkop/ Zuurbult Greenfields, is located on the west of Soweto between Slovoville and Protea Glen. The Lufhereng mixed-use development is seen as a potential site to accommodate a large part of the housing backlog in Soweto and the surroundings. It is therefore important to consider accessibility to employment opportunities, services and connectivity of transport routes to other areas throughout the city region so that people in the area are not left stranded.

The public transportation system plays a significant role in improving accessibility, mobility as well as improving people's lives. This is particularly so in low income communities, thereby increasing access to services, facilities and employment opportunities (Ahmed *et al.*, 2008). Public transport enables mobility and provides access and connectivity to surrounding areas and the broader region.

Currently, the existing transportation system used in the city of Johannesburg comprises taxis, trains and bus services (Rea Vaya, Metro, and Putco) which connect some areas to the city. The BRT bus services operate in the neighbouring areas like the greater Soweto; Protea North, Thokoza Park and Jabavu.

According to the SA Info Report (2015: 2) Premier David Makhura mentioned that "mega projects would lead to radical transformation of human settlements and spatial planning in Gauteng for the next ten years". The Lufhereng project might be seen as an example of the

province's idea of mega projects, which were launched by the Gauteng premier in 2015. More people are being relocated to this new area from the greater Soweto, meanwhile businesses and the economic activities are located further from the area with limited access to those locations.

Turok (2015) suggests that the main goals for the mega projects should include compaction, integration and urban densification by encouraging effective use of land in cities as well as improving public transport connection to other areas and workplaces. The premier in this regard opined that spatial transformation is part of the government's mandate to enhance and improve infrastructure investment. Premier Makhura mentioned that the building and shaping of urban cities is a transformation journey that involves strategic planning so that people can benefit through job creation and infrastructure investments.

In accordance with the Breaking New Ground Policy (BNG) (2014) since 1994, settlements that have developed on the periphery have generally lacked the qualities necessary to enable a decent quality of life and accessibility to other places within the region and neighboring cities. This shows poor levels of investment in infrastructure development, alignment of resources and budgets. The BNG policy was established to champion transformation and improve housing delivery challenges in South Africa, especially in major cities. Some of the primary aims include; (i) redressing the fragmented spatial settlement patterns caused by apartheid planning, (ii) promoting the diversification of housing products as well as (iii) providing sustainable quality housing for different income groups.

Rapid population growth is increasing the demand for housing, which is often located on city edges across the country. This links to the broader debate about large housing projects that are peripherally located.

In the light of aspects discussed above, the purpose of this study is to investigate accessibility of employment opportunities to residents of this relatively new development, as well as how public transport systems link and connect Lufhereng to the rest of the city.

1.2 CONTEXT AND SPATIAL PLANNING POLICIES

Prior to the 1994 democratic elections, spatial planning was done in the form of master planning and in accordance with racial divisions. The main focus of spatial planning at the time was regulating land use and required parties to provide specific details on the manner in which land was to be developed and transformed, management of physical structure erections in cities, changes and land use management. Urban growth and development was undertaken in a racially divided manner, managing land uses by racial groups.

After the democratic elections land use management policies and spatial plans needed to change and be improved (Todes *et al.*, 2010:426). The restructuring and changes in spatial plans included managing and monitoring growth and infrastructure development in metropolitan cities. According to Todes *et al* (2010), spatial frameworks were developed to guide municipalities on strategic capital expenditure as well as managing urban growth.

In addressing some spatial development issues and challenges, the Johannesburg spatial development framework contains developmental principles and guidelines that are supported by the Capital Investment Framework, which indicates annual investments in economic and social infrastructure over a period of five-years (Urban-Econ, 2014). These strategies provide a guideline for spatial development in the city in a manner that will expand opportunities and contribute towards the growth of the economy, especially in poorer communities (Urban-Econ, 2014). The spatial frameworks further

emphasize compaction. However the focus on supplying low cost housing has resulted in development on cheaper land often located on the urban periphery, which then raises concerns about efficient public transport systems and accessibility.

1.3 PROBLEM STATEMENT

Access to employment opportunities and services relies largely on the use of trains and taxis for the urban poor located on the periphery. Peripheral areas are usually located far from access to efficient public transport systems such as the Metro rail trains, Gautrain stations and BRT services, which limits access to opportunities and public amenities throughout the region.

This study aims to investigate whether Lufhereng is a poorly located area in relation to employment opportunities within the city region. The study sets out to explore commuting patterns and whether an efficient, accessible, and affordable public transport system exists as well as how people access economic opportunities and services across the city region. The City of Johannesburg (CoJ) and the Gauteng Department of Roads and Transport (GDRT) have prioritised infrastructure and transportation development in the city-region over the past few years. These transportation systems include; the Gautrain, Metro rail trains and the Rea Vaya bus routes.

The City of Johannesburg is fragmented and spread out. Low income residents in places like Lufhereng tend to be isolated and far from accessing transportation and economic opportunities. The GCRO Quality of Life survey indicated that people placed in low income households, such as the west of Johannesburg are likely to spend more than an hour commuting to work (2015: 37).

In most cases, the cost of transport is high and consumes a large portion of income, making it difficult to travel and therefore inaccessible for certain categories of people. The GCRO 2015 Quality of Life survey suggests that people in Johannesburg travel for social and economic reasons across the Gauteng region, they are divided according to work and retail shopping between men and women. The percentage of trips to work for women has increased (from 26% to 30%), meanwhile trips for retail shopping have increased (from 24% to 27%) since 2013 (GCRO, 2015, 37). According to Ahmed *et al.* (2008) Public policies should respond to the needs of poorly located housing areas in terms of their access to services, opportunities and employment.

The development of public transport systems in Johannesburg has not responded well to the challenges relating to access, mobility and affordability to low income residents located in the urban peripheries west of Johannesburg. Even though the GCRO 2015 Quality of Life survey suggests that new public transport investments are slowly changing commuting patterns in the city-region, the impact has not been all positive, especially in areas like Lufhereng.

1.4 RESEARCH QUESTION

To what extent can Lufhereng be seen as a peripheral area, in terms of access to employment, economic opportunities and connectivity to the broader region?

1.4.1 Sub-Questions

- What economic activities and employment opportunities exist in Lufhereng, or have been generated through the project?
- Where do people commute to for work?

- How does transportation link and connect to the broader city region?
- What are the implications of current transport plans for access?

1.5 OBJECTIVES OF THE STUDY

The following objectives seek to guide the study and help to achieve the aim of this research project.

1. Determine transport accessibility, routes and networks in Lufhereng in relation to the city region.
2. How accessible the area is in terms of people's commuting patterns.
3. How public transportation mechanisms respond to the emergent growth nodes in the west of Johannesburg and the needs of low income commuters.
4. Investigate the extent to which Lufhereng can be understood as a peripheral area in terms of existing employment opportunities and the reasons behind their commuting patterns

1.6 RATIONALE OF THE STUDY

This research aims to build on recent studies and broader debates through examination of the Johannesburg transportation system, policies and spatial patterns, and the position of Lufhereng in this context. The study seeks to examine the economic activities and the location of employment opportunities in relation to Lufhereng as well as the transport systems connecting the area to the inner city of

Johannesburg and the broader region. Furthermore, the study also takes into account the issues related to mega projects located on the periphery with limited access to opportunities and services. The post-apartheid government has focused on addressing the housing backlog by building more RDP housing units on the periphery. In order to support sustainable economic activity in cities, public transport routes and fares should benefit residents and consumers, particularly those located on the peri-urban. Transport policies should be beneficial to disadvantaged residents (Tilahun and Fan, 2014).

It is in this light that public transport development in Johannesburg ought to respond to needs generated by new spaces as well as responsiveness to low income residents and urban growth within the surroundings and broader region. It is important that the transport system within the City of Johannesburg be able to accommodate commuters and their needs. Given the spatial differences within Johannesburg and the vast inequalities that exist, developments in transportation systems need to increase access to economic opportunities. Effective transport systems need to provide services that are inclusive and not socially unjust to the urban poor.

1.7 RESEARCH METHODOLOGY

For the purpose of this study, mixed methods approach was used to facilitate an in-depth and a broad understanding of the research, employing both qualitative and quantitative research methods of inquiry. According to Neumann (2000) mixed method approach provides more substance in the research findings. Philip (1997) highlights challenges in identifying suitable methods to capture socio economic outcomes and represent spatial impacts, but highlights the importance of understanding and representation of data. Creswell (2003) also highlights the importance of mixed methods research,

which captures both insight and a broader understanding of the research question.

This study explored travelling patterns, accessibility and outlined various theories in order to discover whether Lufhereng is peripheral located in terms of access and employment opportunities. The researcher selected this approach because was helpful in order gain a deeper understanding of the opinions of the respondents and to capture the real life context.

1.8 STRUCTURE OF THE RESEARCH REPORT

This research report is divided into seven chapters.

Chapter Two examines the theoretical background and applicable theories. The chapter will provide an overview of the literature and discuss important concepts related to peripherality of location and the importance of accessibility of public transportation systems and mobility to employment nodes, more especially for the urban poor.

Chapter Three presents and provides a justification of selected and applied research methods used in this study. This chapter also provides an overview on the research studies undertaken, which included; taxi drivers, commuters, project managers and households interviews, as well as how data was collected.

Chapter Four discusses the context and the growth plans for Lufhereng. The results of the data obtained will be used to analyze proposed project plans and how these set out to benefit low income residents.

Chapter Five provides an overview of the data that was gathered from key household interviews as well as commuters. The findings presented draw from the experiences and perceived impact of the location to low income residents (i.e. the participants).

Chapter Six presents the main findings of the research results and the analysis is presented with supportive literature. The chapter further provides an overall discussion of the economic and social effects the location has on residents.

Chapter Seven concludes the research about what peripherality means for residents and the concerns rose about the mega projects on the periphery. This chapter also provides recommendations on how public transportation systems can be implemented to meet the needs of low income communities, particularly the new low income developments located on the west of Johannesburg Metropolitan region.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The connection between location, mobility and access to transport and opportunities is critical in spatial planning (UN-Habitat, 2013). In accordance with the UN-Habitat (2013:3) inefficient public transportation is an obstacle to accessing opportunities and services within a city region. The chapter reviews international and local debates on peripherality and mobility. A brief overview of recent work on accessibility to employment opportunities, transport challenges and how they relate to localities in developing countries, particularly in peripheral areas is entered into.

The chapter engages in a discussion on spatial dimensions of household travel within an urban setting, affordability, and travel times as well as how these factors affect people living in peripheral areas. The literature review informs the research study and builds on it. It further unpacks the significance of concepts discussed in the literature and their meaning. The literature review is expanded into an analysis of how local and international practice informs peripherality.

2.2 PUBLIC TRANSPORT CHALLENGES IN DEVELOPING COUNTRIES

For people living in urban poor settlements in developing countries accessibility, affordability and reliable public transport is imperative in order to connect cities and towns. This encourages inclusive cities, especially for areas situated at the periphery (UN-Habitat, 2013). In Mexico City, for example, residents in low income housing settlements on the periphery take two to three separate modes of transport to reach a metro terminal that provides low-cost connections to the city and job opportunities (Miranda *et al.*, 2014). Workers in Mexico City spend hours travelling to and from work each day, which is similar in rapidly growing cities like Delhi (India), Buenos Aires (Argentina),

Manila (the Philippines), Nairobi (Kenya), and Dar es Salaam (UN-Habitat, 2013). This has created disconnection in cities and its surroundings. Travel costs can be very expensive for a daily route. Linking the location of settlements with transport and mobility in urban cities has been recognized to be critical by governments internationally.

According to Loo *et al.* (2015) access to affordable transport modes and effective transport systems is critical for cities to increase mobility, particularly for low income areas. Transport systems have the ability to address this need by transporting people to places of employment (Brown and Lloyd-Jones, 2002). According to Brown and Lloyd-Jones (2002) inaccessibility is a major problem for poor households because facilities and services are often too distant to be reached or too expensive to access by public transport.

Tilahun and Fan (2014) argue that policies need to address issues of mobility and accessibility in developing countries, and surrounding cities. Integrated development initiatives need to be in place in order to encourage social activities, economic and transport investments in peripheral locations. This ensures better transit access and flexibility in the choice and modes of transport systems used. For a public transport system to be sustainable, it must be reliable, efficient and accessible to communities located on the peripheries (UN-Habitat, 2013).

2.3 THE INHERITED APARTHEID CITIES

During the apartheid era, spatial planning was aimed at separating different race groups by placing black people on the edge of the city. Legislation such as the Group Areas Act (1950), made it illegal for the different race groups to reside in the same areas (Goebel, 2007). Industrial areas and the townships still represent the spatial divisions created by previous apartheid planning. In this regard, Berrisford (2011)

makes the following observation: "To varying degrees South African cities reflect not only unequal distribution of amenities but distances where the poor and the rich live intensifies inequality" (Berrisford 2011:249). Spatial segregation has a huge impact on the poor and imposes exclusion significantly through limited physical access to job opportunities and social networks (World Bank, 2002).

Despite transformation and advances of democracy in South Africa there are still clear imbalances in society, in terms of public service delivery, economic inequalities and poor access to transport. Venter *et al.* (2007) argue that despite the commitment to urban integration, some improvements of service infrastructure development and policy formulation, the lives of the previously disadvantaged have not entirely been transformed, as practices have similar effects to those of the apartheid period.

The housing issue in South Africa has not been resolved in a way that creates balance and minimizes segregation post-apartheid. Since 1994, the South African government aimed to empower previously disadvantaged groups by improving access to housing, employment opportunities and services.

Extended informal settlements on the edges of the city attract many migrants from rural areas and other small towns to the city metros. These are referred to as 'estuary zones' (GCRO, 2013). Increasing social divisions, urbanization and poor housing are a growing concern for the South African government to create urban change (GCRO, 2013).

Huchzermeyer (2004 as cited in Cross, 2008) argues that globally, government housing programmes for the poor will always fail to bring poor people into urban core spaces where access and distance is not an issue. Cross (2008:113) also argues a similar point in that available

spaces for low-income housing are found in outside zones where land prices are cheaper. Planned redevelopment usually pushes this group to the borders of the city, which defeats the primary objective of compaction and bringing the poor into the inner city to take part in and contribute in the urban economy (Cross, 2008). Todes (2003) however, argues that post-apartheid planning has focused on promoting integration and urban compaction in cities. This involves densifying urban areas with different classes coming together and maximizing the advantages of location.

2.4 PERIPHERAL HOUSING

According to Stats SA (2011) Gauteng is the most populous and economically vibrant province amongst the other provinces in the country, and the population growth rate is continuously increasing compared to other provinces in South Africa. Employment seeking has been a significant contributor (Biermann and Van Ryneveld, 2007). According to Biermann and Van Ryneveld (2007) unemployment rates have also increased, contributing to a rise in the number of urban poor.

Biermann and Van Ryneveld (2007) argue that South African governments' attempt to keep up with the pace of the growing demand for housing and employment has been receiving a lot of attention and is a priority in policy. In accordance with the Gauteng Provincial Housing Development Plan (2004) the Gauteng province has over the last decades built more serviced housing units but mainly in locations far from the CBD. Biermann and van Ryneveld (2007) argue that peripheral housing developments are reinforcing the city spatial pattern of development from the apartheid era, with poor people being stranded on the peripheries with limited services and low income security.

2.5 AFFORDABILITY AS AN UNDERLYING ISSUE

Cost has been observed to be a fundamental cause of investments in badly located areas (Biermann and van Ryneveld, 2007). According to Biermann, Van Ryneveld and Venter (2004) and Biermann (2005) costs are one of the major reasons why housing projects have continued in post-apartheid urban South Africa to place poor people on the periphery. Poor settlement planning becomes evident in the location of jobs, services and economic activities are placed far from new developing areas which can limit access to opportunities for those who cannot afford or reach these locations (Biermann and van Ryneveld, 2007).

Management and re-evaluation of transport costs has been monitored over time in different locations and cities to address the issues of affordability, policy implications and the evaluation of how changes could impact the lives of those situated in peripheral developments (Biermann, 2005). In response to the peripheral location problem, city planning has a broader responsibility of identifying suitable localities to provide housing for the poor and taking into account resources needed, service provision, local employment and affordability of transportation (Biermann and van Ryneveld, 2007).

2.6 SOCIAL EXCLUSION OF THE URBAN POOR

Lack of access to available job opportunities, services and public transport systems could result in social exclusion (Chamber, 1995 quoted in Brown *et al.*, 2002). Public transport is perceived as a service that warrants public investment as it provides citizens with a basic level of mobility (Preston and Raje, 2007).

Poor access to transport can be used as a measure to define social exclusion and inequalities in mobility. Studies in the United Kingdom (UK) have started focusing more on linking policy to poverty, transport

challenges, access to services and economic and social opportunities to alleviate social exclusion (Lucas, 2012).

The study of transport and social exclusion in the UK has introduced a systematic process of accessibility planning within local transport, land use and service sector planning in order to identify and address transport problems of socially excluded populations (Lucas, 2012). Public transport and spatial disparities are factors that tend to exclude people from opportunities within a city. In most cases the cost of transport becomes more expensive and inaccessible for those unable to afford.

In Brazil immigrants with low incomes (who cannot afford proper local housing) are placed in peripheral areas which often lack basic needs and services such as sanitation, health, education and public transport (Miranda *et al.*, 2014). This results in spatial segregation of low income classes (Miranda *et al.*, 2014).

Poor public transport conditions associated with urban sprawl and increased private vehicles in Brazil are major factors that increase social exclusion of those residing in segregated areas and on the outskirts of cities far from urban centers and job opportunities (Miranda *et al.*, 2014). This prevents people from taking advantage of available opportunities within the city and contributes to urban poverty and social exclusion.

Imbalanced approaches to urban spatial planning and land-use regulation have a major impact on the isolation of the urban poor by locating them in peripheries with lack of infrastructure and development of social services (Brown and Lloyd-Jones, 2002, 191). Similar issues have been experienced in Johannesburg, as low income residents are placed far from opportunities and have to travel distances for formal employment opportunities and in order to access

services (Ahmed *et al.*, 2008). In various cases public transport consumes a large amount of income commuters located on the periphery. This results in inaccessibility to other areas, especially for those who cannot afford. This then limits the poor from taking advantage of income opportunities available throughout the Gauteng region.

