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Corridor Development as a Strategy to achieve a Compact Urban Form – the Case Study of the Edendale Northdale Corridor in Msunduzi Pietermaritzburg

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Corridor Development as a Strategy to achieve a Compact Urban Form – the Case Study of the Edendale Northdale Corridor in Msunduzi Pietermaritzburg

A short dissertation submitted in partial fulfilment of the requirements for the

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ABSTRACT

Technological advancement, the development of the automobile and the accelerated rate of urbanisation has transformed cities dramatically throughout the world. Whilst these radical changes contributed to worldwide growth and development, it has also led to complex problems such as resource depletion, environmental pollution, climate change, food insecurity and widening gap between the rich and poor. The adverse effects of sprawling land use developments, which has far-reaching consequences on cities. Whilst this phenomenon could be attributed to very different and unique socio-economic, and political circumstances that prevailed in both the global North and South, the common feature that has emerged in urban areas across the globe, has been a dispersed, inefficient, unsustainable spatial structure of cities. This furthermore exacerbated the impacts on economic, social and environmental sustainability.

It is therefore argued that in response to the above urban crises innovative planning strategies, approaches and concepts have emerged to combat the adverse effects of urban sprawl. One of the initiatives promoted within the South African context has been the concept of the corridor development. In its quest to promote desirable sustainable development, this new concept inherently held the promise of achieving a compact-integrated urban environment. This dissertation critically examines corridor development as an urban strategy that has the potential to minimize urban sprawl and address 21st Century urban issues of inequality, poverty, and underdevelopment. The primary aim of this research is to examine the notion of corridor development in theory and practice. It evaluates the assertion that the concept is as an innovative strategy, which can significantly transform the economic, social and spatial structure of urban environments. In this instance, the Edendale-Northdale Corridor situated within the Msunduzi Local Municipality was identified as the focus of this research.

The New Urbanism and Smart Growth theories provided a lens that underpinned and guided the study. The analysis of these theories considered the historical emergence, characteristics and main principles of walkability, connectivity, mixed uses, mixed housing, quality architecture, traditional neighbourhood structure, increased density, green transportation, sustainability and quality of life. These principles were adopted as key performance criteria against which the local case study was analysed. The conclusion drawn was that these two theoretical approaches provided an adequate framework through which to analyse international, national and local examples and good practice concerning corridor development.

The literature review uncovered the historical development, debates, understandings and influences of corridor development, compact city and various other interrelated concepts. Whilst some scholars were sceptical, most studies underscored that corridor development was a powerful tool that promoted greater physical, socio-economic integration, compaction, high density mixed use development and high quality public transport that brought places of work-live and play closer. Learning lessons where drawn from best practice precedents at an international and national scale. Furthermore, these case studies demonstrated that the outcomes of corridor development were very different based on the unique circumstances of cities. However, these experiences did set benchmarks that cities across the globe could consider in their future planning. The local case study was interrogated against these best practice benchmarks and criteria.

The primary focus of the research was the exploration of the proposed Edendale- Northdale Corridor, which is located in the Msunduzi Local Municipality in the province of KwaZulu-Natal. In order to assess the potential positive impact of the proposed corridor, a historical overview of the establishment of the City of Pietermaritzburg (now called Msunduzi), and the establishment of the suburbs of Edendale and Northdale has been presented. Critical to the discussion has been the legacy of Apartheid and its impact of spatial disjuncture in the specific area of research. The Edendale – Northdale area exhibits the socio-economic and underdevelopment characteristic of the Apartheid legacy that is synonymous with contemporary urban areas of South Africa generally, and KwaZulu-Natal specifically. A brief description of the proposed corridor and the New Town Node has been presented against this backdrop. The research is linked back to the principles outlined in the precedent chapter of the dissertation. It considers how well the corridor concept can be expected to perform given the current development challenges of the case study area.

The research has utilised a qualitative research methodology, which consisted of both theoretical and empirical data. The theoretical component constituted a considerable part of the study. It included a comprehensive desktop study that involved in-depth analysis of secondary sources of data. The empirical component included the collection of information based on personal interviews with key stakeholders that are directly involved in the case study area. Use was made of structured questionnaires during interview sessions. The opinions, objectives and ideas of all role-players were reviewed and from these perspectives, a set of findings and recommendations have been drawn up. It is intended that these findings will improve the implementation of the corridor development initiative within the Msunduzi Local Municipality.

The research revealed that the corridor development concept could not be applied in isolation. It has to be considered in relation to other concepts such as nodes, land uses, public transportation, high density and pedestrian-friendly planning layouts. Furthermore, the interconnectedness between these concepts has to complement each other in shaping the urban environment as the glue or the stitching together of all parts of the city. Findings from the case study confirmed that some of the key challenges and shortcomings confronting the successful implementation corridor development at a local level included the lack of inter-departmental and inter-governmental relations/collaboration; informal settlements located on strategic portions of land, land legal issues and land ownership. Institutional priorities that differ among internal sector departments and the political agenda of councillors can affect budget allocations and implementation. However, the final chapter concludes that corridor development as a strategy can potentially be used as a tool to achieve a well-defined compact-integrated urban form that will address the various social and economic deficiencies experienced by the poor and low-income areas in Msunduzi Local Municipality.

COLLEGE OF HUMANITIES

DECLARATION – PLAGIARISM

I, Janette Govindamah Perumal, declare that:

1. The research reported in this thesis, except where otherwise indicated, and is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
4. This thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
    a. Their words have been re-written but the general information attributed to them has been referenced.
    b. Where their exact words have been used, then their writing has been placed in italics and inside quotation marks, and referenced.
5. This thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the References section.

This dissertation titled, is my own work. It has not been submitted before for any degree or examination at any other University.

Student: **Mrs Janette Govindamah Perumal** **Supervisor:** **Ms. Annette von Riesen**

Signature: _____ **Signature:** **_____**

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ACRONYMS

ABM:	Area Based Management
AIDS:	Acquired Immunodeficiency Syndrome
APA:	American Planning Association
ASGISA:	Accelerated and Shared Growth Initiative for South Africa
BRT:	Bus Rapid Transit
CBD:	Central Business District
CCTV:	Closed Circuit Television
CITP:	Comprehensive Integrated Transport Plan
CNU:	Congress of New Urbanism
CoGTA:	Cooperative Governance and Traditional Affairs (Provincial Department - KwaZulu-Natal)
CoJ:	City of Johannesburg
CTOD:	Centre for Transit Oriented Development
DFA:	Development Facilitation Act (No. 67 of 1995)
DoT:	Department of Transport (South Africa)
DRDLR:	Department of Rural Development and Land Reform (South Africa)
EIA:	Environment Impact Assessment
ENC:	Edendale Northdale Corridor
EPA:	Environmental Protection Agency (United States of America)
FBC:	Form Based Code
FET:	Further Education and Training
GCRTA:	Greater Cleveland Regional Transport Authority
GDS:	Growth and Development Strategy (Johannesburg)
GEA:	Greater Edendale Area

GEAR:	Growth, Economic Development and Redistribution Strategy (South Africa)
GEDI:	Greater Edendale Development Initiative
HIV:	Human Immunodeficiency Virus
ICMA:	International City Management Association
IDP:	Integrated Development Plan
IRPTN:	Integrated Rapid Public Transit Network
ITDP:	Institute of Transportation and Development Policy
ITPS:	Integration Transportation Plans
JDA:	Johannesburg Development Agency
MSA:	Municipal Systems Act (No. 32 of 2000)
NDP:	National Development Plan
NDP:	Neighbourhood Development Partnership (Msunduzi)
NDPG:	Neighbourhood Development Partnership Grant (Msunduzi)
NLTA:	National Land Transport Act (No. 5 of 2009)
NMT:	Non-Motorised Transport
NSDP:	National Spatial Development Perspective
OECD:	Organisation for Economic Cooperation and Development
PGDS:	Provincial Growth and Development Strategy (KwaZulu-Natal)
PPDC:	Provincial Planning and Development Commission
PPP:	Public Private Partnership
PSEDS:	Provincial Spatial Economic Development Strategy
RDP:	Reconstruction and Development Programme
RSA:	Republic of South Africa
SACN:	South African Cities Network
SDF:	Spatial Development Framework

SGN:	Smart Growth Network
SMME:	Small Micro and Medium Enterprises
SoE:	State of the Environment
SPLUMA:	Spatial Planning and Land Use Management Act (No. 16 of 2013)
SWC:	South Western Corridor (Ankara)
TOD:	Transit Oriented Development
UCT:	University of Cape Town
UGB:	Urban Growth Boundary
UK:	United Kingdom
UN:	United Nations
UNS:	Urban Network Strategy (Msunduzi)
USA:	United States of America
WC:	Ward Councillor
WC:	Western Corridor (Ankara)
WCED:	World Commission on Environment and Development

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION

During the last century, transport and land use planning practices have reinforced the dominance of the automobile that radically changed the structure and the built form of cities. The existence of contemporary cities is therefore underpinned by transportation technologies that provided accessibility in space, allowed suburban development and has contributed to urban sprawl. The adverse effects of encouraging sprawling land use development consumed vast amounts of natural land, which resulted in significant challenges facing cities. Since the 1990's, *"Sustainable Cities"* have become the central theme of focus in urban development. The development of transportation corridors as a structuring urban element presented a powerful and effective planning tool that influenced the restructuring of cities in the world. As expressed by Kleynhans (2001, cited from Duany & Plater-Zyberk, date unknown) that the specific focus of development corridors is to *"integrate the natural environments and man-made communities into a sustainable whole".* Within the context of this study, the role of corridors in addressing the spatial inequity of South African cities in order to create more efficient, equitable and sustainable cities that can meet the needs of the poor and an increasingly urbanising population, will be discussed and analysed.

The aim of this research dissertation is to unpack the notion of development corridors in theory and practice as an innovative strategy to restructure cities. Reference will also be made to international and national precedents and models to identify best practice experiences that could inform local projects and processes. The focus of this research is restricted to an evaluative analysis of the Edendale Town Centre Node located along the Edendale-Northdale Corridor (ENC) in the Msunduzi Local Municipality, which is located in KwaZulu-Natal. This paper will report on the research findings regarding the potential of corridor development has to achieve a compact urban form and thereby address the various spatial, social and economic challenges facing the city. The opportunities, gaps and limitations between planning theory and implementation in terms of contemporary development practice will be explored in the context within which suburban development is occurring. The research data has been collected through interviews and questionnaires from planners, development industry participants and municipal councillors and officials who are the key role players of the city will reveal what is being done to promote the corridor development strategy in order to achieve the desired spatial form for the city.

1.1 BACKGROUND AND MOTIVATION FOR STUDY

"The paradigm of city planning in recent decades has been to promote the compact city of dense development focused around urban centres of employment and local services to reduce the need to travel long distances and to make cities more vibrant. This is a reaction against sprawl induced by the universal use of private automobiles. Claims that compaction will make cities more sustainable have been debated for some time, but they lack supporting evidence as to the environmental, economic and social effects" (Echenique, Hargreaves, Mitchell and Namdeo, 2013:121).

As the above quotation demonstrates, there has been increasing consensus in the past decade that the nature and scale of urbanisation and city growth have caused a multitude of impacts on the environment, which is of critical importance to planning. Rapid urbanisation has generated problems such as urban sprawl, loss of open space and farmland, growing traffic congestion, absence of sense of place and air pollution resulting from automobile dependence, poverty, unemployment, poor housing and crime that are challenging cities. Litman (2015) states that currently massive urbanization is occurring in Developing Countries which will result in approximately 2,2 billion new urban residents entering urban settlements and cities between 2015-2050. It is projected that in the period of 1950-2050, the world population will quadruple. Simultaneously the population distribution will increase from the present pattern of 80% rural to 80% urban. How cities grow and what development models are used will have an immense impact on the economic, social and environmental fabric. The development of appropriate models and policies to guide this change and maximizing benefits whilst minimizing costs are critical in order to leave a sustainable legacy for the future generations.

Yang (2009) recorded that in the last century there have been remarkable shifts in the way people live because of social, political, technological, medical and ideological innovations. Accelerating scientific advancements, telecommunications that are more efficient, improving information technology, mass media and faster transportation has transformed the world dramatically. However, these radical changes have also resulted in complex problems such as environmental pollution, resource depletion, species extinction, and a widening gap between rich and poor, crime and poverty, which are more concentrated in the cities. Finding solutions to these complex problems are considered important components towards achieving sustainable urban development. Sustainable development has advocated that the world needs to be observed as a system that connects space, time and all elements of society (e.g. economic growth, social development and environmental conditions) that do not exceed the carrying capacity of the planet.

Urban sprawl was initially associated with the social problems that arose in the United States of America (USA), United Kingdom (UK) and Western Europe in the 1920's due to the poor hazardous living conditions triggered by the Industrial Revolution. Following World War II, the rise in incomes allowed the purchase of individual transportation in the form of the development of the automobile. Accommodation of these vehicles required highway construction and land availability facilitated mass movement to suburban areas. By the decade of 1960's - 1970's population migration induced the movement of industrial, commercial and office businesses to suburbs that reinforced sprawl hence encouraging urban expansion, which caused cities to grow outwards at low density, e.g. single house developments. Watson (2009) explains that in contrast to the North and West of the world, the issue of urbanizing poverty in the Developing South was severe. It occurred under very different circumstances given that it took place in the absence of mass industrialisation and within the context of low economic growth rates. The legacy of colonisation affected the growth trajectory of the Developing South.

Coetzee (2012) mentions that it was the ideology of Apartheid urban policies and imported international modernist planning system which developed in the 1900's in United States of America (USA), United Kingdom (UK) and Western Europe that influenced the spatial form of South African cities. The Apartheid system offered an ideal tool to enforce and promote separate and fragmented development in urban areas. It created a distorted spatial pattern characterised by racial, socio-economic and land use segregation that kept commercial and industrial activities out of Black townships thus denying these areas an economic base. Simultaneously, it reinforced their dependence on White areas. This facilitated unsustainable human settlements located far from workplaces and poor-quality environments. Dauskardt (1993) has highlighted the point that racial segregation restricted the Black population from the inner cities under legislation and displaced the poorest locating them in townships on the urban periphery. These places were the furthest away from employment, services and urban amenities. Despite the attempts to segregate access to urban areas, people seeking a better life in the urban conclaves found ways to circumvent the legal frameworks that prevented access and located in backyards, informal settlements and on vacant land. Since 1994, the demise and dismantling of Apartheid has hastened this process. A worldwide urban migration process has influenced it. The new political dispensation opened up cities, which led to the decentralisation of commercial, office and retail sectors to suburbs thus causing the accelerated decay of inner cities. This mammoth challenge to radically transform and restructure the inefficiencies and inequalities of the Apartheid city form that was

shaped by four decades of spatial regulation and technocist planning now confronted policy makers and planners.

In response to this dysfunctional urban form one of the main approaches that emerged in the University of Cape Town was the Compact City Concept (Urban Problem Research Unit) which attempted to understand what would make positive sustainable urban environments. David Dewar (1991), the champion of this approach, expressed the view that the first step was to understand what motivated people to choose to live in the city. He stated that people did not just come to the city to find shelter but to experience the economic, social, recreational and cultural opportunities it generated through the provision of services, which was possible due to the physical clustering of large numbers of people. Furthermore, the ability of the urban system to create such opportunities was influenced by the way, in which an area was structured. According to Dauskardt (1993) this approach would facilitate the optimal use of infrastructure, achieve an efficient urban form to support a well-functioning economy and facilitate the integration of a racially divided city through densification. As articulated by the World Bank "*The main influence on improved efficiency in most South African cities will be their capacity to become more compact"* (cited in Dauskardt, 1993, World Bank 1992:4).

Todes (2010) also argued that the need for internationally identified concepts and principles for urban planning with a greater emphasis on sustainability and improved integration was critical. According to Todes, Dominik and Hindson (2004) the reality was that the urban poor would continue to remain in the townships on the periphery and therefore another method of access needed to be considered. The concept of development corridors emerged as a tool that could be used to upgrade township areas to link and integrate them more effectively to the core. Dewar and Uytenbogaardt (1991) emphasised that with the intent of restructuring South African cities the central focus of the compact city and development corridor strategy was the objective to promote the continuity of the urban fabric and the full utilisation of potential transport connector routes i.e. corridors. The underlying factor of the compact city approach is that it is rooted in the needs of the people that gives rise to the form of the city and includes elements such as equity, intensity, diversity, integration, complexity, freedom and balance, which ultimately promote an efficient and equitable urban environment.

South African cities are characterised by fragmented, dispersed, inequitable and inefficient urban forms because of Apartheid policies and modernist planning. Du Plessis (2014) points out that the consequences of poorly located lower income settlements in the periphery, insufficient public transport and unequal access to public services, amenities and job opportunities continue to persist. The

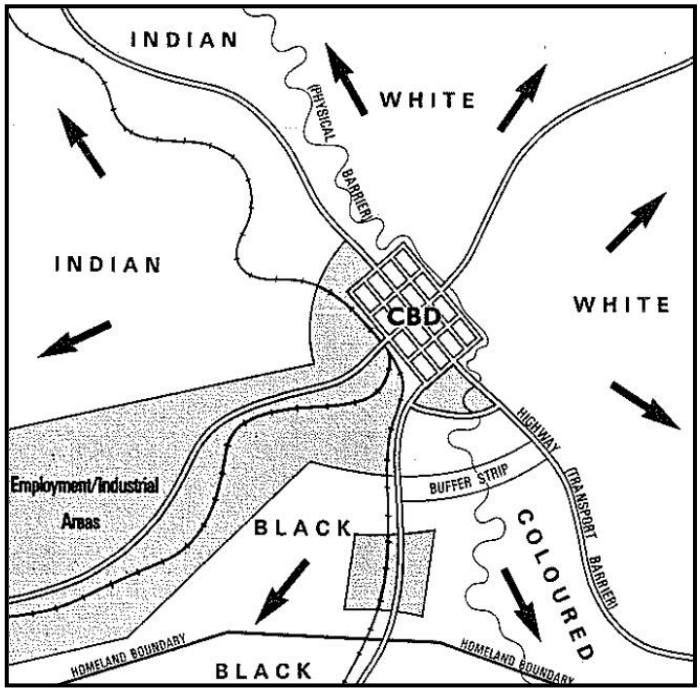
separation between places of work, living areas and recreational spaces have resulted in high levels of mass movement across vast areas which is costly, time consuming and entrenches unequal access to resources. It is therefore argued that the effectiveness of the post-Apartheid era and its efforts to spatial restructuring of South African cities needed to be continually reassessed. Furthermore, various policy documents such as the National Urban Development Framework (2009), the New Growth Path (2011) and the National Development Plan (2012), also indicate that after two decades of democracy, South African cities remain the most inefficient, unsustainable urban environments in the world.

Based on the above assessments it is the intention of the researcher to investigate, analyse and present as a central argument in this dissertation that the notion of Corridor Development as a strategy can be used to achieve an integrated compact urban form in order to reverse the spatial effects of Apartheid. This research will attempt to address the wider debates on an international and national level to show how this strategy attempts to address and overcome the issues of urban sprawl, extreme spatial inequalities and poverty. It will also demonstrate how the pursuit of these goals can be constrained by various obstacles such as restrictive policies, forces of politics, economics (i.e. lack of resources). The research will also be guided and underpinned by an investigation into the various theories and concepts, which relate to the compact city and corridor development strategy. Watson (2009) pointed out that the New Urbanism and Smart Growth theories reflect many spatial principles of the compact and sustainable city at local neighbourhood scale. She stated that they promote a compact urban form, fine-grained mix of uses, mixed housing types, pedestrian friendly streetscapes, defined edges and multi-modal transportation options, facilities clustering around key public transportation routes and intersections to maximize convenience.

1.2 THE STUDY AREA

The Msunduzi Local Municipality commonly known as the city of Pietermaritzburg is a typical example of a South African city. It has a skewed-fragmented spatial urban form which reflects the legacy of the past states policies of separate development for various population groups. The enactment of the Group Areas Act (No. 41 of 1950) changed the social, economic and spatial geography of the city in that whilst a large component of the White population occupied the central core, the Black population was expelled to the outskirts of the city with majority located in the periphery as depicted in Figure 1.

Figure 1: The Apartheid City Structure



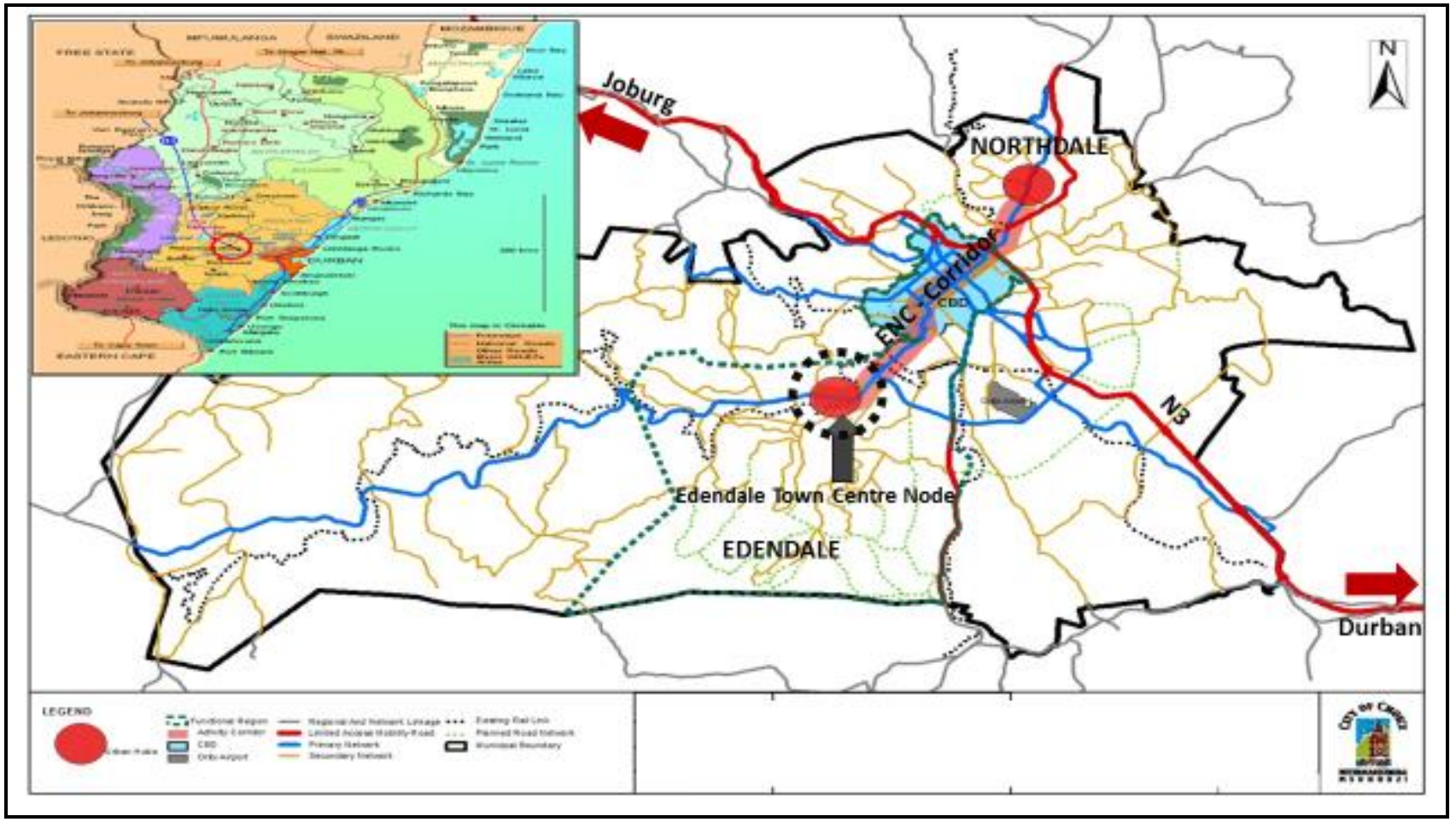
Source: Trevor Wills in Laband and Haswell, 1988

The Municipality's Spatial Development Framework (SDF) 2015 clearly indicates that history has indeed shaped the city that is evident by the Apartheid city model still manifest twenty years after democracy, which is an unacceptable situation. Furthermore, linked to this is the clear disparity of wealth, employment opportunities, levels of neighbourhood planning and access to basic services between the Black, Asian, Coloured and White areas, which needs to be corrected. While some of these marginalised areas have recreational spaces and public services and amenities, the quality, maintenance and accessibility to these communities are questionable. The quality of urbanism within most of these areas is considered low particularly in respect of access to basic services. This situation presents the Msunduzi Local Municipality with the substantial potential for development along key transport corridors for ease of access to economic, social and recreational opportunities. The irony that emerged during the review process was that the most populated and underprivileged areas within the municipality have least access to economic, social and recreational facilities.

Historically, it is the Edendale Township that has the majority of previously disadvantaged, lowest income Black population in the city. The suburb reflects all elements of Apartheid planning. Its position is separated and segregated from the central part of the city. It is lacking in infrastructure and social services, is deficient in employment opportunities, and has high levels of poverty, unemployment and a rapid advancing rate of informal settlements. In order to advance the development of the study area in an integrated and coordinated manner the Edendale-Northdale Corridor (ENC) has been identified. It forms the East-west link to the core and other parts of the city. The corridor was identified in Msunduzi's SDF as the primary corridor that could be used to direct activities and actions in a manner that could yield a more effective, efficient compact urban form. This would facilitate the provision of economic and social facilities with the aim of transforming both the physical and geographical landscape from a dormitory township into a dynamic vibrant urban place of high quality.

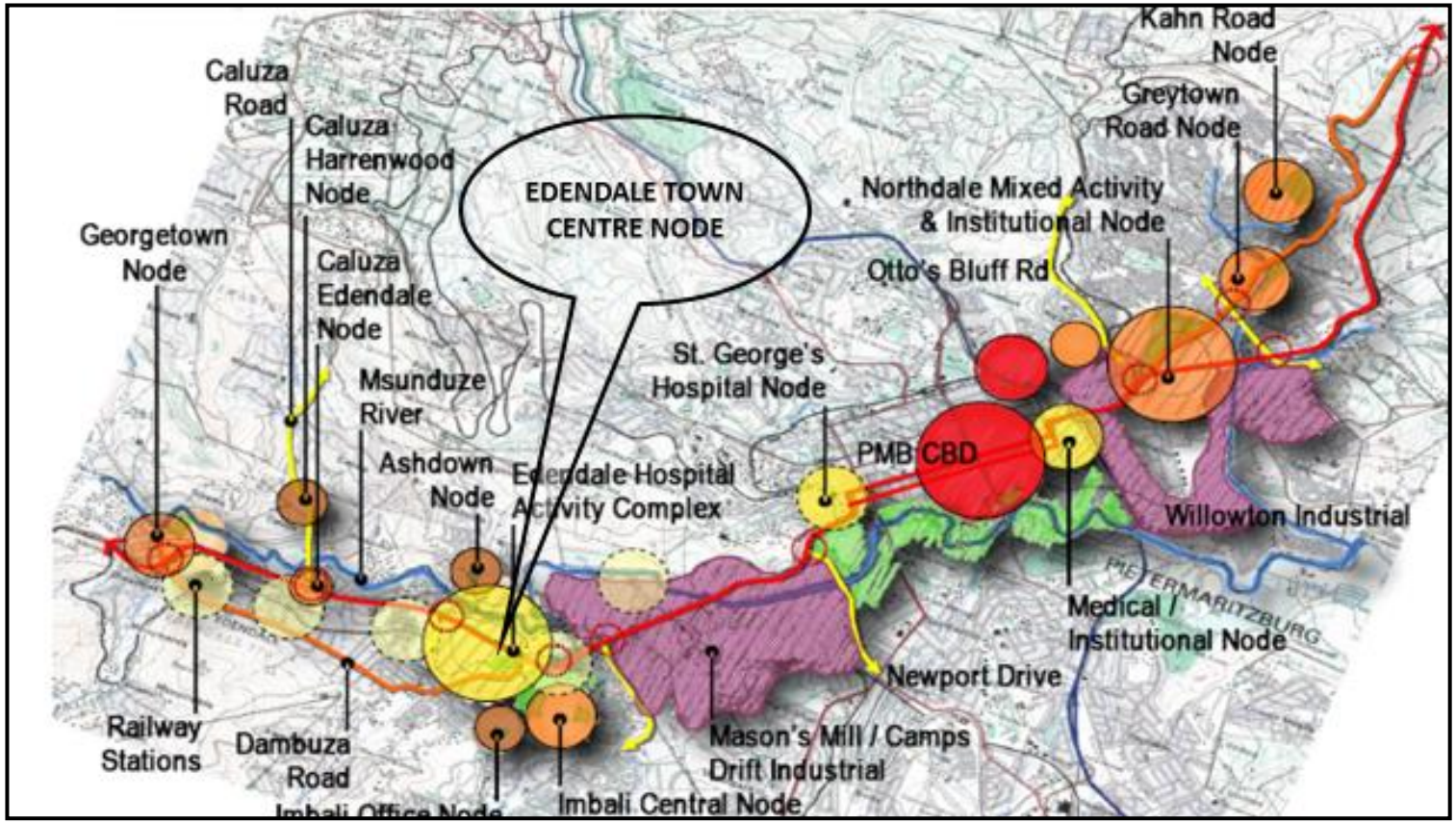
It was further envisaged that the corridor would promote public transport and non-motorised transport by improving infrastructure and services through integrated transport and land use developments. The municipality recognised the corridor as the civic centre and heart of the Edendale area that will contain a wide range of social services, community facilities, and retail and industrial uses. The promotion of mixed-use service nodes at key intersections along the corridor would be encouraged to accommodate commercial, community, public and transportation facilities. The corridor extends from Georgetown in the west through Edendale, through the Central Business District (CBD), extends to Northdale in the north-east, and is approximately seventeen kilometres in length as depicted in Map 1 and Figures 2 below. It has several development nodes that are located along the corridor however, for the purpose of this research it was deemed prudent to limit the study area boundary to the *'Edendale New Town Centre Node'* located within the Township of Edendale in the Msunduzi Local Municipality as depicted in Figure 2 below.

Map 1: Study Area: the Edendale-Northdale Corridor



Source: Msunduzi Municipality, 2006

Figure 2: Study Area: Edendale New Town Centre



Source: Msunduzi Municipality, 2006

1.3 PROBLEM STATEMENT

Since the 1940's the interface of spatial development and transportation routes has occupied the minds of planners debating the need for integration in cities. Various international models have been proposed to address the problem e.g. ribbon development, the model of the linear city and the introduction of mixed use along high traffic areas. As part of the research, a number of international precedent case studies will be reviewed to assess how the principles of city restructuring has been tackled in Developing and Developed Countries. The aim is to compare and contrast international best practice with local examples in order to assess how successful South African approaches can be in addressing the unique planning challenges faced in the country.

Prior to 1994, the problem of city integration was debated in South Africa in a limited form only due to the political dispensation that favoured social engineering and separate development. By the late 1980's it became apparent that South Africa cities were dysfunctional and unsustainable from a financial perspective. One of the key issues addressed by the Reconstruction and Development Plan (RDP) post 1994 was the need for urban reconstruction to mirror the creation of democratic society. Urban models and plans has to address the integration of formerly fractured urban spaces.

It is argued that after two decades of democracy South African cities still bear the core Apartheid features and are the most some of the most inefficient, unsustainable urban environments in the world. This assertion further emphasized by recent policy reviews. With urbanisation predicted to continue, bridging the deepening social-economic inequalities remains a key challenge facing town planners and development specialists. In response to this ongoing challenge facing South African cities, new policies and spatial tools have been developed. One of these is the concept of nodes and corridors. The identification and implementation of corridor development emerged in the 1980's following seminal work undertaken by Dewar and Uytenbogaardt at the University of Cape Town. Primarily their work considered how to understand the structure of the city as a 'web' that needed to have its parts reconnected. In developing the theory and practice of nodes and corridors, Dewar and Uytenbogaardt devised a model for urban reconstruction, which could be replicated in cities across South Africa. They proposed a strategy for promoting an efficient, compact, integrated quality urban environment with a broader goal of restructuring our cities to meet the needs of all citizens

In 2008 – 2009 the Provincial Planning and Development Commission (PPDC) initiated a research project entitled *"Development Corridors: Towards Appropriate Planning within Kwazulu-Natal"* which was intended to provide a set of guidelines for the implementation of the model in the province. The work was published in two volumes, which outlined contemporary theory and practice. In essence, this work has contributed to the broader understanding and implementation of nodes and corridors at municipal level. This research intends to test the model and the methods proposed by both the Dewar Uytenbogaardt School and the PPDC at the local level. As outlined in the previous paragraph the focus area of the Edendale Corridor located in Msunduzi Local Municipality. Within the seven-kilometre area of this project is evidence of the historical land, socio-economic and spatial challenges that have come to characterise the disparate landscape of post - Apartheid cities. Due to its short length, it is possible therefore to adjudicate how successful the nodes and corridors approach will be in addressing the urban challenges long this route. The project has already commenced at the Town Centre Node and thus the research will focus on this area as the start up for the implementation of the nodes and corridors strategy in Edendale.

