

THE SOCIAL AND ECONOMIC EFFECTS OF THE REA VAYA BUS RAPID  
TRANSIT SYSTEM (BRT) IN THE GAUTENG PROVINCE

By

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## Declaration

I declare that '*The Social and Economic Effects of the Rea Vaya Bus Rapid Transit (BRT) in the Gauteng Province*' is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Date

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## **Abstract**

This study aimed at examining the social and economic effects of the Rea Vaya Bus Rapid Transit system (BRT) on various stakeholders in Johannesburg. The objective of the study was to investigate the effect the Rea Vaya has had on users and non-users of the Rea Vaya system. The findings of this study suggest that the Rea Vaya is beneficial in that it provides an option in modes of transport for commuters, particularly for people who were historically disadvantaged and were not permitted to reside in the city during the apartheid era.

BRT systems are designed to provide a safe, reliable and accessible public transport system. The Rea Vaya system is aimed at providing better public transport, reducing congestion, on public roads, improving the roads and creating jobs. The findings have shown that the Rea Vaya has not been successful in meeting all its aims. The Rea Vaya has not managed to provide an accessible transport system thus far. Traffic in the inner city has not been reduced as a modal shift has not yet occurred.

Since the inception of the Rea Vaya system there has been resistance from the Taxi Industry. Despite negotiations and attempts made by the Municipality of the City of Johannesburg to include the Taxi Industry in the Rea Vaya system, by making them shareholders of the system, the findings presented affirms that there is still resentment and resistance from the Taxi Industry towards the Rea Vaya system. The loss of revenue since the introduction of the Rea Vaya has caused a challenge for Taxi owners. Not only is it alleged that the Rea Vaya has affected the Taxi Industry, but the Rea Vaya infrastructure has caused a number of problems for private car users in the City.

Private car users are inconvenienced by the designated bus lanes and lack of road signage in the city. These conclusions affirm that the Rea Vaya is not beneficial to all stakeholders in the City of Johannesburg. The experiences and opinions of users and non-users suggest that the system has a number of deficiencies. However some users of the system have benefited socially and economically. For some of the users the Rea Vaya has created a few opportunities; however the poor customer service from bus drivers and station staff was seen as a setback.

Transit Orientated development in Johannesburg has not yet taken off. The government's attempts to create mixed land use through the implementation of corridors of freedom are in its infant stages. Businesses across the Rea Vaya station found the Rea Vaya to have both positive and negative effects on their businesses. Some businesses found that the development of stations have added aesthetic value, however due to the frequency of Rea Vaya buses at stations, commuters would not wait for long periods of time and this resulted in fewer customers for businesses across the Rea Vaya station.

The Rea Vaya system has provided a safe and reliable transport system in Johannesburg. However, the system is in its infant stages and has a number of deficiencies as presented in the findings of this study.

### **Key words**

Bus Rapid Transit, Public Transport, Accessibility, Sustainable transport, Development, Taxi Industry, Johannesburg, Transport Geography, Rea Vaya.

## Table of Contents

<b>DECLARATION .....</b>	<b>II</b>
<b>ACKNOWLEDGEMENTS.....</b>	<b>III</b>
<b>ABSTRACT.....</b>	<b>IV</b>
<b>KEY WORDS .....</b>	<b>V</b>
<b>TABLE OF CONTENTS.....</b>	<b>VI</b>
<b>LIST OF FIGURES.....</b>	<b>X</b>
<b>GLOSSARY: BRT TERMINOLOGY.....</b>	<b>XI</b>
<b>CHAPTER 1 : AN INTRODUCTION TO THE STUDY .....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 The Context of the Research.....	2
1.3 Research Statement.....	5
1.3.1 Aim of the Study.....	6
1.3.2 The Research Objectives.....	6
1.3.3 Research Questions.....	7
1.4 Rationale of the Study .....	7
1.5 Significance of the Study.....	9
1.6 Structure of the Research Report .....	9
<b>CHAPTER 2 : LITERATURE REVIEW: A THEORETICAL OVERVIEW.....</b>	<b>11</b>
2.1 Introduction.....	11
2.2 Urban Transport Geography.....	11
2.2.1 The Link between Transport and Geography.....	12
2.2.2 The Geography of Transportation Networks .....	13
2.2.3 Transport and Development.....	15
2.2.4 Transport and Accessibility .....	17
2.2.5 Transport Challenges in Developing Countries.....	18
2.2.6 Sustainable Transport Defined.....	20

2.2.7 The Call for Sustainable Urban Transport.....	21
2.3 Developments of Public Transport Systems, the BRT System.....	23
2.3.1 What is a Bus Rapid Transit (BRT) System? .....	23
2.3.2 Basic Components of a BRT System .....	24
2.3.3 The Success and Failures of BRT Systems Globally .....	25
2.3.4 Transit Orientated Development (TOD) Globally.....	32
2.4 Transport in Johannesburg .....	34
2.4.1 The Inherited Apartheid City.....	34
2.4.2 The History of Buses in Johannesburg .....	36
2.4.3 Background to South Africa’s Taxi Industry.....	37
2.4.4 The Post- Apartheid Transport Solution: The Rea Vaya BRT System in Johannesburg .....	39
2.4.5 Structure of the BRT (Rea Vaya) .....	39
2.4.6 Conflict Between The Rea Vaya Management and The Taxi Industry in Johannesburg .....	41
2.5 Summary .....	42
<b>CHAPTER 3 : RESEARCH AND METHODOLOGY .....</b>	<b>43</b>
3.1 Introduction .....	43
3.2 Rationale for the Adoption of the Qualitative Research Design .....	43
3.3 Gaining Access to Research Sites.....	44
3.4 Research Participants in the Study.....	52
3.5 Data Collection Procedures and Processes .....	53
3.6 Data Analysis Procedures .....	57
3.6.1 Open Coding .....	57
3.6.2 Axial Coding .....	58
3.6.3 Selective Coding .....	58
3.7 Authenticating the Study .....	59
3.8 Ethical Considerations .....	59
3.9 Summary .....	60
<b>CHAPTER 4 : DATA PRESENTATION.....</b>	<b>61</b>
4.1 Introduction .....	61
4.2 Experiences of Commuters who use the Rea Vaya.....	61

4.2.1 Rea Vaya Infrastructure.....	63
4.2.1.1 Accessibility to the Rea Vaya Stations.....	63
4.2.1.2 Reliability Regarding Bus Maintenance and Infrastructure.....	65
4.2.1.3 Lack of Public Amenities at Stations.....	66
4.2.1.4 Advantages of Designated Bus Lanes.....	66
4.2.2 Commuter Satisfaction with the BRT Service.....	67
4.2.2.1 Commuters Comfort.....	67
4.2.2.2 Concerns Regarding Safety of Commuters.....	67
4.2.2.3 Time Spent while Commuting.....	68
4.2.2.4 Lack of Communication at Stations Regarding the Smart Card System.....	69
4.2.2.5 Customer Care.....	70
4.2.3 Financial Implications for Consumers.....	71
4.2.4 Strikes by Taxi and Bus Drivers.....	72
4.2.5 Strategies to Improve Public Transport in the City.....	72
4.2.6 Enhancing the Use of Smart Card Machines.....	73
4.2.7 Extension of the Rea Vaya Network.....	73
4.2.8 An Integrated Transport Network.....	74
4.2.9 Best Practice in Public Transport.....	74
4.3 The Effect of the Rea Vaya on the Taxi Industry.....	75
4.3.1 Financial Loss for the Taxi Industry.....	75
4.3.2 Views of Members of the Taxi Industry.....	76
4.3.3 Conflict Between the Rea Vaya Management and the Taxi Industry.....	76
4.3.4 Conflict with Law Enforcement Officers.....	78
4.3.5 Divisions in the Taxi Industry.....	78
4.3.6 The Operational Agreement for Rea Vaya Buses.....	80
4.3.7 History of Public Transport in Johannesburg.....	80
4.3.8 Community Service.....	81
4.4 Experiences of Private Car Users.....	82
4.5 The Social and Economic Effect of the Rea Vaya on Businesses.....	84
4.6 Response from Rea Vaya Management.....	84
4.7 Summary.....	91
<b>CHAPTER 5 : ANALYSIS OF RESULTS.....</b>	<b>93</b>
5.1 Introduction.....	93
5.2 Meeting the Needs of Commuter's in Johannesburg.....	93



5.3 Accessibility and Reliability, with Regards to the Rea Vaya System.....	94
5.4 Designated Bus Lanes and Time Spent Commuting .....	96
5.5 Commuter Satisfaction with the Rea Vaya System.....	97
5.6 The Implementation of the Smart Card System .....	99
5.7 Poor Signage on Roads and at Stations.....	99
5.8 Rea Vaya Versus the Taxi Industry .....	100
5.9 Changing Apartheid Spatial Planning .....	101
5.10 An Integrated Transport Network.....	102
5.11 Transit Orientated Development (TOD) .....	102
5.12 Summary .....	103
<b>CHAPTER 6 : CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>104</b>
6.1 Introduction.....	104
6.2 Conclusions of the Study .....	104
6.2.1 The Social Effect of the Rea Vaya System.....	104
6.2.2 The Economic Effect of the Rea Vaya System.....	106
6.3 Recommendations of the Study.....	106
6.4 Contribution of this Enquiry.....	107
6.5 Areas for Future Research .....	108
6.6 Summary .....	109
References: .....	110
<b>APPENDIX A: SURVEY (COMMUTERS WHO USE THE REA VAYA) .....</b>	<b>122</b>
<b>APPENDIX B: INTERVIEW WITH THE TAXI INDUSTRY .....</b>	<b>123</b>
<b>APPENDIX C: SURVEY WITH PRIVATE CAR OWNERS .....</b>	<b>124</b>
<b>APPENDIX D: INTERVIEW REA VAYA MANAGEMENT .....</b>	<b>125</b>
<b>APPENDIX E: CONSENT FORM .....</b>	<b>126</b>
<b>APPENDIX F: PHOTOGRAPH OF REA VAYA STATION IN JOHANNESBURG .....</b>	<b>127</b>
<b>APPENDIX G: MAP OF BRT ROUTES IN JOHANNESBURG .....</b>	<b>129</b>
<b>APPENDIX H: MAP OF TAXI ROUTES IN JOHANNESBURG.....</b>	<b>130</b>

## List of Figures

Figure 1: Transport network model by Taaffe, Morille and Gould, 1963 (source: Keskinen 2007:66). .....	14
Figure 2: BRT corridors (source: Rea Vaya 2014) .....	40
Figure 3: BRT research site: Rea Vaya Stations (adapted from maps.google.co.za) .....	45
Figure 4: Response to question 1 .....	62
Figure 5: Response to question 2 .....	62
Figure 6: Response to question 6 .....	63

## **Glossary: BRT Terminology**

### **BRT:**

Bus Rapid Transit System (BRT), is a flexible rubber-tired, rapid transit mode that combine stations, vehicles, services, running ways and intelligent transportation system elements into an integrated system, with a strong positive identity that evokes a unique image.

### **Trunk Route services:**

Consists of articulated buses that operate on the trunk route

### **Feeder Routes:**

Buses that operate on feeder routes transport people from outer areas to trunk routes.

### **Complementary routes:**

These routes operate in mixed traffic as well as trunk routes.

### **Corridors:**

Corridors are linear tracts of land that contain a variety of transportation modes, especially public transport and a variety of intense and dense land uses (South Africa, 2003a:35).

# **Chapter 1 : An Introduction to the Study**

## **1.1 Introduction**

In most developing countries, an increase in urbanisation has resulted in both environmental and social challenges. Urban areas are plagued by an increase in the level of pollution and even more so traffic congestion, which creates its own social, economic and environmental challenges (Beavon 2001, Rodrigue, Comtois and Slack 2006). Traffic congestion, pollution, overcrowding and an increase in the number of road accidents, are some of the common problems experienced by a growing city, which results in an increase in the development and implementation of various modes of public transportation systems and more recently the implementation of Bus Rapid Transport (BRT) systems in developed and developing countries, as an alternative model of urban transport systems.

To date 168 countries have implemented BRT systems as a means to alleviate transport problems in those countries (Brtdata n.d). International case studies have shown that BRT systems have brought about a number of successes, ranging from an increase in the number of passenger usage, to the reduction of private vehicle users, as well as other social and economic benefits as more people gain access to job opportunities and environmental benefits (Beavon 2001, Pacione 2009).

Since the establishment of Johannesburg as a city, it has become the hub of South Africa's economic activities. However, over the past decade there has been decentralisation and migration of economic activities from the Johannesburg city centre, as an increasing number of companies have moved their businesses out of the city, as a result of crime, pollution and traffic congestion in the city which has been on the rise (Beavon 2001, Czegledy 2004). However, major transport infrastructure remains focused on the Johannesburg Central Business District (CBD) as the main destination centre for economic activities. Consequently, commuters need to travel greater distances to their places of employment outside the CBD area. The lack of access to transport had a significant impact on the poor (Khosa 2002). Public transportation prior to the implementation of the BRT was in dire need of a

'revamp'. In order to overcome the challenges in the city, the Rea Vaya, Bus Rapid Transport (BRT) system was introduced in Johannesburg.

The purpose of this study was to investigate social and economic dynamics that emerged as a consequence of the Rea Vaya implementation. This study specifically investigated the social and economic effects with the introduction and implementation of the Rea Vaya in Johannesburg on different stakeholders. More importantly the study investigated whether the Rea Vaya BRT system meets the needs of commuters. The inception of the BRT system despite its advantages to some is perceived as a bane to the lives of members of the Taxi Industry as a result of a decrease in the number of commuters using taxis in the Johannesburg region (Mpofo 2008). This study focuses on the experiences of members of the Taxi Industry, commuters who use the Rea Vaya System and private car users, regarding the BRT system.

## **1.2 The Context of the Research**

The transport system in Johannesburg has been inadequate because of the political history of South Africa. This apartheid city was designed to keep the different race groups isolated from the city. The Group Areas Act (1950) ensured that non-white people did not live in the inner city areas which were designated for whites only. Land use planning during the apartheid era was aimed at keeping the different race groups segregated (Czegledy 2004, Khosa 1995, Harrison and Zack 2012).

One of the remaining effects of apartheid is the settlement patterns that are characterised by inefficiencies and inequalities. To date the legacy of apartheid has an impact on access to places such as the inner city. Donaldson (2006:61) argues that the *"inequality and spatial inefficiency caused by apartheid planning remains a spatial challenge in post-apartheid South African cities"* (cited in Chakwizira, Bikam, Dayomi and Adeboyejo 2011). Post 1994, it is evident that there has been an influx of commuters to the city centre (Czegledy 2004). This has placed tension on the already inadequate transport system. An inefficient public transportation system has a negative effect on the functioning of the city centre, putting it at economic risk

(Fourace, Dunkerley and Gardner 2003). Alternatively, an efficient public transportation system could assist in meeting the needs and standards required by commuters and at the same time support urban development policies and programmes (Fourace *et al* 2003).

According to Statistics South Africa, the population of Johannesburg is approximately 4 million people (StatsSa 2005) and like many major cities, Johannesburg experiences traffic congestion, pollution and overcrowding (Mabena 2010). Recent studies have shown that Johannesburg's population is increasing by about 2 percent a year (South Africa 2011). An increase in population will result in an increase in urban problems pertaining to traffic, pollution and overpopulation (South Africa 2011).

According to the World Bank, there is approximately 3.5 million trips made daily in Johannesburg. 47 percent of these trips are made by public transport, whilst the remaining 53 percent of trips is made by private transport. Of the 47 percent of public transport, 14 percent of the trips are made by rail, 9 percent by bus, 72 percent by mini-bus taxis whilst the remaining 5 percent of trips are unaccounted for (World Bank 2011) which makes the Taxi Industry the largest provider of public transportation in Johannesburg. According to the Department of Transport's (DoT) annual report 2011/2012, *"the average time spent on the road using a taxi was 50 minutes and the average cost R186 per month"* (CoJ 2009). Subsequent to the report, traffic congestion has increased and so have taxi fares. This indicates that traffic congestion in the Johannesburg region is directly proportional to the cost of travelling in a taxi. This may also be extended to transport systems in other regions.

The National Household Travel Survey, (2003) states that 67 percent of participants thought taxis are unsafe (South Africa 2003b). Commuters find taxis unreliable as there are no schedules (South Africa 2003b). The lack of schedules results in people waiting for long periods of time and being stranded which leads to public transports inefficiency. Many people find private cars the preferred mode of transport; however, with the increase in fuel prices many people will have to find alternative transport as it is becoming more expensive to travel to work.

As a result of the urban problems mentioned above, the past decade saw a number of companies relocating their businesses outside of the city centre requiring commuters to travel greater distances to their places of employment within the urban area. Thus an efficient transport system is a necessity for Johannesburg as it could provide access to the city for numerous commuters who do not have access to private transport and who live in the townships and suburbs situated a distance from the city.

In order to alleviate these challenges in the city of Johannesburg, the Rea Vaya, Bus Rapid Transport (BRT) system was introduced in Johannesburg. With the inception of the BRT system in 2009, the National Department of Transport and the City of Johannesburg promised a number of benefits for the city. The aim of providing this system was to transform the city into a 'World class African city', while providing a safe and efficient public transport system (South Africa 2011). Furthermore, the Rea Vaya was designed with the intent to increase access to work opportunities, as well as to educational and social activities (Fourace *et al* 2003). However, for various reasons, the Rea Vaya initiative was opposed by the Taxi Association, which is discussed in the next chapter, the Literature Review.

Prior to the Rea Vaya project being launched in 2009, Taxi Associations protested against the launch of the Rea Vaya system and presented a memorandum to the Transport Department (Mpofu 2008). The Taxi Industry in Johannesburg has been providing transportation services to commuters from low income areas for decades, and with the implementation of the BRT system there has been a decrease in the number of commuters using taxis (Mpofu 2008). Thus, with the Taxi Industry protests taking place commuters were left without transport which had a significant impact on the South African economy. To resolve the conflict, the City of Johannesburg (CoJ) included the Taxi Associations in discussions concerning the BRT system in its planning phase. The Research Problem, which follows, outlines and motivates the chosen research topic.

### 1.3 Research Statement

The problem in Johannesburg lies with its public transport system. The Rea Vaya has an effect on commuters who are dependent on public transport as well as those that use private vehicles to access the city of Johannesburg. With transport being an essential element of people's lives, it is important to investigate the effect and draw solutions on how to improve the system.

The problem with transport in the city of Johannesburg stems from its history of spatial planning during the apartheid era. The Group areas Act (1950) separated people according to their race groups and separate areas were designated for each of the "so called, non-white" race groups (Donaldson 2006). Black people living in townships and working in the city commuted to the city by rail and state buses. Subsequently mini bus taxis provided additional transport (Barett 2003). The majority of these commuters were from previously disadvantaged communities and made up the most of the workforce. Additionally, since private cars were unaffordable, commuters relied on public transport and taxis (Pirie 1992). The current public transport system is inadequate and does not meet the needs of commuters; consequently the City of Johannesburg introduced the BRT system (Mpofu 2008).

The introduction of the Rea Vaya has sparked mixed reactions from several stakeholders. Some sectors of the population such as those who rely on public transport, welcomed the project, whilst others especially the Taxi Industry opposed the system and remained sceptical. The Taxi Industry has been less welcoming, to the extent that some are anti-BRT because the BRT has created challenges and threatened some of their livelihoods. This study seeks to investigate and understand the perceptions and experiences of various stakeholders including commuters who use the BRT, those who use private vehicles as well as taxi operators.

The perception of various stakeholders regarding the Rea Vaya is significant in order to understand the successes or failures of the system in meeting the needs of commuters and in measuring the economic effects of the Rea Vaya. Upon observation, it has been found that the Rea Vaya system poses many opportunities



but at the same time many challenges for users and non-users. Some of the challenges observed, are that whilst the Rea Vaya aims to provide an efficient transport system and reduce traffic congestion, it has in turn created more congestion for other road users such as taxis and private car users. There is restricted use by other vehicles and taxis due to specific bus only lanes. The limited space available on the roads in the city because of the 'bus only lane' has resulted in increased traffic volumes and consequently limited road space available for other users. The aims and objectives of the study are discussed next.

### **1.3.1 Aim of the Study**

This study aims to contribute to the broader aspects on Transport Geography by investigating the social and economic effect of the Rea Vaya on different stakeholders in Johannesburg. In addition, this study aims to understand the extent to which the Rea Vaya system has improved urban transport in Johannesburg. Data on the experiences of commuters provided an in-depth understanding of the functioning of the Rea Vaya and the effect that the Rea Vaya has had on commuters in Johannesburg. The researcher also gathered data on the experiences of private car users and businesses that are located across the Rea Vaya station.

Through this investigation this study provided valuable insight into the experiences of different stakeholders regarding the Rea Vaya system. It is anticipated that the findings and recommendations of this study could be used to inform planners in the development of BRT systems in other cities in South Africa as well as other developing countries around the world.

### **1.3.2 The Research Objectives**

The following objectives guided this study and helped to achieve the aim of the study.

1. To investigate the social and economic effect of the Rea Vaya on commuters who use the system.
2. To describe the experiences of users of the system as well as the impact that the system has had on non-users in order to understand in which ways has the Rea Vaya improved travelling experiences of commuters.

3. To explore the opinions and attitudes of the taxi owners and taxi drivers towards the Rea Vaya system. The Taxi Industry is not only an existing mode of transport for thousands of commuters, but also a major source of livelihood as it provides employment for thousands of taxi workers. It is important to understand the impact and relationship between taxi transport systems and the Rea Vaya.
4. To express the views of the Rea Vaya Management and gain an understanding of the rationale of the Rea Vaya system in Johannesburg.
5. To investigate whether the original objectives and aims of the Rea Vaya system have been met.

### **1.3.3 Research Questions**

In order to investigate the economic and social effects of the Rea Vaya on the transport system it is necessary to answer the following research questions.

- What are the social and economic effects of the Rea Vaya in Johannesburg?
- How does the BRT system contribute towards meeting the needs of commuters in Johannesburg and to what extent has the BRT system addressed the commuter problems in the city?
- What are the general perceptions of commuters, private car users and taxi owners towards the BRT system?
- How has the BRT system contributed to development along BRT corridors since its inception?
- In which ways has the Rea Vaya system contributed towards resolving the apartheid transport planning legacy problems.

### **1.4 Rationale of the Study**

This study was undertaken to fill the gap in existing literature on the Rea Vaya system. Furthermore, the study aims to provide insight into the success and failures of the Rea Vaya system, of which future planners could use.

A study of recent literature aroused the researchers interest in the study of urban transport and shows how transport systems in both developed and developing countries are efficient, safe, convenient and reliable, will reduce traffic volumes, and will be chosen as a mode of transport, which will decrease the use of private cars. It is purported that BRT systems will reduce the use of private vehicles. Studies conducted on BRT's around the world have shown the successes of the BRT system. Most of the literature shows the BRT in a positive light. However, in Johannesburg, anecdotal evidence has shown that the BRT is not accepted by all stakeholders and poses a number of challenges for stakeholders in Johannesburg.

South Africa faces three related problems, rapid urbanisation, increasing inequality and rising poverty levels. Dealing with the urbanisation problem is more complex because of the rapid growth in the number of private vehicles, the legacy of apartheid and transforming urban areas. In the context of urbanisation, the Government has to contend with the legacy of urban apartheid transport planning and also provide an adequate transport system in the context of rapid urbanisation and urban sprawl.

To reiterate, Johannesburg is known as the economic hub of Gauteng, and the importance of an efficient transport system that reduces travel times which in turn enables economic growth is essential. Despite the Rea Vaya contributing to providing access to the city, it only caters for a particular segment of commuters who are located along its routes. People who live on the outskirts of the city are unable to use the Rea Vaya. Furthermore the Rea Vaya construction and designated lanes have inconvenienced other road users. The Rea Vaya has sparked controversy in the Taxi Industry, dividing associations into those in favour of the Rea Vaya and those against the Rea Vaya. These reasons have prompted this investigation into the Rea Vaya.

Relevant literature consulted deals specifically with the reasons behind the implementation of the system and the tension which has developed between the Taxi Industry and the Rea Vaya. A large number of people travel from several areas situated on the outskirts of the city. The city should be accessible to commuters however; this does not seem to be the case in Johannesburg. It has been purported

that the Rea Vaya has not only caused an inconvenience to stakeholders, but has also made some areas in the city inaccessible. In the light of the above, an investigation of the situation regarding claims about the Rea Vaya is important. A discussion on the significance of the study follows.

### **1.5 Significance of the Study**

Since this study on the Rea Vaya was intended to verify whether the aims pertaining to the implementation of the system were achieved the findings are significant for the following reasons. It was anticipated that the Rea Vaya would provide a solution to the problems of the existing transport system. The findings of this study will add to existing literature on Transport Geography as it investigates not only users of the system, but non-users experiences which have been investigated. Additionally, this study on the BRT is a qualitative study and is concerned with the opinions and experiences of stakeholders in order to provide an account of the social and economic effect of the Rea Vaya.

The Rea Vaya was launched in 2009 and is a fairly new system that aims to improve transport in Johannesburg. It is expected that the findings of this study will contribute to the existing literature by providing a qualitative rather than a quantitative analysis into the experiences of those who are most affected by the system.

### **1.6 Structure of the Research Report**

The dissertation is structured into five chapters. This introductory chapter encapsulates the context, motivations, research questions and the scope of the study along with an outline of the dissertation.