Accessibility is related to location and whether people can access the job market (Cross, 2008). This raises questions of whether housing delivery in peripheral locations contributes to the poor not accessing employment opportunities, resulting in poverty and further exclusion beyond that generated by the previous apartheid government. Spatial planning and the economy may contribute to the isolation and social exclusion of the poor, which creates a huge gap between the rich and the poor (Cross, 2008).

Spatial planning and land use have been a major focus, as metropolitan cities such as Johannesburg are overwhelmed by increasing growth of the city's population and the need to accommodate urban migrants (Venter *et al.*, 2007). South African government policies have attempted to manage this by placing people on the edges of the city where land is affordable (Todes, 2003). It is questionable whether such policies take into account the relationship between effective transport accessibility, mobility constraints and location, seeing that these issues have a major effect on the poor situated in peripheral areas, especially women (Venter *et al.*, 2007).

2.7 COMPACT CITIES (TRANSIT- ORIENTED DEVELOPMENTS)

The compact city or city of short distances is an urban planning model, which aims to promote high residential density with mixed land uses. This concept is based on efficiency of public transport systems in an

urban setting; it has an urban layout which according to its advocates encourages walking and cycling, energy efficiency and reduced pollution in cities.

A large resident population provides opportunities for social interaction. It is arguably a more sustainable urban settlement because of its ability to facilitate "social cohesion and equity" (Dempsey, 2010: 2). High densification in cities has been a major focus and a vision for planners and urban designers for many years, mainly because city centres/urban areas have always had the potential to create opportunities, contribute to the improvement of the economy as well as encourage connectivity and social liveliness in cities (Waters, 2016).

Recently, much attention has focused on the correlation between urban form and sustainable development of cities. There is a strong link between these two concepts and recent debates have suggested that a sustainable city is the one that encourages walking distances, compaction and social interaction, and efficient public transportation. For many cities compaction policies attempt to intensify development, limit sprawl and bring more people in to revive those cities (Burton *et al.*, 2003). Advocates have suggested compaction through decentralized but concentrated settlements linked by public transport nodes, encouraging self-sufficient communities (Haughton and Hunter, 1994, cited in Burton *et al.*, 2003). Urban compaction includes central city revitalization, high density development, mixed use development, and more efficient services and facilities. The theory behind compact cities is important in developing sustainable urban cities.

The compaction of cities is not only attractive to city planners, architects, urban designers, developers and policymakers but to tourists as well. Compact cities are seen as ideal places where people can live and benefit from urban life. Sustainable development requires

a strong foundation consisting of the economic, social and environmental elements for it to be effective (Burton *et al.*, 2003).

Urban compaction policies involve the advancement of urban regeneration, the revitalisation of city centres, limiting development in peripheral areas, encouraging higher densities, mixed-use development, promotion of efficient public transport and the concentration of urban development at public transport nodes (Burton *et al.*, 2003). For urban compaction to be successful, policies need to be developed and managed successfully to maintain practical solutions to achieve sustainable results (Williams, Burton and Jenks, 2003).

There are many observed and suggested benefits to the concept of a compact city as opposed to urban sprawl (Neuman, 2005). These benefits include less car dependency, reduced energy consumption, better public transport services, increased access due to proximity to urban facilities, regeneration of urban areas and enhanced business activities (Neuman, 2005).

Katz (1994 as cited in Neuman, 2005) argues that compact cities promote community oriented social patterns. The World Bank has advocated for higher densities and compaction in cities as this promotes sustainable living (Waters, 2016). Turok (2011) and the UN-Habitat (2013) have observed that compact cities are more beneficial to the public as they promote inclusive communities, productive economies and maximum and efficient use of urban land and spaces.

Compact cities have, however, not been without criticism. These have been outlined as follows; overcrowding, crime, loss of the urban quality and biodiversity, pollution and congestion, and excessive energy use (Boyko and Cooper, 2011). Even though benefits of compact cities are myriad, concerns remain regarding its effectiveness. Arguments

against implementation of the concept have been based on whether concentration in cities would be sustainable in future (Burton *et al.*, 2003). The debate has extended to the question of how compaction can affect the economy, social and physical wellbeing as well as the environment. In rapidly urbanizing cities people live in overcrowded informal settlements because they cannot afford the urban lifestyle (Huchzermeyer, 2011; Waters, 2016). In such instances compaction becomes part of the problem and results in overcrowded settlements (Huchzermeyer, 2011).

The debate is far from uncontested and achieving compaction is not a task to be taken lightly. It is also important to understand that improved accessibility is more important for cities than densifying (Boyko and Cooper, 2011:3). Watson (2014) argues that the 'compact city' concept needs to be translatable and flexible enough to suit cities in the global south (Watson, 2014 as cited in Waters, 2016:29). To achieve this kind of development globally, governments require commitment and investment from private sectors and other stakeholders.

2.8 IMPROVING CONNECTIVITY

Developing countries such as Senegal, Nigeria and Brazil have invested heavily in development of public transportation systems, resulting in significant improvement over the years (Mitric, 2013). For people living in urban poor settlements in developing countries, affordable and reliable public transport is the breaking point between being integrated into the city region economically and socially (UN-Habitat, 2013). Equal accessibility and affordability is about connecting areas within the city/town including those that are situated in the periphery.

Transport and mobility demands are treated as a means for enabling people to access other people and places. Convenience and efficiency in travelling has become more critical in urban areas.

Therefore minimizing travel times improves the value of time people spend at their destinations and as well as overall effectiveness. Cross (2008) argues that living in places where there is good access to effective transport and developed urban infrastructure increases efficiency in terms of time spent being productive, either at work/home or taking part in social activities. The United Nations (UN) has observed that; "Mobility is thus properly viewed as a means to the greater end of accessibility" (UN-Habitat, 2013:3).

In developing integrated transport systems, cities are able to provide accessibility to employment opportunities that exist within a city. Beijing is an example of a city that has strategically developed railway and buses to increase accessibility to the numerous districts in the city (Tang, 2006).

One of the most important aspects of accessibility is the affordability of transportation. Affordable transportation allows people, including those living in the periphery with low/no incomes, to afford access to services, activities and opportunities (healthcare, shopping, school, work, and social activities) without feeling economic strain (UN-Habitat, 2013).

Sustainability in urban mobility has grown beyond the focus on ecology, livelihood and the natural environment to include social, economic, transport, movements and flows within an urban setting as well as improving people's lives (UN-Habitat, 2013). A holistic and integrated approach to urban land-use and transport planning and investment is needed if cities are to become socially, environmentally and economically sustainable (UN-Habitat, 2013: 2).

2.9 THE LINK BETWEEN TRANSPORT AND LOCATION

With the innovation of new technologies and telecommunication advances, public transportation can be improved especially in the

remote areas. Geographers and transport planners are now focusing on advanced levels of understanding how history, society, transport, technology and location could be consistent and interlinked in accessibility and mobility improvements (Keeling, 2007).

Recent studies have shown that transportation is interdisciplinary as it focuses on a number of aspects which include; mobility, transport modes, traffic flows and congestion in an urban setting (Shaw and Hesse, 2010). It also extends to other professional fields such as economics, governance and policy making, engineering and urban planning (Shaw and Hesse, 2010). Studies have focused on transport, physical connectivity and access to urban utilities (Simon, 2016: 31).

Links between public transport routes, new developments, location of services and local transport systems need to be planned properly because of their strong correlation which affects the livelihood of daily commuters and their ability to access opportunities (Dempsey *et al.*, 2012; Harrison and Todes, 2013). Planners (developers, transport planners, policy makers and urban designers) need to be cognizant of the social and economic effects that transport systems have on communities. Transport and location are intrinsically linked thus, Rodrigue *et al.* (2006) states that there is a clear correlation between transport and spaces as localities cannot function without transport. Efficient urban transport systems can achieve urban compaction through well linked public transportation, even if urban forms are sprawled (Loo *et al.*, 2015).

2.10 DEVELOPMENTS OF URBAN TRANSPORT SYSTEM

The BRT systems have been introduced in developing countries like Lagos (Nigeria) and Johannesburg (South Africa) (UN Habitat, 2013). According to the UN Habitat (2013) this trend is increasing and spreading to other African cities such as; Dar es Salaam (Tanzania),

Accra (Ghana) and Kampala (Uganda). Public transport service has grown its investments for metro and BRT systems in North Africa and China, servicing millions of passengers in urban areas (UN Habitat, 2013).

Numerous modes of transport operate independently to provide services to commuters around Johannesburg. This includes the Gautrain and BRT- Rea Vaya, Metro Rail, Metro Buses and taxi (GDRT, 2013). These transport modes currently work independently under different authorities, with their own independent structures and no system of integration or coordination. There is a lack of coordination in peripheral areas in terms of access, with fewer options to choose from in relation to modes of transportation (GDRT, 2013). The Gautrain is widely criticized for its route selection, which is not easily accessible and unaffordable to low income commuters.

Urban development and transport policies should be malleable enough to accommodate urban changes and work as a way to improve public and private sector investment in poor communities (Todes, 2006). Poor linkages between different modes of transport and the development of a transport system that is unresponsive to changes results in poor accessibility, whereas accessibility is a product of people's mobility and their proximity to a destination (Brown and Lloyd-Jones, 2002).

According to Mokonyama and Mubiwa (2014) increased mobility encourages access to opportunities within a city, especially for metropolitan cities like Johannesburg. Accessibility to opportunities within a metropolitan region can be achieved through the responsiveness of effective public transportation and encouragement of private and public investment (Mokonyama and Mubiwa, 2014). Balance and a systematic approach needs to be achieved between accessibility, affordability and equity (Manaugh *et al.*, 2015). These

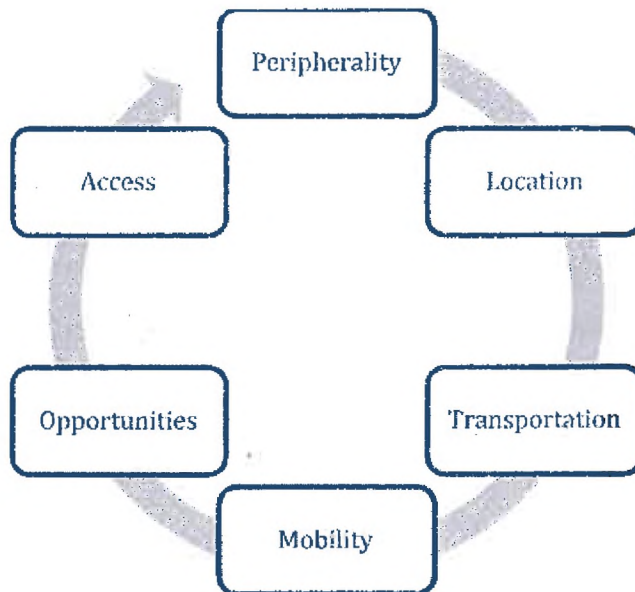
three aspects enable residents to access economic opportunities and services, thus reducing or even preventing social exclusion.

It is critical that the development of public transport systems be integrated in terms of accessible nodes, routes and connections to new developed areas located in the outer city regions. Transformation of peripheral areas can in this way be improved, including the creation of local employment opportunities and through improved access and availability of transportation systems.

In accordance with the UN-Habitat (2013) in many developing countries, there has been a lack of investment in public transportation systems, and infrastructure has been poorly maintained. This tends to affect the quality of service of public transport in developing countries and may in certain instances compromise the health and safety of commuters. Although a public transport system may be beneficial to the environment, economy and the social well-being of cities, investment requirements in developing countries can be very costly, particularly the railway system (UN-Habitat, 2013). According to the UN Habitat (2013) the public transport system has a positive influence for urban cities to maintain a sustainable way of life. Public transportation investment has an economic benefit which includes direct job creation.

2.11 CONCEPTUAL FRAMEWORK

Figure 1: The conceptual Diagram



2.11.1 The Concept of Peripherality

"Peripheral areas are likely to be distant from core areas and markets, have poor or underdeveloped infrastructure and low levels of connectivity. Residents are likely to have lower levels unemployment and underemployment with poor working conditions" (GCRO 2017: 14).

The concept of peripherality, what it means, how it is applied and understood is often subject to much debate (Harris, 2010 and Todes, 2014 as cited in Andreassen, 2017). Peripherality, as a concept, examines the location of people in areas far from concentrated employment and the implications it has for them in relation to services as well as employment opportunities.

According to Harris (2010) it is important to take into account the reasons and experiences of residents, as a primary point of departure,

when investigating or understanding urban expansion and population growth in the periphery. Low cost housing supply in South Africa is continuously increasing and tends to be situated on the periphery (Todes, 2003).

According to Todes (2014 as cited in Andreassen, 2017) there are various influences in urban expansion and the transformation of cities, including cheaper land costs, access to more space at a lower cost, urban planning and development projects. Peripheral areas are formerly rural land where it is continuously developed and incorporated into the urban area (Andreassen 2013 as cited in Andreassen, 2017:2343).

Geyer et al., (2015: 22) argue that:

In Gauteng, as with many developing countries, there are significant spatial inconsistencies between economic and population concentrations. Poverty leads to density, in order to maximize occupation of land at locations where land is cheaper, remote from economic centres, leading to high spatial segregation of population.

The GCRO report (2017: 9) highlights that:

Residents in the periphery are spatially marginalized and frequently lack connectivity, people located in the periphery travel to core areas for work, to look for work, to shop and yet they have less access to public transport and infrastructure.

According to Turok (2015) the location of the megaprojects in urban areas is a concern which is against the objectives of the urban agenda, which include urban compaction, integration and locating new housing projects on well located areas within cities where public transportation systems connect to other places as well as employment

nodes. "The building of housing projects in isolated Greenfield beyond the city boundaries has had negative effects on cities" (Turok, 2015:1). One of the problems associated with the location of low cost housing/RDP housing on the periphery is the entrenched apartheid spatial patterns of placing the poor in isolated locations (Turok, 2015: 4).

Brown and Lloyd-Jones (2002:193) further highlight that recent development trends, particularly in fast growing cities often exclude the urban poor by escalating land prices and unregulated development as shortages in the supply of serviced land, forcing poor households to seek affordable land on the edges of the city. This trend is intensified by "relocation of informal settlements and the high value of land in central cities causing concentration in peri-urban fringe, spreading into agricultural land" (Brown and Lloyd-Jones, 2002:193).

Policy goals for delivering as many houses as possible to previously disadvantaged groups and immigrants have contributed to the development of housing projects located on the peripheries. They have been viewed by some as unfavorable and unsuitable due to the perception that they promote poverty, since there are few economic activities and low levels of service delivery in these areas (Cross and Venter, 2011). According to Behrens and Wilkinson (2003:156) "The implementation of the subsidy scheme has in some respects perpetuated apartheid city structures, and the inequalities and inefficiencies they impose".

According to Biermann and Van Ryneveld (2007) in 1996, government figures showed that over two million households had no access to suitable houses. The backlog of housing delivery has been a major issue for government and the Human Settlements department, which implies that planning for sustainable housing needs to be implemented carefully and effectively (Biermann and Van Ryneveld, 2007).

Infrastructure provision tends to be costly for peripheral locations and therefore becomes a financial burden for residents and service providers. Poor people who earn low incomes are marginalized in terms of access to jobs, services, transport and social networks (Biermann and Van Ryneveld, 2007). They spend a lot of money and time on transportation. According to Behrens and Wilkinson (2003:157) poor mobility has a major effect on the peripheral located households, with regards to travel patterns, use of their time and finances. This frustrates the aim of achieving urban densification and integration (Harrison and Todes, 2016). Peripheral locations have been found to be a burden for the poor due to expensive transportation costs (Biermann and Van Ryneveld, 2007).

Biermann *et al.*, (2004) put forward a different argument. They argue that peripheral locations have some benefits in terms of space and are cheaper to rent. When analyzing accessibility, costs and the provision of resources in locations, one has to take into account that benefits and opportunities differ across neighborhoods and what they have to offer in terms of the lifestyle, environmental benefits and economic/business activities (Biermann *et al.*, 2004). Therefore locations need to be assessed individually and according to the residents' ability to access services, transport, employment opportunities, resources and urban amenities. This is particularly the case as cities become polycentric with a variety of economic centres.

2.11.2 Implications of Polycentricism

Employment opportunities in cities like Johannesburg have dispersed throughout the region with less concentration and congestion in the city center. Ingram (1997 as cited in Lin *et al.*, 2012) argues that the connection between urban spatial structure, location of jobs and commuting patterns in both developed and developing countries have implications for people's lives and their ability to access

opportunities. People's commuting patterns are determined by the location of job opportunities and the time spent travelling to those places is a fundamental issue.

According to Lin *et al.*, (2012: 2)"the polycentric city includes a traditional business core, a secondary business core, a tertiary business core, an outer edge city, and specialized concentrations".

Lin *et al.*, (2014; 4) further observe that:

Suburbanization, as the main mechanism in developed countries, has successfully altered roadway demand to routes with less congestion and away from central areas. With industry moves to the suburbs, the labour force has tended to follow, which has allowed employees in some cases to enjoy reduced commuting times and costs

Geyer *et al.*, (2015: 20) puts forward that "modern transportation allowed the decentralization not only of labour but also of business, while retaining many of the benefits of agglomeration, resulting in multi nodal cities". According to Parr (2004 as cited in Geyer *et al.*, 2015) polycentrism is commonly defined in terms of the level of interaction between centres. In the South Africa context, polycentrism would be relevant in a city-region like Gauteng with distinct growth cores based on a diversity of economic and service activities.

According to Geyer *et al.*, (2015) Gauteng displays a complex spatial distribution patterns and population growth adds to that complexity. Geyer *et al.*, (2015:20) further highlights that commuting patterns in the Gauteng region have demonstrated a measure of functional polycentricism, based on transport infrastructure development, axial development, labour and economic concentration disparities.

According to Lin *et al.*, (2012) in cities of developed countries, city centres, mixed land uses and residential densities influence people's commuting distances. Cervero (1996 as cited in Lin *et al.*, 2012: 9) highlights that nearby commercial land uses in developed countries are associated with short trip distances among residents of a mixed land use area.

2.11.3 Public Transportation and Mobility

"Limited mobility contributes to several social problems in poor communities including unemployment, social isolation and poor quality of education" (Pacetti and Trittipo, 2010:6).

