

UNIVERSITY OF KWAZULU-NATAL

**BARRIERS AND MOTIVATORS TO THE UTILIZATION OF PUBLIC
TRANSPORT: A CASE OF LA LUCIA RIDGE OFFICE PARK IN
DURBAN**

By

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DECLARATION

I, Gloria Nonhlanhla Khoza, hereby declare that:

- (i) The research reported in this dissertation, except where otherwise indicated, is my original research.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
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Abstract

Heavy reliance on private car contributes to various environmental and traffic problems such as pollution and congestion. Measure aimed at reducing private car usage will be more effective when there is an understanding of the underlying causes in the form of the barriers and motivators. This research was conducted to establish the barriers and motivators to using public transport in the La Lucia Ridge Office Estate. In addition to that it looked into the measures that can be employed to remedy the limited or non-utilization of public transport thereby reducing traffic congestion and encourage sustainable urban living. The data used in this research is based on the research that was conducted in La Lucia Ridge Office Estate in 2012. The data was gathered through the use of questionnaires. The questionnaires were administered in public places in LLROE and were targeting both private car and public car users. The analysis of the results found that the majority of respondents in the LLROE use private car as their main mode of transport and for those who use public transport the bus was their main mode of transport followed by minibus taxis. The results also revealed that the cost for both private car and public transport users was the key determinant in the choice of mode being utilised. In addition to that the unavailability of public transport at the time of respondents' going to or from work was also another key issue. The analysis also revealed that the respondents were happy with variety of public transport mode for the LLROE. In trying to establish measures to remedy the situation the study revealed that respondents would support the measures that were suggested in order to improve the use of public transport and reduce congestion and promote sustainable urban living. This research is a valuable contribution in the field of public transport and would serve as a point of reference for other areas experiencing similar challenges.

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CHAPTER ONE:

INTRODUCTION

1.1 Introduction

Transport, including public transport, is the backbone of any economy as it allows the matching of goods, employment opportunities, amenities and services with potential customers. For the country to survive globally, it requires a reliable and efficient transport system that is reasonably affordable to all potential network users and that succeeds in decoupling transport activity from impacts on ecosystem services. In addition, a healthy and inclusive society requires high levels of accessibility and quality for communities.

The challenge, therefore, is to ensure that the public transport system:

- Facilitates long-term economic welfare;
- Maintains competitiveness;
- Improves quality of life;
- Ensures the efficient transportation of people
- Helps deliver a more low-carbon economy; and
- Meets the needs of all citizens, regardless of location.

It is therefore important to ensure that the transport infrastructure and the service provided are kept to a certain standard that promotes the above highlighted points.

1.2 Motivation for the Study

Generally, in big cities, the number of trips between private and public transport is split equally going into the Central Business District (CBD). What makes this a bad situation is that the private vehicles carry one or two occupants and as a result there is increased traffic congestion. This also results in increased consumption of fuel which unfortunately is also associated with high levels of carbon emissions. In eThekweni Metropolitan area, eThekweni Transport Authority (2005) estimates the

trend growth in peak period person trips between 2005 and 2020 to be at 22%. In other words based on the projected trend during this period for reduced use of public transport and increased use of private transport, all growth in trips will be by car with an estimated decrease of 3% in public transport trips (eThekweni Municipality, 2005). This therefore poses a challenge because currently levels of congestion are very high and accommodating a 50% increase in private motor vehicles on the road system is intolerable and unaffordable in both financial and environmental terms.

eThekweni Transport Authority (2005) further states that if something is not done to curb the situation of increased reliance on private transport and decreased use of public transport a number of services problems will result. This includes (i) deterioration of transport services throughout the city, including public transport, freight transport and private transport, (ii) road congestion affecting all forms of transport, (iii) road based public transport will become expensive and unaffordable as well as inefficient as sprawling land use patterns continue to dilute the effectiveness of public transport, (iv) the demand for road capacity will exceed affordability of providing additional road space – land and financial implications, (v) a significant reduction in accessibility and mobility for the public, and (vi) reduced accessibility for freight movement with the associated effect of increased cost for commercial and industrial activities and reduced attractiveness for commercial/industrial development in eThekweni. A ‘wait and see’ approach to the current situation and current trend will have dire negative implications on quality of life and the economy.

eThekweni Transport Authority (2005) realises the impact that the extent of the current situation, if left as is, will have on the city. The result of this is high levels of traffic congestion which causes peak traffic demand to be extended. This would mean that the substantial traffic loads will be extended for longer than an hour period. The only thing that can contribute to reduction of peak travel is a change in modal split which can be achieved by introducing the use of Transport Demand Management (TDM) measures. The White Paper on National Transport Policy

published in 1996 advocated achieving at least a ratio of 80 public transport and 20 private car modal split (Walters, n.d).

Having realised the dire situation that eThekweni and other cities in Africa are facing in relation to the use of private car it then became necessary to explore the subject with the view of trying to better understand the situation, the causes and then establish the remedies.

The information gathered from this study and the results could be of significant value to other areas facing similar challenges. Furthermore, it will add to the international body of knowledge which is continually expanding as more cities around the globe – particularly in developing countries – seek to address the challenges of dealing with dependency on private cars and congestion as well as trying to attract commuters to use efficient public transport systems. The public transport providers in the La Lucia Ridge Office Park (LLROP) will also benefit from the study as it will enable them to understand the challenges and apply measures to resolve them in order to increase ridership.

1.3 Focus of the Study

The issue of car dependency and non-use of public transport is a broad subject which can be tackled from various angles. It is noted that this is an issue for the entire country. However, the study will only focus on Durban in the area of La Lucia Ridge Office Park. This is due to the nature of the problem and the time constraints.

It is also noted that different areas in Durban will respond differently on the issues based on the various dynamics of the communities. For an example, the residential suburbs and the office park have different elements in terms of the communities as well as their needs. These elements will have an impact on the public transport issues.

1.4 Problem Statement

Transportation is acknowledged as being one of the important factors to consider in terms of sustainability. The choice of mode of transportation not only has environmental implications, but also affects the long term sociability and economics of place as well.

1.5 Objectives

The main objective of the research was to yield understanding about the challenges regarding public transportation in the La Lucia Ridge Office Park and what needs to be done to attract commuters to public transport, thereby reducing traffic congestion. The concerns or specific objectives of the research were:

- to establish existing transportation challenges in the La Lucia Ridge Office Park;
- to establish obstacles to people's use of public transport with respect to the economy, local housing areas, attitudes and safety;
- to investigate factors that will increase ridership in the public transport mode;

The objective of the research was therefore to reduce any barriers for commuters by suggesting improvements to the various stakeholders with the aim of increasing the overall number of public transport passengers thereby reducing traffic congestion on the roads and encouraging sustainable urban environment.

1.6 Hypotheses/Research Questions

The key questions to be answered by this research were:

- What are the barriers to using public transport?
- What can be done to change the current tendency of private car dependency?
- What can be done to increase the number of passengers in public transport?

1.7 Proposed Methodology

Primary Data

Primary data was collected from the residents of the La Lucia Ridge Office Park over a period of four weeks. The questionnaire was administered in public places around La Lucia Ridge Office Park. This questionnaire included statistical and closed-ended questions allowing for quantitative data analysis to be conducted.

Sampling of subjects

A systematic random sample method was used to sample subjects to respond to the questionnaire. La Lucia Ridge Office Park covers an area of about 52 ha and is home to more than 270 companies in 11 office parks. The La Lucia Ridge Office Park has 2 029 776.45 m² of total bulk. Based on the total bulk it is estimated that the entire office park can accommodate 15 948 people. Fifteen thousand nine hundred and forty eight (15 948) is therefore the total population of the subject area. A total of 100 subjects were to given questionnaire, which provided a sufficient sample for this study area.

Data Analysis

Once all data and information had been collected, it was captured and analysed in order to meet the objectives of the study. Given the nature of the data quantitative data analysis techniques were employed. Statistical models such as measures of central tendency, measure of dispersion were used to analyse data. SPSS was used to analyse data collected

1.8 Chapter Outline

The research is presented in a chronological manner and is divided into various chapters in a logical sequence. The chapters are as follows:

Chapter 1 is an introduction where an overview of the research study is presented. The chapter contains an introduction, which includes the background to the public

transport situation, the problem definition and formulation of the research question. It also provides the motivation for the study and the focus area of the study.

Chapter 2 is the literature review which highlights the extent of private car use as the main mode of transport internationally and in South Africa. This chapter also draws closer to look at the situation in Durban and in the Umhlanga area within which the LLROE is situated. It gives an overview of the benefits of public transport utilisation in general. The dynamics of bus public transport in South Africa are described in this chapter.

Chapter 3 is the research methodology. This chapter presents the methodology that was used in the research study. In addition this section describes the framework within which this study was conducted and how the study was executed.

Chapter 4 presents the results of the study. The key findings from the respondents are being highlighted in this chapter.

Chapter 5 is the analysis of the results. This chapter analyses the results presented in Chapter 4 and also draws from Chapter 2.

Chapter 6 is the conclusions and recommendations. These are presented based on the entire process. The possible avenues for future research are suggested. It also gives strategic ways ahead and proposes some recommendations to address the problems of public transportation in LLROP.

1.9 Chapter Summary

The aim of this chapter was to place the study into perspective by stating the main problem of the research and the methodology to be used. The chapter put into perspective the motivation of the study and what it aims to achieve. The following chapters aim at addressing the research problem. To lay the groundwork for this process, chapter 2 will provide an overview of the literature review on public transport.

CHAPTER 2:

LITERATURE REVIEW

2.1 Introduction

The previous chapter outlined the context and objectives of the study. This chapter reviews literature on public transport with a broad overview of the South African context and zooming in to the status of public transport in Durban being the metropolitan area where the case study, LLROP, is located. In so doing, this chapter will look at the modes of public transport available and the challenges facing them.

2.2 Background to Public Transport issues

Due to intensive urbanisation and steady economic growth South African cities are experiencing an increased travel demand over the last few decades. Building of additional roads and means of traffic management are no longer sufficient. These may offer temporary solution but on the other hand they will also attract more vehicle usage. Most importantly land is a scarce resource and therefore devotion of more land to roads is considered wasteful. Furthermore the annual growth in vehicle population far outstrips the road building and there will always be an imbalance between the supply and demand.

The issues relating to climate change have been given priority on the political agenda. South Africa has recently hosted COP 17, a big event on environment and climate change issues. It has been noted that public transport has a major role to play in reducing the current levels of CO₂ and this has been highlighted in various platforms. Despite such efforts traffic levels are not showing any signs of improvement and all the projections suggest that the levels of obnoxious emissions will continue to rise hand in hand with traffic level. (Hickman & Banister, 2007).

South African cities are experiencing congestion on the roads. There is a high number of car usage and that comes with challenges. The government and the private sector cannot afford to build new roads. As indicated above, building new roads also attracts more cars on the road, which means building of new roads will be

a never ending cycle. Public transport rather than building new roads needs to be put at the fore front in order to remedy the traffic congestion in big cities (Banister, 2005). An effective public transport system form the basis of the sustainability of a country.

There are a number of benefits in having an effective public transport. Amongst other benefits of investing in public transport is that it (i) it assists in calming down the international drive market; (ii) curtails the impact of transport in climate change, and (iii) improves growth in the economy in cities as well as the well-being of its communities by easing levels of traffic thereby offering efficient mobility. Public transport has therefore been seen as a means of progress for societies (Banister, 2008).

Generally, public transport is not doing well in terms of the market share as it is facing increased competition from private car usage. Finding new ways to bring new customers and at the same time retaining the existing ones is inevitable for the public transport operators. In order to achieve that there has to be an understanding of what the public transport users expect. It therefore calls for implementing measures to improve the service standards through a customer oriented approach. This implies having to increase the responsiveness to both the existing and prospective customers' needs and expectations. Inevitably, high standards of service quality have become more important for public transport to increase the market share and survive in the industry (Beirao & Carbral, n.d).

In order to have an effective public transport system it is important to understand travel patterns and the underlying forces for choosing a particular mode of transport instead of another (Beirao, 2007). Quite frankly travel behaviour is an intricate matter. There are various modes of transport available for people to choose from depending on the individual's needs and preferences which are also informed by specific characteristics, advantages and disadvantages of each mode (Bohte, Maat, & van Wee, 2009). Costs associated with each mode of transport are a determining factor as well in choosing the mode of transport for a particular journey. In addition, the choice of one specific transport mode varies depending on various factors such as time, the type of journey, cost, etc. Hence some people use both public transport and private car in line with the needs at that particular time. It therefore becomes

necessary to understand these various factors which contribute to people's choices of transport mode in order to enable public transport system to modify their service in line with the customer preference thereby become their first choice and at the same time reverse the current modal split (Beirao & Carbral, n.d). Public transport must not be perceived as an inferior or less attractive alternative to the private car. As such, good public transport will become a transport of choice that is able to provide relaxation, ease and consistency. This is the key to achieving sustainable urban environment (Too & Earl, 2010; Commission for Integrated Transport (CfiT), 2009).

It is sad that the sustainable public transport service quality is still far-fetched for many cities and communities in both developed and developing countries. Low and Gleeson (2003, cited in Too & Earl 2010) maintain most parts of the world have not been able to provide sustainable transportation for various reasons. One thing that is certain is that this current state of affairs in transport has dire consequences for the citizens and its environment.

2.2 Importance of public transport

2.2.1 Sustainability

Sustainable development is today mandatory and all public and private developers must adopt the principles of sustainability as the guiding principles of any development (CfiT, 2009). Public transport is at the top of the agenda for sustainable cities. It has been argued that the population growth in the urban areas leads to negative environmental, economic and social impacts. The provision of good public transport services is a key component in redressing some of the adverse effects associated with increase urban development and achieving environmental, economic and social benefits known as sustainability's triple-bottom-line goals (Too & Earl, 2010). Too & Earl (2010) further asserts that public transport services has an impact on social sustainability. Effective public transport system means sustainable society. Too & Earl (2010) noted that a high quality, integrated public transport plan is a key to ensuring a community which is environmentally and socially sustainable.

2.2.2 Socio-economic benefits

According to International Association of Public Transport (UITP),(n.d) public transport facilitates access to social service and economic centres. United Nations, 2006; DFID, 2007; United nations 2008a,b (cited in Mashiri, Bogapane-Zulu & Chakwizira, 2010) also view transport as hugely important to deliver the benefits of access to socio-economic services, resources and opportunities. Public transport is viewed as key in the inclusion of the communities that were socially excluded from participating in meaningful economic activities. This is particularly the case in developing countries characterised by increasing urban population. In developing countries, issues related to transport, mobility and access have increasingly gained attention as critical components to integrated development initiatives in both rural and urban areas (Mashiri, Bogapane-Zulu & Chakwizira, 2010)

The Government of Western Australia (2011) affirms that thriving cities need well-functioning public transport as it plays a vital role in building healthy markets, and sustainable, well integrated communities. Public transport contributes in curbing the transport toxic emissions and it provides a crucial link between families and friends, facilitate access to job centres, education and health care facilities. In essence good public transport contributes to the wellbeing of the society. Most importantly, it provides flexibility and freedom for people without their own cars or for some reason cannot drive (The Government of Western Australia, 2011). With the rate at which private vehicle usage is growing it is expected that in the near future congestion levels will reach a point where a trip on private vehicles is not attractive. With the increase of private vehicle usage come high prices of petrol and parking space becomes limited in central areas and/or costly.