Chapter Two examines the theoretical background regarding central issues of this topic. The literature consulted provides a background to urban transport and sustainable urban transport and examines other BRT systems from around the world, analysing the systems successes and failures in different settings. The history

of public transportation in Johannesburg and in particular the development of the Rea Vaya is analysed in this chapter.

Chapter Three presents and justifies selected and applied research methods used in the study.

Chapter Four presents an analysis of the data that has been gathered for this research study. Data on the social and economic effects of the BRT system are presented and conclusions were drawn regarding the impact of the system in Johannesburg.

Chapter Five presents a critical analysis of research results in the context of strategic objectives of BRT systems. The analysis is presented with supporting literature; additionally, it provides an overall discussion of the social and economic effect of the Rea Vaya in Johannesburg.

Chapter Six presents the main findings of the research, drawing conclusions and suggestions for future research on BRT projects.

## **Chapter 2 : Literature Review: A Theoretical Overview**

### **2.1 Introduction**

This literature study presents a discussion on urban transport and emphasises the use of the BRT system both globally and locally (South Africa). The purpose of conducting this literature review is to facilitate a profound analysis pertaining to data collected on the experiences and opinions of commuters who use the Rea Vaya with the intention of interpreting the research outcomes. Due to the dearth of literature on the apartheid city of Johannesburg it was necessary to source information older than five years.

It is important for every city to have an efficient public transport system in order to alleviate many of the environmental, economic and social problems experienced in urban areas which are evident in both, developed and developing countries. This chapter is divided into three main sections. The first section provides a theoretical framework on Transport Geography. The role of transport in development and transport challenges in developing countries is discussed. The second section looks at case studies of Bus Rapid Transit systems in Brazil, Columbia, Nigeria, India and Los Angeles. The challenges and successes of the system in these countries are discussed. The third and final section of the literature review focuses on transport in Johannesburg and the implementation of the Rea Vaya system. The development of the South African public transport system and the challenges and opposition to the implementation of the Rea Vaya Bus Rapid Transit (BRT) System in the South African context will come under scrutiny. This literature review will begin by examining the role of transport in the discipline of Geography.

### **2.2 Urban Transport Geography**

In an attempt to understand transport geography a discussion of the link between transport and geography is presented. This is followed by literature on transport and development and the development of transport systems. Thereafter the transport challenges that developing countries face is examined. Sustainable transport offers a

solution and a framework to address transport challenges in both developed and developing countries. To conclude the theoretical framework on transport geography a definition on sustainable transport and finally the call for sustainable transport is discussed.

### **2.2.1 The Link between Transport and Geography**

“There would be no transportation without geography and there would be no geography without transportation” (Rodrigue *et al* 2006:1)

“Geography is concerned with the interrelationships between phenomena in a spatial setting and with the explanation of spatial patterns” (Hoyle and Knowles 1992:2). Transport on the other hand is concerned with the transfer of goods as well as people from one destination to another as well as the mode or system of transport that is used (Tiawaun 2000). What this essentially means is that ‘transport’ is a mode of transporting goods and people from place to place and differs in the type of system used for example transportation by sea and air as opposed to transportation by rail and road.

Whereas geography is concerned with spatial patterns and relationships, transport geography is concerned with the “*Study of the spatial aspects of transportation*” (Goetz, Ralston, Stutz and Leinbach 2003:221). Transport geography is “*concerned with explaining the location of transport facilities as well as the magnitude of flows over or near the earth’ surface*” (William 2004:13). Transport and geography are intrinsically linked thus, Rodrigue *et al* (2006) states that there is a clear relationship between transport and geography as geography cannot do without transport and vice versa, therefore concluding that geography and transport are interdependent and complement each other.

Historically research in the field of transport geography was focused on the movement of people and goods (Goetz *et al.* 2003, Williams 2004, Musekene 2010). Williams (2004) examined the evolution of Transport Geography in America and found that during the 1920’s and 1930’s research in this field was focused on describing routes for rail and air travel. Post World War II; saw a shift in the literature as transport problems surfaced and transport geographers began to examine these

problems. In the 1950's attention shifted towards the economic aspects of transportation (William 2004).

With the introduction of new technologies in the 1980's, transport geographers began thinking on an advanced level in understanding how the four equally important components which are history, society, technology and geography could be interlinked and found coherence in accessibility and mobility (Keeling 2007). Modern day Transport Geography is interdisciplinary as it focuses on mobility, transport models, traffic flow and extends to other fields inside and outside of geography such as economics, engineering and urban planning (Shaw and Hesse 2010, Williams 2004).

It is the duty of a transport geographer to examine the links between transport and development, accessibility and the environment in which transport systems are found. A transport geographer is also tasked with exploring the social and economic effects that these transport systems have on communities; the economic development of the country as well as on the effect on the environment. The geography of transport networks is discussed below.

### **2.2.2 The Geography of Transportation Networks**

It is important to understand the development of the transport systems and transport networks in order to appreciate the potential and its limitations of the current transport systems and its implications for planning for future transport (Knowles and Smith 1992). Networks are used to show the similarities between the structure and flow of a transport system and according to Rodrigue *et al* (2006:47) a network is a "framework of routes within a system of locations identified as nodes".

Taaffe, Morrill and Gould (in Knowles and Smith 1992) developed a model to explain the interrelationship between transport and development in a developing area. The model shows how a developing country could evolve from a pre-colonial situation, to a period of political independence through the development of a transportation network.



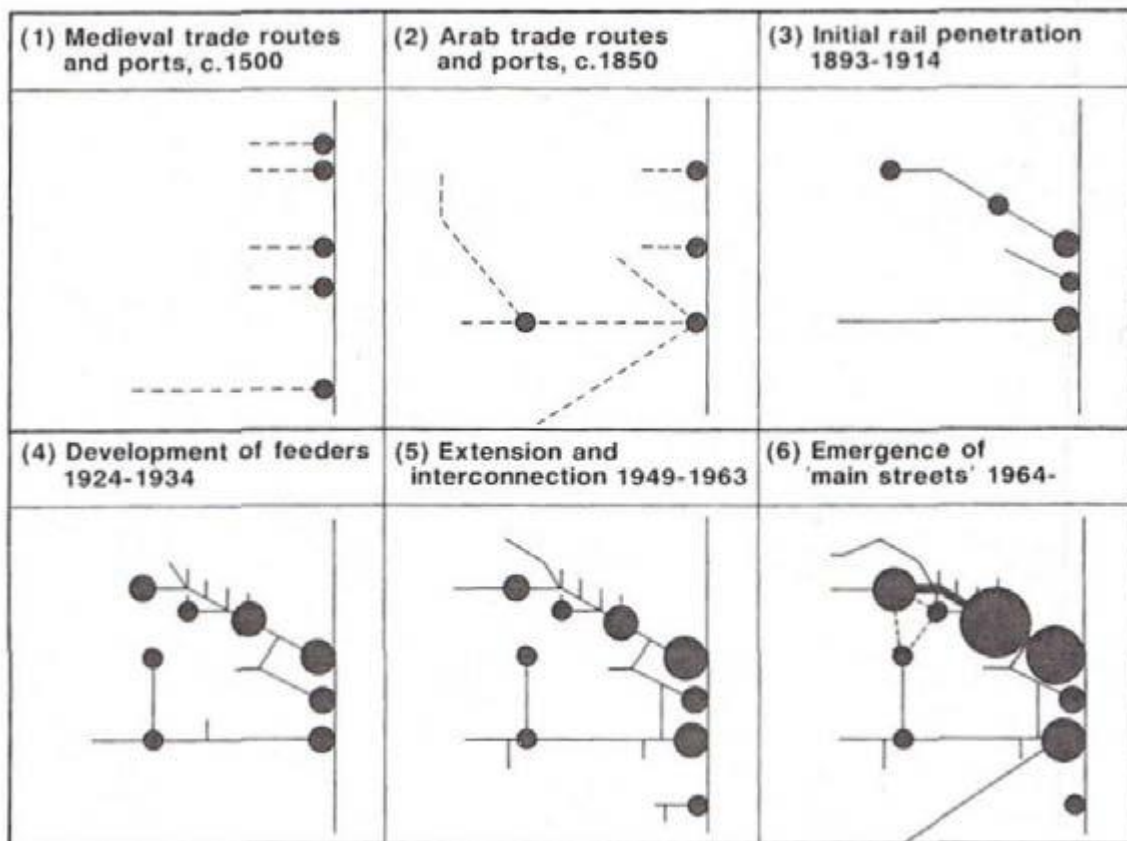


Figure 1: Transport network model by Taaffe, Morille and Gould, 1963 (source: Keskinen 2007:66).

The above model is based on the assumption that transport networks begin at seaports (Knowles and Smith 1992; Taaffe, Gauthier and O'Kelly 1996; Keskinen 2007). A network model according to Taaffe *et al* (1963) consists of four phases (Keskinen 2007). The first phase begins with a few scattered nodes (Knowles and Smith 1992). There is not much integration between the nodes along the coast and those in the interior. The second phase is the development of penetration of trunk lines and gateways. This occurs when linkages begin to develop between the port nodes and the nodes in the interior, markets expand around these nodes and feeder lines will spread out. In the third phase feeder networks will develop and will interconnect with major trunk lines. Each city will expand its hinterland in an attempt to improve its position. In the final phase the development of high priority trunk lines and a hierarchical system develops (Taaffe *et al* 1996).

Based on the diagrammatic illustration of Taaffe et al (1963) transport model it is evident that transport routes within an area is not static. It will undergo changes with demand for transport activities and an increase in economic activities. According to Knowles and Smith (1992:14) *“This model represents the evolution of political, economic and transport systems in a developing country”*. Although the model is simplified and confined to the period of European colonialism, the model still holds some value in that it provides an understanding into how transport networks develop (Knowles and Smith 1992). In Johannesburg transport systems did not develop from the coastline but rather from the interior. Networks were developed to transport goods to major areas. The transport system in Johannesburg was influenced by apartheid spatial planning, which will be discussed later. Transport plays a major role in development. The role of transport in both social and economic development is presented next.

### **2.2.3 Transport and Development**

*“Transport is an epitome of the complex relationships that exist between the physical environment, patterns of social and political activity and levels of economic development” (Hoyle and Smith, 1992).*

The basic function of urban transport is to link residence and places of employment, and producers and users of goods and services (Johannes 1983 cited in Tiawoun, 2000). Transport contributes to social, political and economic development (Musekene 2010). Economic development is the *“growth in the economy over time and how this is reflected in the wealth of individual countries”* (Banister 2005:3). Social development on the other hand addresses issues of social and spatial equity and provides an understanding of how wealth is distributed in a country (Banister 2005). Research conducted in transport geography examining the relationship between development and transport dates back to the 1960’s (Musekene 2010).

A number of researchers (Knowles and Smith 1992, Taaffe et al 1996, Tiawoun 2000) have provided insight into the relationship between transport and development. There is debate surrounding the contribution of transport infrastructure to development (Musekene 2010). Transport acts as a catalyst for development but is not necessarily a requirement for development to occur. Thus transport is important for development but not a predominant factor for development (Low and

Gleeson 2003; Keeling 2007, Rodrigue *et al.* 2006, Musekene 2010). Additionally, Keeling (2007) acknowledges that transport contributes to development, but argues that transport in itself cannot bring about development. Transport systems do not operate in isolation but are affected by other activities (Keeling 2007). Although a number of authors argue that the exact impact that transport has on development needs to be investigated, the literature has shown that transport has played a role in development.

Transport systems together with transport infrastructure also contribute to economic growth by creating new opportunities for investment and employment and by efficiently transporting goods and services to areas (Fourace *et al* 2006, McGaffin and Gavera 2012). Investments in transport could have a number of economic benefits such as savings on vehicle operating cost, time savings, reduced traffic, safer roads , improvements in the transit orientated development and urban regeneration (Musekene 2010, McGaffin and Gavera 2012).

An efficient urban transport sector itself provides jobs for the urban population (Button 1993, Banister and Lichfield 1995, Tiawoun 2000). Banister and Lichfield (1995) provide an example of Heathrow airport which consists of approximately 40 000 employees and a further 100 000 people who are indirectly employed. It is evident that most developing countries are dependent on transport which accounts for approximately “6 to 12 percent of their GDP” (Rodrigue *et al* 2006:76).

Transport is also linked to social development and enables people to have access to resources which could improve their lifestyles. Transport provides a response to demand, people travel for a specific purpose, to benefit from the opportunities presented by mobility (Button 1993). Where an efficient transport system does not exist, people’s mobility is restricted and could result in social exclusion (Chakwizira *et al* 2011). Button (1993) explains that, in an area where there is an efficient transport system or where there is sufficient mobility, social interaction will take place. Transport facilities provide access to a number of services such as education, employment, training opportunities, social activities and health care (Rodrigue *et al* 2006, Chakwizira *et al* 2011). Due to an increase in mobility people are now able to

relocate to areas outside the city enabling them to separate leisure from work (Button 1993).

It is evident from the literature that transport plays a significant role in both social and economic development. Although it may be argued that transport alone cannot bring about development in an area, a lack of transport infrastructure will result in less development in that area. Accessibility is one of the main factors of development (Musekene 2010).

#### **2.2.4 Transport and Accessibility**

*“The extent to which land use and transport system enable individuals to reach activities or a destination by means of transport modes” (Geurs and Wee 2004:127).*

The above definition clarifies the concept of accessibility. Transport and accessibility are closely linked as transport especially public transport provides access to services such as better health care and education (Sohail, Maunder and Cavill 2006). Accessibility plays an important role, in the economic development of cities. Rodrigue *et al* (2006) states that all locations have some level of accessibility, however, there are some locations that are more accessible than others and because of transport these locations will have higher land values. Additionally, improved access to transport results in improved employment opportunities and subsequently increased access to markets for the poor (Tiawoun 2000, Sohail *et al.* 2006). *“Inaccessibility emerges as a major cause of social exclusion in studies of the poor in urban areas” (Gwilliam 2002:1).*

The lack of accessibility will result in the poor having limited access to goods and services and employment opportunities. *“ Limited mobility of non-drivers contributes to several social problems, including incomplete education, unemployment, social isolation and ill health, which impose economic as well as other cost” (Pacetti and Trittipio 2010:6).* Accessibility could act as a catalyst for land development (Deng and Nelson 2013). Dutch planners achieved accessibility by using public transport systems and areas of mixed land use (Kennedy, Miller, Shalaby, Maclean and Coleman 2005). Accessibility also influences travel demand, peoples social and

economic opportunities and the time needed to carry out those opportunities (Geurs and Wee 2004).

The mode of transport used is influenced by the distance to transport networks. A study conducted by Crevero, 2004, illustrated the idea that *“the further the distance from the railway station, the lower the proportion of journeys made”* (cited in Banister 2005:117). Among the challenges found in developing countries are inaccessibility and inefficient transport system. A discussion of other transport challenges found in developing countries ensues.

### **2.2.5 Transport Challenges in Developing Countries**

Urban problems related to transport are experienced in both developed and developing countries as they both endeavour to develop sustainable transport systems to address the challenges specific to an individual country. Common transport related problems in developing countries are a common feature.

Transport challenges exist in both the developing and developed countries, however, the major difference between developing countries and developed countries lies in the fact that priorities differ in developed and developing countries. In this regard developed countries do not experience the same social, environmental and economic problems experienced by developing countries. There are a number of factors such as lack of finance, resources and infrastructure that exacerbate the transportation problem in developing countries.

Developing countries have to contend with increasing population growth, a lack of financial resources, urbanisation, poverty and lack of infrastructure (Mpofu 2008, Barrett 1991). These cities in developing countries are centres of trade as most economic activities take place in cities. Consequently, the number of people who commute to the city has increased (Mpofu 2008). This unplanned growth has caused a number of problems such as traffic congestion and accidents, thereby resulting in cities becoming inaccessible for many (Mpofu 2008). There are a number of factors that contribute to this such as un-roadworthy vehicles, congestion and unplanned and poorly maintained roads.

In 1999 between 750 000 and 880 000 people died in road accidents worldwide, with the majority of these deaths recorded in developing countries (Whitelegg and Haq 2003). In Kenya in 1991, there was “580 road fatalities per 100 000 vehicles”, whilst in India there is “60 000 fatalities each year” (Gwilliam 2003:577). Developing countries record an increasing high number of road fatalities each year. The increasing number of road fatalities is caused by unplanned and poorly maintained infrastructure and roads (Gwilliam 2003).

A common characteristic of urban transport in developing countries is the variety of public transport available. Barrett (1991) explains that in India, there is a range of public transport that includes, cars, buses, bicycles, pedi-cabs and three wheeler motor vehicles (tuk-tuk), not to mention the other forms of non-motorised transport (cited in Heraty 1991). The wide variety of vehicle types on streets presents problems with regard to efficiency and safety (Barrett 1991). In West Africa, there are taxis, mini-buses, pick-up trucks, conventional single-decker buses and converted trucks (Barrett 1991).

In most developing countries there are a greater proportion of poor low income earners who rely on public transport, due to the fact that they cannot afford a private vehicle (Barrett 1991). In countries where there are inefficient public transport systems there are long queues of commuters waiting to use public transport facilities, which is time consuming (Button 1993).

The increase in the number of private cars has caused a major challenge in the developing world. Travel patterns in most developing countries depend on the car and there has been a substantial growth in car ownership over time (Banister 2005). In Delhi the number of car ownership grew from “1 830 000 in 1990 to 3 300 000 in 1999” (Whitelegg and Haq 2003:6). The car is seen as a symbol, an icon that symbolises capitalism and one of the reasons why it appeals to many is because it provides the user with a status, freedom and flexibility (Banister 2005). Although there are some social benefits attached to private cars, the economic and environmental problems caused by the increasing numbers of private cars, especially in urban areas, has created a number of challenges such as traffic congestion, air and noise pollution as well as urban sprawl (Banister 2005). The car

allows cities to spread, people are able to live and work in different areas. Urban sprawl results in people having to travel greater distances (Banister 2005).

Infrastructure plays a major role in the provision of public transport in urban areas. In African countries and most developing countries the conditions of roads are poor, which contribute to the congestion experienced in developing countries (Kumar and Barrett 2008). Most developing countries lack good infrastructure which causes a decrease in mobility and in turn affects the economy of developing countries adversely. "*Bangkok loses 35% of its gross city product just due to congestion*" (Gakenheimer 1999:673). Congestion results in delays and subsequently less time spent at work results in a decrease in production levels (Turton and Knowles 1992). In developing countries the increasing use of private cars has resulted in the decline in investments in public transport development (Turton and Knowles 1992).

Congestion is another factor which contributes to road fatalities. Gwilliam (2003:576) explains that in 2006, in "*Bangkok travelling speeds were 4.8 km/hr*". One of the contributing factors from this is congestion in the city. Cities in India suffer from traffic congestion which is exacerbated by hawkers at road junctions and vendors on sidewalks who force people on to the roads, thus resulting in vehicles having limited road space (Gwilliam, 2003). Traffic congestion results in a lot of time being lost (Button 1993). Not only is there a loss of time for the user, but congestion results in more pollution due to the burning of fossil fuels from the stopping and starting in traffic (Button 1993).

Cities are centres for trade, education, research and innovation and these factors allow developing countries to become players globally (Gakenheimer 1999). It is therefore critical to identify strategies to reduce traffic congestion and find sustainable means of transport, so that problems do not hinder development. A solution to the problems experienced in cities, is to develop a sustainable transport system, which will be discussed next.

### **2.2.6 Sustainable Transport Defined**

In order to gain an understanding of sustainable transport, a definition needs to be established. A number of researchers have provided definitions for sustainable

transport. These definitions will be discussed in an attempt to define sustainable transport.

There are varying definitions of sustainable development, the most well known definition being that of the Brundtland Commission (1987);

*“Development that meets the needs of the present without compromising the ability of future generations to meet their needs”* (Akinyemi and Zuidgeest 2000:31).

Akinyemi and Zuidgeest (2000) define sustainable transport as a transport system that meets the needs of people in terms of accessibility, mobility and safety. Akinyemi Zuidgeest (2000:31) adds to this definition *“The term sustainable transportation development is a combination of sustainable development and transportation”*. They explain that the concept of sustainable development involves the application of the sustainable development idea to a transportation system.

*“The ability to meet society’s need to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values today or in the future”*

(Leda 2010:60)

The Council of Transport Ministers of the European Union adopted a more versatile definition of sustainable transport. They see sustainable transport as a system that

*“Allows the basic access and development needs of individuals, companies and societies to be safely and in a manner consistent with human and ecosystem health, and promises equity within and between successive generations, is affordable, operates fairly and efficiently, offers choice of transport mode and supports a competitive economy, as well as balanced regional development, limits emissions and waste within the planets ability to absorb them, uses renewable resources at or below their rates of generation, and uses non-renewable resources at or below the rates of development of renewable substitutes while minimising the impact of land and the generation of noise”*

(Goldman and Gorham 2006:264).

In summary it may be said that sustainable urban transport is a transport system that is socially acceptable, meets the needs of commuters, is financially sustainable, affordable to the poor and environmentally sustainable, that is, hence reduced pollution levels and has minimal negative impact on the environment, thus the call for sustainable urban transport.

### **2.2.7 The Call for Sustainable Urban Transport**

*“Without life, there will be no sustainability and without sustainability life will even really end”*

(Leda 2010:62).



Since the Brundtland commissions report there has been a move towards a sustainable future, where there is a call for greener development policies and minimising the use of non-renewable resources. Attention has been given to sustainable development in almost all spheres of urban development. Goldman and Gorham (2006) argue that due to the complexity of the transport sector it is difficult to define sustainable development.

The World Bank (1996) states;

*“Without physical access to jobs, health, education and other amenities, the quality of life suffers, without physical access to resources and markets growth stagnates and poverty reduction cannot be sustained”.*

This quotation basically outlines the importance of and the need for a sustainable transport system. With the city being the centre of various activities, it is important that people are able to have access to the city and mobility within the city. This may be achieved through the development of a sustainable transport system.

Banister (2005) highlights some of the objectives of sustainable transport and states that there should be a reduced need to travel. By placing facilities and services in close proximity to residential areas would result in people having to travel less. The second objective of sustainable transport is to reduce the levels of car use and road freight in urban areas. A third objective of sustainable transport is to promote more energy efficient modes of travel for both passenger and freight and finally noise and vehicle emissions should be reduced at the source. In addition there is a need to encourage a more efficient and environmentally sensitive use of the vehicle stock. It is also important to improve safety of pedestrians and all road users and to improve the attractiveness of cities for residents, workers, shoppers and visitors.

An inefficient transport system will hinder sustainable development. Public transport should be of a high standard so that it could result in a modal shift. If the car is seen as unattractive due to the costs of ownership of one then people would resort to using other forms of transport in particular public transport (Banister 2005). Car free developments are one solution to addressing the problem of private car use and would reduce the carbon footprint. In cities a car free development will mean that no parking space will be allocated to dwellings (Banister 2005). In order to achieve

sustainable transport it is important to find a balance in the use of transport systems such as the BRT.

## **2.3 Developments of Public Transport Systems, the BRT System.**

BRT is the new 'buzz word' in many developed and developing cities. There is extensive international literature on BRT systems from around the world; however there is a dearth of literature on the local front. The Rea Vaya was launched in 2009 and the system is still in its infant stages. Considering the limited literature available on the BRT systems in South Africa, this study has drawn upon case studies from Curitiba, Bogotá, Nigeria, India and Los Angeles to explain the structure and advantages of developing a BRT system in different settings. These countries were chosen due to the success of the BRT system in these countries likewise, research on the BRT in South Africa tends to focus on public transport in Johannesburg. In order to understand the concept of BRT it requires an in-depth discussion of the system.

### **2.3.1 What is a Bus Rapid Transit (BRT) System?**

There are various definitions of BRT, one of which is "*Bus-based rapid transit service that attempts to emulate the high quality service of rail-based transit modes at a fraction of the capital cost*" (Cain, Flynn, McCourt and Reyes 2009:1). BRT is also defined as a form of mass transit that is reliable and flexible and more cost effective than conventional buses (Deng and Nelson 2010). The US General Accounting Office provides a more comprehensive definition of a BRT;

*"A set of elements that includes exclusive bus highways and lanes, High Occupancy Vehicle (HOV) lanes, technological and street design improvements, traffic signal prioritisation, better stations and or bus shelters, fewer stops, faster service, cleaner, quieter and more attractive vehicles"* (Cabrera 2010:2).

This description could be applied to understand the BRT system in South Africa. Most of the above definitions of BRT include a positive description relating to the structure of the system. Hess (2008) argues that the reason why definitions of the BRT promote this positive image is to create an identity as a world class, efficient transport system, and sell this to the public. According to the BRT planning guide (Wright and Hook 2007), a BRT needs to invoke a feeling of confidence in its users.

In order for the system to be successful it needs to give the user a sense of community pride. A BRT system may be defined as a public form of transportation that is more developed than the conventional public transportation of a bus, more efficient, flexible and attractive. Additionally, it aims to modernise public transport and change the perception of public transport. Each BRT system requires specific basic components as may be observed from the following discussion.

### **2.3.2 Basic Components of a BRT System**

BRT systems differ from city to city because the system's design is dependent on the needs of the commuters in that city; the road networks, patterns, routes and the governments of cities where the BRT is available have policies in place as well as available financial resources (Cabrera 2010). The literature on BRT systems indicate that although systems may differ in design, route and size, the basic components of BRT systems are similar in each city. Depending on the factors mentioned above by Cabrera (2010), BRT systems could range from 'BRT-Lite' to full service BRT systems (Thole and Samus 2009).