1.4 LITERATURE REVIEW

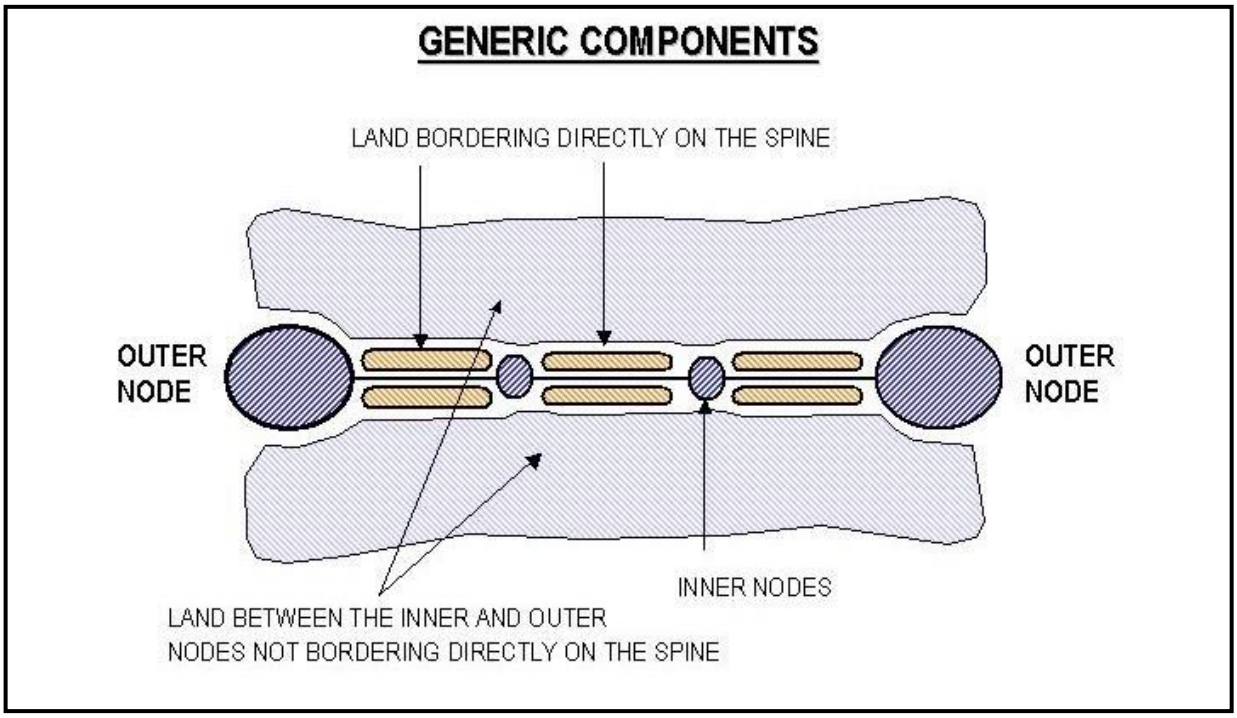
Pillay, Tomlinson and du Toit (2006) state that a group of planning academics from the University of Cape Town (UCT) were key to developing alternative approaches to restructuring South African cities in the late 1970's and the early 1980's. Their work under the academics and planning practitioners David Dewar and Roelof Uytenbogaardt has been influenced by the urbanist critique of Apartheid and modernist planning which included writers such as Christopher Alexander, Lewis Mumford, Jane Jacobs, Louis Krier and David Crane. They argued that planning should be more interventionist through designing structuring systems rather than regulatory - control through Town Planning Schemes and Zoning plans. A capital web of public services at high access points through which public transport would move should reinforce these systems. In addition, economic activities, high-density residential and mixed uses be located in close proximity to transportation routes, which would facilitate higher thresholds for services, facilities, economic activities and public transport. They contended for a more compact, integrated development that would mitigate environmental degradation and urban sprawl. In this regard, various papers on urban compaction and integration were presented and the Council for Scientific Transport reinforced these concepts further for integration through urban corridors. In line with this strategic move, these ideas on urban restructuring, compaction and integration found

expression in various pieces of policy documents. Furthermore, international visits to Curitiba and Toronto that characterised successful corridor development experiences strengthened the University of Cape Town (UCT) School's planning approaches where Dewar and Uytenbogaardt taught and developed their ideas. Subsequently the notion of restructuring urban space through the creation of *"nodes and corridors"* was accepted into mainstream planning elsewhere in South Africa. In the late 2000's it was the subject of a research project initiated by the Provincial Planning and Development Commission and undertaken by a consortium of planners in private practice.

According to the research documents published by Provincial Planning and Development Commission (PPDC, 2008) the corridor development concept is not new but has been implemented in many cities of the world. Within the South African context, it emerged in reaction to the need for housing and the location of low-income housing on the periphery. Corridors have been described as land use systems that have a linear form of intense mixed-use activities, which gives structure and shape to surrounding environments and are recognized as a spatial structuring and economic growth tool. According to Dewar (2007), corridors are found at different scales and circumstances. In an urban area they comprise a one kilometre wide portion of land with mixed uses located on either side of one or more interlinked transport routes that connect nodes on either end like a 'string of beads' as depicted in Figure 3 located on the next page. These transport routes are the arteries of corridors that carry flows of people, goods and finance that make it functional.

Warnich and Verster (2005) describe corridors as a continuous link between two metropolitan nodes and emphasize that it is not an elongated node. Dewar and Uytenbogaardt (1991) emphasize the significant role of corridors in promoting continuity of the urban fabric where the connector routes integrate various elements into a compact-integrated urban environment thereby resulting in well performing urban environments. The historical development, definitions, key concepts and elements that underpin corridor development including critiques will be further explored to set the framework for this research. A detailed evaluative analysis of the impacts of the corridor development concept in Edendale will provide a basis to establish whether current planning initiatives will indeed contribute to spatial restructuring of the city. This will present important lessons for planners to take into consideration.

Figure 3: The Generic Components of a Development Corridor



Source: PPDC, 2008

1.5 RESEARCH AIM AND OBJECTIVES

1.5.1 Primary Aim of Study

The primary aim of this study is to research the concept of corridor development as a strategy, and thus to evaluate whether it can achieve a compact urban form in Edendale.

1.5.2 Research Objectives

The objectives of the research process are outlined as follows: -

i. To unpack Corridor Development as a strategy and its linkages with the concept of Compact Urban Form;

ii. To research the history and spatial expression of corridors and nodes in international theory and practice;
iii. To investigate the contribution of Corridor Development towards achieving a Compact Urban Form;
iv. To examine how it is understood and applied through international and national precedents;
v. To apply these findings and lessons at local level;
vi. To evaluate these findings with the context of the Edendale case study area; and,
vii. To identify opportunities, challenges and limitations that will influence its success or failure in local contexts.

1.6 RESEARCH QUESTIONS

In order to test the validity of the research hypothesis, the following questions have been proposed.

1.6.1 Key Question

The main research question is:-

"To what extent can the strategy of corridor development achieve a compact urban form in Edendale?"

1.6.2 Sub Questions:

In order to unpack the main research question, the following sub questions have been developed:-

I. What is understood by Corridor Development and Compact Urban Form?
II. How does the history and spatial expression of corridors and nodes in international theory and practice contribute to an understanding of the concepts use in South Africa?
III. How can Corridor Development as a strategy contribute to achieving a Compact Urban Form?
IV. What lessons can be learnt and applied from international and national best practice models?
V. What are the key opportunities, challenges and limitations that influence success or failure?
VI. How can these findings be evaluated within the context of the Edendale case study area; and,
VII. What opportunities, challenges and limitations that will influence its success or failure in local contexts.

1.7 HYPOTHESIS

The research proposed the following hypothesis: –

"*Corridor Development as a strategy has the potential to achieve a Compact Urban Form in Edendale.*"

This statement will be critically evaluated through the research process to ascertain its validity.

1.8 RESEARCH METHODOLOGY

Soanes and Stevenson (2004, cited in Naoum 2013:13) states that according to the Oxford Dictionary, research is defined as a 'careful search or enquiry; to discover new or collate old facts by scientific study of a subject; course of critical investigation'. Therefore, the words research, enquiry, study and investigations are synonymous and must be carried out in a methodical and systematic manner. This research attempts to develop an understanding of the corridor development concept by undertaking an evaluative analysis of the application of the concept in theory and practice. Since this will constitute a descriptive analysis, a qualitative data approach will be adopted. Naoum (2013) explains that qualitative research is subjective in nature and emphasizes meanings, experiences and description. Palgrave (2013) also points out that this type of approach is used to understand meanings, ideas, beliefs and intangibles. The study methodology therefore includes both theoretical and empirical components. Primary data collection involves fieldwork/personal observations through interviews and discussions and, secondary data collection that involves a desktop study that will be adopted as discussed below.

1.8.1 Secondary Data Sources (Literature Review)

This will form a considerable part of the theoretical underpinnings of the study and will involve an in-depth analysis of information, which will be sourced from books, articles, journals, government publications, reports and the internet.

1.8.2 Mapping and Diagrams

Relevant data will be sourced from the municipality and other service providers to enable a mapping analysis where necessary. Additional maps and diagrams will be used and sourced from secondary documents to illustrate concepts, plans and ideas, which are pertinent to the research analysis and its findings.

1.8.3 Primary Data Sources

1.8.3.1 (Fieldwork/Observations)

Site visits to the study area will provide direct visual analysis of the study area by observing the current situation. Qualitative information will be sourced from the following specialists.

1.8.3.2 Key Informant Interviews

The purposive sampling method has been adopted for the selection of interviewees who comprise of predominantly government officials and town planners who are directly involved with the study area and have adequate knowledge on the subject. Discussions with key stakeholders will include:

- Public Sector: Spatial Planning official from Local Government (2);
- Public Sector: Transport Planning official from Local Government (1);
- Public Sector: Local Government Ward Councillor (1);
- Public Sector: Spatial Planning official from Provincial Government (Cooperative Governance and Traditional Affairs -COGTA) (2);
- A Non-Government Organisation – the Edendale Development Forum (1) and,
- Private Sector: Planning and Development Consultant (2)

It is noted that a sample size of six to ten stakeholder interviews are require for extrapolation of themes or observations in quantitative analysis. It is anticipated that given the time of the research and the availability of officials and other stakeholder representatives this target should be possible.

1.8.4 Questionnaires

Structured and semi-structured interview questions have been prepared for the interviewees and all interviews will be documented. Prior consent will be obtained if recordings are going to be undertaken. According to Naoum (2013), the elements that characterise semi-structured interviews include respondents who have in-depth knowledge and experience on the research subject and includes an interview guide linked to the research hypothesis. Furthermore, the interviewer has the freedom to probe queries during the interview. In structured interviews, all questions are identical and follow the same sequence. During the formulation of the questionnaire, it is important that the research aims, objectives and hypothesis be translated into specific questions. Open-ended questions that allows the interviewer the freedom to express his opinions (See Appendix 1, page 202).

1.9 SCOPE AND LIMITATIONS

With respect to the study area boundary, based on the nature, scale and scope of this research it was confined to one node being the Edendale New Town Centre. The Edendale-Northdale Corridor extends over seventeen kilometres in length and comprises several nodes. The entire length of the corridor could not be included in this study, as time will not permit the investigation of its complexity. Initially, it was proposed that all the interviews would be undertaken within approximately two weeks in 2016. However, due to time constraints and work commitments, it became necessary to interview some of the participants in 2017. It is not expected that the gap of approximately one year would in any way negatively impact on the outcomes of the research. Rather it is believed that the temporal gap will provide a substantive understanding of the complexities inherent in the projects associated with the Edendale Development Corridor. Accordingly, the research outcomes will be more robust. Due to the fact that the Edendale New Town Centre is currently under construction, the assessment is based on the various planning and development project proposals that are underway. It considers what they are trying to achieve in terms of creating and integrated development corridor in the case study area.

1.10 CHAPTER OUTLINE

The following dissertation is divided into seven chapters, and is structured in the following manner:

1.10.1 Chapter One: - Introduction and Research Methodology

The first chapter will outline the introduction and contextualize the nature and scope of the research problem and will highlight the main elements of the research such as the hypothesis, research aims and objectives, research questions and research methodology.

1.10.2 Chapter Two - Conceptual/Theoretical Framework

Following the introduction, Chapter Two will provide a detail discussion and critical analysis of the key theories that will provide a theoretical grounding and a lens/ framework through which the research will be guided. The discussions will include New Urbanism and Smart Growth theories, which reflects many key spatial principles of corridor development and the compact city concepts.

1.10.3 Chapter Three: - the Literature Review

Discussions in chapter Three will include a comprehensive review of the existing literature that traces the emergence and foundations upon which development corridors have been laid. In addition, other

key concepts and broader debates linked with the corridor development concept such as urban sprawl and the compact city form will be discussed.

1.10.4 Chapter Four: - Precedent Studies

Thereafter Chapter Four will outline various international and national precedent case studies and models. These will include successful world examples such as the cities of Cleveland in Ohio (United States of America), Curitiba in Brazil (South America), Ankara in Turkey (Europe/West Asia) and the city of Johannesburg in Gauteng (South Africa). Lessons will be drawn from these precedents and critically evaluated for their usefulness in guiding practice. These examples will inform and guide the development of corridors at local level planning and highlight the challenges that planners need to take into consideration when proposing this concept as a spatial restructuring tool.

1.10.5 Chapter Five: The Case Study

Chapter Five will outline some of the forces that have shaped the spatial transformation of the city of Pietermaritzburg in Msunduzi. The Edendale New Town Centre Node selected for this case study will be assessed in terms of the various planning initiatives put forward to date in order to establish whether the corridor development strategy can achieve a sustainable, compact urban form.

1.10.6 Chapter Six: Research Methodology and Findings

Chapter Six involves an enquiry into the potential of corridor development strategy to achieve a compact urban form with the objective to address the various spatial, social and economic challenges facing the city. This will be facilitated through the collection of data through research questionnaires and structured interviews conducted with key institutional and political role-players in order to establish the role of the state and governance at various scales. The outcomes will also reveal how the concept is perceived, the support received and the prospects for the implementation of the concept in responding to the needs of the city. Potential opportunities, limitations, conflicts and gaps between planning theory and implementation in terms of real life development practice will be identified and discussed. A detailed evaluative assessment of the impacts of the corridor development (i.e. Edendale New Town Centre) in relation to the key theories and precedent case studies against selected criteria will be discussed.

1.10.7 Chapter Seven: Conclusions and Recommendations

Finally, chapter seven will present a summary of the research with concluding remarks and propose interventions and recommendations, which will serve as a guide in support of the spatial restructuring process of Msunduzi Municipality through the corridor development strategy.

1.11 CONCLUSION

This section of the dissertation has provided the background of the topic, contextualized the nature and scope of the research problem and explained its relevance for the research. The main elements of the research such as the hypothesis, research aims and objectives and research questions have been discussed in detail. The research process is also detailed in the proposed methodology for the study. The above chapter has outlined the purpose and clearly, sets out the details of the successive chapters and the constraints and delimitations to the study have been outlined. The forthcoming chapter that follows deals with the theoretical framework that will inform the study.

CHAPTER TWO: THEORETICAL/CONCEPTUAL FRAMEWORK

2.0 INTRODUCTION

Bhatti and Dixon (2003, cited in Vallance, Perkins and Dixon, 2011) have noted that *"it is unrealistic to expect people to care about global warming or species extinction when they are cold, hungry, looking for work, or feel unsafe in their own homes".* Thus, creating built environments that provide equitable access to essential services, jobs, transport and housing is a fundamental precondition to sustainable development. Hassan and Lee (2014) point out that the notion of sustainability and sustainable development emerged as part of a global lexicon in 1972, when the United Nations Conference was held. Several years later (1987) the World Commission on Environment and Development (WCED, 1987) initiated by the Norwegian Prime Minister Brundtland was established. The WCED also known as the Brundtland Commission in its report *"Our Common Future"* prepared for the World Commission on Environment and Development defined sustainability as *"development that meets the needs of the present generation without compromising the ability of future generations to meet their needs"* (WCED, 1987:8). This is the most well know definition, which has been widely criticised yet still remains unchallenged. The Oxford Dictionary explains the meaning of sustain as, *"to keep up or keep going; endure; to keep in existence or maintain."* The above definition therefore clearly implies that development is to take place within the human-environment context, which balances competing interests between the major pillars of sustainability being economic growth, social equity and protection of the environment.

However, it is interesting to note that in the writings of Vallance, Perkins and Dixon (2011) that studies and debates on social sustainability emphasize the importance of social preconditions for it to occur. This implies that sustainable development takes place only when the basic or essential needs of communities are met. For example, when the poor are given priority in developmental processes, then they become empowered to engage actively in addressing the biophysical and environmental concerns i.e. the reconciling of meeting people's basic needs with environmental management goals through economic development. The United Nations (UN) also defined sustainability as, all members of society being able to meet their needs without depleting the existing resource base and compromising the prosperity and ability of future generations meeting their own needs. Here again the emphasis is firstly on meeting *"needs"* and is then followed by the idea of limitations in respect of not exceeding the environments carrying capacity for the present and future generations. The United Kingdom (UK)

government in congruence with the Brundtland definition described sustainability simply as a better quality of life.

In 1992 at the Earth Summit Conference in Brazil, the Agenda 21 Global Action Plan highlighted the promotion of sustainable development for human settlements through the 21st Century. Therefore, in keeping with the global agenda on sustainability, governments, planners and geographers are seeking appropriate solutions to the economic, social and environmental problems through sustainable theories, strategies and policies. Jepsen and Edward (2010) argue that one of the major challenges in the planning and development field is the translation of sustainable development principles and standards onto the ground e.g. into physical human settlements. Therefore, planners as reflecting the land use characteristics of sustainable development perceive the emergence of development approaches such as New Urbanism and Smart Growth. They have been promoted as a means of creating this environment and meeting its objectives. New Urbanism is proclaimed as a guide to development that can be sustained and Smart Growth as a way to meet challenges of sustainability.

Therefore, within the context of sustainable city building and after careful review of the body of theoretical literature the researcher identified New Urbanism and Smart Growth as the most appropriate theoretical frameworks to base this research on. Furthermore, the principles and elements that characterise these approaches have been successfully adopted as tools to address issues of physical fragmentation and inaccessibility by facilitating the creation of compact-integrated cities. These theories are interlinked and closely related to the notion of urban compaction, which is the final end product this research aims to achieve. More importantly, in order to develop a better understanding of these approaches the chapter below attempts to define, describe and discuss the theories that are considered influential determinants in underpinning the spatial restructuring of Edendale in Msunduzi through the Corridor Development Strategy. Also bearing in mind that the study area's built environment is influenced and shaped by various political, economic and socio-cultural dynamics including issues such as the legacy of Apartheid, poverty, unemployment, poor health and inadequate housing.

2.1 THE NEW URBANISM THEORY

2.1.1 History and Emergence of New Urbanism

New Urbanism is a planning and urban design movement that emerged in the United States of America in the early 1980's as an intentional response to post-World War II suburban sprawl. Katz (1994) noted that several architects and planners that included Peter Calthorpe, Michael Corbett, Andres Duany and Elizabeth Plater-Zyberg amongst others supported a sustainable development model promulgated the movement. Talen (1999) explains that New Urbanism represented an umbrella term that encompassed neo-traditional development and a return to traditional neighbourhood concepts and transit-oriented designs to promote social interaction and to create a sense of community. Other authors emphasize that the approach was largely promoted to reconnect transport with land use. In particular the approach will establish transit-oriented development where high density, mixed use areas are built along high quality transport networks facilitating an urban structure that will reduce car dependence, sprawl and improve societal well building through compact, socially diverse and pedestrian oriented settlements (Newman and Kenworthy, 1996; Oranje, 1995).

Trudeau (2013) explained that the ideology was an attempt to reconcile ideas about urbanism in America that gained prominence in the 1990's which was informed by planning approaches used in the town planning movement of early 20th Century such as Howard's Garden City model (1985), Jacobs (1961) Greenwich Village's density and diversity and, Perry's (1974) Neighbourhood Unit Theory. Hartley (2006) points out that its goal was to redress the failures and cure the ills caused by the conventional approach of modernist urban planning, which resulted in unchecked suburban sprawl, a dependence on the automobile, and the abandonment and decay of the built form of towns and cities. In the beginning of the 19th Century, American cities were characterised by compact, mixed-use neighbourhoods however this pattern changed since the inception of the industrial revolution and the advent of the automobile that induced cities to expand outwards creating suburbs that decentralized the central city and eventually led to land use segregation and urban sprawl. Ellis (2008) explains that since the Industrial Revolution, American cities experienced a population explosion where millions of rural inhabitants, who were no longer needed on farms, as well as large numbers of European immigrants, flocked to American cities in search of better prospects and living conditions.

Technological innovations such as the automobile, the rapid construction of roads, bridges and freeways, the overcrowding of populations in central cities, inadequate sanitation, water and housing, pollution and disease were some of the urban problems that led to the process of city expansion.

Growing populations encroached into the surrounding countryside of urban settlements in search of healthier environments. Freeway construction opened up large areas of land for suburban developments including manufacturing and housing. Furuseth (1997) indicated that post World War II urbanisation was one of the sinister forces that brought American cities into a socio-economic crisis. The plight of American cities therefore led to the emergence of the New Urbanism Movement in the late 1990's as an alternative to conventional suburban planning where planners and architects were disillusioned with the decay of cities, environmental degradation and urban sprawl.

Talen (2000) argued that the main principles of New Urbanism addressed two key problems namely, - the separation of land uses and the lack of mobility. The solution to the first being the diverse mix of land uses that rejected single land use zoning and the creation of functional spaces; whilst the solution to the latter included the notion of compact urban form, the need to promote accessibility and public transit where pedestrian and transit-oriented development takes precedence over car-oriented development. New urbanists therefore concluded that suburban development failed environmentally, socially, aesthetically and ethically because of the separation of land uses.

According to Trudeau (2013) the Congress of New Urbanism (CNU) was founded in 1993 to give voice and visibility to the organisation which advocated "*Many activities of daily living should occur within walking distance, allowing independence to those who do not drive, especially the young and the elderly"* (Congress for the New Urbanism 2000:83). Likewise, Mohammad, Parisa, Alireza, and Seyed (2012) argued that the evolution of theories, which resulted in the emergence of the New Urbanist movement, was in response to the degeneration of cities. Saab (2007) has postulated that the New Urbanism Movement therefore sought to "*reintegrate the components of modern life-housing, workplace, shopping and recreation into a compact, pedestrian friendly, mixed-use neighbourhood linked by transit and set in a larger regional open-space framework"* Saab (2007:192).

2.1.2 The Principles of New Urbanism

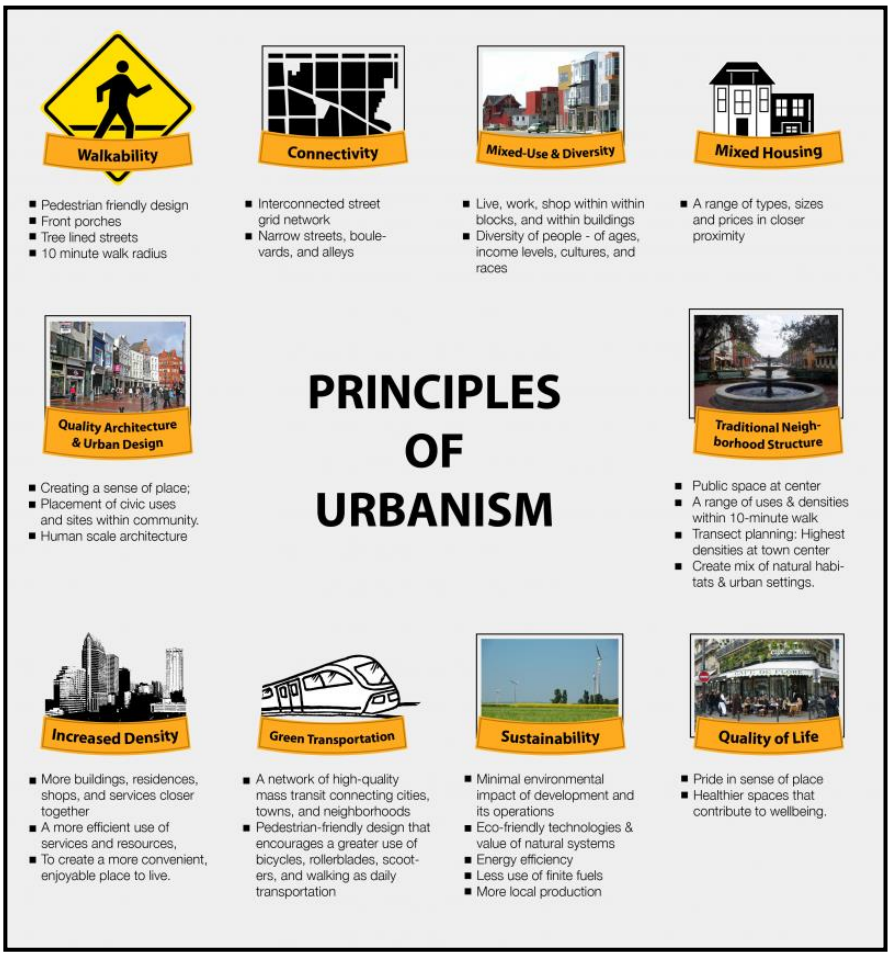
The new urbanist principles focus on building and re-building cities, towns and neighbourhoods that are compact with defined edges, which are walkable, include a pedestrian scale, are socially diverse, have mixed land uses, are transit friendly and promote a variety of housing typologies. Garde (2004) emphasized that the approach was largely promoted to mitigate sprawl, the deteriorating environment

and inner city decline. It did so in order to foster sustainable development and to facilitate infill development through the provision of a high quality of life for residents, whilst protecting the natural environment.

Subsequent to the formation of Congress of New Urbanism, a Charter was launched for New Urbanism at its fourth annual congress in 1996. In the Charter, it proposed twenty-seven principles that defined New Urbanism and reflected its vision for settlements (CNU 2000). A multi-disciplinary team of architects, planners, scholars and elected officials developed it. A group of nine principles was developed for different scales of development - the region, the neighbourhood and the block respectively. These principles were to guide public policy, development practice, urban planning and architectural designing. They have been built upon and reviewed through practice. Elshater (2012) highlights that the ten principles applicable at neighbourhood level are namely - Walkability, Connectivity, Mixed Use and Diversity, Mixed Housing, Quality Architecture and Urban Design, Traditional Neighbourhood Structure, Increased Density, Smart Transportation, Sustainability and Quality of Life. These principles are illustrated in Figure 4 on page 25. Furthermore, a number of these principles can be applied at different scales of development ranging from a single building to an entire community, a city block or neighbourhood, a village, town or city.

Wheeler (2013) described the term neighbourhood as the basic building block of cities that constitutes the residential fabric of an urban area that we all inhabit in our daily living therefore planning and designing at this scale affects our everyday lives. This included elements such as the availability of services and amenities, the need to travel, socio-economic diversity and interaction with our neighbours. He argued that it is planning at a level that deals with decisions regarding the design and width of streets and sidewalks, size of blocks, land use mix, location of public parks and the nature of open spaces that can have a drastic impact on urban liveability and sustainability. The neighbourhood scale is viewed as significant in the post-industrial society to reinvigorate a sense of community, which also has the potential to bring about more sustainable neighbourhood designs and urban development. These foundational principles, which outline the vision, ethics and values of New Urbanism, are discussed in more detail below.

Figure 4: New Urbanism Principles



Source: https://opentextbc.ca/geography/wp-content/uploads/sites/34/2014/06/Cristine-PrinciplesOfUrbanism-01-e1406069906609.png

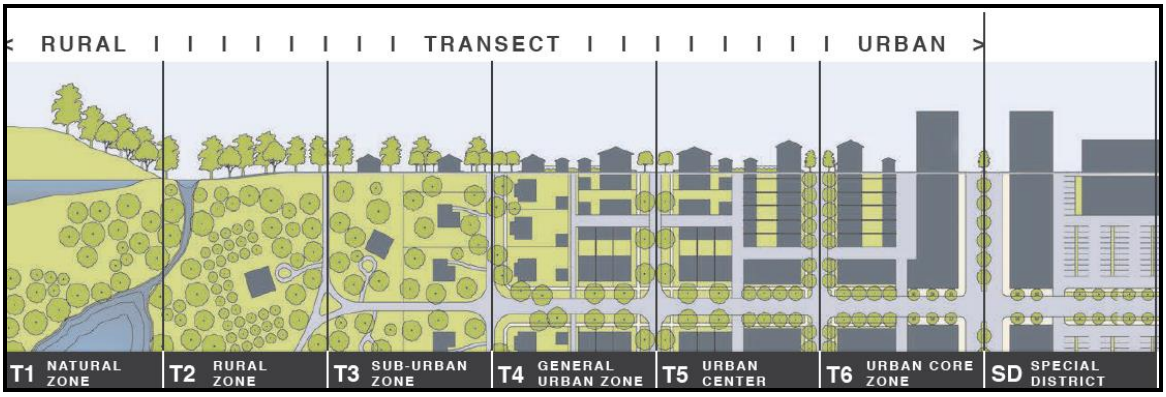
2.1.2.1 Traditional Neighbourhood Structure

According to Bohl, (2000) the notion of the rural-to-urban transect is a core concept which provides the framework for identifying types of streets, buildings and public spaces linked to rural, suburban, urban settings or a traditional neighbourhood structure comprising central, general and edge zones. Duany Plater-Zyberk & Company (1999) maintained that the concept emerged in reaction to codes and standards that prohibited traditional urbanism in the United States. The design approach of the transect concept facilitated a more interconnected city that better reflected local and regional architectural

traditions. Duany Plater-Zyberk & Company released the first set of transect-based codes in 2003 that categorized zones based on form instead of land use.

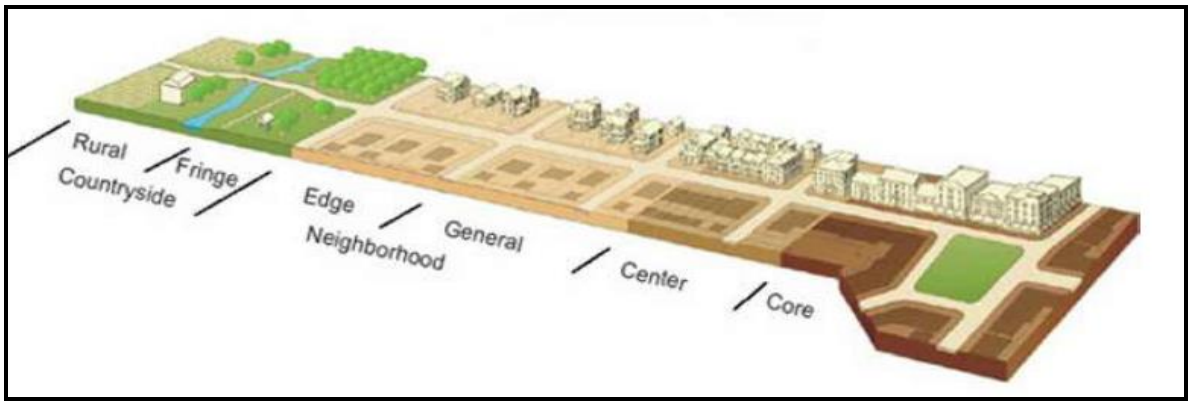
The six transect zones provide the basis for real neighbourhood structure which requires walkable street, mixed-use, transportation options, and housing delivery. The diagram has a discernible centre and edge, a public space at centre with an emphasis on the importance of quality public realm and public open space designed as civic art. It contains a range of uses and densities within an eight hundred-meter radius or a ten-minute walk. As depicted in Figure 5 below, *"The highest densities are located within the town centre and gradually becomes less dense towards the edge. The transect is an analytical system that conceptualizes mutually reinforcing elements and creates a series of specific natural habitats and/or urban lifestyle settings. The Transect integrates environmental methodology for habitat assessment with zoning methodology for community design. The professional boundary between the natural environment and human-made environment disappears, enabling environmentalists to assess the design of the human habitat and the urbanists to support the viability of nature. This urban to rural transect hierarchy has appropriate building and street types for each area along the continuum'" (www.newurbanism.org)*

Figure 5: A Transect Diagram



Source: Takemoto 2000, cited in Logan, (page 34, 2012)

Figure 6: An Urban to Rural Transect



Source: Takemoto 2000, cited in Logan, (page 34, 2012)

2.1.2.2 Walkability

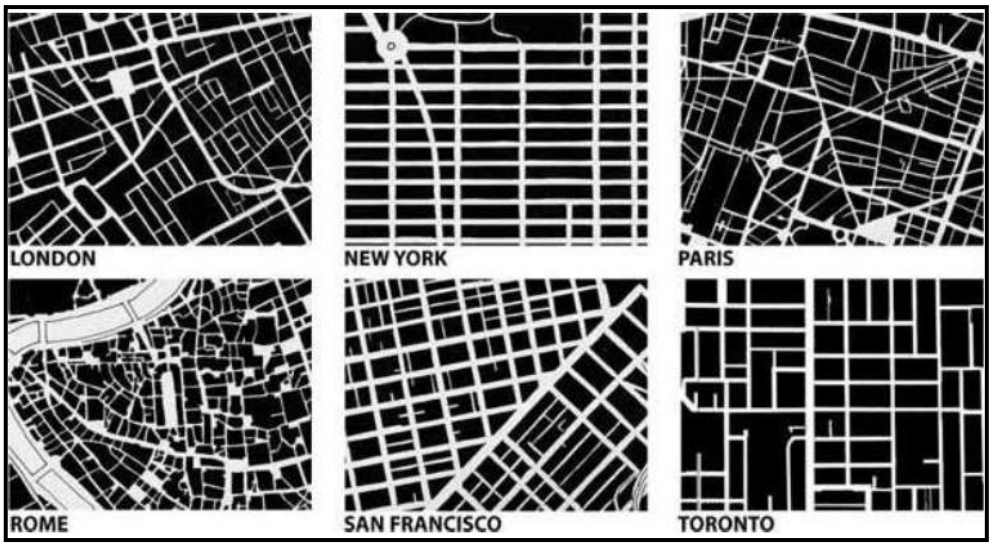
Trudeau (2013) states that New Urbanism fosters pedestrianisation. His assertion is based on the premise that compact neighbourhoods with pedestrian-oriented design will inspire people to walk therefore most uses and facilities should be located within eight hundred metres or a five to ten minute walking distance between work and home. Street design should be pedestrian friendly (buildings close to street, porches, windows and doors; tree-lined and greenbelt around streets; on-street parking; hidden parking spaces and lots; garages in rear lane; narrow, slow/low speed of cars) and pedestrian streets that are free of cars.

