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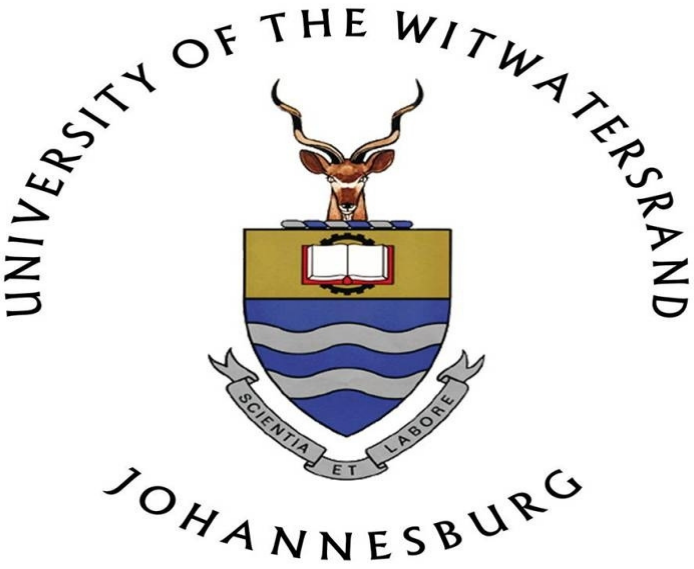
An investigation of the property investment trajectory which is induced by the introduction of bus rapid transit corridors: the perspective of property developers and investors

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Title of the research project: An investigation of the property investment trajectory which is induced by the introduction of Bus Rapid Transit Corridors: the perspective of property developers and investors.

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Course Name: BUQS 7027 - Research Report

Degree: Masters in Building (Property Development and Management)

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DECLARATION

I, Manuel Morwasehla, declare that I have undertaken research at the University of the Witwatersrand for Masters in Building (Property Development and Management). Further declare that the Research Report is my own original work and was never submitted at any other University. Information obtained from other researchers and authors has been indicated and referenced clearly throughout the Research Report.



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Abstract

Purpose - The study sought to understand how the introduction of the Rea Vaya Bus Rapid Transit affect property development along the transit corridor. Also, understand if transit oriented developments are possible in areas which are serves by the bus rapid transit system. Further, understand how communities from disadvantaged area can contribute to the success of the transit-oriented development, since the bus rapid transit system serves such communities.

Design/ Methodology/ Approach – The study is cross sectional as data was collected a single period. The unit of analysis for the study was professionals and inventors, and government officials involved property developments. The data collection instrument was a structured questionnaire which included quantitative and qualitative questions. The questionnaire was an online survey through Google Forms. Thirty professionals in the property development space responded to the online questionnaire and the data was analysis using Statistical Package for the Social Sciences and thematic analysis method.

Findings – The study found that transit-oriented developments can be realised through the introduction of bus rapid transit in the City of Johannesburg. Social development, affordable housing and alleviation of congestion are identified as opportunities which come about by the introduction of bus rapid transit. The level of employment is a critical consideration when deciding on a transit-oriented development investment relating to bus rapid transit. Further, the study found that government can promote transit-oriented developments by relaxing the zoning development requirements. Bus rapid transit can encourage social cohesion.

Practical Implications – The findings of the research are useful to property developers, investors and government officials, in terms of providing in depth knowledge of transit-oriented developments.

1.0. Chapter 1 – Introduction, Research Objective and Chapter Overview

1.1. Research Topic

An investigation of the property investment trajectory which is induced by the introduction of Bus Rapid Transit Corridors: the perspective of property developers and investors.

1.2. Introduction and background of the study

Properties are bought either to be owner-occupied or to be rented out to tenants. Property investment occurs when properties produce rental income and undergo capital value appreciation. This is known as investment value which concerns property owners, while the tenants are concerned with use value of the property (David & O'Leary, 2011). The value of properties is affected by various amenities such as accessibility, parks, toll roads, size and shape of the house, and other public amenities, etc. (Geisler & Daneker, 2000; Fujita, 1989).

Focusing on accessibility, literature shows that a relationship exists between property values and various mode of accessibility (Adair, Alastair; McGreal, Stanley; Smyth, Austin; Cooper, James; Ryley, Tim, 2010). In general accessibility is gained through highways and railways in a particular neighbourhood (Bruinsma, Frank; Pels, Eric; Priemus, Hugo; Reitveld, Piet; Van Wee, Bert, 2008). According to Benjamin & Sirmans (1994) the levels of rent and property value are determined by the proximity to place of employment, shopping, etc., and the proximity is provided through mobility.

The Bus Rapid Transit – henceforth abbreviated as bus rapid transit, as a mode of accessibility, has been introduced as an alternative from light weight railway transit which is more suitable to low density development away from the CBD (Cervero & Kang, 2009). The City of Johannesburg has adapted transit-oriented development strategy known as Joburg 2040 – the Growth Development Strategy. The overall objective is to promote sustainability by providing affordable bus rapid transit System, mixed use and high density development along the transit corridor, and address social inequalities which arose from apartheid (City of Joburg, 2015).

1.3. Problem Statement

The actions of government have significant effects on the economy, and in terms of the property markets, investments are positively and negatively affected by the decisions or actions of government (e.g. Lowies & Hall, 2016). Through the actions of the aparthied government communities were established far away from the centre of economic activity. These communities are disadavantaged by their physical or geographical location. According to Horowitz cited in Menou & Mchombu (2007), disadvantaged communities have lower living standards and a huge gap exist between their ability to meet their own needs and the available resources. The local governement is addressing the problem of social inequality by committing public funds to invest in public goods such as the Rea Vaya bus rapid transit in order to stimulate growth in disadvantaged communities (City of Joburg, 2015).

The main concern is whether accessibility provided by the Rea Vaya bus rapid transit encourages broader economic participation, which is property development and investment, in disadvantaged communities through increases in rentals and property values. The vision of local government is to stimulate economic growth through transit investment, while property developers and investors objective is to make investment decisions which will yield higher returns. The challenge is aligning the developers and government investment decisions in order for transit-oriented development to be successful. At the moment, there is no evidence that transit oriented developments are taking place through investment by private developers.

The most studied mode of accessibility is the light weight railway in which a positive relationship was established between property values and accessibility for properties found in close vicinity of the railway stations (e.g. Debrezion, Pels, & Rietveld, 2007; Dziauddin, Powe, & Alvanides, 2014; Liu, Deng, & Le Vine, 2016; Jones & Ley, 2016). However, fewer studies exist for Bus Rapid Transit as a mode of accessilibity and the impact it has on property values and neighbourhood quality (e.g.Cervero & Kang, 2009; Munoz-Raskin, 2007). Further the studies have taken place in developed countries like Canada, USA, etc. (e.g. Revington & Townsend, 2016; Liu, Deng, & Le Vine, 2016); and fewer studies have been undertaken in developing countries like India (e.g. Cheshmehzangi & Thomas, 2016).

An investigation evaluating the impact of bus rapid transit accessibility on property values and neighbourhood quality is important because the current development pattern is highly dependent upon automobile usage to access places of employment, retail, recreation and other places (Freilich, 1998). The high usage of automobile has caused congestion, emission of greenhouse gases, and governments responded by introducing transit corridors to mitigate the negative impact high automobile usage (Bowes & Ihlanfeldt, 2001).

1.4. Research Problem

There is not enough property development occurring along the Rea Vaya Bus Transit which could benefit disadvantage communities and encourage broader economic participation.

1.5. Aim of the research

The study sought to understand how the Rea Vaya Bus Rapid Transit affect property development along the transit corridor.

1.6. Research Questions

- Are developers investing in transit-oriented development along bus rapid transit?
- How does access provided by the Rea Vaya Bus Rapid Transit affect property values?
- If access affects property values positively, is transit oriented developments fostering social cohesion or acerbating social inequality?
- Does the government provide enough incentives for developers to invest in transit-oriented development and which policies, laws and regulations should change in order to promote transit oriented develop?
- What are the factors affecting the implementation of transit-oriented development?

1.7. Research Objectives

The objectives of the study were as follows:

- Investigate if transit-oriented development are taking place in areas serviced by the bus rapid transit system; and evaluate elements which will make transit oriented development successful.
- Evaluate government's incentives for developers to invest in transit-oriented development.
- Evaluate which policies, laws and regulations should change in order to promote transit oriented develop.

1.8. Research Hypothesis

This study hypothesis that there is no evidence of transit-oriented development occurring along the bus rapid transit corridor.

1.9. Significance or contribution of the study

The study is beneficial to local government as the rise in property value increases the property taxes collected which can be a good justification for future capital investments into the bus rapid transit system (Gert & Boshoff, 2013). In order for transit-oriented development to be successful, property developers and investors need to understand the impact of bus rapid transit on property values and neighbourhood; the understanding will help them to invest in a manner which yields higher returns (Guthrie & Fan, 2016). Further, previously disadvantaged communities will benefit from transit-oriented development, thus encouraging broader economic participation.

1.10. Summary of chapter and brief chapter overviews

Property investments are driven by the value of property and the level of rent generated by the property. In term, the level of rentals and property values are determined by the amenities which directly and indirectly affect the property and the neighbourhood. They are a number of amenities such as accessibility, parks, toll roads, size and shape of the house, and other public amenities, etc (Geisler & Daneker, 2000; Fujita, 1989). The accessibilty amenity relates to ability of residents to accesss place of employment, shopping centre, recreational centres and other places of importance to the residence.

There are various modes of accessibility available to households such as cars, walkways, taxis, buses, trains, gautrain and bus rapid transit. The interest of this study

was to understand how the introduction of the bus rapid transit system has affected property investment trajectory. Also, understand if transit oriented developments are possible in areas which are serves by the bus rapid transit system. Further, understand how communities from disadvantaged area can contribute to the success of the transit-oriented development, since the bus rapid transit system serves such communities.

2.0. Chapter 2: Literature Review

2.1. Introduction

The purpose of the literature review was to identify and understand existing literature regarding property values, transit-oriented development and other factors which affects transit-oriented developments. In studying the existing literature, research gaps and opportunities were identified.

The chapter is set out in following manner: definition of property values, bus rapid transit corridors, value capture, and transit-oriented development, neighbourhood level of quality, background of previous studies, and research methodologies used in this area of study. The last section of the chapter is the conclusion in which research gaps and opportunities are identified.

2.2. Definition of property values

Property is a right of ownership of an asset protected by law. The right involves the ability to enjoy exclusive use, to capture value, transfer and change the form of the item (Pejovich, 1990). Property value is derived from the tangible right of ownership. In law, property can be viewed as an entitlement a person has on a tangible thing against anyone (Sprankling, 2014).

Value is usually defined from the perspective of a customer relating to the benefits received and sacrifices incurred from the usage of a thing (Rech, et al., 2008). The price determined among the market participants to sell an asset is considered value, assuming that they acted with full knowledge and not coerced to conclude a transaction (Epstein, et al., 2009). In relation to property, value can be views as value-in use and exchange value. The exchange value is primary determined by the market. The level of rent which a property can attract and appreciation of the price of the property over time determines the value in exchange (Wyatt, 2013). The market value of a property is affected by the following characteristics (Janssen & Soderberg, 1999, p. 359): “locational attributes, size, age, types of use, composition of rentable space, construction zoning, future redevelopment opportunities, adjacent land use, transport links, etc.”

Accessibility, space and environmental amenities are important considerations by households when deciding on a location to live in (Fujita, 1989); while landowners want to achieve the highest and best of use of the land they own (Munizzo & Musial, 2010). The Bid Rent theory is used to define the decision making process faced by households and landlords; and according to Floyd & Allen (2002) Bid Rent theory illustrates the maximum price or rent a potential tenants are willing to pay for a specified piece of land or property given the available level of accessibility, space and environmental amenities, etc. (Fujita, 1989).