A full BRT system is ranked the highest of BRT systems. The minimum characteristics that a full BRT system has, is a designated bus-way that is usually situated in the middle of the road (median lanes), an integrated network of routes and corridors, improved stations that are secure, level access, pre-board fare collection, fare and physical integration between routes, corridors and feeder services and restricted entry to prescribed operators under a reformed business and administrative structure (Wright and Hook 2007).

Some of the common advantages of BRT systems are:

- Dedicated bus lanes, mixed traffic lanes, reserved lanes on freeways. This provides exclusive right of way to buses allowing them to reach greater speeds than conventional buses.
- Level boarding, off-boarding fare payment and multiple doors for boarding all allow for ease of passenger flow on to buses

- Intelligent Transportation Systems (ITS) are more commonly used in developed countries because of its capital cost. ITS provide buses with real time information and bus signal priority (Wright and Hook 2007)

Park and ride facilities are a component of BRT that are not included in all BRT systems (Levinson, Zimmerman, Clinger, Rutherford, Smith, Cracknell and Soberman 2003). Johannesburg does not have a park ride facility; however MyCiti which is Cape Towns' Integrated Rapid Transit system has included a park and ride facility into the design of their system (MyCiti 2014). These facilities allow people to use other modes of transport in conjunction with the BRT (Levinson *et al* 2003, Cabrera 2010).The above discussion focuses on the common components of BRT systems both globally and locally. Despite the BRT contributing to an improved transport system there are however, successes and failures that require attention.

### **2.3.3 The Success and Failures of BRT Systems Globally**

A number of BRT systems have been developed globally of which only five case studies have been reviewed for this study namely Brazil, Columbia, Nigeria, India and Los Angeles. These countries were chosen because of their experiences regarding the use of the BRT. The effect of the BRT systems in these different contexts as well as their different structures will be analysed.

The concept of BRT first originated in 1937 in Chicago. However, the full BRT was only implemented in 1974 in Curitiba, Brazil (Wright and Hook 2007). According to Wright and Hook (2007) as a means to address these issues, the construction of a rail-based metro system was considered however, an alternative had to be sought due to the lack of funds (Wright and Hook 2007). Public transport prior to the implementation of the BRT system was unregulated, dominated by private sector operators and failed to meet consumer needs (Wright and Hook 2007). In order to find a cheaper form of transport, the BRT system was developed (Wright and Hook 2007).

The structure of the Curitiba BRT consists of long-haul bus routes and feeder routes. Feeder routes which are found in the city centre consist of circular routes which are serviced by minibuses (Pienaar, Krynauw and Period 2005). Buses are colour coded

so that they are easily identifiable. The red buses are line haul routes, orange buses are feeder buses and green buses are used for ring routes (Pienaar *et al* 2005). Another feature of the Curitiba system is that fares are fixed. Passengers do not need to pay more when they need to transfer from one bus to another along their route (Pienaar *et al* 2005). “ *Same level boarding combined with pre-boarding fare payment results in typical dwell time of no more than 15-19 seconds at a stop*” (Wirasinghe, Kattan, Rahman, Hubbell, Thilakarathne and Anowar 2013:11). Another area that uses the BRT system is Bogotá, Columbia.

The TransMilenio is Bogotá’s own BRT system. Prior to the implementation of the BRT system, Bogotá’s public transport consisted of buses and minibuses. Some of the major problems with the buses were poor ventilation, the buses were old, trips took more than an hour and there were no defined bus stops. Buses occupied a low percentage of the roadway network, which resulted in more people using private vehicles. Drivers collected fares which were time consuming and subsequently increasing travel time (Leal and Bertini 2003).

Bogotá used the Curitiba model to fashion its’ own system. According to the BRT Planning Guide (Wright and Hook 2007:24) the “*Bogotá system has transformed the perception of BRT around the world*”. Because of the success of the TransMilenio a number of countries have tried to replicate the BRT model in their own countries The TransMilenio which was launched in the year 2000 and similar to the Curitiba model, in that it has dedicated bus-ways, elevated stations, level boarding facilities, a smart card fare collection and wide vehicle doors which in combination, allow for ease of passengers boarding buses (Czegledy 2004, Replogle and Kodransky 2010). Stations have passenger overpasses and sidewalks along with bikeways that feed into most stations along the route (Pacetti and Trittipa 2010). These features allow for ease of passenger flow into and out of the station.

The Bogotá system consists of 400 feeder buses which transport passengers from outside the city. This system integrates pedestrian and bicycle paths from low income areas into its system (Replogle and Kodransky 2010). The cost of the BRT system is relatively cheap compared to the construction of other forms of public transportation, the Bogotá system costs 5.5 million Dollars per km (Replogle and

Kodransky 2010). *“Some two dozen civic plazas, pocket parks and recreational facilities lie within a half kilometre of busway stops”* (Pacetti and Trittipo 2010:26). These developments had an added advantage for the system as 70 percent of BRT users are able to reach the stations on foot or by bicycle and this could be one of the reasons for the high ridership numbers recorded in Bogotá (Pacetti and Trittipo 2010).

The implementation of the TransMilenio has many advantages for Bogotá as it attempted to address problems that were experienced with the previous transport system. Some of the major advantages include reduced travel time, reduced pollution and a reduced number of accidents (Pacetti and Trittipo 2010, Wirasinghe *et al* 2013). The TransMilenio also has a high customer satisfaction and this has resulted in high volumes of commuters using the system (Wirasinghe *et al* 2013). High volumes of commuters resulted in the TransMilenio being able to operate without a financial subsidy (Wirasinghe *et al* 2013). The operators of the old bus system were involved in the planning process of the BRT, and when the new system was implemented, these operators were afforded the opportunity to purchase buses in the new system. This obviated the problem of employee protests (Leal and Bertini 2003).

Some of the notable successes of the TransMilenio is that *“It decreased the average travel time by 32%, increased property values along the main line by 15-20%, enhanced tax revenues, created jobs, and improved the health and safety of the community”* (Turner, Kooshian and Winkelman 2012:6). The number of commuters has increased to *“1 750 000 passengers daily”*, by 2011 (Turner *et al* 2012:10).

The TransMilenio system in Bogotá works well because of a peak-period traffic restraint scheme, which places a restriction on vehicles travelling into the city. During the week there is a restriction of 40 percent of vehicles coming into the city in the morning between 06:00 and 09:00 and in the evening between 16:30 and 17:30. (Wright and Fulton 2005). *“Car restrictions are implemented through parking restrictions and a programme that only permits peak-hour vehicle use on certain days, which is based on ones license plate”* (Wright and Hook, 2007:27). Another measure that is in place to promote the use of public transport is the car free Sunday

initiative (Replogle *et al* 2010). Bogotá has the largest and most successful car-free weekday (Wright and Hook 2007). The system includes a 300 km of new cycleway and pedestrian and public spaces have been upgraded (Wright and Hook 2007).

The proposal of the BRT system in Bogotá was initially met with resistance from bus companies that feared the loss of business, as a measure to address this they were incorporated into the system (Turner *et al.* 2012). Fifty-nine of the sixty-four companies became shareholders of the bidding companies in Bogotá (Turner *et al.* 2012). In addition, open dialogue with transport companies was held so that these bus companies could be included in the reallocation of routes (Turner *et al.* 2012). A similar approach was used in the implementation of the Rea Vaya system in Johannesburg, however in Johannesburg there is still resentment from the Taxi Industry towards the Rea Vaya system.

TransMilenio SA (South America) operates the control centre which is equipped with 12 workstations, which allow planning and real time supervision of bus operations (Turner *et al.* 2012). Each bus contains a global positioning system which reports the location of the bus every six seconds with a two metre precision (Gwilliam 2002, Turner *et al.* 2012).

Nigeria is yet another country that uses the BRT system. Lagos, Nigeria is one of the many developing countries that have implemented the BRT system. The BRT system was the first system to be developed in Sub-Saharan Africa. Lagos is one of the wealthier areas in Nigeria and experiences great traffic congestion due to poor urban planning in certain areas. This has resulted in Nigerians using private cars to travel to the city. In 2008 the BRT was launched in Lagos, which uses a 'BRT Lite' system (Cavero 2013). Before the BRT was implemented, taxis, Danfos (small vans, which hold 15 people), midi-buses and scooters were used for longer journeys, whilst for local journeys motor cycles and taxis were used (Mobereola 2009). A common problem experienced before the introduction of the Nigerian BRT was long and unreliable journey times. The practice of vehicles not leaving until full, and the lack of transport penetration into residential areas meant that public transport journeys were long and uncertain (Mobereola 2009).

The Nigerian BRT system consists of a 22km route and makes use of dedicated lanes that are located on state and federal roadways (Mobereola 2009). The route runs from the city centre into the outer areas of Lagos which consists of designated lanes, of which 65 percent of the system is completely separated from traffic, whilst 20 percent of the system is separated by bus lanes, which are marked in paint and the remaining 15 percent operates in mixed traffic (Mobereola 2009). One of the advantages of this type of lane is that it has reduced traffic congestion caused by broken down vehicles that occur in bus lanes. In addition, broken vehicles could be easily towed away as lanes are not continuous and approaching BRT buses may also avoid the blockage by going around (Mobereola 2009). In addition to the introduction of the Lagbus, the government introduced a corporate taxi scheme (Filani 2012). This has helped with integration of the different modes of transport in Nigeria.

The Lagos BRT system shares similar features with other BRT systems from across the globe such as improved stations and off-board fare collection while operating from 06:00 to 22:00 during weekdays (Mobereola 2009). With regard to public participation the Lagos Metropolitan Area Transport Authority (LAMATA) launched a community engagement strategy, which allowed the community to be involved in the BRT system and essentially gave the community a sense of ownership (Mobereola 2009). Groups of people from the community were identified (Mobereola 2009). *“When each group was consulted the scheme was explained as a means of solving their problems rather than those problems identified by others”* (Mobereola 2009:24).

The Lagos BRT was advertised within the corridor in newspapers and on radio and television. *“Television advertisements educated the public on the system, as well as how to use the system”* (Mobereola 2009:24). Discussions and road shows were held with the community and a customer relations management line was set up for customer complaints. A live television program was launched to address some of the issues with the BRT system and created awareness of the project during its construction phase which helped to decrease resistance towards the system (Mobereola 2009).



A number of positive benefits for Nigeria have been identified, as a result of the Lagos BRT. Mobereola (2009) states that the success of the Nigerian BRT system is as a result of a holistic approach, which has reorganised the entire bus industry in Nigeria. In addition, to the restructuring of the bus industry, the BRT has reduced travel times and fares. Although queues of approximately 200 people have been recorded the average queuing time was only ten minutes (Mobereola 2009). The reduced travel time was as a result of the increase in speed from less than 15 km an hour to 25 km/hour (Mobereola 2009). The Lagbus has also encouraged economic development and employs 2000 workers as well as reduced carbon emissions (Filani 2012).

Another country that experienced success from the launch of the BRT is India. India has launched a number of BRT systems; the first BRT system in India was launched on the 14 October 2009 (Replogle and Kodransky 2010). The name of the BRT 'Janmarg' means the peoples way, is the BRT system in Ahmadabad and was launched in 2009 as a means to address some of the city's traffic problems (Replogle and Kodransky 2010). The Janmarg is a closed system, which makes use of dedicated lanes (Kost 2010). The first phase of the BRT ran along the western ring road. BRT buses pass through both low and middle income areas in Ahmadabad (Replogle and Kodransky 2010). This system uses dedicated bus lanes, with its stations a short distance from main intersections (Unfcc 2014). Ahmadabad has introduced 'square-about' to overcome the problem of turning in narrow streets. The square about is similar to a round-about but has two phase traffic signals (Kost 2010).

The Ahmadabad planners tried to build cycle tracks parallel to the BRT lanes; however, this created challenges for the city because of the uneven road surface (Kost 2009). Cycle tracks are found at the lower elevation in the street which results in rainwater collecting in these tracks and are being used by hawkers and as parking bays (Kost 2009). Maintenance checks of the buses are conducted daily and drivers who fail to maintain their buses or who violate any of the standards that are in place are fined. Janmarg is also one of the first BRT buses in India to use a GPS which relays real time information to passengers (Kost 2009).

Some of the successes of this system include, faster speeds, environmental benefits, combating congestion and the development of infrastructure around the system. Ahmadabad has seen a reduction in motor-cycle use by 20-22 percent, the survey conducted in Ahmadabad, also shows that 65 percent of people who use the Janmarg walk to and from the bus station (Unfccc 2014). Infrastructural success includes the widening of roads, which has resulted in the development of bridges which connects the city. Part of the corridor passes through vacant former mill lands that now are being developed. This includes new housing and shopping areas for the urban poor. Old diesel buses have been replaced with compressed natural gas buses. The routes of these buses now operate as feeder services for Janmarg. (Unfccc 2014).

The Los Angeles BRT system is one of the many BRT systems found in the United States. Los Angeles has a 'BRT- Lite' system which was developed as a way to improve bus services in the area. The Orange line BRT was only launched in 2005 on an abandoned railroad corridor (Niles and Jerram 1999; Wirasinghe *et al.* 2013). *"It is operated by the Los Angeles County Metropolitan Transportation Authority (METRO) and connects the San Fernando Valley to the west"* (Vincent and Callaghan 2007:3). The Orange Line BRT system is very efficient as it uses a signal priority system which allows buses to have a longer green phase or even shortening the red phase. This signal priority can result in up to ten seconds of additional green time, when a bus is at an intersection (Deng and Nelson 2011 and Levinson *et al.* 2003). The BRT system operates in 28 corridors and covers a distance of 450 Miles (Deng *et al.* 2011).

The Metro Orange line is a dedicated busway that is operated by the Los Angeles Metropolitan Transportation Authority (Thole and Samus 2009). The Orange line full service BRT features include: off-board fare payment, headway-based schedules, Community centred stations that are spaced approximately a mile apart, bicycle parking and wheel chair access on to the bus (Deng and Nelson 2011 and Thole and Samus 2009). The route for the Orange line occurs on the rail system map. Stations have ticket vending machines that allow for off-board fare payment that reduces boarding time (Deng and Nelson 2011). The Los Angeles BRT stations have

attractive canopies; stations also have real time bus arrival information available for commuters (Deng and Nelson 2011).

Los Angeles metro is the third largest transit agency in the United States with approximately 495 million annual commutes (Niles and Jerram 1999). This BRT system is environmentally friendly as it is powered by natural gas. Some facilities found are on board video monitors, spacing for two bikes, two wheelchairs and three extra wide doors (Deng and Nelson 2011). The total cost of the Los Angeles Orange Line was approximately \$350 Million (Niles and Jerram 1999). "*The agency serves a 1 688 square miles area with a population of 11.8 million*" (Niles and Jerram 1999:42). Some of the advantages of the Orange line BRT system are that it operates seven days a week 22 hours a day; the system has reduced waiting times for commuters, reduced traffic and accidents on roads (Vincent and Callaghan 2007). "The Orange line connects to the Metro Rapid Ventura Line and numerous local bus lines (Vincent and Callaghan 2007:5).

The above discussion of the BRT in five countries around the world provides a backdrop against which this study is located. The literature has shown that the early developments of BRT systems have resulted as part of a solution to some of the common transport problems in many of the world's urban areas today. It is argued that the BRT system is a cheap and reliable system and from the case studies outlined, it is evident that there are benefits in developing such a system in countries where transport problems prevail. One of the catalytic effects of such a system is land development. The advent of the BRT system has given rise to land development along the BRT route in certain countries.

### **2.3.4 Transit Orientated Development (TOD) Globally**

Although this study examines five countries that use the BRT system, as explained above, land development will not be restricted to these countries. The topic on land development has not been widely explored (Deng and Nelson 2011). There is considerable qualitative research conducted on land development but fewer quantitative studies to support the theory that land development is likely to take place near BRT systems (Perk and Catala 2009):

It is natural for development to occur near BRT systems as the stations are designed to have a catalyst effect and lead to development in the area (Deng and Nelson. 2011, Wirasinghe *et al* 2013). “Transit Oriented Development promotes the development of compact, walkable, mixed use communities around transit stations as a way to reduce people’s dependence on cars and improve the quality of life in cities” (McGaffin and Gavera 2012:6). Accessibility to public transport and other services as a result of the BRT system plays an important role and will result in development of retail businesses as well as investment in areas that were previously seen as unattractive for real estate.

Real estate investors are now attracted to the areas along the BRT route and see the opportunity in developing these areas (Rodriguez and Majica 2008). Land values near transport arteries increase as investors and developers recognise that improved accessibility creates opportunities for new development (McGaffin and Gavera 2012). Areas such as Ottawa, Canada and Boston and Massachusetts in the USA have had success regarding land development and the different land use policies could have played a role in this. However, in areas such as Los Angeles it was found that properties near BRT stops were generally sold for less, while commercial properties sold for more (Thole and Samus 2009). In Boston it was found that there was an increase in the demand for housing, which resulted in almost 2 000 new houses being developed along the corridor (Thole and Samus 2009). Property values in Brisbane, Australia rose by 20 percent (Levinson *et al* 2003).

In Seoul, South Korea, land reclamation played an important role in Transit Orientated Development. Land that was previously used by the private car was transformed into public spaces (Cervero and Kang 2009). A number of these areas were located along the BRT corridors.

*“In Seoul, faster, more punctual bus services and the ease of transferring to subway portals triggered a market demand for high density residential uses” (Cervero and Kang 2009:30).*

In areas such as Bogotá it is difficult to state that development occurred due to the implementation of the BRT. Rodriguez and Majica (2008) argue that planners could have just sited the stations in these areas because they were already valued by residents. In Pittsburgh, USA development was estimated to a value of \$302 million

from 1983 to 1996, and since 2004 it was an estimated \$ 300 million. The FTA report (Cain *et al* 2009, Perk and Catala 2009) states that the improved appearance of Pittsburgh system played a role in development. The report also states that development can only occur if there is support from land developers, financiers as well as regulators (Perk and Catala 2009). Having discussed the BRT system in the five countries and having highlighted the advantages of the BRT system it is necessary to examine the BRT system in Johannesburg.

## **2.4 Transport in Johannesburg**

Transportation in Johannesburg has evolved from horse-drawn carts to the use of private vehicles. According to Beavon (2001) transportation played a major role in the structure and development in the city. The major forms of transport in the city are commuter trains, state buses and mini-bus taxis (Chakwizira 2007). Public transport such as buses and taxis played a significant role in the struggle against apartheid laws, through actions like bus boycotts and strikes. The apartheid era also saw the growth and establishment of the Taxi Industry. Post-apartheid has seen a need for improvements in public transport. The Apartheid laws have had a significant impact in shaping the urban area and transport in the city of Johannesburg. The inherited apartheid state grapples with the effect that the segregationist policy has had in the city of Johannesburg.

### **2.4.1 The Inherited Apartheid City**

During the apartheid era, apartheid spatial planning was aimed at separating the different race groups. Highways, railway lines, cemeteries and industrial areas help to fortify spatial divisions (Czegledy 2004). However, during the apartheid era legislation such as the Group areas Act (1950), made it illegal for the different race groups to reside in the same area (Donaldson 2006). Indian people were forced to live in Lenasia which lacked municipal amenities and public transport. Commuters had to walk long distances in order to obtain transport (Mandy 1984). Coloured housing was situated in the areas of Bosmont and Eldorado Park. As the coloured population grew, more land was needed and Ennerdale was allocated as a coloured

township (Mandy 1984). This resulted in a city with a number of townships and lack of transport corridors.

During this period the main function of the transport system was to transport labour to their work place (Khosa 1995). African people were restricted from buying land or renting land in white areas, *“the whole of the Johannesburg municipality was proclaimed white in 1933”* (Harrison and Zack 2012:558). The Slums Act (1934) was used to clear all mixed races from the city (Harrison and Zack 2012).

White randlords (these are the owners of the mines) moved to the Northern suburbs of Johannesburg away from the pollution of the city (Harrison and Zack 2012). Harrison and Zack (2012:559) argue that *“The mining industry was the key driver in the increasing levels of urban segregation and provided a template for the socio-spatial engineering of the National Party government in later years”*. The economic growth and shift to financial services resulted in decentralised offices from the city centre; which ultimately led to the collapse of the inner city (Beavon 2001, Czegledy 2004).

After the 1994 elections and the birth of democracy, there was an influx of people into Johannesburg, who occupied old buildings. The emerging black middle class left the townships and began taking up residence in what was previously known as white suburbs (Harrison and Zack 2012). To date in some areas especially in township areas the legacy of apartheid is still apparent.

*“To varying degrees each town or city in South Africa reflects not only an unequal distribution of infrastructure, amenities and accessibility, but the distances between the places in which the poor and the well off live exacerbate that inequality”*  
(Berrisford 2011:249).

The inherited Apartheid city of Johannesburg is one where the wealthy few are located in the northern suburbs of the city and use private vehicles, whilst the poor are forced to use a combination of modes of transport, such as foot, bicycle, taxis and rail (Patel, Freeman and Mitchell 2001, Thomas 2013). The decentralisation of major businesses from the city centre due to congestion, pollution and crime has resulted in these businesses relocating to areas such as Rosebank, Sandton and Randburg. *“To this day cross-city transportation in Johannesburg is geared to*

*movement into and out of the down-town core on an axial-basis” (Czegledy 2004:67).*

This exodus from the city has created a challenge as many of the new suburbs have limited public transport and require a mass transport system. The absence of a mass transport system has led to the use of private cars which results in traffic congestion. The poor are reliant on public transport to commute to and from places of employment. There are a number of forms of public transport in Johannesburg but buses have played a major part in the history of South Africa, with the bus boycotts in the 1950's and 60's playing a major role in the struggle against the apartheid regime.

#### **2.4.2 The History of Buses in Johannesburg**

*“The history of the bus in the city mirrors the history of the city itself”  
(Sey 2008:14).*

Buses are the oldest form of public transport in Johannesburg and form a very important part in the history of this country. Buses provided transport for long distance travel to and from “Bantustans” (Czegledy 2004). During the apartheid era buses played a major role as people were separated by race. Black people were given a limited number of seats at the back of the buses, provided for white people (Sey 2008).

Service delivery protest linked to transport was an area of political mobilization (Khosa 1995). In 1952 buses were being subsidised, however the funding was inadequate and this had to be replaced with direct funding from government. The Motor Carrier Transportation Act (Act 39 of 1930) played a fundamental role in creating a monopoly among bus companies (McCarthy and Swelling 1985). Essentially this Act ‘squeezed’ out African taxis and bus companies (McCarthy and Swelling 1985).

One of the first bus companies in South Africa was the Public Utility Corporation (Putco) which is still operational today. Putco buses played a major role in the history of South Africa as this was the service provider for non-whites (Mandy 1984). During the apartheid era these buses were burnt as part of protest action against rising fare

prices and resistance to Government action (Mandy 1884). In the 1950's there were a number of strikes, as a result of increased transport cost for blacks living on the outskirts of cities (Khosa 1995).

The Monopoly of the bus industry allowed for fare increases to occur ( McCarthy and Swelling 1985), resulting in a number of protests against fare increases (Khosa 1995). *“Bus boycotts assumed central significance in the political struggles in urban areas in the 1940s, 1950s and 1980”* (Khosa 1995: 177).

*“Bus boycotts highlight fundamental contradictions in South Africa’s transport policy; monopoly control over bus transport, and increased fares in spite of the rising cost of living for the African commuters”* (Khosa 1995: 178).

In 1957 the Alexandra bus boycott resulted in over 1 200 summonses issued to boycotters (Khosa 1995). Boycotters walked to work singing boycott songs, or found alternative transport (Khosa 1995, Sey 2008). *“The occupation of the streets symbolised defiance, determination and will on the part of the African commuters in their struggle for adequate transport”* (Khosa 1995: 181). Lorries, horse carts and taxis provided transport to boycotters (Khosa 1995).

“ It was only after the Evaton and Alexandra bus boycotts in Johannesburg in the 1950's that transport policy as it is exists today was entrenched with the passing of the Bantu Transport Service Act of 1957 (Act 53 of 1957)”

(McCarthy and Swelling 1985: 382).

This Act shifted the responsibility of black transport subsidies from the Natives Affairs Department to the Transport Department (MacCarthy and Swelling 1985). Although subsidies were provided for Blacks, it did not include all classes of labour nor did it include the unemployed (Khosa 1995). The Taxi Industry developed during the apartheid era and was one of the few areas where African entrepreneurs could operate.

#### **2.4.3 Background to South Africa’s Taxi Industry**

The Group Areas Act (1950) was an instrument of the apartheid regime that forcefully removed black people from the city. Black people were forced to live on the outskirts/periphery of cities and had to commute great distances to work. Money was not allocated to these areas for the development and implementation for public transport. Many Black people used trains and buses; however these forms of



transport were limited in lower income areas on the outskirts of the city and consequently presented an opportunity for entrepreneurs (Barrett 2003).

During the late seventies the first mini-buses were allowed to be used as public transport vehicles. This industry was one of the few places where black people at that time could find work (Lomme 2008, Venter 2013).

*“The industry only began to take its modern South African shape with the introduction of the Motor Carrier Transportation Act of 1930” (Sey 2008:85).*

As the Taxi Industry began to grow the Government prevented taxis from operating. In 1983 a commission recommended that the 16 seater mini-bus taxis should be allowed to operate but quotas should be set. According to Sey (2008:101),

*“The white paper on transport policy tabled in January 1987 in conjunction with the Transport Deregulation Act of 1988 effectively deregulated the entire Taxi Industry overnight”*

This Act legalised the 16 seater minibus taxi, which gave rise to the Taxi Industry. The Deregulation Act removed most of the barriers like rank space (Venter 2013). In 1979, 21 Taxi Associations joined to form the South African Black Taxi Association (Sey 2008). During the period 1975 to 1990 there was a rapid growth in mini-bus taxis. In the 80's feuds broke out over permits. *“At this time there were about 444 formal and informal taxi ranks in Johannesburg”* (Sey 2008:95). As a consequence of deregulation these Taxi Associations could take over routes and intimidate their opposition as well as exploit taxi owners (Sey 2008). Individual taxi owners paid a substantial fee for the right to operate (Venter 2013). There was an influx of illegal operators and due to the lack of control from Government; taxi violence broke out (Barrett 2003, Sey 2008).