2.2.3 Moving people

Public transport has a significant role to play in improving the mobility of people such as children, youth, students, older citizens and people with disabilities who may not be able to have access to alternate forms of transport including those who cannot afford a car (The Government of Western Australia, 2011). Public transport provides access to essential social services and economic hubs.

2.2.4 Managing congestion

Most cities are experiencing increasing levels of traffic congestion. Areas which are major employment centres are characterised by traffic congestion during peak hours (Sloman, 2006). Prevalence of single occupancy car usage has contributed tremendously in heavy peak period traffic. It is only through public transport that a significant reduction in the growth of peak period commuter traffic can be achieved.

2.2.5 Creating development opportunities

Public transport can serve as a motivation for densification and mixed land uses. The optimum land use developments are centred around well-serviced transit nodes (Banister & Hickman, 2006). This also helps in reducing urban sprawl and makes optimum use of infrastructure. Mixed-use developments in the high density nodes served by well-functioning public transport provide communities with easily accessible employment opportunities and basic services become easily accessible with minimal impact on the environment. It also promotes good urban planning practice and it also makes sustainable and liveable cities (UITP, n.d; Chen, Gong & Passwell, 2008). Densification with the right mix of land use around transportation nodes promotes active lifestyle as people can easily walk or cycle to employment work place within the core of the development.

2.2.6 Connecting centres

People travel for various reasons and the central city area is not always the destination point. University students and school learners have different transport requirements than those people who are employed in the urban centres and those who wish to access goods and services from other areas. As such the role of public transport is to ensure connection between the various centres in order to enable smooth functioning of the city (The Government of Western Australia, 2011).

2.2.7 Environmental and social benefits

Public transport contributes in reducing other effects associated with a transport system that is dependent on private vehicles. Studies such as the Garnaut Climate Change Review 2008 (cited in The Government of Western Australia, 2011) highlight

that Australian cities are among the leading cities which are highly reliant on single occupancy vehicles in the developed world. In Australia transport alone contributes approximately 14% of their total obnoxious emissions, and the highest contributor is private vehicles (The Government of Western Australia, 2011). This is very detrimental to the environment and needs to be reduced enormously. Public transport therefore provides some mitigation in the sense that there is reduced pollution from CO2 emissions and other obnoxious materials associated with gas-powered transportation. Public transport reduces the foot print of the land required for new roads and parking lots (Hickman & Banister, 2007a).

2.2.8 Improved health

The tendency of people using private cars is that they become less active as they walk less and often look for parking nearby. Public transport users on the other hand have to walk or cycle to get to the bus station. In doing so they are exercising and thereby improving their health. Research indicates that private car users have a 6% greater likelihood of gaining weight than public transport users (The Government of Western Australia, 2011). This does not just benefit the individual but the society at large, because, as the individual health improves the more likely is the individual going to participate in the economy and social activities. This also reduces the burden on the health system and the government coffers.

2.2.9 Reduced road fatalities

Increased usage of public transport, and subsequent reductions in private car travel, can greatly reduce the number of road accidents which some of them result in fatalities and serious injuries and the associated costs of road trauma. There is a relationship between the levels of road accidents and the number of accidents on the road (The Government of Western Australia, 2011).

2.2.10 Land used efficiently

As indicated above one of the major impacts of over-reliance on private cars is the invasion of precious land by highways. Land is a scarce resource and increased

public transport usage provides optimum usage of it than a car-dominant society. Reliance on public transport ensures that land is reserved for other sustainable uses and for the better enjoyment and benefit by of the society at large (Laffel, 2006; Hickman & Banister; 2007b).

2.2.11 Reduced costs

The use of public transport reduces fuel demand and vehicle maintenance costs. High levels of public transport usage result in savings by the authorities on road maintenance costs for cities and provinces. For a country such as South Africa which is heavily reliant on oil imports which is also coupled with long supply chain makes the country open to instabilities in global oil prices and supply commotions (Mashiri, Moeketsi & Baloyi, n.d). In a period when oil demand is up it would result in significant increase in the price of oil which would in turn impact enormously on the country's economy (Laffel, 2006).

In developing countries public transport has been used to get rid of slums because people build slums next to places of employment opportunities because their homes are far from these places. International Association of Public Transport (n.d) argues that public transport has to be the number one mode of choice for all income levels or the purpose of a trip.

2.3 Public Transport in South Africa

South Africa has an unsustainable transport system which is a challenge for a developing country. The modal split in South African roads is very skewed with 80:20 (private: public) ratio. In addition to that in South Africa choices are very limited when it comes to public transport. It is noted that different cities have various service levels of public transport. The metropolitan cities have all modes of transport such as bus, minibus taxis as well as rail while the smaller towns are only served by mainly bus and minibus taxis. According to Mashiri, Bogapane-Zulu, & Chakwizira (2010) public transport forms there are offered to the ordinary South African are limited mainly to three, being that of minibus taxis, trains and buses. Rail and bus systems have a

competitive advantage over minibus taxis as these forms are subsidised by the government leaving the minibus taxi industry to provide for itself.

There are very few off-peak services. The public transport service operates mainly during the busy hours of the morning and afternoon when people go to their activity centres. The public transport system is designed mainly to service the working community. As such it makes it poses a challenge for those who do not necessarily need transport only as a means to get to work, but have other important activities to attend to during the day. A public transport service designed to service the working community is only available in the mornings during the start of the business hours and in the afternoons for close of business hours. An effective and sustainable public transport service needs to provide not only for workers during peak hours and should be available throughout the entire day. Commuters should be able to get a world class service at any time of the day (Trans:SIT, 2007). A perfect public transport service should match the services offered by private vehicle usage rather than being considered an inconvenience and a last recourse. The current state of public transport systems in South Africa requires major overhaul which needs financial investment and shakeup for the betterment of the service quality that is currently offered and to match up with the needs of the commuters to an acceptable level (Trans:SIT, 2007). In order to improve the public transport market share a major investment in large scale transport infrastructure, including: fleet, stations, technology and systems, is required.

2.3.1 Modes of Public Transport

In South Africa the majority of the workforce mainly use minibus taxis which is considered to be relatively affordable. The taxi industry currently is dominantly owned by Blacks with statistics showing more than 90% of operating taxis being in the ownership of black South Africans. The taxi industry is male dominated. It is estimated that the taxi industry employs about 185 000 people with a fleet 150 000 minibus taxis as at 2007. Minibus taxis are the most popular form of transport for most of the workforce and are responsible for 65% of public transport commuting in rural and urban areas. Thirty five percent (35%) is shared between the buses and

trains with the buses making 21% and trains accounting for 21% (South Africa, 2010).

In comparison, bus and train systems provide the most efficient forms of transport when looking at fuel consumption per commuter kilometre and the occupancy levels. Regardless of the bus and train system being relatively cheap as compared to the minibus taxis, these forms of public transport remain underutilized. Minibus taxis, despite of being the most popular form of transport, it is riddled with problems such as safety, regulation issues, and the cost issues. The importance of public transport in a third world and a country such as South Africa cannot be downplayed and therefore the problems in the minibus taxi industry become an issue of importance to be addressed (van Zyl & Lubuschagne, n.d). The government appreciates the significance of the taxi industry in terms of its contribution towards employment creation and the economic growth of the country. As such the government has put up plans to support with the financing of education and training programmes with the aim of improving issues relating to maintaining customer relations, governance and managerial skills, labour relations and public wellbeing. This will ultimately improve the image of the industry and the service provided thereof (South Africa, 2010).

2.3.2 Challenges facing the public transportation in South Africa

The public transportation in South Africa is an emergency situation which requires attention from all corners. Access to public transport is hampered by unreasonable long walking distances to bus / train stations coupled with extended times spent on bus stations mainly due to poor service and network design, as well as timetables which are not properly drawn up or not followed (Mashiri, Bogapane-Zulu, & Chakwizira, 2010). As a result convenience is severely undermined. In addition to that, public transport commuters face transit conditions that lack comfort. According to Mashiri, Bogapane-Zulu, & Chakwizira (2010) at times this also hinders people from boarding at the desired time as crowding imposes relatively severe discomfort and poses safety concerns. This is particularly more so in train stations.

Mashiri, Bogapane-Zulu, & Chakwizira (2010) assert that public transport in South Africa is characterised by limited availability of public transport vehicles during rush hours with commuter having to wait for buses/train longer times. This is combined with the fact that public transport operates uneconomical routes which contributes to high operating costs which gets passed on to the commuters through fares. The public transport system is often not on scheduled time due to traffic congestion along major routes which is the resultant of high volumes of private cars on the road. The high operating cost is particularly evident in the case of the taxi industry. In the taxi industry, there is high competition characterised by over-trading, long off-peak periods. This has contributed negatively to already stained image of public transport (Mashiri, Bogapane-Zulu, & Chakwizira, 2010). Furthermore, public transport is costly for the majority of poor citizens due to the fact that it is under-funded. Research has shown that poor people spend typically more than 10% of their entire earnings on transport (Mashiri, Moeketsi & Baloyi, n.d).

Metrorail is mandated with the management of all rail commuter services within South Africa. In South Africa rail is mainly used by the poor sectors of the communities. It is estimated that about half of all rail commuters earn a monthly income of less than R2 500, and are therefore reliant on affordable transport means (Passenger Rail Agency of South Africa, 2010). Metrorail's foot print covers all South Africa's six main urban centres, that is, Cape Town, Durban, the greater Johannesburg region, Pretoria, Port Elizabeth and East London, and in total have 471 stations. It is interesting to see that between 2000 and 2006, Metrorail's passenger trips per annum increased from 507.4 million to 511.9 million. Despite this increase a noticeable decrease in 2003 was recorded with 465.1 million passenger trips per annum (Passenger Rail Agency of South Africa, 2010).

With regards to safety in the commuter rail system in the midst of safety concerns that tainted the rail industry the South African government introduced a Rail Safety Regulator. There had been a number of serious rail catastrophes between 2002 and 2006 and the South African Rail Commuter Corporation decided to put more funding for the rail infrastructure upgrades and improvement in the safety standards. In line

with that the National Railway Safety Regulator Bill (2002) was also introduced as a means of improving rail safety conditions. Passenger Rail Agency of South Africa (PRASA) was launched in 2009 to replace South African Rail Commuter Corporation. It is estimated that PRASA transports more than 645 million passengers per year across Metrorail which represents 95% of the commuter share and Shosholozza Meyl and Autopax throughout the country (South Africa, 2010).

2.3.3 Recent Improvements in the Public Transport System

On a rather positive note, a number of public transport projects associated with the 2010 Soccer World Cup were undertaken around the country. Amongst them is the Gautrain and Rea Vaya both in Johannesburg, a Bus Rapid Transit (BRT) system in the Nelson Mandela Metropolitan Municipality, and an integrated rapid transport (IRTP) system in Cape Town (Deloit, 2010). These were completely new improvements which demanded large capital outlay as well as promotional campaigns and awareness campaigns to educate the public about these new forms of investment which brought about changes in the whole public transport system. There have been some improvements in the system but noting the challenges in the implementation. A complete assessment of the impact of these developments has not yet been undertaken.

In most cities some buses are privately owned but receive government-subsidy and some are owned and run by the municipalities in those major urban centres. Buses are in direct competition with minibus taxis. In recent years, government introduced Bus Rapid Transit (BRT) system. BRT system is meant to improve public transport networks by introducing high quality priority lanes for buses to operate on exclusive right of way. This is to enable high speed operations and make public transport efficient (Trans:SIT, 2007).

BRT at its core has the aim of increasing the desirability of bus transport as opposed to other modes. This system has gained popularity in the circles of transport policymakers with the aim of reducing factors associated with extreme transport demand such as traffic congestion and time delays. In comparison to other modes of dedicated travel, such as light rail, it is economical and can be affordable to the poor

and is considered to be easy to implement and at the same time has an added advantage of carrying large number of passengers as the light rail. Most importantly, it offers temporal flexibility in terms of service standards and has a network coverage that is not easily achieved by light rail (McDonnell, Ferreira, & Convery, 2008)

BRT is a ground-breaking mass transportation system which is designed to increase the effectiveness and quality of cities. It is designed to provide flexibility and relative low cost of buses with the added benefit of being mindful of the environment. A well designed BRT can achieve equivalent levels of service as that of rail-based systems but what makes it more enticing is that it can be constructed at a minimal cost and shorter construction time (Trans:SIT, 2007; McDonnell, Ferreira, & Convery, 2008). BRT is one of the affordable solutions of public transport to keep pace with urban growth and its demands. Since BRT uses dedicated bus lanes time spent by passengers on the road is much lesser compared to a regular bus journey. Conventional BRT system requires that the station floor be at the same level as the bus floor. This ensures that even people with limited ability are able to access BRT easily. The BRT in some of the cities in South Africa such as Johannesburg, Pretoria, Bloemfontein, Port Elizabeth and Cape Town started functioning well before the 2010 Soccer World Cup. In fact the system was part of 2010 World Cup plans and is supposed to address congestion and drive economic growth (South Africa, 2010; van Zyl & Lubuschagne).

For people to get to a habit of using public transport in South Africa a major investment and improvement in infrastructure and the standard of service and efficiency of service is not an option. This is an extremely expensive and a long term undertaking which will however definitely provide rewards in the long term.

2.3.4 Public Transport Policy

Banister (2005) listed the following as major policy influences on transportation: institutions and organizations, technology, finance, urban forms and culture. The National Department of Transport has the following as its vision for the public transport.

NDOT Vision for Public Transport:

“Promote a safe, reliable, effective, efficient, co-ordinated, integrated and environmentally friendly land passenger transport system in South Africa urban and rural areas, and the southern African Region, managed in an accountable manner to ensure that people experience improving levels of mobility and accessibility”

In addition, there is a Public Transport Strategy in place. The Public Transport Strategy is intended to fast track the improvement in public transport sector by introducing integrated rapid public transport networks (IRPTNs), and bring to the picture priority rail networks and BRT systems in all major urban centres. The important element of the Public Transport Strategy is the strategic conglomeration of all mode-based vehicle recapitalisation into IRPTNs. This amalgamation comprises an integrated package of light rail, BRT, minibus taxis and metered taxi priority networks, especially in big urban centres. It is expected that by doing so there will be a considerable improvement in the public transport services every citizen in the country to enjoy (Department of Transport, 2007)

The South African Vision for a Public Transport Legacy: 2007-2020 is:

“Integrated rapid public transport service networks (IRPTN) are the mobility wave of the future and are the only viable option that can ensure sustainable, equitable and uncongested mobility in liveable cities and districts” (Public Transport Strategy: 2007).