The basic function of urban /public transport is to link people, residences and places of employment, producers and users of goods and services (Biermann and Van Ryneveld, 2007). Simon (2016) acknowledges that transportation determines how people are able to access such destinations efficiently. According to Biermann and Van Ryneveld (2007:196) accessing locations and mobility is affected by factors including; income, availability of transportation and its affordability.

Transportation contributes to social, political and economic growth and development of a country (Musekene, 2010). Many researchers have provided insight into the relationship between transport, mobility and debates surrounding the contribution of transport infrastructure to development (Musekene, 2010). According to Brown and Lloyd-Jones (2002: 189) "the mobility of the poor is constrained by lack of access to affordable transport, which may limit the extent to which they can access resources". Transport acts as a fundamental element for development, thus public transportation is important for development but not necessarily a predominant factor for development (Keeling, 2007; Rodrigue *et al.*, 2006, Musekene, 2010).

Keeling (2007) acknowledges that transport systems contribute to development. He also observes that transport systems cannot operate in isolation, that they are affected and influenced by other factors that encourage economic activity and social transformation. Investments in public transport could have a number of economic benefits, including savings on traveling time, reduced traffic, and improvements in transit orientated development (Musekene, 2010; McGaffin and Gavera 2012).

Transportation allows people to have access to resources which may improve their lifestyles. Transport systems ought to provide a positive response to affordable travel as well as benefits from the opportunities presented by mobility with increased accessibility (Button, 1993). Where an efficient transport system does not exist, mobility is restricted and this may result in social exclusion throughout the city (Chakwizira *et al.*, 2011).

Chakwizira *et al.* (2001) posits that places where there are efficient and reliable public transport systems and sufficient mobility, tend to become vibrant. Increased mobility can also enable people to move easily from areas located outside the city to the metropolitans. Therefore transport plays a significant role in both social and economic development (Musekene, 2010).

2.11.4 Access to Opportunities

"The extent to which land use and transport systems enable individuals to reach activities or a destination by means of transport modes" (Geurs 2004:127).

This definition clarifies the concept and the importance of accessibility and the need for sustainable transport system. Transport and accessibility are linked because public transportation provides access to services and opportunities (Sohail, Maunder, and Cavil, 2006).

Accessibility plays a critical role in the economic growth and development of cities. Simon (2016: 29) considers accessibility to refer to the ability of individuals to participate in necessary activities and income opportunities. Areas that are centrally located are more accessible than those situated further from the metros and because of effective transport and less travelling distances these locations will have higher land values and are considered ideal places to live and work. Improved access to transport results in improved employment opportunities and subsequently increased access to markets for the poor (Tiawoun, 2000; Sohail *et al.*, 2006).

"Inaccessibility emerges as a major cause of social exclusion in studies of the poor in urban areas" (Gwilliam 2002:1). Inaccessibility, inefficient transport systems and the location of people are among the many challenges faced in developing countries (Simon, 2016). Lack of accessibility may contribute to several social problems including uncompleted education, unemployment, social isolation, ill-health and inequality resulting in economic costs. A balance between social and economic development needs to be maintained for cities to successfully achieve transformation and development goals.

Accessibility also influences travel demand, social and economic opportunities and amount of time required to explore opportunities (Geurs and Wee, 2004). According to Simon (2016: 35) accessible cities should permit easy access for all urban residents to critical services and opportunities that a city has to offer.

2.12 CONCLUSION

In developing effective transport systems cities around the world can increase accessibility to economic and employment opportunities. Cost of travelling from peripheral areas has raised concerns regarding connectivity to other areas (in terms of access and mobility demands)

and how these enable (or prohibit) people in peripheral areas from accessing employment opportunities and services. Population growth is a reality that needs to be faced globally and has resulted in a high demand for low income housing.

Access is often a problem in poorly located areas because facilities and services are too distant to reach or too expensive to afford (Brown and Lloyd-Jones, 2002). According to Biermann, Van Ryneveld and Venter (2004) the cost of services and infrastructure is higher for peripheral areas, thus compounding the challenge on the part of the state to provide services in these locations.

Biermann, Van Ryneveld and Venter (2004) puts forward the view that employment opportunities, commuting patterns, efficiency, accessibility, and affordability of existing and proposed transport network systems should speak to the needs of people located in the periphery. In poor areas, household access to services and opportunities is usually a challenge because of public transportation issues and poor location. It is evident from the literature that a lack of transport infrastructure could result in a slow pace of development and growth of an area. Having provided an overview of the respective theories whose purpose is to expand the theoretical framework of this study, the following chapter proceeds to consider research methods which are relevant for the study.

CHAPTER 3: RESEARCH METHODS

3.1 INTRODUCTION

The objective of this chapter is to provide an outline of methods used to conduct empirical investigations for the research. In order to achieve the objectives, qualitative and quantitative research methods were used.

Research is the "systematic investigation and study of materials and sources in order to establish facts and reach new conclusions" (Oxford Dictionary, 2013:771). According to Cooper and Schindler (2006) research is a systematic endeavor that seeks to provide in-depth answers, building on from previous research or opening opportunities for new research questions.

According to Henning, Van Rensburg and Smit (2004) research methodologies can be described as the philosophical framework within which the research problem is framed and structured. Particular research methods further guide the research study through selection of participants, data-gathering and analysis techniques. The research methods used captures the participants' general perspective about certain issues, the manner in which they view experiences as well as their surroundings (Salkind, 2003).

This chapter describes and justifies the selection of a mixed methods approach for data collection as appropriate for this study. The section below describes the mixed methods research approach which includes surveys, interviews and discussions with respondents on site. Interviews with the key respondents and the rationale for the purpose of a mixed methods research approach used is discussed.

3.2 LUFHERENG AS A CASE STUDY

For the purpose of this study, a case study approach was used, focusing on the Lufhereng development.

3.2.1 Case selection

Case studies are a common way of conducting a qualitative inquiry, analytically or holistically by using mixed methods or whichever method the researcher chooses (Stake, Denzin and Lincoln, 2005). Teddlie and Tashakkori (2009: 25) explain that; "data collection of a case study involves a variety of sources that may include quantitative data relevant to the case being studied". The authors continue to state that this involves a process of "developing an in-depth analysis" of a case that is being studied.

Breakwell, Fife-Schaw and Hammond (2000: 2) further explain that case studies may be defined as "retrospectively written reports of observations or opinions made by individuals, who may raise questions that can initiate new research or responses to certain behavior." Different disciplines have different interpretations of what a case study is and how it is used in research. Burton (2000) suggests that case studies can be seen as detailed investigations of an event or problems which allow the researcher to demonstrate the operation of some identified theoretical principal.

A case study can also be viewed as a detailed investigation of events or a description of people's behavior, history and response to circumstances which the researcher seeks to reveal or explore using theoretical principles (Burton, 2000). Burton (2000) further explains that case studies are also empirical enquiries that explore an identified phenomenon in context and make use of multiple sources to examine findings. Case studies are investigations of real life events and may include people's daily lives and their behavior, neighborhood changes

as well as political stances. Shaw (1999) states that case studies are flexible, descriptive and unique entities which may consist of situations, people or organizations to be explored. According to Schostak and Schostak (2008:12) case studies are essential because circumstances and events that have taken place can be elaborated in detail while describing the respondent's interactions, intentions, behavior, beliefs, values and interests.

For the purpose of this study, findings from similar case studies were used as a secondary source against which the material from the Lufhereng case study project was considered. This includes, for example, places within eThekweni municipality (Cato Manor and Quarry Heights), the City of Johannesburg (Alexandra, Diepsloot and Cosmo City). The case studies have investigated accessibility, affordability and peripherality of these areas in relation to places of employment and services. Existing information from these low cost housing projects, drawing from the literature, was used in the construction of the approach and later for discussing findings on the study.

3.3 RESEARCH METHODS AND METHODOLOGY

According to Fraenkel and Wallen (2010), even though quantitative and qualitative research methods are different, they can be combined in whichever way that is suitable for conducting a research study. Qualitative research approaches apply philosophical methods which are not formalized. This approach is entrenched in the belief that reality is socially constructed and aims at uncovering what lies beneath the surface of the phenomenon that is being investigated, while seeking to understand perceptions of the participants involved (Airasian, Gay and Mills, 2010).

Airasian, Gay and Mills (2010) emphasize that quantitative research methods consist of the collection as well as analysis of highly formalized numerical data which is explicitly controlled to describe, explain and predict phenomena of interest. It is primarily embedded in positivism which embraces that reality is objective and measurable. Unlike qualitative research, it is aimed at an objective analysis to ensure that the information obtained from participants is reflected correctly. Given that this study will be fusing both quantitative and qualitative elements, a mixed methods approach is more appropriate.

3.3.1 Qualitative research

According to Creswell (2013) qualitative research is an approach which aims to explore and understand the significance of individuals' attitudes and behavior to a social or a human problem. He further explains that this process involves developing questions and procedures, collecting data from participants' settings, analyzing that data, and interpreting its meaning. Qualitative interviews are usually unstructured, general and less direct. Qualitative unstructured interviews are usually conducted in an individual setting or a group setting (Tashakkori and Teddlie, 1998).

Best and Kahn (2003) describe the qualitative research approach as a process of gathering data, whereby participants provide information from their own views. Participants attach their own behavior, experiences, perspectives as well as their interpretation of different situations (Woods, 1999).

This research approach usually discloses situations and experiences as understood by participants. This type of research can consist of either present or past findings (Salkind, 2003). Qualitative research is a realistic enquiry, which encompasses non-interfering data collection approaches to capture the real-life stories and events naturally. Salkind (2003) explains that qualitative research is critical when examining

human behavior, social, cultural, and the political setting as and when it occurs. According to Henning, van Rensburg and Smith (2004); Flowerdew and Martin (2005) this type of research may assist in interpreting the manner in which participants behave in their natural setting by describing and explaining what they feel and think about it.

According to Wilson (1997) qualitative research involves non interfering data collecting strategies to capture the natural flow of real life events and processes through semi structured or structured interviews, observations and questionnaires containing open-ended questions. Both quantitative and qualitative research methods may be utilized together to enable flexibility. Qualitative research methods in this study were used to gather information on experiences, opinions, and the perceptions of household respondents, commuters who use public transport and to draw conclusions as to how public transport affects their daily lives in accessing employment opportunities and other places throughout the metropolitan region.

3.3.2 Quantitative research methods

Creswell (2013:4) describes this research approach as testing objective theories by examining the relationship among variables which can be measured, analyzing numerical data using statistical procedures. Quantitative research involves one or more variables of interest as well as controlling these variables to draw out conclusions from the data (Leedy and Omrod, 2010). The aim of quantitative research is to draw an objective analysis to ensure that information collected from participants is reflected correctly and honestly.

Quantitative methods focus on gathering numerical data and generalizing it across groups of people to explain a particular phenomenon. The researcher needs to determine the relationship between an independent variable and a dependent variable or an

outcome within a population (Babbie, 2010). Quantitative research methods can be either descriptive or experimental (Thomas, 2003). For the purposes of this study quantitative methods were descriptive.

For the purposes of this study, quantitative data was derived from the household survey. According to Thomas (2003) careful sampling is an aspect of quantitative methods aimed at producing generalizable results. Questionnaires were used to collect data and to draw information from the participants. The process of data collection and the nature of the questions asked to household participants is explained below under household survey. Quantitative interviews are more structured and often closed ended questions are asked to allow for coding and analysis of large samples.

3.3.3 Mixed methods

A mixed research design was chosen; secondary sources were collected and both qualitative and quantitative research methods were used. Usually qualitative data collection involves open-ended questions and responses while quantitative data consists of closed-ended questionnaires and responses from the participants. Early literature in the 1990's supposed that all methods had weaknesses and some form of bias, therefore a mixed methods data collection approach was observed to neutralize these weaknesses (Creswell, 2013).

3.4 POPULATION AND SAMPLING

Bless, Higson-Smith and Kagee (2006) describe the population of a research study as the complete set of events and people, finding application in the research findings. Sampling refers to participants or respondents chosen from the larger population and used to obtain data for research (Travers and Cooper, 1996).

3.4.1 Population

Polit and Hungler (1999:37) describe population as an aggregate or all the objects, subjects or members that conform to a set of specifications. Similarly, McMillan and Schumacher (2010) define population as a group of elements, cases or events which interest the researcher for a study and conform to specific criteria. The population used is explained further in the research design section below, under each study undertaken in the research which includes; project managers, households, taxi drivers and commuters.

3.4.2 Sampling

Sampling means selecting a subset of a population to participate in the study and considering it to be a representation in the research. Arasian, Gay and Mills (2009) describes a sample as extracting a fraction of individuals from the greater population of the study in such a way that those individuals represent the larger group from which they were chosen.

In light of approaches described above, the next section discusses the sampling methods and data collection procedures specifically applied in this study.

3.5 DATA COLLECTION PROCEDURES

For this study four data collection methods were used for all the research studies (taxi drivers, commuters, project managers and households) so as to allow baseline analysis for findings. Semi structured and structured face-to-face interviews, questionnaires, unstructured observations and statistical data/evaluation of documents were used to collect information. Interviews are frequently used in social research

as a method of collecting data and often used in qualitative rather than in quantitative research studies.

A questionnaire is one set of questions that is designed for participants to respond to each question honestly and openly (Neuman, 2000). According to Airasian, Gay and Mills (2009) questionnaires are tools which attempt to receive comparable data from all participants partaking in the sample through answering the same questions. Similarly to interviews, questionnaires may also cover a variety of issues and comprise different forms, for example open and closed-ended questions (Tashakkori and Teddlie, 1998).

In large scale survey studies, questionnaires are often read to participants to accommodate those who cannot read and write (Tashakkori and Teddlie, 1998). Open ended questions assist in determining how people feel about certain issues, gaining insight of experiences as residents in the area and establishing people's behavior regarding troubling issues and concerns. This aspect is important for the purpose of the study because certain issues can only be expressed by participants through their views, experiences and opinions. How these approaches were applied is discussed below.

3.6 RESEARCH DESIGN

For the purpose of this study, the Lufhereng development project was used as a case study for the research. Two project managers were interviewed as key informants in the study as well as 40 households. A small number of interviews (with 2 taxi drivers and 3 commuters) were undertaken. The interviews consisted of closed and open ended questions. The studies undertaken for this study are as follows:

3.6.1 Key Respondents Interviews with Project Managers

In-depth interviews “are used to determine individual's perceptions, opinions and their reactions to initial findings and potential solutions” (Vos *et al.*, 2002:298). The researcher sent a questionnaire with open ended questions before the interview commenced to two project managers involved in the Lufhereng housing development project from the Urban Dynamics and City of Johannesburg Housing Department in order to gain insight into departmental future plans and employment opportunities. This allowed respondents to express their views regarding the project, plans and provide further views on any aspects of the project.

Documents containing information about the growth plans of the project were collected from the project managers (empirical primary and secondary research) and used in the construction and subsequent findings of this research project.

The 2 project managers were asked the following questions (refer to the Appendix C for the list of questions asked):

1. What the project was about and who it targeted
2. What the economic interventions are currently being employed to promote job creation in the area.
3. How well linked public transport systems are to the area.
4. Whether Lufhereng is accessible in terms of employment, services and employment opportunities.

In this way, the interviews took the form of unstructured open- ended questions to allow the participants to respond using their knowledge and experiences. This also allowed the key respondents to reflect on their own thinking and knowledge rather than being restricted by the interviewer through close-ended questions.

3.6.2 Household Interviews

The household's interviews consisted of a joint questionnaire of 40 households undertaken with another student. The questionnaire consisted of common questions as well as more detailed questions from each researcher. Household interviews took the form of structured open-ended interviews to allow the participants to respond using their knowledge about the household as well as their personal opinions. This also allowed the household member interviewed to reflect on their own experiences. The researcher allowed the household member interviewed to reflect and share their personal views in detail to the questions posed to them. The 40 households that were interviewed were asked the same questions with 20 containing more detailed questions on housing and the other 20 with more detailed questions on access and transportation.

For purpose of this study, the interviews and the questions asked focused on transportation and access. The survey focused on the geographical location of employment opportunities and schools, total cost of travelling per household, as well as the duration of time spent travelling. Even though forty participants may not be representative of the whole population, the sample size provided insight into the experiences and opinions of people who reside in the area.

Data collection procedures

The households were selected using a grid method; a grid was drawn and placed on a map of the area, within each grid/block three houses were selected to participate in the study. If a house was empty or people were not interested in participating, a neighboring household was selected. The aim of the interviews was to provide the researcher with insight into participants' experiences, feelings and attitudes regarding transport access, routes, timeframes and distances for household members who travel to work or school.

Data was collected using a quantitative survey of households, more structured and some closed ended questions were asked using face to face interviews. The household survey contained both closed and open ended questions to encourage the respondent to answer questions fully using their own knowledge, perspective and experiences and to also allow the researcher to probe more where answers were not clear. Data collection methods were used to allow baseline analysis for findings and to uncover results.

Participants in the study

The 1st – 10th of November 2016 was allocated to for conducting the survey at Lufhereng. Residents, who participated in the survey, referred to as participants, were approached door to door in their households and requested to participate in the study. A total number of 40 residents/households were interviewed. One household member over the age of 21 years was interviewed in each household. Participants were asked questions details about other members of the whole household.

Household's questions asked included the following (refer to Appendix D for the questionnaire and the list of questions).

1. Household members who are employed or schooling
2. Where they are employed or go to school (geographical distances)
3. The modes of transport used by each member of the household travelling to school/work
4. The monthly travelling costs for each household member and the total for the whole household
5. Time spent travelling to work/school for each household member
6. The members of the household who travel to look for work, the geographical location, how often and the cost of travelling looking for work)

7. Household members who work from home/self-employed or not looking for work
8. Total household income
9. The headship of the household
10. The ages of each member of the house

Analysis of data

According to Neuman (2000:426) "data analysis involves searching for patterns in raw data". It is important for the researcher to develop a system that will help in analyzing the collected data. Data collected from household interviews was interpreted according to themes derived from the findings of the research, and identified in order to extract the important aspects of the participant's experiences and perspectives. Meaningful themes were discussed, which included; the number of household members who use public transport to commute to work/school, the geographical location of work/school, total household income, where household members were located previously, their personal experiences as residents of the area in relation to transport and access, household travelling costs and age groups.