2.1.2.3 Connectivity/Movement Network

New Urbanism advocates a highly interconnected street grid system with good internal and external access aimed to reduce travel time and distances. Levine, Grengs and Shen (2012) describe accessibility as the ease of reaching places or the potential of opportunities of interaction, and mobility is described as the ease of movement or a means of accessibility. When destinations are nearby then accessibility is high and mobility is low, to the contrary, when destinations are located further away mobility is high but accessibility is low. The promotion of street networks that distributes and disperses traffic and makes

walking easier such as a hierarchy of narrow streets, boulevards, alleys and lanes, high quality walking networks and attractive good quality public realms therefore beautification and urban landscaping should be given priority. A variety of traffic calming measures to improve movement of pedestrians and cyclists and to control and reduce the flow and speed of fast moving traffic by incorporating physical design features. Pedestrianisation of streets or pedestrian precincts/zones that prohibit the use of vehicles to create walking networks in areas generating high volumes of pedestrian traffic should be encouraged. Figure 7 below illustrates how well known cities in the world have developed a hierarchy of street grids that help disperse and filter both vehicular and pedestrian traffic.

Figure 7: A Hierarchy of Street Grids



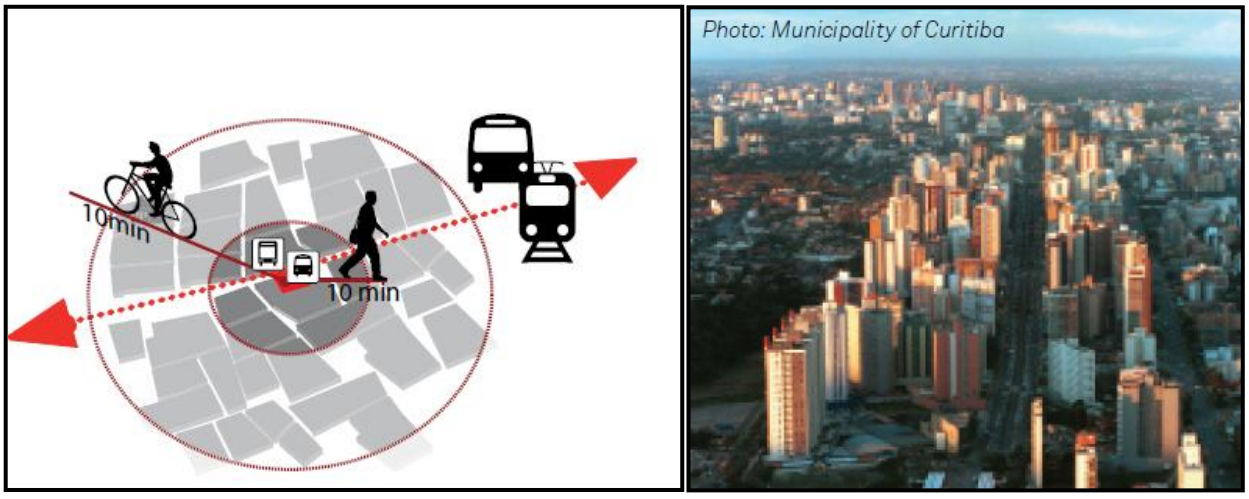
Source: Iyer Urban Design, cited in Logan, (page 32, 2012)

2.1.2.4 Increased Densities

The emphasis is on creating greater residential densities i.e. compact development that create larger thresholds for transportation networks and various amenities, pedestrian-oriented design located within eight hundred metres or a five to ten minute walking distance between work and home. High-density neighbourhoods with a mix of residential, commercial and civic land uses are designed for easy access and mobility. Wheeler (2013) also suggests that a mixture of subdivision plot sizes will facilitate housing variety, choices, affordability and cater for diverse income groups. Residential plots to be located close

to public transport stops and centres of businesses and recreation. Communities will be created where places of live, work, learn, worship and play are located closer together within walking distance. The promotion of a more efficient use of services and resource by fostering a more convenient, enjoyable, friendly atmosphere that improves safety, security, comfort and that increases the viability of businesses, transportation and enhances community interaction will be supported. (See Figure 8 below).

Figure 8: Density around Transit Nodes - Pedestrian, Walking, and Cycling - Ten-Minute Catchment Areas



Source: The Institute for Transportation and Development Policy (ITDP), (page 30, 2010)

2.1.2.5 Mixed Use and Diversity

The integration of mixed land uses, creating a fine grain mix of land uses such as shops, offices, houses, apartments that are well designed within communities promoting wider access to opportunities and choices. This will make for more interesting, functional, and vibrant pedestrian environment. It allows for the accommodation of a diversity of age groups, classes, races and income groups.

2.1.2.6 Mixed Housing

The goal of New Urbanism is to promote a diverse and liveable community with a greater range of housing typologies in terms of size and cost accommodating different income groups that are in close

proximity to each other. Wey and Hsu (2014) conclude that the aim is to develop and maintain a melting pot of neighbourhood homes serving a wide variety of family sizes, ages, cultures and incomes.

Figure 9: Mixed Modes of Transport -Cycling and Buses

Source: ITDP, page 16, 2010

2.1.2.7 Smart Transportation

The impacts of global warming and climate change on the natural environment have provide the rationale for why New Urbanism promotes green transportation alternatives and the use of high quality modes of transportation such as high speed trains and buses that connect cities, towns and neighbourhoods. Transportation networks that promote pedestrian-friendly designs and encourages the use of non-motorised smart transportation such as bicycles, scooters, rollerblades, skateboards and walking as illustrated in Figure 9. Modes of transportation that minimizes pollution, energy consumption and destruction on the natural environment. Wheeler (2013) highlights four (4) initiatives to reduce unsustainable transport systems:-

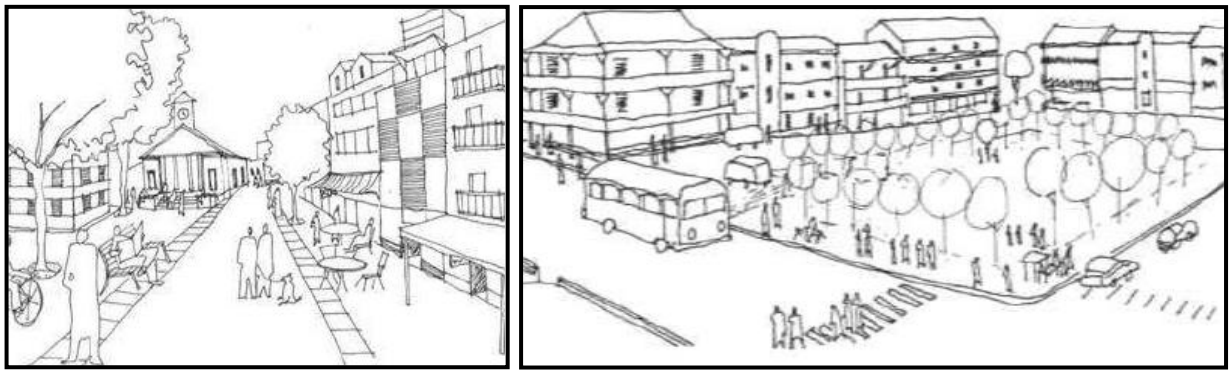
- Provide good alternative modes of travel such as walking, cycling and public transit;
- Change of land uses that support alternative transportation modes that will reduce frequency of travel trips;

- Incorporate environmental and social costs in transport pricing i.e. fuel, parking and vehicle registration and;
- Changing behaviour and lifestyles to travel less.

2.1.2.8 Quality Architecture and Urban Design

Emphasis on beautification, urban landscaping, aesthetics and architecture creating a more intimate-humanistic scale environment with a sense of place and standards that value and respect architectural beauty and distinctiveness. The location of civic uses in close proximity to community. Attractive surroundings that creates a sense of self-worth, relaxation and the uplifting of the human spirit. Designing streets that are more pedestrian-friendly and liveable that includes wider sidewalks, landscaped areas and creating pedestrian oriented boulevards as illustrated in Figures 9 and 10.

Figure 9 and Figure 10: Urban Design and Architectural Guidelines



Source: Iyer Urban Design, cited in Logan, (page 33, 2012)

2.1.2.9 Sustainability

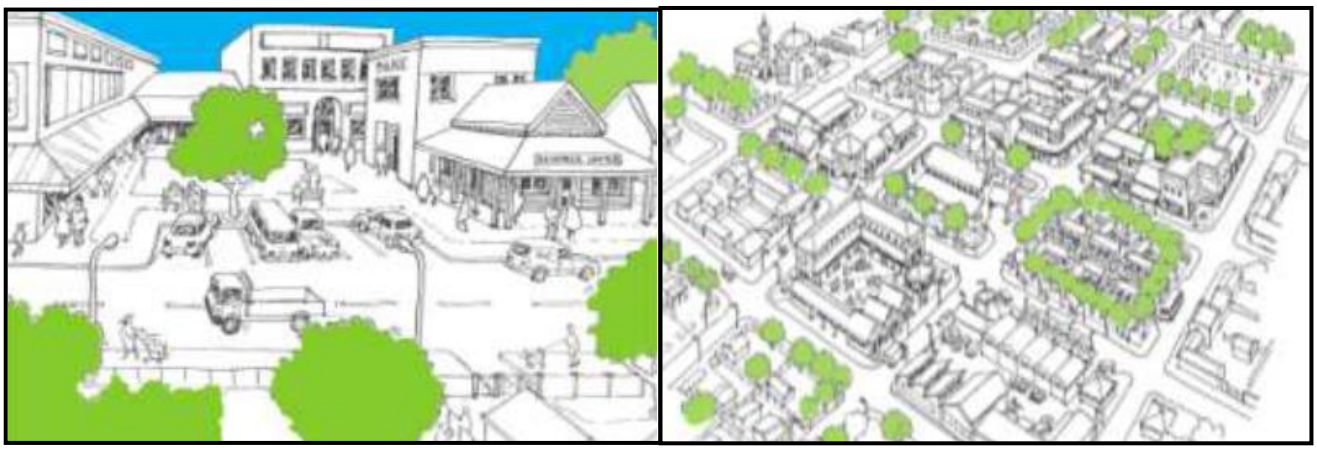
Promoting development that has minimum impact on the environment has a number of elements in it. The use of green eco-friendly technologies, and respect for ecology and value of natural systems forms part of this principle. It is translated into the built form through the promotion of the design of sustainable buildings to reduce environmental impact during construction and life cycle of buildings. Energy efficiency and the use of alternative energy sources such as solar technology, reuse, recycling

materials, rainwater harvesting and green roofs that filter and control storm water is part of the design considerations. The reduction of the carbon footprint and pollution is addressed through compact-transit-oriented development, walkable, bicycle friendly land uses and mixed-use development and maximising access to public transport to reduce the need for private vehicles. Sustainable landscape architecture and energy-efficient landscaping forms part of the principle and is implemented by using plants and materials bought from local producers. The planting trees to shade buildings and provide protection from winds is integral to the streetscape design utilised in sustainable development approaches. The use of local materials is prioritised.

2.1.2.10 Quality of Life

New Urbanism principles promotes a high quality environment that fosters a high quality of life. This is achieved by creating places that enrich, uplift and inspire the human spirit. Creating a sense of place includes celebrating local culture, traditions, art and providing collective spaces that link neighbourhoods to the natural environment. Safety and security are prioritised for public spaces. Trudeau (2013) emphasised the need for creating neighbourhoods with equitable access to services, jobs, transport, housing and fostering sustainable communities which includes social interaction, neighbourhood pride and participation in collective activities makes people want to live there (See Figures 11 and 12 below).

Figure 11 and Figure 12: Increased Quality of Life



Source: Iyer Urban Design, cited in Logan, (page 33, 2012)

2.1.3 The Benefits of New Urbanism

There are social, economic and environmental benefits that can be derived from the implementation of New Urbanism principles at a city, town and neighbourhood scale. As highlighted by the Congress of New Urbanism (*www.cnu.org*), it is healthier because access to affordable foods and health services are made easier and more convenient. Furthermore, walking and cycling promotes a more active lifestyle that promotes physical fitness, good health and well-being emotionally, physically and psychologically e.g. a reduction in sicknesses and diseases such as cardiovascular and respiratory health. Better air quality due to reduced greenhouse gas emissions and pollution as there will be less cars and more transportation choices. The new design principles will create a strong close-knit community as a result of social integration and social support i.e. Integration of a diversity of people, ages, income, ethnicities and cultures creating a sense of community.

The promotion of economic growth since it creates live, work and walk communities. Places of work, business and shopping are convenient at walking distances e.g. a greater access to goods, services, jobs and housing. It also decreases infrastructure and utility costs for the local municipality due to more efficient land uses. Multi-modal street design creates transport diversity (pedestrians, cyclists, buses and cars) which increases the efficiency and safety of pedestrians by reducing crime and violence. Guides and facilitates sustainable development through the promotion of renewable energy, reduction in pollution and greenhouse gas emissions and encourages better waste management producing a cleaner, attractive more beautiful city and community.

2.1.4 A Critique of New Urbanism

Although New Urbanism emerged as an effective critique to conventional planning, growing challenges and differing perspectives have also been levelled against the benefits of this approach. Foster, Hooper, Knuiman, Bull and Giles-Corti (2012) have argued that evidence from criminology literature directly linked the key design elements of new urbanism with increasing crime. Various non-residential uses that are within walking distances such as shops, recreation, drinking and alcohol trading areas have been associated with attracting crime and violence. Furthermore, streets being more permeable and highly connected i.e. Grid Street layouts become more easily navigable by criminals and potential offenders who can escape easily.

Moore (2013) in his article entitled *"What's Wrong with Best Practice*," argues that in the city of Toronto which has the largest number of new urbanism projects in the world, the movements design codes, practices and principles have been implemented as a prescriptive universal solution without taking into

consideration the uniqueness, diversity and complexity of the problems facing the city. Therefore, the adoption of New Urbanism as *"best practice"* was viewed as a rigid formula, ritualistic approach, self-delusional and a dangerous political ploy that stifled and stunted free creative expression, alternative visioning and creative innovation.

Furthermore, the government through policy formulation and implementation promoted New Urbanism projects as a model or pattern to be copied or imitated for future growth and development in Greater Toronto with a total disregard of local contextual dynamics. In addition, the writer strongly opposed the idea of communities being restricted and forced into thinking, acting and behaving in a conformed manner like robots. He emphasized that New Urbanism should be a matter of local interpretation rather than an enforcement of universal goals.

Murray (2013) documented that despite its popularity New Urbanism has attracted scepticism and hostility regarding various deficiencies in its principles more especially its escapist desire to return to a less complex imaginary past. He highlighted various critiques such as the movement's belief in the power of physical design to facilitate change and over-reliance in an inauthentic landscape that only produces artificial places. In his critique, he pointed out that various scholars have argued that the traditional small town invented by New Urbanists appears to be timeless and placeless because it fails to take into consideration the chronological and historical changing conditions and local cultures. It represented the adoption of a naïve, backward looking, romantic attachment to an idealized past in an attempt to reclaim a long lost traditional lifestyle and closely knit communities.

As a normative design theory, it is notoriously impertinent. Supporters have to make a leap of faith based on belief rather than proof on the positive outcomes they claim. As a result, the theory falls short in meeting its stated intentions. Other critics suggest that this mythology mounts to wishful nostalgic longing for the good old days, which is not a recipe for a sustainable future. Furthermore, its principles ignore the fact that cities are spontaneous creations that should be guided and not controlled due to its enforced mandated designs, building codes and strict land use regulations that inhibit creative thinking and promotes homogeneity. They fail to deliver on their social equity, cultural diversity and housing for low-income population goals since their projects are bias and only attract homogenous groups of upper-middle income populations.

Penar (2015) stated that even though the principles of New Urbanism developed in 1993 were intended to fight off the spread of faceless sprawl and had a legion of adherents; it needs to evolve over time. Duany has admitted that if the movement does not evolve it is in danger of becoming irrelevant. As a

result, his firm is currently in the process of developing a new venture called 'Lean Urbanism' that targets government regulations to foster sustainable development.

2.2 THE SMART GROWTH THEORY

2.2.1 A Historical Overview of the Emergence of Smart Growth

Chapin (2012) highlighted the three eras of urban planning that included the Era of Growth Controls between 1950-1975 in the United States (US), Comprehensive Planning between 1975-2000 and the Era of Smart Growth 1990-to present day. However, he argued that a fourth era is emerging namely Sustainable Growth. He listed environmental degradation, infrastructure provision, place making and urban economic development as the main issues of the Smart Growth Era whilst economic development, environmental degradation, climate change and, energy demand and supply are the central themes of the Sustainable Growth Era. It was these forces that propelled New Urbanism and that contributed to the transition into the Smart Growth Era. The American Planning Association (APA) formally launched this approach in the late 1990's.

In 1996, the Smart Growth Network (SGN) was formed through the coalition of the private sector, public sector and non-governmental partner organisations led by the United States Environmental Protection Agency (EPA), which now comprises of a consortium of approximately 40 organisations. Knaap and Talen (2005) state that in 1997 the SGN produced a *"Growing Smart Legislative Guidebook: Model Statutes for Planning and Management of Change"*. Later the Natural Resources Defence Council and the Surface Transportation Policy Project published that year a "Toolkit for Smart Growth". The International City Management Association (ICMA) that serves as an organisational home to the Smart Growth Network helps facilitate membership programs and support local governments to create sustainable communities through various smart growth activities and programs.

The ICMA indicated that Smart Growth leverages new growth (i.e. not slow/no growth) to improve the quality of life of residents (ICMA 2014). Through their experiences, they have discovered that various features of smart growth that distinguishes communities vary from place to place and that there is no *"one size fits all"* solutions to urban problems. Smart Growth channels time and resources to restore the vitality of city centres and older suburbs and is therefore more town-centred. Furthermore, their findings have indicated that only communities who develop a common vision and establish goals defining where they want to go, and translate their values into development plans tend to be more

successful than those who do not. The organisation argues that not all growth and development improves a community's quality of life. However, it is the implementation of Smart Growth principles that will ensure new developments improves the economic, social and environmental fabric of a community and ultimately will build places where people will want to live.

Talen and Knaap (2003) have stated that over the past decade the principles of interrelated concepts such as Smart Growth, Sustainable Development and New Urbanism have dominated planning practice and scholarship in their support of mixed use, accessibility, public transit and compact urban forms. Wey and Hsu (2014) pointed out that although New Urbanism and Smart Growth are synonymous; there are significant differences between the two approaches. Firstly, architects and physical planners founded New Urbanism while environmentalists, citizen groups, transportation planners and policy makers initiated Smart Growth. Secondly, the scope of New Urbanism incorporates the function and ethics of the built environment whereas the emphasis of Smart Growth is on planning. Thirdly, Smart Growth does not mean slow/no growth but its central focus is on revitalising the built environment to foster efficient development in its quest to create more liveable communities.

Littman (2004) defined Smart Growth as land use practice that creates more accessible land use patterns that reduce travel time and costs to reach goods and services. This land use pattern results in a more compact urban form, which is an alternative to urban sprawl and thus facilitates the process towards attaining the goals of sustainability. Various studies have confirmed that compact land use patterns also known as Smart Growth reduces infrastructure and service costs as compared to dispersed/sprawling land use patterns. It also produces a variety of social, economic and environmental benefits as illustrated in Table 1 below:-

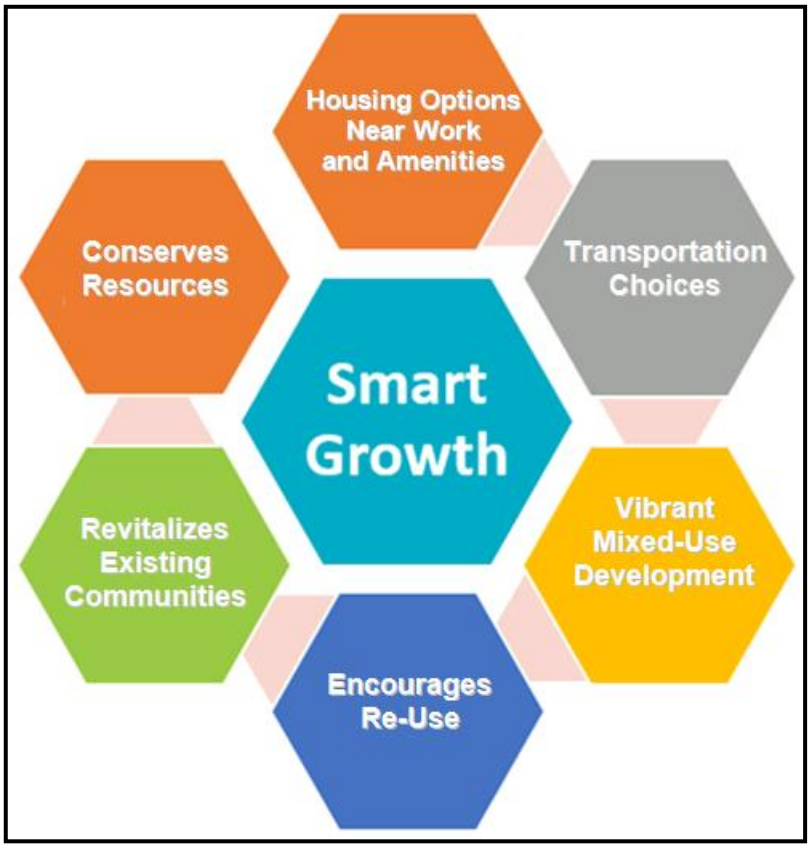
Table 1: Smart Growth Benefits

SOCIAL	ECONOMIC	ENVIRONMENTAL
Improved housing options; Community cohesion; Improved transport options; Mobility, accessibility to goods and services; Preserves cultural resources (historic sites, traditional neighbourhoods); Increased physical exercise; and, Health benefits.	Supports industries that depend on high quality environments (tourism, farming); Reduces development costs; Reduces public service costs; Reduces transportation costs; Efficient transportation; and. Economies of agglomeration.	Reduced pollution; Reduced water pollution; Reduced heat-island effect; Increased energy efficiency; and, Greenspaces and habitat preservation.

Source: Litman, (page 3, 2004)

Resnick (2010) defined Smart Growth as a policy framework that promotes an urban development pattern that is characterised by walkable, bike-able neighbourhoods, high population densities, preserved green spaces, mixed use development, available mass transit and limited road construction. He suggests that an effective tool that can be used to encourage Smart Growth and discourage urban sprawl is the implementation of a defined Urban Growth Boundary (UGB) that will delimit urban sprawl. He argued that this will prevent dispersed developments; limit the provision of services within the UGB by targeting growth to areas already serviced by infrastructure and, will protect high potential agricultural/farmlands and green space (see Figure 12 on page 38).

Figure 12: Smart Growth Diagram



Source: http://www.growsmartri.org/wp-content/uploads/2016/08/SG-HEX-Graphic.png

Litman (2015) discussed the differences between the various features of Smart Growth and Urban Sprawl land use patterns as illustrated in the Table 2 below on page 39. He noted that Smart Growth principles could be applied in rural areas to create compact, walkable villages with single or multi-family housing surrounding commercial centres. In large cities it can create dense, mixed-use neighbourhoods located around transit stations i.e. compact, multi-modal developments. In older suburbs, inner cities and existing neighbourhoods these principles encourage incremental infill development whilst in growing cities urban expansion.

Table 2: The Differences between Sprawl and Smart Growth

ATTRIBUTES	SPRAWL	SMART GROWTH
Density	Lower density, dispersed activities	Higher density, clustered activities
Growth Pattern	Urban periphery (greenfield) development	Infill (brownfield) development
Activity Location	Commercial, institutional activities are dispersed	Commercial, institutional activities are concentrated
Land use mix	Homogeneous, single use, segregated	Mixed land uses
Scale	Large scale, larger buildings, blocks, wide roads, less detail	Human scale, Smaller buildings, blocks and roads - design details for pedestrians
Transport	Automobile-oriented poorly suited for walking, cycling and transit	Multi-modal transportation that support walking, cycling and public transport
Connectivity	Hierarchical road network with loops, dead-end streets and unconnected sidewalks	Highly connected roads, sidewalks and paths
Street Design	Streets designed to maximize motor vehicle traffic volume and speed.	Streets designed to accommodate a variety of activities. Traffic calming.
Planning Process	Unplanned with little coordination between jurisdictions and stakeholders	Planned and coordinated between jurisdictions and stakeholders
Public Space	Emphasis on the private realm (yards, shopping, malls, gated communities, private clubs)	Emphasis on public realm (streetscapes, sidewalks, parks, public facilities)
Services (Shops, schools, and parks)	Regional, consolidated, larger. Requires automobile access	Local, distributed, smaller. Accommodates walking access.

Source: Litman, (page 3, 2015)

2.2.2 Smart Growth Principles

The Smart Growth Network developed ten basic principles based on their findings of communities that have implemented these strategies to guide communities to create liveable and vibrant neighbourhoods. In addition, one hundred policies were developed for communities to consider ensuring they had a say in how development occurs and where they want it. According to the US EPA Guidebook (pages 1-21, 2010) for local governments, these principles included mixed land uses, compact building design, a wide range of housing types, walkable-pedestrian friendly neighbourhoods, distinctive attractive communities with a strong sense of place (i.e. culture, heritage), protection of open spaces and farmlands, a variety of transportation options and community participation amongst others. This type of development focused on the HOW- which concerned the design of buildings and infrastructure; and the WHERE- which involved the location of land use and the decisions made in order to accommodate new developments. The principles promoted the development of mixed-use centres, the consideration of building design and the improvement of efficient transportation systems thus reducing the cost of infrastructure and services. Smart Growth also produces significant energy, environmental, economic, social and public health benefits as listed below:-

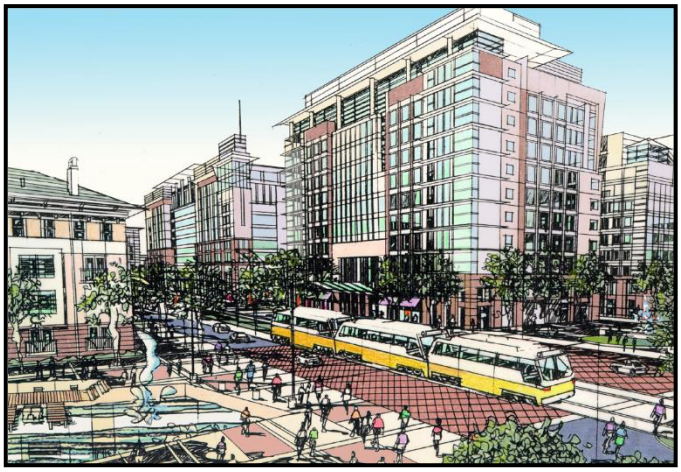
- Reduces greenhouse gas emissions because of neighbourhoods that are designed for walking or biking that are safe and easy. Trips will be shorter as compact development will bring places closer together;
- Reduces energy costs connected to land use decisions i.e. by emphasising compact, mixed use, transit oriented developments;
- Reduces pollution through walkable neighbourhoods or public transport;
- Enhances public health by promoting healthy lifestyles through physical activity i.e. walking and cycling to school, work, and recreation thereby reducing obesity. There is less pollution preventing respiratory illnesses and chronic diseases;
- Increases community choices, market surveys indicate more homebuyers seek areas that contain smart growth principles where stores, parks, schools are in within walking distance and that are safe to walk and cycle and;
- Enhances the quality of life meaning the way neighbourhoods feel and look and the experience of living there. Designed neighbourhoods that promote social interaction and street activity that increases safety.

As outlined by the Smart Growth Network (www.smartgrowth.org), smart growth principles are flexible and adaptable and have been implemented successfully in rural areas, small towns, suburbs and cities throughout the United States. However, the outcomes can be very different from location to location, which depends on existing development patterns and infrastructure. The nine principles are outlined in more detail below.

2.2.2.1 Mixed Land Uses Together

The first principle promotes efficient use of land and resources**.** Each neighbourhood should incorporate a variety of compatible land uses including residential, commercial, business, recreational, institutional and open spaces. New growth should be focused around transit routes and transportation hubs as this approach results in efficient land use, and a variety of housing types and densities. A reduction in distances between places of live-work-play is promoted which strengthens neighbourhood character and encourages the use of non-motorised transport modes such as walking and cycling.

Figure 13 and Figure 14: Compact Building Design

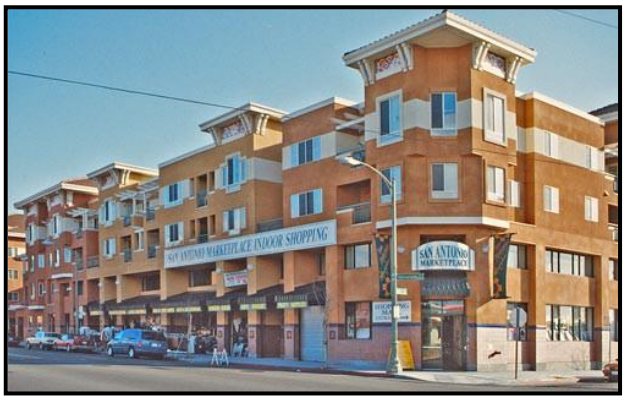


Source: www.smartgrowth.org /2013/07/tysonsPlan.png **Source:** http://teqcorner.com/wp-content/upload/

2.2.2.2 Creating a Range of Housing Opportunities and Choices

Principle two supports the provision of a broader range of housing types that cater for different cultural, family types, life stages and income groups with both ownership and rental options. Diverse housing choices such as multi-generational housing, backyard cottages, retirement villages, residential smaller apartments, extended family housing and smaller housing are proposed to accommodate people's needs and desires. This strengthens the concept of the neighbourhood catering for different socio-economic groups and allows interchanges of accommodation within a single but familiar locality. Living near workplaces, services, schools and access to transportation, which will improve quality of life and contribute to a sense of, place (See Figures 15 and 16 below).

Figure 15 and Figure 16: Housing Options



Source: https://web.njit.edu/abs/images/da102b_th.jpeg

Source: http://smartgrowth.org/wp-content/uploads/2015/05/housing_ops2-.jpg

2.2.2.3 Creating Walkable Neighbourhoods

Promoting a healthy lifestyle through food, exercise, walking as a primary mode of transportation, also cycling, trails, pathways, sidewalks is the core of principle three (See Figure 17 below). The design of developments that are more pedestrian than auto-oriented and creating streetscapes that better serves a wider range of users in close proximity to transit facilities. Reducing car dependence reduces

pollution, improves air quality, reduces noise, streets are safer, improves social interaction. Furthermore, this will contribute to economic growth of the local economy for retailers i.e. increase of foot traffic near their stores.

Figure 17: Walkable Neighbourhoods

Source: www.smartgrowth.org

2.2.2.4 Fostering Distinctive, Attractive Communities with a Strong Sense of Place

Principle four relates to space and proposes the creation of unique, attractive neighbourhoods that support opportunities for businesses and residents. Developing designs for open space network system and superior landscaping that gives character to the surrounding local areas. Encouraging development that reflects the culture and heritage of the neighbourhood. Promoting the preservation of historical, retrofitting older buildings and constructing new buildings with energy efficient measures, buildings that will enhance architectural beauty and distinctiveness of communities (the US EPA Guidebook Page 13, 2010).