According to Sey (2008:103) *“Taxi violence was at its highest in 1993 as the political situation intensified due to the run up to the elections”*. In 1995 the Government established the National Taxi Task Team (NTTT). The team consisted of a Taxi Industry representative from each province, a representative from all three tiers of Government and nine specialist advisors (Ahmed 2004). The task of this group was to establish a way to solve the taxi violence that had spread throughout the country (Ahmed 2004). In their 1996 report they proposed a reregulation of the industry (Sey 2008, Ahmed 2004).

The recapitalisation program which was announced in 1998 was an attempt to try to assist the mini-bus Taxi Industry. The National Land Transport Transition Act, (Act No 22 of 2000) was put in place to help formalise and reregulate the industry. The 16 seater mini bus taxis would be replaced with 18-35 seater buses (Ahmed 2004). In 2004, the Minister of Transport released a revised recapitalisation timeline which was scheduled to start in 2005/6 (Ahmed 2004).

In 2003, 60 percent of commuters used minibus taxis (DOT 2003 cited in Venter 2013). Currently there are approximately 140 000 public mini bus taxis in operation. *“The Taxi Industry nationally is estimated to have a turnover of approximately R16.5 billion”* (Sey 2008:84). The Industry is one of the major role players in the public transport sector today and the Taxi Industry has grown rapidly and still continues to serve a large sector of the population; however, tension still exists between taxi owners and the City of Johannesburg, the proponents of the Rea Vaya. The Rea Vaya BRT system was developed to overcome some of the transport challenges in Johannesburg and is perceived as the post apartheid transport solution. The Rea Vaya system will be discussed next.

#### **2.4.4 The Post- Apartheid Transport Solution: The Rea Vaya BRT System in Johannesburg**

The Rea Vaya, which means ‘we are going’ in Sesotho, is Johannesburg’s own BRT system. This system was launched in 2009, after a period of taxi strikes. The system was designed to provide a world class public transport system that is efficient, reliable, safe and cheap. The project is part of the city’s revitalization plan, in order to bring business back in to the city centre (Weinstock 2009).

#### **2.4.5 Structure of the BRT (Rea Vaya)**

There are two types of buses that are used in this BRT system. The first is the articulated buses, which have a capacity of 112 passengers and the second is the complementary buses which have a capacity of 81 passengers (South Africa 2011).

Related to these are the three categories of routes:

- Trunk route services: this consists of articulated buses which operate only on trunk routes.

- Feeder routes: these buses transport people to trunk routes. There are currently 5 feeder routes. F1 runs from Naledi via Thokoza to the CBD, F2 goes from Protea Glen via Thokoza to Ellis Park, F3 runs from Jabavu via Lakeview to the CBD, F4 runs from Mofolo via Boomtown to the CBD and F5 runs from Eldorado Park via Lakeview to Ellis Park (South Africa 2011).
- Complementary routes: there are three planned complimentary routes. C1 which runs directly from Dobsonville and the Central Business District (CBD), C2 runs between Dobsonville and Maponya Mall and C3 is a circular inner city route. Complementary routes run in mixed traffic roads as well as on trunk routes (South Africa 2011).

Due to the extensive cost and planning involved with the BRT system, the Rea Vaya was launched in phases. The first phase of the project included: 25.5 km of trunk route, with 70 000 trips, 10 routes made up of 1 trunk route and 5 feeder routes, 20 BRT stations from Soweto to the Ellis Park Stadium in Johannesburg, 143 buses, BRT control centre and the use of smart card technology (Debakwane 2011).

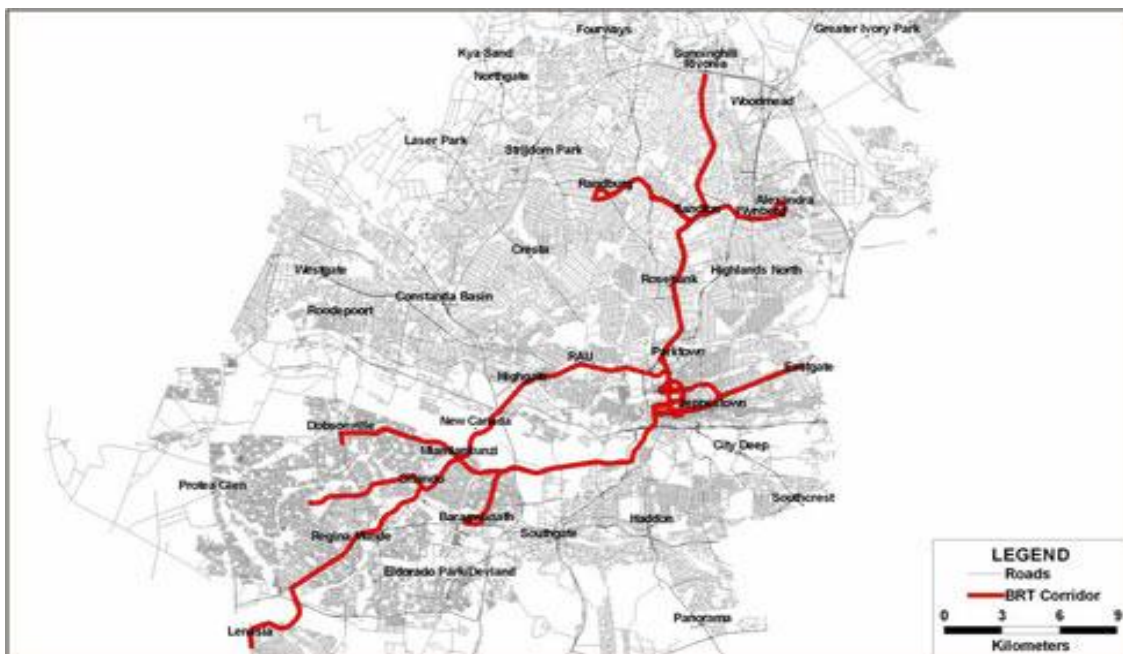


Figure 2: BRT corridors (source: Rea Vaya 2014)

Figure 1 above shows the complete route of phase 1. The completed phase 1 was planned to be completed in 2013 (Mabena 2010). However, the City of

Johannesburg has failed to meet this deadline and to date phase 1 b has been completed. Phase 1 a: was completed in 2010. It consists of the original trunk route from Bertrams in the inner city to Thokoza Park in Soweto, several feeder routes around Soweto and a circular route in the inner city via Braamfontein and Joubert Park (South Africa 2011).

Phase 1 b: This phase was projected to be completed in January 2012, however due to a number of challenges Phase 1b was completed in 2013. It consists of 18km trunk route from Noordgesig via the University of Johannesburg to the city centre. This phase will consist of an additional 650 buses and will cover 122 km's (South Africa 2011, Dibakwene 2011).

Phase 1c. This encompasses the third trunk route between Parktown and Sandton, along Oxford and Rivonia roads (South Africa 2011). The complete Phase 1 of the project is planned to be completed in 2013 and will comprise 7 routes of 123 km and 150 stations (Rea Vaya 2014), however due to a number of reasons only phase 1 b is currently completed These routes are primarily serviced by the local Taxi Industry that was initially in opposition to the Rea Vaya.

#### **2.4.6 Conflict Between The Rea Vaya Management and The Taxi Industry in Johannesburg**

The Taxi Industry has been servicing South Africans from low and middle income areas for decades. The development of the BRT system has sparked mixed reactions amongst taxi owners. During the planning of the BRT project it was reported that in phase 1A a total of four Taxi Associations would be affected which involved 575 vehicles. In phase 1 b 2 700 taxis would be affected (Visser 2008)

One of the reasons for the series of strikes having taken place is the fact that the BRT is a new system and the Taxi Industry lacks an understanding of the benefits related to the system (Visser 2008). Despite numerous attempts to educate the Taxi Associations they are still dissatisfied with the implementation of the Rea Vaya. The most recent strike that occurred in May 2012 was due to the dedicated lanes reserved for BRT use, taxi drivers argue that they are also providing a service and should therefore also be allowed to use these lanes (Citypress 2013).

Before the BRT project was launched a series of information sharing workshops were held with taxi operators. Formal negotiations with the Taxi Associations began on 5 August 2009 (South Africa 2011). There are two main umbrella bodies representing the Taxi Industry namely the Johannesburg Regional Taxi Council (GJRTC) and the Top Six management positions which together represent 100 Taxi Associations that operate in Johannesburg (South Africa 2011). In 2007 it was agreed that the bodies would merge and form the steering committee which would represent both associations. On the 27 January 2010 a participation Framework Agreement was signed which set out the requirements and process for operators to become shareholders (South Africa 2011).

Even though there has been such an extensive period of discussion and agreements have been signed, the Taxi Industry is still not satisfied. Sibiya (2009) suggests the reason behind this tension is a result of conflicting interest in the projects and that because the Taxi Industry's livelihood is threatened by the BRT system which is the core reason why they have not accepted the system.

## **2.5 Summary**

In this chapter the literature consulted for this study was presented as well as the theoretical framework on urban transport systems and the development of the BRT system globally and in Johannesburg. From the case studies presented in the literature review, it is evident that the BRT system has a number of benefits for both developing and developed countries. It is also evident that each country has its own unique setting and challenges. Like in South Africa the TransMilenio in Bogotá also experienced resistance from the local transport providers. In order to address the issue, local transport providers were incorporated into the BRT system. In South Africa however, the attempt to integrate the Taxi Industry has failed. The next chapter, Chapter three, discusses and justifies the methodology chosen for this study.

## **Chapter 3 : Research and Methodology**

### **3.1 Introduction**

This chapter describes and justifies the selection of the qualitative method of data collection as it is most appropriate for this study. The qualitative method involves the recording of actual events recording interviews and discussions and observing behaviour (Neuman 2000). Additionally, qualitative research focuses on real life experiences (Flowerdew and Martin 2005). Qualitative data is unstructured compared to quantitative data (Flowerdew and Martin 2005). The advantage of a qualitative study is that it assists with the manner in which participants behave in their natural setting by describing the natural setting and what they think and feel about it (Henning, van Rensburg and Smith 2004, Flowerdew and Martin 2005). Qualitative methods in research are used to gain insight in to the perceptions of participants (Creswell 1998, Kitchen and Tate 2000, Flowerdew and Martin 2005). The rationale for the adoption of the qualitative research will be discussed below.

### **3.2 Rationale for the Adoption of the Qualitative Research Design**

The qualitative research design is deemed the most appropriate for this study, since qualitative researchers study phenomena in their natural settings, to make sense of and interpret social phenomena such as opinions, perceptions, interaction and behaviour (Creswell 1998, Kitchen and Tate 2000, Flowerdew and Martin 2005). Most researchers who use a qualitative research design do so because of the flexibility and evolving nature of qualitative research (Strauss and Corbin 2008). Qualitative research also enables researchers to delve beneath the surface and uncover the inner- most experiences of participants (Strauss and Corbin 2008).

This study makes use of qualitative research methods to gather information on the experiences, opinions and perceptions of commuters using the BRT and to draw conclusions as to how this has influenced the use of the BRT system in Johannesburg. Given that this study will not focus on measurement and quantifying

numerical data, the qualitative research method was deemed more appropriate than the quantitative research method. Although the qualitative method is most appropriate it has limitations (Creswell 1998). Some researchers argue that the qualitative researcher tends to be biased and may lead the participants during the research process (Flowerdew and Martin 2005). In order to collect data it is necessary to identify research sites.

### **3.3 Gaining Access to Research Sites**

The BRT in Johannesburg is administered and managed by the City of Johannesburg (Municipality). The Rea Vaya Management is situated at the Johannesburg Roads Agency building in the city centre. In order to obtain permission to enter the stations and conduct the survey, it was necessary to forward a letter from the University, where the researcher is registered to explain the purpose of the researchers visit to the Rea Vaya stations. Upon receipt of the letter from the university, an appointment was scheduled with the Rea Vaya marketing manager Mr Ndlovu (pseudonym). On meeting with him the survey questionnaire was handed to him and the methodology to gather data from commuters was explained to him in detail. Dates for the survey to be conducted were scheduled and the manager suggested that stations with high volumes of commuters be identified to conduct the survey. Consequently the research sites were identified.

A research site is *“The context in which events or activities occur and a socially defined territory with shifting boundaries”* (Neuman 2000:352). In order to gather information of the experiences of participants who use the Rea Vaya it was necessary to interview participants at Rea Vaya stations.

Two Rea Vaya stations were chosen namely the Ellis Park station which is situated in Doornfontein and the Johannesburg Art Gallery station in Twist Street, Joubert Park. The rationale for selecting the Johannesburg Art Gallery station as a site to conduct interviews is that the Johannesburg Art gallery station receives high volumes of commuters daily. In addition this station forms part of the C3 route, which is a complementary service(c). Complementary routes service begins or end on

routes in mixed traffic but join the trunk route. It is at this site where commuters would transfer from one Rea Vaya bus to another that would take them to their destination. The data collected from participants at this station provided information on the experiences of commuters who use the Rea Vaya to travel long distances. The Ellis Park Station was chosen as this station services the T1 (Trunk route), this route bring people from Thokoza Park to Ellis Park. The Ellis Park station is also located in close proximity to student accommodation. Therefore a number of the participants who were interviewed at this station are students. Trunk route buses run on the dedicated lane and only stop at the BRT stations, that is the buses are not allowed to stop anywhere else (Rea Vaya 2012).

The rationale for selecting the Johannesburg Art gallery and Ellis Park stations are because these two stations are the busiest stations in the Braamfontein and Doornfontein areas. Furthermore, the T1 route services commuters directly from Thokoza Park to Ellis Park stations as well as commuters from the inner city. The Johannesburg Art gallery services people from within the city as this station forms part of the C3 inner city ring and participants use this station to transfer between buses. In selecting these two stations it was envisaged that the experiences of commuters who live on the outskirts of the city as well as those who reside in the city would use the Rea Vaya. The map of the research sites appears below:

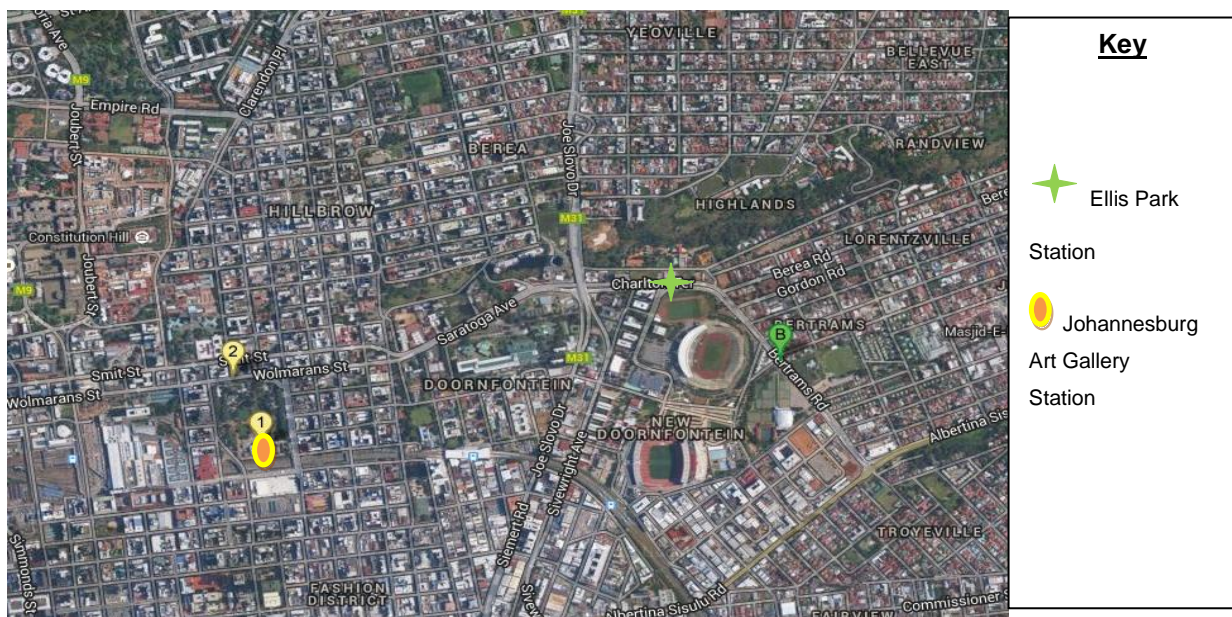


Figure 3: BRT research site: Rea Vaya Stations (adapted from maps.google.co.za)



The research sites have been indicated on Figure 2 above. Both the Ellis Park station and the Johannesburg Art Gallery were launched as part of Phase 1 A of the Rea Vaya System, in 2009.

The Ellis Park station is situated in Charlton Terrace Street, opposite the Ellis Park stadium in Doornfontein and is centrally situated in the road with traffic lanes on either side. Access to the station is difficult as commuters are required to cross a busy street to enter the station, which results in time being wasted trying to cross the street to access the station and consequently in commuters missing the bus. Additionally, this problem of crossing the street causes delays as bus drivers have to wait for pedestrians to cross the street before continuing on their journey. Despite the existence of traffic lights to the side of the station, pedestrians choose to “jay walk” across the bus lane and oncoming traffic towards the Rea Vaya station. On the opposite side of the road is a filling station that receives many customers, some of whom are Rea Vaya commuters. Taxi drivers also park their taxis at this filling station.

The Rea Vaya station is situated in the middle of the road to allow for arrivals and departures to occur on both sides of the stations, stations and buses have multiple doors and boarding and departures on both sides of the station reduces boarding time, which contributes to the reduced travel time. The raised platforms allows for level boarding on to Rea Vaya buses to occur, which results in easy and quick access into a bus, however commuters cannot exit stations from the boarding doors due to the raised platforms and the point at which the smart card machines are located is the only point of entry and exit to the Rea Vaya station. Staff at the station includes a security guard at the entrance, a person at the information counter and a person at the smart card machine situated at the entrance of the boarding area.

The Rea Vaya station is an elongated glass structure with entry and exit doors situated on the length of the structure where commuters are able to enter and exit the station while in transit. On each end of the structure there are doors, however, one door remains shut, while the other allows access to the station for commuters not in transit who will be boarding the bus. Access to the station is gained via a long walkway ramp, at the end of the ramp there is a kiosk where commuters may obtain

their smart cards and information if required. On entering the station one is confronted by the rules pertaining to the use of the Rea Vaya on an A0 size notice board. This notice board bears illustrations that exemplify what is permitted and prohibited at stations and Rea Vaya buses.

During busy periods the queues extend beyond the ramp onto the concrete area. A customer information board indicating the Rea Vaya routes is located opposite the kiosk, in front of the smart card machine. Hanging from the ceiling inside the station is an information board depicting a bank card; bearing the words “smart card”. It may be assumed that this was meant to inform commuters about the smart card that is in use.

Despite having no dustbins the waiting area inside the station was clean. A suggestion box is situated on top of a railing that runs along the length of the station. In both the Ellis Park and Johannesburg Art Gallery there are only four seats available in the boarding area to accommodate commuters. This results in a number of commuters having to stand during peak periods. The roof plates of the structure are not sealed thereby not providing sufficient protection to commuters from the elements; this is exacerbated by the open shutters at the entrance of the station as indicated in the photograph of the Rea Vaya station (to view the photograph of the Rea Vaya station refer to Appendix F). There is no internal heating system and due to the open door at the one end of the station commuters once again are exposed to the elements such as cold temperatures and winds.

The “live time feed” which displays arrival times of buses is suspended from the roof panels. Although arrival times were displayed, the arrival of buses was not consistent with the time displayed on the live time feed. In the morning peak period there was an influx of commuters, however after 10:00 am commuter numbers subsided and bus intervals increased. Johannesburg Art Gallery is the second Rea Vaya station that was chosen to collect data because it is one of the busiest stations.

The Johannesburg Art Gallery station is situated in a part of Johannesburg that is experiencing urban decay, with papers and refuse dumped on the side of the street, and high levels of noise pollution and unmaintained buildings. Opposite the station is

a line of small businesses. However inside the station it is clean and quiet. This station is positioned opposite the Johannesburg Art Gallery in Braamfontein in the middle lane of Twist Street which is a very busy street. Because the Rea Vaya buses operate on both sides of the station, it is difficult for commuters to cross the street. There are five Rea Vaya customer care centres which are located at the Carlton Centre East station, Johannesburg Art Gallery station, Mavumbi station, Diepkloof station and Orlando Police Station.

The Johannesburg Art Gallery station is a main station because it has the infrastructure to assist commuters with queries regarding travel and the smart card as it has a customer care centre. In addition, it has a separate customer help section. The structure of the Johannesburg Art Gallery station differs from that of the Ellis Park station in that it comprises two sections. Customer care is located in the first section, whilst the second section is for commuters to board the buses. The Johannesburg Art Gallery station also uses a smart card system; however, smart cards are obtained from the first section, after acquiring a card commuter's walk to the second section of the station to access the Rea Vaya bus.

The Johannesburg Art Gallery station allows for boarding on both sides of the station. Some gates are for arrivals, whilst others for departures. The Johannesburg Art Gallery forms part of the C3 route, therefore a number of commuters have to transfer to other buses at this station, hence boarding and departures occur through multiple doors on either side of the station and a high volume of commuters and buses pass through this station. In order to gain insights into the emotions and opinions of the Taxi Industry it was necessary to conduct interviews with specific members. Taxi drivers who were willing to be interviewed were identified.

There was no specific site chosen for the interviews with taxi drivers, however when it was possible interviews were conducted with participants (taxi drivers) who were willing to participate in the study. Although there was no specific site chosen, interviews were conducted at filling stations as this is where most taxis were found, because they parked their vehicles at filling stations in Johannesburg. Filling stations are busy and noisy and therefore this was not the ideal environment to conduct an interview, however, taxi drivers needed to be interviewed in a setting where they

were comfortable and consequently the interview was conducted outside of the parked taxi (Neuman 2000). To gain different opinions regarding the effects of the introduction of the Rea Vaya, it was necessary to interview a members of a local Taxi Associations.

The first interview with a member of a Taxi Association was conducted in Woodmead. The interview was conducted at the place of employment of the Taxi owner. An appointment was scheduled for the 18 January 2013. The interview was conducted in the resting area of the building. Mr Jacob the taxi owner was very helpful in providing information on the Rea Vaya system and its effect on taxi owners; however Mr Jacob was unable to provide exact figures on the loss of revenue to his business as he said he was not directly affected by the Rea Vaya. The second interview that was conducted was with a member of a different Taxi Association in the Johannesburg region.

An appointment was made to meet with one of the Taxi Associations in Johannesburg. The Taxi association is located in a busy area, where there are many businesses and scarce parking. The offices of the Taxi Association are located in a tall building, with numerous other offices. Upon arrival at the association, the researcher was welcomed by the secretary, who then contacted the chairperson of the association. The chairperson invited the researcher to the board room where tea and coffee was available. The Board room had a large oak table in the centre of the room, with chairs around the table for each board member. It is in this board room where all board meetings of the association are held.

The purpose of the research was explained to the chairperson who indicated that it would be necessary for him to negotiate with his executive members before he could be interviewed. An Interview schedule along with a consent form was presented to the chairperson and the chairperson promised to contact the researcher on receipt of permission from his executive members. On obtaining permission from the executive of this particular Taxi Association the researcher was contacted by the chairperson and a date and time for the interview was agreed upon.

The interview was scheduled for the 23 August 2013, at the offices of the Taxi Association at 14:00; however, upon arrival at the offices for the meeting with the Chairperson the researcher was informed that the Chairperson was unavailable and that the Vice-chairperson was amenable to being interviewed. The researcher was taken into his office, which he shared with another member. The office was an average size and overlooked a busy street. Street noise permeated the office which interfered with the recording of the interview. The furniture in the office comprised numerous steel cabinets, which according to the Vice-chairperson contained the files of the associations' members. He stated that the files contained important documents, such as reports of incidents, disciplinary hearings and other legal information.

The researcher and the participant were seated at a coffee table in the office where the interview was conducted. Permission to use an electronic voice recorder was granted by the participant prior to the actual interview that was conducted. The interview was successful as rich, thick data was collected and information was gathered on the effect that the Rea Vaya has had on the Taxi Industry as well as the opinions of the Taxi Association regarding the City of Johannesburg Municipality and the Rea Vaya Management. Additionally, business owners opposite the Rea Vaya station were interviewed to establish the influence that the Rea Vaya has had on their businesses.

Business owners who were willing to participate in this study were interviewed. Four business owners, from different types of businesses were selected on the basis of their willingness to participate in the study and the location of their business in relation to the Rea Vaya station. Two owners were from a general store, one from a food shop and the last business sold radios and car sound equipment. The music shop was small, with speakers and hi-fis placed on the floors. The manager was not willing to answer questions and referred us to the owner of the store. The owner was uneasy initially, however, once the aim of the research was explained to him, he was forthcoming. Due to the size of the shop, the researcher was not offered a seat and the interview was conducted with the participant and the researcher standing in this confined space.