2.3. Property Development

Property Development is a wide discipline or process which involves the purchase of land to build new structures for purposes determined by the developer. The development process is not limited to the purchasing of land but includes the appraisal of the property market value. Renovation of existing buildings, alteration of structures, adaption and construction of new buildings are property development. The property development process further includes leasing and sales of land, residential houses, sectional title schemes, office buildings and other special purpose buildings (Harvard, 2014). Cadman & Topping (1995), defined property development as, “a process that involves changing or intensifying the use of land for profit.” They further noted that property development does not only involve the buying and selling for profit only but involves the use of labour, infrastructure, material, land and finance to produce the desired outcome (Cadman & Topping, 1995).

According to Reed & Sims (2015), property development is unique and present various challenges depending on the characteristics of the location and the country in which the development is taking place. A development in a rural area will differ from a development in the city. At the heart of the property development is risk and profit. The development process takes into account the various elements which affects profitability of the completed development. Further, the development process includes the combination of labour, material, land and finance to produce varying levels of profit (Reed & Sims, 2015).

The property development has the following stages or processes as indicated by the Reed & Sims (2015):

- Initiation
- Investigation and analysis of viability
- Acquisition
- Design and costing
- Consent and permission
- Implementation
- Leasing, managing and disposal

2.3.1. Initiation

Initiation stages is the initial conceptualisation of a parcel land in terms of its potential to a different or more intensive use. The developer discovers a demand for particular use of the land which might be profitable (Cadman & Topping, 1995).

2.3.2. Investigation and analysis of viability

The investigation and analysis of viability stage is the most important stage of the property development process. The stage includes market research and financial appraisal of the parcel of land identified in the initiation stage of the property development stage. The analysis employed in this stage are to determine the highest and best use of the proposed development (Cadman & Topping, 1995; Reed & Sims, 2015). The outcomes of the investigation and analysis of viability assists property developers and investors with the decision-making process.

2.3.3. Acquisition

The outcome of the decision-making process is the purchase of the parcel of land or the proposed development. The decision-making process is influenced by the level of risk, uncertainty and the potential economic returns. The acquisition stage involves the legal and physical investigation of the parcel of land (Reed & Sims, 2015). The legal investigation looks into issues of ownership, zoning requirements and any other municipal by-laws which may affect the profitability of the development. The physical investigation involves survey of the ground, surrounding areas and positioning of the proposed development (Cadman & Topping, 1995).

2.3.4. Design and costing

The design and costing stage involve the assembling of a professional team which will undertake several design activities. The design activities are based on the client brief. At this stage, all aspects of the development site are investigated in order to identify and minimize identified risks. The main aim is to identify a particular design which offers the highest and best use of the development site. The highest and use of the site also involves cost estimating of various designs in order to identify which design offers lower cost criteria and maximisation of profits (Reed & Sims, 2015).

2.3.5. Implementation

Once the appropriate design is completed and costed, the developer will have to decide if the design is going to implemented. Implementation involves the developer raising capital from lenders and investors (Forlee, 2015). Further, the process involves the identification of a suitable construction company to construct the development, municipal approvals and by laws.

2.3.6. Leasing, managing and disposal

Depending on the purpose of the development, the developed property maybe leased, managed and disposed. Leasing of the property involves acquiring tenants who will pay an agreed level of rent. This generates income for the developer and investors. When the timing is right, the property develop may decide to sell the development at a higher value than the cost of developing the development. (Reed & Sims, 2015).

2.4. Property Developer

A property developer is an individual who is able to skilfully work through the development process in order to derive profits and reduce the risk exposure of the development. It is an individual who can combine all available resources to attain a successful property development. They are specialists in coordinating scarce and valuable resources such as land, material, labour and finance. They are rational and have a good judgement to make investment decisions which yield profits (Casson, 2003).

Kohlhepp & Kohlhepp (2018), defined property developers as entrepreneurs. They have the ability to successfully combine the factors of production to produce a finished product which has greater value than the cost of the component's inputs. They conduct the activities of the enterprise to derive economic benefits as outcomes of their risk-taking behaviour. They are considered prominent citizens who construct cities and other important infrastructure (Kohlhepp & Kohlhepp, 2018).

The Urban LandMark (Unknown) definition of a developers is more accurate and concise. The definition encapsulates the meaning of a developer very well. In their very words, they describe the activities of developer as follows, "developers study the property market carefully and then, based on the property cycle, and risk and profit calculations, they acquire land and develop it, with a specific product in mind."

2.5. Types of Developments

According to Forlee (2015), there are two main categories of developments are residential developments and commercial development. The difference on the two lays in how the generate income. The value of a commercial development is depending on the income of the it generated; while the value of a residential development is dependent on the demand and supply of the residential properties (Forlee, 2015). In the research by conducted by Ho, Rengarajan & Lum (2013), noted that investors have the opportunity to invest a diversified portfolio which includes residential, commercial, industrial and hospitality.

2.6. Bus Rapid Transit Corridors

The Bus Rapid Transit, thereon refer to as the bus rapid transit, is mode of public transportation with dedicated physical lanes for exclusive use. The bus rapid transit system provides transit stops which are usually covered; the transit stops usually serve as a weather protection and the users pay before boarding the buses. Further, local governments prefer this mode of transport as opposed to railway because of low cost of implementation and it provides great capacity to large number of passengers (Suzuki, et al., 2015).

The implementation of the bus rapid transit system is intended to promote sustainable development in the fabric of the community in which they operate (Munoz & Paget-

Seekins, 2016). Sustainable development encourages developments in such a way that the environmental, social and economic resources are used to meet the current needs without depleting the resources to enable future generations to meet their own needs (van Wyk & Xulu, 2011).

Environmental sustainability relates to the use of natural resources without compromising the ability of nature to remain intact, and that current use of the natural resources should not compromise future generation use (Vezzoli & Manzini, 2008). Social sustainability is a process whereby current and future generations use systems to create liveable communities which are equitable and promote diverse (Dujon, et al., 2013). Economic sustainability relates to financial feasibility of attaining social and environmental sustainability (van Wyk & Xulu, 2011).

In order to promote sustainable development through the bus rapid transit system, public transportation, users, pedestrians and cyclists, and enforcement of public street space should be prioritised (Munoz & Paget-Seekins, 2016).

According to Munoz-Raskin (2007), the introduction of the Bus Rapid Transit has an effect on the properties which are in close proximity to the access point. The property values are influenced by changes in accessibility and the subsequent pattern changes of land use (Boshoff, 2013). Schuetz (2015) indicated the following as benefits of investment in transit developments: increase in accessibility to existing jobs and public spaces, encouragement to develop new rental stock near the transit, minimization of vehicle traffic and congestion, and the stimulation of physical and economic developments.

The purpose of investment in public transportation is to increase the supply of labour in the urban centres, reduce traffic congestion and pollution from cars (Daraio, C., Diana, M., Di Costa, F., Leporelli, C., Matteucci, G. & Nastasi, A., 2014). However, the research conducted by Revington and Townsend (2016) indicated that rental prices within the catchment area of the transit have a tendency to increase and according to Boshoff (2013) this tendency causes poor households experience hardship and relocate to cheaper areas.

2.7. Value Capture

The concept of value capture relates to the benefits property owners derive from using public infrastructure, such as public transit system, medical facilities, etc. Value capture is a process whereby the value of a property increases due to local government investment into public assets and the subsequent ability of government to collect higher property taxes, thus increasing its revenues (Asian Development Bank, 2016). The value of a property is affected by sets of attributes as noted by Mathur (2014):

<table>
<tr>
<td>

Structural Attributes:

Size of the living space
Lot size
Age of the house
Number of bedrooms and bathrooms, etc.

</td>
<td>

Locational attributes

Slope of the land parcel
Traffic noise
Air pollution
Views offered by the house

</td>
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<tr>
<td>

Neighbourhood quality level

Quality of roads
Public transportation
Public services, etc.

</td>
<td>

City level attributes: Demand and supply of housing

Employment opportunities
Population growth
Zoning

</td>
</tr>
<tr>
<td>

Regional and National attributes:

Mortgage rates
Construction Cost
Unemployment rates

</td>
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</table>

The neighbourhood attributes are benefits which results from the action of local government. The benefits, such as the accessibility, may affect neighbouring property values positively which should be capitalised into higher property values (Mathur, 2014).

2.8. Transit Oriented Development

Transit oriented developments, hereon refer to as TOD, is a mixed-use development which is close to a high-quality transportation system (Guthrie & Fan, 2016). The main aim of transit-oriented developments is to reduce high auto dependency and encourage walking and transit trips (Ewing, et al., 2017). According to Ewing,et al., (2017), transit oriented developments is an urban development which has a relatively high density housing coupled with friendly pedestrain design in a mixed land use development. According to Quinn (2006), sustainble growth is achieved through transit oriented developments using the following principles:

- Regional growth to be organised in a combat manner and to be supportive of public transportation.
- Promote mixed use development by placing within the transit stop, commercial developments, housing, jobs, parks and civic use.
- Connect local destinations through pedestrian friendly street routes.
- Create diverse community with a mix of housing types, densities and costs.
- Buildings to orientate around public spaces and neighbourhood activities.
- Encourage redevelopment within existing neighbourhoods.
- Promote sustainable developments

The concept of transit-oriented developments was adopted from the Calthorpe's concept of pedestrian pocket which had an objective of reducing private car usage from 85 percent to 60 percent driven by usage of public transit, walking and cycling (Quinn, 2006).

2.9. Factors affecting transit-oriented developments

According to Cervero (2004a) transit oriented developments are affected by tax incentives, public sector participation, and development of mixed use and unsubordinated ground leases. In the affordable housing space, the tax incentive amount is extrapolated from the development cost, but the cost of acquiring the land is excluded. However, the exclusion of the cost of land from the calculation of tax incentives may disadvantage developers as the land cost may be driven by it being a

transit oriented development site. In some cases, the tax incentives are allocated used specified to low income earners (Wise, 2009).

Public sector participation is very important in the success of transit oriented development. The public sector initiate the development of transit corridors. Further, the introduction of laws and regulations by government around the transit development play a crucial roles in the success or failure of transit oreinted developments (Belzer & Autler, 2002). In Tokyo, the floor area ratio was relaxed in order to stimulate developments around the railway stations. This means that the highest FAR values are allocated to developments within the sub centres and regional centres (Curtis, et al., Unknown).

Mixed use development relates developments on land which different uses are allowed. The development encourages urbanisation, sustainable lifestyles and higher density. Some of the advantages of mixed use development include reduction in travel time, possible low rentals and social inclusivity (Coupland, 1997).

According to Cervero (2004a) unsubordinated ground leases are contractual agreements between the lender and the developer. The lenders assumes the risk of the development not succeeding as planned.

2.10. Neighbourhood level of quality

Galster (2001 p. 2112) cited Lancaster in defining the word neighbourhood as follows, “Neighbourhood is the bundle of spatially based attributes associated with clusters of residences, sometimes in conjunction with other land uses. “The attributes of neighbourhood as noted by Galster (2001 p. 2112) are:

- Structural characteristics of the residential and non-residential buildings
- Infrastructural characteristics such as roads, dams, etc.
- Demographic characteristics of the resident population
- Class status characteristics of the resident population
- Tax and public service package characteristics
- Environmental characteristics
- Proximity characteristics
- Political characteristics

- Social-interactive characteristics
- Sentimental characteristics

2.11. Effects of amenities on property values

2.11.1. Golf Course Developments

Property values of homes are affected positively in developments which are in a quality golf course. Home owners are attracted by the large vacant lots and not necessarily by the sport of golf (Mothorpe & Wyman, 2017). One of forces affecting property prices in a golf course development is the slightly newer and large houses as compared to interior developments. Golf course is an amenity which affects the value of properties situated along the course. Further, the premiums of property values are higher compared to other non-golf estate developments (Shultz & Schmitz, 2009).

2.12. Regulations, laws and policies incentives

The land use patterns, zoning, setbacks and design within boundary area of a transit development are crucial for the success of the transit oriented development. All regulatory provisions required to implement developments should be prioritised, especially those provisions which encourages active and walk able streets, building density and intensity, and the integration of transit (Dittmar & Ohland, 2004).