2.2.2.5 Preserving Open Space Farmland, Natural Beauty, and Critical Environmental Areas

The promotion of green building design and sustainable strategies that will reduce greenhouse gas emissions is addressed by principle five. Facilitating development that respects protects and conserves the natural landscape features and has higher aesthetic, environmental, and financial value. To protect and enhance agricultural lands that provides food security, employment, habitat, biodiversity, open spaces and is maintained as an urban containment boundary. Also encouraging the use of renewable energy sources (the US EPA Guidebook, page 14, 2010)

Figure 18: Preserving Open Spaces

Source: www.smartgrowth.org

2.2.2.6 Strengthening and Directing Development towards Existing Communities

Directing growth to existing built-up areas by providing infrastructure such as roads, sewer and water thus maintaining public and private investment is principle six. The promotion of more efficient use of land, infrastructure and facilities as it is more cost effective and communities benefit from a stronger tax base (the US EPA Guidebook, page 18, 2010)

2.2.2.7 Providing a Variety of Transportation Choices

Principle seven proposes a variety of transport choices that contribute to a multi-modal approach for public needs by ensuring good connectivity within road networks, between pedestrian, bikers, and transit facilities. It is argued that long distance travelling to places of work, commercial and recreational places reduces the quality of life. The cost and time consumed for travelling and dependence on motorized transport are unsustainable. Therefore, Smart Growth promotes and encourages the use of public transport, carpooling, walking and cycling (the US EPA Guidebook, page 17, 2010)

2.2.2.8 Making Development Decisions Predictable, Fair, and Cost Effective

Promoting regulatory processes that make development decisions fair and cost effective (time and cost efficiencies to be considered) and expedite approval processes are outlined in principle eight. It is argued that the creation of a framework that provides incentives for the use of Smart Growth principles in planning and designing is needed. By creating a supportive environment for the development of innovative, pedestrian-oriented, mixed-use projects, governments can provide leadership for the private sector involvement in projects and initiate Public Private Partnerships (PPPs) (the US EPA Guidebook, page 18, 2010)

2.2.2.9 Encouraging Community and Stakeholder Collaboration in Development Decisions:

Principle nine proposes the inclusion of a range of public and private group and individual participation and buy-in from investors, developers, bankers and residents in projects. Interest groups and citizens have a strong stake in developments therefore it is important to involve them from the inception phase of developments right through to implementation. Places belong to the people who live, work, and play there. Thus, citizens need to participate in community life and decision-making (the US EPA Guidebook, pages 19, 2010)

2.2.3 A Critique of Smart Growth

According to Zeynali and AghaJani (2014), despite the popularity and support for Smart Growth, several critics have expressed the negative effects of its approach on the built environment. There are claims that it reduces property values because of increased population densities and commercial developments. Commercial developments increase traffic and attracts crime, which contributes to the decreasing values of properties. Suburbanites have complained that sidewalks and bike paths take up valuable lawn areas and reduce green space. Smart Growth prevented farmers' from selling agricultural

and forest land for development purposes, and has disrupted communities by replacing low-density, quiet, non-commercial areas with high density, mixed use, noisy developments that contributes to congestion and pollution.

Litman (2015) in his research reported on the impact of Smart Growth policies in North American cities and highlighted various criticisms. Critics argued that regulations restricted housing and transport options, which increased consumer costs and reduced their welfare. Policies contradicted consumer preference for single-family homes because the cost of single family or attached housing with private gardens was less affordable to the lower-income households and therefore forces poor households into inferior, overcrowded neighbourhoods. Fruits (2011, cited by Litman, 2015) argued that there is very little to no evidence that the Smart Growth approach reduces greenhouse gas emissions. He concluded that the potential of compact development to slow climate change is inaccurate. Furthermore, increasing densities and the encouraging of infill development increases peoples' exposure to noise and air pollution. Communities fear more affordable infill housing will increase urban poverty and crime.

Critics also claim that sprawl is a clear reflection of consumer preferences and Smart Growth is therefore in contradiction to the trends of consumer market demand. Current land development and transport trends demonstrate that sprawl is unavoidable. Smart Growth does not respond to the demands of busy modern families that rely on automobile travel. It reduces personal freedoms and imposes excessive regulations upon residents. This is viewed as indicators of an oppressive government bureaucracy that places restrictions on the rights of property owners. Smart Growth is also regressive and unfair to the poor and minority groups who are priced out of housing and travel options. Litman (2015) articulated that there are legitimate criticisms, which are listed below:-

- Proponents sometimes exaggerate the benefits of Smart Growth and the costs of Sprawl;
- Smart Growth can have unintended consequences;
- By itself, increased development density can increase traffic congestion and local air pollution emissions;
- Regulation based strategies reduce consumer options and have unintended consequences;
- Automobiles are the most efficient modes for many trips;
- Strategies that reduce land supply available for development can increase housing costs; and,
- The economic costs of farmland preservation are not a justification for restricting urban expansion.

He further responds that Smart Growth increases development and transportation efficiency and includes various strategies that reflect market principles and offer positive benefits. Although critics claim that Smart Growth is unfair, ineffective and unjustified, they tend to consider only a limited set of impacts and benefits and use information that is not appropriate, not complete, outdated and wrong. However, Litman concludes that critics' arguments are legitimate as listed above and helpful, and that these concerns should be addressed in order to optimize Smart Growth.

Dong and Zhu (2015) argue that according to research findings in Portland and Los Angeles Metropolitan neighbourhoods, urban landscapes indicate that few areas are smart. This statement, which suggests that the implementation of Smart Growth has not produced the anticipated success rates. Results showed that the histories and local forces of urban spaces play an influential and critical role and that Smart Growth policies are highly dependent on local political and economic environments. Findings indicated that the implementation of Smart Growth policies could not override such forces that shaped the urban landscapes of American metropolises. Although there is hope for the future, it is recommended that Smart Growth advocates consider how neighbourhoods can be retrofitted to bring about positive outcomes on current urban patterns. It is argued that Smart Growth alone has limited influence in addressing the broader and deeper dynamics that shaped cities and that the social, political and economic forces that caused problems are challenges that must be given priority.

2.3 CONCLUSION

The theories presented above namely New Urbanism and Smart Growth are alternative approaches to suburban sprawl in urban planning and architecture that entrench a number of key principles that are fundamental in the transition toward achieving a sustainable compact city. As highlighted in the discussion above these new approaches that emerged over two decades ago represent a collection of urban development strategies that play a central role in promoting development and planning design that is opposed to an automobile centred city. It is clear that the goals and objectives of the above theories are to promote diverse, liveable, vibrant, high quality neighbourhoods with a greater variety of housing typologies, mixture of land uses with higher densities that are interconnected with high levels of mobility and accessibility that will foster a better, more attractive, equitable and affordable built environment. Ultimately, creating places and spaces that are socially, economically, environmentally and ecologically sound and more sustainable to live, work and play.

Given the current situation of South African cities that are characterised by sprawling, low density, mono-functional land uses that were deliberately caused through the legacy of Apartheid planning, and the fact that this was accompanied by transport investments that promoted private car oriented development, the incorporation of the above approaches is therefore considered critical to this study. In spite of the various critiques, the researcher is of the opinion that these two approaches have proven to be the most successful planning concepts in the 21st Century. They have combatted the threat of sprawl (dispersed, segregated, automobile-oriented, urban fringe development) and to achieving compact - higher population densities, mixed uses, less dependence on automobile (multi-modal development) and high quality public services to countless number of communities throughout the world. For this reason, the mixing of both these theories resembling an eclectic blend will be adopted by the researcher as a lens that will underpin and guide this research study in response to the inefficient, unsustainable spatial structure predominating in the study area i.e. Edendale in Msunduzi which is situated on the periphery of the city.

CHAPTER THREE: THE LITERATURE REVIEW

3.0 INTRODUCTION

This literature review begins by exploring the issue of urban sprawl and its emergence in Developed Countries. It then, focuses on a detail discussion on the South African landscape, which places the need for this study in a context. Many spatial ideas influenced planning during the post-1994 period with particular attention being focused on the restructuring and transformation of urban landscapes. This was largely due to the negative consequences of Apartheid planning which separated places of work, live and play resulting in unsustainable urban environments. As such, the compact city urban model and corridor development concept were considered the most prominent approaches to emerge from this period of debate having the potential to create integrative environments and therefore they have been identified as fundamental to this research. The following sections provide a general understanding and critical perspective on the above concepts by various authors within the academic discipline.

A review of international and local literature on the above approaches that embraces the notion of integration within planning that emerged as relevant to spatial restructuring and its potential to bring about changes to urban space will be discussed and presented. The chapter will engage with literature to trace the origins, historical significance and highlight the academic debates that developed about how it has been disseminated and applied and how it is understood by, various authors and scholars interested in the topic. The chapter further explores other theoretical foundations interlinked to the corridor concept and, will outline the key elements underpinning the approaches. The various policy documents and legislation that were advocated with an attempt to establish the specific role of corridor development as a strategy to achieve compact-integrated-sustainable cities in South Africa will be discussed. The review will also take into account the key issues, opportunities, capacities, limitations and challenges associated with, and the influences on the effective implementation of these strategies.

3.1 THE CHALLENGE OF URBAN SPRAWL

3.1.1 Urban Form and Structure

Before defining and discussing urban sprawl and the compact city approach, it was deemed prudent that the terms Urban Form and Structure are defined and described, since it forms the central theme of this dissertation. Lynch (1981) and Handy (1996, cited in Seto and Dhakal, 2014) described urban form as patterns of spatial arrangements of land use, transportation systems and urban design which includes

physical urban extent, layout of streets and buildings as well as the internal configuration of settlements. It is characterised by four dimensions namely; density, land use mix, connectivity and accessibility that are interdependent but measure different aspects of urban form and structure. Urban density is the measure of an urban unit i.e. population, employment and housing per unit area. It is presented as spatial units – the block, the neighbourhood, the town, the city, the metro area, the region or the nation. However, the most common are population per unit area, built-up area (i.e. buildings or urban land cover per unit area) and employment (i.e. jobs per unit area). Land use mix refers to diversity and integration of them (e.g. residential, commercial, open spaces/parks) at any given scale. Land uses that are separated (i.e. work places, living areas, shops, and recreation) cover a longer travel distance than mixed land uses that reduce travel distances and enable walking and cycling. Connectivity refers to street density and design. When street connectivity is high, a finer system of smaller blocks is created which allows walking. The fourth dimension accessibility refers to access to jobs, housing, services, shopping and in general to people and places in the city. It can also be viewed as a combination of proximity and travel time that are closely related to land use mix.

Tsai (2005) defines urban form as the spatial pattern of human activities that can be classified into three categories namely – the density, diversity and spatial-structure pattern. The spatial structure of metropolitan areas refers to its overall shape that characterises land use phenomena such as monocentric versus polycentric, centralised versus decentralised patterns and continuous versus discontinuous developments. In addition to land use characteristics, urban form in a broader sense may also concern transport spatial structure and may be classified into different geographical scales such as metropolitan area, city and neighbourhood. Grosvenor and O'Neil (2014) record that urban structure is defined as the distribution of land uses throughout a city and urban form is the characteristic morphology of settlements of a city. Urban structure describes the macro structure within which micro examples of urban form function for example, density can be used as an indicator of urban structure and form. The relationship between density and transport is another measure that can be used i.e. distance to the Central Business District (CBD), by researchers especially those interested in the influence urban structure has on transport choice. Newton (2000, cited in Grosvenor and O'Neil, 2014) in his investigation to test the impact of urban structure on sustainability identified six different urban structure types in Melbourne, Australia. These he described as the dispersed city, the compact city, a multi-node city, the corridor city, a fringe city and the ultra-city. These concepts are described in the table below. Newton concluded that, the trend to a more compact city would lead to significant environmental benefits.

The focus of this dissertation is on spatial interventions that seek to transform the urban form and structure of South African cities in order to improve the quality of lives of urban populations. Therefore, the first three categories indicated in Table 3 will form the central theme of discussions and investigations.

Table 3: Physical Patterns of Urban Sprawl

URBAN STRUCTURE CATEGORY	NEWTON'S DESCRIPTION
Compact City	Increased population and density in the inner group of suburbs surrounding the CBD
Multi-Nodal City	Increased population, housing densities and employment at selected nodes across the metro area, with key infrastructure linking nodes
Corridor City	Growth along linear corridors emanating from the CBD and supported by upgraded transport infrastructure
Dispersed City	Outward random suburban expansion at relatively low densities, with connections to the central cities as key economic node
Fringe City	Additional growth beyond the dispersed suburban context
Ultra-City	Additional growth accommodated primarily in provincial cities within 100km of the principal city and linked by high-speed rail

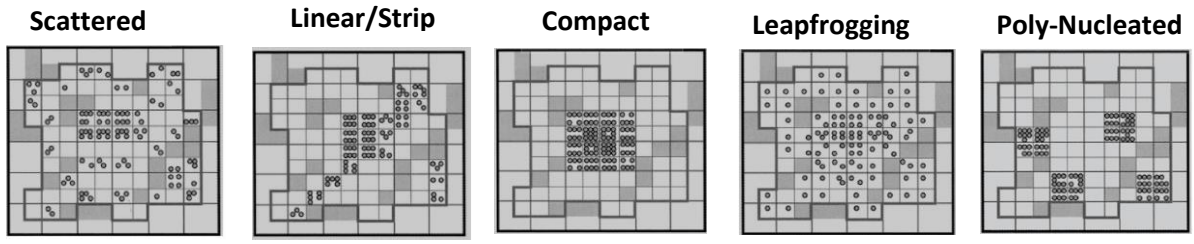
Source Newton, 2000: 47 cited in Grosvenor and O'Neil, (page 448, 2014)

3.1.2 Urban Sprawl

Sprawl is defined by four land use characteristics: low density, scattered development (i.e. decentralised sprawl), commercial strip development, and leapfrog development, the last three are spatial structure based phenomena as opposed to density-based sprawl and are found in particular parts of an area. One of the major urban problems confronting cities in the world is the hostile feature known as urban sprawl. Salingaros (2006) emphasised that sprawl is considered a menace that threatens the culture of

cities and impacts on the environmental, social and economic mechanisms. Besussi (2010) argued that urban sprawl can be described in a variety of urban forms such as contiguous suburban growth, linear patterns of strip development, leapfrog or scattered development that are based on two dimensions being settlement density (high or low) and physical configuration (i.e. contiguous, compact and discontinuous) as illustrated in the Figure 19 below. However, the traditional pattern of suburban growth known as sprawl is characterised by a contiguous expansion from the core whereas the scattered or leapfrog pattern is at the opposite end of the continuum characterised by a discontinuous type of development with interspersed vacant land areas. Other types of urban forms as illustrated below includes the compact growth which occur around centres (i.e. poly-nucleated) and the linear or strip development pattern that is located along major transportation routes. These urban forms emerged because of uncoordinated development occurring throughout the world and more especially on the periphery. They range from highly clustered centres to edge cities to low density landscapes.

Figure 19: Physical Patterns of Urban Sprawl



Source: Besussi, (page 20, 2010)

Kotze, Donaldson and Visser (2014) defined urban sprawl as uncontrolled, irresponsible and poorly planned expansion of urban areas into rural areas. It leads to problems such as loss of green spaces, congestion, and increasing traffic. The direct implication is the change in land use and land cover that is converted into built up paved areas. Bhatta (2012, cited in Kotze, Donaldson and Visser, 2014) stated that defining the term *"sprawl"* is difficult. He then went on to describe it as "*patterns of land use, processes of land development or causes of land use behaviours or consequences of land use behaviour" (*Bhatta (2012, cited in Kotze, Donaldson and Visser, 2014). Indicators used to measure sprawl are low

density or single use housing, development located at a substantial distance from urban areas, radial, stripped or isolated areas and development into protected or agricultural land.

Stomp (2013) pointed out that urban sprawl is a complex multi-dimensional phenomenon that is neither American nor Western but an international characteristic of urban growth. Horn (2010) outlined that the consequences of sprawl can be attributed to the 1920's when "*central cities started to lose favour to the romance offered by the American Dream*" (Clawson and Hall, 1973 cited in Horn, 2010: 42). During the two World Wars, inner cities became overcrowded slums with extreme poverty and hazardous living conditions. Then after World War II rising incomes, affordable housing and transportation development facilitated mass movement to suburbs as cities promoted restructuring, growth and expansion. During 1960,'s-1970's people no longer desired to return to central cities for consumer goods and services and this prompted the migration of commercial and industrial markets to suburbs leaving town centres in a crisis. Major cities of the world such as London, Birmingham, Manchester and North America's larger cities that were driven by the commercial and industrial revolution were susceptible to the symptoms of sprawl. Likewise, South Africa's major urban areas have this common feature with North American, Australian and British cities where urban growth has taken the form of dispersed residential accretion at the city edges.

However, in South Africa this can be attributed to firstly, the pre- 1994 Apartheid regime where policies and legislation found expression in racial segregation. Black people were expelled to homelands and rural areas located far from urban centres and separated from White areas by industrial, transportation and environmental buffers. The lack of social and economic facilities was the key contributor to high levels of poverty in rural and peri-urban areas. Secondly, economic stability and prosperity after the 1940 great depression, prompted the rich white South Africans to leave the city centres for suburban lifestyles. Thirdly, the counter-Apartheid measures adopted by the post-1994 democratic government to restructure the distorted inefficient, inequitable spatial pattern in order to provide opportunities for the poor, disadvantaged communities; resulted in low-income settlements being located on the urban fringes.

Turok (2012) also explains that in the late 19th and early 20th Century a distinctive form of segregated urban development dominated South Africa, which was based on cheap rural-urban migrant labour. The period between 1930-1940 the demand for a large labour force stimulated by the diamond-gold mining boom and manufacturing sectors resulted in governments efforts to control black urbanisation through anti-urbanisation policies ineffective. As a result, local municipalities were compelled to

provide housing for the black population in order to ensure the continued supply of cheap labour. However, after World War II in reaction to restrict black urbanisation, intense Apartheid policies and imported planning principles through modernist ideas of land use separation and non-integration of activities fractured the physical form of South African cities. The disruption to black people's lives forcing them to the periphery that functioned as labour reserves for the urban economy created a distinct urban-rural divide. Furthermore, commercial and industrial activities were prohibited in Black townships and the little to no economic and social facilities reinforced their dependence on the white higher income areas, which generated the need to travel. The spatial separation of race groups was achieved by establishing buffer zones, open spaces and major transportation networks i.e. highway construction since 1960 that separated places of work, home and leisure.

Unfortunately, the post-1994 democratic governments have made little progress to overcome the distorted urban form of cities to create liveable, sustainable functional places. Counter-Apartheid measures and various pro-poor policies and programmes initiated to alter the inefficient spatial layout of cities further entrenched it. For instance, the establishment of government subsidized low-income settlements on the urban peripheries instead of promoting better locations. This dispersed built form facilitates the demand for long travel distances, increases carbon emissions, causes a reduction in city productivity and undermines financial viability creating unequal access to jobs, amenities and public services. The middle to high income reside in low-density suburbs while the majority poor are confined to townships and informal settlements. Recent research indicated that there are around 2,700 informal settlement areas throughout the country with appropriately 1.2 million households. Many informal settlements function as gateways for migrants to get entry into the urban labour markets. Municipalities try to prevent land invasions that contain urban growth by enforcing demolition, eviction or removals to transit camps, which serve as holding places for provision of formal housing.

Many cities in South Africa are characterised by dense informal settlements scattered around the periphery, which indicates a shortage of accessible land. The challenges that confront cities are the building of economic bases in existing townships, strengthening and improving of public transportation that links places of living and working hence, the need for promoting greater integration to improve efficiency. The location of government-subsidised housing developments in urban areas has had an adverse impact on urban integration. Housing provision was divorced from creating viable integrated human settlements resulting in poorly located, inflexible, unaffordable housing. New developments have reinforced the inherited patterns of spatial separation. President Zuma called for a paradigm shift from housing provision to human settlements stating, "*the concept of human settlements is not about*

building houses. We have to change spatial patterns and ensure that low income households have access to economic centres, social facilities and key services" (Turok, 2012:33). Transportation is viewed as driving force to create functional cities and help knit together the patchwork form of South African cities by encouraging high-density developments along transport corridors and near transport hubs.

Plate 1: Informal Settlements

Source: **http://www.sabc.co.za/wps/wcm/connect/d0874b804c3bf30fac09ad6995218ba3/shacks%28R%29.jpg?MOD=AJPERES&CACHEID=d0874b804c3bf30fac09ad6995218ba3**

Cash (2013) states that according to the UN Habitat's State of the World Cities 2010/2011: *"Bridging the Urban Divide Report",* North American world class lifestyles influenced by urban sprawl is fast engulfing many Developing Countries in the world including South Africa. The report highlights the negative effects of sprawl. These include an increase in the costs: of transport, infrastructure, residential and commercial developments; a detrimental impacts on ecosystems; environmental degradation; pollution; increase in traffic and energy consumption. Furthermore, the South African State of the Environment Report (SoE) (2011) indicated that large areas of natural habitats are being destroyed by sprawling informal and formal settlements while the more affluent suburbs establish gated-walled communities, golfing and country estates creating further division and disintegration.

Chobokoane and Horn (2014) emphasized that land market forces and urbanisation deepened the sprawling structure of South African cities created by Apartheid planning. Low-income housing programmes and spatial decentralisation of high and middle-income groups referred to as the American Dream further perpetuated this. A series of policies and legislation that focused on service provision to disadvantaged communities only resulted in large-scale low-income settlements being located at the edge of cities. Moreover, the impact of decentralisation has led to inner city decay in major cities. It has contributed to the unsustainable and undesirable structure of South African cities. However, recently there has arisen a sense of urgency to regenerate inner cities in order to control decentralisation. De Villiers (2009) outlined that market led decentralisation, which influenced the flight from inner cities accelerated after 1994. This international trend affected the form and structure of South African cities. Lower taxes in suburban areas, better lifestyle options and the close proximity between home and places of work triggered this phenomenon.

The American influence through retail development clusters in the form of malls began to shape cities seeking economies of scale and communities living closer to economic and social amenities. Turok (2012) argued that economic forces also perpetuated the fragmentation of South African cities, which includes weak employment growth, income disparities and skewed private investment locations. Furthermore, economic growth has lagged behind urban population growth and income inequality translated into spatial segregation, which has now replaced racial segregation under Apartheid. High levels of income inequalities and spatial segregation are reinforced by disparities in the quality of social and economic facilities that compound each other. The poor are therefore forced to settle on leftover land in the periphery, which the state uses for low-income settlement housing. The city is segmented by income, which is reflected in the decisions to locate industrial and commercial companies in high-income suburbs rather than townships because investors regard these areas as high risk due to the lack of infrastructure supply.

The mounting problems of urban sprawl which have far reaching consequences including monetary implications (i.e. costs of fuel, infrastructure, cost and time spent travelling) the need to restructure inequitable, inefficient cities is recognised in the post-Apartheid South Africa. The idea of a more compact urban form that holds the hope of increased accessibility to urban opportunities, greater viability of public transport as well as various other social, economic and environmental advantages as proposed as discussed in the following section.

3.2 THE COMPACT CITY APPROACH

3.2.1 History and Background

Both Smart Growth and New Urbanism theories highlight the creation of a compact city form as the outcome of their approaches. In this section, the idea of the Compact City is unpacked and critically reviewed. Chobokoane and Horn (2015) explained that the compact city ideal could be traced to medieval times and to ancient cities that were compact in size although the rationale was different to modern cities. Cities were fortified with walls as a means of protection against their enemies. With the advancement of military technologies, transportation (road, railways, cars) and the accelerated rate of urbanisation during the Industrial Revolution, the capacity of walls were exceeded and cities could not be contained which inevitably led to the removal of them. This was followed by the formulation of greenbelt policies in European cities during the 18th and 19th Century. The green spaces occupied by the walls became buffer zones that divided the urban from rural areas so that urban spaces would not encroach into agricultural areas. According to proponents (Jenks 1996, Dewar 2000, Burton 2002, Cereda 2009, OECD 2012), the compact city model offers various benefits such as; reduced travel, social equity, and better access to services, efficient utility, infrastructure provision and revitalisation of inner cities. However, some of the challenges foreseen in its implementation in Developing Countries included high land values, lack of infrastructure capacity, controlling rural-urban migration and problems associated with population increase and city restructuring. The dismal reality that people prefer private car ownership, which represented a symbol of social and economic status.

Burgess (2000:9) defined the compact city approach as follows - "*to increase built area and residential population densities; to intensify urban economic, social and cultural activities and to manipulate urban size, form and structure and settlement systems in pursuit of the environmental, social and global sustainability benefits derived from the concentration of urban functions".* Kotharkar, Bahadyre and Vyas (2012) stated that compaction has three forms namely densification, intensification, containment, and the idea of the contained and compact city is prevalent in many Developed Countries. The high-density Compact City concept originated with Le-Corbusier's high-density living idea of the radiant city, the utopia city of high-rise buildings off the ground supported by fast mass transit systems. Dantzing and Saaty first proposed it in 1973 and by the end of 1980's public transport was viewed as the critical element in the creation of liveable concentrated cities. Since 1990, research has reinforced its ecological advantages and that it could be implemented at any scale including old cities that could be intensified and converted into new cities.

The European Commission also endorsed the concept in its Green Paper, which was acknowledged and supported as a solution to unsustainable cities throughout United Kingdom, Europe and more recently in the United States of American and Australia. According to Morrison (1998), the debate on urban form intensified after the publication of the document. The report highlighted the vital role that planning and urban form played in promoting sustainable development through the compact city, which promoted density, multiple use, social and cultural diversity. In reaction to the dispersed settlement form and car dependence the Green Paper's vision stated that; "*instead of new forms of dense, diverse, sustainable cities with a renaissance of urban living: the past decades have seen a rediscovery of the value of urban living and a growing appreciation of life in the cities of Europe. In part, this reflects the failure of the periphery: the absence of public life, the paucity of culture, the visual monotony, and the time wasted in commuting. By contrast, the city offers density and variety: the efficient, time and energy saving combination of social and economic functions, the chance to restore the rich architecture from the past*" (CEC 1990:19). As a result, in many European countries, urban compaction became the policy direction that was followed since 1990's.

Galster (2001, cited in Tsai, 2005) defined compactness as the degree to which development is clustered which minimizes the amount of land used. Although compactness does not have a specific definition, Ewing (1997, cited in Tsai, 2005) described it as high density or monocentric development i.e. with some concentration of employment, housing and mix of land uses. Ewing and Hamidi (2015) viewed the compact development pattern with spatial contiguity, strong centres, mixed land uses, medium to high densities, good accessibility and permanent open spaces. Spatial contiguity meaning to adjoin, abut, to border or be in direct contact with existing development. Anderson (1997, cited in Tsai, 2005) defined both mono-centric and polycentric urban forms as being compact. Burton (2000) noted that there has been an increasing need for sustainable models for towns and cities in the Developed World. He defined the compact city as a high density, mixed use city based on an efficient public transport system and has dimensions that encourage walking and cycling which is in contrast to the car-oriented urban sprawl. The methodology proposed to achieve compactness was through intensification, consolidation, densification, the re-use of brownfield land, more intense use of buildings, subdivisions, conversion of existing buildings and increase in the density of urban population. Furthermore, higher densities promoting social equity, households are in close proximity to facilities hence have access to a wider range of services and the increased densities provide thresholds for social and economic viability. However, critics have questioned the advantages of the compact city stating that its influence on travel is insignificant and is argued that it leads to poor and unsafe environments for walking and cycling due

to congestion and is detrimental to the physical and mental well-being of the poor who are compelled to live in the most polluted and cramped housing.

The Organisation for Economic Co-operation and Development's (OECD, 2012) report outlined the key characteristics of the compact city as dense and proximate development patterns which consist of intense urban land uses, urban agglomerations that are contiguous, the boundary between urban and rural land is distinct and density and proximity as the two major physical elements. In addition, urban areas are linked by public transport systems that facilitate mobility and efficient functioning of urban areas. In addition, residents have easy access to jobs, local services such as stores, restaurants, workplaces, schools and clinics, land uses are mixed, and most residents commute by foot or public transportation. Jenks & Burgess (2000, cited in de Villiers, 2009) also presented various theoretical views on the Compact City. It strives to achieve a sustainable future by reducing travel distances and combatting global warming. Although increased residential densities of urban dwellers create congestion, they benefit from the low transport costs and reduction in air pollution. Urban dwellers also have the choice between centralised or decentralised urban forms. Centralisation is characterised by places of residence-employment-recreation being in close proximity to each other. Alternately, decentralised suburbs are located far from the concentration of activities. Both choices present advantages and disadvantages. In contrast, Stretton (in Jenks & Burgess, 2000) argued that compaction is unsustainable and has no positive impacts on the social, economic and natural environments. He argues that transportation systems should be transformed instead of reversing cities urban forms.

Rerat (2012) further concurs that an alternative model that can be used to regulate urban sprawl is the Compact City model, which is compatible with the sustainable development criteria. Densification of the built environment would slow urban sprawl and limit resource and energy consumption. It would reduce the role or motor vehicles and increase non-motorised transportation such as walking, cycling and the use of public transportation. The 2000 transition to a compact-denser city form has become the central theme of urban metropolitan strategy planning and public policy despite opposition, debate and criticism. City planning adopted the compact city concept based on the following methods, which included-

- Limiting urban growth boundaries;
- Promoting infill, higher densities, wide range of housing typologies and tenures;
- Encouraging growth around activity centres,
- Concentrating of economic activities in employment areas,

- Promoting public transport;
- Encouraging growth along high accessibility transport corridors and
- Encouraging walking and cycling.

Research also revealed that whilst some progress has been made towards achieving a compact city form there were also some challenges.

Beatly (2000) and Pinho (2011, cited in Naess, 2014) argued that densification in contrast to urban sprawl provides protection of natural areas, arable land and biodiversity. Furthermore, concentrated housing typologies such as apartments and row housing require less energy consumption than single detached family houses. Research findings on appropriately fifteen cities in Greater Oslo revealed that the correlation between urban form and transportation played a major role in promoting sustainable development. In addition, urban densification was clearly preferable to outward urban expansion with the intent to mitigate climate change, protect biodiversity and natural landscapes and accessibility to facilities. Although there were some tensions relating to public health in urban planning such as the exposure to pollution, noise and traffic accidents nonetheless densification policies that were implemented since mid-1980 has proved successful. In addition, several studies undertaken amongst the Swedish and Danish population revealed that medical professionals in the preventive health field agreed that physical exercise i.e. a short distance from home to recreational areas stimulated residents to walk, jog and bike more frequently reduced stress and obesity-related diseases. Frank, Andresen and Schmid (2004, citied in Naess, 2014) indicated that studies in the United States also revealed that patterns of mixed land uses show lower obesity rates whereas Ewing, Brownson and Berrigan (2006, citied in Naess, 2014) found higher levels of obesity among Americans living in sprawling cities and a similar tendency was found in Canadian metropolitan areas.

Westerink, Haase, Bauer, Ravetz, Jarrige & Aalbers (2013) observed that the Compact City paradigm is not only based on efficient land use and urban containment concepts. It incorporates various goals such as urban containment, efficient land use, separation of settlements; lower car use/travel costs and greenhouse gas emissions, health benefits; protection of ecological diversity, agricultural land and countryside; densification of urban neighbourhoods, which facilitate social cohesion/mixing, economic diversity and many more benefits. The compact city was originally based on the idea of proximity where daily needs of residents are within walking or cycling distance however, the focus on proximity has also moved to a focus on accessibility i.e. travelling time has taken precedence over distance. Hence, the emergence of Transit-Oriented-Development (TOD) that promotes the integration of travel with land use planning and concentrating development in accessible locations, which is closely related to mobility.

The emphasis is on public transport to reduce private car use. Furthermore, from an economic perspective, connection and accessibility are key ideas that lead to concepts such as concentration, corridors and metropolitan networks. The Compact City is also linked to density and intensity since it strives towards the concentration of buildings, people and activities.

Westerink, et al (2013) described density as a measure used to define urbanity i.e. the denser the more urban. It can be defined as the number of people per hectare, the number of addresses or dwelling units per hectare, square metres per hectare or urban volume. High densities do not only mean high rise buildings since it may be viewed as inefficient because it limits access to natural light to lower storeys. Whilst density represents a quantitative unit of measurement, intensity addresses the use of space and is therefore a qualitative measure of urbanity however; both are often used as synonyms. Williams (1996, cited in Westerink, et al, 2013) defined intensity as being related to both built form and activity. Built form intensification includes redevelopment of existing buildings and sites or on undeveloped properties. Intensification of activities is defined as an increase in the existing use of land and buildings. The principle of high intensity implies multilevel and multifunctional use of urban land and buildings. Haccou et al (2007, cited in Westerink, et al, 2013) listed four types of multi-functional land use namely: interweaving, intensifying, layering and timing. Interweaving combines functions on the same land, intensifying increases effectiveness and efficiency of land use. Layering involves the mixing of land uses in a vertical dimension and timing uses the same building or space for different uses and different times.