Once again both the general stores had a variety of products that spilled over onto the floors leaving limited space for movement around the store. Both the general stores were busy and therefore the interviews had to be conducted in a limited space of time, because the managers were impatient, as they had to attend to customers. The fourth business was a food store which was in the process of receiving stock, so time was spent waiting for the manager to attend to the researcher. Eventually the manager was able to answer a few questions; however his attitude was one of disinterest. Finally to gather insight into the rationale and the aims of the Rea Vaya project it was necessary to interview a senior member of the City of Johannesburg Municipality.

The first interview with Layla Docrat (pseudonym) was conducted on the 4 December 2012, at a hair dressing salon in Mayfair, Johannesburg; this was due to the nature of Layla's schedule and as a researcher it was necessary to accommodate the participant. Although it was not an ideal venue for data collection it was the only time that Layla was available for an interview. Since Layla was the only person in the salon at that time, it was possible to conduct the interview, however, subsequent to the interview with the Taxi Association it was necessary to conduct a second interview to authenticate the claims made by the Taxi Industry and commuters.

The second interview was conducted on the 26 August 2013, in Layla's home, as she had resigned from the City of Johannesburg Municipality. Layla's home is in a very tranquil surrounding, with an open field across from her home, away from the noise of the city. Her home gave off a welcoming and homely feel. The interview took place in the living room which housed numerous books and she explained that she was starting her business from home. The atmosphere of the home contributed to collecting rich, thick data which was more informative than the previous interview. Data on the effects of the Rea Vaya on the different stakeholders, the role of the Taxi Industry and future plans for the Rea Vaya were obtained.

### **3.4 Research Participants in the Study**

Research participants were chosen to represent the different stakeholders. These participants were drawn from commuters, Taxi Industry members and Taxi drivers, business owners and private car users and finally a former senior member of the City of Johannesburg Municipality. Commuters who later became participants in this study were approached at Rea Vaya stations. Random sampling was used. No specific criteria regarding race, gender and age were used in the selection of commuters as participants at Rea Vaya stations who were willing to be interviewed were selected. As commuters entered the Rea Vaya station, they were given an explanation of the study, permission to interview participants was requested and only those participants who were willing to participate were interviewed.

A sample of 100 participants was interviewed; this number was divided into 50 participants from each station. Although it cannot be claimed that 100 participants are representative of all the commuters who use the Rea Vaya, this sample will provide an indication of the experiences and opinions of Rea Vaya commuters. Although there was no specific criteria used in the selection of participants, such as age, race or gender the sample of participants ranged between the ages of 18 and 60, and consisted mostly of university students and workers who used the Rea Vaya to access the university and their places of employment respectively. The next group of participants came from the Taxi Industry.

The only criteria used for selecting taxi drivers and members of the Taxi Association is that they belong to Taxi Associations that operate in Johannesburg as they are directly affected by the Rea Vaya system. Only those taxi drivers who were willing to be participants in this study were interviewed. There were three taxi drivers and two taxi owners, from different Taxi Associations in Johannesburg who participated in this study. A number of taxi drivers and Taxi Association members were approached, however, due to the controversial nature of the Rea Vaya system only a few were willing to participate in the study. The research aims and objectives were explained to the participants before permission was obtained to conduct the interviews. To gain

discrete opinions and experiences of the Rea Vaya, business owners opposite the Johannesburg Art Gallery station were interviewed.

Businesses that operate opposite the Johannesburg Art Gallery Rea Vaya Station were selected for the research. They were selected on the basis of type of business and location opposite the Rea Vaya station. A number of businesses were approached to participate in this study, however, as previously mentioned; only four business owners were willing to participate in the study. Private car users were randomly selected. No specific criteria was used for the selection of participants however, the raw data revealed that all the participants used their vehicles for work purposes in the city of Johannesburg.

A former senior member of the City of Johannesburg Municipality was interviewed in order to gather information regarding the Rea Vaya project and its effects in Johannesburg. Layla was a member of the City of Johannesburg Municipality (2006-2013), in charge of transport. Under Layla's leadership the Rea Vaya Bus Rapid Transit system was implemented. Before the development of the Rea Vaya a group of representatives that included Layla was sent to Bogotá to investigate the BRT system there. Therefore it was incumbent upon the researcher to interview Layla in order to gather data on the Rea Vaya system, the social and economic effects of the system on the different stakeholders as well as future developments of the system.

The aim of the interviews was not to be representative but rather to give the researcher deeper insight into participants feelings and attitude (Flowerdew and Martin 2005).

### **3.5 Data Collection Procedures and Processes**

Data was collected using in-depth face-to-face interviews and a qualitative survey. The 1 July to the 6 July 2013 was allocated for conducting the survey at the Rea Vaya stations. Although permission was granted for five days, only two days were required to conduct the survey.



The Rea Vaya commuters who participated in the survey, who later are referred to as participants, were approached at Rea Vaya stations and requested to participate in the study. The purpose of the study as well as the ethical consideration was explained to each participant. A qualitative survey was used to gather data from commuters at the Ellis Park and Johannesburg Art Gallery stations in Johannesburg. A survey is a tool which is used to collect data from large samples. The questionnaire is designed with a set number of questions and all participants answer the same questions (Neuman 2000).

In this study a qualitative survey was used as it allowed the researcher to interview a large sample in a short period of time. Interviews were conducted with participants as they waited to transfer between buses or as they entered and exited stations. Questions were pertinent to answering the main research question 'What is the social and economic effect of the Rea Vaya on commuters' were used in the survey. (For questions refer to Appendix A). Rea Vaya buses operate between 5-10 minute intervals, due to this time constraint the survey was limited to 8 questions. Both open ended and closed ended questions were used in the survey.

Closed ended question were used for question 1 and 2, as these questions required a specific response, either yes or no (Neuman 1997). Although closed ended questions allowed for a quick response and made it easier for the researcher to compare the responses of the various participants, closed ended questions may result in important data on the beliefs and feelings of participants being lost (Neuman 1997). Therefore it was necessary to include open ended questions in the survey. An advantage of open ended questions is that participants are given the opportunity to explain their responses, it also "*permits creativity, self-expression and richness of detail*" (Neuman 1997:241). Questions selected for the survey were based on the main research questions. Questions 1-4 answered the research question 'How does the Rea Vaya contribute to meeting the needs of commuters in Johannesburg'. These questions provided data on the experiences of commuters who use the Rea Vaya system. These questions also provided information on the general perceptions of commuters towards the system.

The remaining questions provided information on the social and economic effect that the Rea Vaya has had on commuters. Surveys were then arranged into two batches, one from each station. Thematic analysis was used to analyse and sort the data which is discussed in more detail below. Some of the major themes that were anticipated from questions in the survey were accessibility, safety, reliability and time consumption. In order to gather data on the effects of the Rea Vaya on private car owners who commute to and in the City of Johannesburg a qualitative survey was conducted.

Private car users were identified using the snowball method of sampling and the aims and objectives of the research were explained to them. Snowball sampling is also referred to as network sampling (Neuman 2000). Neuman (2000:207) explains “it is based on an analogy to a snowball, which begins small but becomes larger as it is rolled on wet snow”. In this research the snowball method was used to identify participants for the study. Participants were referred by other participants. In the snowball sampling method participants are linked to each other (Neuman 2000). Permission was granted by participants to conduct the interviews. Open ended questions were used, in order to gain insight into the experiences of private car users with regards to the Rea Vaya system. Question 2, 3 and 4 focuses on the effect that the Rea Vaya has had on private car owners’ daily commuting patterns, whilst questions 1 and 6 focused on the opinions of private car owners towards the Rea Vaya system.

Questions included in the survey aimed at gathering data on the rationale for the use of private cars in the City of Johannesburg, the way in which the Rea Vaya has affected private car owners daily commuting patterns and the effect that dedicated bus lanes has had on private car owners. Inaccessibility of the Rea Vaya, comfort and reliability are themes that were anticipated from the interview questions.

In-depth face-to-face interviews were conducted with the remaining stakeholders, to gain a profound understanding of the effect that the Rea Vaya system has had on them and their businesses. In qualitative research the researcher is able to gather information on the participant’s beliefs and perceptions (Kitchen and Tate 2000). The interviews took the form of an unstructured open ended interview. In-depth

interviews are “*used to determine individuals perceptions, opinions, facts and forecasts and their reactions to initial findings and potential solutions*” (Vos, Strydom, Fouche and Delpont 2002:298). In this type of interview the conversation is controlled by the interviewer (Kitchen and Tate 2000). The strength of this approach is the use of open ended questions by the researcher, which allows the participant to reflect their own thinking rather than their response being restricted through close ended questions (Neuman 1997, Kitchin *et al* 2000).

An Interview schedule which appears in Appendix B, was used to guide the interview, probing was used, when responses lacked detail and there were follow up questions which were linked to the main question on the social and economic effects of the Rea Vaya (Vos *et al* 2002). In order to gain insight into the effects of the Rea Vaya on the Taxi Industry in-depth interviews were conducted with participants from the Taxi Industry.

An Interview schedule was used to gather data from the Taxi Industry (Interview schedule for the Taxi Industry appears in Appendix B). To date there have been a number of strikes by the Taxi Industry against the Rea Vaya system since its inception. The Taxi Industry has publically made a number of claims and has voiced its resentment towards the system. This study aimed to gather data on the social and economic effects that the Rea Vaya has had on the Taxi Industry, with this in mind questions used in the interview schedule were aimed at answering the main research question.

Question 1 and 4 focused on the opinion of the Taxi Industry towards the Rea Vaya system. Questions 2 and 3 focused on gathering data on the economic effect of the Rea Vaya on the Taxi Industry with regard to the effect that the Rea Vaya has had on their routes and income. Themes that were anticipated from the interview were conflict, accessibility and financial implications. An in-depth face-to face interview was conducted with Layla to gain insight into the aims and developments of the Rea Vaya system in Johannesburg. An interview schedule (Interview schedule used for Layla appears in Appendix E), was used to guide the researcher during the interview process. A face-to-face in-depth interview was used as it allows the researcher to

gather data on the opinions and experiences of the Rea Vaya system (Neuman 1997).

Question 1 focused on the social and economic effect that the Rea Vaya has had in/on the city of Johannesburg. Question 2 focused on the effect the Rea Vaya has had with regard to traffic in the Johannesburg inner city. Question 3 focused on accessibility to the Rea Vaya system, whilst question 5 investigated the conflict between the Rea Vaya Management and the Taxi Industry. Question 6 focused on the development of an integrated transport network in Johannesburg. Themes that were anticipated from the interview with Layla were accessibility, safety, reliability and tension between the Rea Vaya Management and the Taxi Industry.

The formal in-depth interviews with the Taxi Association and Layla were recorded so that there would be evidence of these interviews to keep an audit trail. The recordings were subsequently transcribed for analysis.

### **3.6 Data Analysis Procedures**

Raw data obtained from the survey with Rea Vaya commuters were transcribed and arranged in two batches, namely participants from Doornfontein and participants from Bramfontein. *“Data analysis means a search for patterns in data”* (Neuman 2000:426). The transcribed data were analysed using content analysis method (Neuman 1997, Patton 2002). Content analysis is appropriate for *“describing and interpreting written productions of a society or social group”* (Marshall and Rossman 2010:161). There are three stages through which the raw data passed namely open coding, axial coding and selective coding (Neuman 1997). It is important to develop some sort of system to classify or analyse the data. Patton (2002) states that without classification there is chaos. The data was sorted and passed through three stages. Open coding was the first stage, which is discussed next.

#### **3.6.1 Open Coding**

Open coding is the first pass through raw data (Neuman, 2000). According to Miles and Hubberman (1994:56) *“Codes are tags or labels for assigning units of meaning*

*to the descriptive or inferential information*” (cited in Neuman 1997:422). At this stage labels were assigned to comments and opinions of participants. Preliminary labels were assigned to concepts that emerged, some of which were changed at a later stage. *“Open coding helps to bring themes to the surface from deep inside the data”* (Neuman 1997:422). The comments made by participants were highlighted in yellow and assigned a label, for example “accessibility”. This procedure was carried out until all the raw data was labelled. From the labels that were assigned a list of labels were extracted and put into a word document before proceeding to the next step which was axial coding (Neuman 1997).

### **3.6.2 Axial Coding**

The second stage of thematic analysis is Axial Coding. It is at this stage that preliminary labels are re-examined and necessary corrections made, thereafter labels were clustered to form themes (Neuman 1997, Neuman 2000). As themes emerged only the most important themes were recorded (Neuman 2000). In order to process the data files were opened in excel for each of the different stakeholders, as the lists of labels were consulted they were transferred to each file. Clustering of the labels identified themes that were presented in the literature. At this stage connection, causes and consequences between the different categories were made. Once the list of themes that were identified in axial coding was completed the final pass through the data which is selective coding was done.

### **3.6.3 Selective Coding**

Selective coding is the last pass through the already categorised data where the most prominent categories are selected (Neuman 1997). This step included going through the data again and making comparisons and contrasts. Once this was completed categories were condensed and themes that were similar were categorised under main themes (Neuman 1997). Main themes were highlighted in different colours in the excel file that had been created. Due to the volume of data collected, it was necessary for the data to be synthesised and only the most appropriate data is presented in the study (Neuman 2000). Themes were condensed to form major themes such as Infrastructure, commuter satisfaction and financial implications, are some of the major themes that were identified. Any qualitative study of this nature requires authenticating.

### **3.7 Authenticating the Study**

Neuman says (2000:171) “*Authenticity means giving a fair, honest and balanced account of social life from the viewpoint of someone who lives it every day*”. The aim of the qualitative researcher is to be truthful which is central to validity. Authenticity of findings assists the researcher to ensure accuracy and credibility by using triangulation. It is necessary for a qualitative researcher to ensure credibility, dependability, transferability and confirmability (Patton 2002).

Credibility in a qualitative study is the alternative to internal validity. “The strength of the qualitative study that aims to explore a problem or describe a setting, a process, a social group or a pattern of interaction will be its validity” (Vos *et al* 2002:351). With this being said the researcher provided an in-depth description of the sites and the interactions with participants, additionally findings for this study originated from true transcripts. Once the in-depth interviews were recorded and transcribed, the transcriptions were then emailed to participants for verification what Patton (2002) refers to as member checking. In order to show that dependability was considered in this study the findings were underpinned by the literature review.

### **3.8 Ethical Considerations**

Conducting an investigation in an ethical manner will contribute towards ensuring reliability and validity of the research (Merriam 2002). On identifying participants who were willing to be interviewed they were presented with a consent agreement form also known as “informed consent” (for the consent form refer to Appendix E). This agreement was explained to participants in detail. Participants were informed that participation in this study was voluntary and no harm would be experienced by participating in this study. Additionally, they were informed that they could withdraw from this study at any time without any consequences. Confidentiality and anonymity concerning their identities was maintained at all times as pseudonyms were assigned to each participant to protect their identity.

### **3.9 Summary**

This chapter presents and justifies the selection of the research methods used in this study. The qualitative methodology was used in this study. A description of the research sites and explanation of the participants used in this study was given. The next chapter presents the findings.

## **Chapter 4 : Data Presentation**

### **4.1 Introduction**

This chapter presents the findings from the investigation into the experiences of commuters and different stakeholders regarding the BRT in Johannesburg. The research findings in this chapter emanate from interviews with commuters who use the Rea Vaya, those who use private vehicles to access the city, taxi drivers, taxi owners, business owners whose businesses are located alongside the BRT stations as well as a senior member of the City of Johannesburg Municipality. The findings presented below elucidate the views of the different stakeholders as well as the social and economic effect that the Rea Vaya has had on them. There were a hundred participants in the first segment of the data collection and as previously mentioned these participants were required to answer specific questions related to the Rea Vaya (see Appendix A). The number of participants precluded the use of pseudonyms, instead they were referred to as participants and the actual words of the responses are used in reporting the findings.

### **4.2 Experiences of Commuters who use the Rea Vaya**

The first group to be interviewed were commuters who will hereafter be referred to as participants. They were interviewed particularly regarding the Rea Vaya and its goals of meeting the needs of people. Data were collected at two stations, namely: the Johannesburg Art Gallery and Ellis Park stations. Rich, substantial data was collected and analysed using thematic analysis to identify the main themes in the raw data. The data was grouped into themes and the themes were then grouped to form broader themes. The themes that were most evident in the responses of participants appear below. Question 1, 2 and 6 required a yes or no answer and the results are depicted in Figures 4, 5 and 6 below.

In response to the question; *“Do you think that the BRT has achieved its goal of meeting the needs of commuters in the city?”*. 72 per cent of the participants responded in the affirmative, whilst 28 per cent of the participants believed that the



Rea Vaya did not meet their needs. A number of participants felt that the Rea Vaya provided them with an alternate mode of transport. Furthermore, the Rea Vaya has reduced travel times for a number of participants.

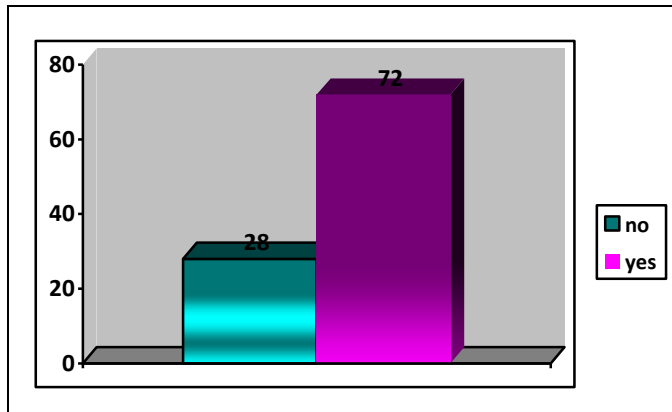


Figure 4: Response to question 1

The question “Do you think the Rea Vaya has managed to reduce traffic volume in the city?” elicited the following responses depicted in Figure 5 below. 71 percent of the participants believed that the Rea Vaya had reduced traffic volumes in the city, however, there has been no studies done to confirm this and the responses given are the opinions of the participants. 23 percent of the participants believed that traffic in the inner city has not decreased. A number of participants added that traffic congestion in the inner city had increased since the introduction of the Rea Vaya. The remaining 6 per cent of the participants were not sure if traffic congestion in the inner city had been reduced.

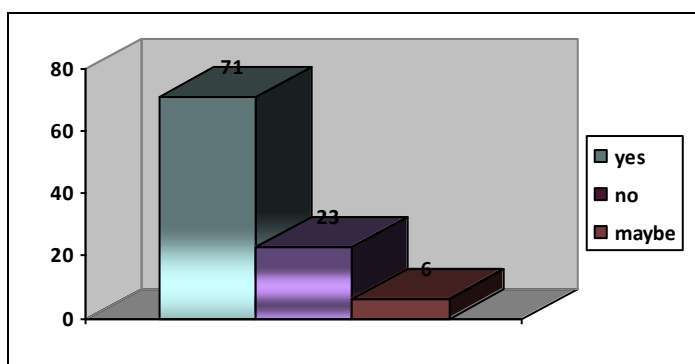


Figure 5: Response to question 2

To obtain information regarding the travel experience of participants the following question was asked “*Has the Rea Vaya improved travel conditions for you?*”. 90 percent of the participants believed that the Rea Vaya had improved travel conditions for them. Most of these participants had previously used taxis to commute to and within the inner city. They compared the travel experience of the taxi with that of the Rea Vaya and felt that the Rea Vaya was clean, safe and comfortable. This is one of the reasons why these participants chose to use the Rea Vaya.

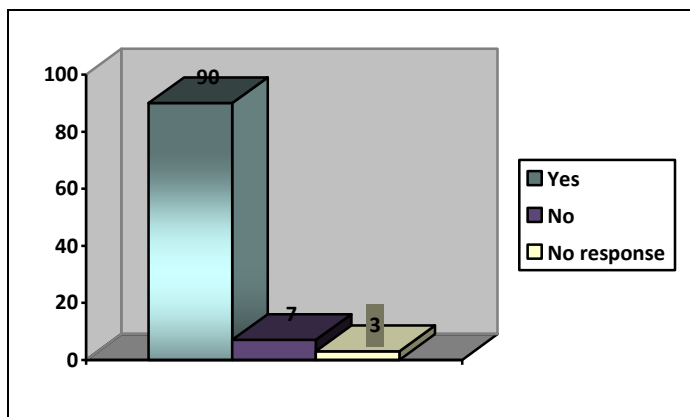


Figure 6: Response to question 6

Analysis of the responses highlighted a number of significant themes; the first is the Rea Vaya infrastructure.

#### 4.2.1 Rea Vaya Infrastructure

The theme Rea Vaya infrastructure has been divided into sub-themes namely: accessibility, reliability, poor signage, public amenities and designated bus lanes. The following sub theme illustrates the effects that accessibility to the Rea Vaya station has on participants.

##### 4.2.1.1 Accessibility to the Rea Vaya Stations

Accessibility to the Rea Vaya stations presents problems to some commuters. A participant’s response regarding accessibility to Rea Vaya stations was, “*It depends where you are and where you are going*”. Participants who live in Johannesburg close to BRT stations found that the Rea Vaya was accessible. One participant explained that the Rea Vaya “*Goes to all the routes I travel along*”. Another participant responded that “*The Rea Vaya stops outside my house*”. A reason for the

positive responses regarding accessibility could be that these commuters are located along BRT stations and therefore they do not have to travel great distances to access the Rea Vaya infrastructural route/network.

A response from another participant regarding accessibility is *“It depends, Soweto is relatively accessible, it don’t go to Kensington”*. A complaint voiced was *“The Rea Vaya don’t have many routes”*. The Rea Vaya is not accessible as participants were restricted to specific routes. As the Rea Vaya routes are limited the system is not accessible to all commuters in the city as indicated by the above comments. *“There are a limited number of buses that go into Bramfontein”*, consequently participants were not able to board buses to all areas in the city, thus restricting commuter’s access to the entire city, because of the specific routes allocated to the Rea Vaya, and this limits commuter’s movement around the city.

As many of the participants reside in the suburbs or on the outskirts of Johannesburg, public transport is the only means to access the city, and upon arrival in the city, only then are they able to access the Rea Vaya. On the other hand, some commuters have to walk long distances to Rea Vaya stations in order to access the Rea Vaya bus. A participant commented that *“The Rea Vaya stations are hard to get to, not easy to get in”* and found that because of the distance entry into the Rea Vaya station was difficult. She explained that *“At the Ellis Park station you have to go around”*, in other words what this participant was elucidating is that to gain access into the station it is necessary to circumvent the Ellis Park stadium. In response to the question *“Do you think the Rea Vaya is easily accessible compared to other modes of transportation?”* another participant responded *“Not compared to taxis”*. A reason behind this response goes back to the fact the Rea Vaya operates on specific routes and therefore the bus does not enter the heart of residential areas, in comparison to some taxis that stop outside “your door”.

The latest development with gaining access to the Rea Vaya station (waiting area) is with a smart card. Commuters are granted access if they have a smart card, which serves as a pass and allows them access to the station. There were a number of negative comments related to the implementation of the smart card system which was on the 1 July 2013. A major complaint was that the system was continuously

offline leaving commuters frustrated and unable to access the bus. In addition, many commuters and staff lacked the knowledge on how to use the smart card system. Some commuters were also unaware that the smart card system had been implemented and that they would not be able to board the bus without a smart card. Those commuters who were unable to purchase smart cards had no option but to leave the station in search of alternative transport. The introduction of the card system restricted access to the station. The next theme that emerged from the raw data is that of reliability.

#### **4.2.1.2 Reliability Regarding Bus Maintenance and Infrastructure**

Reliability plays a significant role in attracting new consumers and in keeping the old consumers (Sohail *et al* 2006). There are a number of factors regarding reliability that need to be considered, such as weather, traffic and equipment failure. These factors could influence the reliability of a transport system by disrupting the operation of the system, which consequently could influence the way that customers view the system (Sohail *et al* 2006). Perceptions play a major role in the choices commuters make with regard to the mode of transport they use. Wirasinghe *et al* (2013) explains that if commuters tend to choose transport systems that are reliable, however if the transport systems fails to meet their needs they would change to an alternate mode.

Participants in this study found the bus system to be reliable and punctual, however, there were a few participants who found that the buses did not always arrive timeously as stated on the monitor, and this problem was confirmed while conducting the interviews. The monitor indicated a 2 minute delay before the arrival of the next bus; however, when the two minutes had elapsed the bus had still not arrived. The monitor automatically changed to the next arrival time. This caused commuters to be delayed.

A number of participants found it difficult to travel with the Rea Vaya as the buses ceased operating at 18:00 on weekends “*Which makes it hard for people who work on weekends*”. One participant explained “*The afternoon, most of the buses do not stop here, have to wait for a long time from about 14:00*”. Another participant said “*For a week it’s constant, for next week it’s not*”. The inconsistency of buses has caused a challenge as people were unable to plan their trip.

However, a positive aspect that contributes to reliability is the fact that the Rea Vaya buses do not “*breakdown*”. One of the reasons for this could be that the system is still fairly new and therefore buses are easily maintained. Compared to other modes of transport such as the mini-bus taxis, commuters believe that the Rea Vaya is more reliable, since there are no incidents to interrupt the smooth running of the Rea Vaya. Despite the fact that the majority of participants commented on the reliability of the Rea Vaya participants pointed out that the Rea Vaya appeared to have fallen short in the area of communication and information dissemination as there were no signs displayed to inform commuters of the change from paper tickets to the use of smart cards. This caused considerable frustration among commuters which could have been avoided had there been signs notifying commuters of the change. Another theme that emerged from the interviews was the lack of public amenities at the Rea Vaya stations.