The South African systems mandates municipalities to play a governance role and ensure that developments are consistent with government policies and area development plans. There are two government policies or legal instruments which the municipalities are (Urban LandMark, Unknown):

- The former town-planning and township establishment Ordinances which regulates rezoning requirements.
- The Development Facilitation Act 1995.

2.13. Background on previous related studies on property values

A study was conducted by Guthrie & Fan (2016) to investigate how developers perceive transit-oriented development through structured interviews. It was found that transit access is beneficial factor to support successful developments. A case study conducted in Laguna West in the US found that mass transportation development is

not a realistic goal in urban areas with low density, and that there are social and economic forces which hinder the success of transit-oriented development (Quinn, 2006). In the study conducted by Freilich (1998) found that the development community perceive transit-oriented development to be risky than the traditional development methods, because of the departure from standard development standards. However, transit-oriented development was found to encourage mixed used development along the transit corridor as concluded by Ewing,et al., (2017).

The effect of transportation amenity on property value resilience during recession was examined by Zhang,et al., (2016), and they found that property values are positively resilient compared to properties which do enjoy the transportation amenity benefit. According to Debrezion, Pels, & Rietveld (2007), railway accessibility has a greater positive impact on commercial properties in relation to residential houses; and particularly commuter railway affects property values positively in comparison to light and heavy railway; moreover, when considering other modes of access, such as highway motor access, railway has a low impact on property values. Property values are negatively impacted if the property is in close proximity to transit corridor but does not enjoy access benefit (Kilpatrick, et al., 2007). In the study conducted by Gert & Boshoff (2013) found that low income area experiences a positive effect on property values compared to affluent neighbourhoods.

The success of the increase in property value depends on the routing of transportation system and other factors such as the desirability, income and quality of pre-existing mode of access available in the neighbourhood (Dziauddin, et al., 2014). The quality of the bus rapid transit is highly valued by middle income households and thus bus rapid transit has a positive effect on the property values; however, low income households are negatively affected (Munoz-Raskin, 2007). The research conducted by Revington & Townsend (2016) indicated that rental prices within the catchment area of transit are high and households experience hardship due to the inability to afford properties which are in close proximity to the stations.

According to Liu, et al., (2016) investment in public transportation brings about social impacts which are both negative and positive. In their research, they found that high income earning households are found in close proximity to the stations, while low income households have relocated.

2.14. Research methods used in this problem area

2.14.1. Qualitative methods – Transit oriented developments

A qualitative method was used to investigate how developers view transit-oriented development through the use of interviews. The interview manuscripts were analysed using word frequency and topic co-occurrence (Guthrie & Fan, 2016). Guthrie & Fan (2016:4) stated that, "word frequency analysis offers a simple but comprehensive first look at recurring themes in the interviews." and they further noted that topic co-occurrence illuminates the important issues around the promotion of transit-oriented developments. A questionnaire as research instrument will be the best method to investigate the topic, because it enables the researcher to focus on specific themes and to arrange themes in the order of importance (Wilkinson & Birmingham, 2003).

In the case study conducted by Quinn (2006), the research method was not clearly defined, but the case study was an intensive literature review of the components of transit-oriented developments and a comparison with the status of Laguna West development. A similar methodology was used by Freilich (1998) in which 300 agencies were surveyed to evaluate the extent of transit-oriented developments initiatives in the areas operated by the agencies. In the study conducted by Ewing,et al., (2017), a master development plan of a single developer was used as the sample. The sample imposed significant limitations on the ability to generalise the findings to other developments. A study with a larger sample would enhance the significance of the study.

2.14.2. Quantitative methods – transit-oriented developments, Property values and Transit Corridors; and Gentrification

In general, the methodology used to evaluation the relation between transportation, property values, transit-oriented development and gentrification is quantitative (Zhang,et al., 2016; Debrezion, et al., 2007; Liu, et al., 2016). A hedonic modelling is key analytic method of assessing the relationships and uses various amenities and distance from the corridors (Kilpatrick, et al., 2007). A better description of hedonic modelling is provided by Janssen & Soderberg (1999) in which they view the models as a tool to measure non-observable qualities of property such as air quality, good access and other amenities in the neigbhood. The hedonic price modelling was

adapted from the consumer theory which is that the determinants of the price of a commodity are the characteristics of the commodity (Dziauddin, et al., 2014).

Data needed to construct the hedonic model is house prices over a period of time (Zhang, et al., 2016), and limited to a specific geographical area of analysis (Gert & Boshoff, 2013).

Some of the studies have developed better models such as the Geographically Weighted Regression which can represent the value of a property as a function of transportation accessibility, structural or physical characteristics, location attributes and socioeconomic characteristics (Dziauddin, et al., 2014).

2.15. Gentrification

Gentrification is a process whereby neighbourhoods with poor households experience economic reinvestment (Boggess & Hipp, 2016), and eventual displacement of residents (Maloutas, 2011). According to Smith, (1979) gentrification is a movement of capital rather people back to the city after a long period of deterioration and depreciation. Historically, the decline industrial and manufacturing activities before the 1959 and growth of the middle class induced the movement of affluent households out of the city to the outer suburbs. The movement of the middle class caused to the deterioration and depreciation of the inner city (Smith, 1979). The middle class were replaced with poor and unemployed households as the rents are low enough for the poor and the unemployed. Further, a ring of poverty and lack of services characterise the neighbourhoods along with crime and violence (Rankin & Mclean, 2015). The sociocultural transformation makes in the neighbourhoods makes it harder for the low-income groups to stay (Rankin & Mclean, 2015).

Boggess & Hipp, (2016) noted that the process of gentrification requires the transformation of existing house stock which yield higher property values. The presence of historic qualities architectural building in the inner city is essential for reinvestment (Zukin, 1987; Hamnett, 2003). The emergence of the service industry has created a need by the middle class to invest in properties which are close work places and other social amenities (Zukin, 1987). However, the study by Sigler & Wachsmuth, (2016) shown that gentrification is a global phenomenon which is not limited to inner cities, but any location with a housing stock which can be gentrified.

According to La Grange & Pretorius, (2016) gentrification is tool used by the government by capital investment, such as investing in public transportation systems. Butler & Lees, (2006) defined the global phenomenon of gentrification as the social replacement rather than displacement of the social class structure which impact relations in communities.

2.16. Conclusion: Identification of research gaps or research opportunities

Based on the above analyses of literature and definition of concepts found in the field of research, a summary of research gaps and opportunities will have highlighted. Firstly, the most studied mode of access is railway and highways in developed countries (Liu, et al., 2016; Dziauddin, et al., 2014; Jones & Ley, 2016), and there is limited study on how bus rapid transit affect property values in developing countries (Munoz-Raskin, 2007).

Secondly, the concept of transit-oriented development is being adapted by the developing countries as a mechanism to encourage sustainable developments (Quinn, 2006). This type of development encourages use of public transportation and less reliance on automobile to access places of employment, retail and etc. (Guthrie & Fan, 2016). In literature conflicting views exist regarding the sustainability of transit oriented developments; as the access provided by the development has a positive impact on the property values (Gert & Boshoff, 2013), but the impact on the low and middle income households is negative and present the presence of gentrification and displacement (Ley & Dobson, 2008; Rankin & Mclean, 2015). The City of Joburg has adapted transit-oriented development as a strategy to address the urban sprawl and social divisions and inequality. The strategy is known as Joburg 2040 – the Growth Development Strategy. The overall objective is to promote sustainability by providing affordable bus rapid transit system, mixed use and high-density development along the transit corridor, and address social inequalities (City of Joburg, 2015). Research opportunities exist to prop the following:

- How does access provided by the Rea Vays Bus Rapid Transit affect property values?
- If access affects property values positively, is transit oriented developments fostering social cohesion or acerbating social inequality?

- Does the government provide enough incentives for developers to invest in transit oriented development and which policies, laws and regulations should change in order to promote transit oriented develop?
- What are the factors affecting the implementation of transit oriented development?

The hypothesis can be borrowed from Guthrie & Fan (2016) stating that significant obstacles exist which hinders the implementation of transit-oriented development in the Johannesburg Metropolitan such as current regulations. Developers do not have enough incentives to investments in transit-oriented development, particularly if the transit stop is the bus rapid transit such as Rea Vaya Rapid Transit.

Thirdly, an opportunities exist to test consumer theory and bid rent theory in relation to accessibility and property values, and how consumers interact with various amenities presented to them particularly in developing countries (Janssen & Soderberg, 1999). The methodology for these type of research is the hedonic modelling (Zhang, et al., 2016)

Lastly, previous studies have limitations which hinders the researchers ability to generalise their findings (Ewing, et al., 2017). A large sample and a study in a different geographic area will enhance the significance and contributions of previous studies if similar results are found.

3.0. Chapter 3: Research Methodology

3.1. Introduction

In this chapter, the research methodology will be identified and justification of the preferred research method will be provided. In general, the preferred research strategy is that of a mixed research method: quantitative and qualitative research strategy. The structure of the chapter includes exploring research philosophy, research design and strategy, population, sample size and sampling method/technique, data collection method and questionnaire administration, data analysis, and ethical considerations. The final section of this chapter provides the general findings and justification of the research methodology chosen.

3.2. Research Philosophy

The type of this study is cross sectional, as the data will be collected at single period in time (Rothman, et al., 2008). In this type of study the data is collected from a group of people, customers and etc who are chosen as a unit of analysis at a single period in time in order to derive conclusions of the research (Parasuraman, et al., 2007).

The unit of analysis in this study are real estate professionals, property developers and investors, and government entities involved in the development of bus rapid transit in Johannesburg. Cross sectional study will be beneficial for this, because it is efficient and saves time as the information or data is collected at a single period in time, and it will be convenient for time frame of this study, which is a year (Troy, 2006).

There are two main philosophies which are positivism perception and interpretivist perception. The positivism philosophy uncovers knowledge by understanding events through empirical research; while interpretivist is a research philosophy which relies on the social constructs to give meaning to events (Schutt, 2006). This study investigated the property investment trajectory which is induced by the introduction of bus rapid transit corridors; in particular, the research interest in uncovering the perspective of property developers on transit oriented development. Based on the research problem and objective, the philosophy of the study has taken the form of interpretivist philosophy.

There is a need explore the perception of property developers on the phenomena of transit-oriented development in Johannesburg. The interpretivist perception is important for this research as the interaction of individuals creates knowledge through interpretation and responses to events when norms and values change (Burton & Bartlett, 2005).

The purpose of the research questions in this study was to uncover if developers are investing or interested in investing in transit oriented development along the bus rapid transit. Based on the research questions, the study was an exploratory research. Exploratory research objective is to describe and understand a phenomenon in a deeper manner in order to be able to generalise the findings and thus creating knowledge (Stebbins, 2001). According to Majundar (1991), exploratory research is applicable where little is known about the problem being examined; this type of research seeks to clarify and substantiate concepts. Further, the research was convenient because of low cost and less time requirement.

3.3. Research Design and Strategy

The research methodologies employed in this study was a mixed research method approach. The mixed method approach includes the use of quantitative and qualitative research strategy to collect and analysis data. The mixed method is advantageous because the strengths of one method complement the weakness of other method (Creswell, et al., 2003). The quantitative methods is objective and the results can be generalised with ease; while qualitative methods is subjective as it depend upon the individuals view points (Johnson & Onwuegbuzie, 2004).

The initial quantitative strategy involved obtaining quantitative data from the City of Johannesburg from which a hedonic regression analysis will be employed to analysis the strength of property values. The data required was going to be for a neighbourhood which has the bus rapid transit system, while the control neighbourhood was going to be that which does not enjoy the advantages of bus rapid transit system. The data was going to include the property values, number of bedrooms, size of the erf and other amenities. However, there were challenges in obtaining data from the City of Johannesburg. A questionnaire was structured in a way in which qualitative and quantitative data was obtained.

The qualitative strategy will involved opened ended questions to property developers and investors, government officials and real estate professionals. The aforementioned participants were a unit of analysis in order to describe the events around the success or lack thereof of transit oriented development. The sample of the population was selected using convenience sampling. The participants were selected based on availability and accessibility; and the method was cheap and simple to use (Ellisomn, et al., 2009).