3.2.2 The South African Context

Post-Apartheid cities of South Africa are deeply divided by class. The legacy of racial segregation underlies the spatial fragmentation, the deep economic divide and social inequalities. Notions for compaction and integration emerged during the 1980's in academic circles. The most popular proponents of this approach were Dewar and Uytenbogaardt who encapsulated their ideas in a publication entitled *South African Cities: A Manifesto for Change* (1991). Dewar and Uytenbogaardt (1991) recorded that the primary goal of compaction and densification is the maximisation of the capacity of urban systems to create quality cities. Whilst densification increases diversity and promotes social interaction, compaction provides various opportunities through infill and densification. This reinforces and promotes vitality and the viability of cities and corridors due to higher thresholds that generate economic activities and fine-grain urban form. The Compact City concept was expanded to form the Compact-integrated City approach. Professionals and academics supported this approach

because it proposed the integration of activities within urban areas and indicated that this objective plays a central role to urban performance. Theorists and planners also accepted the corridor development concept as the primary and most effective tool that could facilitate a compact integrated urban environment.

Chobokoane and Horn (2015) stated that spatial structure and form of the current pattern of South African cities were inequitable, and unsustainable. The call for greater urban compaction and integration was made almost thirty years ago when the government committed itself to promote the restructuring of cities. This ideology was embodied in a number of acts and policies from national and provincial government departments extending across various sectors that guide and direct the spatial and functional restructuring of South African cities. A summary of legal and policy frameworks included the Development Facilitation Act (DFA) (No. 67 of 1995). This law was intended to combat sprawl and facilitate towns that are more compact and cities through a number of actions, which included the promotion of smaller subdivisions, encouraging walk-up dwelling units, promotion of infill policies and new growth areas to be contained within the existing urban fabric as opposed to creeping beyond the urban edge. Other policy frameworks and guidelines that promoted the compact city were the Reconstruction and Development Programme (RDP, 1994). Du Plessis (2014) argued that the RDP called for densification and unification of the urban fabric whilst Chapter One of the DFA resource document outlined basic principles of integration. This concept embraced three dimensions namely; the integration of social, economic, institutional and physical sectors; integration of rural and urban areas in support of each other and integration of places of live, work and recreation in close proximity to each other. Furthermore, these concepts remained central to the planning and policy agenda up to the National Development Plan (NDP) 2030.

Chobokoane and Horn (2015) further listed the following policies namely:-

- The Growth, Employment and Redistribution (RSA 1996);
- The Accelerated and Shared Growth Initiative for South Africa (ASGISA, 2007);
- The New Growth Path (2010);
- The National Growth and Development Strategy;
- The National Spatial Development Perspective;
- The Integrated Rural Development Strategy;
- The National Physical Development Framework;

- Spatial Guidelines for Infrastructure Investment and Development;
- Planning Framework for Republic of South Africa;
- The Green Paper on Spatial Planning which served as a foundation for the White Paper on Spatial Planning and Land-use Management;
- The Urban Development Strategy and the Urban Development Framework

Source: Pieterse, 2007; Harrison et al 2008, Oranje and van Huys (2007).

The White Paper on Local Government was another policy framework, which mandated municipalities to draft Integrated Development Plans (IDP) to guide and inform planning, budgeting, management and decision-making. The promulgation of the Municipal Systems Act (MSA) (No. 32 of 2000) provided the legislative framework to make this mandatory.

In terms of the MSA, the IDP is to include a Spatial Development Framework (SDF), which must provide basic land use guidelines for land use management. All SDFs are to be linked and informed by National and Provincial development and framework plans. The recent plans that have emerged propose to integrate and compact towns and cities with corridors, nodes and urban growth boundaries. The intention is to channel public investment with economic growth potential into these target areas. The National Development Plan (2011) included strategies to increase urban density. The government also published the Spatial Planning and Land Use Management Act (SPLUMA) (No. 16 of 2013) which came into effect on 1 July 2015. It provides a framework for planning and land use management that is inclusive, developmental, equitable and efficient in terms of spatial planning. It stipulates that the compaction of South African cities should be based on principles of diversity and choice. This approach allows for a range of opportunities to diverse groups and that offers various options to different populations. It intends to cater for the needs of various income groups with different preferences ultimately striving towards a more compact-integrated city.

Turok (2013) documented that the main objective of the South African government since the advent of democracy has been to integrate the dispersed-fractured urban form of cities. This objective found expression in various policies and legislation relevant to local government, land-use planning, housing, transport and environment that repeated the objective to integrate, restructure and connect the urban landscape to create a viable, socially and economically integrated communities with easy access to health, economic, educational and social amenities. Numerous reports and speeches of political leaders

have acknowledged and recognised that there has not been a great deal of progress made in transforming the inherited distorted spatial patterns in the quest to address the structural problems of unemployment, poverty and inequality and that spatial integration has proved elusive. Furthermore, this aftermath of Apartheid had not disappeared due to the durability of the skewed built form. The National Development Plan 2030 that was published in August 2012 also reiterated that the Apartheid spatial divide continues to dominate the South Africa's landscapes, which now presents major challenges to municipalities, planners and politicians.

3.2.3 Challenges and Critique of Compact City Model

Rerat (2012) highlights some of the drawbacks that have been levelled against the Compact City model, which includes the supply and demand of housing – the potential of densification to meet housing supply may be too limited to curb sprawl. It may not be workable as it runs counter to the desires of residents who favour low-density housing. Some scholars have viewed this approach as undemocratic since it encroaches on the land market, transport and traffic economy and the freedom of choice of residents. Furthermore, it is argued that only undemocratic countries implement this model. Critics have also focused on the social implications stating that it is socially selective and undesirable in that it only focuses on middle to upper classes due to the costs of renting and buying dwellings created by these projects. That such a high quality city will not be accessible to most people and will deepen social inequalities. Several other researchers have stressed social inequality and those environmental consequences in respect of the urban form, is not compatible to sustainable development since it may increase traffic congestion, pollution and decrease the quality of life.

The majority of the urban dwellers will not benefit from functional mixing (i.e. residential and economic activities) as benefits of proximity are in conflict with current trends. Furthermore, arguing that the focus is on daily mobility and fails to consider other forms of mobility concerning people living in central locations may go more frequently on holiday and engage in leisure activities, which will result in more trips being, generated which impacts negatively on the environment. Coppola, Papa, Angiello and Carpentiere (2014) also pointed out that studies indicated that compact developments are the cause of severe urban congestion levels, increase in land and dwelling prices creates social exclusion and segregation of peripheral areas and communities are more exposed to noise, air and traffic pollution which has negative impacts on their health and wealth being.

3.3 THE CORRIDOR DEVELOPMENT CONCEPT

3.3.1 Definition and Emergence of Corridor Development Concept

"When man began using mechanical transportation the one-speed pedestrian city of the past changed into two-three and four speed system. From this it follows that, where in the past there was isolated settlements, there now are complex systems of transportation leading to very complex urban settlements…" (Doxiadis, 1963:117, cited in Herwin, 2005).

The quotation above illustrates the impact of vehicular transport on city form. It is not surprising then that the emergence of the corridor concept should be linked to transportation routes. According to Chapman, Pratt, Larkham and Dickens (2003) there has been a number of urban structure concepts that emerged throughout the history of planning that took the form of linear belts, which could be linked to the corridor concept. The first linear plan was envisioned in the early 1880's by Spanish engineer Soria y Mata and addressed a regional scale linear suburban development in Madrid. This led to the formation of the Association Internationale des Cités Linéares by French planner Benoit-Lévy (Soria y Pug, 1968) which had an influence on Russian planning. The notion of outward linearity along transport routes from the city centre was developed in London in 1942.

However, in the United Kingdom (UK) linear concepts became fashionable in the development of new towns during the post war era, which took the form of circuits and double circuits. This also included development along major transport routes that spread sideways and, the grid-plan pattern, which were at an urban and sub-regional scale rather than regional, and inter-regional. The most relevant plan took place in Wales that included the stringing together of a series of villages along a new major road that ran parallel to local roads joining the main road at junctions. Hall and Ward (1998, cited in Chapman, Pratt, Larkham and Dickens, 2003) described it as the *"necklace of beads approach*" that influenced the recently proposed term the *"string/stringing"* of larger settlements along transportation corridors called sustainable development corridors. From the late 1980's, the reformulation of the Garden City in the 21st Century found expression in the proposal of three linear cities in South East England namely; the cities of Mercia, Anglia and Kent. In order to meet increasing housing demand, the clustered development of a series of towns and villages was proposed strongly linked to strategic regional infrastructure, which facilitated the reopening of railway routes and new light rail systems.

Research findings that focused on UK's West Midlands London corridor suggested that the primary purpose of corridors provided the means of access to a variety of different spaces and activities. Functionally and economically, it could be seen as a dynamic space yet at the same time produced a

wide range of experiences. To the contrary, corridors of development and infrastructure may or may not serve a wide range of requirements in the same corridor and conflicts may arise between various functions. Furthermore, the European Spatial Development Perspective promoted a polycentric urban form as a means to balanced development. Within this context, *"bundles of infrastructure"* could be configured along the corridor identified as *"braids"*. This braided approach applied to lines of movement and development that reduced traffic on any single braid by providing greater access and development across a wider corridor. It was further postulated that corridors could exist as axes of:-

- Infrastructure;
- Economic development;
- Urbanisation or
- Institutional development.

All were viewed as qualitatively serving different functions that coexisted but also operating at different scales.

The research revealed that although the term corridor suggested connection and access it might not always contain all four of the above dimensions. This also implied physical and linear geographical form more than institutional structure, and homogeneity rather than distinctiveness. It was further highlighted that the fundamental characteristic of corridors was connection, and that it ought to be contained within the definition regardless of the scale of development. Corridors enabled relaxed flow or transmission of goods, people and information. It was argued that the corridor concept presented a strategy that could be used to address regional disparities, promote economic development, the protection and repair of environments. It was indicated that these performance criteria might not always be met. More importantly, the critical evaluation of the performance and functionality of heterogeneous development patterns (i.e. polycentric, monocentric, linear) against clearly defined local, regional and transitional aims and objectives was necessary.

Herwin (2005) stated that the corridor development concept, whether planned and unplanned, gained influence in spatial theory at the end of 1960's - 1970's. Researchers such as George R. Collins, C.F.G Whebell and Constantinos Doxiadis supported this idea. They wrote from an architectural history, geography and urban planning and design perspective on linear cities and corridor development that were directly related and could be used interchangeably. These new ideologies emerged as a cultural shift from modernism to postmodernism, an economic/technological shift from Fordism to post Fordism and post industrialism. These shifts were attributed to increase in mobility, flexibility, accessibility,

connectivity, the need for space, visibility, decentralisation and the withdrawal of government interventions which were the ingredients leading to the emergence of the contemporary unplanned corridor development.

However, in 1999, various Dutch spatial planning documents propagated planned corridor development, which then emerged as a future concept for spatial planning in the Netherlands. It was first perceived as a transport-corridor, which focused on the bundling of infrastructure, and related commercial activities within the transportation sector but included offices, research, development, and production sites. Part of the definition for corridors was presented in the *"Starting Document"* as "*bundles of road, rail and where possible water and pipe infrastructures connected by so called multimodal change and transhipment locations"* (VROM, 1999:42 cited in Harwin, 2005).

The notion of the unplanned or organic corridor development that included other activities besides transport resulted in the approach being recognised as a potential urbanisation concept. The acceptance of the idea led to the broadening of the definition as, "*an urban development axis, constructed along infrastructure, composed of (existing) urban centres in combination with building zones in suburban densities between those centres intended for companies, services and dwellers"* (VROM, 1999:41 cited in Harwin, 2005). This was followed by a second part to the definition, "*Corridors are intended to meet the urgent need for settlement-space of households and companies and thereby form a realizable integration-framework for the bundling of de-concentrating urban space-use."* This bundling of de-concentration was presented in a national spatial planning report, which referred to meeting the demands of population growth, and suburbanisation that occurred at appointed agglomerations along main infrastructures.

Corridor development was perceived as an inevitable and necessary phenomenon that connected main urban centres in the West of Netherlands to similar urban centres abroad such as the Ruhr Valley area in Germany and Flemish triangle in the North of France. They were recognised as an emerging network of cities to which the nodes and corridor concept was attributed. Clearly confined corridors situated along infrastructure connecting cities around greenbelts were seen as offering critical growth potential. The planned corridor consequently emerged in reaction to the unplanned corridor and urban sprawl that was widely supported and incorporated into various regional plans.

However, the lack of political support and the criticism that it would impact negatively on the economy of urban centres and urban landscapes resulted in the Compact City concept outweighing the ratification of the planned corridor. Nonetheless, the Compact City concept still encompassed the idea

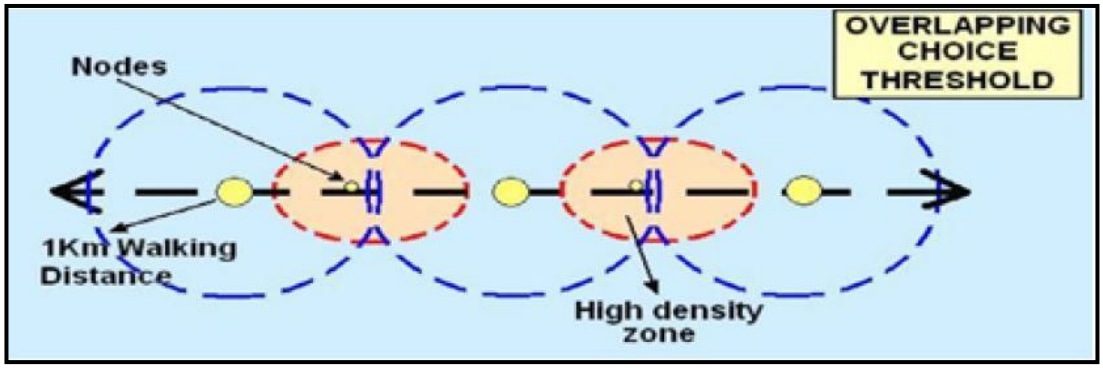
of network cities within which was embedded the corridor development concept. Furthermore, the mobility of people, goods and technology resulted in urban networks that were shaped by linear (i.e. corridors) and nodal (i.e. nodes) urban development. By the end of 1990's, the Dutch discussion on corridors presented it as an actual spatial development concept that could be complementary to existing urban nodes. Corridor development was not just regarded as a Dutch concept but was promoted as a spatial planning strategy in Europe, UK and Germany. However, confusion around whether it should be regarded as an urban development axis, infrastructural axis, economic development axis and issues surrounding scale levels were debated.

Khoza and Willemse (2013) have argued that the term *"corridor development"* can be used interchangeably with many other terms such as *"development axes, connecting axes, concentration axes, urban axes, growth axes, development lines, growth axes, ribbon development or development spines"* (Geyer, 1989 and Potter, 1963). Moreover, the term *"development centres"* referred to towns and cities located along or on either side of development corridors/axis, which serve as centres that activate social and economic activities. Other terms that can be used to describe development centres included *"development nodes, growth centres, growth poles or core regions"*. According to Friemann (1966, cited in Khoza and Willemse, 2013), development axis (i.e. corridors) connect two or more development centres (i.e. nodes). The spatial and functional organisation of regions occurs along corridors that comprise of an agglomeration of nodes (i.e. development centres). Recent studies have made use of the term *"development corridors"* that refer to bundles of infrastructure (highways, rail links, bus lanes, cycle paths, air connections, sea canals) that link two or more urban areas. Marriam and Freeman (2001, cited in Khoza and Willemse, 2013) defined corridor as "*a linear spatial element consisting of two outer nodes and strips and/or inner nodes of high intensity non-residential and/or high density residential land use that are connected by at least one mass public transport route which may be fed by supporting feeder routes."*

The South African National Department of Transport have defined corridors as "*high volume transport routes that link major urban centres that are highly concentrated with passenger and freight movement"*. The Cape Metropolitan Council (1996:43) illustrated the concept of development corridors as a string of beads which refers to corridors that connect a series of nodes where centres/nodes and sub-centres/sub-nodes are located along the main movement channel that generate high levels and densities of development as depicted in Figure 20 below. They support the principles of urban integration, intensification and containment of urban sprawl to facilitate the creation of quality urban environments. In order for corridors to function, optimally some of the critical elements needed

include; public transport, major transportation routes, human interaction, linkages between nodes and sub-nodes, available services and public investments.

Figure 20: String of Beads Concept



Source Cape Metropolitan Council, 1996

Certain preconditions are required in order for corridor development to occur and these include economic, political, institutional, physical, planning, transport, behavioural and perceptual. Meyer and Oranje (2001, cited in Khoza and Willemse, 2013) present a structure that described the phases of corridor development and the generic components. Initially corridors require forces of attraction. These forces stimulate the movement of people and activities between the two outer most nodes/centres of the corridor, the inner nodes/centres between the two outer nodes, and the land area running directly alongside the corridor and between the inner and outer nodes. The inner and outer nodes act as attractors or senders of people, or activities or both. Therefore, the main purpose of the corridor is to convert senders to attractors in the form of investors and incentive schemes.

3.3.2 Types of Corridors

Warnich and Verster (2005, cited in Khoza and Willemse, 2013) distinguish between the activity and growth corridor whilst Priemus and Zonneveld (2003, cited in Khoza and Willemse, 2013) distinguish between infrastructure, economic development and urbanisation corridors as described in the following paragraphs.

- **Activity Corridors** represent structures along social activities such as high density mixed uses and economic development that are promoted and integrated into the urban fabric. Their function is to improve the quality of life. In order for efficient functioning a major transport route, public transportation, linkages between the outer-inner and sub nodes, intense human interaction, availability of services and public investment along the axis are required. It can therefore be equated to a communication corridor since it not only focuses on traffic movement but also rather fulfils the function of linking urban centres that are dynamic, vibrant and diverse in an interactive way. According to Warnich and Verster (2005) the functioning of an activity corridor depends on the specific context such as metropolitan, city or local scale; its location in relation to the city or the specific land use patterns;
- **Growth Corridors** refers to a more extensive, metropolitan scale area that exists in various forms of maturity and has the potential for further growth, which ultimately matures, into an activity corridor. The phases of growth and development of the corridor from infancy to maturity, old age to dormancy, the dynamic to the degree of development can be classified into primary, secondary and tertiary;
- **Infrastructure Corridors** focus on both traffic engineering and economic development;
- **Urbanisation Corridors** refer to the geographic locations and size and, determines the direction of future growth and urbanisation for residential and employment opportunities; and,
- **Development Corridors** are classified according to the concentration of land uses and the interaction between them resulting in residential, commercial, industrial or urban corridors. It is also dependent on the size, vitality of the centres, distance between centres, availability of services, intensification of development and public investment in activity corridors.

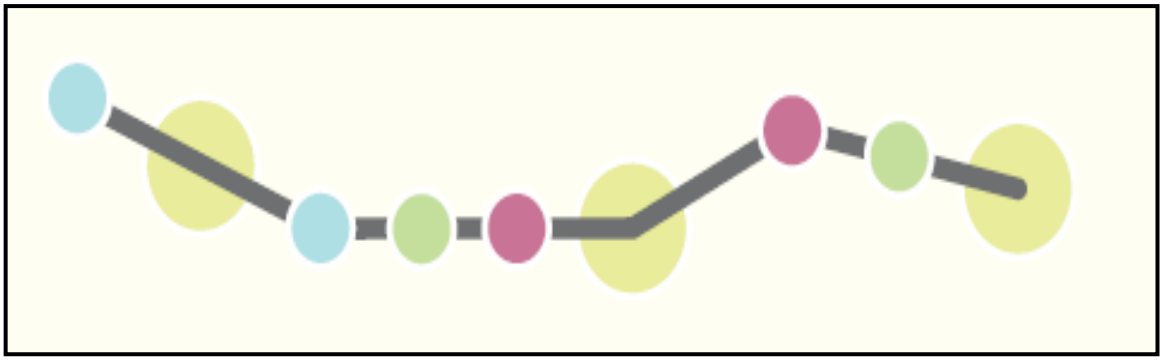
The Centre for Transit Oriented Development (CTOD, 2010) also distinguished between three types of corridors namely -the Destination Connector, Commuter and District Circulator. Each of these corridors are defined in terms of how it is connected and what influence it has on their potential as each facilitates different opportunities. Although these specific types of corridors can be used for analysis and planning purposes, corridors cannot be easily categorized, as they tend to encapsulate a mixture of these three types. Additional details about each of the corridors is provided below.

3.3.2.1 Destination Connector

These connectors as depicted in Figure 21, link residential areas to various activity nodes and connect to a series of job centres, medical health facilities, commercial and educational centres. As a result of their

linkages to these places, they have high ridership and therefore facilitate support for future transit investments

Figure 21: Destination Connector



Source: Transit Corridors and TOD: Connecting the Dots, 2010

They encourage commuting in both directions throughout the day as they can serve up to five to nine employment centres and a wide range of other destinations. Some destination connectors also serve as commuter corridors. A good example is the Bus Rapid Transport (BRT) network in South Africa that is envisaged to boost economic development, tourism and employment opportunities. The MyCiti in Cape Town and the Rea Vaya in Johannesburg connects economic nodes and residential areas.

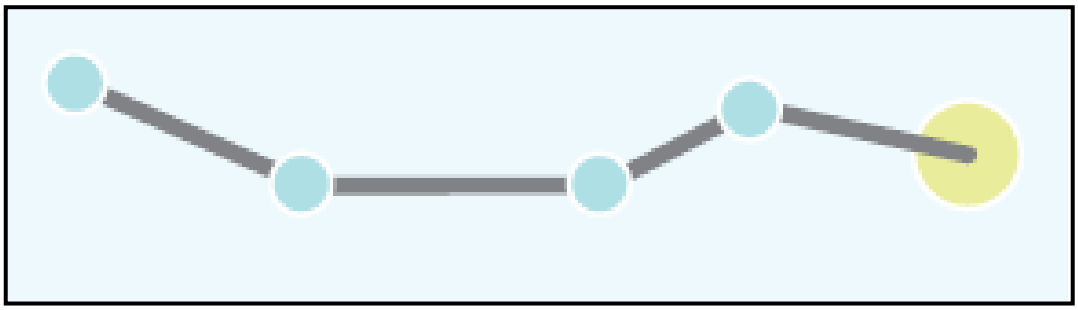
3.3.2.2 Commuter Corridor

The commuter corridor differs from the destination connector in that it does not connect to a series of centres but to one major activity centre being the Central Business District (CBD). It transports commuters to and from the CBD throughout the day. The modes of transportation include heavy rail, light rail and high quality bus service that function from moderate to high frequency during peak times and filters down during off peak hours in the day (See Figure 22).

In the metro areas of Cape Town, Gauteng and KwaZulu-Natal, rail and bus services are essential for both passenger, freight transportation, and provides local examples of Commuter Corridors. The recently introduced Integrated Rapid Public Transport Network (IRPTN) a public transport system has become a viable option for providing residents easy access to places of shopping, work and leisure. Another example is the Gautrain rapid rail transport that links Johannesburg, Pretoria and the OR Tambo

International Airport, and offers commuters a viable alternative to road transport. The central core is the station point for both the Gautrain and the Rea Vaya bus system. However, some of the problems associated with the Commuter Corridor are the limited business hours of operation that will not stimulate real estate markets and therefore not contribute optimally to economic growth. The promotion of non-motorised transport and the beautification and upgrade of public realm are proposed in order to realize maximum ridership. Furthermore, transit feeder services and park and ride lots at corridor stations in suburban neighbourhoods are also viewed as alternatives.

Figure 22: Commuter Corridor

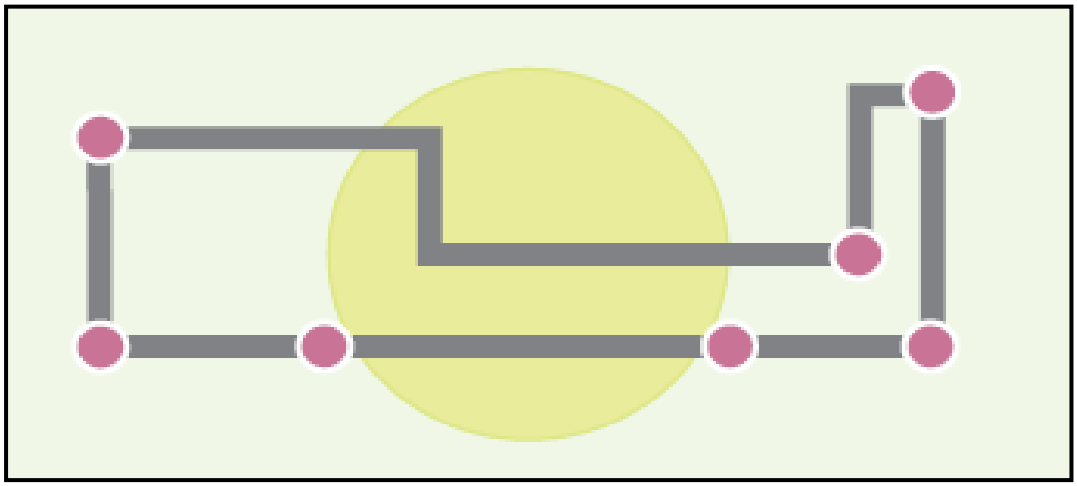


Source: Transit Corridors and TOD: Connecting the Dots, 2010

3.3.2.3 The District Circulator

District Circulators facilitate movements within activity nodes, which includes commercial, medical, educational, city centres and neighbourhood activity nodes. They promote non-motorised transportation such as walkability and cycling facilitating easy access to various services and amenities. This also compels the transformation and beautification of streetscapes that involves tree and shrub planting, wider pavements and street furniture. It is noted that the need for a district wide parking plan may reduce parking ratios because of non-car usage, which would therefore contribute to an increase in retail sales. Furthermore, the system has the potential to increase ridership since it creates accessibility to a wider transportation networks and has the potential to attract development on vacant parcels of land that are linked to destinations (See Figure 23).

Figure 23: District Circulator



Source: Transit Corridors and TOD: Connecting the Dots, 2010

3.4 THE IMPACTS OF CORRIDOR DEVELOPMENT

Khoza and Willemse (2013) pointed out that research studies revealed that there are both positive and negative impacts of corridors on communities worldwide regardless of their geographic location as discussed in the following section.

3.4.1 Positive Impacts:

From an economic perspective, a corridor can contribute to the improvement in infrastructure and transportation in peripheral areas. The development of multimodal transportation which enhances integration and cooperation between cities facilitates the agglomeration of land use activities such as retail, wholesale, manufacturing and services. This can stimulate economic development and job opportunities for communities and contribute to an efficient flow of imports and exports (African Development Bank Group 2009, Keorodom, Butphomvihane and Vanhnalat, 2007, Kleynhans, 2002, Anderson, 2011 cited in Khoza and Willemse, 2013). From a social perspective, the development of a corridor can contribute to an improvement in standard of living and quality of life related to better access to services and facilities such as health care, education and markets (African Development Bank Group, 2009, Mitchell and Anderson, 2011).

3.4.2 Negative Impacts

An increase in competition between cities and towns is one of the negative economic impacts of badly planned corridors. Others include an increase in negative spill-over, which reduces the attractiveness of the adjoining areas hence, decrease of investment opportunities, slower economic growth than expected and income disparity. From the social perspective, corridors can result in the fragmentation of population into smaller subpopulations, increase in the migration to corridor areas, increases in crime and spread of HIV and AIDS[1]. Climate change and global warming through increase in greenhouse gas emissions, disturbance of ecosystems and natural habitats can occur if corridor development is has been implemented in an unsustainable manner. In terms of operational impacts, corridor development can impact negatively or at the expense of neighbouring urban centres, creating difficulties in regulating traffic, and an increase in road accidents due to inadequate infrastructure.

3.5 MAIN STRUCTURING ELEMENTS OF CORRIDORS

Dewar (2011) pointed out that that the corridor planning approach facilitates more intensive activities, non-motorized and public transport, stimulates small business growth, promotes land use mix and pursues equity and urban integration vigorously. It spatial form represents a broad band (approximately a kilometre wide) of mixed uses that are continually intensifying around one or more hierarchically interlinked system of transportation routes or spines that accommodates public transportation. These continuous transport routes in urban areas represent energy arteries that carry flows of people, goods, services and finance and the greater the volume of movement along the route the greater the potential market and they tie together a number of local areas, which they pass and act as integrators. As a result, no one area is entirely independent on its own resources but they support each other in a symbiotic way as illustrated in Figures 24 and 25.

As discussed by Dewar (1994, cited in Provincial Planning and Development Commission (PPDC) 2008) research report, Figure 24 illustrates an inward orientation of local areas with intensive activities in the centres which was a dominant model in South Africa (SA) for the past fifty years. These centres were dependant on their own resources to support the intensive uses of the public and depended on public

[1] It is noted that the spread of HIV and AIDS in Southern Africa and elsewhere has been directly linked to the transportation corridors particularly the long distance routes used by trucking companies that in turn are utilized by sex workers.

support for their viability. Within this context insufficient thresholds, lack of public support to maintain essential activities and inaccessibility of essential services to people living in the cell resulted in poverty, degradation and low quality of life. However, in Figure 25 the cells are oriented towards the transport routes, which are the primary arteries of access. As a result, local areas support each other by contributing to the system hence the levels of services are higher and better. Furthermore, access to shared services are more convenient through public transport and walking and is therefore more sustainable to channel investments and increase densities due to higher thresholds.

Figure 24: Corridor Growth

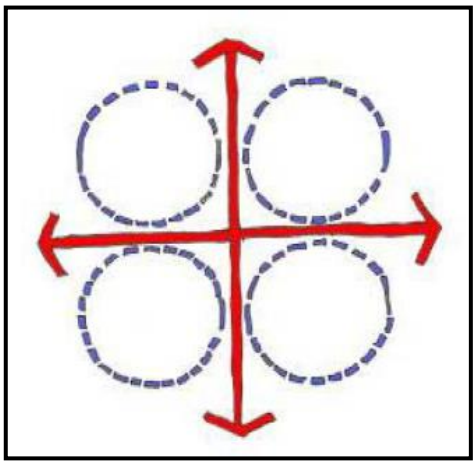
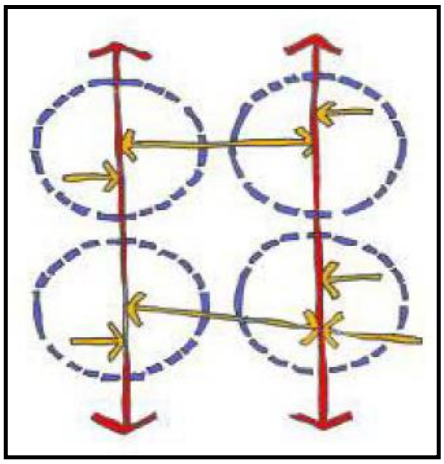


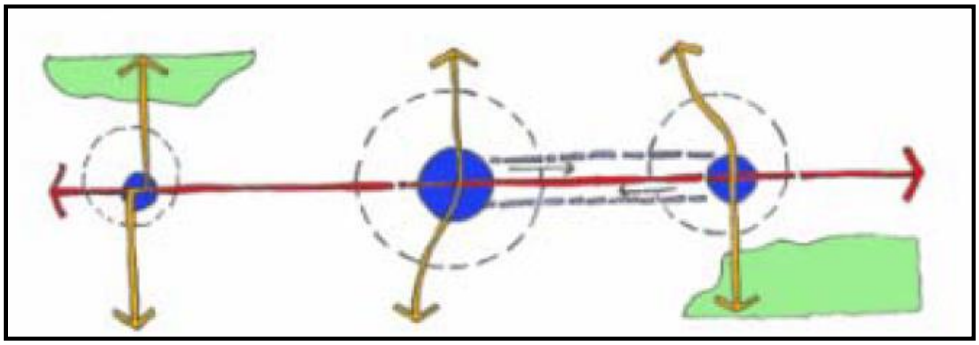
Figure 25: Corridor integrating Local Areas



Source: Uytenbogaardt, Dewar and Todeschini (1997, cited in PPDC, 2008)

Dewar (2011) indicated further that intensive activities do not occur evenly along the corridor but tend to agglomerate or cluster according to the relative accessibility of points hence, the pattern is one of *"beads on a string"*. Dewar (1994, cited in Provincial Planning and Development Commission (PPDC) 2008) argued that, the greater the accessibility to economic and social facilities at a specific point the greater the tendency to attract more intensive uses. At an intersection, an arterial with limited access represents a low accessibility point. The pattern therefore is one of uneven development in the growth of clusters at various points as illustrated in Figure 26 which results in the development of a hierarchical nature of beads or nodes) and system of routes or corridors.