3.6.3 Taxi Drivers

Data collection procedures

Two taxi drivers were interviewed face to face and asked open-ended questions relating to routes, costs, and flexibility of changing routes to accommodate residents. Questions regarding the efficiency and reliability of taxis in the area were posed. The objective the study was explained by the researcher before the interview commenced and the key respondents gave permission to the researcher to proceed.

Participants in the study

The criteria used for selecting taxi drivers was due to the fact that they operate in Lufhereng, transporting residents to neighboring areas or towns. Only taxi drivers who were willing to partake in the study were interviewed. A few taxi drivers were approached to participate in the study but only two taxi drivers were interested in participating in the research.

3.6.4 Commuters

Data collection procedures

Primary information was obtained from the interviews, informal conversations with residents also referred to as commuters.

Participants in the study

Research participants were asked questions relating to their commuting patterns and the duration of the trips to their destinations. Commuters who were also local residents in Lufhereng were approached at the taxi rank for a brief interview regarding the routes they use and the affordability of public transport from where they reside to places of employment or services.

No specific criterion in relation to race and gender was used in the selection of participants. Three female commuters were willing to participate in the study and were interviewed at the taxi rank while they waited for their taxis to be full. The commuters were asked short conversational questions relating to affordability, efficiency and accessibility of taxis and their usual commuting patterns

3.7 AUTHENTICATING THE STUDY

The primary goal of the researcher is to present information that is truthful, which is fundamental to legitimacy (Patton, 2002). Validation of research findings assists in assuring the researcher regarding the

accuracy, reliability and credibility of the information. According to Neuman (2000:171) "Authenticity means giving a fair, honest and balanced account of social life from the viewpoint of someone who lives it every day".

Reliability of information is critical in a qualitative or a quantitative study as a substitute to internal validity. "The power of a qualitative study that aims to explore or describe a setting or a problem, a process, or a pattern of interactions will be its validity" (Vos *et al.*, 2002:351).

The researcher presented the findings for the study, how participants were chosen and interactions with participants were unique and unpredictable. In-depth interviews with the key officials, household members, commuters and the taxi drivers were recorded, compared and checked with the draft written copies for validity and dependability.

3.8 ETHICAL CONSIDERATIONS

In accordance with the University of the Witwatersrand's policy on research ethics, the dignity, rights and well-being of participants interviewed is protected and anonymity ensured (where specifically asked for), therefore all risks to violation of policy were minimised.

Conducting an investigation in an ethical manner contributes towards ensuring that the research is reliable and valid (Merriam, 2002). It is of utmost importance that the researcher ensures the protection of identities of respondents who participate in a study and ensure 'informed consent' by explaining the process in a language understood as well as maintain effective communication and transparency throughout the interview process. This aspect was explained to participants in detail before the questions were asked; Participants were asked to sign a consent form refer to consent forms in

the appendix. The proposal and all the forms were submitted and given ethical approval by the school's ethics committee.

3.9 CONCLUSION

This chapter identified the research methods used in the study and the rationale for the selection of methodologies. Qualitative and quantitative data analysis was discussed and explanations were provided on how information attained from the questionnaires was validated and authenticated.

The data capturing process was put forward and clarified after the population and sample for the study were identified and explained. Purposeful sampling was used in different studies which included; households, taxi drivers, commuters and project managers.

Explanations on how participants were interviewed in this study were given as well as the process of selection. Elements of the Lufhereng case study and how the survey applied the mixed method structure as well as applicable data analysis techniques were explained. Growth plans of the settlement and the context is discussed in the next chapter.

CHAPTER 4: DISCUSSION OF THE CONTEXT AND GROWTH OF THE SETTLEMENT

4.1 INTRODUCTION

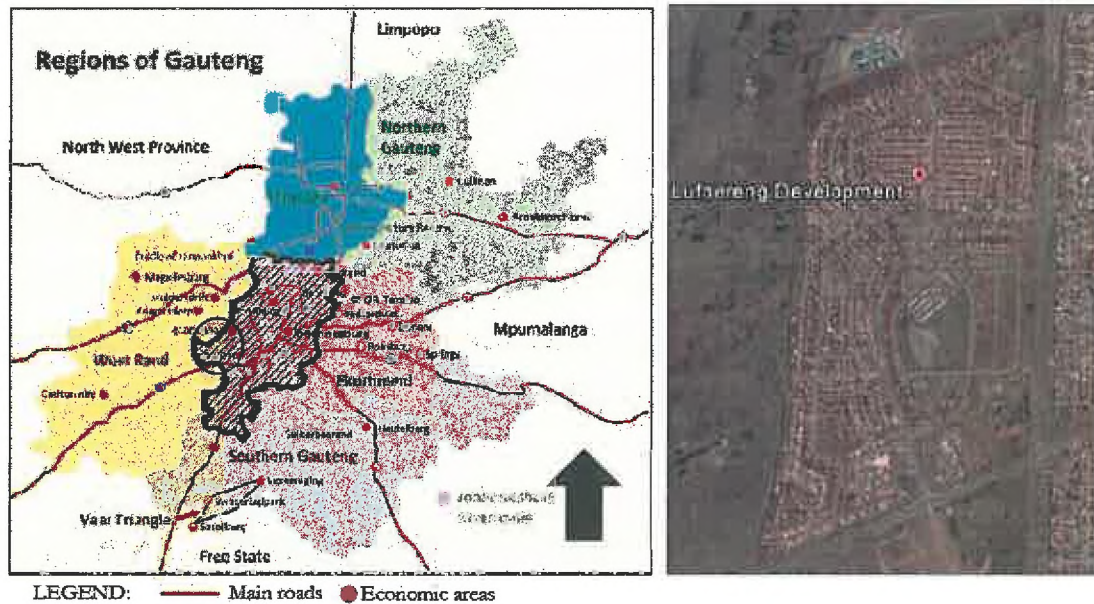
The chapter explores context to the city of Johannesburg and Gauteng. A brief background of the metropolitan's demographics, spatial structure and the direction of spatial changes over the past 20 years is provided. The chapter further discusses the history of Lufhereng as well as growth plans; connecting transport routes and proposed economic development.

Through the use of maps and figures this chapter locates Lufhereng in relation to the city's economic development, accessibility of resources as well as geographically locating employment opportunities for different income groups. It also shows road links and connections to the city region. The chapter concludes with an analysis of the current status of the area, social changes and expectations.

4.2 BACKGROUND OF THE CITY OF JOHANNESBURG

According to Census (2011) the city of Johannesburg is the largest city in South Africa with an estimated population of 4.4 million residents. It remains a rapidly growing city in the country with an estimated growth rate of 3.18% from 2001 -2011. Spatially, densities differ between locations and income groups. The highest densities are found in the city's informal settlements and in some parts of the inner city. According to Tomlinson (1999) spatial rearrangements and development has occurred at a great pace in Johannesburg, especially outside the CBD. However, the city has not matched the pace of the development occurring on the north.

Figure 2: Location of Lufhereng on a Regional Scale



(Source: www.joburg.org.za)

Housing development projects in South Africa previously faced various challenges which included land shortages, limited RDP housing options, dysfunctional settlements and mobility issues (CoJ, 2013). National policies and budget allocation have been struggling to resolve the changing nature of increasing housing demand derived from rapid urbanization pressures particularly in the metropolitan cities like Johannesburg (CoJ, 2013). To respond to the housing delivery challenges revised methods were established to find appropriate ways to deal with these issues (CoJ, 2013).

According to Bremner (2000: 186) "the city's image was exclusively celebratory of white dominance and brushed aside the alternative black experience of the city". In the early 1980's during the time of the city's centenary celebrations, a shift occurred where black people gradually moved from the townships into the inner city and the inner city suburbs (Bremner, 2000). According to Morris (1996) by 1986 the majority of the black populations within the inner city were living in

Hillbrow, and migration to the inner city has increased rapidly since then. In the mid- 1990s changes were accelerating, by then apartheid laws relating to racial segregation had become irrelevant.

4.2.1 Migration Patterns

During the apartheid period, racial policies such as the Group Areas Act prevented black people from moving to inner city areas, forcing people to stay in rural areas and townships where service delivery, infrastructure and employment are a huge problem (Kok, 2003). Previously disadvantaged areas continue to experience challenges and vulnerability. This has resulted in migration to urban areas and within these, to former white, colored and Indian areas post 1994 to improve the quality of their lives. Between 1992 and 1996, Gauteng has been the most preferred province to migrate to compare to other provinces in South Africa (Kok, 2003).

The high growth rate in Johannesburg is due to migration into the city together with the disintegration of rural economies which has caused high unemployment. The migration of the population to cities has resulted in high urbanization causing rapidly growing and overcrowding cities, which has also resulted in increasing housing demands and a slow delivery rate. The city of Johannesburg, as one of the major metropolitan and the most populated, is facing the challenge of addressing the backlog issue and delivering housing programmes.

4.2.2 Spatial Structure and Changes in Johannesburg

Some of the developments include low cost housing on the periphery, multi-nodal city as well as the growth of mixed-use and densification in the inner city (Todes, 2012). Informal trading in the City of Johannesburg was one of the changes that expressed de-racialization

and “desegregation of urban spaces” and as a symbol of the end of apartheid (Bremner, 2000: 187).

Although much has changed in terms of desegregation in the north, spatial divisions still exist in some areas with different income groups and class imbalances (Todes, 2012: 158). According to Bremner (2000) by 1990's it became evident that the shape of the inner city of Johannesburg was changing with street trading.

The inner city started to take a different shape with foreign inflow from different places all around the continent as well as a significant number of black South Africans (Tomlinson, 2003). Further demographic shifts occurred in the 2000s as more Africans arrived in the inner city. They are often blamed for informal trading sectors and the deterioration of the physical environment in the inner city Simon (1998 as cited in Bremner, 2000). Johannesburg inner city has always been a place for employment and opportunities for the black population even though they were not allowed in the inner city during apartheid. Economic and employment opportunities, as well as tertiary business sectors to this day occupy areas such as Fourways, Sandton and Midrand. As a result, these areas have developed rapidly in a short period of time. Meanwhile low income housing schemes are placed on the peripheries with low infrastructure investment (Todes, 2012).

4.2.3 Unemployment

According to Beall, Crankshaw and Parnell (2000:6); Stats SA (2011) the level of unemployment in Johannesburg decreased up to (37.4% in 2001 and 25% in 2011) but not for the residents located in Lufhereng, while, population growth increased (3 226, 055 in 2001 and 4 434, 827 in 2011).

The lack of formal employment in urban low income households results in vulnerability, urban poverty and deprivation of basic services. Studies have indicated that residents in informal or low income households adopt survival strategies like selling fruit and vegetables, renting backyard rooms and the like (Beall, Crankshaw and Parnell, 2000). Soweto was established as one of apartheid regime's relocation townships in the 1950's and is now the most densely populated township in Johannesburg.

The levels of formal or regular employment opportunities in Soweto are very low despite entrepreneurship and transformation of spaces to provide income (Todes, 2012). Soweto produces only 4.6% of Johannesburg's economic output. Although developments like the Lufhereng mixed use project are located within existing townships, they are still located on the periphery because of lack of economic activities in the area. Places like Lufhereng attract large numbers of low income residents and the biggest challenge in such areas is low levels of job opportunities.

4.3 GROWTH AND DEVELOPMENT PLANS OF LUFHERENG

4.3.1 Background of the Settlement

Lufhereng is an example of one of the largest mixed integrated housing developments in Gauteng undertaken by the City of Johannesburg. It is one of the newest housing developments and is still in its early phases in terms of projects. The housing development is an extension of Soweto, situated on the south-west of Johannesburg CBD with an estimated population of 858, 644 in 2001 and 1,271,628 in 2011 (Stats SA, 2011). Two farms have been converted to accommodate the Lufhereng development; the Doornkop 239 IQ Farm and Zuurbult 240 IQ Farm. The development project is situated on the west of Soweto because of the size (1,800ha) of this site to accommodate the

large housing backlog from the Greater Soweto (Urban Dynamics, 2008).

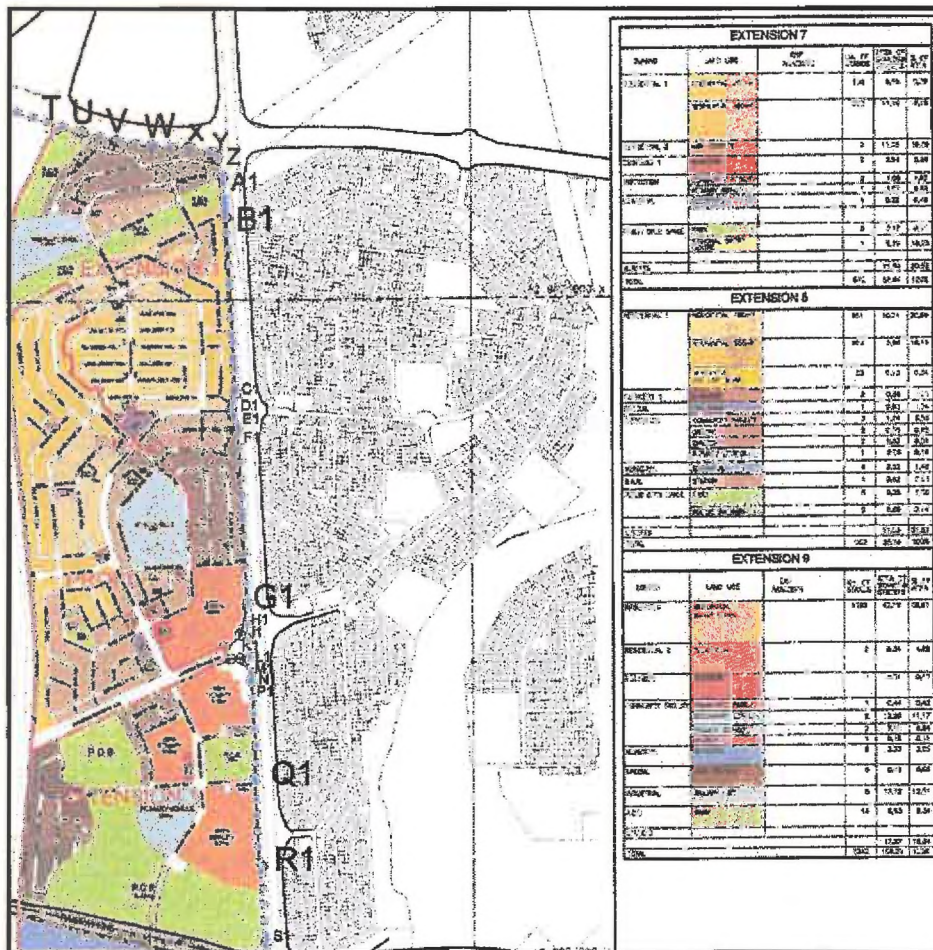
Lufhereng is located to the north of Protea Glen and south of Slovoville forming a western extension to Soweto. It was planned to physically, socially and economically integrate with Soweto (Urban Dynamics, 2008). Lufhereng was formed and established by the City of Johannesburg as a large scale mixed housing project. According to Urban Economics (2014) the mixed-use housing development is an approach that is currently being implemented in the area which aims to deliver mixed integrated houses with efficient residential environments including housing options for different income groups, a variety of socio-economic facilities and other land uses associated with sustainable urban green spaces such as; schools, agricultural land uses, municipal, shopping centres, clinics and public open spaces.

4.3.2 Current Housing Types and Characteristics of the Households

The project started in 2008 and thus far 1st phase of the project has been completed, delivering RDP housing so far, as presented in map 2. Phase 1 delivered detached, semi-detached and row housing with 1832 subsidized housing units in 2012. The second phase of the project was launched in 2014 with the completion of one primary school recently built (the high school is not formally built as yet).

Part of the second phase included servicing 2176 housing stands, finalization of Johannesburg's Social Housing Company (Joshco) high density housing scheme to deliver 660 SHRA (Social Housing Regulatory Authority) and providing 112 subsidized housing units and 30 military veteran housing units.

Figure 3: Lufhereng Completed Phase 1A

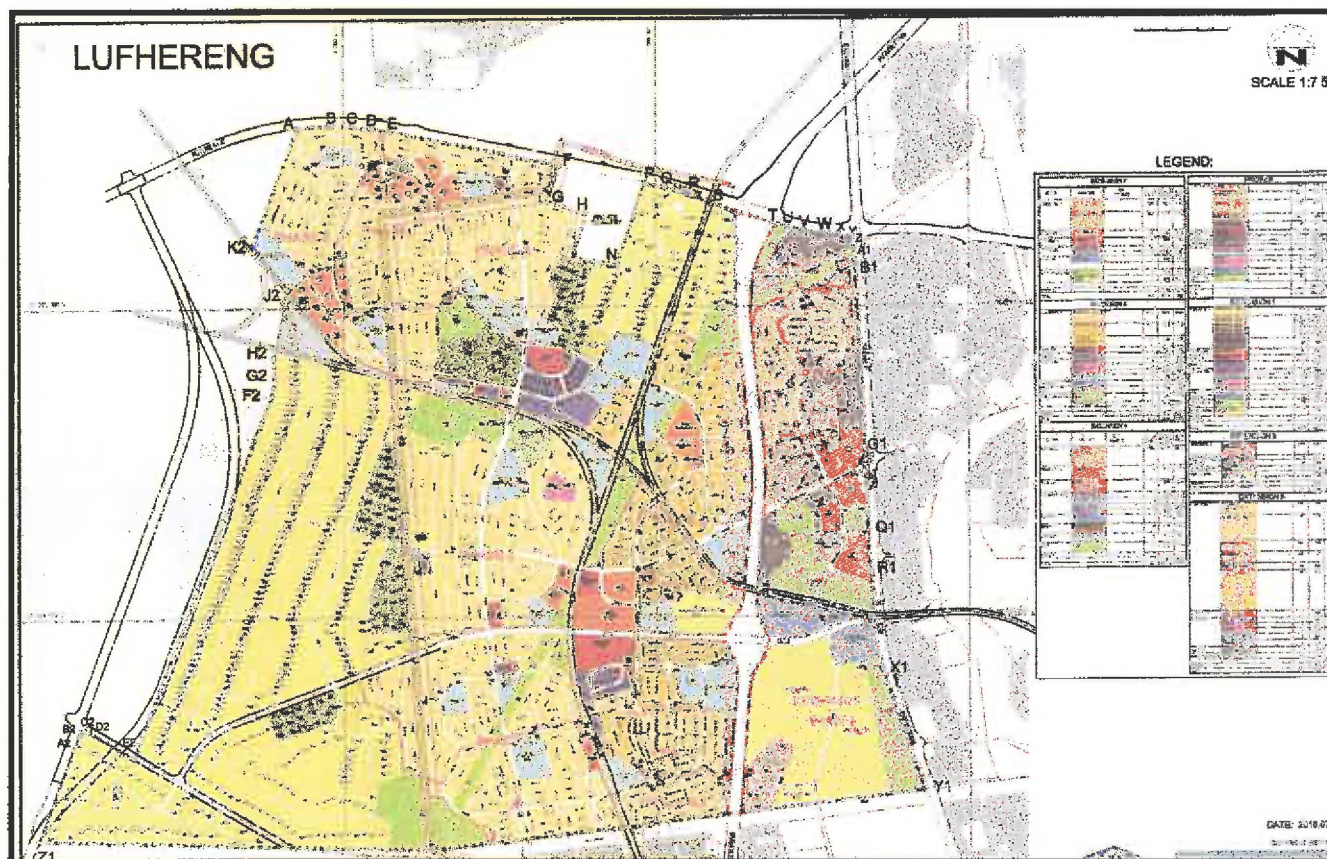


Source: www.joburg.org.za

4.3.3 Project Plans

According to the Lufhereng Business Plan drafted by the City of Johannesburg (2008), the project is originally divided into three different Phases, sub-Phases and extensions. The project is targeted for the 1996/1997 waiting list from Protea South informal settlement, Greater Soweto, Doornkop and Bram Fisherville. The total number of the residential units for the project is expected to be about 22850 residential units, divided into various phases over a period of nine to ten years, Map 3 shows the various phases the project will undertake over the 9/10 year period.