The physical scope of the study was Johannesburg in terms of the data collection and analysis. The Rea Vaya Phase 1A services the route between Ellis Park in Doornforntein and Soweto. The Phase 1B servies the route between Thokoza Park and Joburg CBD; while Phase 1C services the route between the Hillbrow and Sandton (Rea Vaya, 2019). The study focuses on the properties which are found along the Rea Vaya routes found in the City of Johannesburg.

Figure 1 is adapted from Creswell et al. (2003, p. 167) which indicates a method whereby the quantitative results are explained through qualitative strategy. The idea of the research method was to obtain quantitative data from the City of Johannesburg and analyse the data using hedonic regression. Quantitative research was undertaken through the use of Interviews.

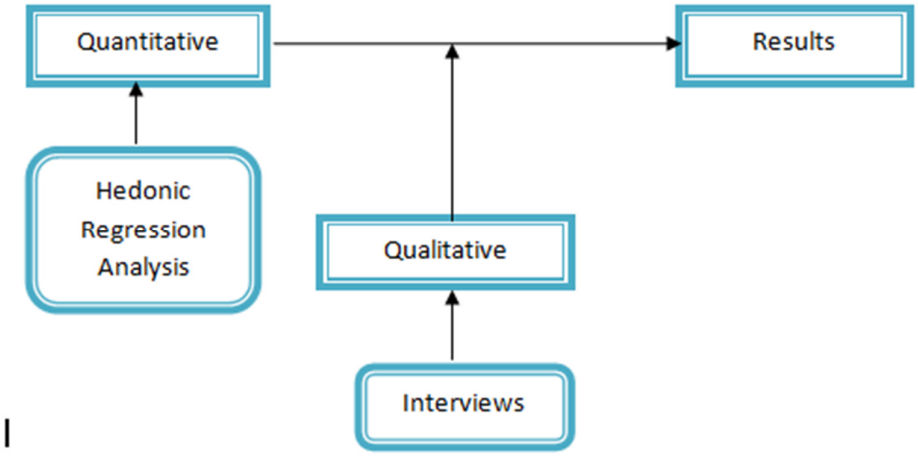


Figure 1: Research Methodology

3.4. Population

In order to identify a representative sample and suitable contestants, the population must be defined in the area of research. According to Drew, et al., (2008) a population is all of the elements which are a focus of an investigation; the elements of the study maybe objects, a group of people and events.

The population of this study was all property developers and investors, government officials who are involved in property development and real estate professionals found in the City of Johannesburg. Quantity Surveyors, Project Managers and other professionals are involved in property development projects (Shafiei & Said, 2008).

3.5. Sample size and Sampling method/technique

A sample size is a subset of the population being studied from which observation will be drawn and statistical inferences drawn regarding the population. Sampling is important as it is not practical to study the entire population due to cost constraints (Bhattacherjee, 2012). The characteristics or composition of the population will determine the correct sample size (Bailey, 1994).

There are two sampling techniques, namely probability sampling and non-probability sampling. According to Tayie (2005) there are four considerations in choosing the appropriate sampling technique, which are purpose of the study, cost versus value, time constraints and amount of error allowed. Probability sampling technique includes cluster sampling, matched-pairs sampling and stratification; the technique systematic which provides practical sample designs (Kalton, 1983). Non-probability sampling includes convenience sampling, quota sampling and Expert sampling (Bhattacherjee, 2012).

The online questionaire was distributed to professional who are involved in property developments found on LinkedIn and property development companies.

3.6. Data collection method/questionnaire administration

There are numerous ways of data collection available to a researcher. Harrell & Bradley (2009) noted the following data collection methods: surveys, interviews, observations, extraction and secondary data sources. Surveys use structured and semi-structured questionnaires to collect data for which the researcher can compared

responses from different respondents for the same question (Cloke, P., Cook, I., Crang, P., Goodwin, M., Painter, J. & Philo, C., 2004).

Observation relates to the data collection method whereby the researcher does not interact with the participants; this is so that the findings can be generalised and to achieve validity. Further, participants are observed in their natural environment rather than in a laboratory (Jackson, 2008).

Extraction is a method whereby the researcher searches for information from available sources such as annual reports of companies, articles and books to draw conclusions about the event being studied (Brown & Sleath, 2016). Secondary data sources are information collected and compiled by someone else and inferential statistics is used to analysis the data (MacInnes, 2017).

The research strategy used in this study was a mixed method strategy, the research questionnaire was prepared which had quantitative and qualititative questions. The was distributed using google forms and emailing to the selected participants.

3.7. Data collection instrument

Data collection instruments are examined based on validity and reliability. Validity of an instrument relates to its ability to measure the concept accurately; while reliability of an instrument relates to its ability measure the concept consistently (Kazandjian & Sternberg, 1995). According to Thyer (2010) researchers must use research designs which will yield empirical groundness, generalizability and minimization of bias on the data collected and the findings derived from the study.

In this research, the data collection instruments was structured questionnaire which included qualitative questions. However, the researcher had intended collect data which relates property prices on the bus rapid transit routes; and use hedonic regression analysis to understand the impact of the bus rapid transit on property values quantitatively. This availability of the information was a challenge and thus the methodology was abunded.

3.8. Data analysis

In qualitative research, there are three key combinations for effective and proper data analysis. The first key pertains to the views and choices of the researcher which

influences the data collected and analysis. Secondly, the methods and design to collect data determine the type of data analysis technique to be used. Thirdly, the process is impacted by the technique used to display the findings and theoretical interpretation of the collected data (Grbich, 2013).

Questionnaire was the data collection method used in this research, a thematic analysis technique was employed for qualitative data and SPSS used for quantitative data analysis. Thematic analysis involves the identification of the ideas within the data using grounded theory to match with the raw data (Guest, et al., 2012).

3.9. Ethical Considerations

The research was conducted based on the following the ethical guidelines of the University of the Witwatersrand: Guidelines for Human Research Ethics Clearance Application/ non-medical. The ethics application forms were completed According to the University of the Witwatersrand, Johannesburg ethics application form for School of Construction Economics and Management. The main sections of the Ethics Application Form consisted of submission of the completed ethics application form, research proposal, proposed research instruments, participant information sheet and consent form.

The above-mentioned documents were submitted for approval by the School of Construction Economics and Management. A conditional approval of the research proposal and research instruments was given. The approval had the following restriction: the researcher will not audio record any conversation with the participants.

The initial methodology of reaching the participant was to email a pdf copy of the structured questionnaire, participant information sheet and consent form. The method proved to be inefficient as the participants were required to print, complete and email back. Thus, the rate of respondents was very poor. As part of plan B, an online questionnaire was prepared. In order to ensure that the research abides the research clearance obtained from the School's Ethics Committee; the online questionnaire provided the participant with the background of the research, information stating the research is voluntary and confidential. Hence, by completing the questionnaire, the participants have offered their consent to freely participate in the research.

The research ensured that the questions of the questionnaire were not worded in a complicated manner. No personal questions were asked which may infect emotions which are harmful to the participants. The participants were further allowed to query and complain to the researcher and the supervisor if any part of the questionnaire is unclear or offensive.

According to Babbie (2017) voluntary participation and no harm to the participants are important ethical consideration. The participant in this research were not be forced to participate and the information provided by the participants is kept confidential to ensure no harm occurs. Permission was sort from the participant before they completed the online questionnaire.

The identity of the participants was kept confidential, as the questionnaire was structured in a way the participation was anonymous. The questionnaire did not require the participants to give personal information. During the analysis, only the following background information was analysis:

- Profession of the participants
- Experience duration in the property development space
- Types of Development Projects

In order to protect the integrity and image of the University of the Witwatersrand, the ethics committee was approached to sort consent to proceed with the interaction with the identified participants. A clearance certified was issued to proceed with data collection based on the questionnaire. Before the questionnaires were issued to the identified participants, a spell check and grammatical consistency was conducted. This was to ensure that integrity and perception of the University of the Witwatersrand was protected.

3.10. Summary of chapter

The study was cross sectional, as the data was collected at single period in time (Rothman, et al., 2008). The study geographically focused on Johannesburg. The unit of analysis were real estate professionals, property developers and investors, and government entities involved in the development of bus rapid transit in Johannesburg.

The philosophy of the study toke the form that of interpretivist philosophy perspective. It was an interpretivist study as the researcher intended to uncover the perceptions which exist regarding transit oriented developments and how they affected property values. The research methodology employed in this study was a mixed research method approach. The mixed method approach includes the use of quantitative and qualitative research strategy to collect and analysis data. The data collection instruments used were a online questionaire using Google Forms.

The data collected was analysed using thematic analysis techniques for questions which required the participants to write their understanding regarding the subjected studied. This method of analysis assisted with the grouping of similar responses and measuring of importance of those responses. Most of the questions required descriptive statistics to analysis and draw conclusions. The mean, standard deviation, frequencies and bar charts were used to analysis the structured questions. SPSS was to analysis the data based on descriptive statics.

3.11. Research Project Plan

Activity	Duration	Resources
Secondary Data Collection	3 weeks	
Removing noise from data	2 weeks	
SPSS Data Analysis	4 weeks	SPSS
Preparation of Interview Question	2 weeks	
Interview sessions	6 weeks	Airtime, travel & lunch cost, recording device
Analysis of data	4 weeks	
Compilation of Chapter 4 – Data Analysis	3 weeks	
Review of Chapter 2 & 3	2 weeks	
Compilation of Chapter 5	3 weeks	
Edit and checking of Report	4 weeks	

4.0. Chapter 4: Data Analysis

4.1. Background of Respondents

The questionnaire was formulated using google forms – an online questionnaire template powered by google. It was distributed randomly to professional who are predominantly involved in property developments through emails. The questionnaire included two main sections: background of the respondents and stakeholder's perspective on transit-oriented developments. The participation of the respondents was voluntary and 30 respondents completed the online questionnaire.

The respondents are professionals in the property development space such as Development Managers, Project Managers, Industry Research Analysts and Quantity Surveyors. Forty percent of the respondents have worked in the property development space greater than five years but less than 10 years. Seventeen percent of the respondents have more than 10 years of working experience in the development space. In overall, fifty-six percent of the respondents have thorough knowledge of the mechanisms of the property development space. Figure 2: Professionillustrates the professional who participated in the study. The highest participants were Quantity Surveyors who amounted to nine; while the lowest participants were Architects and Industry Research Analyst amount to one respectively.

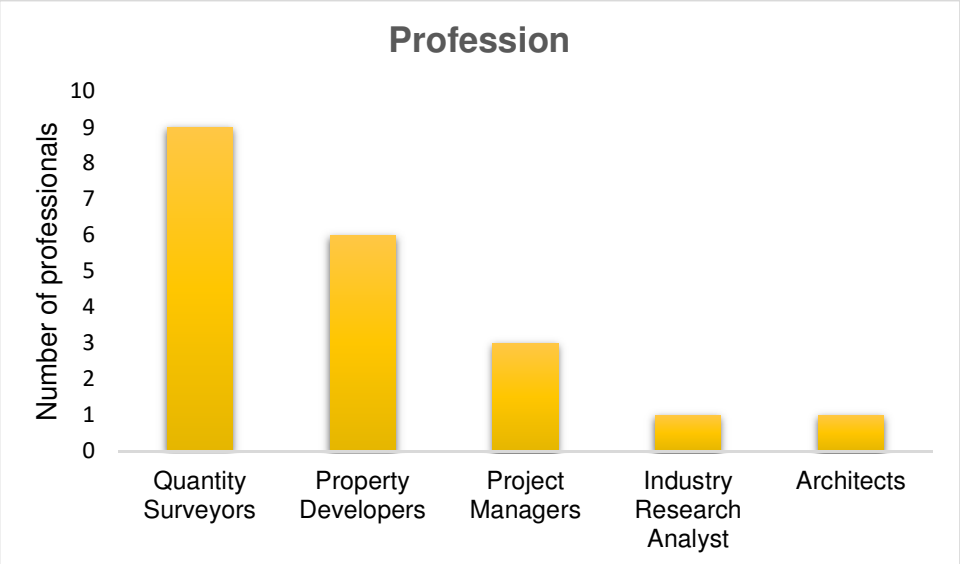


Figure 2: Profession – Nine Quantity Surveyors, Six Property Developers, Three Project Managers, One Industry Research Analyst and One Architect participated in the research.