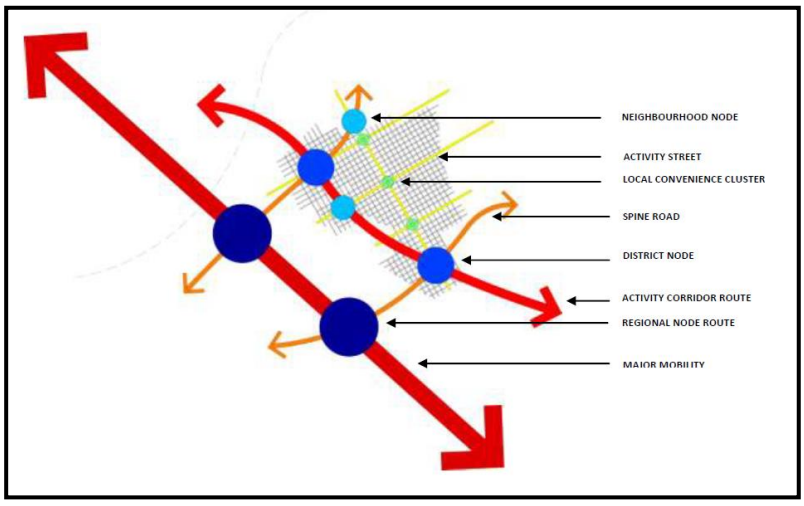
Figure 26: Corridor Growth



Source Uytenbogaardt, Dewar and Todeschini (1997, cited in PPDC, 2008)

Furthermore, successful corridors are two sided at places where there is an agglomeration of intense activities and pedestrians are able to cross on either side quickly and easily as indicated in Figure 27 where roads are narrowed or pinched. The advantage of a hierarchically differentiated (defined in terms of continuity) system of routes along the corridor is that a complex pattern of land values emerge that allows all activities being large, small, formal and informal to be accommodated within the system.

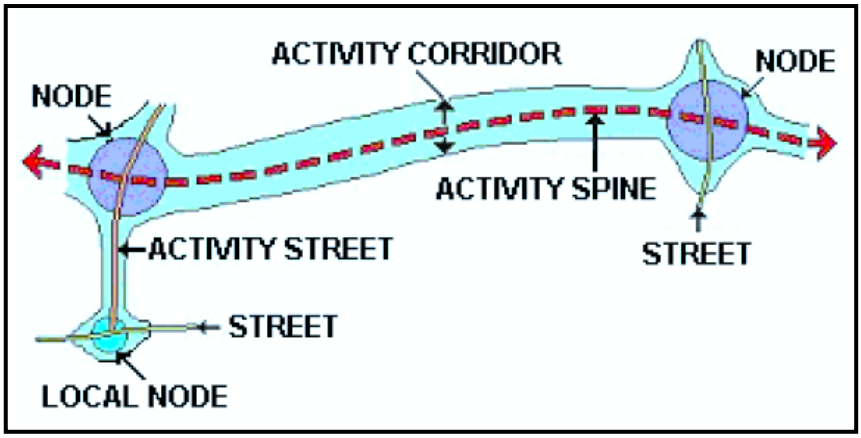
Figure 27: Corridor and Node Hierarchy



Source: cited in Logan, (page 23, 2012)

Martins (2001) states that a distinction therefore exists between corridors, spines and activity streets. An activity corridor is at a metropolitan/city scale approximately two kilometres wide comprising of mixed uses, high density urban activities concentrated along public transportation routes i.e. large inter-urban corridors. At the centre of an activity corridor is an activity spine, which carries major public transport. It provides locations for intensive mixed uses that function at a district level, and is at medium scale. The activity street occurs at a small scale, residential local level and has lower levels of market thresholds (See Figure 28). Furthermore, major mobility corridors accommodate linear routes such as railways, freeways, large shopping areas, industrial parks, social, cultural and sporting facilities. Corridors can therefore be used as tools to structure where and how activities take place based on access being the main element however, in order for corridors to function efficiently there has to be linkages between key structuring elements as identified above (i.e. nodes and corridors).

Figure 28: Structuring Elements of a Corridor



Source: Cape Metro Council, 2000 cited in Warner and Verster, 2005

Dewar (2011) listed some advantages that flow from corridor planning namely:-

- They promote decentralisation and reduces movement and carbon emissions;
- The high land prices along the corridor ensures a wide range of competitive activities;
- Facilitates a symbiotic relationship between large and small activities where larger enterprises are the primary generators of movements and are located at more accessible locations whilst

the smaller activities locate at interceptor locations and feed off the larger which makes corridors play an incubator function for micro-enterprises;

- They discourage monopolisation of larger activities;
- Adapts to growth and change of uses quickly and easily;
- Promotes equity by providing access to various activities through the use of public transportation that is channelled through the corridor;
- Benefits the principle of urban integration i.e. local areas and land uses (i.e. residential, commercial, recreation) that promotes convenience; and
- Combats fragmentation and increases integration i.e. ties many local areas into an integrated system.

An evaluative study undertaken by the Ekurhuleni Metropolitan Municipality (2004) into development corridors indicated that the main elements of a development corridor are: a distinct road hierarchy; mobility spines; activity spines; open space system; connected nodes (varying in types and sizes), and defined start and end as graphically depicted in Figure 28 above. The concept reinforces the importance of the fact that it occurs over a period of time, which depends on critical factors such as; anticipated timeframes together with phasing of developments; the availability of infrastructure services; the rate at which development occurs; prioritising of linking roads with transportation and mobility and the supporting of these roads with strong nodes. In addition, the PPDC report (2008) also highlights generic space types that can be found in corridor initiatives namely:-

- Major Metropolitan Gateways;
- Secondary Gateways;
- Pinch Points;
- Activity Street;
- Dual Access Boulevard;
- Interchanges;
- Station squares;
- Structures public transport stops;
- Sports or recreational forecourts;
- Public or civic forecourts; and,
- Structured non-motorised transport (NMT).

3.6 NODES

Corridors and nodes occur at different scales and levels and can be viewed in terms of the *"beads on a string"* concept, where nodes and sub-nodes are located along these movement channels. The development of corridors can create a well-defined urban structure that has the potential to address various social and economic deficiencies experienced by the poor and low-income areas and has the capacity to integrate dislocated and alienated parts of a city into the larger functional urban environment. The Cape Metropolitan Spatial Development Framework (SDF) Guidebook (1996, cited in de Villiers, 2009) stated, *"an urban node is a place of high accessibility, usually located at a modal interchange or road intersection and through proper location and development can act as a catalyst for the development of corridors"*. The four key characteristics of nodes are:-

- They are located at modal interchanges and provide maximum access and the larger the interchange the greater the potential node;
- They provide locations for high order, health, education, commercial, recreation and residential land uses;
- They promote high densities such as 100 dwelling units per hectare; and,
- They create opportunities for sustained growth and development through significant private and public sector investment and increased accessibility.

Todes (2003, cited in du Plessis, 2009) noted further that concepts such as nodes and corridors are intended to integrate urban areas and provide efficient public transport on corridors that links areas of economic and social activities established within nodes. Dewar (1984, cited in Martens, 2009) described nodes as places of high accessibility where public and private investment is channelled, offers optimal locations for retail, social services, office facilities and informal activities that act as growth points and have the potential to stimulate the development of corridors. It therefore incorporates activity corridors, notions of activity spines, activity streets and activity nodes. Holden (2011, cited in Logan, 2011) stated that nodes constitute land uses, urban form, movement and transport, public amenities and proper management.

3.7 THE SOUTH AFRICAN CONTEXT

Martins (2001) explained that the emergence of the corridor concept in South Africa can be traced back to the late 1970's and 1980's through work undertaken in academic circles the most renowned being David Dewar and Roelof Uytenbogaardt at the University of Cape Town (UCT). A research report

produced confirmed that environments located alongside main transport routes in the city of Cape Town that grew in an evolutionary or organic manner performed better as compared to consciously planned urban development. More importantly, this contributed to integration, convenience and accessibility of services and facilities to communities, which in response stimulated the increase in thresholds and economic benefits. The corridor concept was therefore further refined. It was argued that the creation of an interlocking, reinforcing, hierarchical network of spines that allowed the intensification of activities to be located in direct relation to major movement routes interconnected many local areas and presented a number of advantages.

Dewar (1984, cited in Martens, 2001) argued that these advantages included the integration of the city; accessibility to a wider range of opportunities; generation of thresholds for a range of activities; small businesses could benefit by locating closer to higher order facilities amongst others. Hence, the corridor concept gained credence. It has since become linked to the broader agenda of transformation of South African cities. A report prepared by Council for Scientific and Industrial Research (CSIR) also stated that the corridor concept constituted a critical structuring element which could be used to improve access of opportunities to poor, low-income townships and promote economic growth through improved access. It was also evident that the concept was readily accepted by planning practitioners, academics and the government who recognised the need to promote the integration between land use and transport planning. The corridor concept has since remained an important planning instrument, which was incorporated into various pieces of legislation, and policy documents that provided guidelines and directives towards the restructuring of cities that will be tabulated and discussed in the sections following hereunder.

Donaldson (2006) indicated that the integration between transport and land use planning play a crucial role in the reshaping of urban form. As such, the notion of development corridors is said to connect major nodes to create purposeful interaction and would therefore require high-density development that incorporates residential and commercial development along transport routes. Brand and Geyer (2015) further reiterated that development corridors are the outcome of interaction between development centres (i.e. nodes). The corridor concept is an important tool in planning and geography where nodes play a dominant role in that it is they are a determinant factor in the establishment of corridors. The flow of goods and information between such centres (i.e. nodes) create favourable conditions to promote further urban development. Various nodes form a unique flexible exchange environment allowing for dynamic synergies of interactive growth to achieve scope of economies aided by fast and reliable corridors. Studies have proven that in South Africa, nodes do play a significant role

in the establishment of development corridors. It is a planning tool that can facilitate spatial, economic, social integration; and the restructuring of Apartheid cities in an optimal manner.

Of significance is the concentration of activities within dominant nodes. The emergence of a multimodal structure and the flows of economic activities between nodes results in the creation of development corridors that channel and focus economic growth between a networks of cities. These outcomes endorse the spatial and economic role of corridors as development instruments. In South Africa the four dominant nodes identified represent city regions namely; Tshwane, Johannesburg (as part of Gauteng), Cape Town and eThekwini. These centres are located in defined metropolitan areas and serve as prominent nodes. They exert great forces of attraction for the distribution of development, economic growth and migration. In addition, research findings have shown that the concept of a network of cities provides opportunities for diversity, creativity and greater freedom in locational choice and creates new opportunities for economic agglomeration and growth. It has been pointed out that the strength of corridors responded to distances of nodal areas from each other and that poly-centralisms led to stronger corridors.

The Cape Town Spatial Development Framework (2012) described development corridors as broad linear areas of high-density development centred on activities and development routes characterised by dynamic, mutually supporting relationships between land uses and movement systems. More importantly, facilitating the access and integration of communities to service provision, economic and social opportunities and are regarded as a combination of strip development that comprise mixed uses (i.e. residential, commercial and industrial) located along portions of corridors and nodal development comprising of clustering of activities at points of maximum accessibility. As a result, corridors require vibrant functionally interdependent nodes that generate high levels of interaction in order to function efficiently.

As demonstrated above the corridor concept plays a critical role as a primary restructuring element within the South African context. In 1994, the new democratic government recognised the urban challenges it had inherited and recognised the need for urban planning (i.e. land uses) and transport planning to be integrated. Therefore, new concepts such as corridors and nodes were introduced in a number of plans, policies and legislative documents that have fundamentally changed the planning system in South Africa in order to create an enabling framework for implementation. Hence, some of the key principles that underpinned the legislative framework were informed by the need for greater

integration in contrast to separation, compaction as opposed to sprawl, sustainability as opposed to inefficiency and equity as opposed to inequality.

3.8 POLICY AND LEGISLATIVE DEVELOPMENTS

This section of the dissertation will provide a brief overview of the relevant policies and statutes that have informed the planning milieu. It highlights relevant guidelines and statues, which are pertinent to the development and implementation of corridors and nodes in plans. The overview deals firstly with policy and statutes related to transport and in the second section with the relevant aspects of planning and development.

3.8.1 Transport Policy and Legislation

3.8.1.1 The White Paper on National Transport Policy (DoT, 1996)

The National Transport Policy produced a vision for the transport sector as follows:-

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

The paper set out a number of principles but most important was the promotion of public over private transport and to ensure the needs of commuters, learners, tourists and the disabled are met. The key policy actions included - integrating land use and transport planning; the development of land use frameworks, the provision of guidelines and policies to channel development and employment activities into public transport corridors and nodes. The statute provided for the delimiting and containment of urban sprawl; the development through infill, densification and mixed uses; and Integrating places of live-work-recreation reducing transport costs and travel time. In this regard, the law demonstrated the links and the need for integration between transportation and spatial planning.

3.8.1.2 Moving South Africa (1998)

This paper was released two years later by Department of Transport (DoT), and provides a twenty year Strategic Framework for the sector in South Africa. It emphasized the need to redress spatial distortions and urban sprawl that undermined public and non-motorized transport to meet the needs of

consumers. The policy further reinforced the objectives of the previous White Paper, which also focused the need to develop nodes and corridors as part of the urban transport system.

3.8.1.3 Moving South Africa Action Agenda (DoT 1999)

This was a complementary document that focused on the need for an efficient public transport system; an integrated approach; alignment with economic objectives of Growth, Economic Development and Redistribution Strategy (GEAR) and principles of the Reconstruction and Development Programme (RDP), which emphasized issues of sustainability.

3.8.1.4 Draft Revised White Paper on National Transport Policy (2017)

This paper presented a revised framework of the National Transport Policy of 1996, which reconfirmed government's commitment to the changing national and international trends. It aimed to address the social, economic and political changes that shaped the future of transport and the triple challenge of poverty, unemployment and inequality through transport infrastructure. The main aim of transportation was geared towards creating jobs, stimulating rural economic growth and promoting accessibility needs of the disabled both locally and globally. The 1996 policy goals, objectives and principles were confirmed as still being relevant twenty years later. It further emphasized reducing travel times by integrating land uses and transport planning, integrating non-motorised transport into spatial planning strategies by encouraging shifts to more sustainable modes such as cycling and walking. The promotion of safe, reliable, effective, coordinated, integrated and environmentally friendly public transport was underscored. However, in order to achieve these goals effective modal, spatial, planning and institutional integration amongst all sectors were highlighted as critical with a special focus on the availability and quality of public transport.

3.8.1.5 The National Land Transport Transition Act (No 22. of 2000)

In this Act, the emphasis was placed on the need to integrate transport planning, land use, economic planning and corridor development in order to enhance the efficient functioning of cities. The importance of transport plans to facilitate investment in corridors through nodal development, infill, densification and mixed land uses were highlighted. All local municipalities were required to develop Integrated Transportation Plans (ITPs) aligned with their Integrated Development Plans (IDPs).

3.8.1.6 National Land Transport Act (No 5 of 2009)

This was government's initiative to start an incremental process of devolving responsibilities of commuter rail and bus services to the metros (municipalities) at local level in order to create a more

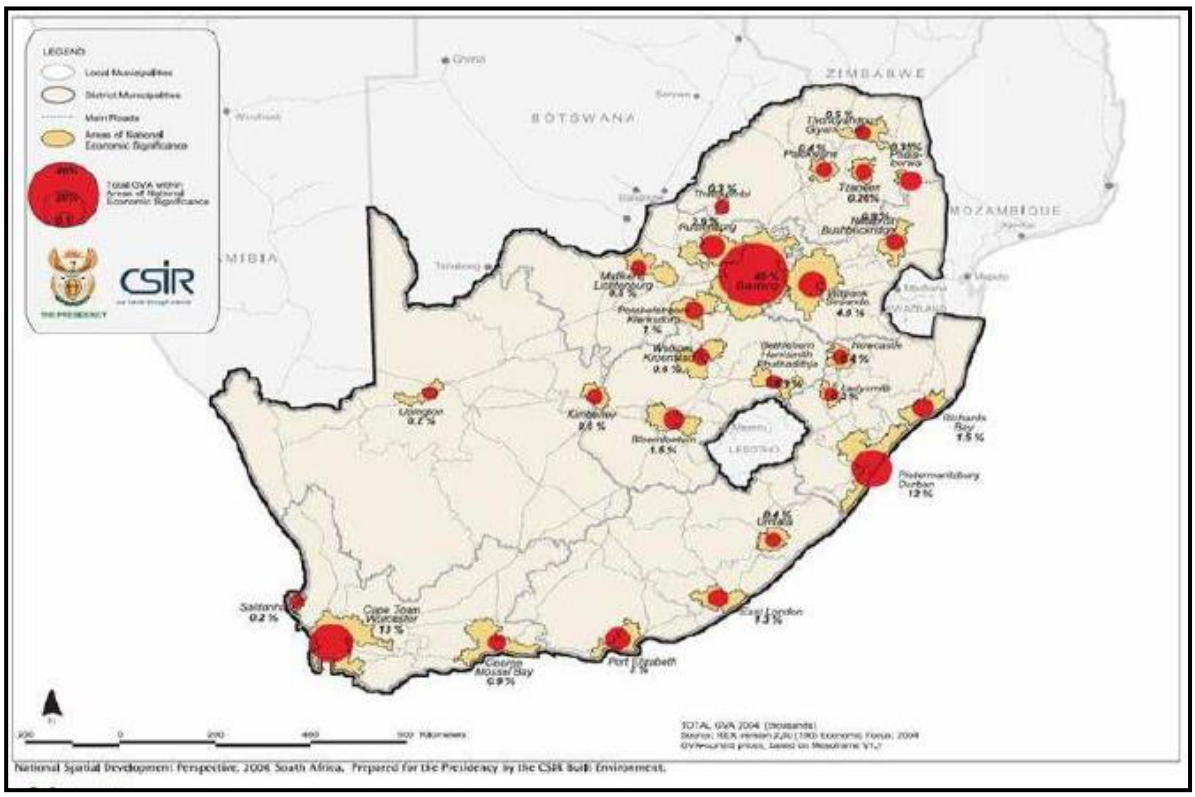
integrated and efficient public transport network. As a result, Department of Transport was required to work more closely with municipalities since travel patterns are at a local level.

3.8.2 Planning Policies and Statutes

3.8.2.1 The National Spatial Development Perspective (NSDP, 2006)

The main policy directives at a national level, which informs provincial and local development planning in South Africa, are contained in the principles of the NSDP. It represents a key instrument towards ensuring greater economic growth, job creation and the eradication of poverty. These principles are based on growth corridors linked to key economic nodes and regions in the country. The important role of cities for public investment and emphasis on nodal areas gave credence to the vision of post-Apartheid South African cities that have clear economic comparative and competitive advantages. Within this context, corridors have been highlighted as channels of investment that provide functional linkages between lagging areas and core regions as a means to address spatial disparities. In this regard, nodes and corridors (designed as 'arteries'), where identified based on the factors such as inherent economic potential; configuration of investments to ensure infrastructure viability through sustainable revenue streams; public-private-partnerships [PPPs] and community-public-private-partnerships [CPPPs]; political commitment; and rapid planning and delivery. (See Figure 29 below).

Figure 29: National Nodes and Priority Areas in South Africa



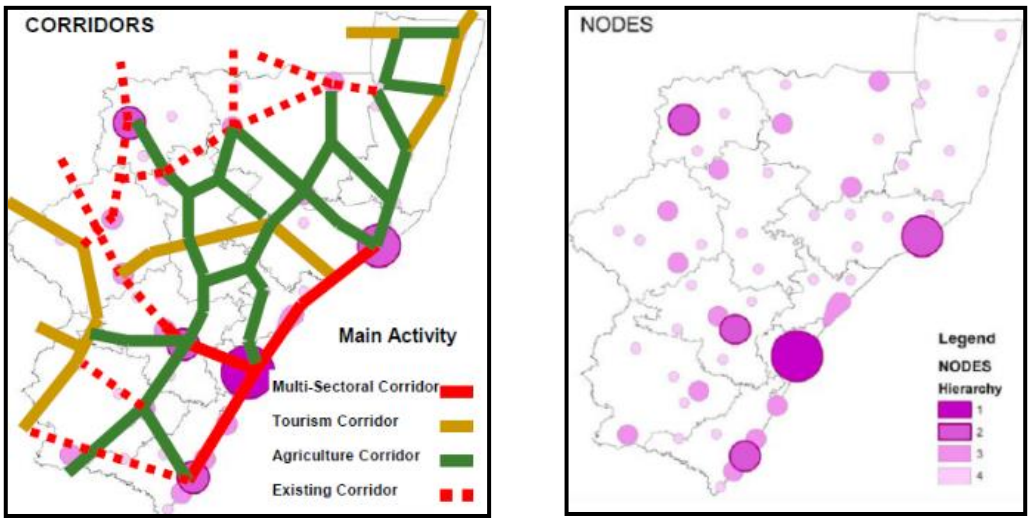
Source: NSDP, 2006

3.8.2.2 The Provincial Spatial and Economic Development Strategy (PSEDS, 2006)

At a provincial level, the Provincial Spatial and Economic Development Strategy (PSEDS) has been developed as a provincial translation of the NSDP and an input into the Provincial Growth and Development Strategy (PGDS) for KwaZulu-Natal. The PGDS provides a framework for public and private sector investment indicates areas of opportunities and development priorities, addresses key issues of implementation blockages, and provides strategic direction. The PSEDS also sets out focus areas of investment and recognises that social and economic development is not evenly distributed. The spatial marginalization of economic opportunities of the majority of the population therefore needs to be addressed in order to reduce poverty and inequality. Hence, the PGDS identifies a series of corridors and nodes at different levels, which indicate key centres as main elements for spatial development of

cities and emphasises that future economic development should be channelled into activity corridors and nodes that are adjacent to or link the main growth centres as illustrated in Figure 30.

Figure 30: Provincial Corridors and Nodes



Source: The Provincial Growth and Development Strategy (PGDS), 2006

3.8.2.3 The National Development Plan (2011)

In the more recent National Development Plan (NDP), the role of nodes and corridors was further emphasized. Key proposals and guidelines towards corridor development were outlined to enhance and strengthen economic development in the country. The recommendation that municipalities provide an explicit restructuring strategy that included priority precincts for restructuring and critical interventions to redress past segregation with a strong focus on integration. The National Planning Commission (2011) outlined the South African Government's long term vision for the transport sector for 2030 and the identification of investment that will ensure the empowerment of all South African citizens by:-

- Improving access to economic opportunities, social spaces and services by bridging geographic distances affordably, reliably and safely;
- Economic development, by supporting the movement of goods from points of production to consumes;
- Facilitating regional and international trade; and,

- Ensuring greater mobility of people and goods through transport options that will minimise negative impacts on the environment.

The government also committed to oversee the transport system that serves the interests of society; to prioritise, plan and provide the basic infrastructure; to regulate public and private transport; and to ensure that at all levels of government those responsible for delivery of transport are competent to achieve these goals.

3.8.2.4 The Local Government: Municipal Systems Act (No. 32 of 2000)

The Constitution of South Africa envisages a robust local government system, which can provide democratic and accountable government for local communities; ensure the provision of services to communities in a sustainable manner; promote social and economic development; promote a safe and healthy living environment; and encourage the involvement of communities and community organizations in the matters of local government. The Act aimed to empower local government to fulfil its constitutional objectives and in terms of Section 25 (1) were each Municipal Council must within a prescribed period adopt a single, inclusive and strategic plan, known as the Integrated Development Plan (IDP), of which the SDF is a core component (Section 26 e). Chobokoane and Horn (2015) stated that all SDFs are to be linked and informed by national and provincial development and framework plans. Some recent plans that have emerged propose to integrate and compact towns and cities with corridors, nodes and urban growth boundaries with the intention to channel public investment with economic growth potential into these target areas.

3.8.2.5 The Spatial Planning Land Use Management Act (SPLUMA) (No. 16 of 2013)

The Department of Rural Development and Land Reform (DRDLR) published the Spatial Planning and Land Use Management Act (SPLUMA No. 16 of 2013) which came into effect on 1 July 2015. It provides a framework for planning and land use management that is inclusive, developmental, equitable and efficient spatial planning. The Act stipulates that the compaction of South African cities be based on principles of diversity and choice, which allows for a range of opportunities to diverse groups and that offers various options to different populations. This approach is also intended to cater for the needs of various income groups with different preferences ultimately striving towards a more compact-integrated city.

Chapter 4 Section 11 (1) provides a clear framework for the preparation of Spatial Development Frameworks (SDFs). Some of the provisions that are important include the need for municipal plans to include a written and spatial representation of a five-year Spatial Development Plan (SDF), the

municipality's spatial form, and the need to identify current and future significant structuring and restructuring elements of the spatial form. The plan should include development corridors, activity spines and economic nodes where public and private investment may be prioritised and facilitated.

3.9 THE CHALLENGES AND CRITIQUE ON CORRIDOR DEVELOPMENT

Villiers (2009) has indicated that there are a number of criticisms raised concerning the concept of corridor development. He outlined these issues as follows:-

- That compaction and integration were not always the best option for communities;
- That the need for space between the poor living in the periphery and those closer to the central city are not the same;
- That survival strategies change with time and people therefore rely on rural and not only urban incomes for a livelihood; and,
- That people living in remote areas enjoy lower cost of living and service charges and that rural areas offered larger plots, which could accommodate life cycle changes, agricultural practices and sub-letting of land and buildings.

Carmona (2015) contended that research findings indicated that the various challenges stemming from mixed used corridors in the United Kingdom (i.e. London) included the poor design of the public realm with various land uses competing for spaces i.e. signage, barriers, lighting letter boxes, benches, bins, cycle racks and utility boxes, street furniture and street trees. In addition, failure to deliver on safety and security benefits, a loss of physical character and distinctive uses, national and multinational chain stores located along the mixed-use corridor drove out local businesses by offering below cost prices to consumers. Furthermore, these trends led to more car reliance, fewer local jobs and services, breakdown in civic pride and the undermining of local communities and businesses. The compaction of smaller properties accommodating small independent businesses resulted in an increase in surrounding residential property values and issues of crime and anti-social behaviour that was evident during the night. The Department of Transport stated that it was difficult to manage the corridor due to the high volume of pedestrians, cyclists, public transport users, specialist service delivery, emergency and waste disposal vehicles all sharing the same space. Finally, the banning of parking and parking restrictions resulted in increasing traffic and congestion spilling over into the surrounding neighbourhoods. Witte, Wiegmans, Oort and Spit (2014) indicated that inland ports were important to the efficiency of corridor development. However, research of eight case studies in Netherlands revealed that challenges

confronting inland ports included conflicts between land uses and planning which resulted in imbalances, there was therefore an urgent need for government structures to bridge the gaps between transport and land uses.

Sulaj, Themelko and Shumeli (2014) have pointed out that research studies on the impact of corridor development on land uses showed that there was a significant reduction in agricultural land, which was transformed for commercial, industrial and service activities. It was further envisaged that urban development along the corridor would impact negatively on the ecological and biodiversity systems and reduce green open spaces. Therefore, it was recommended that land uses along the corridor needed to be properly managed and that agricultural land and green open spaces be preserved and protected. Furthermore, any future development of the corridor needed to be restricted to the design and implementation of long term strategies and to comply with all the necessary planning and legislative requirements in order to ensure better living conditions and healthier environments.

Sutcliffe (2013) also argued that there were no guarantees regarding the intensification and compactness of urban development and positive results in the quality of life of the residents near the corridor. Furthermore, that the transformation of existing cities would not be easily achieved due to the additional demands placed on infrastructure. He contended that communities may not be prepared to relocate and the high population growth, poor transit services and the lack of infrastructure and urban management structures especially in Developing Countries posed major challenges to implementation. Research findings revealed that although corridor development presented certain benefits contrarily problems such as increase in traffic due to transport policies that promoted private car use rather than public transport, walking and cycling, and lack of government participation had an adverse impact on the successful implementation of corridor development.

3.10 CONCLUSION

The literature review has provided an extensive collection of information and perspectives on the ideas, debates and key aspects relating to the Compact City urban model and Corridor Development model. It is evident that these approaches emerged as innovative mechanisms in response to major social, economic and environmental problems that confronted cities throughout history. While these approaches are subjected to various criticisms and scepticism of some scholars, the majority of case studies underscored that these models are powerful tools that encompass critical elements that promote greater physical and socio-economic integration, compaction, urban intensification, high-density development, mixed use development linked by efficient high quality public transport and non-

motorised transport. The key potential being to integrate and bring places of home-work-recreation together that would facilitate a desired sustainable urban form and transport pattern development. A denser, more efficient, more equitable urban pattern that would provide thresholds for local markets, social services and public transportation; encourage non-motorized transportation; reduce commuting distances; lower the rate of car use-age and energy consumption, the need for people to travel, reducing greenhouse gas emissions, air pollution, noise pollution, and limiting the loss of open spaces, natural and agricultural spaces.

More importantly, existing studies have revealed that after over two decades of democracy, plans and policies that aimed to create integrated-equitable cities further reinforced the scars of Apartheid that still dominate South African landscapes that are socially and spatially divided. Furthermore, of particular concern is the phenomenon of informal settlements, illegal invasions by the urban poor and, the middle and upper income gated and high security residential complexes located on the urban edges that are susceptible to environmental hazards and exacerbate sprawling urban peripheries, inequalities and exclusion that prove costly for planning and service delivery. This therefore presents to professionals and policymakers the critical challenge of fulfilling a positive role by finding creative ways to achieve urban restructuring, within the existing realities of the built environment and limited resources. Hence, the bleak realisation as articulated by Dewar (2004) that there are no *"big bang"* solutions to city's problems. Positive changes can only occur incrementally and primarily through a series of small actions that are co-ordinated and integrated. As it appears, not all problems and complexities can be solved instantaneously since urban growth is a process that is constantly evolving and therefore needs to be managed consistently with proper planning.

In the following section of the dissertation, the discussion will turn to an examination of international and national precedent case studies addressing nodes and corridors. The intention of this new chapter is to draw lessons from practice, which would inform the research observations of the case study area in Edendale and provide a bench-mark against which to evaluate the proposed development in Msunduzi.

CHAPTER FOUR: PRECEDENTS AND BEST PRACTICE BENCHMARKS

4.0 INTRODUCTION

Many cities across the globe have successfully embarked on a process of transformation through the implementation of the corridor development concept as a means of reversing car dependant sprawl and promoting sustainable development. As indicated by Brand and Geyer (2015) corridors are characterised by a dynamic, mutually supporting relationship between land use and movement systems which provide communities access to economic, social and recreational activities. Transport corridors or networks link activity centres or nodes together through the provision of high quality, efficient, reliable public transport services that operate at high frequencies. Hrolfsdottir (2008) explained that transportation networks play the key role of transporting goods, services and people to their destinations that are determined by their land uses, therefore without destinations there would be no need for transport networks. As a result of transportation and land use being fundamentally interrelated, the need for a coordinated planning approach is necessary. A report prepared by the Hume City Council, Australia (2011) pointed out that the integration of land use and public transport referred to the planning of areas for purposes such as residential, commercial and industrial and that these land uses are mixed in order to promote greater use of public transport, walking and cycling. The two land use methods used to encourage alternative transportation modes to the automobile are increased density and land use mixture that brings destinations closer accordingly reducing travel time and costs, encourages social interaction as people fulfil their needs and will create sustainable, well-connected communities.

Taylor and Sloman (2011) argued that well planned cities would avoid the unnecessary need for travel and would encourage low carbon modes of transport such as public transport, walking and cycling. Furthermore, a number of case studies have revealed that there are several benefits that result from the coordination of land use planning and transport planning, especially the liveability and prosperity of cities that depend on this mutually complementary approach. Cervero (2013) argued that in addition to relieving congestion, cleansing the air, conserving energy and long term economic growth spatial and transportation coordination has the potential to alleviate poverty. The planning and designing of cities and transport systems enhances accessibility and affordability that is pro-poor through the promotion of non-motorized and public transportation. In his earlier writings, Cervero (2002) articulated the view that the main objective of the interaction between transport and land use planning is to find solutions to negative impacts. This could be achieved by creating compact-liveable urban environments by applying

zoning regulations that allowed for high density and the mixing of land uses. Residential development would be located in close proximity to shops, services and jobs and thus there would be more destinations within walking and cycling distances.

Lau, Giridhharan and Ganesan (2005, cited in du Toit, 2009:62) defined mixed use as the *"intensification of land use through mixing residential, commercial and other uses at higher densities at selected urban locations, while being supported by an efficient public transport and pedestrian network"*. It is therefore quite apparent as expressed by Dewar and Uytenbogaardt, that corridors refer to *"the symbiotic relationship between intensive flows of traffic (automated and non-automated) and human intensive activities which results in corridors of heightened activity and it is such a symbiosis that results in sufficient threshold densities for viable public transport while improving equity of access to services"*. (Dewar and Uytenbogaardt, 1991:49). The Twentieth and the beginning of the Twenty First Century have been dominated by debates regarding the unsustainability of issues relating to transportation such as traffic congestion, infrastructure costs, air quality and the loss of biodiversity. Wright (2005) emphasized that in Developing Countries transportation modes have also been shifting from private car to public transport as a sustainable-cost effective means of travel to places of employment, education and public facilities that are beyond walking distances. Therefore, in view of these current trends the main aim of this chapter is to conduct a literature review on corridor development best practice case studies in order to learn from these models.