The Public Transport Strategy and Action Plan is geared towards moving people from the inefficient transportation modes to user-friendly, municipal operated, fully assimilated, mass rapid public transport networks (van Zyl & Lubuschagne; Department of Transport, 2007).

2.4 Public Transport in Durban

eThekweni Municipality covers approximately 2 300km² and is home to some 3,7 million people, just over one third of the population of KwaZulu-Natal. It is by far the largest of the two metropolitan councils in the province and accounts for 60% of economic activity within the province.

In line with the National and Provincial vision and mission statements eThekwini's mission statement is:

“To provide and manage a world-class transport system with a public transport focus, providing high levels of mobility and accessibility for the movement of people and goods in a safe, sustainable and affordable manner” (eThekwini Transport Authority, 2010).

Generally, in the highly populated cities, the modal split ratio is generally half private to half public transport going into the CBD (Walters, n.d.). What makes this a bad situation is that these are single occupancy vehicles which lead to increased congestion and result in high fuel consumption with associated high levels of carbon emissions threatening the environment and the society.

In eThekwini Metropolitan area, eThekwini Transport Authority (2005) estimates the trend growth in peak period person trips between 2005 and 2020 to be at 22%. In other words based on the projected trend during this period for reduced use of public transport and increased use of private transport, all growth in trips will be by car with an estimated decrease of 3% in public transport trips (eThekwini Municipality, 2005). This therefore poses a challenge because currently levels of congestion are very high and accommodating a 50% increase in private motor vehicles on the road system is intolerable and unaffordable in both financial and environmental terms.

eThekwini Transport Authority (2005) further states that if no actions are taken to deal with the situation of increased reliance on private transport and decreased use of public transport a number of services problems will result. This includes (i) deterioration of transport services throughout the city, including public transport, freight transport and private transport, (ii) road congestion affecting all forms of transport, (iii) Road based public transport will become expensive and unaffordable as well as inefficient as sprawling land use patterns continue to dilute the effectiveness of public transport (iv) The demand for road capacity will exceed affordability of providing additional road space – land and financial implications, (v) a significant reduction in accessibility and mobility for the public (vi) reduced accessibility for freight movement with the associated effect of increased cost for

commercial and industrial activities and reduced attractiveness for commercial/industrial development in eThekweni. A 'wait and see' approach to the current situation and trend current trend will have dire negative implications on quality of life and the economy.

eThekweni Transport Authority (2010) realises the impact that the extent of the current situation if left as it will have on the city. There will be increased levels of traffic congestion which would in turn cause spreading of the peak traffic demand. This would mean that the traffic congestion last throughout the day and have an impact on the economy. It is only the change in modal split which can bring about any meaningful reduction in peak travel. The change in modal split can be realised with the implementation of Transport Demand Management (TDM) measures. The White Paper on National Transport Policy published in 1996 advocated a modal split to public transport of 80:20 (public: private) (Walters, n.d)

In addition to TDM measures which are needed to reduce the demand for private transport some measures are needed to retain current public transport ridership whilst attracting new riders from the private transport group. In many instances issues of system efficiency, effectiveness, safety, affordability and sustainability under-score the need for effective TDM measures.

2.4.1 Existing public transport system in eThekweni

2.4.1.1 Commuter Rail

The commuter rail system comprises the following:-

- A north-south line following the coast from beyond the limits of the metro area to both the north and south.
- The mainline into the hinterland which carries commuters within the metropolitan area.
- A circuitous line between Pinetown CBD and Rossburgh Station on the north-south line.
- Three spur lines into the major residential areas of Umlazi, Chatsworth, and KwaMashu.

- A spur line along the south side of the harbour to the lower Bluff which is largely undeveloped.
- A section of single line adjacent to Chris Hani Road, parallel to the main north-south line.

The existing rail system is characterised by decreasing levels of service and heavy reliance on financial support, which is currently provided by the National Department of Transport. The state of the rail infrastructure is not up to an acceptable standard. It is derelict with some parts of the signal system that are outdated which raises concerns in terms reliability of efficient operations. It is also noted that many of the eight rail lines operate with low passenger loads and are deemed to be economically inefficient and in some instances, such as the Pinetown line are not well located to provide a reasonable service for the major passenger origin-destinations (eThekweni Transport Authority, 2010). It is interesting to note that a new station has been built at Bridge City by a public / private joint venture and construction of the rail link has commenced. A further new station has been built and commissioned adjacent to the Moses Mabhida Stadium, as part of the 2010 FIFA World Cup.

The major issue around rail is the real possibility of a shutdown of all parts of the system unless there is a major investment in the system either through existing institutional structures or through some form of concession. In light of this the government provided capital outlay for the underground Bridge City rail station in the vicinity of the Intuzuma, Nanda and KwaMashu (INK) area. This new rail station is expected to handle 14 000 passengers in peak hours (Passenger Rail Agency of South Africa, 2010). It is seen as big investment to address the shortage of public transport infrastructure. There have been some concerns regarding passenger safety in the rail system. In order to address passenger safety problems, the railway police contingent has been increased to 700, based at 5 police stations plus a high command at Durban station (Passenger Rail Agency of South Africa, 2010).

2.4.1.2 Bus and Taxi system

The taxi and bus major route system provides extensive coverage throughout the metropolitan area including services parallel to and in direct competition with most of

the rail services (eThekweni Transport Authority, 2010). In most locations the bus and taxi services follow similar routes except in the Outer West, west of Pinetown. In these areas most of the routes are taxi routes with limited or no bus service, with the exception of bus service to Mpumalanga from Durban and the Pinetown areas.

The metropolitan area has four major public transport nodes with a number of other nodes of local significance. The major nodes are located at:-

- Isipingo in the south
- Durban CBD
- Bridge City to the north
- Pinetown to the west

Isipingo in the south and Bridge City define the limits of the major north-south coastal public transport corridor. Durban CBD located in the middle of this corridor is a major attractor for trips from both the north and the south.

The other major node is Pinetown Central which is largely a hub for services from the Outer West and industrial and residential areas to the south of Pinetown central and to the north-east. Although Pinetown is a major node it is not connected by a major corridor to any other node of significance (eThekweni Transport Authority, 2010). Consequently, the only corridor carrying sufficiently high volumes of commuters to be defined as major public transport corridor is the north-south coastal corridor between Isipingo in the south and Bridge City in the north.

Other public transport nodes of significance include, Prospecton, (an industrial area), Isipingo node, Hillcrest (which is becoming a sub-regional centre), Phoenix town centre, Verulam (with a significant concentration of bus and taxi activity) Tongaat (also with a major concentration of bus and taxi activity) and the developing node around the Umhlanga town centre.

Major issues around the bus system and service are that bus and rail services operate in direct competition; unsubsidised bus services are deteriorating and many bus trips operate with low passenger loads even in peak periods (eThekweni Transport Authority, 2010).

The 2010 figures show that there are approximately 120 taxi associations serving the municipal area (eThekweni Transport Authority, 2010). Generally the taxi industry operates in direct competition with bus and rail service throughout the metro area. Peak passenger loads on most routes are high although not always over the full extent of the journey. In some areas indications are that over-trading has resulted in associations operating with split schedules whereby different operators provide the service on different days of the week. This has the effect of keeping passenger loading at unreasonably high level. Addressing the issues of management of public transport services should also be at the forefront as the highly disjointed management leads to competition between the different public transport modes. This is not necessarily a bad thing as it is supposed to improve the quality of service each mode is providing in order to gain a big market share.

Issues around the taxi system and service relate to the overall deterioration of the taxi fleet, resulting in reduced safety and reliability of service, over-trading in some areas which results in below average profit levels and association competition for new routes or service which often leads to aggressive confrontation and violence. Safety is a major concern in the minibus taxi industry (eThekweni Transport Authority, 2010). Concerted efforts need to be made to improved passenger safety as it has been highlighted as one of the reasons for people not to use public transport.

According to eThekweni Transport Authority (2010) overall the public transport system in eThekweni metropolitan area is economically inefficient with many services in direct competition with each other resulting in unprofitable rail and bus trips and in some instances taxi trips. Generally, apart from subsidised bus contracts, the rail, bus and taxi service fleet is in an advanced stage of deterioration with no signs of significant investment in new fleet in the short term future (eThekweni Municipality, 2005). Consequently, service levels are dropping and public transport patronage is reducing.

2.4.2 Umhlanga Region

It is understood that, generally, public transport passengers in Umhlanga region primarily come from the west and south-west. The major roads used to access this area are the M41 west of the N2, the N2 from the south, Umhlanga Rocks Drive (URD) and the M4 to the south. The current public transport infrastructure comprises a taxi rank within Gateway, on-street stops along Umhlanga Rocks Drive (URD), URNTC and Armstrong Drive in the LLROP. It is also noted that over and above this formal infrastructure taxis also make use of the various traffic circles (particularly in the LLROP), the M41 and accesses to specific developments as pick-up/drop off points. The other public transport infrastructure in close proximity which influences patterns in this region are the existing ranks in Umhlanga Rocks and the La Lucia Mall.

A survey that was done by Vela VKE (2005) for eThekweni Municipality shows that Umhlanga area has the same patterns as throughout the eThekweni Municipality, with passengers being dropped off along the routes in the morning, but being picked up at the ranks and lay-bys in the afternoon or evening. The periods with intense congestion are mostly between 7.30 and 10.00 in the mornings and 4.30 and 5.30 in the afternoons. The study also revealed that the taxi rank in Gateway caters for a high proportion of all public transport trips in the region (65 percent), peaking at some 780 boarding passengers in the evening peak hour. The study also revealed the following key points:

- Bus is an important mode, particularly along URD.
- Gateway is the largest single origin/destination in the area, accounting for some 43% of all trips in the evening peak period.
- Only 52 to 57% of all passenger trips in the Gateway rank are related to Gateway.
- Construction and domestic workers are a sizeable component of all trips in the morning and evening commuter peaks. This is particularly so at the public transport stops closest to the residential areas and construction sites.
- The home end of the trips are very varied. The majority come from the west (Phoenix, Ntuzuma, KwaMashu, Amaoti), but trips are also made from far away (Umlazi, Durban CBD).
- Some of the on-street stops within the area were not very well utilised

Vela VKE (2005) concludes that there is no land available for the provision of PT ranks in the LLROP and suggests on-street laybys as the only option. The report further states that the security arrangement in the La Lucia Ridge Office Park is such that pedestrians can only enter at specific controlled entrances.

2.5 Barriers to Modal shift

Derek (2003) publication looks at the car dependency and came out with a number of barriers to modal shift from private car to public transport. The barriers to modal shift are into three categories: soft factors, hard factors and complementary factors. Time, money and land uses are considered hard factors whilst information is considered as a soft factor. Complementary factors include lifestyle and the load to be carried to work.

2.6 Conclusion

The literature reveals that heavy reliance on private cars has a negative impact on the economy and environment as well as the society at large. Congestion, costs related to congestion, costs of using private cars as well as pollution are some of the negativities associated with reliance on private cars. It is clear from the discussion that public transport is central to poverty alleviation and economic empowerment. It has also emerged that effective & efficient public transport is key to sustainable urban environment. However sustainable public transport still remains a dream for the majority of cities. Having said that, in South African roads are still congested and there is a need to find out what could be done to attract people to use public transport. The next chapter will focus on the methodology that was employed in undertaking this research study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will provide an overview of the research instrument development process, as well as the data collection process for the research (See Appendices B for copies of the questionnaire). A detailed discussion of each of these aspects will be presented in this chapter. The focus of the research design and methodology will be to answer the main research problem.

3.2 Aim of the study

The literature review clearly shows that many parts of South African cities are facing the challenge in terms of the increasing usage of private cars. Despite all the problems associated with such levels of private car usage and with the understanding that most of these problems associated with private car usage can be eliminated quite easily with the use of public transport, public transport still remains under-utilised. It was therefore necessary to get to understand the underlying factors that cause people to rely mainly on private cars. It was also essential to look into factors that would attract people to use public transport as the main mode.

The main objective of the research was to yield understanding about the current status and challenges regarding public transportation in the La Lucia Ridge Office Park and what needs to be done to attract commuters to public transport, thereby reducing traffic congestion and other challenges associated with high reliance on private car usage. The concerns or specific objectives of the research were:

- to establish existing transportation challenges in the La Lucia Ridge Office Park;
- to establish obstacles to people's use of public transport with respect to the economy, local housing areas, attitudes and safety;
- to investigate factors that will increase ridership in the public transport mode;

The objective of the research was therefore to reduce any barriers for commuters by suggesting improvements to the relevant stakeholders with the final result of increasing the overall number of public transport passengers thereby reducing traffic congestion on the roads and encouraging sustainable urban environment.

3.3 Participants and Location of the Study

The La Lucia Ridge Office Park (LLROP) is located approximately 18 kilometres north of Durban on the southeast side of the intersection between the N2 and the M41 as depicted in Figure 3.1. It is situated adjacent to the Umhlanga Ridge New Town Centre. The LLROP is home to more than 270 companies in 11 office parks. These range from international companies (e.g. DELL, Sun International) to large national companies (e.g. UNILEVER, Sovereign Health, Liberty Life) and smaller independently owned operations (e.g. medical and legal practices and investment brokers).

The participants to this research were the residents of the LLROP regardless of the mode of transport being utilised. Noting that LLROP is a business estate, that is, people come there mainly for work purpose.

3.4 Research Approach

The focus of this research is on the commuters' perception and therefore methods that were used focused on the respondents to reveal their thoughts, knowledge, experience and feelings about the public transport in LLROP. The nature of this research called for the quantitative methodology to be employed for this research purpose. It is understood that all methods have pros and cons. The major one being that different methods tend to focus on different parts or reveal information about different aspects of a research problem. Therefore, it is always prudent to pull together different methods to obtain a good database that enables theories to be verified and general conclusions drawn. Collis and Hussey (2003:55) state that the research paradigm will have a significant influence on the research methodology that is selected for the study. The research methodology that was selected for this paper is that of a case study, LLROP being a case, which falls within the phenomenological

research paradigm. Collis and Hussey (2003) define a case study as “an extensive examination of a single instance of a phenomenon of interest”. A case study is also described as a research study which concentrates on divulging the fundamental imperatives present within a particular location or situation.

The background that emerges is that of the study of a single phenomenon, within a specific context that is examined in order to arrive at a set of findings or conclusions. Given the nature of this research study, which focuses exclusively on the barriers or motivators to the use of public transport in La Lucia Ridge Office Park, a case study approach is deemed to be the most suitable research methodology to follow. According to Collis and Hussey (2003) case studies can be described into a number of categories, such as descriptive, illustrative, experimental or explanatory case studies. However, they are most commonly referred to as “exploratory research, used in areas where there are few other theories or a deficient body of knowledge” Collis and Hussey (2003:68). This applies extremely well to the LLROP research, as there has no research that has attempted to find what motivates or hinders people to use public transport in the greater eThekweni metropolitan area.