Figure 4: Future Development Plans for the Project



Source: Urban Dynamics, 2014

The project will include 17 primary and high schools and over 60 community facilities, crèches and churches (Urban Dynamics, 2008). The next phases will further develop 21 000 housing units, consisting of 7128 subsidized units, 7722 bonded and 6150 high density apartments (Urban Dynamics, 2014).

4.3.4 Income Groups and Housing Types

The project will comprise of fully subsidized housing for poor residents as well as affordable housing for low income households. Middle to high income bonded houses will be for the profitable housing market. The affordable, middle and higher income groups are projected to make up to 50% of the development in total. Affordable housing stock will be

for rental and freehold under the institutional housing project (Urban Dynamics, 2014).

4.4 FUTURE ECONOMIC DEVELOPMENT PLANS

The Lufhereng agricultural estate is an urban agricultural concept that will be integrated into the development project plans, consisting of 1900 lots. This will promote an environment where residents can live and work with an opportunity to participate in sustainable urban agriculture. The city of Johannesburg has identified agriculture as a job creator and a key sustainable economic driver. According to Urban Dynamics (2014) the Agricultural-Estate has the potential to create more than ten thousand formal jobs through farming and production. This is anticipated to boost the local economy and contribute to food security meanwhile, creating a sustainable community by seeking small and medium sized farmers to promote self-sufficiency to agricultural entrepreneurs (Urban Dynamics, 2014).

As in accordance with the City of Johannesburg (2008) as part of the initiative, the City of Johannesburg, Economic Development Department, Johannesburg Property Company and the Gauteng Department of Agriculture Conservation and Environment will in unison formulate an implementable business plan. Adding to retail and commercial job opportunities offered by the development project, the Agricultural –Estate will assist with business opportunities (Urban Dynamics, 2014).

The four agricultural estates extend to over 480 hectares; it will incorporate displaced Doornkop farmers and train aspiring farmers with the support from government assisting in mentoring and training in agricultural practices “in a manner that will integrate intensified agricultural activities” (CoJ, 2008: 1). This investment is a proposed

development of seven to ten years. The Agri-Estate is anticipated to become an economic catalyst not just for Lufhereng development project but for the Gauteng region as a whole.

4.5 TRANSPORT PLANS

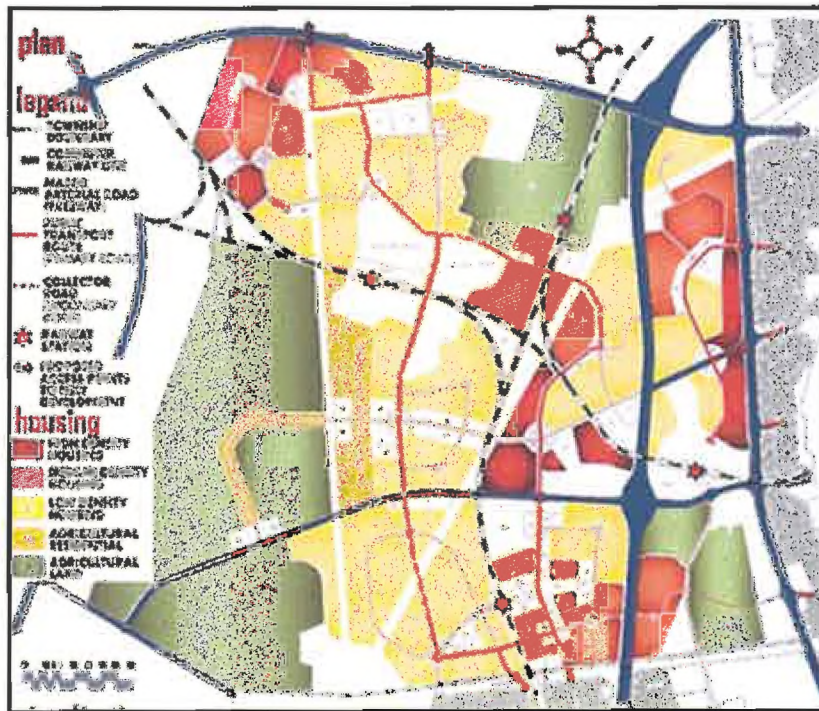
Major housing developments have occurred mostly on the south west and east of Johannesburg, including Lufhereng and Diepsloot with thousands of residents moving into these areas (Rea Vaya, 2014). These areas are usually situated on the periphery with high unemployment, lack of infrastructure and poor public transport services.

Population in these low cost housing developments is growing rapidly and government is facing unavoidable pressure to providing basic services and establishing efficient and reliable public transport system for peripheral located households. The most critical factor with developments of this scale is establishing efficient and reliable transport systems that will enhance accessibility and mobility options in order for residents to be able to access services and employment opportunities throughout the Gauteng region.

The provision of sustainable, efficient and reliable public transportation has been a major priority in Johannesburg. Different sectors have merged to come up with a solution to resolve these challenges. Numerous initiatives have come up over the last few years including the launch of the Bus-Rapid Transit. In the case of Lufhereng, Figure 5 shows the proposed connecting primary and secondary roads as well as the railway line that will link the area to economic nodes and other places throughout the metropolitan region, which will increase accessibility and mobility in the area. According to the project managers the railway is a proposed project that is still in planning

phase with different stakeholders, which would be implemented in 15-20 years.

Figure 5: Proposed Transport and Connecting Routes

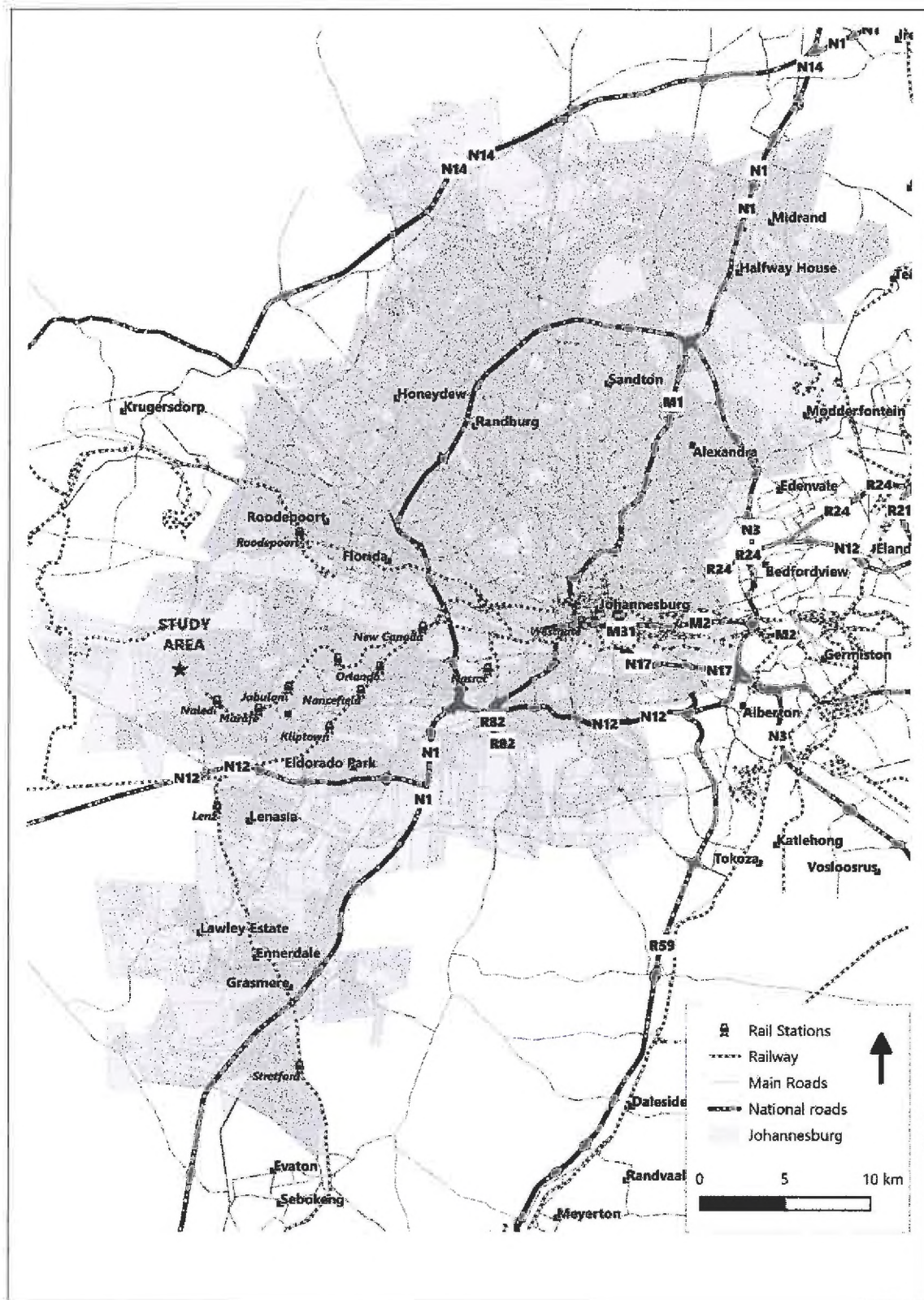


Source: Urban Dynamics, 2008

4.6 EXISTING TRANSPORT LINKS AND CONNECT

Taxi drivers were also asked questions relating to accessibility of the taxis for commuters in the area, and one taxi driver said that *"taxis travel to specific routes at certain times in a day, if you are going to places like Sandton you have to be at the taxi rank as early as early 6am because taxis going there straight end before 10am"*. This response provides an indication that commuters are limited to specific routes at certain times, which may result in increased limitations on commuters' accessibility and movements throughout the metropolitan municipality. The area is, however, connected to other areas by main roads as depicted in figure 7 below.

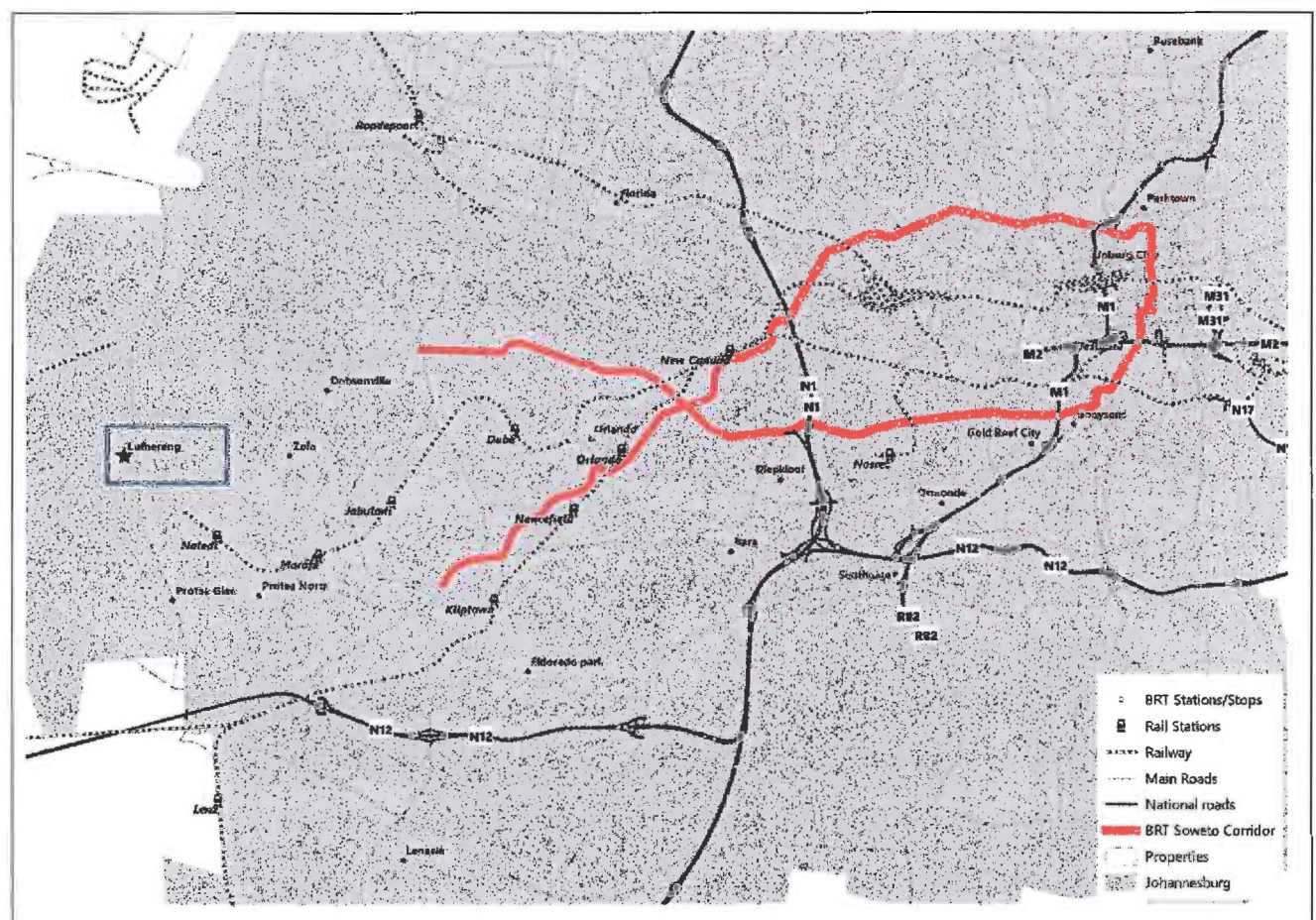
Figure 6: Connecting Routes and Railway Stations



(Source: GDRT, 2013)

There are extensive discussions and proposed plans surrounding the sustainability of transport network systems in the area from the project managers. Participants have commented on this aspect and various transport modes which concentrate on different routes have been suggested by commuters. A suggestion from one participant was "BRT buses should be within a walking distance as an alternative transport mode from taxi".

Figure 7: Rail and BRT network in Relation to Economic Nodes



(Source: GDRT, 2013)

Currently the Rea Vaya buses do not have a route closer to the area. What one participant suggested was that BRT buses and taxis should transport commuters and share routes to accommodate the needs of low income communities. The lack of integration between spatial and

transport planning has been an issue for low cost housing communities in Johannesburg, however, Lufhereng is still too small an area without the population to implement the Bus-Transit system as yet.

4.7 CONCLUSION

The discovery of gold in 1887 made the city of Johannesburg what it is today. Major transformation has occurred over the last hundred and thirty years and has had a huge impact on the economy and geographically. Despite the population growth in the west of Johannesburg, commercial and business nodes are still located in the north of Johannesburg.

During the apartheid era black people were economically excluded and racially marginalized from what used to be known as "white areas". The imbalances are still evident in some parts of the city; spatial changes have resulted in further segregation of black people located in poorly serviced areas in the periphery and some areas have integrated and became mixed.

Unemployment in Johannesburg is a major issue that government needs to focus on in order to improve the lives of residents located in the periphery. In order to achieve that, major investment needs to focus on establishing effective public transport system to increase accessibility and mobility for people to access employment opportunities in other areas.

CHAPTER 5: PRESENTATION OF DATA AND FINDINGS ON HOUSEHOLD INTERVIEWS

5.1 INTRODUCTION

The chapter sets out to present the findings from household interviews conducted with residents as well as the investigations into the challenges, perceptions and the experiences of commuters in Lufhereng. It aims to describe and illustrate social and financial implications that the location has on residents in relation to aspects such as accessibility and mobility. Findings presented below consist of a sample of 40 households surveyed.

Responses from households and commuters are based on questions posed by the researchers during the data collection phase. Households participants were required to answer specific questions related to public transport availability, efficiency as well as the geographical location of employment opportunities and schooling facilities. Please see the questionnaire in the appendix D. Household respondents were asked the same questions, in order to compare their responses. Some of the questions were based on:

- (i) personal experiences regarding mobility
- (ii) accessibility of employment opportunities
- (iii) perceived accessibility of routes
- (iv) household costs for public transportation to schools and work, and
- (v) The average duration of time spent travelling to places of employment for example (Johannesburg CBD, Sandton, Roodepoort, and Vereeniging).

5.2 CHARACTERISTICS OF THE HOUSEHOLDS

5.2.1 Household Size and Structure

The residents in Lufhereng were moved from areas within Soweto such as Protea South informal settlement, Bram Fischerville and Doornkop. The residents were selected from the 1996/97 list of beneficiaries who applied for RDP houses. Of the 40 households surveyed, there were 179 people, 76 (42%) of these were male and 103 (58%) were females.