4.1 INTERNATIONAL AND NATIONAL BEST PRACTICE LEARNING LESSONS

The scope of this investigation focuses on four cities in terms of their historical background, vision, significant initiatives and approaches adopted towards the successful implementation of corridor development. These include both international and national examples namely; the city of Cleveland in Ohio (USA), Curitiba in Brazil (South America), Ankara in Turkey and the City of Johannesburg in South Africa. Being cognisant of the fact that cities around the globe differ in terms of their character, culture, people and divergent challenges, the researcher's primary aim is to analyse and draw on the valuable insights, experiences, challenges and main lessons learned from both international and national contexts, which are considered best practice benchmarks of corridor development.

4.1.1 The Euclid Avenue Corridor Development: Cleveland, Ohio

Hook, Lotshaw and Weinstock (2008) argued that many American cities are finding that the construction of heavy load rail subways and metro systems are too costly. They take longer time periods to implement and require up front capital expenditure. As an alternative, officials are opting for lower cost Bus Rapid Transit (BRT) in their quest to combat suburban sprawl. In cities like Curitiba, Brazil, Guangzhou, China there is copious evidence that these BRT corridor systems have stimulated positive development as a spin off and thus there is a demand for the implementation of additional routes. BRT systems being relatively new in the United States (US) and thus there is limited evidence in the form of case studies that have been documented to assess how this transportation system contributes both positively or negatively in the built form. In this section, the city of Cleveland in Ohio will be explored and the factors that contributed to its success will be discussed.

4.1.1.1 Historical Background

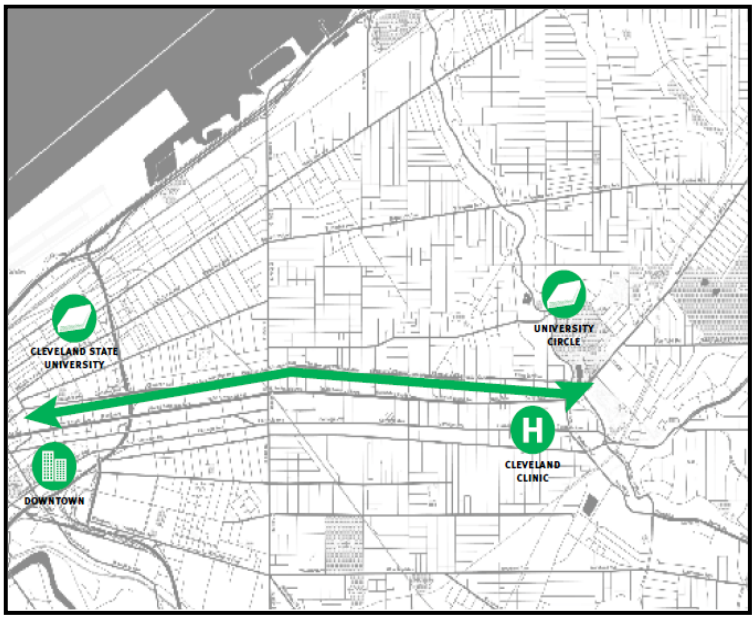
Cleveland is the second largest city in Ohio, and since the second half of the Nineteenth Century until middle of Twentieth Century the population grew massively from 17, 000 to 914,808 (see Map 2). Hook, Lotshaw and Weinstock (2008) have pointed out that the manufacturing industry flourished before World War 1. The 1950's Euclid Avenue was the central corridor in the city and was compared with the importance of Fifth Avenue in New York as an iconic place. Corporate giant millionaire mansions such as Rockefeller (Standard Oil) and Andrew Bush (General Electric) were located along this corridor. As the economy boomed, lucrative and exclusive department stores and shops eventually replaced these areas. Pedestrians, trolleys, cars and small trucks coexisted in the same space that were safe and low speed. However, with the demise of streetcars in 1950's and the dominance of motor vehicles radically changed the city. Significantly, the population dropped from 900,000 in 1930 to 400,000 in 2010 indicating an outflow of residents to other urban areas. Furthermore, the middle to upper income businesses and residents began to relocate to suburban areas. This process led to the decline and blight of the corridor and urban core of Cleveland, Ohio (USA).

Map 2: The Locality of Cleveland, Ohio (United States of America)

Source https://www.google.co.za/

Like many other cities in the United States (US) new developments in Ohio were characterised by low-density sprawl which contributed to the decay of city centres and real estate markets with limited employment and few retail and entertainment amenities to attract new residents. According to Cleveland's Smart City Report (2016), between 1980 to date there was a loss of approximately 50% jobs in the manufacturing industry sector. Furthermore, Cleveland was the first American city since the Great Depression to default in loan payments. However, in the 1980's, George Voinovich who became the mayor, promoted the Dual Hub Strategy. This plan was based on mass transit system that would link the region's two major hubs, which constituted the two largest employment centres. They were both situated along the Euclid Avenue Corridor (highlighted in green) in Figure 27 below. It was proposed that the new plan linking downtown Ohio to University Circle would more importantly serve as a catalyst to regenerate and revive the city.

Figure 31: The Euclid Corridor



Source: Hook, Lotshaw and Weinstock, 2008 (page 120)

The downtown area, which comprised of the Central Business District and main commercial sector of Cleveland, was situated on the western end of the corridor whilst residential communities, Cleveland clinic, Case Western University, University hospital, cluster of museums, music venues and medical centres occupied the eastern end, which provided jobs for over 30000 people. Vincent and Jerram (2008) noted that the 2020 Citywide Plan presented a compelling vision for Cleveland, which included the remaking of the city into a thriving urban centre. This requires the need to increase residential development along the corridor and to attract businesses and industries with the main emphasis being on connectivity; transit and pedestrian oriented development and the targeting of high-density development in close proximity to transit and bus stations in support of public transport. This was to be reinforced through changes in the zoning regulations that promoted multi-storey mixed-use developments along the Euclid Corridor.

Furthermore, the city offered incentives such as tax credits, loans, bonds and rebates to developers and businesses that invested in residential, commercial and retail development specifically along the corridor. The Community Planning Workshop Report (2009) emphasized that the historic significance

and architecture of many buildings along the corridor presented the opportunity for preservation. It was further envisaged that if the city could link the two main economic hubs with high quality transit connection then sections along the entire corridor would begin to fill in with various land use developments. Prior to the initiative, the downtown area suffered abandonment from industrial activities and only a few businesses remained. Initially the city planned a subway line but could not implement the project due to high financial costs associated with the construction of rail networks. The City Planning Department fulfilled the role of lead project management for the proposed development that promoted the fully featured corridor development

4.1.1.2 BRT and Euclid Avenue Corridor Development Initiatives

In 1998, the mayor who served as Ohio's governor for eight years visited Curitiba in Brazil and was impressed with the BRT system. His second visit included a delegation of various business leaders and officials from the Greater Cleveland Regional Transport Authority (GCRTA) who were inspired and supported the development of the corridor and BRT system for the city of Cleveland. With the assistance and support of Voinovich who was by then elected senator of the US Senate, a grant funding of 82 million dollars was budgeted and secured for the project in 2004. The fully featured corridor vision included a 2.3-miles (approximately 4 kilometres) transit zone. The authorities also proposed the installation of underground power lines, fibre-optic telecommunications cables, the rebuilding of dilapidated water and sewer connections, the upgrading of street amenities such as sidewalks, cycle paths and public art. The total value of the project was in the region of 200-million-dollars, which included the implementation of BRT vehicles, bus stations, platforms and infrastructure. The iconic stations that beautified the streets along the corridor in Cleveland is graphically illustrated in Plate 2 below on page 97.

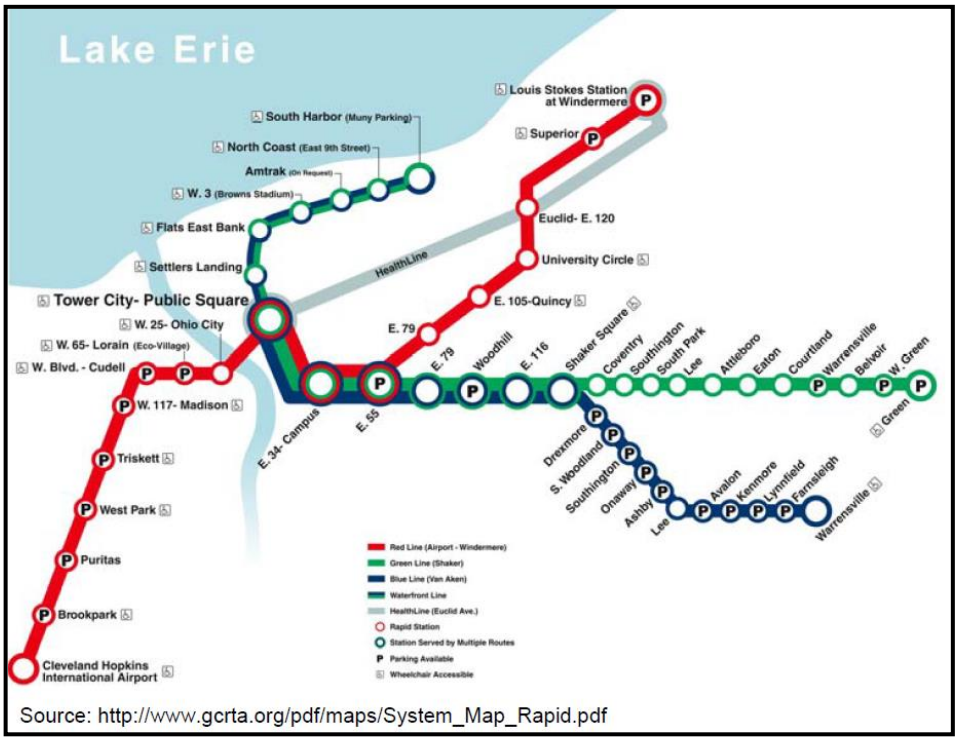
The Community Planning Workshop report (2009) indicated that the Greater Cleveland Regional Transit Authority (GCRTA) began planning for BRT along Euclid Avenue a strategic economic-business development corridor in 2005. The route was named the Health Line BRT Corridor and it is illustrated in Figure 32. In 1995, it was selected an alternative over the rail system due to its financial implications and, became operational in 2008. The Cleveland Regional Transit Authority outlined three goals for the BRT system, which included the need to improve public transit efficiency to promote long-term economic growth and development and, the improvement of community development. The three goals were to contribute to the overall quality of life of citizens.

Plate 2: Iconic Bus Stations

Source Community Planning Report, 2009

The development was promoted as a means to combat congestion, pollution and other problems associated with sprawling, auto-dominated suburban growth patterns, which characterized the city. The report further indicated that since its implementation of the BRT, use of its facilities had increased by 39% per month in comparison to other means of public transportation including one heavy rail line and two light rail lines and the bus system. The route comprised of fifty-eight bus stops over a length of elven kilometres and operated twenty-four hours a day, with frequencies ranging between five to thirty minutes. The major features of the Health Line BRT included dedicated bus lanes; fast loading and unloading; raised platforms and off-board fare collection. The off board collection system at stops expedited the boarding process and frequent services whereby the Health Line runs every five to ten minutes between 5:00am to 7:00pm and every fifteen to thirty minutes overnight.

Figure 32: A Map of Rapid Rail lines (Green, Blue and Red) and Health Line (Grey)



Source: http://www.gcta.org/pdf/maps/Systes_Map_Rapid.pdf

Hellendrung (2012) highlighted that the two hundred million dollar BRT system along the eleven-kilometre corridor induced five point eight billion dollars of investments, which included a three point three billion dollar rehabilitation centre. A similar amount was spent on construction work and over a hundred and ten million dollars on additional projects. Furthermore, the BRT services was instrumental in connecting major economic generators across the whole city. The two major employment generators being the Cleveland Clinic and University Hospital who purchased the naming rights of the BRT line for six and quarter million dollars and named it the Health Line.as a branding and marketing strategy. As a result, the implementation of the corridor development propelled Cleveland's evolution into a world-class destination for health care and biotech industries. Smith (2012) reported that ridership had increased by 60% (from 9000 to 14400 riders per day) and that the BRT is more like a rail service than a bus service with long articulated buses that look like trains with its off board fare collection, 3 doors on each side for fast easy loading and internet kiosks available throughout the corridor. The Smart City 2016, Department of Transport report also verified that the downtown neighbourhoods of Cleveland

experienced a surge of economic development in residential and commercial development. In the four years from 2010-2014, more than four and half billion dollars was invested in downtown Cleveland. More than 600 million dollars of investment, which included residential flats, the Cleveland Convention Centre and Global Centre for Health Innovation. Furthermore, the downtown area experienced a 53% increase in residential growth since 2000. The strong public transport system maintains and creates jobs by connecting workers to employment, reduces travel expenses that is critical to Greater Cleveland's economic and social quality of life.

Subsequently the fastest growing population that use public transportation are the millennial, baby boomer generations in the age group of twenty something. In addition, young professionals who prefer to live and work in urbanised areas also use the lines. Studies have also revealed that almost 91% of millennials are of the opinion that public transportation creates jobs and improves the economy. It was emphasized that a coordinated and integrated approach to planning and development was critical to making Cleveland competitive in the 21st Century. It has been argued that integrating high-density developments along transportation corridors and changes to land use regulations including zoning were the key tools to reinventing development along the corridor. Connecting people, places and opportunities is the theme that dominates Cleveland's Smart City Planning. Cleveland revised its zoning controls to create transit and pedestrian-friendly areas, encourage the use of bicycle lanes, and reduced parking to encourage transit oriented development to facilitate more walkable, sustainable and liveable communities. The Euclid Corridor received the highest positive ranking in 2013. The Institute of Transportation and Development Policy (ITDP) citied the project as a catalyst for powerful transformation and redevelopment. It has spurred over six billion dollars in investment since its inception. The corridor is being used as a national model with its components being replicated in Oregon, Washington, California, Florida and Washington DC.

In 2015, the corridor was further upgraded to decreases travel time by 10%. Cleveland's 2013 District: a coalition of forty-one property owners are collaborating in initiatives to reduce energy use, water use, carbon emissions. The Cleveland Local University Initiative Program that has been in existence for the past ten years continue to partner addressing specific challenges in respect of disinvestment in neighbourhoods. Similarly Sustainable Cleveland 2019, originally launched in 2009, worked together to ensure dynamism, inclusiveness and long term success were one of the key focus areas is economic sustainability. This therefore demonstrates the city's ability to collaborate with local institutions. *"The success of our project is not what we did. It is what other people did in response to what we did. They really saw this as an opportunity and a way to leverage investment" (CEO: Greater Cleveland RTA:*

Smith, 2012). The corridor has therefore contributed to making the city vibrant for people to live, work and play.

4.1.1.3 Successful Elements and Lessons for Practice

The above discussion clearly demonstrates that some of the factors that played a key role in the successful implementation of the Euclid Corridor Development Strategy included:-

I. Strong Government Support

Strong government support particularly under the leadership of Mayor George Voinovich contributed to the social and economic development of the area. The city succeeded in leveraging billions of dollars in new developments and investments. It established strong plans for government intervention and had identified the transit corridor with good land potential. Grant funding was also established and secured at the outset of the project, which ensured implementation. Furthermore, the federal government through loans, credits and public programs made a significant contribution in the region of 50% to promote developments in the corridor and did not depend on the interventions of pure market forces.

II. Integrating Transportation and Land Uses

A coordinated and integrated approach to transportation and land use planning and development was adopted. The strategy of intensifying development densities along the corridor and the vision of creating a network of transit oriented development. A mix of uses that included housing, retail, entertainment and restaurants in close proximity was encouraged which created accessible economic opportunities for low-income residents. The city's long term planning vision, land use regulations and strategies, transportation planning and implementation was undertaken concurrently to foster integration. The initiative received strong institutional support and commitment. Furthermore, the rezoning of properties along the corridor encouraged mixed-use development and formed part of a comprehensive plan for the area.

III. Public Participation and Community Development Corporations

Strategic partnerships were formed between diverse groups such as public, private, non-profit and neighbourhoods. Community consensus and support, public participation and close collaboration with businesses, institutions and economic development agencies was key to the success of the corridor. Furthermore, there was buy in from all stakeholders into the project at the outset during design phase of the project and this was sustained throughout the project and is still sustained whereby businesses and communities also contribute financially towards the continued maintenance of the corridor.

IV. The Quality of the Transit Investment: Efficiency, Viability and Affordable Public Transport

Investments in the quality and standards of the BRT system in terms of design included dedicated bus lanes where buses run along exclusive lanes in the centre of the street, which reduces travel time, and travel expenses; the stations architecture and construction in glass and steel supports the public realm; the affordable rating system; technology and 24-hour service. All these elements contributes to the efficiency and viability of the corridor. This also ensures thresholds that will support the BRT system and businesses. In addition to the viability and efficiency of public transit along the corridor being dramatically improved, the functionality, diversity, vibrancy and quality of urban life has significantly revitalised the city centre.

4.1.2 Curitiba Corridor Development, Brazil

The following section of the dissertation will provide an overview of the development of the iconic development corridor and the BRT in Curitiba, Brazil.

4.1.2.1 Historical Background

South American cities such as Curitiba and Bogota have been recognized as having the most successful and cost-effective public transit systems that have been implemented in the world. These developments were guided by the primary aim to enhance mobility, speed and movement throughout the cities. These initiatives were strongly supported by the World Bank. According to Nikitas and Karlsson (2015) Curitiba is the capital city of the state of Parana in Southern Brazil with a population of 1.85 million covers a land area of 435 square kilometres in extent (approximately 4200 people per kilometre). Bogota in comparison has a population of 8.081 million (2017) and an area of 1,775 square kilometres. It is the fifth-most-populous city in the Americas. The city is situated on a high plateau known as the Bogotá savanna, part of the Altiplano Cundiboyacense located in the Eastern Cordillera of the Andes. The focus of this section is the BRT in Curitiba (See Map 3 below).

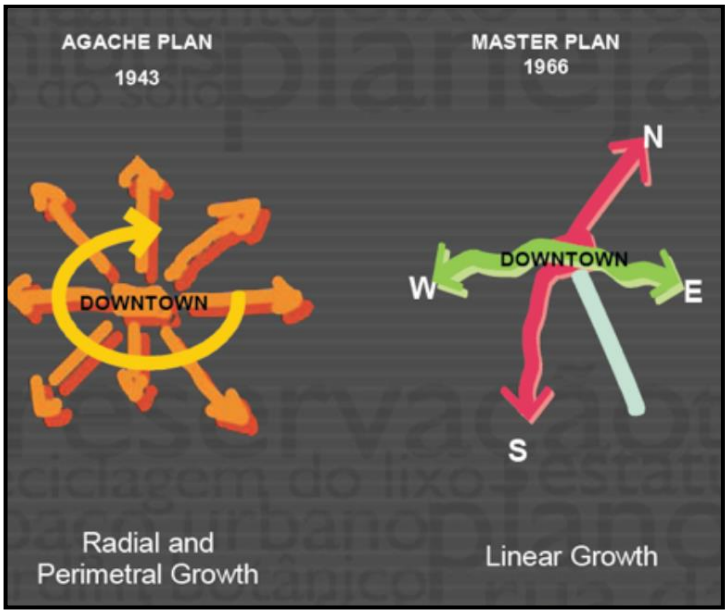
The first bus rapid transit (BRT) system was implemented in Curitiba in 1963 however; the BRT system with dedicated lanes became operational in 1974. Burgess and Ordiz (2010) record that the history of Curitiba's urban planning commenced in 1934. Due to rapid population growth, the city quickly outgrew the limits of the Master Plan developed by the Alfred Agache in the early 1940's. His plan restricted high-density development along corridors radiating from the city centre.

Map 3: The Location of Curitiba in Brazil

Source: Burgess and Ordiz, 2010

Hence, in 1965 the development of a new plan transformed the city's radial structure into a linear model urban expansion as depicted in Figure 33 below. The plan was approved in 1966. The Master Plan limited growth in the central areas and encouraged commercial and service sector growth along the north-south transport arteries radiating from the city centre. It also promoted economic growth through the promotion of industrial development and service provision; the integration of traffic management; transportation and land use planning and adopted a flexible developmental approach.

Figure 33: The Organized Growth of Curitiba



Source: Burgess and Ordiz, 2010

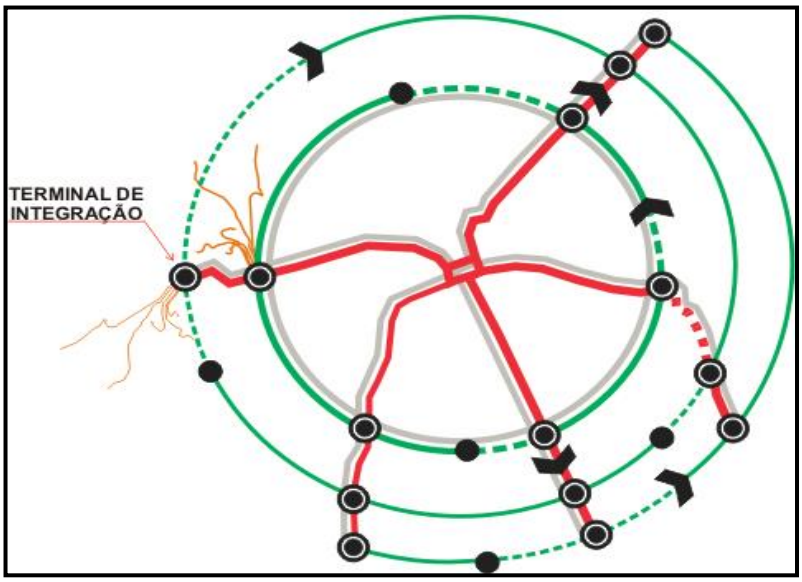
4.1.2.2 BRT and Curitiba Corridor Development Initiatives

The revised plan revolutionized the city and in 1970, new zoning regulations reinforced the linear structure by promoting residential and commercial densification along the mass transport corridors. Furthermore, the most significant change was in 1974, which resulted in the implementation of a road hierarchy, land control and development of the BRT system, which fulfilled a central role in the overall masterplan. The masterplan included a radial expansion of the city along five corridors along structural axes. Five major arterials integrated land use, transport and protected the traditional central city as depicted in Figure 34. More importantly, planners recognized the critical role of transportation in the future growth of the city. Wright (2005) explained that under the innovative leadership of Mayor Jaime Lerner the process of the busway corridors emanating from the city centre was implemented.

The layout of the Curitiba bus system included five radial corridors emanating from the city core, with fifty-seven kilometres of exclusive bus ways and three hundred and forty kilometres of feeder services. The new plan departed from the traditional core-periphery model and proposed that all of Curitiba's

buildings be located along the five transportation axes that converged on the city centre from the north, south, southeast, east and west. In the 1990's visits of technical teams from other cities such as Bogota (Columbia) and Los Angeles (United States of America) to Curitiba served as a catalyst to replicate similar systems. Cervero (2006) mentioned that cities such as Curitiba in Brazil and Ottawa in Canada stand out, as good examples where the bus based mass transit system can be successful provided. It is linked to strategic, forward-looking, intelligent planning. Other cities like Brisbane one of Australia's fastest growing cities were also attempting to implement the bus rapid transit to shape their city growth in this time.

Figure 34: Radial and Circular Routes



Source: Pienaar, Krynauw and Perold, 2005

Lindau, Hidalgo and Facchini (2010) indicated that Curitiba was the only city in Brazil that directed growth through land use, transportation and environmental preservation integration. Whilst cities such as Sao Paulo, Rio de Janeiro, Recife and others used state funding for bus systems, Curitiba used the investment on busway-transportation corridors to direct growth. Furthermore, in contrast to Curitiba their bus systems were implemented in isolation from a coherent system of regulations, comprehensive long term planning and land use strategies, which as a result led to limited success. In 1970, the Institute for Research and Urban Planning of Curitiba implemented the bus system, which through its

ultimate success obtained status as the first full BRT system in the world. In 1990, a legally binding agreement was drawn up between the State of Parana and the city that empowered the Urban Development Authority of Curitiba to plan and manage transportation modes for the entire metropolitan area. Hence, an integrated approach was introduced as the result of cooperation between the Institute and the Urban Development Authority. The former agency consolidated urban plans, programs and projects for various administrative units of Curitiba. The latter dealt with the planning and controlling of transit/transportation played a central role in the traffic and urban planning sectors. Curitiba therefore stands out as an iconic city for urban planners that represents a rare case where the implementation of plans surpassed political administrations.

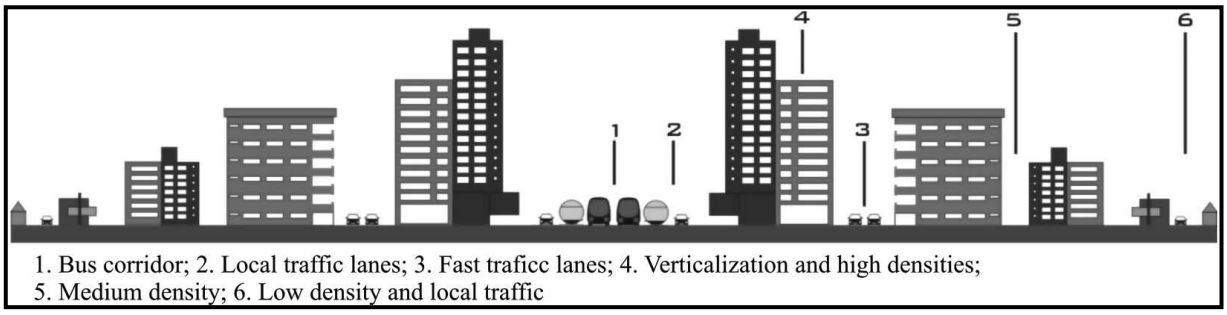
Plate 3: Corridor Development: Arrangement of Structural Axes

Source: Lindau, Hidalgo and Facchini, 2010

As illustrated in Plate 3 above and Figure 31 below the parallel streets are dedicated to high-speed traffic providing movement in one direction to the city centre and suburbs. As can be seen in Figure 31, the corridor has a specific design quality with high-density developments along corridors decreasing to neighbouring blocks further away from the trinary transportation system. Side blocks are zoned for

mixed uses but at a lower density, allowing less intensive uses. The influence of the transect design is evident with land uses and intensity decreasing from the edge of the corridor into the surrounding urban fabric until the traditional neighbourhood structure is reached. This is a concept that proved successful over time with the full BRT system having taken over thirty years to develop.

Figure 35: BRT Corridor Scheme



1. Bus corridor; 2. Local traffic lanes; 3. Fast traficc lanes; 4. Verticalization and high densities;
5. Medium density; 6. Low density and local traffic

Source Duarte and Ultramari, 2012

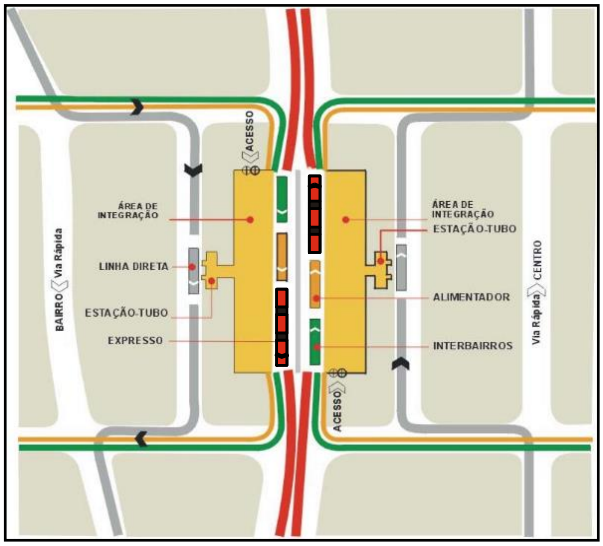
Herbst (1992) stated that the city introduced an auto-free downtown pedestrian lane in a 17 block area and a 24-hour street comprising of an enclosed alley lined with shops and the bus system that was refined by a 3-tiered system with the following characteristics:-

- Commuters could transfer without charge between the red express that ran along the axes to the yellow feeder buses that circulated to the outlying districts and the green inter-district buses travelling along the concentric circles to outlying areas as depicted in Figure 32. The diagram shows the graphic image of the radial and circular routes between 8-12km long radiating outward from the CBD;
- An express line was connected to the two universities and coastal beaches;
- A computerised traffic control system gave preference to the buses;
- Two hundred and seventy passenger buses and express routes were developed covering thirty four miles or fifty five kilometres;

- A hundred tubular bus stations were constructed which enabled passengers pay their fees at a turnstile located at the end of the tube. Once a ticket was purchased a user could wait inside for another bus which they entered from sliding doors; and,
- A computerised system was installed that calculated the number of passengers waiting for transportation and could dispatch additional buses if necessary.

The BRT system proved to be cost effective with its construction being completed in approximately six months. In financial terms, the construction of a subway of similar complexity would have cost three times the cost. Lerner, the former mayor has confirmed that the BRT system transported approximately 1.3 million passengers per day with less cost. Commuters using the new system spent only 10% of their monthly income on transport, which was cheap in the city of Brazil.

Figure 36: The Bus Route System



Source: Pienaar, Krynauw and Perold, 2005

4.1.2.3 Successful Elements and Lessons for Practice

A number of other BRT systems constructed elsewhere in the world have benefitted from experiences of Curitiba. It has provided useful lessons and has served as catalytic example promoting the corridor development concept. Pienaar, Krynauw & Perold (2005) emphasize that the BRT system was introduced during a political era characterised by a unitary autocratic government (1964-1988) which

was thereafter followed by a democratic system of government. Lindau, Hidalgo and Facchini (2010) stated that the success of Curitiba could be attributed in part to a mixture of an autocratic political leadership approach, innovation, pragmatism, technocracy and continuity. In the first phases of development, a number of difficult decisions had to be made concerning the BRT. Some of these were unpopular with local businesses and communities. In the later stages, a more participatory process could be engaged. The success of the BRT system can be attributed to the following factors:-

I. Strong Political Will and Leadership

According to Herbst (2005), Lerner was a dynamic, charismatic visionary, political champion who was creative, innovative and determined to promote Curitiba's growth and development by finding creative solutions to urban problems. He acquired the necessary education, training, skills and experience and was then employed as an architect by the city in 1965 and later as planning consultant (1980's). He was first appointed as Mayor in 1971 under Brazil's military dictatorship who waged a campaign to reconstruct Curitiba. In the 1970's his radical approach involved the restructuring of the planning department into a multidisciplinary team of urban planners, architects, engineers, economists, sociologists and archaeologists. By 1979, he was appointed for the second term and served a third term from 1988 onwards under the new democratic regime. Of importance was that his planning was linked to and based on an annual dedicated budget of two hundred and fifty million dollars.

II. Control of Urban Growth through the Implementation of a Master Plan

Rabinovitch (1996) highlighted that Learners approach required the decongestion of central area and preservation of historical legacy. Specific land use controls limited high-density growth in the city centre and pushed growth into corridors, which eased congestion and facilitated the pedestrianisation of streets. Demographic control and management was pursed through layout of corridors that followed demographic growth. Economic support has reinforced urban development since it was supported by infrastructural improvement. Radial growth was changed to linear design. Corridors functioned as high-density pathways for both transport, circulation and settlement growth.

III. Effective Institutional Arrangements

In order to implement the corridor design the Curitiba Municipality took on the role as the law enforcement authority tasked with both development and regularisation. In some instances, this required taking unpopular decisions. Rabinovitch (1996) outlined that the land use control policies involved changes in land use legislation, which occurred incrementally. They were designed to respond

to realities on the ground. An example of this proactive approach was the introduction of fifth corridor, which responded to an unpredicted demographic change and a demand for low to medium income housing and small-scale commercial facilities in the higher income areas. In response, planning legislation was amended to include a mix of residential and small-scale commercial uses in these areas.

IV. The Integration of Transportation Planning, Land Use Management and Legislation

In line with the multi-disciplinary approach used in Curitiba, an integrated urban management strategy was employed. Transportation planning, and use management and the legislative framework were regarded as mutually supporting sectors, which utilised complementary tools to guide city growth (Rabinovitch, 1996). Corridors redirected settlement growth out of city centre thus creating a more even population distribution. This strategy alleviated traffic congestion and noise pollution whilst simultaneously creating right densities and thresholds to support public transportation. Transportation planning was not isolated from other disciplines. Land use controls targeted the optimal type of mixed land use (residential, commercial, industrial,) to support activity corridors. Densities varied in relation to transportation routes and with road hierarchy (e.g. floor area ratios diminished the further the site was from public transport). The trinary road system consisted of dedicated bus lanes, and dedicated cycle paths and was complimented by adjacent pedestrian streets that facilitated mobility of both motorised and non-motorised transportation.

V. Housing Projects integrated places of Work-Live-Play

Rabinovitch (1996) points out that the city acquired vacant land along the corridors long before development occurred and built subsidized low-income housing, which was located along the transport routes and in close proximity to industrial developments. This reduced the time and costs of travel and integrated low income into the economy and culture of the larger city through mobility and accessibility.