3.5 Sampling

A sample is a small fraction of a population carefully chosen for investigation. This means that a sample is a smaller representative of a larger whole. The main aim of a research is to find ideologies that can be applied generally (Kumar, 2005). It is impracticable, if not impossible, to study a whole population in order to arrive at generalisation. Using a sample method enables the researcher to draw valid inferences and can use the findings to generalize on the basis of careful interpretation of variables within a relatively small proportion of the population. Kumar (2005) argues that before a researcher compiles a sample he/she should know the characteristics of the population and that would enable the researcher to draw up a representative sample.

For the purpose of this research a random sample method was used to sample subjects to respond to the questionnaire. La Lucia Ridge Office Park covers an area of about 52 ha and is home to more than 270 companies in 11 office parks. The La

Lucia Ridge Office Park has 2 029 776.45 m² of total bulk. Based on the total bulk it is estimated that the entire Office Park can accommodate 15 948 people. Fifteen thousand nine hundred and forty eight (15 948) is therefore the total population of the subject area. Israel (2012) argues that if descriptive statistics are to be used to analyse the data any sample size would be acceptable. Israel (2012) further argues that for multiple regression, analysis of covariance or long linear analysis then a good sample size would be 200 to 500. The researcher chose a sample size of 100 because according to Sekaran & Bougie (2010) a sample size larger than 30 and less than 500 is considered to be appropriate for most research. In addition to that Israel's (2012) table for sample size shows that 99 for a population of 15000 and 100 for a population of 20000 with 10% precision levels where confidence level is 95% and proportion of .5. As indicated above, the estimated population is 15948 which falls between the two populations (15000 and 20000) stated in Israel's (2012) table. The researcher then decided to use 100. Therefore, a total of 100 people were given questionnaire, which provides a sufficient sample for this study area.

Due to the nature of the population a systematic random sample was used. A systematic sample is a random sample compiled in a systematic manner. In this research it was determined as follows: $15948/100= 159.48$ (which was rounded off to 159). This meant that the interval was 159. A random number between 1 and 159 was selected. That number happened to be 7 and it represented the first subject and the starting point for choosing the remaining subjects. Starting with the 7th person to be identified on the street, every 159th person was given a questionnaire.

3.6 Development of the Instrument

The research instrument used was a questionnaire. Sekaran and Bougie (2010) defines a questionnaire as a pre-determined set of questions and respondents are required fill out their answers, usually within rather closely defined alternatives. The questionnaire was designed within the confines of the objectives of the research. Questions were outlined in a chronological order in order to assist with the ease of responding. Where possible the response options were limited to a few however in order to get a true reflection of the situation a few questions had quite a wide range of options. This also assisted in reducing the element of biasness which is a

drawback which questionnaires have by forcing respondents to choose from alternatives or by making them select alternatives that might not have occurred. The advantage of using questionnaires is that they are cost-effective in that they collect data in a short time at very low cost.

The survey instruments were drafted and designed to assess the following public transportation issues:

- What are the barriers to using public transport?
- What can be done to change the current tendency of private car dependency?
- What can be done to increase the number of passengers in public transport?

3.7 Data Collection

Primary data collection for this research mainly took the form of a questionnaire administered largely on a face to face basis with residents of the La Lucia Ridge Office Park. However, in other instances respondents preferred to take the questionnaire and completed it at their own convenient time as most of them were in a hurry to get somewhere. The questionnaire included statistical and closed-ended questions, for quantitative data analysis to be conducted. The questions asked were centred on the respondents' sentiments about public transport services. The respondents had to state whether they agreed or disagreed with different statements about public transport attributes and also measured the degree to which they felt about that statement. The ratings used the following scale: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree, and (5) strongly agree. The respondents also answered some background questions such as age and gender. The questionnaire used a combination of Likert scale, nominal scale and ordinal scale.

It is noted that the questionnaire was used because it is cheaper and can be more effective than interviews since the data analysis is faster. It is also noted that not all aspects can be investigated by use of questionnaires. A questionnaire was distributed to a 100 respondents and only 70 respondents returned the questionnaire. As noted above some respondents preferred to take the respondents

for them to complete in their own convenient time. Some respondents never returned them back. This means that there was 30% of non-respondents. Participation was completely voluntary and respondents were notified of the confidentiality and the purpose of the study.

The respondents were recruited mainly at bus stations along Umhlanga Rocks and Armstrong Drive as well as key points such the vicinity of The Square and some Office Park where there is a lot of activity. The survey was done between 05h30 am and 06h30pm. The reason was to target both public transport users and private car users. The researcher made an assumption that if it was done in the morning and afternoon there would be lesser chance to get private car users. The assumption was that the private car users will be available at lunch time when they are going out for entertainment. It was also assumed that during the course of the day private car users would also be available as they move between offices for meetings and other business activities.

3.8 Validity and Reliability

Validity refers to the degree in which the research echoes the given research problem, while Reliability measures consistency of the set of measurements. Collis and Hussey (2003:186), define data as being reliable if another study would obtain the same results should the research be repeated. Validity has to do with the extent of the accurateness of the research data in view of the situation that is being studied. Collis and Hussey (2003:186) identify three common ways of testing the reliability of responses to questions in interviews or questionnaires. These are:

- The test re-test method, which requires the researcher to ask the same questions of the interviewee at two separate occasions;
- The split-halves method, in which the interview record sheets are split into two halves which are compared to one another to determine data correlation; and
- The internal-consistency method, where the researcher determines the inter-item correlation between every item in the entire sample.

In this study the reliability was tested by asking different questions with the same intention. The questionnaire was designed to reveal the respondents underlying

motivators and pushers regarding use of private and public transport. This ensured that the data collected was valid and relevant to the problem.

3.9 Data Analysis Methods

Once all data and information had been collected, it was captured and analysed in order to meet the objectives of the study. Statistical Packages for Social Sciences (SPSS) was used to analyse data. Given the nature of the data both quantitative and qualitative data analysis techniques were employed. The analysis of the data that was collected for this research was analysed using both descriptive and inferential statistics. The researcher used descriptive methods to summarise raw data collected from the field through the use of percentage bar graphs and pie charts. To establish the relationship between two variables the chi square test method was used.

3.10 Concluding Remarks

In this chapter, the research design, data collection techniques and data analysis methods were discussed. In the next chapter the results of the empirical study and the initial analysis will be presented.

CHAPTER FOUR:

PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the key findings of research conducted in the LLROP on public transport and private car usage. The data was collected using a questionnaire from 70 respondents and was captured and analysed using descriptive statistical methods. The data was manually inputted into the computerised and international standard quantitative statistical software called Statistical Package for Social Science (SPSS) version 15 format. The presentation of results was obtained from SPSS. SPSS allowed the researcher to review data frequencies and means across the variables. The results presented include profile of the respondents, travel frequency and mode, reasons for not using public transport and private car, perceptions about the public transport facilities and service, and respondents' views on actions to encourage people to use public transport.

4.2 Profile of Respondents

Figure 4.1 graphically illustrates the profile of respondents by gender. Sixty four point seventy one percent (64.71%) of the total response was received from the female group and the male group made up the 35.29%. The female group is the dominant one in this research.

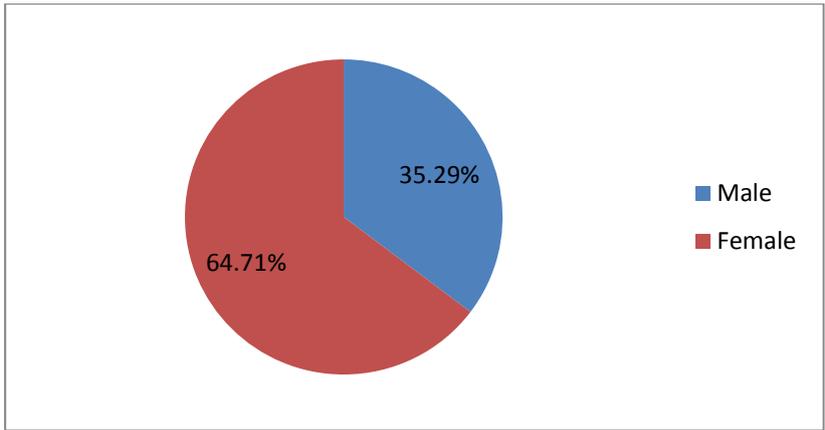


Figure 4.1 gender of respondents

Figure 4.2 shows that the majority (41.2%) of the respondents falls in the age category of 26-35 years, followed by 36-46 years with 26.5%. Those that fall between 18-25 and 46-55 years make 14.7%, respectively.

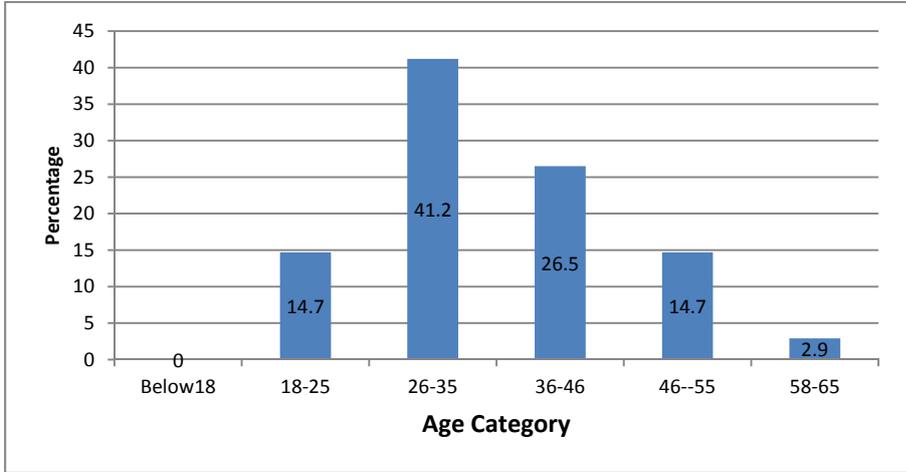


Figure 4.2 age of respondents

4.3 Travel Frequency

In order to determine the frequency of travel respondents were asked to indicate whether they were regular commuters. For the purpose of this survey regular refers to 3 times and above in a week. The results indicate that 83.82% regularly travel to work. The commuter travel frequency is reflected in Figure 4.3.

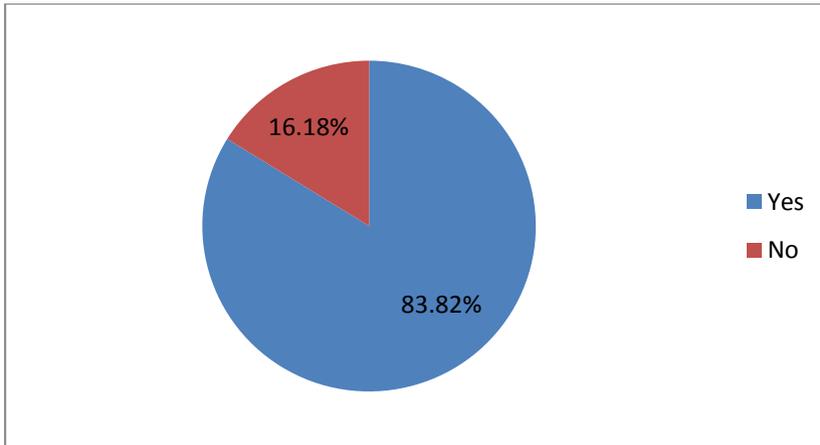


Figure 4.3 Frequency of travel

4.4 Commuter travel distance

In Figure 4.4 it can be seen that 38.2% travel between 11-20km followed by 20-30km (30.9) and 6-10km and above 30km with 13.2%, respectively. Figure 4.4 also shows that only 4.4% travel less than 5km.

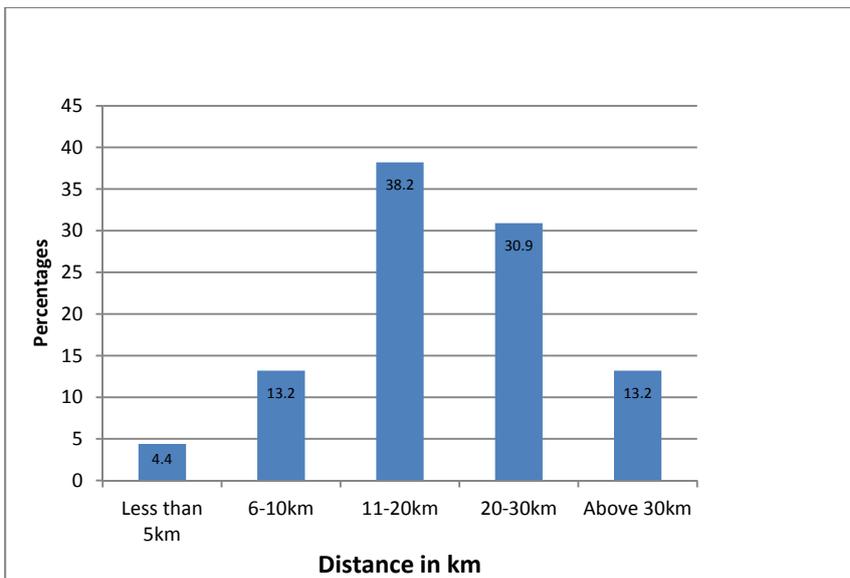


Figure 4.4 Travel Distance

4.5 Modes of Transport

There is some reliance on more than one transportation mode. Figure 4.5 shows that most work trips are undertaken by car (35.3%), followed by bus (33.8%), the taxi (29.4%) and walking (1.5%). The dominance of the private car as a mode of

transport is apparent. Bus transportation is the second most popular mode of transportation to work in La Lucia Ridge Office Park.

While the majority (63%) of participants reported that they use public transportation, there are statistically significant differences in public transportation use by mode. The 63% of public transport users is made up of 33.8% of bus users and 29.4% of minibus taxi users. It is also interesting to note that 4.4% of respondents travel below 5km and only 1.5% is reported to walk.

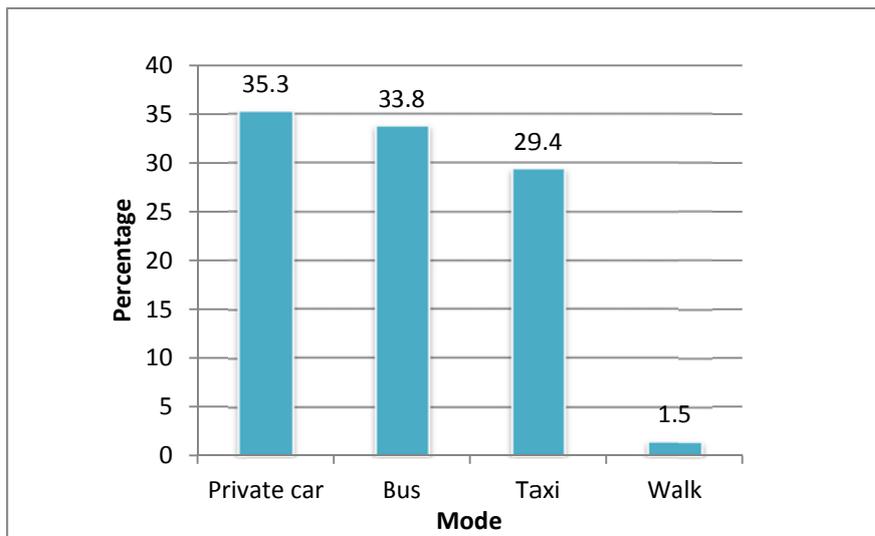


Figure 4.5 Various modes of transport

Chi-square analysis as presented in Table 4.1 confirms there is a relationship between age and the mode of transport used when travelling to work. Figure 4.6 shows that most age groups mostly use private cars, bus or taxi to work with the majority (21%) using bus in the 26-35 years.