#### **4.2.1.3 Lack of Public Amenities at Stations**

Some participants indicated that public toilets were a necessity at Rea Vaya stations. Additionally insufficient seating for passengers at the station was problematic, specifically during peak periods. According to a participant “*Sometimes queues is too long, and we have to wait for more than 2 hours*”. As a result of the long wait passengers are left standing for extended periods of time. Despite buses being comfortable, participants found that these buses were cold and lacked a heating system, which posed a problem especially during the winter months. One advantage with the Rea Vaya System however, is the designated bus lane.

#### **4.2.1.4 Advantages of Designated Bus Lanes**

Designated bus lanes were designed with the intent, of reducing traffic in the city. The majority of the participants found that the Rea Vaya was quicker as opposed to other forms of public transport in the city. One participant said the speed could be attributed to the fact that the Rea Vaya operated in its own bus lanes, thus allowing the bus to bypass traffic and consequently reducing travel time. While the Rea Vaya’s designated bus lanes have benefited the Rea Vaya users, it has caused a challenge, such as an increase in traffic congestion, for other road users in the City of Johannesburg. As a way forward to improve transport a participant suggested

*“Taxi must have their own lanes to reduce traffic and accidents”*. Closely related to the advantages is commuter satisfaction that plays a major role with regard to the use of the Rea Vaya system.

#### **4.2.2 Commuter Satisfaction with the BRT Service**

Commuter satisfaction with the BRT service is a theme that emerged and will serve as an umbrella theme for the following sub-themes. Commuter comfort which received extensive attention among participants, safety is also one of the main concerns that emerged from the analysis of the interviews, time spent on the journey using the Rea Vaya is a theme that participants identified in their interviews; the smart card and customer care are two additional themes that were given attention by the participants. Commuter comfort regarding Rea Vaya buses is discussed below.

##### **4.2.2.1 Commuters Comfort**

Commuter comfort with regards to public transport is important as it promotes the use of public transport in this case the Rea Vaya. A number of participants mentioned comfort and cleanliness as reasons for choosing the Rea Vaya, as opposed to other modes of public transport. A participant commented that *“This system is better than other transport; it comes on time, clean and comfortable, nice stations”*. Participants pointed out that *“There is more space, you are free”*, *“There is overcrowding in the taxi”*. Although many participants mentioned comfort as a reason for choosing the Rea Vaya, there were a number of participants who complained about waiting in long queues in the mornings. One participant said *“During peak periods, buses are full and we have to stand in the bus”*. Public transport is seen as unreliable and unsafe; however the Rea Vaya aims to change this perception.

##### **4.2.2.2 Concerns Regarding Safety of Commuters**

Safety plays a significant role in the choice of public transport and it is imperative that commuter’s safety is given priority. Many participants choose to use the Rea Vaya as they feel that it is *“safer”* than other modes of transport. A participant indicated her preference to travel on the Rea Vaya since she claims that there have *“Been no accidents”* involving the Rea Vaya buses. The Rea Vaya is *“Safe, drivers don’t speed”* is the opinion of a participant. Many participants compared the Rea Vaya to Taxis, and maintain that *“Taxi’s are not safe”*, *“Taxi’s drive like morons”*, and

*"Taxis are in a bad state"*. A participant who is a parent claimed *"I would prefer my child to commute using the Rea Vaya as I know it that it is safe"*. Whilst another participant contends that *"You would not find people harassing you on the Rea Vaya bus"*. However there are some participants who are disappointed with Rea Vaya bus drivers, *"They should employ drivers who follow the same rules, some drive like they driving taxis"*, and this causes dissatisfaction among commuters. A major concern, to many Rea Vaya users, is the inconsistent bus intervals and bus times, since it causes an inconvenience to a number of participants; consequently it is imperative that travel time tables are adhered to. The amount of time spent commuting is an important factor when choosing a mode of transport.

#### **4.2.2.3 Time Spent while Commuting**

The time spent commuting is a significant consideration when using public transport. The question *"In using the Rea Vaya has your average travel time been reduced?"* elicited mixed responses from participants. The majority of participants claimed that they had saved time whilst using the Rea Vaya. Participants saved anything from 5 min to one hour on travel time. One participant said *"With the Rea Vaya there is no traffic; I do not have to leave at 05:00"*. 66 percent of the participants maintained that they had saved time as they did not have to queue for a bus, nor did they have to wait for the bus to reach its maximum capacity as is the case with taxis. A participant stated that *"The buses come within minutes"*.

Another participant said *"The Rea Vaya does not have traffic"*, in other words, did not have to contend with traffic as the Rea Vaya has its own designated lanes. Although the majority of participants saved time whilst using the Rea Vaya, there were a few participants that found that they did not, as is evident by the following statement; *"Service for card, need to be improved, waited 2 hours in a queue for card machine"*. The smart card system causes delays and results in participants travel time increasing. A participant's response was that the Rea Vaya did not reduce travel time as it *"Takes longer than taxis"*. Another participant stated that the Rea Vaya does not always reduce time *"Saturday and Sunday doesn't reduce time"*. This is due to long intervals between buses during off-peak periods and Sundays. The paper tickets which were used previously have been replaced by the current system which is the Smart Card system.

#### **4.2.2.4 Lack of Communication at Stations Regarding the Smart Card System**

Whilst conducting interviews at the station it was evident that there were no signs displayed to inform commuters that paper tickets were no longer in use, and had been replaced by a smart card that they would have to purchase. The lack of notices informing commuters of this change frustrated commuters as many had to leave the station after waiting for lengthy periods in a queue for alternate modes of transport as they did not have sufficient money to purchase smart cards. This problem could have been avoided had there been notices informing commuters about the change in the method of payment.

Only 3 percent of the participants said that they preferred the old system as it was more efficient and it was not necessary to queue to purchase a ticket. Some participants mentioned that the card system was more expensive than paper tickets; consequently, commuters desist from using the Rea Vaya. A participant stated that he was “*Broke because of the penalties*”. The penalty that this participant referred to is incurred when commuters do not swipe their smart cards on entry into and departure from stations.

The card system is perceived to cause delays as a participant claimed that “*The cards are slow*”, they also claimed that the system was frequently offline, causing further delays. A number of commuters were not satisfied with the loading fee that they were charged, every time they loaded money onto their smart cards. A participant complained that she had missed four buses, while waiting to obtain a card. Another participant was frustrated because he was required to wait in a queue before he could swipe his card to enter the station, since commuters are not familiar with the new system which requires the use of smart cards; time was wasted trying to decide how to use the cards. One participant posed the question “*What will happen when the system crashes*”. The participant was inquiring whether there was an alternate plan if the system broke down. This negative perception of the use of smart cards appears to be the general consensus among commuters regarding the new card system. Closely aligned to the smart card system is customer care.



#### 4.2.2.5 Customer Care

Customer care is central to any organisation or service provider. Rea Vaya provides a transport service for the inner city of Johannesburg. Participants commented on the quality of service received from Rea Vaya bus drivers. 9 percent of the participants were dissatisfied with the manner in which bus drivers interact with commuters. This led to the perception that drivers lacked knowledge pertaining to customer care and service. A participant mentioned that *“Some (bus drivers) would not stop where they suppose to”*, another participants said *“Drivers don’t greet, Metrobus is better, (Rea Vaya) drivers are not helpful”*, and whilst another participant commented that *“There is no customer service, even with the Rea Vaya”*. From the above comments we may infer that participants were frustrated and discontented with the poor customer service that they received from the Rea Vaya bus drivers. Another participant suggested that Rea Vaya should *“Have permanent drivers for certain routes”*; the reason according to this participant is that if drivers were familiar with passengers who use the service frequently the drivers would wait for passengers, even if they arrived late. On the one hand some participants complained about the buses not adhering to the schedule and on the other hand a participant like the one mentioned above expects the bus to wait for them. If a bus runs according to schedule it cannot be expected to wait for late comers. *“They should learn to take care of the people in the bus if the bus is full they should bring another bus”*. Once again it is apparent that some participants do not understand the system of schedules. This is apparent from their comments.

Although a number of participants were dissatisfied with what they deemed as poor customer service, there were a few positive comments regarding customer care. A number of participants compared the conduct of the Rea Vaya bus drivers to that of taxi drivers. A participant commented *“With taxis you have no rights, (you) at the mercy of the taxi drivers”*. Another comment was *“Rea Vaya staffs are more user friendly in that they treat everyone well, other transport systems should adopt the same attitude”*. However, a participant remarked that with the Rea Vaya buses there is not much interaction with the drivers, because drivers are constantly changing, but with taxis *“You can talk to the driver, taxi drivers are sometimes rude”*. These positive remarks regarding Rea Vaya drivers emanate from participants who had used taxis prior to the advent of the Rea Vaya. Despite the positive comments about

Rea Vaya drivers there were suggestions that these drivers should be trained in customer care. Not only has the Rea Vaya had a social influence on participants it also has financial implications.

#### **4.2.3 Financial Implications for Consumers**

Invariably financial implications play a key role in the lives of a community. In this study the cost of commuting with the Rea Vaya comes under scrutiny. From responses received it was evident that participants found the Rea Vaya to be affordable; however, there were a few who were not satisfied with the increase in fare prices which was implemented from the 1 July 2013. A saving of up to R120 a month was recorded by some participants whilst using the Rea Vaya, "*Financially (was) not too much compared to taxis*", commented a participant. There were a number of complaints regarding the administration fee, which appeared as a loading fee on the receipt that commuters received.

A participant intimated that "*People would stop using the Rea Vaya and would use taxis as it was now cheaper*". In addition there was a complaint from a participant that "*Fares for kids is high, universities fares went up to R9.50*" (the participant is referring to student travel). This participant explained that he preferred his son to use the Rea Vaya to travel to university because it is safer than using taxis, however the fare for students had gone up and it was no longer feasible for his son to use the Rea Vaya, "*Prices have gone up, calculating by distance it is expensive, forcing many people to use taxis instead*" complained a participant. Another participant commented that it cost her "*R12 to Thokoza Park*", whereas previously she paid R8.50. Another complaint was that money would be deducted from the card without a commuter's knowledge. One of the reasons why an amount could be deducted from their cards could be because of a penalty.

Although some participants found the Rea Vaya affordable, a particular participant complained that the Rea Vaya was expensive as it had cost her "*R45 from Thokoza Park to the Johannesburg Art Gallery*". An angry participant protested "*If you load R100 you should have R100*". The participant was referring to the loading fee which he was charged. A recommendation made by participants regarding the success of

public transport is the provision of cheaper fares. A common feature in transport throughout South Africa is strikes by taxi drivers and bus drivers.

#### **4.2.4 Strikes by Taxi and Bus Drivers**

Strikes by both taxi drivers and bus drivers are common. A number of reasons underpin these illegal or legal strikes which have a negative effect on the economy of the country as commuters are unable to reach their places of employment. Participants explained how strikes affected them and leave them stranded. *“Strikes affect the transport to work and other places we need to go”*. Reference was also made to the Rea Vaya strike, causing commuters to wait for taxis, *“It was worse when Rea Vaya was on strike, it was horrible”*, and this situation when Rea Vaya bus drivers went on strike caused commuters to revert to the use of taxis.

Although commuters are informed about an impending strike by taxi drivers or bus drivers, this information does not reach most commuters with the result that there are members of the community that are unaware of the strike. In order to improve public transport in the city it is necessary to implement strategies that would contribute towards the improvement of public transport.

#### **4.2.5 Strategies to Improve Public Transport in the City**

This theme outlines the solutions proposed by participants on how to improve public transport in the city. The following sub themes; Education and staff development, dissemination of information, management at stations, extension of the Rea Vaya network, an integrated transport network, best practice and strategies to promote the use of public transport, is presented below.

As a result of the poor customer service and lack of knowledge from staff participants suggested that staff be trained in customer care, the new card system and how to treat disabled people. The new card system caused many grievances among commuters. A number of participants complained that the smart card system caused delays and recommended that staff should be trained in order to use the system optimally. A suggestion from a participant was that the *“Public be educated on how to use the card system”*. Participants who complained about the poor customer service that they received from bus drivers and station staff recommended

that the staff be trained in customer care and service delivery. Staff training and development is crucial for any service provider. If commuters are dissatisfied with the service that they receive they will cease using that service.

In addition to staff training and development participants commented on the dissemination of information. A participant suggested that “More information readily available, there a lot of transport but you don’t really know”. As a way forward a participant suggested that “We should get updates on their smart phones as to when a bus would arrive”. This would help commuters to plan their trips more effectively. Another recommendation to improving the Rea Vaya service to commuters is the installation of machines that would inform commuters about the balances on their smart cards.

#### **4.2.6 Enhancing the Use of Smart Card Machines**

The present system of smart card use does not cater for commuters to view the balances available on their smart cards. As a means towards a more efficient smart card service a participant suggested that “*Terminals should be placed in stations so people could check their balances*”. It is imperative that commuters are able to establish the balance available on their smart cards before loading additional credit. Yet another remark was that “*The card system should give you a balance, like a slip. Different machines give you different balance, we need to budget*”.

A challenge that participants faced is, “*That at the Jabulani Mall bus station there is no machines and we need to travel to Thokoza Park to get a machine*”. This is an added inconvenience to commuters using the Rea Vaya. To obviate future challenges a number of participants viewed the extension of the Rea Vaya to areas on the outskirts of the city as a solution to the transport problem.

#### **4.2.7 Extension of the Rea Vaya Network**

There are plans for the extension of the Rea Vaya to the outskirts of Johannesburg. From the findings we may infer that majority of the participants were satisfied to a certain extent with the Rea Vaya system. Consequently a number of participants suggested that the Rea Vaya Network be extended to other areas beyond the city. Layla confirmed that other cities such as Tshwane had already begun implementing

the BRT system; she also stated that other areas were now also interested in developing BRT systems. The most recent city to establish plans to develop a BRT system is Ekurhuleni. The complete phase one was projected to be completed in 2013, however due to a number of challenges, only phase 1b was completed in 2013. More stations and more routes were suggested by participants as a solution to the transport problem. 13 percent of the participants recommended that the Rea Vaya should be extended to a number of areas namely, East Rand, Kensington, Midrand, Diepsloot, Glenvista, Turfontein, Eastgate and Thembisa. A participant suggestion was that *“It should be extended into the locations”*, while other participants saw the expansion of the Rea Vaya as a solution to replace taxis. A comment *“Cancel taxis and have more Rea Vaya buses”* was made by a participant and another participant suggested that the Rea Vaya network be *“More extensive and it should be extended to all transport routes”*. Currently there is talk of an integrated transport system in Johannesburg being a solution to the transport needs in the city.

#### **4.2.8 An Integrated Transport Network**

Subsequent to the extensive debate and discussion surrounding an integrated transport network system there have been endeavours to integrate various modes of transport. A suggestion from a participant looks specifically at transport routes *“The Rea Vaya should work certain routes and taxis should take over from there”*. What this participant is trying to suggest is that the Rea Vaya and taxis share the transporting of commuters. Integration between the different modes of transport could perhaps contribute towards a more efficient transport system where Metro buses, taxis, Rea Vaya and trains are integrated into a system that would satisfy the needs of commuters. Using *“Best practice”* from other service providers is seen as a means to improve the Rea Vaya system.

#### **4.2.9 Best Practice in Public Transport**

Metro bus is a transport service provided by the City of Johannesburg. A number of participants commented on the good service that they had received when using Putco and Metro buses and recommended that Rea Vaya *“Learn from other bus systems”*. A participant suggested that they should *“Do best practice from Putco and Metro bus”*. Another comment was that the Rea Vaya should learn from Metrobus

and have an access control machine on each bus, thus enabling commuters to swipe their smart cards on the bus. Since the Rea Vaya is in its infant stages, learning from other service providers may be beneficial. A number of suggestions were made pertaining to promoting public transport in the city. The above findings clarify and emphasise the participant's experiences of the Rea Vaya transport system. However, the introduction of the Rea Vaya was not without criticism and dissent from the Taxi Industry.

### **4.3 The Effect of the Rea Vaya on the Taxi Industry**

Face-to-face interviews were conducted with taxi owners and taxi drivers in Johannesburg. Pseudonyms were used for both the taxi drivers and taxi owners. The taxi drivers are Mr Khumalo, Mr Mnguni and Mr Mothudi, whilst the taxi owners are Mr Jacob and Mr Ncube. Themes which emerged very strongly from the interviews were; financial implications, conflict, division, the operational agreement for Rea Vaya buses, harassment, history of transport and community upliftment. Financial loss is a significant issue that emerged strongly from the interviews.

#### **4.3.1 Financial Loss for the Taxi Industry**

Prior to the introduction of the Rea Vaya the only means of transport were Metro Bus, Putco Bus service and Metro Rail, which was inadequate at the time, this transport system was augmented by privately owned mini-bus taxis. Since planning began on the Rea Vaya bus service the Taxi Industry objected to the implementation of the Rea Vaya system. This dissatisfaction is evident in the findings emanating from the interviews. One complaint was that the Taxi Industry was experiencing financial loss due to the implementation of the Rea Vaya.

A number of taxi owners experienced a loss of revenue and apportion blame to the Rea Vaya. Mr Ncube claims *"Before the Rea Vaya we would have a taking of R1000 a day on some routes, however at present the taking has dropped to R200-R350 a day, routes that would make R500 a day, currently makes R200-R250 a day"*. The loss of income has had a negative effect on taxi owners' revenue, since they are dependent on the income for their survival. Mr Ncube explains that when he was

generating a substantial sum of money he was able to send his children to school, and enrol them in a college of further education; however, since his income has decreased he is experiencing difficulty paying tuition fees. The loss of revenue has an effect on other aspects of the Taxi Industry, for example taxi drivers have been retrenched. One of the main reasons for loss of income could be the commuter's preference of the Rea Vaya service as opposed to taxis. Mr Mothudi commented that *"Now that the public feels that the Rea Vaya is moving faster than the taxi they prefer to use the Rea Vaya"*.

#### **4.3.2 Views of Members of the Taxi Industry**

A major concern of the members of the Taxi Industry is that the Rea Vaya has created unemployment *"They taking all our customers away"* said Mr Khumalo. Although some taxis may not operate on the same route as Rea Vaya they are still indirectly affected by the introduction of the Rea Vaya. Many commuters who reside outside the city, and who use taxis from their homes; tend to use the Rea Vaya once they enter the city instead of taxis, to be transported to their destinations. Prior to the Rea Vaya bus service being introduced, taxis operated on a transfer system, that is once commuters entered the city they would transfer to another taxi which took them to their final destination, however with the advent of the Rea Vaya there is a break in the chain system, causing what the Taxi Industry claims to be a loss of revenue. This has led to conflict between Rea Vaya Management and the Taxi Industry.

#### **4.3.3 Conflict Between the Rea Vaya Management and the Taxi Industry**

Conflict between the Rea Vaya Management and the Taxi Industry is as a result of the route assigned to the Rea Vaya. Despite the numerous talks held between the Rea Vaya Management and the Taxi Associations, the situation has not been resolved amicably, there appears to be resentment on the part of the Taxi Industry towards the Rea Vaya Management. According to Mr Khumalo a taxi driver in Johannesburg, *"The reason why the taxi drivers and Rea Vaya do not see eye to eye is because they both operate on the same routes"*. Mr Ncube adds that the City of Johannesburg took their routes,

*"Without our concession, they just pick out were having so many questions cause of those routes, you taxis you gona use those routes, because of accidents, we appreciate that"*.

The sentiment that prevails among some of the members of the Taxi Associations is that their routes were “*Hijacked*” by the Government. (See Appendix G and H for the routes of the Rea Vaya (BRT) and taxis). As indicated on the maps taxi routes are found along most of the streets in the inner city. Streets in the inner city such as Loveday, Rissik, Bree, Smith, Kotze, Jeppe, Harrison, Commissioner and Market Streets are amongst the busiest streets in the inner city. These streets are used by taxis as well as by the Rea Vaya. Mr Ncube claims that the “*City has hired their drivers they gave the drivers the keys and said use the taxi routes and that’s what they are now doing*”. Although this is not how the Rea Vaya operates, this statement provides an indication of how the Taxi Industry views the Rea Vaya bus routes.

Conflict also stemmed from the fact that the Rea Vaya buses operate in their own designated lanes, while taxis have to drive with traffic in the general traffic lanes. According to Mr Ncube in April when the Rea Vaya bus drivers were on strike,

*“If they (JMPD) get you in the dedicated lanes they took the disc and impounded your car for using that, that’s what even happening today, you can follow the private car, to the private car they say hey, but to the taxi they take the disc and impound the car”*

Using the general traffic lanes is a challenge to taxi drivers as the volume of traffic causes delays and as Mr Ncube explains “*Our passengers tempted by this dedicated lanes, that we are taking 5 minutes from Soweto to Johannesburg, with the taxis it gonna take 45 minutes to 1 hour*”. As Rea Vaya buses have their designated lanes they are able to bypass the general traffic, thereby reducing travel time, whilst taxi have to contend with the volume of traffic , consequently commuters prefer the Rea Vaya which has led to aversion towards the Rea Vaya Bus Service by the Taxi Industry.

A number of members of the Taxi Association felt that the conflict between the Taxi Associations and the Rea Vaya Management could not be resolved, because the members of the Taxi Associations felt threatened by the presence of the Rea Vaya Bus Service. Mr Khumalo is of the opinion that “*Buses were putting taxis of the road*”. In other words it is no longer lucrative for taxis to run alongside the Rea Vaya. Mr Mnguni, a taxi driver claims that “*The Rea Vaya is a threat to our income*”, and believes that “*The conflict between the Rea Vaya and taxis cannot be resolved*”. As a result of the different views held by the Taxi Association and the Rea Vaya



Management, unfortunately there appears not to be a point of agreement. Additionally, Mr Jacob, a taxi owner argues that the Rea Vaya (BRT) Management have not taken into consideration the plight of taxi drivers. However, Mr Jacob argues that the Taxi Associations were “*Not presented with an impact study of the BRT*” upon implementation of the system.

Although the City of Johannesburg conducted an investigation which outlined the affected Taxi Associations in Johannesburg, a number of Taxi Association members stated that they were not involved in the discussions of the Rea Vaya system and this is one of the key reasons behind the conflict. A number of the members of the Taxi Association complained about conflict that they experienced with law enforcement officers.

#### **4.3.4 Conflict with Law Enforcement Officers**

Taxi drivers are frequently harassed by law enforcement officers, according to Mr Jacob “*You would never see a policemen pull over a BRT bus*”. Taxis are frequently harassed by police officers and their permits taken away. Mr Ncube claims that when the Rea Vaya was on strike, police officers parked in bus lanes and would not allow taxis in these lanes, “*A taxi that was found driving on the bus lane would have their car impounded*”. This harassment of taxi drivers by police officers may be perceived by the Taxi Association as the police being in favour of the Rea Vaya Bus Service and because of this impartiality towards the Rea Vaya the Taxi Industry is treated unfairly, thus contributing to the tension between Rea Vaya buses and the Taxi Industry. As Mr Ncube pointed out, the Taxi Industry has a history of servicing the people. In addition to the conflict between the Rea Vaya Management and members of the Taxi Associations, divisions within the Taxi Associations are evident.

#### **4.3.5 Divisions in the Taxi Industry**

“*Divide and Rule*” is how Mr Ncube described the City of Johannesburg’s approach to involve the Taxi Industry in the Rea Vaya system. The Taxi Associations is of the opinion that the City Johannesburg “*Is trying to get rid of taxis*”, furthermore the Taxi Associations blame the City of Johannesburg for orchestrating this strategy that divides the different Taxi Associations. Mr Ncube claims that “*What they (the City of Johannesburg) have done is they took partly of our members, they divide and rule,*

*instead as we are 400 members in our association they took plus minus 20 members to send for this BRT thing". This division has resulted in resentment on the part of the Taxi Associations who believe that the City of Johannesburg has created divisions by co-opting some members of the Taxi Associations for negotiations and subsequently forming PioTrans, which is the bus operating company for the Rea Vaya Bus System.*

This preferential treatment given to some members of the Taxi Association, according to members who were interviewed has resulted in hostility between the various Taxi Associations. Mr Ncube alleged that the representatives of the Taxi Associations were bribed. He claims;

*"There is no individual that can sign for himself or herself to the BRT, they have gone to the BRT and will go to the general committee and say we are proposing one, two, three, but no individual should get there, so what has been done by the government is just divide and rule, its promised some other members, it take 20 members and give money, promised them a lot of money".*

Mr Ncube is implying that the Rea Vaya Management paid representatives and that is one of the reasons why they accepted the Rea Vaya System. Mr Ncube claims that another reason why they accepted the system,

*"We are working together and people have changed, they promised them the earth of doing one, two, three for you, because of when they started this thing they promised they are going to pay them (R) 15 000 per of which some of them are given 5 000, some of them are not given anything, but what divides us is the 15 000 per car".*

On probing Mr Ncube responded,

*"Yes that is what they said, at this beginning of this thing, they said while we were at the meeting , taxi for the people who were serving five taxis they are going to give them 15 000 per taxi, you see why people were tempted".*

What may be inferred from this claim is that during initial negotiations representatives of the Taxi Association were promised the amount of R15 000 per taxi if they surrendered their taxi operating licences, however, according to Mr Ncube the promises were not fulfilled, thus prompting these representatives to return to their Taxi Associations. Related to the surrender of the taxi operating licenses, the Rea Vaya Management extended the offer of an operational agreement to taxi owners should they desire to obtain a Rea Vaya bus.