Tables 1 and 2 presents information about the survey respondents' household sizes and structure. Table 1 shows that there were 179 individuals in the 40 households surveyed. Over half of households were small, with 53% having four people or less. The most common household size was 6 with 23% of surveyed households having this size. The largest household size is ten, 3% of the households surveyed have this number. There are two households where a person lived alone (5%) and four households that comprised two people (10%).

Table 1: Household Size

Household Size	No of Households	%
1	2	5%
2	4	10%
3	8	20%
4	7	18%
5	6	15%
6	9	23%
7	2	5%
9	1	3%
10	1	3%
TOTAL	40	100%

Table 2 shows that 60% (24) of the households in the area consisted of multi-generational extended families, from grandchildren to other

family members who are either related to the household head or the spouse, for example nephews, brother in laws and cousins. Thirty five percent 35% (14) of the households consisted of the nuclear family, with parents and their children only living in the household.

Of the 40 households surveyed, 19 (48%) were headed by females. Fifty three percent (21) homes were headed by males. Men were considered as heads of the household because of their social status, financial contribution to their families and as co-owners of the house. In some cases males were still considered as the heads of households despite the fact that they live elsewhere during the week.

Table 2: Household Structure

Household Structure		
Household Type 1	No	%
Nuclear	14	35%
Alone	2	5%
Extended	24	60%
TOTAL	40	100%
Household Type 2		
Male heads of the house	21	53%
Female heads of the house	19	48%
TOTAL	40	100%

5.3 AGE GROUPS

Participants that were interviewed were over the ages of 21 and were able to respond to the questions asked about the household members' age. The figures in table 3 reflect the ages of the population in the 40 households surveyed. Sixty one percent of the total of population in the households surveyed was over the age of eighteen. The age group 6-18 was the largest at 28% (51). This group represents children who are

part of the schooling age, while the second largest group was between the ages of 19 and 34, with 27% (49). Pensioners made up to 5% of the age group, which consisted of the population of men and women aged 65 and older. This group is considered economically and socially dependent or inactive.

Table 3: Age Groups

Age Description	Ages of Participants	%
0-5	19	11%
6 – 18	51	28%
19-34	49	27%
35-49	29	17%
50-64	22	12%
>65	9	5%
TOTAL	179	100%

5.4 EMPLOYMENT STRUCTURE

Table 4 presents the results of the employment structure of the households surveyed. This table represents adults who are above the ages of 18. Participants were asked questions such as how many household members are employed and unemployed and for how long they have been looking for work as well as the geographical location of work. Forty two percent (46) were employed, while 35% (38) were unemployed of the total of 109. The area is expanding in terms of the population growth as more people from the greater Soweto are being relocated to the area, which also contributes to unemployment (35%) in the area. Five percent (5) were housewives or the household keepers, while 12% (13) were retired.

Table 4: Employment Structure

Employment	No	%
Employed	46	42%
Unemployed	38	35%
Self-employed	7	6%
Housewife	5	5%
Retired/Pensioner	13	12%
TOTAL	109	100%

Of the households surveyed, 6% (7) are self-employed from the total number of 109. These people make means to gain an income by selling vegetables that they buy from the market, in-house salons, operating taverns, painting and tiling jobs locally. One male participant said that *"I was retrenched from my job in 2010, since then I have been doing painting jobs locally and my wife sells fruit"*.

Unemployment and job scarcity seem to cause frustration for residents, which also affects many aspects in their lives including their perception about the living experiences in Lufhereng. Another participants said *"I have been unemployed for more than 3 years; it is difficult to access job opportunities in Johannesburg inner city and throughout the region because transport is expensive and employment opportunities are located far from the area"*. Travelling costs from the area was one of the discouraging factors for participants not to go out and look for jobs outside the area.

5.5 HOUSEHOLD INCOME

The cost of commuting with public transport was investigated to understand the financial implications the location has on the participants who are also referred to as commuters. The financial component is a very important aspect in the lives of residents in low

income communities and speaks to questions of affordability and household income as represented in table 5. Table 5 represents the total monthly income of the households as a whole, which includes; members of the household that receive grants and income. Thirty five percent (14) of the 40 households surveyed have a total income that is ranging between R3200 and R 6400, while a total of 40% (16) households have a total income of less than R3200. Eighteen percent (7) of the households surveyed have a total income between R6401-R9300, while a very small number 8% (3) have an income between R10,000-R12800 per month.

Table 5: Total Monthly Income per household

Household Income	No of household income	%
R1 -R400	1	3%
R801- R1600	4	10%
R 1601-R3200	11	28%
R3201-R6400	14	35%
R6401- R9300	7	18%
R10000- R12800	3	8%
TOTAL	40	100%

5.6 HOUSEHOLDS WITH STUDENTS AT SCHOOL, HIGHER EDUCATION OR NOT AT SCHOOL

Of the households surveyed, table 6 shows that 87% (58) children between the ages of 6-18 attend primary and secondary schools of a total of 67 in the sample, while 3% (2) of the students were in higher education. Of the total of 67 children in the sample, 10% (7) represented children who were not schooling. The children not schooling represented in table 6 are not of schooling age.

Table 6: Households with Pupils Schooling, Higher Education and Not at School

Households with pupils schooling/not schooling		
Description	No of pupils schooling per household	%
Schooling (Primary/High school)	58	87%
Higher education	2	3%
Children not schooling	7	10%
TOTAL	67	100%

5.7 GEOGRAPHICAL LOCATION OF SCHOOLS

Table 7 shows that of the 37 pupils attending school, 59% (22) attend Lufhereng primary and Lufhereng high school because it is closer to households and safer for children in primary school. Lufhereng primary school is the only primary school in the area, within a 5km walking distance. Seventy percent of the children are attending school within 6-7km, while 16% were up to 11-17km away. Eight percent were up to 20-29 km away from the area and 5% were more than this, up to 40-45km.

Table 7: Location of Schools

Geographical location of schools attended			
Distances in k/m	No of pupils	Places	%
5	22	Lufhereng	59%
6	3	Zola	8%
7	1	Green Village	3%
11	2	Mapetla	5%
13	1	Protea South	3%
17	3	Tshiawelo	8%
20	1	Randfontein	3%
20	1	Eldorado park	3%
29	1	Huguenot Primary School	3%
40	1	University of Johannesburg	3%
45	1	Orange Farm Primary	3%
TOTAL	37		100%

Households that had children in schools raised concerns about the distances to high schools and that they are located far from Lufhereng (Zola, Diepsloot and Tshiawelo) as seen in Table 5. One parent said that *"I couldn't move my child from the school because there was no high school in the area when we relocated to the project"*. Another parent mentioned that *"my child attends at Green Village primary, most of the time the robots in the main road do not work which is not safe because he walks to school"*.

5.8 TIME SPENT COMMUTING AND GOING TO SCHOOLS

Table 8 demonstrates the amount of time spent travelling to school, 65% of the pupils in the area spend 10-15 minutes going to school. This reflects the 59% of pupils who go to school in Lufhereng as presented in table 5 above. Lufhereng schools are located within a walking distance; therefore it takes pupils less time to get to school than those attending elsewhere outside the area. Some 12% of children from the households surveyed spend 15-20minutes travelling, while others spend 30-45 minutes travelling to schools with taxis or private school shuttles.

Table 8: Time Spent Travelling To Schools

Travel time to school	No of pupils	%
0-10min	2	8%
11min-15min	17	65%
16min-20min	3	12%
21-30min	1	4%
31-45min	3	12%
TOTAL	26	100%

5.9 COST OF TRAVELLING TO SCHOOLS

More than half of the pupils in Lufhereng walk to the local schools, therefore, they do not spend on travelling costs. Pupils who attend in other areas, especially those travelling greater distances spend more commuting; some 50% of 20 households surveyed spend between R400 and R550 monthly on travelling costs to school using taxis and private school shuttles as depicted in table 9.

Table 9: Travelling Costs for Students who pay for Transport

Cost of travelling to school	No of pupils	%
R201-R400	2	25%
R401-R550	4	50%
R551-R750	2	25%
TOTAL	8	100%

5.10 LOCATION OF THE POOR WITH REGARDS TO EMPLOYMENT OPPORTUNITIES

5.10.1 Travelling Times

According to participants in the households surveyed, 70% regarded the area as peripheral in terms of transport access, routes and in relation to the duration of time spent commuting to places of employment. In 30% of the households, participants did not have an issue with the location of Lufhereng and accessing taxis to malls, as they are residents that do not commute daily to work. Travel times also depend on the geographical location of employment. Tables 10 and 11 illustrate travelling times for commuters going to work as well as the geographical location of where people are commuting to for work.

Table 10 shows that 34% of people from the households surveyed travel for less than 30min to work (excluding the amount of time to walk to public transport from home), while, 9% (4) travel for 30-45min. The largest group of 29% (13) travels for 46-59 min to work, while some 29% travel more than this 1-2hours.

Table 10: Duration of Travelling Times

Traveling time to work	No of persons	%
10min-15min	4	9%
16min-20min	4	9%
21-30min	7	16%
31-45min	4	9%
46min-59min	13	29%
1hr+	8	18%
2hr+	5	11%
TOTAL	45	100%

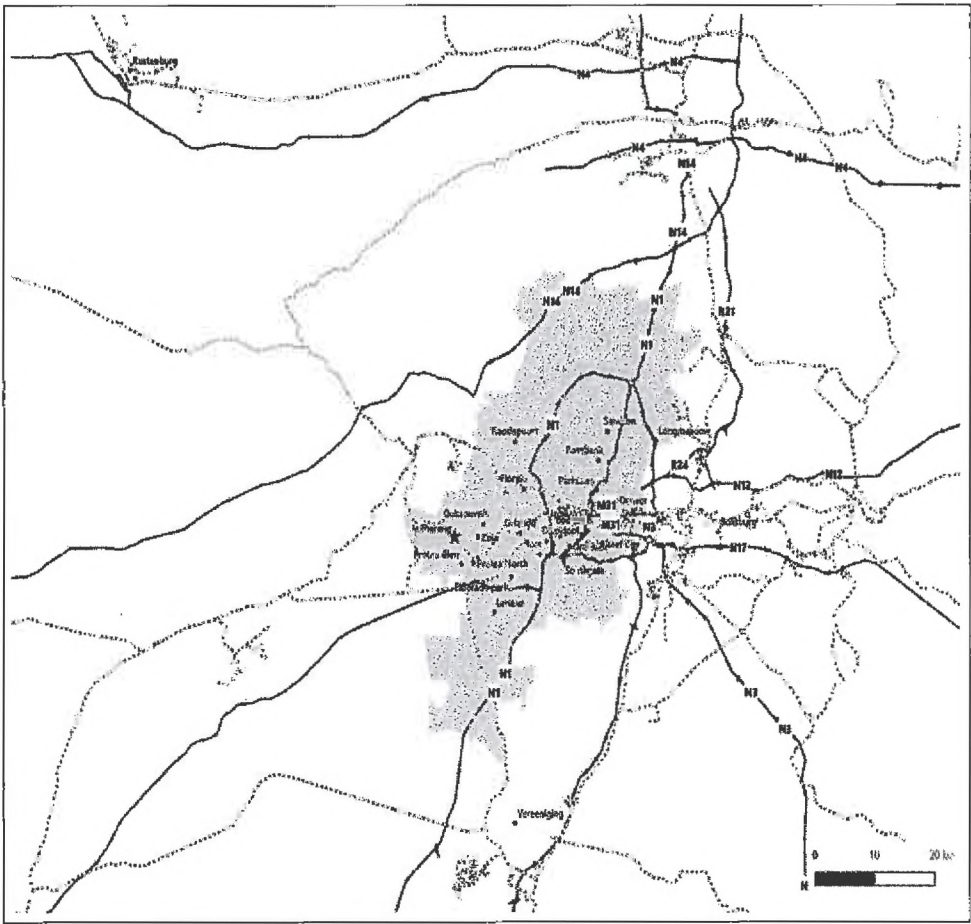
Time spent while commuting is an important aspect to consider when using public transportation. Participants interviewed were asked how long it takes them to travel to work and the time they wake up in the morning and come back in the afternoon. One respondent said that *"it takes my husband 45min to 1hour to get to work"*. More than 29% of commuters claimed that they wake up as early as 4:30/5am and get home around 6:30/7:30pm because it takes them 45min and longer to get to their work places.

One respondent said that *"I leave at 05:00 and get back at 6/7pm because of traffic and the taxi queues at the taxi rank"*. When asked about their households' travelling times, another participant responded and said that *"we all need to consider the amount of time we have to wait for the taxis at the taxi rank and the time it will take us to get to work; otherwise one will be late because of the queues and traffic"*.

Although the majority of the participants had to leave their houses early in the morning and get back late in the afternoon, 33% found that they did not have to spend a lot of time travelling to places of work (10-30min). One participant commented and said *"it takes me 15min to get to work and my children take 10-12min to school"*.

5.10.2 The Location of Job Opportunities

Figure 8: Geographical Location of Employment Nodes



(Source: GDRT, 2013)

Table 11: Location of Employment in km

Geographical location of employment

Distances in k/m	Places	No of people	%
6	Protea Glen	2	4%
6	Zola	2	4%
7	Dobsonville	1	2%
8	Protea North	2	4%
20	Lenasia	4	9%
20	Florida	1	2%
20	Eldorado park	2	4%
22	Bara	2	4%
25	Orlando	1	2%
26	Roodepoort	4	9%
26	Booyens	1	2%
28	Southgate	1	2%
32	Diepkloof	1	2%
33	Gold Reef City	1	2%
34	Ormonde	3	7%
40	Joburg CBD	6	13%
41	Parktown	1	2%
45	Rosebank	2	4%
45	Denver	1	2%
54	Sandton	2	4%
60	Vereeniging	1	2%
60	Boksburg	1	2%
70	Longmeadow	1	2%
109	Rustenburg	1	2%
TOTAL		45	100%

Table 11 shows that employment locations are varied and dispersed. Thirteen percent (6) of the individuals work in Johannesburg CBD and the majority work closer to the area in the south and west, as well as closer and in Soweto.

In households where members work in areas like Rustenburg, Vereeniging and Boksburg, some live closer to work and come back on weekends or monthly, as seen in table 12. Interviewed participants for the household surveys mentioned that those members of the household had to live elsewhere because of long travel distances and expensive commuting costs. Another female respondent said that *"My husband stays at work in Rustenburg and only comes home month*

end, it better that he stays closer to work to save travelling costs". Another participant said that "my daughter studies at the University of Johannesburg and stays at the school residences, it makes financial sense that she stays at school".

Table 12: Household Members Staying Elsewhere

Households with people who do not stay at home			
Description of travelling patterns	No Of People	Places	%
Weekends	1	Boksburg	20%
Other weekends/Fortnight	1	Limpopo	20%
Monthly	2	Rustenburg, Bloemfontein	40%
Randomly	1	Auckland park	20%
TOTAL	5		100%

5.11 EXPERIENCES OF COMMUTERS ON THE USE OF PUBLIC TRANSPORT

5.11.1 Financial Implications

General income earning capacity within a household contributed to the views relating to the cost of travelling for each household member. Participants were asked questions like; *what is your view relating to the cost of travelling from Lufhereng to other areas throughout Johannesburg?* Participants pointed out that local taxis cost from R9.50 depending on where one is commuting to. One participant said that "the cost of travelling from here is expensive for my household, for example even when we need to fetch letters we have to take a taxi to Diepkloof or Protea North post office and sometimes when you get there the letter you are waiting for is not there, so you have to go again on a different day". Another participant also raised concerns about the expensive travelling costs for her household to neighboring townships for services, she said that "taxis are expensive, for example I'm a pensioner and have to go to the clinic for checkups every month

and sometimes I have to pay an extra fee so that the taxi can drop me off in front of my house, it depends on the driver sometimes its R20 a single or more".

Commuters usually have to take other modes of transport like the train and Rea Vaya buses at Naledi station to minimize the cost of the rest of their trips. Ninety percent 90% of the participants indicated that retail shops and other public services and schools were located in walking distances from their households before they relocated to Lufhereng and now they have to take taxis to access police stations, clinics and the post office.

One participant said that *"sometimes I ask my neighbor who travels daily to work to buy me things I need because taxis are expensive and the money would not be enough to get what I need and for travelling"*. Another participant responded and said *"I work at Baragwaneth Hospital and take 2 taxis. It costs me R14.50 from Lufhereng to the station and R11.50 to the hospital which becomes expensive for a daily commute, meanwhile my sister works part-time locally and she also spends most of her income on taxis"*.

Table 13: Cost of Travelling to Work per month

Cost of travelling to work		
Cost of travelling	No of workers	%
< R200	5	11%
R201-R400	13	29%
R401-R550	11	24%
R551-R750	5	11%
R751-R950	6	13%
R951-R1500	4	9%
R1501-R2500	1	2%
TOTAL	45	100%

Table 13 above shows that 60% of the commuters travelling from Lufhereng to other places for work or income opportunities spend more than R400 on public transportation per month. Of the households surveyed, people found commuting costs to work to be expensive and a huge impediment in their lives. Those who were unemployed but looking for work in other places throughout the municipal region mentioned that transport costs put them off looking for work in other areas.

5.12 PARTICIPANT VIEWS RELATING TO RELIABILITY AND ACCESSIBILITY OF PUBLIC TRANSPORT IN THE AREA

For many years taxis have been the most dominant form of transport throughout the region. Implementation of other transport modes like BRT buses in most areas to increase accessibility has received positive feedback especially from residents in low income communities.

Having choices on which public transport mode to use in order to suit commuter need is a significant aspect for commuters. Lufhereng is one of the places in Johannesburg that only has taxis operating. During interviews participants were asked questions such as how far the taxi rank is from their households and if it is within a walking distance, how long they had to wait for taxis to be filled if it was not within a walking distance, and if it was easier to access taxis to where they often travel to or if they have to change taxis.

Participants commented on the importance of reliable transport systems in the area. Residents raised issues of unreliability of the taxi system. Taxi strikes often leave commuters stranded, whereas if there are other modes of transport then commuters are able to access alternative means of transport to get to where they need to be.

From responses solicited from participants, it may be argued that accessing opportunities and services is a recurring challenge for

residents. Participant responses regarding accessibility to other areas were, *"It depends on where you travel to and where you work"*. Participants indicated that taxis are available throughout the day but scarce, that mornings are the busiest times until 10am and mobility is limited to certain routes. During the interviews with taxi drivers they said that after 8pm there are no taxis available at the ranks because after peak times there are few people who take taxis and in the afternoons it is mostly people who are coming back from work and schools.