Table 4.1 chi square test between age and mode of transport

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	44.162 ^a	15	.000
Likelihood Ratio	19.549	15	.190
Linear-by-Linear Association	1.838	1	.175
N of Valid Cases	70		

a. 18 cells (75.0%) have expected count less than 5. The minimum expected count is .03.

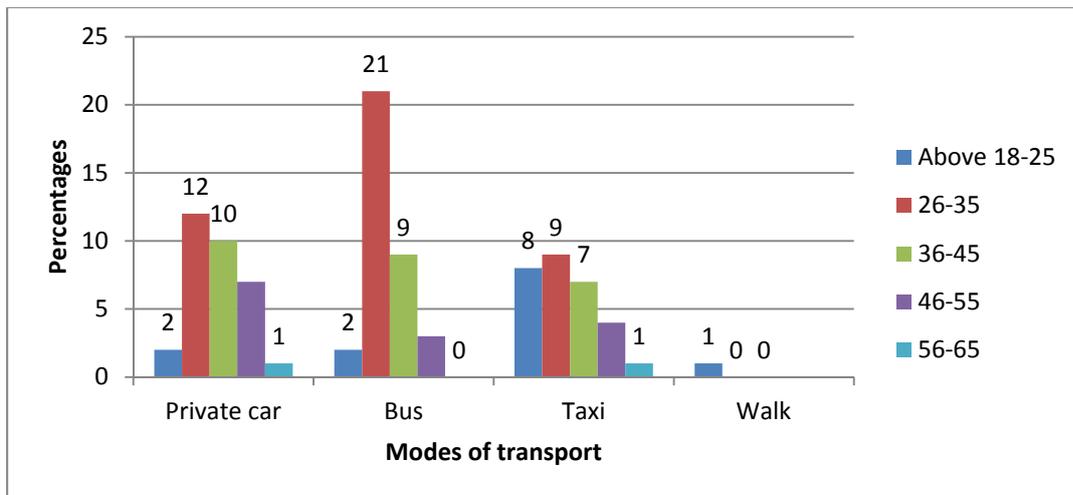


Figure 4.6 Relationship between mode of transport and age category

4.6 Frequency of Public transport usage

The results show that 26.47% uses public transport usually, followed by 20.59% of those who rarely and those who always use public transport, respectively. Those that use public transport half the time and those who never uses it all make up 16.18%, respectively. These results are shown in Figure 4.7.

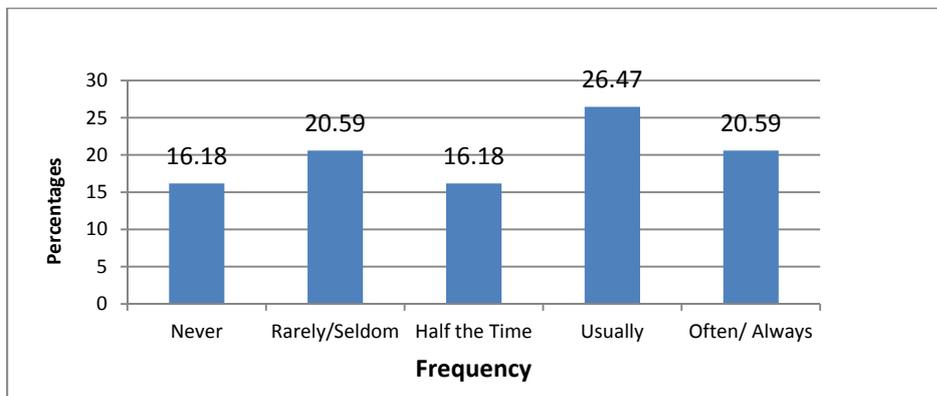


Figure 4.7 Frequency of public transport usage

4.7 Reasons for not using public Transport

To find out the reasons people prefer to travel in their private vehicles instead of travelling in the public transport the researcher structured a question to address this.

Respondents cited that they did or would not use public transportation because of the reasons outlined in Figure 4.8. Cost appears to be the leading major reason with 33.8% for not using public transport. The other top three main responses of not using public transport include takes too long to get there by public transport (14.7%), inconvenient or easy to use my car (11.8%) and not available at the time I go to work (10.3%).

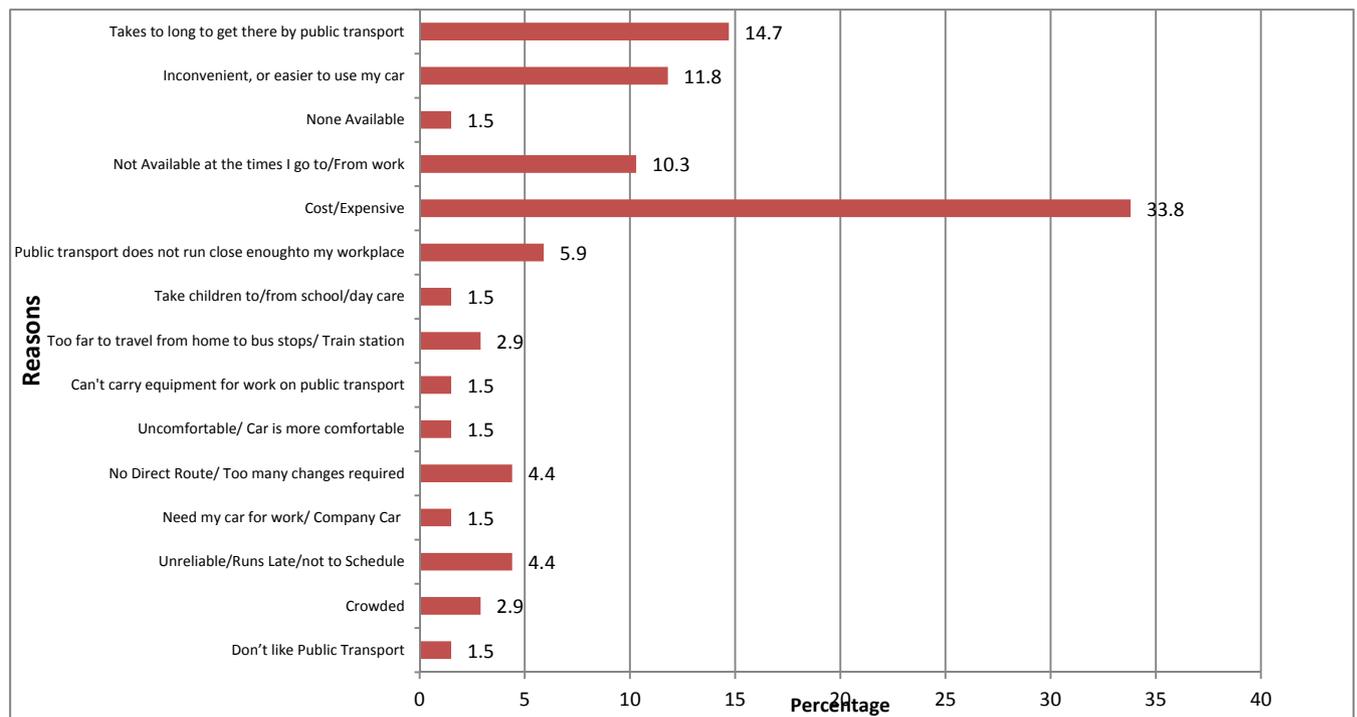


Figure 4.8 Main reason for not using public transport

The Chi square analysis as presented in Table 4.2 reveals that there is a relationship between age category and the reason for not using public transport.

Table 4.2 Chi square test between age category and reason for not using public transport

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	118.964 ^a	70	.000
Likelihood Ratio	74.041	70	.348
Linear-by-Linear Association	.140	1	.708
N of Valid Cases	70		

a. 88 cells (97.8%) have expected count less than 5. The minimum expected count is .03.

Figure 4.9 indicates the age category and the reason to not use public transport. The figure shows that the respondents in the age category between 26-35 and 36-45 cited cost/expensive as the main reason to not using public transport.

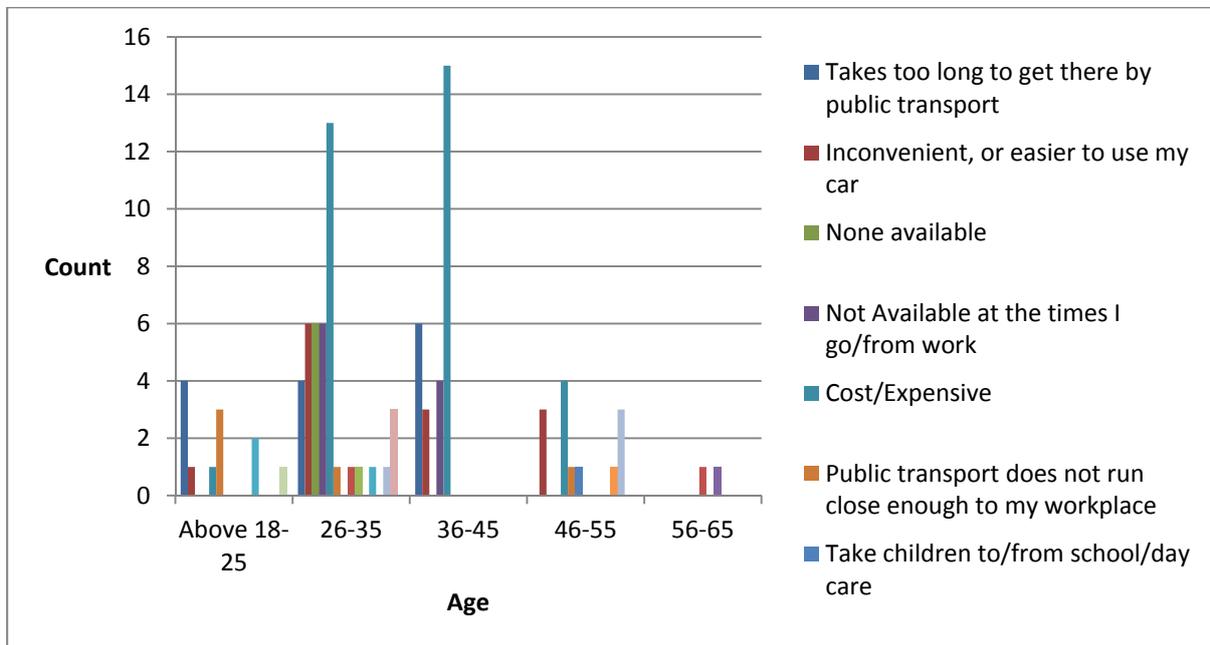


Figure 4.9 Relationship between age category and reason to not use public transport

Respondents were also asked to indicate other reasons (not more than four) in addition to the main reason that contribute to their decision of not using public transportation. Figure 4.10 shows that the other top four reasons include cost (17.26%), crowded (14.88%), not available at the times I go to/from work (7.14%), and unreliable and do not like waiting (6.55%), respectively. Table 4.3 shows reasons not to use public transport in the order of priority from highest to lowest.

Table 4.3 Other reasons to not use public transport

Reason	%
Cost/Expensive	17.26
Crowded	14.88
Not available at the time I go from work	7.14
Unreliable/Runs late/ not to schedule	6.55
Don't like Waiting	6.55
Uncomfortable/Car is more comfortable	4.76
Lack of safety on public transport	4.76

Reason	%
No Direct route/Too many changes required	4.17
Inconvenient, or easier to use my car	4.17
Takes too long to get there by public transport	4.17
Too far to travel from home to bus stops/trans stations	3.74
Can't carry equipment for work	3.38
Don't like public transport	2.98
Limited/ infrequent services	2.98
Take children to/from school day care	2.38
Car pool	2.38
Need my car for work/ Company car	1.79
Public transport does not run close enough to my workplace	1.19
Too far away	1.19
Non available	1.19
May to use car before/during/after work	1.19
Dirty/Smelly	0.6
Live close to work/Walk to work	0.6
Total	100

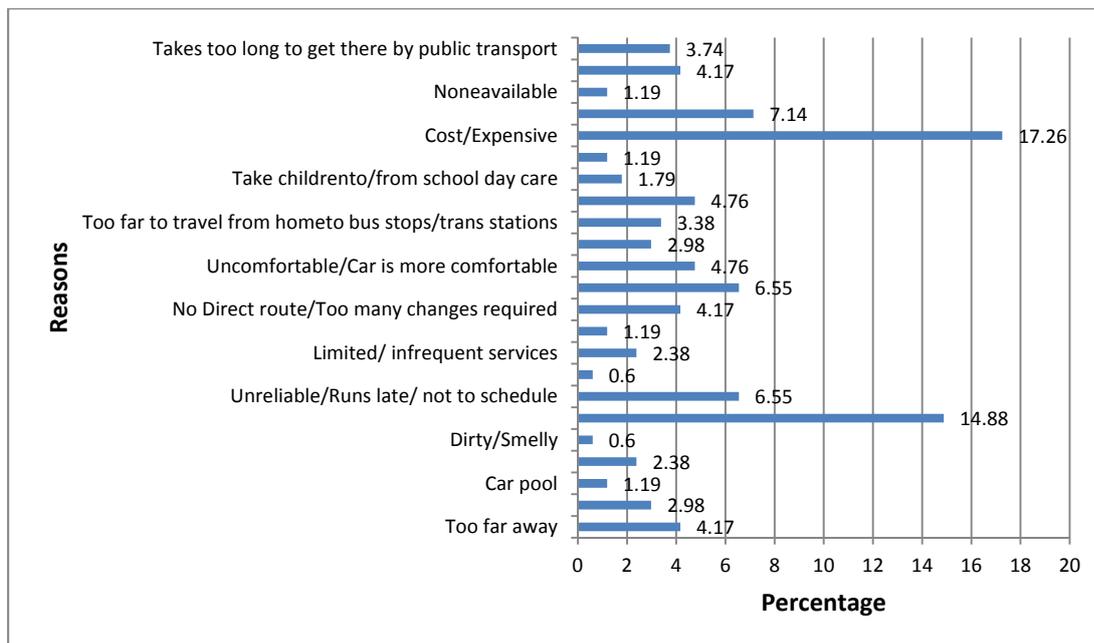


Figure 4.10 Other reasons for not using public transport

4.8 Reasons for not using private cars

Respondents cited that they did or would not use private car because of the reasons outlined in Figure 4.11. Cost of petrol appears to be the leading major reason with

52.9% for not using private car. The other top three main responses of not using private car include: don't have a car (10.3%), cost of car maintenance and traffic congestion with 8.8%, respectively, and like to read/relax (5.9%).