The respondents participated in various developments such as sectional title development, residential houses, mixed use developments, transit development and high-density residential development.

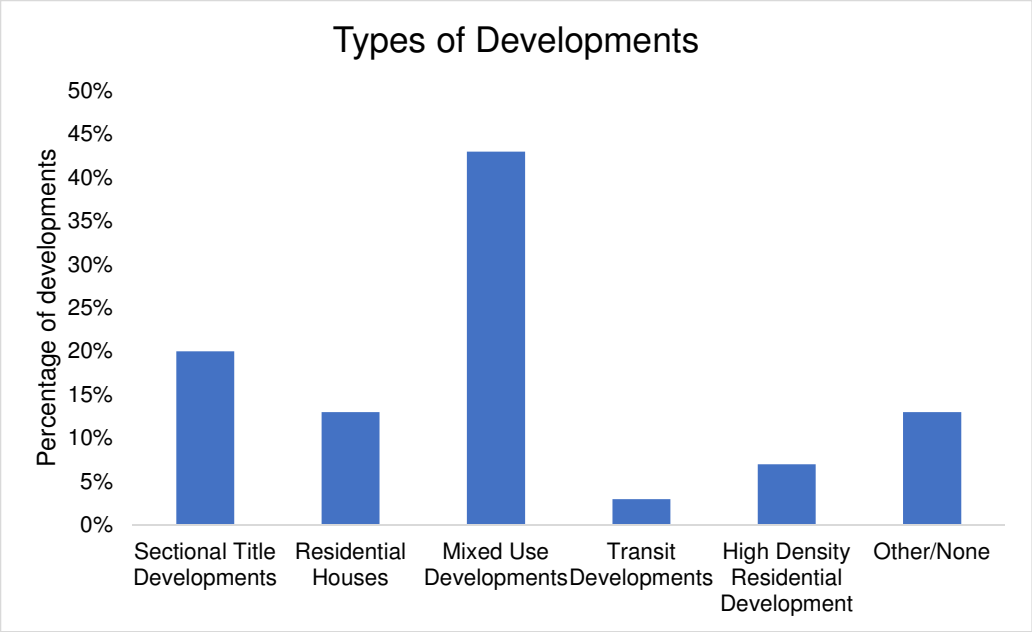


Figure 3: Types of Developments – The respondents participated in the following developments: 43% Mixed Use Developments, 20% Sectional Title and 12%Residential Houses.

Figure 3: Types of Developments above illustrates the percentage of professional who participated in various types of developments. The survey indicates forty-three percent of respondents were involved in the mixed-use development and twenty percent were involved in sectional title developments. Three percent were involved in projects which are related to transit developments.

4.2. Stakeholder's perspective on Transit Oriented Development

4.2.1. Development Opportunities

Ninety percent of the respondents view transit-oriented development opportunities arising from the introduction of the Bus Rapid Transit. The responses are themed into the following categories: new developments, transportation, regeneration and economic hubs.

Fifty percent of the respondents identified new developments as opportunities arising from the introduction of the Bus Rapid Transit. The opportunities identified includes

office parks and residential settlements, high density developments, retail centres, educational institutions and office spaces.

In terms of opportunities related to transportation, 23 percent of the respondent indicated that Bus Rapid Transit will increase the reliability and effectiveness of the transport in the country. They further noted that the social development and affordable housing and alleviation of congestion will occur. Moreover, it is noted that property developers will have an opportunity to renovate or rejuvenate properties along the corridor. The development will attract new tenants and small to medium households will be positively affected. Further, linked to the transport convenience is increased in productivity and personal savings of households.

Eight percent of the respondents identified regeneration of the inner city as an opportunity arising from Bus Rapid Transit. This opportunity entails high density residential and conversion of existing commercial properties to residential.

Economic hubs were identified as an opportunity by 19 percent of the respondents. The specific opportunities identified are improvements in local construction skills, shopping centres and social cohesion.

4.2.2. Investment Decision Making Attributes

The following attributes were measured using a Likert scale question:

• Parks	• Traffic Noise
• Public Transport	• Zoning
• Age of the House	• Employment Opportunities
• Number of Bedrooms	• Air Pollution
• Available Healthcare	• Construction Cost
• Quality of Roads	• Parking Spaces

The scale was an importance measure which ranged from Not at all Important to Very Important. The results are displayed using descriptive statistics through SPSS.

Parks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	12	40.0	40.0	40.0
	Important	10	33.3	33.3	73.3
	Fairly Important	5	16.7	16.7	90.0
	Very Important	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

PublicTransport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	1	3.3	3.3	3.3
	Important	5	16.7	16.7	20.0
	Fairly Important	5	16.7	16.7	36.7
	Very Important	19	63.3	63.3	100.0
	Total	30	100.0	100.0	

AgeoftheHouse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	2	6.7	6.7	6.7
	Slightly Important	5	16.7	16.7	23.3
	Important	8	26.7	26.7	50.0
	Fairly Important	11	36.7	36.7	86.7
	Very Important	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

NumberofBedroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	2	6.7	6.7	6.7
	Slightly Important	4	13.3	13.3	20.0
	Important	10	33.3	33.3	53.3
	Fairly Important	8	26.7	26.7	80.0
	Very Important	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

AvailableHealthcare

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	2	6.7	6.7	10.0
	Important	8	26.7	26.7	36.7
	Fairly Important	6	20.0	20.0	56.7
	Very Important	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

QualityofRoads

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	1	3.3	3.3	3.3
	Important	5	16.7	16.7	20.0
	Fairly Important	7	23.3	23.3	43.3
	Very Important	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

TrafficNoise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	4	13.3	13.3	13.3
	Important	7	23.3	23.3	36.7
	Fairly Important	11	36.7	36.7	73.3
	Very Important	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

Zoning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	4	13.3	13.3	16.7
	Important	4	13.3	13.3	30.0
	Fairly Important	10	33.3	33.3	63.3
	Very Important	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

EmploymentOpportunitie

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	2	6.7	6.7	6.7
	Important	3	10.0	10.0	16.7
	Fairly Important	7	23.3	23.3	40.0
	Very Important	18	60.0	60.0	100.0
	Total	30	100.0	100.0	

AirPollution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	10	33.3	33.3	36.7
	Important	5	16.7	16.7	53.3
	Fairly Important	6	20.0	20.0	73.3
	Very Important	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

ConstructionCost

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	1	3.3	3.3	6.7
	Important	5	16.7	16.7	23.3
	Fairly Important	5	16.7	16.7	40.0
	Very Important	18	60.0	60.0	100.0
	Total	30	100.0	100.0	

ParkingSpaces

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	2	6.7	6.7	10.0
	Important	4	13.3	13.3	23.3
	Fairly Important	10	33.3	33.3	56.7
	Very Important	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

Table 1: Investment Decision Making Attributes

The responses are summarised above using frequency Table 1. On the Likert scale the “Important” is the mark at which the view points of the respondents are measured from. Based on the frequency tables, the importance of the attributes is ranked on the below Table *2* – from most important to least important:

Attribute	Scale
Employment Opportunities	83.3%
Public Transport	80%
Quality of Roads	80%
Construction Cost	76.7%
Parking Spaces	76.6%
Zoning	70%
Traffic Noise	63.4%
Available Healthcare	63.3%
Age of the House	50%
Air Pollution	46.7%
Number of Bedrooms	46.7%
Parks	26.7%

Table 2: Percentage for Investment Decision Making Attributes

Based on the mean (refer to the below Table 3), Public Transport, Quality of Roads, Employment Opportunities, Construction Cost and Parking Spaces are important attributes for investment decision making. For transit-oriented development parks are not considered to be an important attribute for investment decision making.

Descriptive Statistics

	N	Mean	Std. Deviation
Parks	30	2.9667	.99943
PublicTransport	30	4.4000	.89443
AgeoftheHouse	30	3.3333	1.12444
NumberofBedroom	30	3.4000	1.16264
AvailableHealthcare	30	3.9333	1.14269
QualityofRoads	30	4.3333	.88409
TrafficNoise	30	3.7667	1.00630
Zoning	30	3.8667	1.16658
EmploymentOpportunitie	30	4.3667	.92786
AirPollution	30	3.3333	1.29544
ConstructionCost	30	4.2667	1.08066
ParkingSpaces	30	4.0667	1.08066
Valid N (listwise)	30		

Table 3: Descriptive Statistics

The findings are supported by Cervero (2004a) and Wise (2009) in that various elements affects the transit-oriented developments such as tax incentives, public sector participation and construction costs.

4.2.3. Attributes which best describe transit-oriented development

The following attributes were measured using a Likert scale to determine which best describe transit-oriented developments:

• Number of Parking Spaces • Low Income Housing • Walking Spaces • Close proximity to places of employment and shopping	• High Density Development • Immediate Access to Public Transportation • High Income Earning Households • Zoning

The collected data is presented using frequency tables as per the below Table 4:

NumberofParkingSpace

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	4	13.3	13.3	13.3
	Neutral	15	50.0	50.0	63.3
	Slightly Best	8	26.7	26.7	90.0
	Very Best	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

LowIncomeHousing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	6	20.7	20.7	20.7
	Neutral	9	31.0	31.0	51.7
	Slightly Best	10	34.5	34.5	86.2
	Very Best	4	13.8	13.8	100.0
	Total	29	100.0	100.0	

WalkingSpaces

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	2	6.9	6.9	6.9
	Neutral	8	27.6	27.6	34.5
	Slightly Best	13	44.8	44.8	79.3
	Very Best	6	20.7	20.7	100.0
	Total	29	100.0	100.0	

ProximitytoEmployment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	2	6.9	6.9	6.9
	Neutral	2	6.9	6.9	13.8
	Slightly Best	10	34.5	34.5	48.3
	Very Best	15	51.7	51.7	100.0
	Total	29	100.0	100.0	

HighDensityDev

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	1	3.4	3.4	3.4
	Neutral	8	27.6	27.6	31.0
	Slightly Best	9	31.0	31.0	62.1
	Very Best	11	37.9	37.9	100.0
	Total	29	100.0	100.0	

PublicTransport

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	1	3.4	3.4	3.4
	Neutral	3	10.3	10.3	13.8
	Slightly Best	8	27.6	27.6	41.4
	Very Best	17	58.6	58.6	100.0
	Total	29	100.0	100.0	

HighIncome

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	11	37.9	37.9	37.9
	Neutral	11	37.9	37.9	75.9
	Slightly Best	4	13.8	13.8	89.7
	Very Best	3	10.3	10.3	100.0
	Total	29	100.0	100.0	

Zoning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Best	2	6.9	6.9	6.9
	Neutral	10	34.5	34.5	41.4
	Slightly Best	9	31.0	31.0	72.4
	Very Best	8	27.6	27.6	100.0
	Total	29	100.0	100.0	

Table 4: Transit-Oriented Developments Attributes

The frequency table is interpreted as follows: The percentage of Slightly Best and Very Best is added together and tabulated on the below Table 5:

Attribute	Scale
Number of Parking Spaces	36.7%
Low Income Housing	48.3%
Walking Spaces	65.5%
Close proximity to places of employment and shopping	85.5%
High Density Development	68.9%
Immediate Access to Public Transportation	86.2%
High Income Earning Households	24.1%
Zoning	58.6%

Table 5: Percentage of Transit-Oriented Development Attributes

Based on the mean (refer to the below Table 6), close proximity to places of employment and shopping; and Immediate Access to Public Transportation describe transit-oriented development best compared to the other attributes.