One elderly participant indicated that *"taxis are always available throughout the day; I don't struggle to get taxis because they pass in front of my house"*. Another respondent said that *"the taxi rank is situated within a 5min walk from my house"*. The reasons for the positive responses from the commuters were based on the notion that they could access taxis in a short walking distance from their houses. Another respondent when asked questions regarding accessibility of taxis in the area said that *"We have to walk 10-15min to access taxis and when you have groceries it is stressful because of the distance to the house"*. The complaint voiced by this respondent shows that some residents are situated further from the taxi ranks and local taxi routes that they have to walk distances to access taxis.

Figure 9: Lufhereng Primary and High School



(Source: GDRT, 2013)

5.13 CONCLUSION

The findings presented in the chapter highlight the different views, experiences and challenges of the low income earning residents who were also commuters. Although some respondents from surveyed households had no issues regarding travelling distances from Lufhereng to places of employment, commuters who had to travel long distances to get to work and school raised issues about expensive travelling costs that they had to endure. There were many challenges experienced by commuters in relation to taxi routes being limited to specific times for certain areas.

From the discussion above it is evident that many children in the area attend local schools within a walking distance (10-15min) while some 28% have to travel between 15-45 minutes to get to school. More than a half of the commuting population in the households surveyed spends more than R400 per month on travelling costs to school.

Levels of unemployment are high in the area. As a result, some (6%) of the residents make a living by working from home (micro enterprises) or elsewhere in close proximity. Therefore, the overall numbers of people who commute to work and school are fairly low; those who commute go to different places. However, some have to stay closer to work and come back on weekends or monthly due to travelling distances (2hrs and more) and expensive commuting costs.

CHAPTER 6: ANALYSIS OF RESULTS

6.1 INTRODUCTION

This chapter seeks to analyze the findings of the study. A number of themes have emerged from interviews with the project managers, households, taxi drivers, commuters and were presented in previous chapters. These themes are further examined as they have emerged from the different sources and interviews. In addition, the chapter will evaluate how proposed development plans for public transport may meet the needs and challenges faced by the poor in low income communities.

6.2 ACCESSIBILITY, RELIABILITY AND MOBILITY OF THE POOR

Participants who were interviewed responded negatively to questions posed regarding accessibility to employment opportunities and public services due to unreliable and inefficient public transportation.

Although, the number of residents commuting to other areas is fairly low, commuters complained about the limitation of mobility and access in the area.

Lack of affordable and reliable transport continues to be a major issue for the poor communities. The literature reveals that improved and efficient access to transport systems provides many opportunities for the poor (Tiawoun, 2000; UN-Habitat, 2013). Sustainable transportation systems are able to provide and improve accessibility to public services such as police stations, retail, education and clinics. The lack of effective transport systems in low income communities may limit access to amenities and opportunities for the poor and result in increased urban poverty.

There were mixed reactions elicited from the interviews, as discussed in the previous chapter. Participants who stay 2-5min away from taxi

ranks and routes indicated that there was easy access to taxis and therefore they did not have to travel long distances for access. Conversely, participants who live 10-15min away from taxi ranks and routes complained that accessibility was a challenge.

Commuters found it to be a concern that the Rea Vaya bus stops (Protea Glen) and the train station (Naledi) are not in a walking distance from Lufhereng because accessing other modes of transport within a walking distance would improve mobility for commuters. Residents that use the ReaVaya and the train opt for these services because they are relatively cheaper than the taxis and therefore cut travelling cost.

Commuters still need to take local taxis to get to the station, which has an effect on the time spent travelling to places of employment. According to Cervero (2004 as cited in Banister, 2005) reliable and efficient transport modes should be accessible within a walking distance to commuters.

According to the UN-Habitat (2013:107) urban mobility should aim to provide access to activities and services; such as work and education to the disadvantaged urban poor located in peripheral areas. The literature discussed has shown that development has occurred at a rapid pace in the west of Johannesburg with less provision of basic services combined with a few and mostly informal job opportunities.

6.3 UNEMPLOYMENT AND POVERTY IN LOW INCOME COMMUNITIES

Over the last decade, transformation and development has occurred on the north of Johannesburg with numerous employment opportunities that exclude some residents, particularly residents of Lufhereng. Additionally, low income housing developments that have recently emerged in the west of Johannesburg are not without challenges. Increasing growth trends have resulted in spatial and

economic changes within the city of Johannesburg with employment opportunity concentration shifting from the inner city. This means that job opportunities have spread to other areas around the municipal metropolitan. However, despite many businesses having spread throughout the city, this does not translate to increased employment opportunities.

Unemployment is a crucial issue in the area; therefore, connectivity plays a critical role in linking people to other areas. Some view Lufhereng as more peripheral in terms of access to job opportunities and services than others. Findings in the previous chapter show that currently residents are moving to different places within the region for work, some work locally while others travel. The percentage of people who work closer to the area is higher than those who travel to other areas for employment. This reflects the polycentric nature of the metropolitan city. Therefore not all residents from Lufhereng who work are disconnected from the area.

The majority of people in households in low income communities is either unemployed or earns a relatively low income. The high unemployment rate has resulted in social and economic challenges in low income communities which often play a part in increased crime and poverty in peripheral areas. Project managers from Urban Dynamics and the City of Johannesburg believe that planned developments within Lufhereng might lead to more job opportunities for residents. However, the same respondents did not explicitly state whether these developments would create direct or sustainable job opportunities for residents.

The literature discussed in Chapter 2 highlighted the many challenges that areas situated on the urban periphery face, including high unemployment and poverty compounded by poor or lack of infrastructure development and services. In the case of Lufhereng a

notable finding which emerged from the data was that the area is still at early stages of development, and many facilities could be expected later as the project develops, as indicated in Chapter 4. For now residents have to use services or facilities from neighboring areas (i.e. clinics, police stations, retail shops).¹

6.4 INTEGRATED TRANSPORT DEVELOPMENT IN JOHANNESBURG

The Transit- Oriented Development system (TOD) is used in urban cities to encourage and promote people connecting to other spaces by making use of the BRT and Rea Vaya systems as well as bringing people closer to places of employment and public services.

The TOD model is designed to help better the lives of the poor in urban cities. However, literature shows that it has not achieved that much as yet in the City of Johannesburg (Weakley, 2015). As revealed in Chapter 4, the development of public transportation systems in Johannesburg has not only been unaffordable, but it has excluded the poor, especially residents located on the periphery in low income communities. According to Harrison and Todes (2013) the TOD model may be used to move low income residents who are located on the periphery, so that they are closer to the economic hubs to access opportunities and services.

Considering that improved access to transportation systems and connecting routes to other places in Johannesburg and the rest of the Gauteng region presents a great opportunity to improve integration and the quality of life for the poor, the TOD model may be a viable intervention for the area. However, seeing that the area is still fairly small, the BRT system at this stage would be premature.

¹ Detailed discussion on location of facilities will be dealt with by my other colleague who focuses on housing and facilities.

The lack of efficient public transportation system might be a temporary issue at this stage for the Lufhereng development project. During the data collection phase, project managers indicated that the area is still at its earliest phases of development. Therefore integration of efficient public transport in Lufhereng to increase accessibility is still in planning phases with different stakeholders presumably being engaged.

6.5 TRANSFORMING APARTHEID PLANNING

As mentioned in Chapter 2, low income earners and unemployed people were located in the west and south of Johannesburg by the apartheid government through policies that discriminated and separated people of different race and class. Post-apartheid spatial policies and RDP housing schemes that were meant to improve the lives of previously discriminated groups have failed to address some of the problems currently faced by residents living in informal or low income settlements with Lufhereng being an example.

It is further evident from the findings that there seems to have been no prioritization of efficient and reliable public transport planning before the settlement was developed in order to accommodate residents who work in other parts of the metro and throughout the city-region. Chapter 2 narrowed the focus to issues related to inaccessibility, mobility challenges and the lack of basic amenities faced by the poor located in peripheral areas.

6.6 SOCIAL AND ECONOMIC EFFECTS OF THE LOCATION

There have been racial and class divisions between the north and the south of Johannesburg for many years (Winkler, 2012). Development and spatial trends have influenced the direction and focus of investment in infrastructure, improved public transportation systems and the provision of basic services to the north. Literature and discussions in chapter 2 suggests that low income housing units are

being built on the periphery far from the urban centres, work opportunities and services.

Findings discussed in the previous chapter, suggest that a large number of residents in Lufhereng are unemployed with some households surviving on social grants. Income in many households is often not enough to maintain the number of members and their basic needs as the majority of households surveyed supported extended family members. Findings also suggested that employment locations are diverse and spread throughout the metropolitan region; not everyone who is employed are commuting long distances with long travel times, some are employed within short distances from the area. Therefore, some residents regard the area peripheral and others not.

6.7 SUSTAINABLE PUBLIC TRANSPORT IN LOW INCOME COMMUNITIES

Despite the development of the Rea Vaya Bus Rapid Transit (BRT) system and the Gautrain for efficient public transport systems in the metropolitan region, the transport systems have failed to be inclusive and affordable to low income commuters. Commuters are forced to use the taxi industry as the only public transport service available in Lufhereng currently.

Discussions surrounding the sustainability of transport networks and the need to invest more on infrastructure in Johannesburg are based on the international standards and practices that have succeeded in developing effective, affordable and reliable public transport systems.

The project managers have stated that future developments will be able to connect residents to business nodes and that the BRT system intends to accommodate the different needs of the urban poor and low income residents. During household interviews, participants commented on this aspect by stating that affordable and different transport modes, which will travel to specific routes, would make

commuting from Lufhereng a lot easier. Currently the Rea Vaya buses do not have routes or bus stations closer to the area.

6.8 CONCLUSION

The chapter has examined the social and economic effects of the location. Public transport systems are designed to transform cities, alleviate poverty for the poor, improve mobility and increase access to other places.

The developments of public transport systems in Johannesburg seem to have excluded low income communities, as residents in Lufhereng have complained that Rea Vaya buses and BRT stations were far from where they are located. However, the findings have revealed that there are future plans to improve transport systems in the west of Johannesburg as the project managers explained.

In as much as there is a need to extend and develop further public transport systems in Johannesburg in order to accommodate the urban poor, this on its own is not a panacea to the challenges faced by communities located on the periphery. Challenges associated with the lack of access to effective, affordable and reliable public transportation as well as mobility needs to be addressed together with unemployment. With the above highlighted challenges in mind, the next chapter proceeds to advance recommendations aimed at potentially resolving some of the issues and concerns observed.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

The Lufhereng development project was launched in 2008. As indicated previously, the project is still at its infancy with only Phase 1A currently completed. Since the mixed-use housing development project is fairly new, much development still needs to occur (including development of public transport systems and public services).

The study took into account the issues related to public transport systems, initiatives that ought to be put in place and how these initiatives can ensure improved accessibility, mobility, and change in commuter patterns. In addition, questions relating to encouraging economic activities within the settlement to improve the lives of the urban poor living on the periphery have been explored.

In order to address the research question, the study examined the spatial growth trends and economic activities in Johannesburg and how the development of public transport systems may affect these trends, as well as how proposed transport plans in the west of Johannesburg will respond effectively to the needs of the poor located in low income settlements. The objective of the chapter is to present conclusions to the study and recommendations.

7.1 CONCLUSIONS OF THE STUDY

The social and economic effects of the location has been investigated in order to understand the experiences and views of residents regarding access, economic opportunities as well as connectivity of routes to other areas using available public transport systems. Interviews were conducted and findings were presented in chapter 5.

7.1.1 The Social and Economic Effects of Public Transport Development

One of the key objectives of public transportation systems is to provide reliable, accessible, affordable and efficient transport for commuters to connect to other places (Rea Vaya, 2012). The study has found that the bus services (Rea Vaya, Putco and metro busses) are not accessible to some commuters located in low income settlements in the west of Johannesburg at present, particularly in Lufhereng. Low income commuters located on the periphery needs public transportation that will be able to cater for their needs and increase access and mobility to the metropolitan region. Therefore development of an efficient and reliable transport system would increase the chances of low income residents acquiring a job or maintaining one.

Johannesburg is a large fragmented region. As a result, the development of an integrated public transportation in the city region is complex and requires strategic planning and a clear vision. A cost effective plan, spatial changes and growth trends within the city need to be monitored for the benefit of commuters, particularly those located in Lufhereng.

The aim of the bus system is to allow people located in the periphery to have access into the inner city and the metropolitan region. However, the Rea Vaya bus system would be expensive for a daily commute of low income commuters. Development of public transport systems are tools that need to address issues associated with unemployment and poverty in low income communities. Inaccessibility to other modes of transport is the reason why commuters from Lufhereng are forced to use the taxi system as it is the only transport mode currently available to transport residents to the inner city and the city region to access employment opportunities and services.

7.1.2 Lack of Integration in Public Transport Systems

The absence of developed public transportation systems in the metropolitan region have resulted in the taxi industry taking over the responsibility of transporting low income households, particularly those located in the west of Johannesburg and to places of employment in Johannesburg inner city and throughout the city region. Although some participants have complained regarding the taxi industry's unreliability, it is still a flexible form of public transportation service in Johannesburg and throughout the country to accommodate even the low income commuters located on the peri-urban.

This taxi industry can easily adapt to spatial changes and new developments compared to other forms of public transportation, whether such changes are formal or informal. Therefore, because of the services provided by the taxi industry, low income commuters in Lufhereng have no choice but to rely on it to access other places in the Johannesburg city region for opportunities and facilities, despite the issues that commuters have with the transport system.

As discussed in chapter 4, public transport systems in Johannesburg are not aligned with spatial changes. There is no service integration to offer low income commuters. The Metrorail system also provides a service for low income residents in Lufhereng, connecting Soweto to the Johannesburg CBD. Although some commuters in Lufhereng use Metrorail trains to commute to work and to cut costs, this transport system has not been developed in over a decades (Beavon, 2001). Public transportation systems in Johannesburg have been unsuccessful in responding to changing commuter patterns and the shifting economic growth trends in the metropolitan region. Findings from the study show that employment opportunities are varied and diffused throughout the region and the few that commute to other places for work spend more time and the majority of their income on public

transport. Most of the residents in Lufhereng are forced to work closer or within Soweto because of expensive public transport costs.

7.1.3 Future Developments of an Integrated Public Transport System in Johannesburg

According to Cervero (2004) the Transit-Oriented Development is used as a tool to promote growth, economic development as well as to cater to different mobility needs, lifestyles and preferences in low income households. Countries such as Canada, United States of America and China have used the TOD models successfully to promote densification in urban cities (Cervero, 2004). The TOD's objective is to create redevelopment in and around transit nodes. It is also considered as a "promising tool for curbing sprawl and vitality into areas of need by channeling public investments into struggling inner city settings, and by creating more walkable, mixed-use neighborhoods with good transit connectivity" (Cervero, 2004:3).

As discussed in Chapter 2, there is a need for effective and integrated public transportation in the west of Johannesburg and the metropolitan region to connect people to other places to increase access and mobility to opportunities and services, and also improve the quality of life for the urban poor located on the outskirts of the city. A challenge is in the form of integrated transport systems which factor the financial demographic of residents living in Lufhereng (such as affordability). While a more efficient system of transportation is capable of being developed, cost and cost recoupment (on the part of government) may be a challenge potentially prohibiting initiatives aimed at improving existing infrastructure. Despite these challenges, integrated public transport systems are beneficial for the city of Johannesburg and the urban poor.

The Transit-Oriented Development has not been achieved in Johannesburg as yet; however the development of the BRT system promised to provide alternative and improved access to job opportunities and services. Although in reality it seems the BRT system might be targeted at improving accessibility for low income commuters, it is currently limited and unable to provide improved access and mobility to employment nodes for low income residents in Lufhereng.

7.2 PERIPHERALITY AND ACCESS

As discussed in Chapter 2, the location of low income households in the periphery conflicts with the agenda of densifying cities and promoting efficiency to reduce travelling costs and isolation of the urban poor. Such projects have the potential to increase poverty and unemployment in cities for the low income residents located in these isolated urban areas. Findings also suggest that jobs are not only located in the city centres but in various locations throughout the metropolitan region. According to Geyer *et al.*, (2015) Gauteng forms the core of polycentric urban structure or a multi –nodal city region with some level of interaction between centres.

According to Flyvbjerg *et al.*, (2003) large developments of housing projects sometimes carries a financial burden to the urban poor because of the distances and the limited access to opportunities and services located in the inner cities. Turok (2015: 6) highlights that although the housing mega projects are framed as a response to the backlog and to rid poverty for the urban poor, the poor location could place the metros at risk of having to bear the costs of dispersed infrastructure and service delivery.

Although development in the periphery has its disadvantages and challenges as discussed in chapter 2, some literature suggests that

growth on the periphery is inevitable, and some literature says that it is more affordable and spacious and sometimes people prefer that. Some literature also put forward that development in the periphery is not such a bad idea, particularly where there is efficient transportation systems.

According to Mabin *et al.*, (2013) housing development and urban change may occur on the borders of the city where there are rapid population increase and agricultural activities in some areas, but it is not necessarily a bad location to place people. This changes the physical structure of city centres, since peripheral expansion and redevelopments of older areas shifts the focus of economic activities concentrated mainly in city centres to remake patterns of urban life and movements of people (Mabin *et al.*, 2013).

Mabin *et al.*, (2013:5) further puts forward the idea that:

Peripheries is where constant movement of urban frontiers is not merely extending the existing urban fabric, but creating new kinds of mix and spaces for different urbanism.