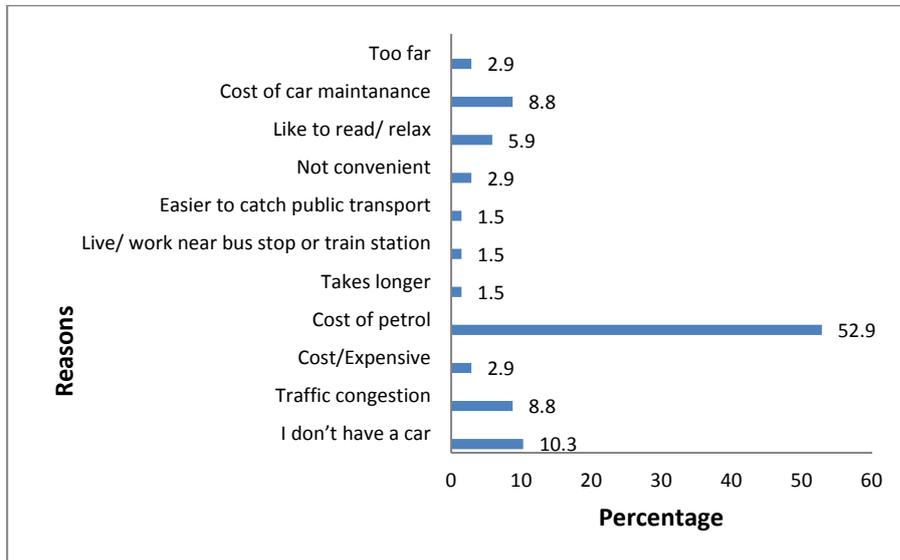


Figure 4.11 Main reason for not using private car

Respondents were also asked to indicate other reasons (not more than four) in addition to the main reason that contribute to their decision of not using private car. Figure 4.12 indicate that the other top four reasons include cost of petrol (32.6%), traffic congestion (14.7%), cost of car maintenance (10.1%), and I don't have a car (6.55%).

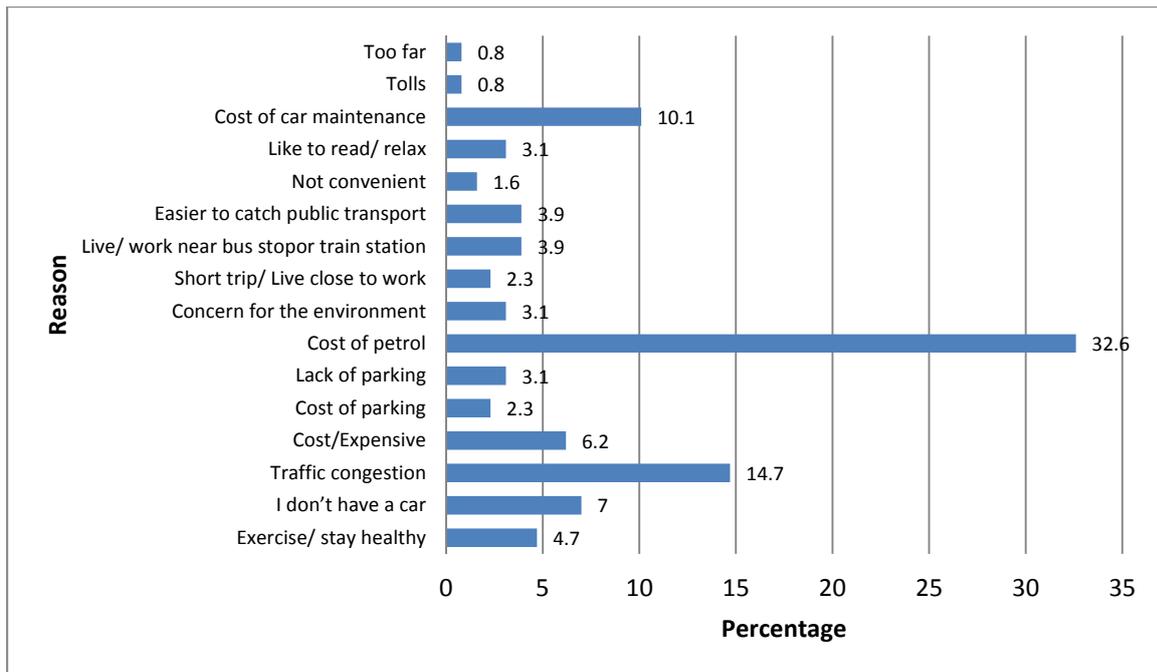


Figure 4.12 Other reasons for not using private car

4.9 Public transport facilities

The results reveal that 48% of the respondents believe that public transport facilities in the LLROP are adequate whilst 17.6% disagree (meaning they are not adequate). Figure 4.13 shows the respondents' perceptions regarding adequacy of the public transport facilities in LLROP. It is also important to note that 27.9% responded neutral as this is quite a big percentage.

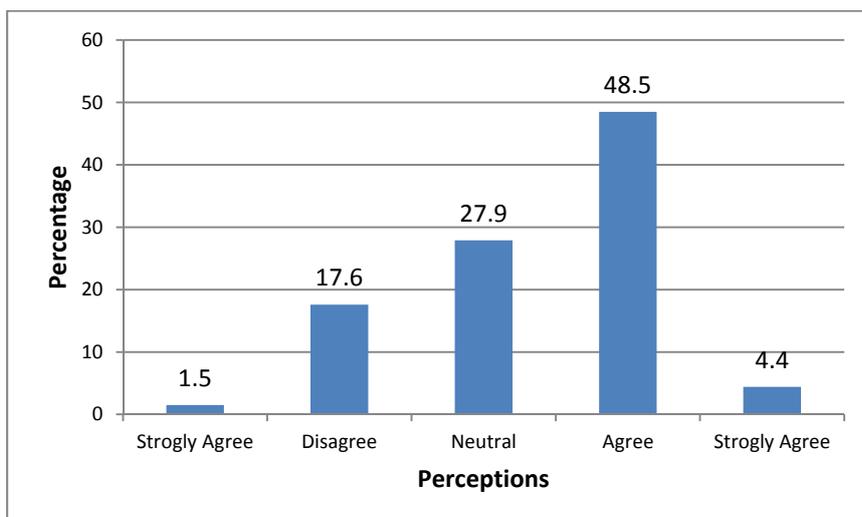


Figure 4.13 Perceptions about public transport facilities

4.10 Adequacy of public transport mode

Figure 4.14 shows respondents' perception regarding the choice of public transport modes. The results indicate that 38.2% of the respondents believe that there is enough public transport modes whilst 26.5% think that it is inadequate. A significant percentage (22.1%) responded neutral to the question.

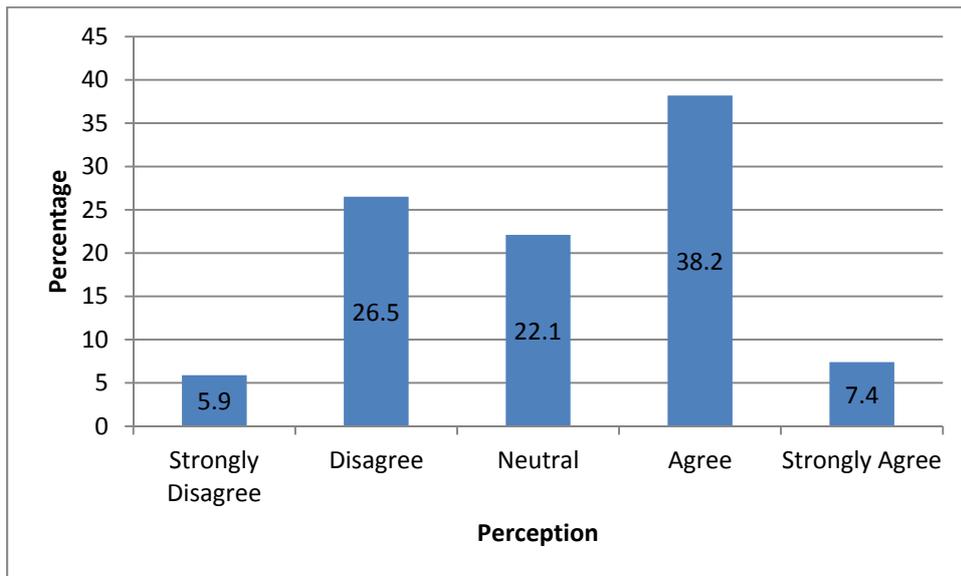


Figure 4.14 Perceptions about adequacy of public transport mode

4.11 Roads in relation to pedestrians

Figure 4.15 shows that 39.7% of respondents agree that roads in the LLROP are pedestrian friendly. However, this is followed by 23.5% of the respondents that disagree with the statement and 22.1% being neutral.

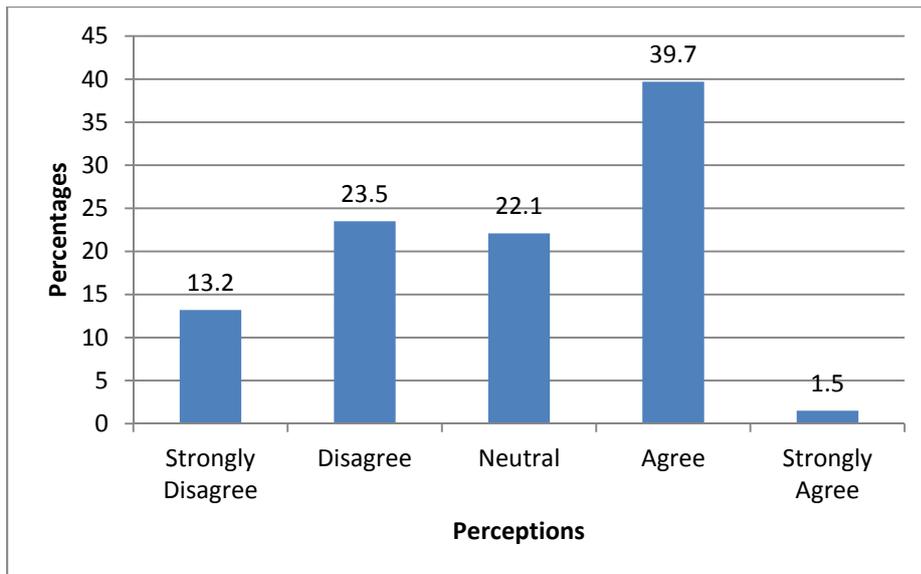


Figure 4.15 Perceptions about friendliness of the road to pedestrians

4.12 Public transport service

The results reveal that only 38.2% believe that public transport service is good. Figure 4.16 also shows that 32.4% of respondents believe public transport is poor. A significant number (26.5%) were unsure of the state of public transport service.

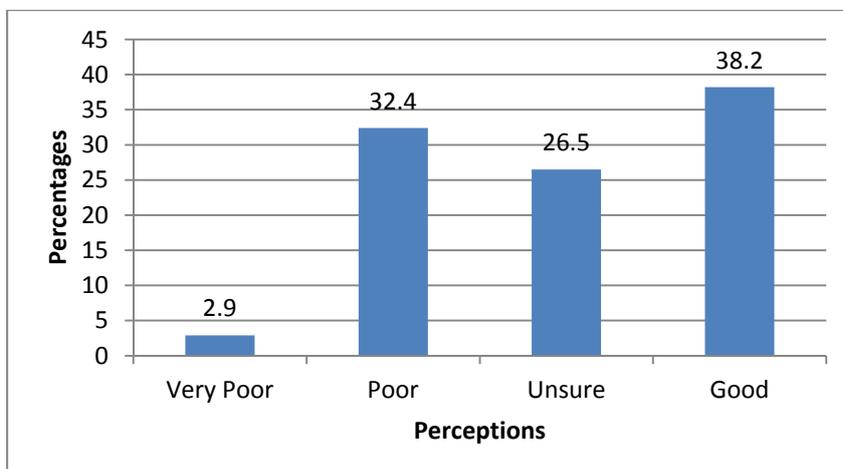


Figure 4.16 Perceptions about public transport service

4.13 Measures to encourage public transport usage

The results indicate that 86.76% would support the move to improve public transport so that people can use public transport instead of driving their cars with rest 13.24%

indicating that they would oppose such move. Figure 4.17 shows the respondents that would support or oppose improvement of public transport to encourage people to use it rather than private cars.

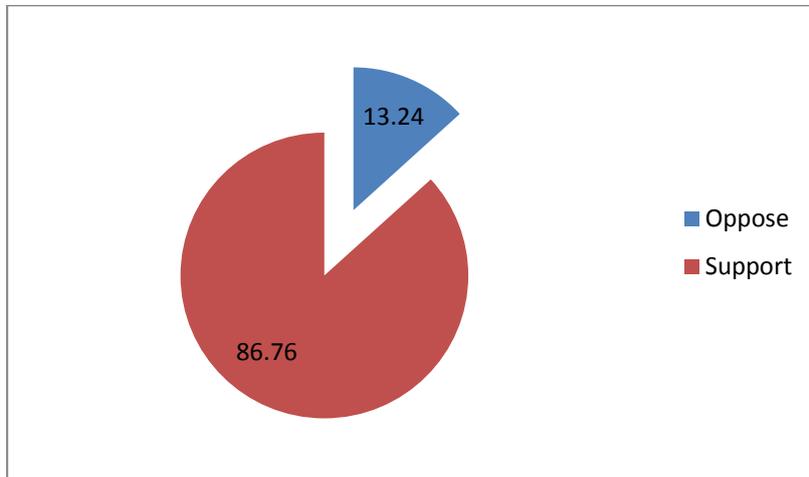


Figure 4.17 Views about improvement of public transport

Figure 4.18 shows that 91.2% of the respondents would support the improvement of the city planning to make public transport, cycling and walking simple and convenient while 8.8% would oppose the initiative.

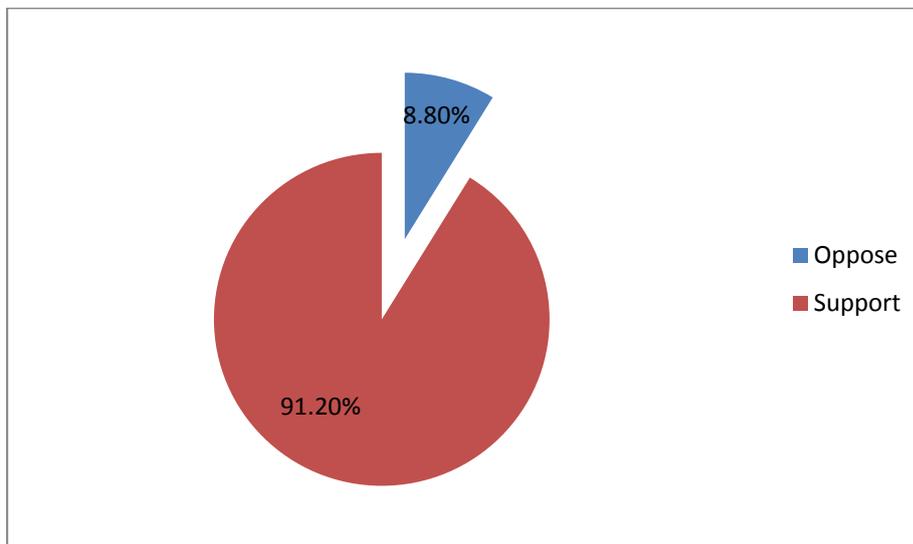


Figure 4.18 Views about improvement of city planning

It also appears that there is a relationship age and the views about improving city planning as indicated by the Chi square test in Table 4.4. Figure 4.19 shows this relationship graphically. It shows that respondents between the age categories 26-35, 36-35 and 46 – 55 support the improvement in city planning.