#### **4.3.6 The Operational Agreement for Rea Vaya Buses**

The City of Johannesburg has come to an agreement with representatives of the Taxi Association, which would enable these representatives to become major shareholders in the Rea Vaya system. This could be perceived as the Rea Vaya Management including the Taxi Industry. However, Mr Jacob explained that *“The operational agreement that is being used to operate the Rea Vaya bus is not fair and was not in favour of taxi owners”*, and he would have to *“Give up three permits for one bus”*. This situation does not bode well for the Taxi Industry because; in Mr Jacob’s opinion in order to operate one Rea Vaya bus it would be necessary to surrender three taxi permits. Additionally, the owner of a Rea Vaya bus would have to bear the cost of training the drivers and roadworthy tests for a bus that will belong to the City of Johannesburg and not the individual.

#### **4.3.7 History of Public Transport in Johannesburg**

The Taxi Industry has been operating for a long period. During the apartheid era, taxis transported black people from the townships to their places of employment. The Taxi Industry was one of the few sectors in which black people were employed.

*“We have a history of servicing the people. We are servicing more passengers than this BRT 80% of the passengers are serviced by Taxi Industry only 10 % is serviced by the BRT”*

*Mr Ncube.*

Taxis are perceived as a more convenient, affordable and accessible mode of transport as opposed to other modes of public transport in the city. Mr Khumalo explains *“We serve nearer to home and Rea Vaya has their designated stops”*. As taxis operate in townships, and transport commuters to the main areas of employment in the city centre, taxis are more accessible to commuters, than the Rea Vaya buses. Furthermore, taxis are viewed as more convenient by some commuters, since they do not have a set schedule like the Rea Vaya. *“If you go at the taxi rank at 02:00 am you will find them, if you turn 10:00 pm- 11:00 pm you will get the taxi”*, says Mr Ncube. Neither do taxis have a set route on which they operate, however, they do not have specific stops en route and are therefore very accessible to commuters , since taxis tend to stop anywhere along the route as requested by commuters. Furthermore, because taxis do not operate according to a fixed schedule, they may operate all hours of the day unlike other modes of public transport.

The Taxi Industry is perceived to be unstable and violent; however, despite the negative perceptions surrounding the Taxi Industry, the industry is involved in a number of community service projects.

#### **4.3.8 Community Service**

The Taxi Industry is viewed by many in a negative light; however the Taxi Industry is known to support various welfare projects in their communities. Mr Jacob explains how his Taxi Association provides funds to Non-governmental Organisations (NGO). In the event of a funeral they donate money towards burial services, churches and to community members for school fees in the township. In their efforts to aid the community, the Taxi Association bears the cost of transporting the corpse in the event of death.

Mr Ncube explains:

*“When you are going to the bank if somebody died, you are given the money in your policy but here in our association if a member died we are paying 23 000 for his burial, and our 72 combis are going to attend that funeral”*

What Mr Ncube is trying to explain is that some people have funeral policies; however, if a member of the Taxi Association dies the association pays the above mentioned sum for the burial of the deceased. In addition, the Taxi Industry also assists with the burial of community members

*“Some people they do not have money to bury their family, some of the people they use to come here, we don't have money to bury our beloved ones we use to take our combis here, to give those families, even give them donation to bury, their loved ones since we are servicing the communities”.*

Although the taxi owners suffer a loss of income, if one of the drivers were in a fatal accident, the Taxi Association would bear the cost of the funeral as per the association's policy and support the family by providing transport for the funeral. Thus despite the negative perceptions of the Taxi Industry they assist the community when necessary. Not only has the Taxi Industry been affected by the Rea Vaya, but so have private car users. Private car users are also part of the affected stakeholders in Johannesburg. The Rea Vaya has had a significant effect on the daily commuting patterns of private car users in the City of Johannesburg.

#### 4.4 Experiences of Private Car Users

A qualitative survey was conducted with commuters who use their private vehicles to access the city. The themes that emerged from the surveys include; the rationale for the use of private cars in the city, problems caused by the Rea Vaya buses and public participation in the planning process of the Rea Vaya. These themes will be discussed below.

Private car users have provided an array of reasons for the use of their private vehicles to commute to the city. Comfort, reliability and convenience are among the reasons provided by private car users for their choice of transport to commute to and in the inner city. In the opinion of these private car users' public transport is overcrowded, slow and unreliable; consequently, private cars are the preferred mode of transport. "I use my own car *to avoid queues for taxis and Rea Vaya*" said Jack, whilst Memory lists reliability and safety as her reasons for the use of a private car.

Memory states "*Public transport from my home is not reliable; also there is crime which would place me in a vulnerable situation*". Mike concurs that safety is a reason for using a private car "*Rea Vaya buses are always packed and I don't feel safe using a bus*". Ron, Lia, Helen, Jennifer and David identified convenience as their main reason for choosing a private car. In Jennifer's opinion "*I need to be on the move, when I need to*". Janet agrees "*I don't have to look for someone who travels in the same direction as me, I can go shopping during lunch and leave work when I want*". Ron explains "*It (private car) is more convenient because I don't have to worry about being left behind; I go at my own time*". Among the reasons listed for the use of private cars was that of accessibility.

The reason why the Rea Vaya is not popular with private car owners is because it is not an accessible mode of transport, as it only caters for commuters who reside along its routes, thus participants who reside on the outskirts of the city resort to using private vehicles to commute. Tanya states "*It (The Rea Vaya) could have a positive impact if it catered for everybody but currently only people on bus routes can make use of the service*". David, Lia and Helen states that their jobs required them to

drive out to clients and this could not be done with public transport. Helen explains *“I travel to places where Rea Vaya does not go”*.

The reasons presented above provide insight into why a number of commuters use private vehicles; as a result the City of Johannesburg has not succeeded in its plan to encourage commuters not to use their private vehicles. Because, many commuters are still using private vehicles, this contributes to congestion in the city. Private car owners insist on using their vehicles which presents a number of challenges which are exacerbated by the introduction of the Rea Vaya System in Johannesburg. There is no culture of using public transport; one of the key reasons commuters fail to use public transport is due to the perception/stigma surrounding public transport. Public transport is perceived as unsafe and unreliable (South Africa, 2003b).

Private car users are annoyed by the designated lanes in Johannesburg as these lanes pose a problem with regard to driving in the city. *“They have just made life impossible for cars and other pedestrians. The roads are more congested, now as cars and taxis cannot ride on the bus only roads, very unfair”*, whilst Sue agrees *“Well, it has created a lot of traffic because they took the whole lane to themselves”*. Mary adds, *“Crazy as they run down the middle lanes of the roads they are in, causing further congestion on the already busy roads”*. Chris concurs with Mary that *“the designated lanes are not efficient, already the lanes available are not enough to handle the flow of traffic in Jozi”*.

Sue was among the private car users who viewed the designated lanes in a positive light. *“It’s (the designated lanes is) good because the buses are not disturbing the other motorist”* Jennifer agrees with Sue but states, *“I think it’s a good idea, however I don’t believe it has been implemented correctly”*. Memory asserts that the dedicated lanes have become a problem as *“Many other vehicles including taxis ignore this and use the lanes”*.

Tanya suggests *“People must be educated on how to read the traffic signals. The Traffic Department should start issuing tickets to people who disregard the traffic lights and ride when the light shows buses only”*.

A large percent of private car users complained that as other vehicles use the bus only lanes it causes an inconvenience for the private car users, as they attempt to navigate traffic. As Tanya suggested this problem could be solved with stricter measures being implemented to monitor these lanes in order to ensure that other road users do not make use of designated bus lanes. The Rea Vaya System could have a catalyst effect, which could lead to economic benefits for businesses that are located along its corridor (Deng and Nelson 2013)

#### **4.5 The Social and Economic Effect of the Rea Vaya on Businesses.**

In other countries that have a similar system to the Rea Vaya (BRT), considerable socio-economic effects were evident (Deng and Nelson 2013). Face- to-face interviews were conducted with selected business owners found along the Johannesburg Art Gallery station. These businessmen, namely Martin and Jason operated businesses opposite the Johannesburg Art Gallery Station. What emerged from the interviews were three main themes, economic impacts, safety and beautifying the city. The findings have shown that the economic benefit of the Rea Vaya system for businesses is not very lucrative.

Jason found that the Rea Vaya had reduced his revenue as there were fewer commuters who queue for the Rea Vaya as opposed to commuters who queued for taxis, prior to the introduction of the Rea Vaya System. Therefore there were “*Less customers coming to the shop*”. Martin believes that the introduction of the Rea Vaya has “*Decreased crime in the area and the area is clean and bright*”. The Rea Vaya has had a positive effect on the city of Johannesburg as it has added aesthetic value to the city. Part of the system is to redesign the city which includes street furniture which helps to beautify the city. The final word on the Rea Vaya is from a former member of the City of Johannesburg Municipality.

#### **4.6 Response from Rea Vaya Management**

For the purpose of this study the former member of the City of Johannesburg Municipality will be referred to by the pseudonym Layla. Being a member of the City

of Johannesburg Municipality, Layla was interviewed to provide insight into the Rea Vaya project and its social and economic effect in Johannesburg. The findings emanating from the interview with Layla are presented below.

Changing the face of transport in the city is one of the main aims of the implementation of the Rea Vaya, which has changed the spatial planning that was a feature during the apartheid era. As a result of the change of transport delivery in Johannesburg people are afforded the opportunity to commute to the city. Additionally, the Rea Vaya has provided another mode of transport. The intention behind the introduction of the Rea Vaya was to provide easy access to the city. Complementing the aim to change the face of the city, are various other social developments.

During the apartheid era, there were specific laws that governed the movement of the different race groups, prohibiting free movement into and within the city. Subsequent to South Africa becoming a democracy there was a need to restructure the inadequate transport system which led to discussions on a transport system that would improve transport in South Africa. These discussions began in March 1996, with the White Paper being published in August 1996.

*The vision for South African transport is of a system which will:*

*“Provide safe, reliable, effective, efficient, and fully integrated transport operations and infrastructure which will best meet the needs of freight and passenger customers at improving levels of service and cost in a fashion which supports government strategies for economic and social development whilst being environmentally and economically sustainable”*

*White Paper on National Transport Policy, 1996(South Africa 1996)*

The Rea Vaya BRT system was chosen by the City of Johannesburg as a system which aimed at developing a world class city. It aimed at providing better public transport, reducing congestion on public roads, improving the environment and creating jobs (Rea Vaya 2012). This aim is in keeping with the White Paper of 1996.

It is obvious that the Rea Vaya would change the spatial planning of the apartheid era by providing access to transport for people of different race groups, who were previously segregated according to apartheid laws.



*“Well I think the Rea Vaya project firstly certainly the Phase 1b route, has the potential to certainly build social cohesion, because it knits together communities that historically have been kept out. So if you look at the route that comes from Soweto, Industria passing areas such as Bosmont, Westdene, Auckland Park, Melville and finally getting into Parktown. These are communities that historically have not really got to each other”.*

From the above statement it may be inferred that there is social cohesion, according to Layla, however, it may be argued that this route actually services people from different communities as there is no proof of social cohesion. In fact, what has been created by the Rea Vaya Management is what could be referred to as “Freedom Corridors”.

In his recent speech the Mayor Tau announced the city’s plans towards the development of corridors of freedom. These corridors are meant to undo some of apartheid’s spatial planning (The Star, 3 August 2013).

According to Layla:

*“The executive Mayor’s speech earlier this year as well as the cities input at Metropolis, gives a clear sense that the policy direction that the city is moving in with regards mention to pronouncing corridors of freedom was really looking to bringing people closer to economic opportunities”.*

This statement clarifies that these corridors of freedom are in fact providing the opportunity for people to access economic opportunities in other words employment. The Mayor states *“We are restitching our city to create a different future for our residents where we can link jobs to people and people to jobs”* (The Star 3 August 2013:14). Anecdotal evidence (in the Star 3 August 2013), highlights the fact that these corridors will act as a catalyst for residential developments, supported by the development of health care and educational facilities as well as government services.

Transit orientated development occurs along major transport roads as a result of development of the transport network. In Johannesburg this consists of student’s accommodation such as South Point, as well as investment in infrastructure and revamping of buildings. South Point is a company that provides student accommodation around Johannesburg. Layla claims that *“You can now see inner city buildings being advertised by virtue of their location, in relation to the Rea Vaya”*. As the city develops, more investment will flow into the city. The phase 1b has the

potential for mixed land use and this could lead to transport oriented development along that Rea Vaya corridor.

In Layla's opinion when viewing the development and impact of the Rea Vaya, cognisance should be taken of the role played by Rea Vaya to change apartheid spatial planning for land development. A consequence of apartheid spatial planning is that many people were forced to reside away from the city. *"It changes the whole apartheid city structure, by bringing people who were excluded in the past back into the city"*. From a social perspective the Rea Vaya has brought people from different areas together, provided them with the opportunity to commute to the city and brought people closer to economic opportunities.

Having mentioned the above it is important to note that the Rea Vaya is not accessible to the majority of people who commute to the city. However, there is only specific Rea Vaya stations to which commuters may have access. Layla was questioned about accessibility to the Rea Vaya stations.

*"Fifty two percent of commuters make use of cars, forty seven percent make use of public transport. The Rea Vaya provides an option" to commuters in the city. Rea Vaya was always intended to be within walking distance of where people live"*

said Layla.

Her response to accessibility to Rea Vaya stations was:

*"Well, accessible to these areas where it currently services, so no, by no stretch of the imagination it's a 25.5 km trunk route."*

Despite the intention for the Rea Vaya to be in walking distance of where people live, Layla admitted that this was not always the case. She however, mentioned an integrated transport system. Layla indicated that the city has moved towards the development of an integrated transport system which was announced by the Minister of Transport in June, 2013. An integrated transport system would link the different modes of transport, making commuting more efficient. Layla admits that Johannesburg does not boast a fully integrated transport network and that integration should extend beyond modes of transport and should include integration in fares and timetabling.

*"I think there is, the other thing is that you are not having sufficient synergising between for example the Gautrain timetable, the Rea Vaya timetable, the Metro Bus timetable and so people if they where to use the various modes of public transport are having far too lengthy times during transfers, which I think the city needs to look at more seriously to*

*synergise timetabling frequency, so that it makes sense for people to move from one mode to the other”*

Commuter shelters are an important aspect of the provision of transport; new look shelters are one of the projects in the cities development plans.

*“The new look commuter shelters are intended to look to service all modes of transport, so whether people are in buses or taxi’s, they should be able to wait, at one of the new look shelters. ... Progressively there will be 1400 shelters built throughout the city”.*

From the information provided by Layla, it may be assumed that “New look shelters” aim to integrate different modes of transport in order to enhance public transport in the city of Johannesburg.

In order to gain access to the Rea Vaya stations it is necessary to acquire a smart card. The majority of the commuters complained about the use of the smart card. These complaints were discussed with Layla and her comments are as follows.

The Smart card allows commuters access to the Rea Vaya bus. This card system was rolled out and fully implemented in July 2013. The card system was part of the initial plans of the Rea Vaya and the delay in the “roll out” of this system could be one of the factors for the resistance experienced from commuters. Layla indicated that the problem with the issue of smart cards was due to a lack of communication. According to Layla, commuters were not informed that they ought to treat the smart card as a bank debit card, they did not value the card and in some cases commuters lost the card.

Currently, the smart card is meant to reduce boarding time; however the smart card system could have other benefits. It is anticipated that the smart card could serve as a multifunctional card that may be used for all modes of transport as well as for the purchase of groceries in the future, is what Layla claims:

*“I think the long term benefits of the smart card system you will be able to introduce concessions for pensioners, for students, you will be able to introduce off peak discounts, a whole range of things that were difficult to do with the paper ticket system”.*

Due to the lack of communication, commuters are unaware that smart cards are available free of charge from the main Rea Vaya office. Commuters were not well informed about the system thus causing resistance towards the system. In addition, Layla maintains that the station staff were not trained sufficiently with regard to the introduction and use of smart cards, this resulted in a decrease in commuter

numbers. This lack of communication also affected the informal Rea Vaya paper ticket vendors, who received a commission for the sale of these paper tickets. This loss of revenue caused dissatisfaction among the vendors who threatened not to allow commuters to board the Rea Vaya buses.

In Layla's opinion the sale of paper tickets should gradually have been phased out and replaced by the smart card. A window period was given where commuters could have had balances on the paper tickets transferred to the smart cards. Another area of dissatisfaction was the loading fee that commuters were charged, which Layla believes should be absorbed by the City of Johannesburg. To make the Rea Vaya more accessible it would benefit the City of Johannesburg to introduce "Park and Ride" facilities.

Park and ride facilities are a feature of BRT systems across the world. During the FIFA Soccer World cup in 2010, park and ride facilities were available in Johannesburg for spectators going to stadiums such as Ellis Park, in Johannesburg and Soccer City. This park and ride system alleviated numerous access problems. However, the park and ride facility was not a permanent feature of the Rea Vaya, but an arrangement during the FIFA World Cup. Thokoza Park in Soweto, is on the Rea Vaya route and has its own self made Park and Ride facility available to commuters. Layla recommends *"Get people to park just at the entering of the city. Mary Fitzgerald Square, West Gate Station and get people to leave their cars there and get on to the infrastructure and the service that is currently running"*. Although this suggestion is a good one, people are reluctant to park their cars in unprotected areas because of the crime rate. Unless the park and ride areas have a good security system, commuters will not be prepared to leave their cars at the entrance to the city. Signage was also problematic when the Rea Vaya was introduced.

In addition to the challenges mentioned above poor road signage was a problem because, initially when the Rea Vaya system was implemented there was a lack of road signage which caused confusion and frustration among commuters and private car owners. Designated bus lanes are currently indicated by painted red lanes. Apart from this marking on the road there were no overhead signs to indicate the availability of the Rea Vaya. Layla confirmed that, *"When Rea Vaya was developed*

*there was nothing in the South African road traffic signs manual*” .This clarifies the reason perhaps for the lack of road signage, which created a challenge for commuters to access various areas around the city. In addition poor signage contributed towards a number of accidents in the city.

With the introduction of the Rea Vaya and its designated lane, road space has become limited. Many private car users complained that the Rea Vaya has taken up space on an already congested road. In response to the complaints made by private car users Layla defends the decision of the City of Johannesburg *“The big issue is how you use the same amount of road space to move more people and not more cars”*. Here it is evident that Layla is promoting the idea that commuters resort to using public transport and not their private vehicles. Despite the belief that there were no accidents involving the Rea Vaya buses, Layla refutes this notion.

There have been a number of accidents that involved Rea Vaya buses in Johannesburg and Soweto. However, none of these cases are published. Layla confirms that there have been accidents involving Rea Vaya buses, however, statistics pertaining to the accidents may only be provided by ‘Piotrans’, the Rea Vaya bus operating company. A number of accidents have been caused by private cars using bus lanes, whilst others included people being injured for walking or crossing in bus lanes. Layla states that there was a problem with the planning which did not take all road users into consideration. She provides an example of the area adjacent to Raheema Moosa hospital where commuters were not taken into consideration, thus forcing commuters to cross the road in the bus lane. In response to this the city erected “jersey barriers” to ensure commuter safety.

Layla explains compared to the Bogota model, Johannesburg only has two overhead pedestrian bridges and this has created the problem of people walking on streets. She recommends that both bus drivers and private car users are educated in the use of the road where the Rea Vaya buses operate, because it appears that they do not differentiate between the green light for buses and the green light for cars. Although there are a number of negative perceptions and beliefs about the Rea Vaya system one area that requires close attention is that of the Taxi Industry.

From the foregoing discussion regarding the Taxi Industry's opinion of the Rea Vaya it is evident that the Rea Vaya has affected the Taxi Industry. When the Rea Vaya system was launched there were two main Taxi Associations in Johannesburg, namely the Greater Johannesburg Regional Taxi Council, and the Top Six Taxi Association. The United Taxi Association is not formally recognised by the government and essentially UTAF is an anti-BRT association. Layla claims that upon the planning of Phase 1 four Taxi Associations were identified, that would be affected by the introduction of the Rea Vaya, however, the Taxi Associations identified up to ten associations that would be affected by the Rea Vaya. According to Layla this has resulted in *"More people coming to the table for negotiations"*. Although the Taxi Industry believes that the city is trying to *"Get rid of taxis"*, Layla argues that the city has no desire to do away with taxis and they acknowledge the historical role that taxis have played in the city.

The Taxi Industry claims that the Government does not subsidise them. Layla defends the City of Johannesburg because she claims that the Government has invested in the training of trainers, training of taxi drivers in conflict resolution in order to minimise conflict among the Taxi Associations and to improve relationships between the City of Johannesburg and the Taxi Industry. There are plans for the extension of the Rea Vaya System, despite its' many challenges. Currently Phase 1 B is being implemented; with Phase 1 C planned for 2014. Other developments include the Integrated Strategic Rapid Transport System in Ekurhuleni and Areyeng in Tshwane. Layla believes *"The trick is that the Provincial (Departments) should make sure these systems are not built by cities by stand alone systems that don't begin to create the possibility for people to move"*. Through integration of the different cities transport systems as well as fare payment and timetabling between different modes of transport, commuters will be able to travel between the different cities using different modes of transport with ease.

#### **4.7 Summary**

In conclusion the findings presented above highlight the different perceptions, experiences and challenges from the four sources of data collected. Although the

Rea Vaya is seen in a positive light by a number of commuters, there are some challenges with regards to the system. Integration of different modes of transport is a possible solution to some of the transport problems experienced in Johannesburg. The analyses of these findings are presented in the next chapter.

## **Chapter 5 : Analysis of Results**

### **5.1 Introduction**

This chapter presents an analysis and discussion of the findings of this study. A number of important themes emerged from the interviews held with three groups of participants and a former member of the City of Johannesburg Municipality were presented in the previous chapter. These themes are examined, considered and evaluated with reference to the investigation undertaken for this study. Each theme will be discussed as it emerged from the interviews with the various participants elaborating on and elucidating the relevance of each theme to the study. In addition, the literature review supports and refutes some of the claims made by the participants in the study. Accessibility to the Rea Vaya received mixed responses.

### **5.2 Meeting the Needs of Commuter's in Johannesburg.**

Literature has shown that one of the main aims of the BRT system is to meet the needs of commuters (Mpofu 2008). Figure 3 indicates that the majority participants interviewed believe that the Rea Vaya has met the needs of commuters. One participant believes that the Rea Vaya is work in progress. From the above statistics we can infer that not all participants' needs were met. A possible reason could be due to the fact that many of the participants felt that the Rea Vaya was inaccessible. From the above results we can deduce that although more than half of commuters interviewed are satisfied and feel that the Rea Vaya has achieved its aim in meeting the need of commuters there are commuters who feel it has not achieved that aim.

Figure 5 found on page 62 indicates that the majority of participants found that the Rea Vaya has reduced traffic since its implementation in 2009, whilst 23 percent of the commuters said that it has not, as traffic during peak periods is still problematic. One of the main aims of the Rea Vaya is to reduce traffic congestion in Johannesburg (Rea Vaya 2012). From the above figures it is obvious that there is a perception amongst commuters that the Rea Vaya has in fact reduced traffic.



However, this is merely a perception as there is no empirical evidence to confirm this.

Figure 6 found on page 63 shows that a large number of participants who were interviewed felt that the Rea Vaya improved their travel conditions. They listed a number of benefits of using the Rea Vaya as it saves them time; they do not have to queue for long; it is fast, reliable as well as comfortable. However, private car users will beg to differ as they believe that private cars are more comfortable. Private cars have a social status attached to them, they appeal to a number of commuters because of the social benefits such as comfort, safety and accessibility (Banister 2005). One participant mentioned that the Rea Vaya buses were comfortable. In order to elicit information pertaining to travel experiences of participants, additional questions were asked. Accessibility to stations is an important factor when it comes to transport planning.

### **5.3 Accessibility and Reliability, with Regards to the Rea Vaya System**

Literature has shown that improved access to transport provides a number of opportunities for the poor (Tiawoun 2000, Sohail *et al.* 2006). A sustainable transport system provides access to basic services such as health care and education (World Bank 1996). The lack of access to transport will limit access to opportunities for the poor (Pacetti and Trittipio 2010). In Johannesburg the aim of the Rea Vaya is to provide an accessible mode of transport that would enable people who previously were not allowed into the city access to the city (Rea Vaya 2012). Mixed responses were elicited from the interviews, as those commuters who reside along the BRT route and close to BRT stations believed that the Rea Vaya was easily accessible and therefore they were not required to travel great distances to access the Rea Vaya Bus Stations. However, for many participants who live a distance away from the Rea Vaya Bus Station accessibility was a challenge. Because the bus routes are found within the city commuters who live on the outskirts of the city are required to use alternate modes of transport to access the Rea Vaya Bus Stations. Mabena (2010) states that if stations are not accessible and within walking distance of commuters, this will result in commuters not using the system. Many commuters

found the Rea Vaya inaccessible thus they preferred to use the taxi as it they found taxis more accessible.

According to Crevero, 2004 (in Banister 2005), the mode of transport that is chosen and used by commuters will depend on the distance they have to travel to access that mode of transport. In Johannesburg the Rea Vaya is not accessible to all commuters and this could account for the low ridership of the Rea Vaya as compared to BRT system in countries such as Bogotá. For the period 2011-2012 the target for ridership was 100 000 passengers per day, however the Rea Vaya has failed to meet this target as after the strike in 2012 ridership decreased to 42 000 per day (South Africa 2012). Since the inception of the Rea Vaya there have been a number of strikes by unhappy bus drivers. Strikes have left commuters stranded, which resulted in commuters being discontented with the Rea Vaya system, which has contributed to the low ridership figures. Strike action is not the only factor that has led to the decrease in ridership, the rising fare prices and inaccessibility of the Rea Vaya are contributing factors that can account for the low ridership figures and hence not meeting the target that was set. The TransMilenio system has reached ridership numbers of 1 750 000 passengers daily as recorded in 2011 (Turner *et al* 2012). Layla stated that the Rea Vaya was intended to be accessible to commuters that are in walking distance, however, she conceded that it was not and was only a 25.5 kilometre trunk route.