Descriptive Statistics

	N	Mean	Std. Deviation
NumberofParkingSpace	30	2.3333	.84418
LowIncomeHousing	30	2.4667	1.00801
WalkingSpaces	30	2.7333	.90719
ProximitytoEmployment	30	3.2667	.90719
HighDensityDev	30	3.0333	.88992
PublicTransport	30	3.3333	.92227
HighIncome	30	1.9667	.96431
Zoning	30	2.8333	.94989
Valid N (listwise)	30		

Table 6: Descriptive Statistics

This finding is supported by Scheutz (2015) in which the benefits of transit developments are increases in accessibility to existing jobs and public spaces, stimulation of the physical and economic developments.

4.2.4. Change in Requirements

The zoning requirements were measured in terms of whether they should Increase, Keep as is or Decrease. The requirements measured were:

- Density Development Requirements

- Height Zone Development Requirements
- Coverage Development Requirements
- Floor Area Ratio Development Requirements
- Building Line Delimitations

The results are displayed on Table 7:

DensityDevelopmentRequirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	12	40.0	40.0	40.0
	Keep as is	10	33.3	33.3	73.3
	Decrease Requirment	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

HeightZone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	12	40.0	40.0	40.0
	Keep as is	9	30.0	30.0	70.0
	Decrease Requirment	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

CoverageRequirements

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	12	40.0	40.0	40.0
	Keep as is	9	30.0	30.0	70.0
	Decrease Requirment	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

FloorArea

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	18	60.0	60.0	60.0
	Keep as is	9	30.0	30.0	90.0
	Decrease Requirment	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

BuildingLine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	10	33.3	33.3	33.3
	Keep as is	14	46.7	46.7	80.0
	Decrease Requirment	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

OnsiteParking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Increase Requirement	12	40.0	40.0	40.0
	Keep as is	9	30.0	30.0	70.0
	Decrease Requirment	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

Table 7: Change of Requirements

Forty percent of the respondents indicated that requirements for Density Development, Height Zone Development, On-site Parking and Coverage Development should be increased. Sixty percent indicated that the Floor Area Development requirement should be increased. Building Line Delimitations should be kept as is as indicated by 46.7 percent of the respondents. In the literature it is noted that regulations should be reviewed in order to encourage transit-oriented developments (Curtis, et al., Unknown); and the findings are in support of the literature.

The following are reasons why zoning requirements should be change in order for transit-oriented development to take place:

- To reduce barrier of entry for new developments. Flexibility of the zoning requirements will increase the ability of developers to meet new and current demands.

- The changes can incentivize developers to develop around the transport nodes
- The development should be structured in a manner which reduces inconvenience.
- Households in close proximity to the transport route will benefit positively, however the taxi industry should buy-in.
- On-site Parking should be limited in-order to promote public transport use.
- Transit oriented developments should be accessible to low income communities, if the requirements as they stand impede that object then government should reconsider for developers to develop such systems in necessary areas rather than just cities to suburbs.

4.2.5. Social Inclusion

The respondents, eighty-three percent of them, strongly noted that the introduction of Rea Vaya Bus Transit system encourages social inclusion. Ninety percent of the respondents indicated that the Rea Vaya Bus Rapid Transit system has a positive impact on the middle to low income households.

The Rea Vaya bus rapid transit system is a high-quality transportation system which can induce transit-oriented developments, as noted by sixty-five percent of the respondents. The findings support the government strategy of promoting social inclusion (City of Joburg, 2015). However, forty-three percent noted that the Gautrain is the preferred system to stimulate developments; and only twenty-six percent saw Buses as a stimulant.

Transit oriented development affects households in following way:

- TOD's brings people close to economic places due to less travel time to other facilities. There are potentials of employment and business opportunities.
- It decreases household's transportation cost as there is less need of personal vehicle usage. This increases household liquidity and convenience.
- It will improve residual land value as rental values increases.
- Traffic congestion will decreases thus decreasing noise and increasing safety on the national roads.
- It brings communities together, centralises services such as health care, education and other amenities.

- It opens up mobility options for families. It's an opportunity for small business to pull customers from surrounding neighbourhoods.

4.2.6. Economic Factors

The following economic factors were rated on a Likert Scale of importance:

• Land Use • Bus Service Frequency • Employment • Development Location	• Level of Rentals • Leve of Property Values • Household Income

The Likert Scale ranged from Not at all Important to Very Important. For interpretation purposes Important is the zero point for measuring Not at all Important and Very Important. Table 8 below indicates the respondence in frequency on economic factors which affects transit-oriented development.

LandUse

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	5	16.7	16.7	16.7
	Important	9	30.0	30.0	46.7
	Fairly Important	5	16.7	16.7	63.3
	Very Important	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

BusServiceFrequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	4	13.3	13.3	13.3
	Fairly Important	5	16.7	16.7	30.0
	Very Important	21	70.0	70.0	100.0
	Total	30	100.0	100.0	

Employment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	2	6.7	6.7	6.7
	Important	5	16.7	16.7	23.3
	Fairly Important	9	30.0	30.0	53.3
	Very Important	14	46.7	46.7	100.0
	Total	30	100.0	100.0	

DevelopmentLocation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	1	3.3	3.3	3.3
	Slightly Important	4	13.3	13.3	16.7
	Important	3	10.0	10.0	26.7
	Fairly Important	5	16.7	16.7	43.3
	Very Important	17	56.7	56.7	100.0
	Total	30	100.0	100.0	

LevelofRentals

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	2	6.7	6.7	6.7
	Slightly Important	4	13.3	13.3	20.0
	Important	5	16.7	16.7	36.7
	Fairly Important	10	33.3	33.3	70.0
	Very Important	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

LevelofPropertyValues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Important	2	6.7	6.7	6.7
	Slightly Important	4	13.3	13.3	20.0
	Important	7	23.3	23.3	43.3
	Fairly Important	7	23.3	23.3	66.7
	Very Important	10	33.3	33.3	100.0
	Total	30	100.0	100.0	

HouseholdIncome

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly Important	6	20.0	20.0	20.0
	Important	8	26.7	26.7	46.7
	Fairly Important	6	20.0	20.0	66.7
	Very Important	10	33.3	33.3	100.0
	Total	30	100.0	100.0	

Table 8: Economic Factors

Fairly Important and Very Important are added together to demonstrate which economic factor is of higher importance the other. The results are tabulated on the following Table 9:

Attribute	Scale
Land Use	53%
Bus Service Frequency	87%
Employment	77%
Development Location	73%
Levels of Rentals	63%
Levels of Property Values	57%
Household Income	53%
Land Use	53%

Table 9: Importance Percentage of Economic Factors

The Bus Service Frequency is the most important economic factor during development selection. The respondents, consisting of 26.70 percent, noted transit-oriented development will work just because of the introduction of bus transit stop. The Rea Vaya bus rapid transit system is good stimulus for development investment opportunity in the property market as indicated by 63.3 percent of the respondents. However, 30 percent of the respondents noted that the Rea Vaya bus rapid transit system is not suitable for low density development. This is contrary to the findings of Cervero & Kang (2009) where they found that the Bus Rapid Transit will be suitable to low density development. The contrast can be attributed to the fact that most studies have occurred in developed countries (Revington & Townsend, 2016). However, Quinn (2006) noted that the transit-oriented developments are not suitable for low density development. The conclusion is that transit-oriented developments are suitable to high density development and mixed using development (Ewing, et al., 2017).

Employment, Development Location and Levels of Rentals are also very important economic factors for development investment selection. The finding supports the view expressed by Benjamin & Sirmans (1994) which shows that access to employment will have a positive effect the levels of rent and property values. A transit-oriented development must be a mixed-use development as indicated by 92.3 percent of the respondents. This finding supports the City of Joburg's strategy known as the growth development strategy, whereby mixed-use developments will occur due to the introduction of the Rea Vaya bus rapid transit system (City of Joburg, 2015).

4.2.7. Rental Level Control Mechanisms and Property Value Regulation

4.2.7.1. Rental level Control Mechanisms

Forty percent of the respondents indicated that rental level control mechanisms should be used to make it easier for low and poor households to gain access to transit-oriented development (refer to Figure 4).

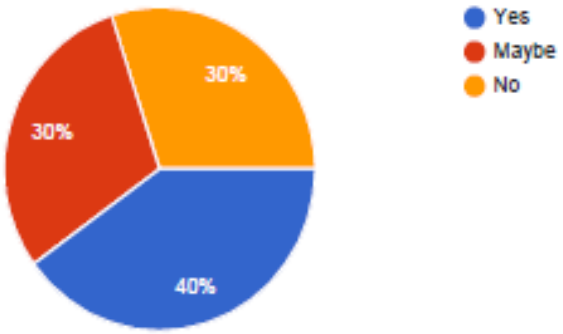


Figure 4: Rental Level Control Mechanism – 30 percent of the respondents indicated that they are indifferent on whether rental level control mechanism should be used as indicated by red pie on the chart; while 30 percent indicated no rental control should be used as indicated by orange pie. Forty percent of respondents indicated that rental level control mechanism should be employed as indicated by blue pie.

As indicated in the literature by Revington and Townsend (2016) that rental prices within the catchment area of the transit have a tendency to increase, it would be best for government to regulate the levels rent. Literature indicates that poor households tend to experience hardship due to rent increase and have to relocate to cheaper areas (Boshoff, 2013). According to Liu, et al., (2016) high income earning households tend to occupy transit-oriented developments due to their ability to afford high prices.

4.2.7.2. Property Value Regulation

Figure 5 below illustrates the proportion of respondents view on property value regulation. Majority (sixty-three percent) indicated that value of the property should not be regulated.

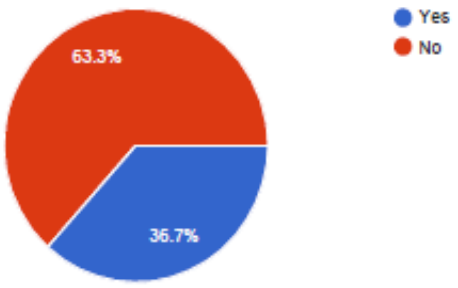


Figure 5: Property Value Regulation – blue indicated percentage of respondents who agree to property value regulation; while red indicates percentage of respondents who did not agree to property value regulation.

4.2.8. Findings – Conclusion of data collected

The study found that transit-oriented development opportunities arises from the introduction of the Bus Rapid Transit as indicated by the 90 percent of the respondents. The identified opportunities are office parks and residential settlements, retail centres and educational institutions. Social development, affordable housing and alleviation of congestion are identified as opportunities which come about due to the introduction of the Bus Rapid Transit. Households will experience an opportunity to increase their personal savings and productivity.

During investment decision making process, a number of attributes are very important to consider. It is noted by eighty-three percent of the respondents that the level of employment is a critical consideration when deciding on an investment related to Bus Rapid Transit. Other factors which are crucial during investment decision making process of a transit-oriented development are public transport, quality of roads, construction cost and parking space.

Further to the above, bus service frequency is the most important economic factor to be considered during investment selection process. This is indicated by eighty-seven

percent of the respondents. Other economic factors which are important are employment, development location and levels of rentals.

A development can be considered to be a transit-oriented development if the development has the following attributes:

- Close proximity to place of employment and shopping as indicated by 85.5 percent of the respondents.
- Immediate access to public transportation as indicated by 86.2 percent of the respondents.
- High density development as indicated by 68.9 percent of the respondents.
- Walking spaces as indicated by 65.5 percent of the respondents.

The study found that Density Development Requirements, Height Zone Development, On-site Parking and Coverage Development Requirements should be changed in order to incentivise property developments to develop transit-oriented development. The respondents noted the following reasons for the need relax zoning requirements for transit-oriented developments:

- To reduce the barrier of entry for new developments,
- To increase the ability of developers to meet new and current housing demands,
- To increase access for low income households.

The study found that the introduction of the Rea Vaya Bus Rapid Transit can encourage social cohesion and inclusion. This is indicated by 83.4 percent of the respondents. Social cohesion and inclusion can happen because the cost of transportation will be decreased and thus increasing the household liquidity and convenience. Further, the Bus Rapid Transit can bring communities together through the centralising of services such as health care, education and other amenities.

Further to above, rental level control mechanisms should be used to increase access for low income earning households, as indicated by 40 percent of respondents. According literature high income earning households to tend to occupy the transit-oriented development due to their ability to afford high prices (Liu, et al., 2016).