Table 4.4 Chi square test between age and improving city planning

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	118.964 ^a	70	.000
Likelihood Ratio	74.041	70	.348
Linear-by-Linear Association	.140	1	.708
N of Valid Cases	70		

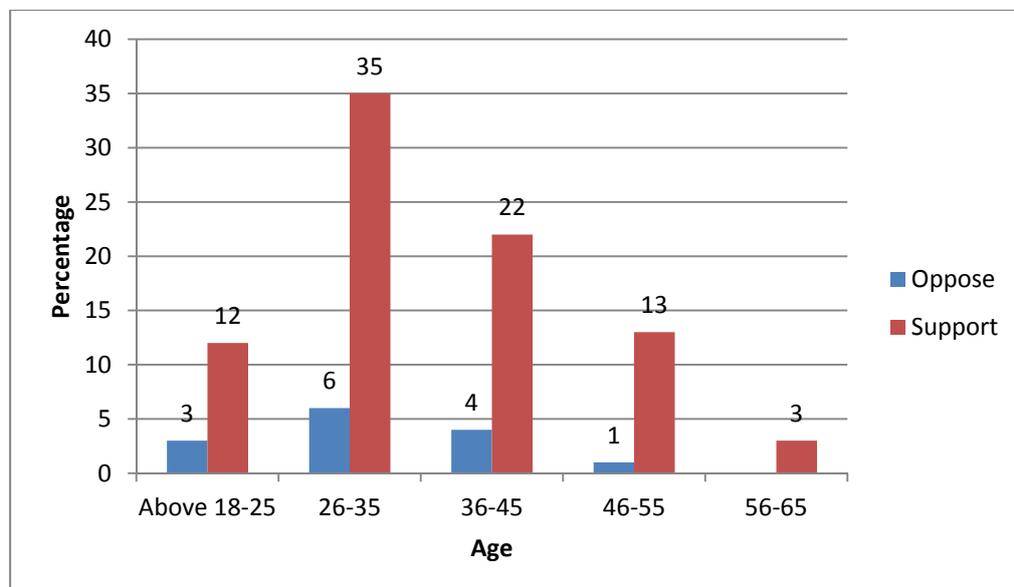


Figure 4.19 Relationship between age and views about improvement of city

Figure 4.20 indicates that 85.3% of the respondents would support the initiative to invest in smart technology that monitors traffic congestion and improves traffic flows and 14.7% would be averse of the initiative.

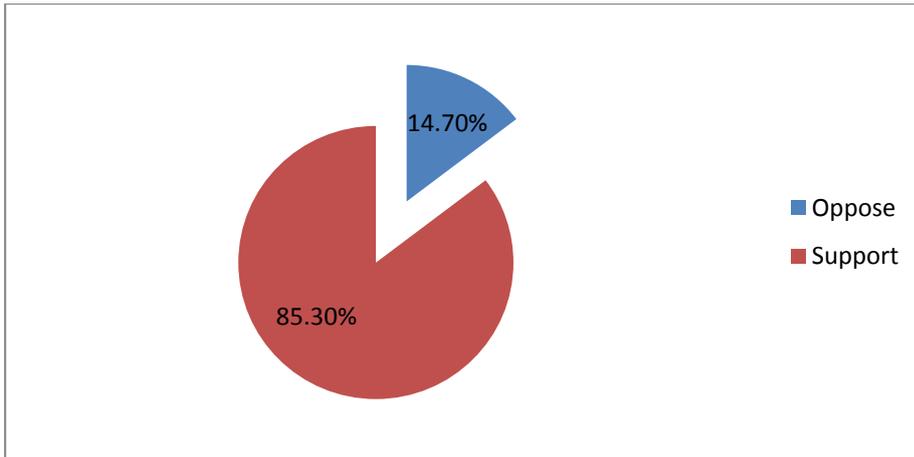


Figure 4.20 Views about investing in smart technology

4.14 Chapter Summary

This chapter has presented the results of a survey of 70 commuters on public transport in the LLROP. The results reveal that the majority of people travel to work regularly and that the main mode of transport being used is private car followed closely by bus. The survey also reveals that the main reason for not using public transport is cost followed closely by the issue of crowding. The majority of respondents noted cost of petrol as the main reason for not using private transport. Interesting to note that, traffic congestion is among the top four reasons for not using private car. The survey also reveal that majority of respondents believe that there is enough public transport facilities as well as enough choice of public transport mode for the LLROP area. The results also indicate that majority of respondents would support measures such as improving public transport, improving urban planning and introducing smart technology to encourage people to use public transport. In the next chapter the interpretation of the results will be presented.

CHAPTER FIVE:

DISCUSSION

5.1 Introduction

This chapter presents the interpretation of the findings from the questionnaire survey. This chapter mainly draws from the results presented in chapter 4 which will also be supplemented by the literature review. The discussion will mainly focus on the questions that were specific to the objectives of the study.

5.2 Mode of Transport

It has been confirmed through this research that the majority of people in the LLROP use private car instead of public transport for various reasons as indicated in the previous chapter which will also be elaborated on further in this chapter. This is a disturbing situation as it has been established in Chapter 2 that heavy reliance on private car usage has tremendous challenges.

It has been found that the most preferred mode of public transport is bus instead of minibus taxis. This does not mirror the views presented by South Africa (2010) stating that minibus taxis are the most popular form of transport for most of the workforce. It however, confirms the results of the study undertaken by Vela VKE (2005) for eThekweni Transport Authority which states that buses are an important mode especially along the Umhlanga Rocks Drive. Only 1.5% reported to use walking as a mode of transport. This could be because of the distance between the point of departure and the destination. Only 4.4% of respondents travelled less than 5km.

5.3 Motivators to utilization of public transport

5.3.1.1 Cost of petrol

The cost of petrol appears to be the motivating factor for using public transport. The increase in fuel costs in South Africa in the past two years has been tremendous. . For a country such as South Africa which is heavily reliant on oil imports which makes up about 70% of all liquid fuels with long supply lines renders it so exposed to fluctuations in international oil prices and supply disruptions (Mashiri, Moeketsi & Baloyi, n.d). In a period when oil demand is up it would mean a substantial increase in the price of oil which would in turn impact enormously on the country's economy. The forecast is that the fuel price is not going to decrease anytime soon. Marrying this forecast and what came out of the research regarding cost of petrol it is likely that more and more people will opt to use public transport instead of private car. However on the other hand the cost of public transport was only an issue. It is noted that with the increase in fuel price public transport will also be affected. This means that there will not be a sharp increase in the number of people converting to public transport. It is also noted that when it comes to public transport mode preference the bus was the leading mode. The bus industry in South Africa is subsidised by government and this may also contribute to the differences in fares differences. This was however not tested in the questionnaire. Associated with this some respondents also mentioned maintenance costs of a car as another reason for using public transport.

5.3.1.2 Traffic congestion

Traffic congestion leads to stress particularly for those who are driving and for some respondents this is a challenge and a nuisance which then becomes a motivating factor for using public transport. It is however interesting to note that in this research this was not the leading cause for them to consider public transport. Other people make use of the time they spend on public transport to read a book, use social networks and / or relax and unwind.

5.4 Barriers to utilization of public transport

5.4.1.1 Non-availability of public transport

Public transport non-availability was also seen as a cause for people not to use public transport. Ten point three (10.3) percent and 5.9% reported that the unavailability of public transport at the time of either going to or from work and the non-availability of the public transport routes running close to the workplace, respectively. This supports Walters (n.d) who claims that half of the household in his study reported that the main problems encountered in public transport was either the public transport was not available or was too far away. Mashiri, Bogapane-Zulu, & Chakwizira (2010) also noted that access to public transport is hampered by long walking distances to pick-up and drop-off zones and long waiting times largely due to inadequate service and poorly designed route coverage, as well as poorly arranged time tables.

5.4.1.2 Public transport fares

High on the list of the reasons not to use public transport was cost. It appears that people believe that public transport is expensive. This is supported by Mashiri, Moeketsi & Baloyi (n.d) who argue that public transport is costly for the majority of poor citizens due to the fact that it is under-funded. Their research showed that poor people spend typically more than 10 per cent of their total income on transport (Mashiri, Moeketsi & Baloyi, n.d).

It is interesting to note that respondents cited cost of public transport as a reason for not using public transport. Walter (n.d) in his study also found that and 20% mentioned that the cost of transport was a serious problem. In his study Walter noted that 49% of households earning up to R500 per month spend more than 20% of their income on public transport. This is an indication that this is an issue which needs to be addressed for the public to use public transport.

The minibus taxi industry in South Africa is not subsidised and this means that they have to make profits from the fares. International Associate of Public Transport (2010) notes that putting too much focus on the affordability of public transport was not always a better option. To ensure that public transport is affordable will require setting and keeping fares at artificially low levels and not giving operators full returns to enable them to run viable businesses. Clearly, any fare increase in the public transport triggers political concerns. Everyone including those who are not able to pay high prices should still be able to be mobile. On the other hand, maintaining fares low stops the able and willing from paying higher fares, which then leads to poor service overall.

The dilemma is that people expect efficient and improved public transport service and at the same time pay low fares. It should be entrenched in people's mind that in order to get a certain standard of service there must some form of funding to make that happen.

5.4.1.3 Flexibility / time

Private car was seen as a way to achieve greater freedom and flexibility and resolves the snags and limits related to public transport usage. The time taken by a using public transport compared to the time taken when using private car is considered to be a key factor in respondents' selection of mode to use for a journey to work. These findings confirm the views articulated by Trans:SIT (2007) that an effective public transport service should provide a similar service as the private car use and people will not view it as an inconvenience and last resort.

5.5 Infrastructure and service

When respondents were asked about their views on the adequacy of infrastructure and public transport facilities it emerged that there was not a distinct positive view though it can also not be said that they were outright not happy. This echoes International Associate of Public Transport (2010) assertion that road infrastructures will not be able to cope with the demands posed by the private car in the long term.

Closely linked to the issue of infrastructure it is argued that a noticeable percentage of respondents noted that the roads are not user friendly for pedestrians. In LLROP there are a number of traffic circles which is not a common thing in Durban. VelaVKE (2005) also noted that minibus taxis also drop off passengers at traffic circles. This could also contribute the notion that roads are not pedestrian friendly. Strategies and measures to ease the levels of car dependency by creating developments which are pedestrians and cyclists friendly as well as appreciating public transport is a fundamental feature of sustainable development and urban living.

5.6 Proposed measures

The research also tried to source the views of respondents on the measures that can be applied to try and improve public transport usage. It was found that respondents responded positively to the measures suggested to improve public transport, improve city planning and introducing smart technology in order to get people to use public transport. This would therefore lead to the full realization of the potential benefits associated with optimum public transport usage. The margin of those who were not in support of the proposed measures to improve public transportation was negligible as compared to the total sampled population.

It should, however, be mentioned that the smart technology measure is implemented in some parts of the city. South African Roads Agency and KwaZulu Natal Department of Transport has the information boards on the N2 and M4 which were implemented as part of the 2010 FIFA World Cup and is an admirable. Some of the major roads to LLROP such as M41 and Umhlanga Rocks Drive which also largely used by public transport do not have such.

In comparison of the responses to the questions that were asked to establish if people would support measures to encourage people to use public transport, the strongest support went to improving city planning with 91.2% and the other measures with 86.76% and 85.3% respectively. On the whole the available data indicate that those who were for the implementation of measures suggested to

encourage the use of public transport rather than private cars, numerically outnumbered their counterparts on the other side of the divide. This is an indication that people are looking for measures to be implemented to improve public transport and would embrace it should it be introduced. It is also noted that all the measures that were suggested were positive rather than punitive. It is argued that this contributed a lot in the positive response received in support of these measures.

5.7 Chapter Summary

From the foregoing it is evident that the LLROP residents face some challenges with regard to private car usage and public transport. With regard to public transport affordability and accessibility are major issues as are matters such as time and crowding concerns. It was found that improving urban planning with the aim of improving public transport is necessary. In addition to that investment in the smart technology will greatly assist in easing congestion. It is noted that these investments will greatly improve public transportation challenges and in turn ease traffic congestion and improve sustainable urban living. The following chapter will provide some recommendations based on the findings and some concluding remarks on the entire research.

CHAPTER SIX:

RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

The research was an effort to understand the transportation challenges facing La Lucia Ridge Office Park residents. The project has resulted in a more comprehensive understanding of the specific transportation needs of LLROP residents. This chapter is intended to provide recommendations and conclusions based on the results of the research.

6.2 Has the data answered the research question?

The main objective of the research was to yield understanding about the challenges regarding public transportation in the La Lucia Ridge Office Park and what needs to be done to attract commuters to public transport, thereby reducing traffic congestion and promoting sustainable urban living. The concerns or specific objectives of the research were:

- to establish existing transportation challenges in the La Lucia Ridge Office Park;
- to establish obstacles to people's use of public transport with respect to the economy, local housing areas, attitudes and safety;
- to investigate factors that will increase ridership in the public transport mode;

The research was also meant to come up with the suggestion to reduce any barriers for commuters and suggest improvements to the relevant stakeholders with the final aim of increasing the overall number of public transport passengers thereby reducing traffic congestion on the roads and encouraging sustainable urban environment.

The key questions to be answered by this research were:

- i. What are the barriers to using public transport?
- ii. What can be done to change the current tendency of private car dependency?
- iii. What can be done to increase the number of passengers in public transport?

With regard to the first question the data from the field provided some insight into the barriers causing people not to utilize public transport in the LLROP. The data also provided information regarding the factors causes people to rely on private car. In other words both side of the coin were explored, that is, looking at the pushers and attractors. This led to the answers to the second and third question. Having privy to the reason causing people not to use public transport gives one an understanding of the some of the measure that need to be undertaken to reduce heavy reliance on private car and thereby increase the use of public transport. A few other measures that were suggested to the respondents were received quite positively by the majority of respondents. It is noted that the measures suggested were somehow limited. In order to address this question the respondents should have been allowed to identify the actions that they thought would also assist to address the problem.

6.3 Benefits of this Research

This study has identified some fundamental elements encouraging people to choose a particular mode of transport over another and the main influences that affect it positively and negatively. The research investigated the motivators and barriers to public transport usage which is considered to be important to understand in order to promote public transport usage. The findings serve as the basis for seeking various measures that attempts to deal with the issues at hand regarding public transportation. This study can be used as a reference point in the attempts to deal with public transport issues in the area.