Reliability was an important aspect that most participants highlighted and commented on the reliability and punctuality of the Rea Vaya, yet there were a number of participants who did not agree as they complained that the buses did not adhere to the timetable which posed problems for commuters who had to commute to work and arrive timeously. A system such as the Rea Vaya should be one on which commuters may rely. For example in Los Angeles, Curitiba, Bogota and Nigeria the BRT system arrives and departs timeously. Layla conceded that there were delays which could be avoided if taxis and private cars refrained from using the designated Rea Vaya lanes.

## 5.4 Designated Bus Lanes and Time Spent Commuting

Designated lanes separate BRT buses from the traffic, giving them exclusive right of way which enables these buses to reach greater speeds (Wright and Hook 2007). Deng et al (2013:109) states that “the exclusive busway and use of transit signal priority in the heavily congested areas provides a dramatic increase of bus speeds”. In countries such as Los Angeles, Curitiba, Bogota and India travel time has been reduced significantly, as a result of exclusive right of way (Wright and Hook 2007, Turner et al 2012). The TransMilenio has decreased its average travel time by 32 percent (Turner et al 2012). The Rea Vaya system has reduced travel time from 5 minutes to an hour, as reported in the previous chapter, to and from the inner city. Although the system has been successful in reducing travel time for some commuters it has had a negative effect on other road users. Designated lanes had sparked recent strike action by taxi drivers in Johannesburg. In May last year taxi drivers went on strike one of their demands was to use dedicated Rea Vaya bus lanes (Star 14 May 2013).

Mr Ncube, a member from the Taxi Association voiced his grievances about the designated bus lanes. He explained that it was not fair that taxis had to share lanes with other private car users thus increasing their commuting time. The delays caused by traffic resulted in a loss of revenue for taxis as commuters preferred the Rea Vaya as it reduced their commuting time. Designated bus lanes have inconvenienced private car users in the city. As Rea Vaya bus lanes are located in the centre of the road; this has caused a challenge for private car users. They are inconvenienced when they have to turn into a side street and they are on the wrong side of the bus lane, it becomes difficult to cut across at intersections.

The bus lanes are not monitored and are sometimes used by other road users, such as taxis and private cars, as a means to cut through traffic, this causes an inconvenience for buses and can also result in accidents. In Nigeria the bus lanes were designed in a way that they were not continuous and this allowed for broken down vehicles that occurred in bus lanes to be towed away (Mobereola 2009). In Johannesburg the bus lanes are continuous and only break at intersections, this

causes traffic congestion when vehicles stop or break down in the adjacent lanes as they are unable to cross over into the bus lanes to pass the broken vehicle. The findings have shown that not all the participants were satisfied with the Rea Vaya system.

## **5.5 Commuter Satisfaction with the Rea Vaya System**

Developing countries have high levels on road fatalities every year (Akinyemi 2003). In 1999 between 750 000 – 880 000 fatalities were recorded around the world, most of which was in developing countries (Akinyemi 2003). Road fatalities occur due to un-roadworthy vehicles, unplanned and poorly maintained roads and traffic congestion (Akinyemi 2003, Gwilliam 2003). Public transport should be safe and of a high standard so that it can attract private car users and this will result in a modal shift (Banister 2005). Comfort and safety play a significant role in public transport and commuters agreed that the Rea Vaya is, comfortable, clean and safe and this prompted them to choose the Rea Vaya as a mode of transport. In their opinions, taxis were not on par with the Rea Vaya as a means of transport. Although the Rea Vaya was perceived as a safe mode of transport, Layla confirmed that the Rea Vaya buses were involved in a number of accidents. There is no literature to confirm this as the statistics on accidents can only be obtained from PioTrans.

A number of commuters were pleased with the comfort and safety of the Rea Vaya; some commuters were pleased with the time spent commuting because the Rea Vaya cut down on travel time. However, what presented a challenge to the Rea Vaya passengers was the acquisition of a smart card which caused serious delays as many commuters believe that they were inconvenienced by the Smart Card System. Layla confirmed that there were problems due to the compatibility of the software that was in use. However, commuters also complained that there was a lack of communication regarding the implementation of the smart cards. This caused delays and whereas the Rea Vaya was supposed to cut down on travel time, time was wasted trying to acquire a smart card.

Customer care plays a major role in attracting users to the system (Wright 2004). As Wright (2004:129) states “the role of transit staff in making customers feel respected and welcome is one of the most powerful promotional tools”. By achieving good customer care not only will ridership increase, but so will staff morale (Wright 2004). Customer care was emphasised by many commuters who were dissatisfied with the manner in which they were treated by the drivers of the Rea Vaya buses, however, there were some commuters who compared the Rea Vaya Bus drivers with taxi drivers and found that the Rea Vaya Bus Drivers were more courteous. Overall there was a perception that the Rea Vaya Bus Drivers required training. Yet, Layla stated that these bus drivers had been trained by Piotrans and that they should have regular in-service training to avoid “bad habits” resurfacing. In Ahmadabad, bus drivers are fined if they did not maintain their bus or violated the rules set out by the Janmarg system (Kost 2009). Wright (2004) maintains that it is essential for staff training to occur on a regular basis. The TransMilenio has high volumes of commuters that use the system, this is a as a result of high customer satisfaction with regards to the system (Wirasinghe *et al* 2013).

Overall the participants who used the Rea Vaya found it affordable, but the increase in the bus fare on 1 July 2013 caused some consternation and some participants blamed the price increase on what was termed “the loading fee”. One of the main aims of the Rea Vaya was to provide an affordable means of public transport (Sibiya 2009), but since the introduction of the smart card system commuters are finding the Rea Vaya to be more expensive than taxis. A representative from the Taxi Association felt that the price increase was a positive aspect for them, because more commuters now chose taxis as they were more affordable as opposed to the Rea Vaya.

Commuters need a more reliable transportation system which will not be affected by strikes. Commuters believe that specific strategies need to be implemented in order to improve transport in the city. Education and staff development came highly recommended by commuters who believe that the education and staff training would benefit not only the drivers but the commuters as well.

Providing Smart Card machines at more stations and extending the Rea Vaya route were two additional aspects that commuters believed required attention. There are plans afoot to install additional machines at other stations as well as to extend the Rea Vaya route according to Layla. She added that there are also plans for an integrated transport system between the different modes of transport could perhaps contribute towards a more efficient transport system where Metro buses, taxis, Rea Vaya buses and trains are integrated into a system that would satisfy the needs of commuters.

Participants were dissatisfied with the service that they received from Rea Vaya station staff and bus drivers. They recommended that the Rea Vaya learn from other modes of transport in order to be more efficient.

## **5.6 The Implementation of the Smart Card System**

The smart card system is used in a number of BRT systems across the world (Wright and Hook 2007). This off board fare payment system is meant to reduce boarding time (Wright and Hook). According to Layla the smart card system is meant to serve as a low budget debit card and provide a number of benefits for users of the system. The lack of communication and training on the part of station staff has resulted in delays. Participants were frustrated as they were not informed about the smart card. The spokesman for the Rea Vaya stated that commuters were informed of the smart card system; however participants refute this (Star 25 July 2013).

## **5.7 Poor Signage on Roads and at Stations**

Poor signage at Rea Vaya stations has resulted in a communication gap between commuters and Rea Vaya Management. Signage in and around stations is essential as it conveys information to commuters (Wright 2004). Signage within the station assists in providing information to commuters on where to stand and how to use fare collection machines (Wright 2004). The lack of these types of signage can result in commuter's dissatisfaction towards the system and this could decrease usage of the system (Wright 2004). The findings have revealed that commuters were disgruntled

towards the system as they were unaware of the smart card system and price increase which had been implemented in July. The lack of signs or notices at stations to inform commuters of the change to the smart card, resulted in a number of participants being angry and frustrated. As a result of insufficient funds to purchase a smart card, commuters left the stations in search of alternative public transport.

Poor road signage also posed a problem for other road users as the bus lanes appears in the middle of a road, it becomes difficult for other road users as they are restricted to one or more lanes. Initially when the Rea Vaya system was launched there were no signs to indicate bus lanes. This caused confusion and accidents on the roads. Currently there is no overhead signage to indicate approaching bus lanes. Poor signage is a problem in the city and if not rectified will result in the number of accidents increasing. The lack of public amenities has been raised by participants; they suggested that this be included in stations. The conflict between the Rea Vaya and the Taxi Industry will be discussed next.

## **5.8 Rea Vaya Versus the Taxi Industry**

The implementation of the Rea Vaya system has been met with resistance from the Taxi Industry which feels threatened by the Rea Vaya system. The lack of participation of the Taxi Industry in the initial stages of the project also plays a major role in the conflict between the two parties. According to Visser (2008) the Taxi Industry does not understand fully the benefits of the Rea Vaya and this could be a reason for the tension between the Rea Vaya Management and the Taxi Industry. The Taxi Industry is of the perception that the City of Johannesburg has created divisions in the Taxi Industry, in order for them to win over some of the industries members. On the other hand Layla refutes this assertion. She argues that the City of Johannesburg has attempted numerous times to negotiate with the industry. Lack of communication and information has resulted in the misinterpretation of information from the City of Johannesburg and this has resulted in tension between the Rea Vaya and the Taxi Industry.

The Taxi Industry has experienced a loss in revenue since the advent of the Rea Vaya System in Johannesburg. This is as a result of a decrease in commuter numbers. The decrease in revenue has resulted in the conflict between the Rea Vaya Management and the Taxi Industry as the Taxi Industry felt that the Rea Vaya System was taking their customers. Members of the Taxi Industry believed that the Rea Vaya received preferential treatment from the City of Johannesburg and law enforcement officers. As the Rea Vaya has not been intercepted by law enforcement officers and the fact that the City has provided Rea Vaya buses with designated lanes.

The history of the Taxi Industry spans a numbers of years (Barrett 2003, Sey 2008). The Taxi Industry argues that they have provided transport to commuters for many years and they continue to serve almost 80 percent of all commuters who travel to Johannesburg. Layla acknowledged the role played by the Taxi Industry but questions the sustainability of taxis as a mass transport system. Not only does the Taxi Industry provide a transport service to communities, the industry is also involved in a number of community upliftment projects. Mr Ncube explains that the decrease in revenue due to the Rea Vaya has had an effect on their contributions to welfare projects in their communities.

## **5.9 Changing Apartheid Spatial Planning**

Thomas (2013:78) believes that “*The post apartheid challenge was to transform these geographies of exclusion, and to provide a more equitable and effective system of public transport*”. The Rea Vaya system has made significant strides in trying to reshape the inherited apartheid city. During apartheid different race groups were separated (Donaldson 2006). Indian people were forced in areas such as Lenasia, coloured people were forced to reside in areas such as Eldorado Park while Black people were forced to reside in areas such as Alexandra and Soweto (Mandy 1984). The system in South Africa is unique due to apartheid spatial planning. Other countries that introduced BRT systems did not have the challenges that cities in South Africa had to deal with. The Rea Vaya has aimed to provide access to these groups of people who were marginalised during apartheid and forced to reside



outside the city (Mandy 1984). Layla maintains that the Rea Vaya system has provided access to the city for communities who historically were not allowed in the city. Although Layla claims that there is social cohesion as people of different races use of the Rea Vaya, it cannot be assumed that people interact with each other on the Rea Vaya buses. The mayor of the City of Johannesburg recently launched the City's plans towards the development of corridors of freedom (Star 3 August 2013). The Corridors of freedom aimed to restructure the apartheid city by promoting mixed land use in the city as well as creating employment.

### **5.10 An Integrated Transport Network**

An integrated transport network creates a number of benefits for a city. In Nigeria the BRT system is supplemented by other modes of transport (Mobereola 2009). My Citi is Cape Town's own Integrated Rapid Transit system (IRT). The IRT aims to integrate the different modes of transport found in Cape Town such as conventional buses, mini bus taxis and rail (MyCiti 2014). Integration of the different modes of transport has resulted in an efficient public transport system. Layla claims that Johannesburg currently is far from achieving a fully integrated transport system. She suggests that there needs to be integration on different levels, such as integration with timetabling before Johannesburg can achieve a fully integrated system.

### **5.11 Transit Orientated Development (TOD)**

Layla claims that there are opportunities for Transit Orientated Development (TOD) along the Rea Vaya corridor; however development is not as rapid as the City of Johannesburg had anticipated. High density residential areas create ridership which in turn sustains the BRT service (Deng and Nelson, 2011). Countries such as Canada, United States of America and China have had success with Transit Orientated Development (Thole and Samus 2009). Since the introduction of the TransMilenio, property along the main line of the BRT system has increased by 15-20 percent (Turner *et al* 2012). In Johannesburg developments in student accommodation in areas such as Doornfontein and Braamfontein, has generated ridership for the Rea Vaya. Layla claims that the development of inner city buildings

being advertised by virtue of their location, in relation to the Rea Vaya is the beginning for TOD. In Johannesburg businesses along the Rea Vaya corridor have not benefitted from the Rea Vaya System, as consumer numbers have decreased since the implementation of the Rea Vaya. A reason for the decrease in customers is as a result of the frequency of Rea Vaya buses and the absence of queues at stations.

## **5.12 Summary**

The above chapter, chapter 5, provided an analysis of the research findings. It has examined the social and economic effect of the Rea Vaya on various stakeholders in Johannesburg. The following Chapter presents the main findings, conclusions and recommendations of the study.

## **Chapter 6 : Conclusions and Recommendations**

### **6.1 Introduction**

The Rea Vaya system was launched in 2009, in Johannesburg. This system is still in its infant stages, with only Phase 1A and Phase 1 B currently completed. Since the system is fairly new there is much to be learned from the current system and other BRT systems globally. This chapter presents the recommendations and conclusions of the study.

### **6.2 Conclusions of the Study**

“The social and economic effects of the Rea Vaya Bus Rapid Transit System in Johannesburg” was investigated in this study. In order to collect the data on the experiences and opinions of different stakeholders in Johannesburg with regards to the Rea Vaya system, qualitative surveys and in-depth interviews were conducted. In Chapter 4 the findings of the study were presented, whilst in chapter 5 these findings were analysed. The conclusions presented in this chapter are based on the main themes presented in the analysis of the study.

#### **6.2.1 The Social Effect of the Rea Vaya System**

One of the main aims and rationale behind the development of the Rea Vaya system is to provide a safe, accessible, reliable form of transport for commuters (Rea Vaya 2012). The study has found that the Rea Vaya system at present is not accessible to the majority of commuters in Johannesburg. The Rea Vaya system has recently, in 2013, launched Phase 1b, which has aimed at bringing commuters from areas such as Parktown into the city. Inaccessibility to the Rea Vaya Stations is one of the major reasons why many commuters still use private vehicles to access the city; however, commuters who cannot afford their own vehicle are forced to use alternate transport such as taxis as they are viewed as more accessible than the Rea Vaya. The Rea Vaya has created a number of challenges for the Taxi Industry as well as private car users in Johannesburg.

The Rea Vaya is experienced and viewed differently by various stakeholders. Commuters who use the Rea Vaya experience some of the benefits of the system, such as reduced travel time, due to frequent buses and designated lanes, although this benefits the commuters who use the system, it has created challenges for non-users such as participants from the Taxi Industry and private car users. Designated lanes have created tension between the Taxi Industry and the Rea Vaya Management. As the findings have shown, participants from the Taxi Industry felt that the Rea Vaya has its own designated lanes “is not fair”. Designated lanes also created a challenge for private car users as it restricted their movement in the city and in their view increased the volume of traffic in the city. Since the inception of the Rea Vaya poor signage on roads and the lack of overhead signage indicating bus lanes has created a problem for private car users as they are unaware of approaching bus lanes.

Although the Rea Vaya has created a challenge for private car users and the Taxi Industry, commuters who use the system have viewed the system in a positive light. Some of the successes pointed out by participants who use the system, are safety, reliability and cleanliness and has provided an option for commuters in Johannesburg. Prior to the implementation of the Rea Vaya system, commuters had to rely on overcrowded and unsafe taxis and trains; however the development of the Rea Vaya system has provided commuters with alternative public transport system. Additionally, the Rea Vaya has decreased travel time for a number of participants. Customer service is crucial for the survival of any business.

Participants were disappointed and dissatisfied with the poor customer service that they received from bus drivers and stations staff. Although the Rea Vaya staff have all received training, poor customer service prevails. Lack of information has resulted in commuters laying complaints against the system and staff. Frustrated commuters resorted to alternative means of transport. A lack of communication between the Rea Vaya and the Taxi Industry has created tension between the two parties.

The Taxi Industry is of the opinion that the City of Johannesburg “is trying to get rid of them. This could have been caused by the lack of communication. Although the City of Johannesburg had included the Taxi Industry in the negotiations process,

there is currently still tension between the two parties. The economic effects of the Rea Vaya system on various stakeholders were also investigated in this study.

### **6.2.2 The Economic Effect of the Rea Vaya System**

Taxi owners have suffered a loss of income since the inception of the Rea Vaya system in Johannesburg. An increasing number of commuters chose to use the Rea Vaya instead of Taxis, resulting in a decrease in the number of commuters who use Taxis and consequently a loss of income.

Initially when the Rea Vaya system was launched in 2009, paper tickets were used and the fare was affordable compared to taxis; however since the introduction of the smart card system, which was implemented in July 2013, some participants felt that taxis were more affordable. Participants were dissatisfied with the administration fee that they were charged when they loaded money on to their smart cards. This resulted in a number of commuters returning to taxis as an alternative and cheaper mode of transport.

Transit orientated development has not yet been achieved in Johannesburg. However, the city's plan surrounding the development of corridors of freedom provides opportunities for mixed land use and transit orientated development. The success and failures of the Rea Vaya system have been outlined above and the recommendations based on the findings will be discussed below.

### **6.3 Recommendations of the Study**

The study has found that the Rea Vaya is inaccessible to the majority of commuters in Johannesburg. Although future plans indicate an extension of the Rea Vaya network to areas surrounding the city of Johannesburg, the system is not as accessible as taxis. In order to address this challenge there needs to be integration between the different modes of transport. Feeder buses need to operate inside residential areas so that the Rea Vaya may be more accessible to commuters.

A solution to the problem of poor customer service is continuous training of staff and stricter and closer monitoring of customer behaviour. The lack of information and communication regarding smart cards needs to be addressed, notices and signage could help to create awareness of the system as was shown in the case study of Nigeria, where a number of mediums were used to advertise the system and how to use the system.

In order for the Rea Vaya to be more affordable the City of Johannesburg needs to absorb the cost of the loading fee as suggested by Layla. This would result in the Rea Vaya being more affordable and this would meet the needs of the poor. There have been a number of developments of BRT systems around the globe. Areas such as Nigeria, Los Angeles, Columbia, India, and Curitiba have all developed BRT systems (Deng and Nelson 2011). The City of Johannesburg needs to learn from the success and failures of the BRT systems in these countries.

Perhaps the Rea Vaya Management could observe best practice of other transport systems in Johannesburg such as the Metro Bus and Putco and design an onboard fare payment similar to that used by Metro Bus. This was viewed as an efficient payment method by participants as commuters would swipe their cards on the bus as opposed to at the station, as in the case when using a Rea Vaya bus. Putco and Metro Bus has been operational for many years, the Rea Vaya could learn from the success and failures of these two public transport providers and use this to improve the Rea Vaya system. A participant commented on the good service that they received when using Putco and Metro Bus, the Rea Vaya can learn from good customer service from both these service providers. The Rea Vaya Management should also observe best practices from international case studies, where the BRT system has developed and apply those practices to the Rea Vaya.

#### **6.4 Contribution of this Enquiry**

This study looks at the economic and social effects of the Rea Vaya on the various stakeholders in Johannesburg. The study sample was not scientifically representative of commuters or private car users; however the findings provide

qualitative elucidation on a range of issues and concerns to which the City of Johannesburg could devote attention. As this is the only study which has investigated the experiences of users and non-users of the Rea Vaya system, it sheds light on the effect that the Rea Vaya has had on the different stakeholders. This enquiry has provided an in-depth account and can therefore be used in improvement of the system and for the roll out of BRT systems in other provinces. It is obvious from the findings that the City of Johannesburg could realise the need for training of bus drivers and station staff.

Case studies on BRT systems from around the world have shown that the BRT system has both social and economic benefits (Wright and Hook 2007). In South Africa, the BRT system has been developed in Cape Town, Rustenburg, and Johannesburg and recently in Tshwane. It is recommended that in the development of subsequent phases a bottom up approach be used. Public participation is essential for the success of any public transport system. In order to develop a fully integrated transport system there is a need for information sharing and integration between the various public transport providers.

## **6.5 Areas for Future Research**

This study included a total of 125 Participants, as mentioned it is not representative, however, it provides a good indication of the experiences, opinions and attitudes towards the Rea Vaya system. A large scale study needs to be conducted that includes a larger sample, in order to be representative of the population made up of users and non-users of the Rea Vaya. It is recommended that an in-depth study could be conducted that includes more stations as research sites. This study could combine quantitative and qualitative methods of data collection.

Another recommendation is that a study on the impact on the corridors of freedom on people in Johannesburg could be conducted. A further recommendation is that a quantitative study on the impact on transit orientated development and its effect in Johannesburg could be conducted along BRT corridors.

## **6.6 Summary**

This study aimed to investigate the social and economic effects of the Rea Vaya system on various stakeholders by discussing their experiences and opinions towards the system. This chapter presented the main findings of the study. The conclusions and recommendations were discussed and lastly this chapter explains areas for future research.



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## Appendix A: Survey (Commuters who use the Rea Vaya)

1. Do you think that the BRT has achieved its goal of meeting the needs of commuters in the city?

YES

NO

Do you think the Rea Vaya has managed to reduce traffic volumes in the city?

YES

NO

How do you view the Rea Vaya as compared to other modes of transportation?

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Do you think that the Rea Vaya is easily accessible compared to other modes of transport? (Are you restricted to specific routes or do you find that you are able to commute to most places in the city?)

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In using the Rea Vaya has your average travel time been reduced? (If it has approximately by how much, compared to your previous mode of transport?)

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Has the Rea Vaya improved travel conditions for you?

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Can you describe the challenges you face with regard to public transportation in Johannesburg?

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As a person who commutes in the city, do you have any suggestions on how public transportation can be improved in Johannesburg?

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## **Appendix B: Interview with the Taxi Industry**

(The questions below will not necessarily occur in the order listed. Possible follow up questions occur in parenthesis).

What is your general perception of the Rea Vaya Bus rapid transit system?

How has the introduction of the Rea Vaya impacted on your business?

What is your daily route when coming to the city?

What impact does the Rea Vaya have on your daily serviced routes and commuting in the city?

Did you have to change the routes that you service since the introduction of the Rea Vaya?

Where do you think the conflict between the Rea Vaya and taxi owners stem from? (Do you feel that the Rea Vaya is a threat?)

How do you think the conflict between taxi owners and the Rea Vaya Management can be resolved? (Will there ever be a time, where we will have an integration of different modes of transport?)

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

## **Appendix C: Survey with Private car owners**

What are your general perceptions surrounding the Rea Vaya?

What is the main reason why you make use of your car to travel in the city?

How has the introduction of the Rea Vaya influenced/ impacted on your daily commuting patterns?

How do you feel about the dedicated lanes that have been reserved for buses only?

How do you think that transportation in the city can be improved?

## **Appendix D: Interview Rea Vaya management**

In what ways has the Rea Vaya impacted on the social and economic development in Johannesburg?

Has the introduction of the Rea Vaya minimised traffic volumes in the inner city? (By how much has it reduced traffic volumes?)

Do you think that the Rea Vaya is accessible to the majority of the people who commute to the city?

Do you feel that the Rea Vaya is a sustainable means of transport, despite the fact that it is not used by the majority of commuters in the city?

Has development increased along BRT corridors in Doornfontein and Bramfontein, since the inception of the Rea Vaya?

In the future, are there plans to extend the Rea Vaya system to more surrounding city areas, in order to connect to the city?



## Appendix E: Consent Form

Topic: The social and economic effects of the Rea Vaya, Bus Rapid Transit system (BRT) in the Gauteng Province.

The following research is for the completion of a master's dissertation at UNISA. The study aims to investigate the social and economic impacts of the Rea Vaya, by investigating the perceptions of different stakeholders towards the BRT.

Your participation involves being interviewed. All information provided by you will be treated with the outmost confidentiality and anonymity is guaranteed. It is anticipated that there is no potential risk be it physical or psychological that might result from your participation in this study.

I agree to participate in the following study.

I have read the above information regarding the study and was able to ask questions regarding the study.

I agree to my responses being used for research and education purposes on condition my privacy is respected.

I understand that I am under no obligation to partake in this study and that I may withdraw at any time.

Your signature below is indicative that you have read and understood the nature of this research, what your participation involves and that you have agreed voluntarily to participate in this study.

\_\_\_\_\_  
Signature of the participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of principal researcher

\_\_\_\_\_  
Date

**Appendix F: Photograph of Rea Vaya station in Johannesburg**





## **Appendix G: Map of BRT routes in Johannesburg**

## **Appendix H: Map of Taxi routes in Johannesburg**