5.0. Chapter 5: Conclusion – Summary and Recommendations

5.1. Summary of research

The interest of this study was to understand how the introduction of the Bus Rapid Transit system has affected property investment trajectory. Also, understand if transit-oriented developments are possible in areas which are served by the Bus Rapid Transit. Further, understand how communities from disadvantaged area can contribute to the success of the transit-oriented development, since the Bus Rapid Transit serves such communities. Based on the conducted literature analysis, research gaps and opportunities were identified.

Firstly, the most studied mode of access was railway and highways in developed countries (Liu, et al., 2016; Dziauddin, et al., 2014; Jones & Ley, 2016), and there is limited study on how bus rapid transit affect property values in developing countries (Munoz-Raskin, 2007).

Secondly, the concept of transit-oriented development is being adapted by the developing countries as a mechanism to encourage sustainable developments (Quinn, 2006). This type of development encourages use of public transportation and less reliance on automobile to access places of employment, retail and etc. (Guthrie & Fan, 2016). In literature conflicting views exist regarding the sustainability of transit-oriented developments; as the access provided by the development has a positive impact on the property values (Gert & Boshoff, 2013), but the impact on the low and middle-income households is negative and present the presence of gentrification and displacement of low income earning households (Ley & Dobson, 2008; Rankin & Mclean, 2015).

Thirdly, The City of Joburg has adapted transit-oriented development as a strategy to address the urban sprawl and social divisions and inequality. The strategy is known as Joburg 2040 – the Growth Development Strategy. The overall objective is to promote sustainability by providing affordable bus rapid transit system, mixed use and high-density development along the transit corridor, and address social inequalities (City of Joburg, 2015).

The research methodology employed in this study was a mixed research method approach. The mixed method approach includes the use of quantitative and qualitative

research strategy to collect and analysis data. The data collection instruments used was an online questionaire using google docs. The questionnaire included two main sections: background of the respondents and stakeholder's perspective on transit-oriented developments. The participation of the respondents was voluntary and 30 respondents completed the online questionnaire. The respondents are professionals in the property development space such as Development Managers, Project Managers, Industry Research Analysts and Quantity Surveyors.

The study had three objectives to be investigated which are:

- Investigate if transit-oriented developments are taking place in areas serviced by the bus rapid transit system; and evaluate elements which will make transit-oriented development successful.
- Evaluate government's incentives for developers to invest in transit-oriented development.
- Evaluate which policies, laws and regulations should change in order to promote transit oriented develop.

The first objective of the study was to investigate if transit-oriented developments are taking place in areas serviced by the bus rapid transit system, and eveluate elements will make transit oriented development succesful. In the literature, the research found that transit-oriented dvelopments to take places in areas which are serviced by the rapid bus transit. The developments are induced by the increases in property values and rental levels (Debrezion, Pels, & Rietveld, 2007; Ewing, Tian, Lyons, & Terzano, 2017; Guthrie & Fan, 2016).

Further, the following elements were elements were found in literature to be important for transit-oriented developments to be successful (Janssen & Soderberg, 1999; Mathur, 2014):

- Locational attributes:
    - Slope of the land parcel,
    - Traffic Noise
    - Air Pollution
    - Views offered by the house

- Composition of rentable space,
- Structural Attributes:
    - Size of the living space
    - Lot size
    - Age of the house
    - Number of bedrooms and bathrooms, etc.
- Neighbourhood quality level
    - Quality of roads
    - Public transportation and linkages
    - Public services
    - Adjucent land use
- Future redevelopment opportunities
- City level attributes: Demand and supply of housing
    - Employment opportunities
    - Population growth
    - Zoning
- Regional and National attributes:
    - Mortgage rates
    - Construction Cost
    - Unemployment rates

During data collection and analysis, the above elements were investigated relation to the Rea Vaya bus rapid transit corridor. The research found that employment opportunities, public transport, quality of roads, construction cost, parking spaces and zoning to be important elements which determines the success of transit-oriented developments. Further, employment, development location and levels of rentals are also very important economic factors for development investment selection. The finding supports the view expressed by Benjamin & Sirmans (1994) which shows that access to employment will have a positive effect the levels of rent and property values. A transit-oriented development must be a mixed-use development as indicated by 92.3 percent of the respondents. This finding supports the City of Joburg's strategy known as the Growth Development strategy, whereby mixed-use developments will occur due to the introduction of the Rea Vaya bus rapid transit system (City of Joburg, 2015).

The second objective of the study was to evaluate government's incentives for developers to invest in transit-oriented development. Literature shows that it is in best interest of government when government invest in public assets. The public asset has a positive effect on the property values. Increases in property values will increase property taxes. Hence, government should invest in public assets as an incentive to property developers to engage in property development (Asian Development Bank, 2016). Literature further reveals that government can incentive property developers to develop new properties through regulation, law and policies (Dittmar & Ohland, 2004).

The research found that rental level control mechanisms should be used to make it easier for low and poor households. Further, research found that government should not regulate the value of properties. Regulation of the property values will not incentivise property developer to develop new properties.

The third objective of the study was to evaluate which policies, laws and regulations should change in order to promote transit oriented develop. The research investigated the effects of changes to the following:

- Density Development Requirements
- Height Zone Development Requirements
- Coverage Development Requirements
- Floor Area Ratio Development Requirements
- Building Line Delimitations

The research found that the density development, height zone development, on-site parking and coverage development requirements should be increases in order to promote transit oriented development. Further, research found that the building line development requirements should not be changed. This indicates that the building line cannot promote transit oriented developments.

In general, the study found the following:

- Transit-oriented developments opportunities can be realised through the introduction of Bus Rapid Transit in the City of Johannesburg. Social development, affordable housing and alleviation of congestion are identified as opportunities which come about due to the introduction of the Bus Rapid Transit

- The level of employment is a critical consideration when deciding on a transit-oriented development investment related to Bus Rapid Transit.
- The bus service frequency is the most important economic factor to be considered during investment selection process.
- Density Development Requirements, Height Zone Development, On-site Parking and Coverage Development Requirements should be changed in order to incentivise property developments to develop transit-oriented development.
- The introduction of the Rea Vaya Bus Rapid Transit can encourage social cohesion and inclusion.

5.2. Recommendations to property developers and government officials

The findings of the research are beneficial to the body of knowledge. The reinforcing existing understanding regarding the impact of transit-oriented development on property values. Especially, it reinforcing the impact of Bus Rapid Transit on property values.

The study is beneficial to property developers and investors because the study reaffirmed existing understanding of how investment decisions are impacted by the introduction of the Rea Vaya Bus Rapid Transit. For instance, the research showed that employment, bus service frequency, development location and households can affect the success of transit-oriented development.

Further, the study is beneficial to government officials. The study shown that regulation, law and policies can determine the success of transit-oriented developments. Moreover, the study shown that government should regulate the rental levels. The regulation of the rental level will ensure that poor households are not negatively impacted by developments. These interventions will reduce the effects of gentrifications. Lastly, the study shown that government should not develop mechanisms to regulate the level of property values.

5.3. Recommendation for Further Studies

The limitation of the research relates to the data collection instruments regarding the research question of government incentives for property developers to develop transit-oriented developments. The research did not uncover all available incentives and mechanisms which government can use to incentives property developer to develop successful transit-oriented developments. Further research is recommended to prop this research question deeply

The research design and strategy were to collect quantitative data and use qualitative data to confirm the results obtained from the quantitative data. The major hurdle of the method was the gathering of quantitative data. The recommends that the questionnaire should be designed in a way that property values and rental levels are collected from the respondents. The research should narrow the data collection area. Further, qualitative research instruments should be in the form of an interview where the respondents are able to give more information relating to a topic.

The study recommends that study be undertaken to identify developments which are induced by the introduction of the Rea Vaya Bus Rapid Transit.

The Rea Vaya bus rapid transit project has extended to Louis Botha Road and similar study should be conducted as a case study. The study should investigate historical property prices and rentals in the area before the construction of the bus rapid transit, and after the introduction. The study should be a quantitative study which involves the use of hedonic modelling to determine the trends and property prices.

References

Adair, Alastair; McGreal, Stanley; Smyth, Austin; Cooper, James; Ryley, Tim, 2010. House Prices and Accessibility: The Testing of Relationships within the Belfast Urban Area. *Journal of Housing Studies,* 15(5), pp. 699-716.

Asian Development Bank, 2016. *Gearing up for competitiveness: The role of planning, governance, and finance in small and medium-sized cities in South Asia,* Philippines: Asian Development Bank.

Babbie, R. E., 2017. *The Basics of Social Research.* 7th ed. Boston: Cengage Learning.

Bailey, D. K., 1994. *Methods of Social Research.* 4th ed. New York: The Free Press.

Belzer, D. & Autler, G., 2002. Transit Oriented Development: Moving from rhetoric of reality. *The Brookings Institution and Great American Station Foudation.*

Benjamin, J. D. & Sirmans, G. S., 1994. Mass Transportation, Apartment Rent and Property Values. *Journal of Real Estate Research,* 12(1), pp. 1-8.

Bhattacherjee, A., 2012. *Social Science Research: Principles, Methods, and Practices. 2 nd ed. Open Access Textbooks;.* [Online].

Boggess, L. N. & Hipp, J. R., 2016. The Spatial dimensions of gentrification and the consequences for Neighbourhood Crime. *Justice Quarterly ,* 33(4), pp. 584-613.

Boshoff, D. G. B., 2013. Influence of transport development projects on property values in South Africa. *Advanced Research in Scientific Areas,* pp. 495-502.

Bowes, D. R. & Ihlanfeldt, K. R., 2001. Identifying the Impacts of Rail Transit Stations on Residential Property Values. *Journal of Urban Economics,* pp. 50, 1-25.

Brown, S. & Sleath, E., 2016. *Research Methods for Forensic Psychologists: A Guide to Completing Your Research Projects.* New York: Routledge: Taylor & Francis Group.

Bruinsma, Frank; Pels, Eric; Priemus, Hugo; Reitveld, Piet; Van Wee, Bert, 2008. *Railway Development: Impacts on Urban Dynamics.* Amsterdam: Physica-Verlag Heidelberg.

Burton, D. & Bartlett, S., 2005. *Practitioner Research for Teachers.* London: Sage Publications Inc.

Butler, T. & Lees, L., 2006. Globalization and Gentrifying Global Elites at the Neighbourhood level. *Wiley on behalf of the The Royal Geographical Society,* 31(4), pp. 467-487.

Cadman, D. & Topping, R., 1995. *Property Development, Fourth Edition.* New York: Routledge.

Casson, M., 2003. *The Entrepreneur - An Economic Theory, Second Edition.* Chetenham: Edward Elgar Publishing Limited.

Cervero, R., 2004. *Transit-oriented Development in the United States: Experiences, challenges, and prospects. TCRP Report 102,* Washington: Transportation Research Board.

Cervero, R. & Kang, C. D., 2009. Bus Rapid Transit Impacts on Land Uses and Land Values in Seoul, Korea. *eScholarship University of California.*

Cheshmehzangi, A. & Thomas, S. M., 2016. Prioritizing Accessible Transit Systems for Sustainable Urban Development: Understanding and Evaluating the Parameters of a Transportation System in Mumbai. *Journal of Urban Planning and Development.*

City of Joburg, 2015. *The Big Idea - Corridors of Freedom for a people-centred city.* [Online]
Available at: http://www.jda.org.za/index.php/whatwedo/programmes/the-big-idea [Accessed 29 April 2017].

Cloke, P., Cook, I., Crang, P., Goodwin, M., Painter, J. & Philo, C., 2004. *Practising Human Geography.* London: Sage Publication.

Coupland, A., 1997. *Reclaiming the City: Mixed use development.* London: Spon Press, Tylor & Francis Group.

Creswell, J., Clark, P., Gutmann, V. & Hanson, M., 2003. *Advanced mixed methods research designs. In A. Tashakkori & C. Teddie (Eda), Handbook of mixed methods in social and behavioral research.* s.l.:Sage.