The research helped to understand the needs and expectations of the LLROP residents and to further understand that people are different and therefore are motivated by different factors. This study also included both public transport users and also of non-users which gives a good understanding of the challenges and motivators from both sides. The research identified the primary reasons for not using public transport and is therefore useful to the relevant stakeholders to use to remove potential barriers to public transport usage. It will help public transport owners to devise strategies to attract potential users, to improve public transport and provide the general public more information about the system.

This study focused on LLROP and it provides valuable information on transportation barriers and motivators for the area. It lays the foundation for other future studies to be carried in future on a larger-scale to develop and improve systems for promoting public transport.

6.4 Recommendations

6.4.1 Objective 1: to establish existing transportation challenges in the La Lucia Ridge Office Park

The LLROP remains an important employment and business centre for the entire city and there is traffic congestion associated with the activities and services provided in the area. Travelling to work by private car makes up a large proportion of all car traffic, particularly during the morning and evening peak periods. It is saddening that in the minds of people it is still business as usual. It is necessary to put programmes in place to make people aware of the current state. This requires that a marketing campaign be undertaken to instil in people's minds the importance of public transport. The government and the private sector need to actively publish key facts about public transport and the benefits. In so doing, they will attract more people into the public transport.

It is also recommended that from time to time studies be undertaken to monitor the improvement of public transportation in the La Lucia Ridge Office Park. This will also assist in ensuring that the programmes and measures put in place are relevant and to eliminate those that prove to be not working.

6.4.2 Objective 2: to establish obstacles to people's use of public transport with respect to the economy, local housing areas, attitudes and safety

The results highlighted a few barriers such as the unavailability of public transport. The relevant parties need to relook at the public transport routes and provide feeder systems to cover all areas. It is also important to ensure that public transport takes into consideration the starting and finishing times of businesses as majority reported the unavailability of public transport during these times. To remedy this situation it is recommended that the authorities and public transport service providers examine the possibility of extending the available public transport services within the LLROP by providing transport in the early hours as well as later in the evening.

An integrated approach will be to redesign bus routes and timetables with a view to revising routes, extending operating hours both in the morning and evening, improving service frequencies during off peak hours and improving coordination between buses and taxis. It is noted that some routes were not originally designed for public transport and as such they may not be suitable for big buses. In such instances minibus taxis can be solely used to operate in these areas and act as feeder systems.

6.4.3 Objective 3: to investigate factors that will increase ridership in the public transport mode

Pragmatic solutions are needed to curb the situation and to prevent any further deterioration. Intervention programmes must be implemented within certain time intervals and just when the situation calls for it. The results of the Barriers and Challenges to the utilisation of public transport in LLROP study support the need for investment in smart technology, which may require funding and infrastructure development. It is noted that remains a significant barrier in public transportation in LLROP and it is recommended that measures be put in place to deal with the barriers identified. Effective and reliable modes of transportation remain vital components of an effective public transport plan for LLROP.

- (i) Public Transport ticketing and tariff system

It is recommended that an integrated ticketing system that will allow ticket holders to use one ticket for various routes be introduced. This system is particularly relevant in the metro bus and rail. It would not be possible to introduce it in the minibus taxis at this stage because there are several operators involved and arrangements between them or between operators and authorities have to be made will be difficult if not impossible. For an example if you a buy a bus ticket you can use it to take a bus to LLROP or to any part of the city using the same ticket. This will also require an introduction of chip card systems to enable the implementation of using one ticket. In order to make the system effective and more convenient selling and buying of tickets through a websites or Short Message System (SMS) services and the introduction of vending machines is recommended. The offering smart technology to sell and buy tickets as well as provide public transport information is likely to be appealing to young users and is considered to be a cost effective methodology. The smart card reader machines would need to be installed on buses. Smart card reload machines with information on public transport service provision could be set up at main transport hubs (McDonald et al, 2005). One of the concerns raised in the study was the cost of public transport. The new form of ticketing can also offer discount prices for loyal customers and thus make public transport cheaper.

Ridership can be increased by enhancing the perception of affordability and providing monetary incentives for bus riders. The issue of cost came out strongly in the research and needs to be addressed. Such a programme would also target all classes of class employees as the idea of savings, especially in our current economy, is attractive.

(ii) Public transport routes re-organising and accessibility

Having noted that most respondents reported unavailability of public transport at the time of going to or coming back from work a relook of the public routes and feeder systems is required. This type of measure includes the creation of demand responsive public transport solutions for low demand areas as well as reorganisation of the whole network or a specific type of service for a target group (McDonald et al, 2005). Reorganisation of networks should be carefully planned and supported by the municipality as well as public transport operators.

(iii) Improving infrastructure

Improving infrastructure by bus lanes and priority systems can attract new passengers. The interaction between the car system and the Public Transport system creates speed and reliability problems. In order to improve efficiency and ease of use, investments into new and enhanced transit systems is required. The involvement and support from the municipality can facilitate this improvement. It is noted that similar improvements by prioritising public transport lanes have been implemented in some parts of the city, for an example, the M4 south and the N3.

(iv) Spread working hours

As it is noted that the suggested measures would require some financial investment and some are long term it is recommended that in the meantime businesses consider alternate start and finishing work hours in order to spread traffic during peak hours. This is a short term measure only to address congestion as it does not take away the fact that people will continue to rely on private cars as long as the barriers are not removed. It also does not promote sustainable urban living as reliance on private transport is not addressed.

(v) Funding

Certainly the costs of measures for improvements of Public Transport cannot most of the time directly be recouped through increasing ticket tariffs. It is therefore imperative to ensure that is addressed through agreements between operators and the relevant authority. This should be done upfront in order to avoid delays in the implementation.

6.5 Future research

This study should be seen as the beginning in trying to deal with the public transportation issues in the LLROP. A more in depth study is required to focus mainly on understanding other initiatives that can assist in alleviating the public transportation issues for the entire northern region.

In order to understand the full extent of the effects of congestion caused mainly by car dependency a quantitative appraisal of losses caused by congestion in the LLROP needs to be undertaken. Such a study would need to look into additional factors such as lost work and leisure time, health problems, stress, discomfort, cost of extra fuel, accidents, and air pollution (McDonald et al, 2005). This would make everyone aware of the seriousness and threatening nature of the problem of traffic congestion.

6.6 Limitations of the Study

One of the limitations in regard to this research was time. It is noted that in order to get a better understanding of the issues it would have made a difference if the research was extended to a bigger sample. For this research a bigger sample would have required the researcher to take an additional number of days to get respondents as respondent were to be interviewed in public spaces.

To get people in public places to respond to the questionnaire was a challenge. It is also noted that some of the people were not willing to respond to the questionnaire as they were in a hurry to get to work or to get to the bus station.

As noted above, the questionnaire was close-ended and during the research it appeared that people would have preferred to suggest actions that they thought would assist in resolving the public transport challenges. The questionnaire was mainly based on the issues that had come up from the literature review and did not allow for the fact that not all situations are similar.

6.7 Recommendations to overcome the limitations

In future, for this kind of a research it is suggested that the researcher gets authorisation to interview people in their workplaces with the permission of the employers even if it is during their lunch time.

It is also recommended that a questionnaire must include both closed and open ended questions in order to allow for suggestions and more views from the respondents.

6.8 Concluding Remarks

This chapter has proved that the data collected did answer the research question. It has also highlighted the limitations of the research as well as what can be done in order to try and minimise those limitations. It has indicated the benefits of this research. This chapter based on the results of this study has also highlighted the need for future research on the field of public transport and quantifying the cost brought by traffic congestion.

In Chapter 1 the intention of the study was spelt out as that the research aims to establish the barriers to public transport usage and investigate factors that will increase ridership in the public transport mode. After an extensive research process, a thorough analytical exercise, recommendations to help increase public transport usage has been proposed. None of these recommendations should be looked at in isolation but should rather be considered holistically. If these recommendations are successfully implemented the current situation of car dependency in La Lucia Ridge Estate will improve and it may set an example for other areas in Durban to follow. Hence this research study is considered a valuable addition to the existing body of knowledge and extremely relevant, given current state of affairs regarding transportation in LLROP and the wider Durban metropolitan area.

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Appendix 1

Informed Consent Letter 3C

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

Dear Respondent,

MBA Research Project

Researcher: Gloria Nonhlanhla Khoza (083 701 3561)

Supervisor: Dr Abdulla Kader (0829010225)

Research Office: Ms P Ximba 031-2603587

I, **GLORIA NONHLANHLA KHOZA** am an MBA student, at the Graduate School of Business and Leadership, of the University of KwaZulu Natal. You are invited to participate in a research project entitled **BARRIERS AND MOTIVATORS TO PUBLIC TRANSPORT UTILIZATION: A CASE OF LA LUCIA RIDGE OFFICE PARK IN DURBAN**. The aim of this study is to explore the public transportation issues and challenges in the search for a change; what are the barriers to change - whether people are prepared to change their travel behaviours in the light of the increasing daily congestion situation for public transport.

Through your participation I hope to understand challenges regarding public transportation in the La Lucia Ridge Office Estate and what needs to be done to attract commuters to public transport thereby reducing traffic congestion. The results of the questionnaire are intended to contribute to the understanding of the barriers to public transport utilization.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey/focus group. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about 5 minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature _____ Date _____

This page is to be retained by participant

**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP**

MBA Research Project

Researcher: Gloria Nonhlanhla Khoza (083 701 3561)

Supervisor: Dr Abdulla Kader (0829010225)

Research Office: Ms P Ximba 031-2603587

CONSENT

I.....(full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT

DATE

.....

This page is to be retained by researcher

Questionnaire / Interview Schedule 3B
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**UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS & LEADERSHIP**

MBA Research Project

Researcher: Nonhlanhla Khoza (083 701 3561)

Supervisor: Dr Abdulla Kader (082 901 0225)

Research Office: Ms P Ximba 031-2603587

**Barriers and Motivators to Public Transport Utilization: The case of La Lucia Ridge
Office Estate in Durban**

The purpose of this survey is to solicit information from residents of La Lucia Ridge Office Estate regarding public transport utilization. The information and ratings you provide us will go a long way in helping us identify barriers to using public transport. The questionnaire should only take **5** minutes to complete. In this questionnaire, you are asked to indicate what is true for you, so there are no “right” or “wrong” answers to any question. Work as rapidly as you can. If you wish to make a comment please write it directly on the booklet itself. Make sure not to skip any questions. Thank you for participating.

1. Please indicate your gender

Male	Female

2. Please indicate your age category

Below 18	18-25	26-35	36-45	46-55	56-65	Above 65

3. Do you regularly (i.e. 3 or more times a week) travel to work?

Yes	No

4. How far is your home from your place of work?

Less than 5km		6-10 km		11-20 km		20-30 km		Above 30 km	
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5. What is the main mode of transport that you use when you are travelling to your work?

Private car	
Bus	
Taxi	
Walk	
Bicycle / motor bike	

6. How often do you use public transport mode for travelling to work?

Never		Rarely / Seldom		Half the time		Usually		Often / always	
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7. What is / would be the main reason for you not to use public transport as your main mode of transport for travelling to work? Please select one.

Takes too long to get there by public transport		No direct route / Too many changes required	
Inconvenient, or easier to use my car		Need my car for work / Company car	
None available		Limited/ infrequent services	
Not available at the times I go to/ from work		Live close to work / Walk to work	
Cost / Expensive		Unreliable / Runs late/ not to schedule	
Public transport does not run close enough to my workplace		Crowded	
Take children to/ from school/ day care		Dirty / Smelly	
Lack of safety on public transport		Don't like public transport	
Too far to travel from home to bus stops/ train station		Car pool	
Can't carry equipment for work on public transport		May need to use car before/ during/ after work	
Uncomfortable / Car is more comfortable		Too far away	
Don't like waiting		Other: Please specify:	

8. What are / would be other reasons that contribute to your decision not to use public transport for this purpose? Please select not more than four.

Takes too long to get there by public transport		No direct route / Too many changes required	
Inconvenient, or easier to use my car		Need my car for work / Company car	
None available		Limited/ infrequent services	
Not available at the times I go to/ from work		Live close to work / Walk to work	
Cost / Expensive		Unreliable / Runs late/ not to schedule	
Public transport does not run close enough to my workplace		Crowded	
Take children to/ from school/ day care		Dirty / Smelly	
Lack of safety on public transport		Don't like public transport	
Too far to travel from home to bus stops/ train station		Car pool	
Can't carry equipment for work on public transport		May need to use car before/ during/ after work	
Uncomfortable / Car is more comfortable		Too far away	
Don't like waiting		Other: Please specify:	

9. What is / would be the main reason for you not to use a private car as your main mode of transport for travelling to your work? Please select one.

Too far		Concern for the environment	
Tolls		Cost of petrol	
Cost of car maintenance		Lack of parking	
Like to read/ relax		Cost of parking	
Not convenient		Cost / Expensive	
Easier to catch public transport		Traffic congestion	
Live/ work near bus stop or train station		I don't have a car	
Short trip / Live close to work		Exercise / Stay healthy	
Takes longer		Other. (Please specify)	

Please read the following statements and respond.

10. Public transport facilities for the La Lucia Ridge Office Estate and surroundings are adequate.

Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree
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11. There is enough choice of public transport modes.

Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
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12. The roads are pedestrian friendly.

Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
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13. The public transport service is:

Very poor		Poor		Unsure		Good		Very good	
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14. What are / would be the other reasons that contribute to your decision not to use a private car for this purpose? Please select not more than four.

Too far		Concern for the environment	
Tolls		Cost of petrol	
Cost of car maintenance		Lack of parking	
Like to read/ relax		Cost of parking	
Not convenient		Cost / Expensive	
Easier to catch public transport		Traffic congestion	
Live/ work near bus stop or train station		I don't have a car	
Short trip / Live close to work		Exercise / Stay healthy	
Takes longer		Other. (Please specify)	
		

15. Would you support or oppose the following actions to encourage public transport usage thereby contributing to sustainability reducing traffic congestion on the roads?

Action	Oppose	Support
Improving public transport so people use it instead of driving their cars		
Improving city planning to make public transport, cycling and walking simple and convenient options		
Investing in smart technology that monitors traffic congestion and improves traffic flow when congestion occurs		

End of the Questionnaire

Thank you for taking the time to complete the questionnaire.



UNIVERSITY OF
KWAZULU-NATAL[™]
INYUVESI
YAKWAZULU-NATALI

16 July 2012

Ms Gloria N Khoza (961066988)
Graduate School of Business & Leadership

Dear Ms Khoza

Protocol reference number: HSS/0467/012M

Project title: Barriers and motivators to public transport utilization: A case of La Lucia Ridge Office Park in Durban

In response to your application dated 04 May 2012, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number. Please note: Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....
Professor Steven Collings (Chair)
Humanities & Social Science Research Ethics Committee
/ms

cc Supervisors: Dr Abdulla Kader
cc Academic Leader: Professor K Govender
cc Mrs Wendy Clarke

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