7.3 RECOMMENDATIONS

1. Although Lufhereng is still a small, growing area, integrating different and affordable transport modes in future could possibly be the solution to public transport challenges for low income commuters in the area.
2. Integrated transport routes are often able to create smaller economies and work opportunities even within seemingly peripheral areas by encouraging innovativeness (i.e. through enabling the growth of low income communities and developing skills)

3. The bus system is currently inaccessible to some commuters in the west of Johannesburg currently. Expanding the currently operating bus system in Soweto should be one of the key priorities in order to increase access to employment opportunities and services in the inner city and throughout the metropolitan region for residents located in new low cost housing developments in the west of Johannesburg such as Lufhereng.
4. Proposed plans need to be communicated with residents to encourage public participation in the developments of the project so that developments can be implemented more effectively to meet the needs of the residents
5. The lack of public transport systems and poorly serviced infrastructure isolates and restricts low income residents located on the west of Johannesburg from being able to access opportunities throughout the metropolitan region. Thus, to alleviate the large clusters of unemployment attention needs to be paid to improving accessibility and mobility by providing effective and reliable public transportation for residents.
6. Taxis are the only form of public transport currently available in Lufhereng. The taxi industry needs to be flexible, reliable and inexpensive in order to meet the different needs of low income commuters located in the area.
7. Spatial and transport planning needs to be cohesive so that developments can be measured on how they will affect low income residents located in the west of Johannesburg in future. Johannesburg is a complex city, urban growth and development

occurs rapidly, therefore growth trends need to be monitored, evaluated and plans adjusted as development happens to meet the needs of the urban poor.

8. Metropolitan cities need to recognize the polycentric nature of city regions and plan accordingly.
9. Government and municipalities should avoid building large developments located far from employment and services.
10. Government needs to focus on building sustainable housing, investment in infrastructure and sustainable public transport systems for the periphery located areas in the west of Johannesburg.

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Appendix A: Interview with Key Informant Project Managers

Gender Male/Female Enter M or F	Position as a key informant

INTRODUCTION AND MAIN DISCUSSION

Can you briefly explain the work you do, and your current professional position?

What was your specific role and position in the Lufhereng development project?

What are the recent documented demographics of the area?

What forms / modes of transportation used in the area?

Were there any surveys conducted in Lufhereng and how and where can they be accessed?

Are there any available transport maps that show routes connecting to Lufhereng?

How well linked is public transport system to areas of employment?

Would you consider this place accessible in terms of employment, services, resources and opportunities?

REFLECTIONS AND FUTURE PLANS FOR THE AREA

What were the project plans and aims?

Were these plans achieved, how?

What are the future goals for growth and development for Lufhereng?

Did the project benefit the community? How?

What is being done to promote economic development and employment creation?

How is the process of generating economic activity and job creation working currently?

What were your expectations when this project was started and were they fulfilled

How does the city of Johannesburg plan to connect the area to the broader region?

What public transport is available in the area, where does it link to and what are the future plans to promote public transport usage?

Appendix B: Interview with the Taxi Drivers

What are your daily serviced routes and commuting patterns within the city?

How long have you been operating in this area?

Did you have to change routes when you started operating in Lufhereng?

Currently are there any other transportation services operating in this area?

How do you feel about the dedicated lanes that have been reserved for buses within the city? Has that caused problems or traffic?

Do you have any suggestions on how public transportation can be improved in the city?

Appendix C: Survey with the Commuters

How often do you use public transport?

Where do you often commute to?

What public transport services operate in this area, currently?

What are your concerns with the current operating public transport system in the area?

Do you have any suggestions on how public transportation can be improved in the area?

Appendix D: Survey for Households

QUESTIONNAIRE FOR HOUSEHOLDS

SECTION A

HOUSEHOLD DEMOGRAPHICS								
Position of the respondent in relation to the head of the household	How many people live in this household ?	Ages in the household	Gender	Occupation	Who is in school or in higher education? How many?	Where is school/work geographically located from the household?	How do members of this household get to the place of employment/school?	How long does it take members of the household to get to work/school?
Head 1		0 – 5 1	Enter M or F	Employed	Schooling 1	in a radius of: within Luthereng	Walk 1	
Spouse 2				• formal sector 1				
Son 3		6 – 13 2		• informal sector 2	Higher education 2	5km 10km 15km	Bicycle 2	
Daughter 4		14 – 18 3		Self-employed, own business, • work from home 3	Not schooling 3	20km 25km 30km	Taxi 3	
Brother 5		19 – 34 4		• NOT work from home 4		40km 50km 60km	Bus 4	
Sister 6				Unemployed, • looking for work 5		70km 80km and more	Train 5	
Father 7		35 - 49 5		• NOT looking for work 6			Private car 6	
Mother 8		50 - 64 6		• Do not want to work 7				
Brother in law 9		65 - 79 7		• Disabled 8			Different modes Of transport 7	
Sister in law 10				Housewife/Home-maker 9				
Cousin 11		80+ 8						

Niece 12 Grandson 13 Granddaughter 14 Other relative 15 Other (specify) 16	8	Pupil/Student 10 Retired/pensioner 11				
1						
2						
3						
4						
5						
6						
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SECTION B

1. RESPONDENT AND HIS/HER HOUSEHOLD BACKGROUND						
When did your household move to Lufhereng? (Month, Year)?	Where did you come from when you first moved to Lufhereng?	Did everyone living in this house move from the same previous dwelling? If not. Where did they come from?	What type of dwelling was your household living in before this one you currently live in?	How did your household come to be in Lufhereng?		
	Protea South Informal Settlement 1		House or brick/concrete structure 1	We applied for the RDP house 1		

	Greater Soweto (waiting list) 2 Doornkop 3 Bram Fischerville 4 If other, please specify 5		Traditional dwelling/hut/structure made of traditional materials 2 Flat or townhouse 3 Informal dwelling in an informal settlement 4 Dwelling in the backyard of a formal dwelling 5 If other, please specify 6	We were relocated to the project 2 We purchased a house in the project 3 We rented a room in the project 4 We rented a house in the project 5 If other, please specify 6
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2. HOUSING TYPOLOGY IN LUFHERENG				
What type of dwelling does this household occupy?	How satisfied are you with the dwelling you are currently living in?	3. DWELLING TENURE IN LUFHERENG Please tell me about your tenure in this dwelling. Is it	How satisfied are you with your dwelling tenure?	
Free-standing unit 1 Semi-detached unit 2 Row housing unit 3 Walk-up unit 4 If other, specify: 5	Very satisfied 1 Satisfied 2 Neither satisfied nor dissatisfied 3 Dissatisfied 4 Very dissatisfied 5 Why?	Owned (bonded housing) 1 Owned (partially subsidized housing) 2 Owned (fully subsidized housing) 3 Rented (Social housing) 4 Sub tenant or sublet 5 Private rental	Very satisfied 1 Satisfied 2 Neither satisfied nor dissatisfied 3 Dissatisfied 4 Very dissatisfied 5 Why?	

		6 If other, specify: 7
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4. HOUSING UNITS IN LUFHERENG	
Were you able to choose the design of your house? If so who assisted you?	
What specifically did you get in this settlement in terms of:	
- the size of the house (number of rooms) and - the level of service (electricity; water; flush toilets; tarred roads etc)?	
Is the stand you own the right size for your needs? Why (may need more space for parking, running a spaza, garden, extending your house etc.)?	
Do you have any special features in your house to save water, electricity etc.?	

5. FACILITIES AND RETAIL/SHOPS IN LUFHERENG													
a) Educational facilities													
Is there any member of your household who uses the following educational facilities in Lufhereng? How far is the facility from your household?													
How do you get to these facilities?	Crèche	Walk	1	Crèche	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:

	Preschool	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Primary	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Secondary	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	ALC	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
How satisfied are you with these facilities in Lufhereng?	Crèche	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied		
	Preschool	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied		
	Primary	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied		
	Secondary	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied		
	ALC	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied		
Why?												
If not using these facilities in Lufhereng, where do you access them?												
Why do you not use these facilities in Lufhereng?												
b) Health facilities												
Which of these health facilities do you have in Lufhereng?												
How far is the facility from your household?												
Do you or members of your household use any of these facilities?												
If yes, how do you and your household get to these facilities?	Clinic	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	GPs	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Dentists	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Pharmacy/drug store	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Traditional healers	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
How satisfied are you with												
	Clinic	Very	1	Satisfied	2	Neither satisfied nor	3	Dissatisfied	4	Very dissatisfied		

these facilities in Lufhereng?	GPs	satisfied Very satisfied	1	Satisfied	2	dissatisfied Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Dentists	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Pharmacy/drug store	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Traditional healers	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Why?											
If not in Lufhereng, where do you and your household access these facilities?												
Why do you and your household NOT use the facilities in Lufhereng?												
c) Cultural facilities												
Is there any of these facilities in Lufhereng?												
If yes, how far is the facility from your household?												
Have you or members of your household used any of these facilities?												
If yes, how do you get to these facilities?	Library	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Community Centre	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
	Religious Centres	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:
How satisfied are you or members of your household with these facilities?	Library	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Community Centre	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	
	Religious Centres	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Dissatisfied	4	Very dissatisfied	5	

Why?															
If not in Lufhereng, where do you and your household access these facilities?															
Why do you and members of your household NOT use the ones in Lufhereng?															
d) Recreational facilities															
Is there any of these facilities in Lufhereng?															
If yes, how far is the facility from your household?															
Have you or members of your household used any of these facilities?															
If yes, how do you or members of your household get to these facilities?	Sport field	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:	6		
	Stadium	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:	6		
	Sports clubs	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:			
	Playgrounds	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:			
	Parks	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private car	5	Other:			
	Sport field	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Bus	4	Private car	5	Other:			
How satisfied are you or members of your household with these facilities in Lufhereng?	Stadium	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
	Sports clubs	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
	Playgrounds	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
	Parks	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
	Sport field	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
	Stadium	Very satisfied	1	Satisfied	2	Neither satisfied nor dissatisfied	3	Neither satisfied nor dissatisfied	4	Very dissatisfied	5				
Why?															
If not using these facilities in Lufhereng, where do you or your household use them?															

Why do you and your household NOT use these facilities in Luthering?																											
e) Administrative Facilities																											
Which of these facilities do you have in Luthering? How far are these facilities from your household?		Post Office		1		Police Services		2		Fire Services		3		Information Centres		4		Municipal Offices		5							
Have you or members of your household used any of these facilities?																											
If yes, how do you and your household get to these facilities for services?		Post Office		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	
		Police Station/Office		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	
		Fire Station		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	
		Information Centres		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	
		Municipal Offices		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	
How satisfied are you with these facilities in Luthering?		Post Office		Very satisfied		1		Satisfied		2		Neither satisfied nor dissatisfied		3		Dissatisfied		4		Very dissatisfied		5		Very dissatisfied		6	
		Police Station/Office		Very satisfied		1		Satisfied		2		Neither satisfied nor dissatisfied		3		Dissatisfied		4		Very dissatisfied		5		Very dissatisfied		6	
		Fire Station		Very satisfied		1		Satisfied		2		Neither satisfied nor dissatisfied		3		Dissatisfied		4		Very dissatisfied		5		Very dissatisfied		6	
		Information Centres		Very satisfied		1		Satisfied		2		Neither satisfied nor dissatisfied		3		Dissatisfied		4		Very dissatisfied		5		Very dissatisfied		6	
		Municipal Offices		Very satisfied		1		Satisfied		2		Neither satisfied nor dissatisfied		3		Dissatisfied		4		Very dissatisfied		5		Very dissatisfied		6	
Why?																											
If not in Luthering, where do you and your household access these facilities?																											
Why do you and your household NOT use these facilities in Luthering?																											
f) Retail and Services																											
Which of these facilities do you have in Luthering?		Shopping Centre		1		Spaza shops		2		Home-based hair salons		3		Car wash		4		Car repair		5		Taverns		6			
How far are these facilities from your household?																											
How do you and your		Shopping Centre		Walk		1		Bicycle		2		Taxi		3		Bus		4		Private Car		5		Other:		6	

household get to these facilities for services?	Spaza shops	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private Car	5	Other:	6
	Home-based hair salons	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private Car	5	Other:	6
	Car wash	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private Car	5	Other:	6
	Car repair	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private Car	5	Other:	6
	Taverns	Walk	1	Bicycle	2	Taxi	3	Bus	4	Private Car	5	Other:	6
How satisfied are you with these facilities in Lufhereng?													
Shopping Centre													
Spaza shops													
Home-based hair salons													
Car wash													
Car repair													
Taverns													
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If not in Lufhereng, where do you and your household access these facilities?

Why do you and your household NOT use these facilities in Lufhereng?

6. HOUSEHOLD INCOME GENERATION

Has the household income increased, decreased or stayed the same since the move to Lufhereng? Explain

Are there any members of your household that are/were employed in Lufhereng? If yes, who are they and what do/did they do?

Have they been trained for the job they do? Explain

Does the household engage in any of the following informal activities to generate income? If so, who within the household does the activity?

- Sales of cooked or uncooked food 1
- Home-based tuck-shop 2
- Street vending 3

- Manufacturing (e.g. furniture and related household goods) 4
- Garbage recycling 5
- Renting out a dwelling/flat/room/garage/etc. 6

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7. PROMOTING FOOD SECURITY FOR YOUR HOUSEHOLD		
Do you practice any subsistence farming? If yes, What do you grow? Why? Where do you grow it?		
Do you sometimes sell some of your produce to generate additional income?		
Have you incorporated some of the modern techniques in farming? Explain		

8. EMPLOYMENT AND WORK OPPORTUNITIES IN LUFHERENG		
Are there job opportunities in Lufhereng? If yes, what are they?		
Have you or members of your household benefited from these opportunities? Explain		
Are you or any member of your household currently the owner of a business in Lufhereng, one that you were responsible for starting up? If so who owns the business? What does it do and how old is it?		
Is this business in the formal or informal sector?		
Has the owner ever approached any government departments or agency that provides support for small businesses (SMMEs)? If so, did you feel empowered by the consultation? Explain		

9. PROTOCOL OF LIVING IN LUFHERENG

What rules apply to the residents of Lufhereng in relation to your house, site and plot? Can you add on a room, put up a 'zozo' or start a shop or a tavern in your house or on your site as you wish?	
Do you need permission? If so, who officially gives the permission?	
Are there measures in place for control of such developments? If so, who monitors and controls such?	
What is your opinion about these controls: having to get permission to develop on your site and the monitoring of it?	

10. EXPERIENCE OF LIVING IN LUFHERENG	
What is your perception as a result of your experience about the quality of the house you live in?	
What is your perception about the location of Lufhereng?	
Are you (residents of Lufhereng) accessing free or subsidized basic services such as water and refuse removal and municipal rates?	
Is the service that you receive poor or good?	
What is your view about the cost of living in Lufhereng? (If no transport cost is mentioned ask if the cost of transport could perhaps be a challenge?)	
From your observation or knowledge, who would you say comes to live, seek accommodation or socialize in Lufhereng?	
What about the schools in Lufhereng, do they also serve children from other areas?	
How long do you see yourself living in Lufhereng and why? Do you think your children will live here when they grow up?	
What are the three key issues that you are most satisfied with (positive experience) about living in Lufhereng?	
What are the three key issues that you are least satisfied (negative experience) about living in Lufhereng?	

SECTION C

SOCIO-ECONOMIC AND ACCESS ISSUES	
How far was the distance from place of employment/ school for the rest of the household members before the move?	

Did anyone from this household have to change place of employment/school since the move to Lufhereng? If so, Why?	
How many household members are unemployed, for how long have they been unemployed? Why?	
What travelling changes did this household have to make since the move to Lufhereng?	
How has that affected accessing employment and getting a job in other areas and locally?	
Is there any member of the household that commutes weekly/fortnight/ monthly? If yes, what are the reasons?	
Is there anyone looking for work in this household? If yes, where? And how long does it take to travel?	
If not, why? Is it in relation to transportation/ location?	
How long have they been looking for employment? And how does that affects their living experience in Lufhereng?	
Are there any other modes of public transportation in this area? How frequent and convenient are they?	
Is distance where you reach for taxis an issue? How so?	
How does travelling distances affect this household at work/school?	
How would you describe weekly experiences in terms of mobility/travel?	

Can you describe the challenges this household faces with regards to public transportation in Lufhereng?	
REFLECTIONS	
Has the move to Lufhereng affected efficiently accessing public services and social activities?	
Are you restricted to specific routes in this area? Or do you find that you are able to commute to most places in the city?	
If so, how have those restrictions affected this household?	
Have there been any development improvements in the area since you moved here?	
What are your general perceptions surrounding taxis and the proposal of Rea Vaya Bus Transit System in the future?	
As a person who commutes in the city, do you have any suggestions on how public transportation can be improved in the area?	

Appendix E: Consent form for Project Managers

CONSENT FORM

Research Title

Lufhereng as a peripheral location: An analysis of transport and employment opportunities.

I hereby confirm that I have been informed by the student researcher of the purpose, procedures, and my rights as a participant. I have received, read and understand the written participant information sheet. I have also been informed of:

- the nature of my participation in the form of an interview
- the place and duration of the study
- the reasons I was selected to participate in the study
- the voluntary nature
- no payment or incentives
- no loss of benefits or risks
- anonymity
- confidentiality
- how the research findings will be disseminated

I therefore agree/ do not agree to participate in this study by completing the survey/ interview.

Consent Agreement

I _____ (respondent's name) am willing to participate and aid you with information needed for your research. I fully understand that my participation in this research is voluntary and I may withdraw, if need be, at any time.

Signature

Date



Appendix F: Consent for Residents

FORMAL CONSENT FORM

I hereby confirm that I have been informed by the student researcher of the purpose, procedures, and my rights as a participant. I have received, read and understand the written participant information sheet. I have also been informed of:

- the nature of my participation
- the place and duration of the study
- the reasons I was selected to participate in the study
- the voluntary nature of my participation
- no payment or incentives
- no loss of benefits or risks
- anonymity
- confidentiality
- how the research findings will be disseminated

I therefore agree to participate in this study by completing the survey/ interview.

I AGREE / DO NOT AGREE to audio-recording during interviews.

PARTICIPANT:

Printed name

Signature

Date



Appendix G: Clearance Certificate



SCHOOL OF ARCHITECTURE AND PLANNING HUMAN RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: SOAP105/30/06/2016

PROJECT TITLE: Lufhereng As a peripheral Location: An Analysis of Transport and Employment Opportunities

INVESTIGATOR/S: Thandi Foto (Student No. 1284419)

SCHOOL: Architecture and Planning

DEGREE PROGRAMME: Master of Science in Development Planning (MSc DP)

DATE CONSIDERED: 08 September 2016

DECISION OF THE COMMITTEE: APPROVED

EXPIRY DATE: 08 September 2017

CHAIRPERSON 
(Professor Daniel Irurah)

DATE: 09.09.2016

cc: Supervisor/s: Prof. Allison Todes

DECLARATION OF INVESTIGATORS

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.



Signature

23.08.2017
Date

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