Curtis, C., Renne, J. L. & Bertolini, L., Unknown. *Transit Oriented Development: Making it Happen.* s.l.:Routledge.

Daraio, C., Diana, M., Di Costa, F., Leporelli, C., Matteucci, G. & Nastasi, A., 2014. *Efficiency and effectiveness in the urban public transport sector: a critical review with directions for future research,* Politecnico di Torino: Sapienza Universita Di Roma.

David, I. & O'Leary, J., 2011. *Property Investment.* 2nd ed. New York: Palgrave Macmillan.

Debrezion, G., Pels, E. & Rietveld, P., 2007. The Impact of Railway Stations on Residential and Commercial Property Value: A Meta-analysis. *Journal of Real Estate Finance and Economics,* Volume 35, p. 161–180.

Dittmar, H. & Ohland, G., 2004. *The new transit town: best practices in transit oriented development.* Washington: Island Press.

Drew, J. C., Hardman, L. M. & Hosp, L. J., 2008. *Designing and Conducting Research in Education.* London: Sage Publications.

Dujon, V., Dillard, J. & Brenna, E. M., 2013. *Social Sustainability: A multilevel approach to social inclusion.* New York: Routledge.

Dziauddin, M. F., Powe, N. & Alvanides, S., 2014. Estimating the Effects of Light Rail Transit (LRT) System on Residential Property Values Using Geographically Weighted Regression (GWR). *Appl. Spatial Analysis,* Volume 8, pp. 1-25.

Ellisomn, L. S., Barwick, J. V. & Farrant, J. D. T., 2009. *Practical Statsitics for the Analytical Scientist: A Bench Guide.* 2nd Edition ed. Cambridge: Royal Society of Chemsty Publishing.

Epstein, B. J., Nach, R. & Bragg, S. M., 2009. *Wiley GAAP Codification Enhanced.* New Jersey: John Wiley & Son, Inc..

Ewing, R., Tian, G., Lyons, T. & Terzano, K., 2017. Trip and parking generation at transit-oriented developments: Five US case studies. *Landscape and Urban Planning,* Volume 160, pp. 69 - 78.

Floyd, C. F. & Allen, M. T., 2002. *Real Estate Principles. Ed 7.* Chicago: Evan Butterfield.

Forlee, R., 2015. *Australian Residential Property Development for Investors.* Australia: Wrightbooks.

Freilich, R. H., 1998. The Land-Use Implications of Transit-Oriented Development: Controlling the Demand Side of Transportation Congestion and Urban Sprawl.. *The Urban Lawyer,* 30(3), pp. 547-572.

Fujita, M., 1989. *Urban Economic Theory: Land use and city size.* New York: Cambridge University Press.

Galster, G., 2001. On the Nature of Neighbourhood. *Urban Studies,* 38(12), pp. 2111-2124.

Geisler, C. & Daneker, G., 2000. *Property and Values: Alternatives to public and private ownership.* Washington: Island Press.

Gert, D. & Boshoff, B., 2013. Influence of transport development projects on property values in South Africa.. *Advanced Research in Scientific Areas,* pp. 495-502.

Grbich, C., 2013. *Qualitative Data Analysis: An Introduction.* Los Angeles: Sage Publications.

Guest, G., MacQueen, M. K. & Namey, E. E., 2012. *Applied Thematic Analysis.* Los Angeles: Sage Publications.

Guthrie, A. & Fan, Y., 2016. Developers' perspectives on transit-oriented development. *Transport Policy,* pp. 1-12.

Guthrie, A. & Fan, Y., 2016. *Economic Development Impacts of Bus Rapid Transit,* Washington: Center for Transportation Studies University of Minnesota.

Hamnett, C., 2003. Gentrification and the Middle-class Remaking of Inner London. *Urban Studies,* 40(12), pp. 1961-2001.

Harrell, C. M. & Bradley, A. M., 2009. *Data Collection Methods: Semi-structured Interviews and Group Focus,* United States: Rand Corporation.

Harvard, T., 2014. *Financial feasibility studies for property development - Theory and Practice.* New York: Routledge.

Havard, T., 2014. *Financial Feasibility Studies for Property Developers: Theory and Practice.* New York: Routledge.

Ho (David), K. H., Rengarajan, S. & Lum, H. Y., 2013. "Green" buildings and Real Estate Investment Trust's (REIT) performance. *Journal of Property Investment & Finance,* 32(6), pp. 546-574.

Jackson, S., 2008. *Research Methods: A Modular Approach.* s.l.:Michele Sordi.

Janssen, C. & Soderberg, B., 1999. Estimating Market Prices and Assessed Values for Income Propertie. *Urban Studie,* 36(2), pp. 359-376.

Johnson, B. R. & Onwuegbuzie, A. J., 2004. Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher,* 33(7), pp. 14-26.

Jones, C. E. & Ley, D., 2016. Transit-oriented development and gentrification along Metro Vancouver's low income SkyTrain corrido.. *The Canadian Geographer,* 60(1), pp. 9-22.

Kalton, G., 1983. *Introduction to Survey Sampling - Series: Quantitative Applications in the Social Sciences.* London: Sage Publications.

Kazandjian, V. A. & Sternberg, E., 1995. *The Epidemiology of Quality.* United States of America: Aspen Publishers.

Kilpatrick, J. A., Throupe, R. L., Carruthers, J. I. & Krause, A., 2007. The impact of transit corridors on residentila property values. *JRER,* 29(3), pp. 303-320.

Kohlhepp, D. B. & Kohlhepp, K. J., 2018. *Real Estate Development Matrix.* New York: Routledge.

La Grange, A. & Pretorius, F., 2016. State-led gentrification in Hong Kong. *Urban Studies,* 53(3), pp. 506-523.

Ley, D. & Dobson, C., 2008. Are there limits to gentrification? The contexts of impeded Gentrification in Vancouver. *Urban Studies,* 45(12), pp. 2471-2498.

Liu, X., Deng, Y. & Le Vine, S., 2016. Residential relocaton in response to light rail transit investment: case study of the Hudson-Bergen Light Rail System. *J.Mod.Transport,* pp. 139-144.

Lowies, B. & Hall, J. H., 2016. Government Influences, Emotions, and The Investment Decisions of South African Property Fund Managers. *Journal of Real Estate Literature,* 24(2), pp. 359-376.

Maclnnes, J., 2017. *An Introduction to Secondary Data Analysis with IBM SPSS Statistics.* London: Sage Publications.

Majundar, R., 1991. *Marketing Research: Text, Applications and Case studies.* New Delhi: New Age International Publishers.

Maloutas, T., 2011. Contextual Diversity of Gentrification Research. *Critical Sociology,* pp. 1-16.

Mathur, S., 2014. *Innovation in Public Transport Finance: Property Value Capture.* USA: Routledge.

Menou, M. J. & Mchombu, K., 2007. Information professionals serving disadvantaged communities. *Journal of Information, Communicaton & Ethics in Society,* 5(2/3), pp. 140-154.

Mothorpe, C. & Wyman, D., 2017. Collapse: the decline and fall of master planned golf course communities. *Journal of Property Investment & Finance,* 35(6), pp. 638-651,.

Munizzo, M. A. & Musial, L. V., 2010. *General Market Analysis and Highest and Best Use.* United States of America: Cengage Learning.

Munoz, J. C. & Paget-Seekins, L., 2016. *Restructuring public transportation through bus rapid transit: An international and interdisciplinary perspective..* Chicago: University of Bristol and Policy Press.

Munoz-Raskin, R., 2007. *Walking Accessibility to Bus Rapid Transit: Does it Affect Property Valuse? The case of Bogota, Columbia,* New York: Columbia University in the City fo New York.

Parasuraman, A., Grewal, D. & krishnan, R., 2007. *Marketing Research.* Unit States of America: George T. Hoffman.

Pejovich, S., 1990. *The Economics of Property Rights: Towards a Theory of Comparative Systems.* Netherlands: Kluwer Academic Publishers.

Quinn, B., 2006. Transit-Oriented Development: Lessons from California. *Built Environment (1978),* 32(3), pp. 311-322.

Rankin, A. K. & Mclean, H., 2015. Governing the commercial streets of the city: New Terrains of Disinvestment and Gentrification in Toronto's Inner Suburbs. *Antipode,* 47(1), pp. 216-239.

Rea Vaya, 2019. *www.reavaya.org.za.* [Online] Available at: https://www.reavaya.org.za/?_=178&&l=49 [Accessed 12 July 2019].

Rech, J., Decker , B. & Ras, E., 2008. *Emerging technologies for sematic work environment: technology, methods, and application.* New York: Information Science Reference.

Reed, R. & Sims, S., 2015. *Property Development.* New York: Routledge.

Revington, N. & Townsend, C., 2016. Market Rental Housing Affordability and Rapid Transit Catchments: Application of a New Measure in Canada. *Housing Policy Debate.*

Rothman, J. K., Greenland, S. & Lash, T. L., 2008. *Modern Epidermiology.* 3rd Ed ed. Philadelphia: Lippincott Williams & Wilkins.

Schuetz, J., 2015. *Is Los Angeles Becoming Transit Oriented?,* California: Board of Governors of the Federal Reserve System.

Schutt, K. R., 2006. *Investigating the social world: The process and practice of research..* California: Sage Publications.

Shafiei, M. M. & Said, I., 2008. The Competency Requirements for Quantity Surveyors: Enhancing Continuous Professional Development. *Sri Lankan Journal of Human Resource Management,* 2(1), pp. 17-27.

Shultz, S. D. & Schmitz, N. J., 2009. Augmenting housing sales data to improve hedonic estimates of golf course frontage. *Journal of Real Estate Research, January,* 31(1), pp. 63-79..

Sigler, T. & Wachsmuth, D., 2016. Transnational gentrification: Globalisation and neighbourhood change in Panama's Casco Antiquo. *Urban Studies,* 53(4), pp. 705-722.

Smith, N., 1979. Toward a Theory of Gentrification A Back to the City Movement by Capital, not People. *Journal of the American Planning Association ,* 45(4), pp. 538-548.

Sprankling, J. G., 2014. *The International Law of Property.* United Kingdoms: Oxford University Press.

Stebbins, A. R., 2001. *Exploratory research in the social sciences: Qualitative research methods.* California: Sage Publications.

Suzuki, H., Murakami, J., Hong, Y. & Tamayose, B., 2015. *Financing Transit-Oriented Development with Land Values: Adapting Land Value Capture in Developing Countries.* Washington: World Bank Group.

Tayie, S., 2005. *Research Methods and Writing Research Proposals.* Cairo: Center for Advancement of Postgraduate Studies and Research in Engineering Sciences, Faculty of Engineering - Cairo University (CAPSCU).

Thyer, B., 2010. *The Handbook of Social Work Research Methods.* London: Sage Publications.

Troy, B. D., 2006. *Remington: The science and practice of pharmancy.* 21st Edition ed. Maryland: Lippincott Williams & Wilkins.

Urban LandMark, Unknown. *Urban Land Development in Practice: Developers and municipalities share experience.* Pretoria: Depart for International Development.

van Wyk, L. & Xulu, M., 2011. *"Towards A Green Building Policy Framework: First Draft .V2".* South Africa: Public Works Department.

Vezzoli, C. & Manzini, E., 2008. *Design for Environmental Sustainability.* London: Springer.

Wilkinson, D. & Birmingham, P., 2003. *Using Research Instruments: A Guilde for Researchers.* London: Routledge Filmer.

Wise, D., 2009. *Affordable Housing in Transit Oriented Development: Key Practices Could Enhance Recent Collaboration Efforts between DOT-FTA and HUD.* United States: Government Accountability Office.

Wyatt, P., 2013. *Property Valuation Second Edition.* United Kingdom: Wiley Blackwell.

Zhang, W., Wang, F., Barchers, C. & Lee, Y., 2016. The Impact of Transit-Oriented Development on Housing Value Resilience: Evidence from the City of Atlanta.

Zukin, S., 1987. Gentrification: culture and capital in the urban core. *Annual Review of Sociology,* Volume 13, pp. 129-147.