VI. Efficient and Affordable Public Transport

Part of the success of the BRT system was its appeal in meeting their needs and thus people supported it (Rabinovitch, 1996). With one ticket, passengers could make multiple transfers. The system was operated by ten bus companies with no government subsidies but with guidance from the municipality. Private companies were not paid for number of passengers but by the mileage covered following pre-planned routes and schedules. The BRT reduced traffic congestion in the city centre, which reinforced other modes of transport such as walking and cycling. The pedestrian streets were linked to squares parks, green areas, social facilities and other activities. Bus terminals were supported by lighting, kiosks,

landscaping and amenities. The system was supported by signage, visible routes, maps and lighting that assisted in the creation of a user friendly, multi- modal system.

VII. Comprehensive Recycling programs:

Gustafsson and Kelly (2012) indicated that Curitiba's recycling program promoted job creation and social inclusion. Residents were paid by manufacturing companies for their garbage collection. Almost seventy percent garbage is recycled instead of being incinerated which reduces municipal costs. Furthermore, whilst residents are required to pay for garbage collection similar to electricity and water charges, recyclable materials such as organic waste, glass, plastic and metal that are properly packaged are paid for by manufacturing companies. These companies also create jobs for the homeless, low income and substance abuse individuals on rehabilitation programs. The initiative has benefitted sixty impoverished communities and thirty one thousand families. Due to the many benefits, other cities in the western world such as Washington DC have been inspired to adopt and implement Curitiba's recycling program.

4.1.3 The Ankara Development Corridor, Turkey

4.1.3.1 Historical Background

Camur and Yenigul (2009) recorded that Ankara became the capital of Turkey in 1923 and the metropolitan city has been growing rapidly since. Recent figures indicate an increase of 30, 000 in 1923 to over 4 million in 1980. In 1940, the Greater City Municipality Act (GCMA) defined the boundaries for the city to include and urban population constituting over one million at a fifty-kilometre radius. The city then expanded within this boundary, which encapsulated seven counties, seventeen towns and two hundred and eighty two villages. Two hundred and twenty two villages became the districts of Ankara Greater City Municipality. In terms of land area, the city enlarged its municipal area from 202,000 hectares to 855,000 hectares which was four times more its original jurisdiction. Subsequently, the city was then faced with the enormous task of provision of urban services, transportation, urban planning infrastructure, housing, health, education, sports and recreation, tourism, environmental health and waste management. It was anticipated that problems in the city centre would escalate given the new increased size of the city boundaries; however, it was likely that solutions would be delayed due to the availability of limited resources to address them.

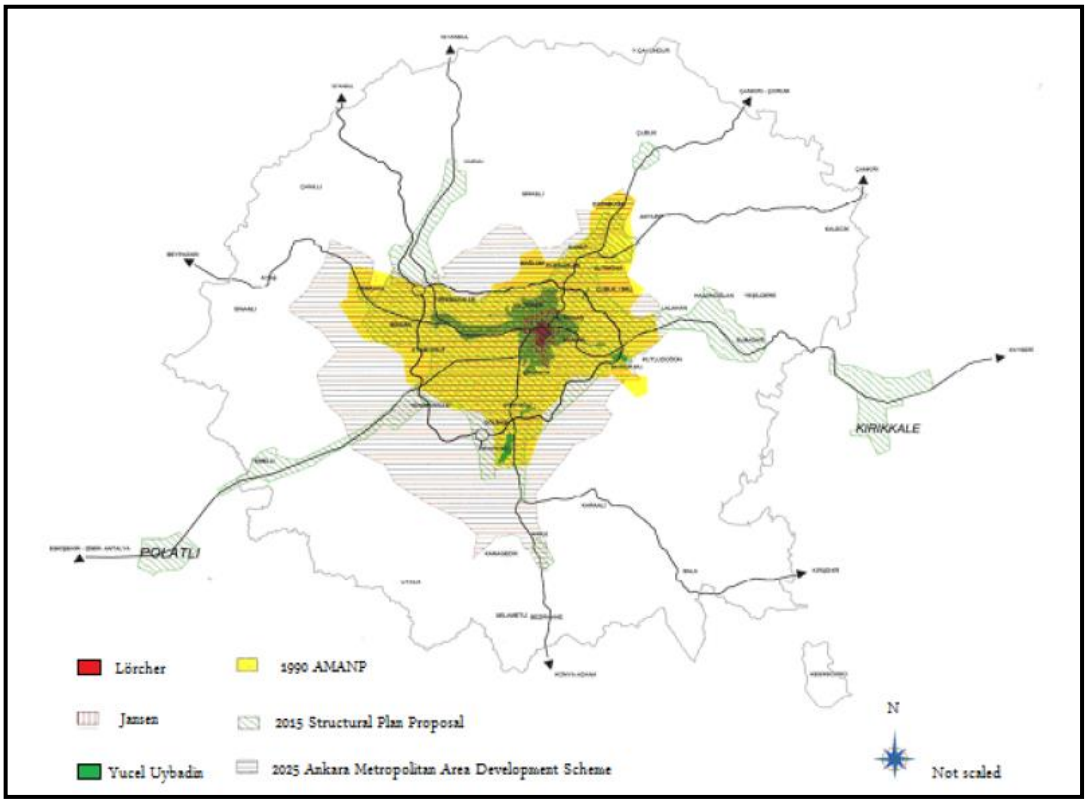
Map 4 A Satellite View of Ankara, Turkey

Source: Google Earth, 2017

During the 1980's, the city underwent radical changes in terms of the planning system and the legislative framework that supported it. In the early 1970's when the city began to recognize the problem of congestion in the central area, a process of decentralisation was encouraged which led to growth in the periphery. The Lorcher Plan in 1925, Jansen Urban Plan in 1932 and the Yucel Ubaydin Plan influenced development in the city in 1957. They are depicted in Figure 33. Balta and Eke (2011) have stated that the Ankara Metropolitan offices established in 1969 prepared the Ankara Master Plan (1990 projection), which favoured development in the west and south west as a result of high land prices and air pollution. (Ankara Metropolitan Bureau Plan 1990). Batuman (2013) indicated that it was because of uncontrollable population growth, the city developed master plans. This was not the only contributing factor. The establishment of small local uncontrolled municipalities within the metro, an increase in private car ownership and rural to urban migration contributed to a growth pattern that was dominated by urban sprawl. Local municipalities were not bound by Ankara's Master Plans since they functioned independently from the core urban structure. In response to this non-compliance, the

Ankara Structural Plan 2015 was proposed. This was followed by the development of the Ankara Metropolitan Area Development Scheme for 2025, which further influenced the current macro form of the city (see Figure 37 below).

Figure 37: Plans for Ankara



Source: Camur and Yenigul, 2009

4.1.3.2 BRT and Ankara's Corridor Development Initiatives

Planning studies undertaken for Ankara in the 1970's proposed two linear corridors for development along the western and south-western quadrants in order to alleviate the population pressure and congestion in the city centre (Sutcliffe, 2013). The strategy proposed a mix of land uses that included residential, commercial, and industrial work places located in close proximity to each other. Both developments anticipated residential growth including work places and new town centres. Whilst the Western Corridor (WC) promoted industrial estates on available land and offered incentives to

developers, the South-Western Corridor (SWC) proposed government offices, which included administrative capital city functions, planned educational university campus areas and earmarked land parcels for development. Residential development along the two corridors differed in that whilst the WC accommodated large-scale mass housing projects funded by government to provide low cost housing, the SWC was left to market forces comprising market led developments. Furthermore, it was also noted that transport investments for the corridors impacted differently on the two corridors in terms of metro lines that were proposed for both corridors to connect the new residential areas to commercial, offices and workplaces.

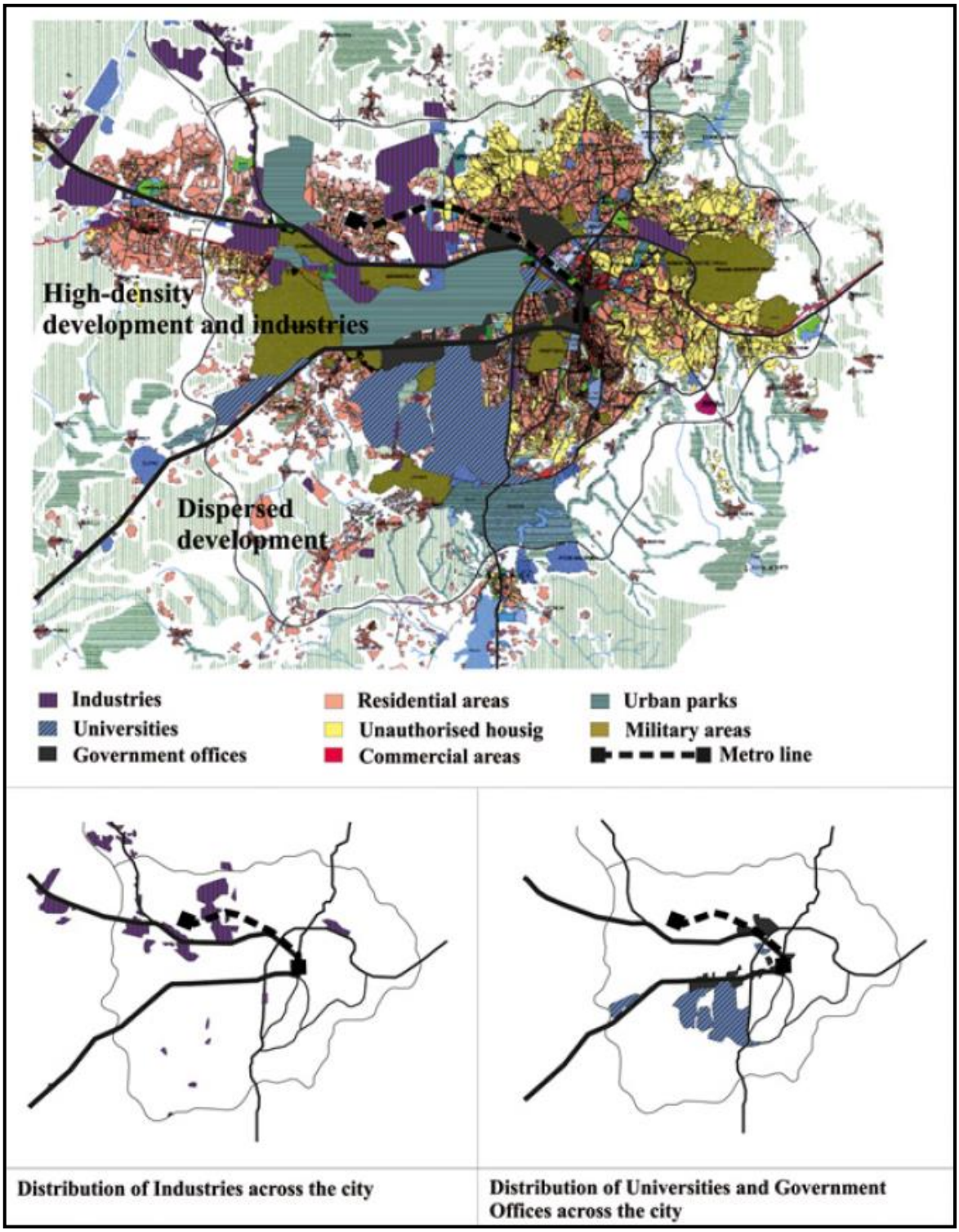
Consequently, the proposed metro line for the WC was only implemented in late 1997, whilst construction for the SWC was delayed, and did not open until 2013. Today, these corridors represent the two main development axes for the city. Research studies have revealed that the WC generated a larger population of over one million in 2000. At the time, this figure represented 29% of Ankara's total population accommodated in the predominantly high-density mass housing projects. The WC was reinforced by the promotion of the metro line public transportation system. In contrast the population along the SWC totalled a meagre 14, 000 people representing only 4% of Ankara's total population. This diversity was largely attributed to the fact that no public investments had occurred along this corridor. It was entirely dependent on a market-led-oriented development. Furthermore, the SWC was characterised by a private automobile-dependant urban structure.

The urban and land use patterns graphically depicted in Figure 34 (page 113) portrays the SWC as having a less dense urban form that is more residential in character whilst the WC consists of a mixed use, more dense land use pattern which has contributed to the reduction of travel distances between places of home, work and play. Furthermore, the population located in the WC is less automobile dependant and has supported alternatives such as cycling and walking. The WC's high density, high level of land use diversity supported by efficient public transportation, which includes the metro rail, bus and mini bus, characterises a more sustainable urban form. In contrast, the SWC, which is predominantly residential in character, lacks public transportation that has resulted in the increase in private car usage. The combination of its low population density, private vehicle dependency and sprawl are symptomatic of an unsustainable urban form.

Yetiskul and Senbil (2012) pointed out that Ankara's public transport system primarily relied on the extensive use of bus and mini-bus routes along with metro-rail lines. The Public Transit Authority of Greater Municipality of Ankara and the Municipal Central Council administer the entire public transport

system. The mayor regulates the routes, ticket prices and service levels. He heads the Transportation Coordination Centre. The buses and metro rail transit operate on pre-paid magnetic tickets. Privately operated minibuses only accept cash. Thus, the use of public transit more user friendly and cost effective. Furthermore, the magnetic cards usage offers benefits such as discounted and lower fares from which private operators are excluded hence, the high patronage of public transit as compared to private transport. As a result of high fuel costs, the majority of the population utilise public transit. Recent research has highlighted that the various challenges such as the establishment of transit only lanes, bus design, distribution of bus stops and routes, driver behaviour and insufficient public funds poses a threat to the future of public transit systems. An additional problem is that metro rail projects have been stalled for the past ten years. On a more positive note, the Turkish Central Government have modified legislation regarding urban transportation projects, which enables their involvement in metro rail construction project. It is anticipated that within the next five to ten years these additional rail lines will become fully functional.

Map 5: The 2023 Master Plan; Ankara Land Use



Source: Sutcliffe, 2013

4.1.3.3 Successful Elements and Lessons for Practice

Although the city experienced a mixed performance with regards to corridor development amongst other challenges the following elements contributed to the success of the western corridor namely:-

I. Government and Institutional Support

The central and local government provided funding for the implementation and construction of high-density low cost housing and public transportation and thereby contributed to the success of the corridor. Furthermore, the development of various urban plans and master plans gave impetus and direction to the growth and development of the city.

II. The Integration of Public Transportation and Land Uses

Urban and transportation planning were used to complement each other. The Western Corridor experienced more success because of the implementation of public transportation systems that were operational in contrast to the South Western Corridor. Furthermore, land use planning reinforced by diverse and dense mixed land uses contributed to the viability of public transport.

III. Promotion of Diverse/Mixed Land Uses

The promotion of diversity of land uses, which brought home to work places together, reduced the need for people to travel. As a result, the majority of the population were motivated to work along the corridor due to the development of commercial and industrial opportunities. Whilst the Western Corridor (WC) experienced a high rate of success, the South Western Corridor (SWC) proved unsuccessful due to the absence of active participation of the public sector, the lack of public transportation and minimal diversity of land uses.

IV. Efficient and Affordable Public Transport

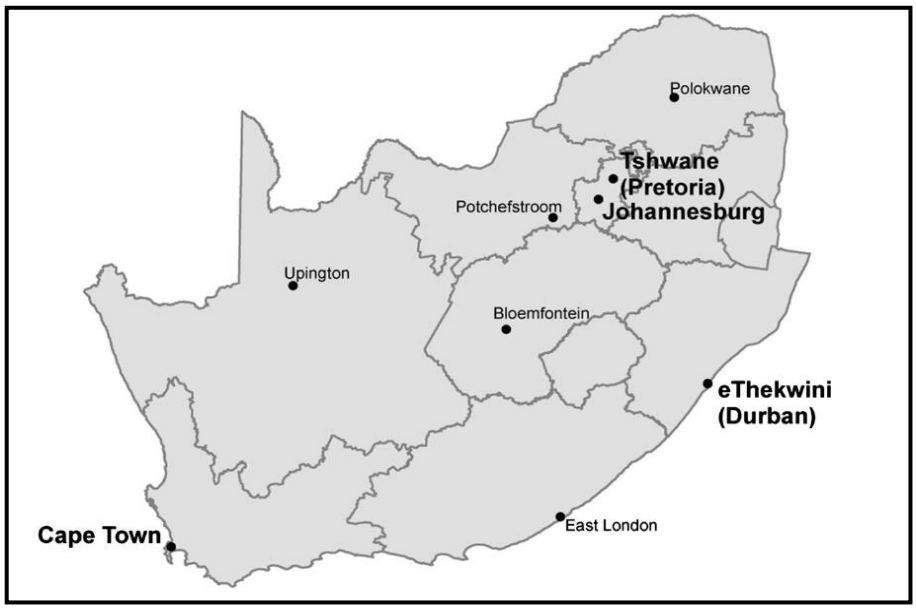
Legislation and policies that regulated pricing and ticketing favoured the use of public transport in Ankara. Furthermore, central and local government involvement and support in the implementation and construction of transportation projects held promise for the future growth and development of the city.

4.1.4 Corridors of Freedom Johannesburg; Gauteng

4.1.4.1 Historical Background

According to Brand and Geyer (2015) within the South African planning context five categories of urban areas are identified. The most dominant of these are Tshwane, Johannesburg, Cape Town and eThekwini as depicted in Map 6. These urban areas represent prominent nodes of attraction both nationally and internationally. The City of Johannesburg being the largest metropolitan municipality in the country that is located in the heart of the province of Gauteng represents the prime economic hub and wealthiest city in South Africa. (Todes, 2012 cited in Ndebele and Ogra, 2014) enunciated that it has a population of 14 434 827 citizens with a density of 2,696 people/km² (Statistics SA 2012). The population projected for the greater metropolitan conurbation of which Johannesburg is a part is estimated to be 14.5 million (2014)[2].

Map 6: Dominant Cities of South Africa



Source: Brand and Geyer (2015)

[2] Stats SA estimated the population of the greater Johannesburg conurbation to be 12 272 263 persons in 2011.

Ahmed (2010) stated that the city is characterised by stark contrasts between extreme poverty and wealth, low-density and high-density development, formal and informal settlements and, formal and informal trade. Furthermore, similar to all other South African cities during Apartheid the city was a two-tier city where the Whites lived in low-density suburbs with well-serviced transport networks and highways located in the north whilst the Black population occupied land in townships located in the periphery in the south. The Central Business District was the core business node within the city, which exhibited a dominant monocentric city structure. Post 1994, the historic monocentric city has increasingly transmogrified into a polycentric city structure whereby the city's Spatial Development Framework Plan (SDF 2010) identified numerous nodes. The emerging Bus Rapid Transit (BRT) and Gautrain Rail systems support these nodes, which have contributed to reshaping the urban form and economy of the city. New transport routes impact on accessibility for the urban poor allowing them to reach various amenities and opportunities within the city. Hence, the city's development objectives and strategies are premised on corridor development and an accessible, affordable, efficient public transport system.

Ndebele and Ogra (2014) have pointed out that as a consequence of the spatial legacy of Apartheid, the Johannesburg Municipality has compiled in the recent years, numerous spatial-urban framework plans and strategies to address the socio-economic imbalances. These included the Metropolitan, and Local level Spatial Development Frameworks, more detailed precinct plans, and the 2010 Growth Management Strategy. In 2011, the development of a Growth and Development Strategy (GDS) 2040 responded to various challenges facing the city and laid the foundation for an integrated approach to develop a resilient, liveable, sustainable city underpinned by infrastructure that supports a low carbon economy. These various objectives were unpacked into strategies based on an efficient movement system that emphasised public transport, promotion of mixed use nodes, corridors linked to public transport, densification and infill development.

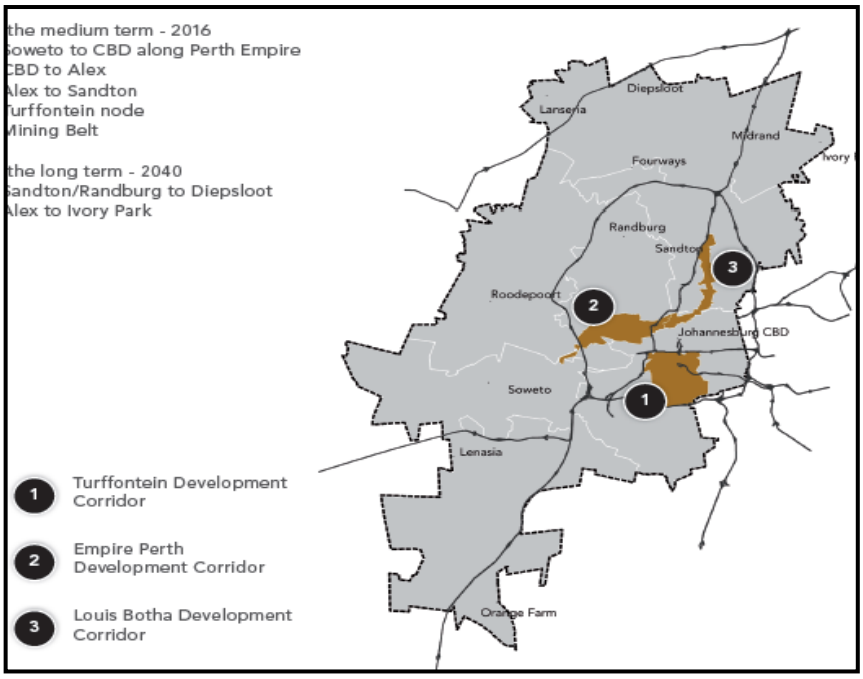
4.1.4.2 BRT and 'Corridors of Freedom' Development Initiatives

A new spatial vision in line with the GDS, 2040 has been proposed for the metro and is epitomised in "*The Corridors of Freedom"* concept, which was launched in May 2013 by the Executive Mayor Mpho Parks (Tau Ndebele and Ogra.2014). In his State of City Address, he outlined that these corridors were envisioned to be "…*well planned transport arteries linked to interchanges where the focus is on mixed use development, high density housing supported by office, commercial developments and opportunities*

for leisure and recreation". The project is intended to change the urban structure to one of a compact city and hence redress the legacy of Apartheid spatial planning of the city (City of Johannesburg, 2013).

The *"Corridors of Freedom"* will promote walking, cycling and public transport that is safe, reliable and affordable. Within the corridor, urban regeneration; densification; and mixed income housing is supported with short walking distances to shops, schools, clinics, offices, community facilities, public parks, economic opportunities and businesses. This approach forms the backbone for achieving spatial transformation and urban restructuring in order to create places where people can work, stay and play. Hence, the city has embraced the concept. The rationale of this decision is that corridor development promotes mixed uses, and high-density development. It is complimented by high quality public transit (See Map 7 below).

Map 7: Medium Term 'Corridors of Freedom'



Source: Johannesburg Development Agency (JDA), 2014

Rahim (2014) outlined that these corridors provide opportunity for people to access places of employment. This is supported by the Mayor who stated, "*We are restitching our city to create a*

different future for our residents where we can link jobs to people and people to jobs" (The Star Newspaper: 3 August 2013:14 cited in Rahim, 2014). Corridor oriented development has occurred along existing major transport routes which has brought people who were excluded in the past back into the city and closer to economic and social opportunities.

Seftel and Peterson (2014) have pointed out that the city identified and prioritised key corridors that correlated with the Rea Vaya[3] Bus Rapid Transit System thereby linking development and transportation planning. The Empire Perth (Soweto to the Central Business District), the Louis Botha Avenue (the Central Business District to Alexandra) and the Turfontein development corridors were identified and prioritized for medium term development (Ndebele and Ogra, 2014). In the longer term (2040), the city intends to extend the system to include links between Sandton/Randburg and Diepsloot and between Alexandra to Ivory Park. Construction work has commenced for the medium term corridors and the BRT system is fully functional.

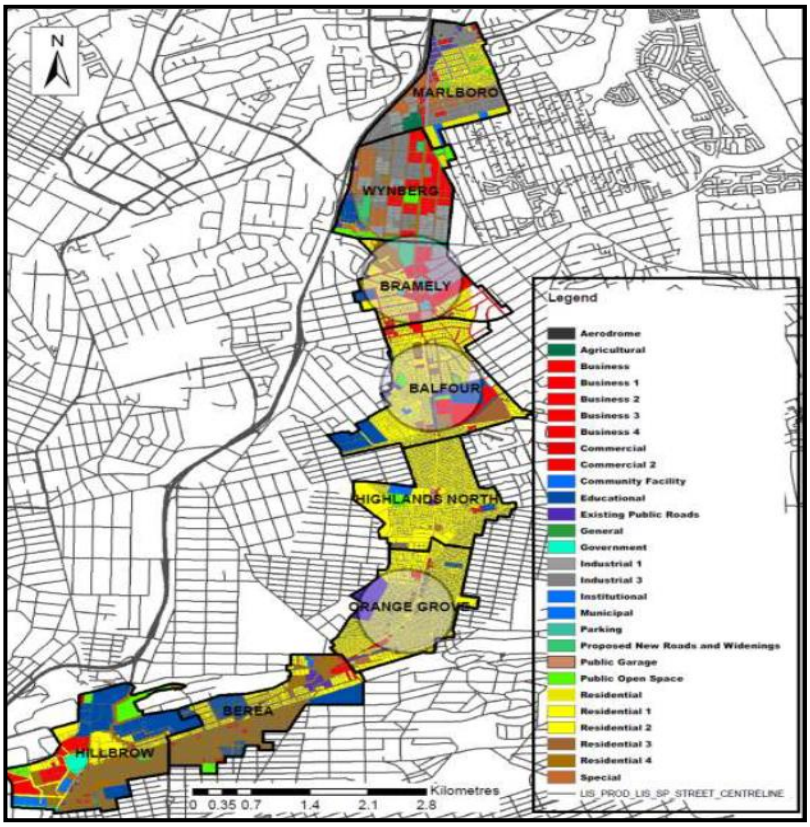
A recent research project critically evaluated the Louis Botha Development Corridor to consider its impact. Due to the long distance of the Louis Botha Development Corridor, only three nodes - Orange Grove, Bramley and Balfour were selected for this assessment (See Map 7). The research revealed that whilst the Orange Grove node is predominantly residential it does accommodate small-scale businesses and commercial uses on the ground floor. The Bramley node however differs from the Orange Grove node since it is characterised by small-scale residential developments but has a predominant mix of uses including commercial, retail and industrial activities that have spilled over from the adjacent Wynberg industrial node. Finally, the Balfour node that is located between these two nodes has been classified as a district node, which promotes the intensification of non-residential land uses. These findings support the premise that different nodes along a corridor perform different functions, depending on their spatial history, location, socio economic support base and market trends.

According to the Johannesburg Development Agency (2014) report, the Empire-Perth Development Corridor shown in Map 8 and which is situated west of the CBD, serves as a regional, national and international node. It has been described as a thriving centre of trade and is expanding in providing housing to a diverse range of population groups. The node provides a link between the dense population of Alexandra in the north and Soweto to the south hence connecting the diverse populations to employment, education, community and recreational facilities. It serves as an important link with

[3] Rea Vaya means, "We are going" in Sesotho.

several metro routes, the Gautrain rail systems feeder routes and the high speed Metrorail crossing the corridor. The Rea Vaya BRT routes interest with other modes of transport along the corridor. Furthermore, accessibility to other strategic uses along the corridor such as the media centre of the SABC, tertiary education centres and its close proximity to economic and business nodes of the CBD such as Rosebank, Randburg and Parktown has resulted in the area attracting a high influx of people. Hence, this significant increase in population growth along the corridor, which is placing pressure on infrastructure and service provision. While the corridor accommodates strong economic and tertiary nodes there are also historically significant neighbourhoods in the area. The Rea Vaya public transit system strengthens and supports the corridor providing public transportation between the CBD and Soweto.

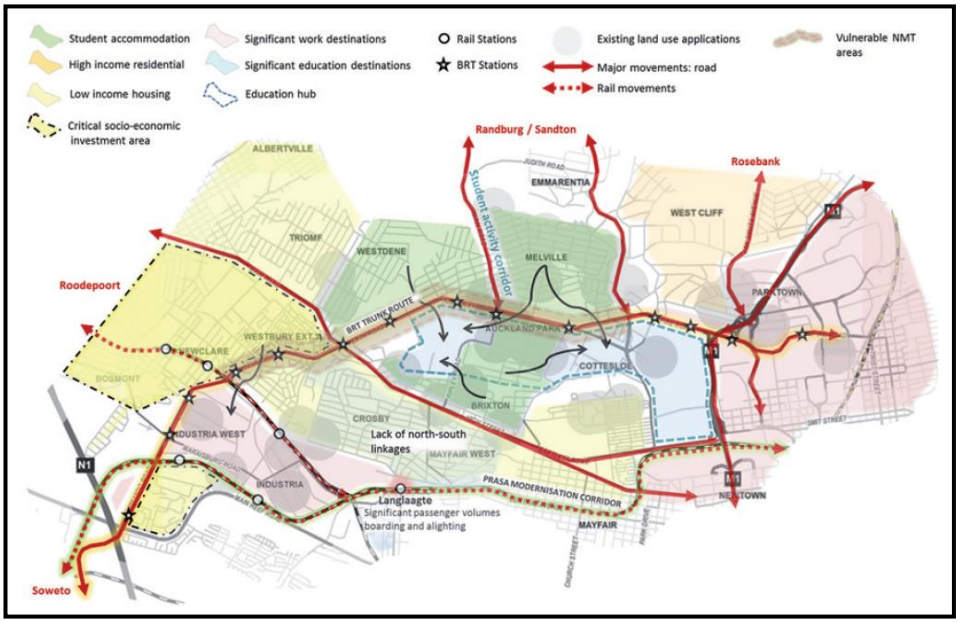
Map 8: Louis Botha Corridor



Source: Ndebele and Ogra, 2014

The Turfontein Development Corridor is situated south of the CBD as illustrated in Map 9 below. It is bordered by the M2 to the north, M19 to the east, M1 to the west and N12 to the south (The Johannesburg Development Agency, 2014). It therefore serves as a gateway to a large number of diverse groups into the city. In this role, it generates high volumes of traffic, which induce substantial economic benefits in this strategic location. It is characterised by industrial and commercial land uses in the north and north-east with existing interspersed mining operations. The northern section accommodates industrial land, warehousing and storage spaces that represents the city's historic manufacturing hub, which continually attracts light industrial and warehousing activities. In the industrial areas adjacent to the mining belt separates the inner city from the lower density residential areas. To the south are the very low-density residential areas of Glenvista and South Alberton. The corridor is strategically located and well integrated with the surrounding urban areas and is interconnected to arterial routes emanating from the CBD to other parts of the city including the N1, N3, N12, N17 therefore making it easily accessible both locally and regionally. In addition, this proximity provides opportunity and potential for a wide range of economic and employment opportunities

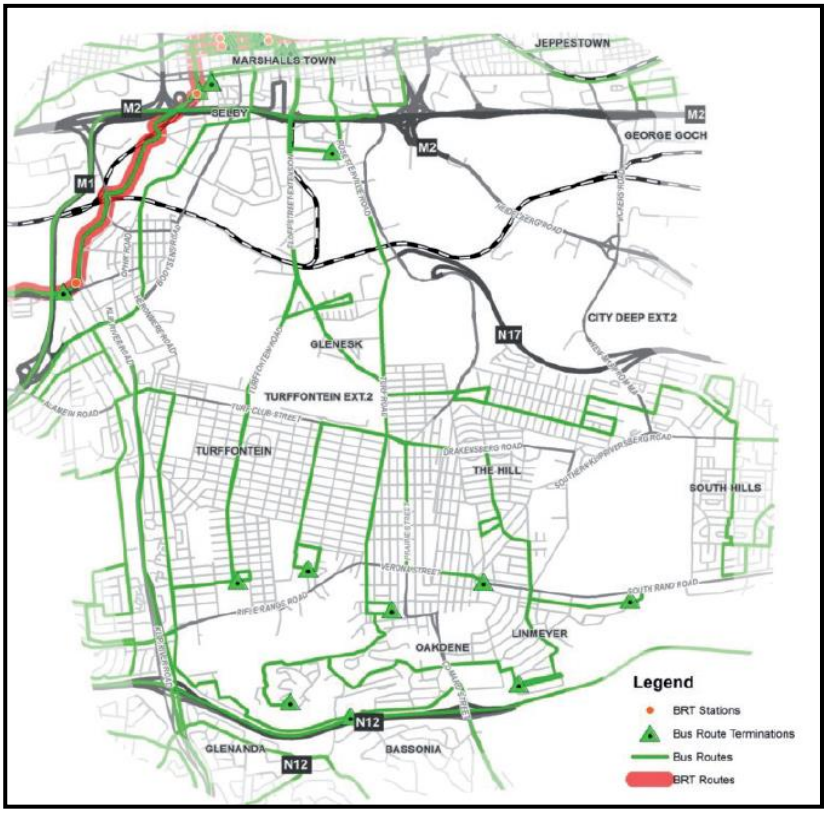
Map 9: The Empire Perth Development Corridor



Source: Johannesburg Development Agency, 2014

The CBD located approximately 7km from Turfontein, contains key transportation nodes such as the bus terminuses, large taxi ranks and railway stations. Of significance is the strategic linkage the corridor creates between the traditional poor areas and economic opportunities of Johannesburg, which warrants its selection as a *"Corridor of Freedom"*. This status is further reinforced by its location and proximity to regional and economic nodes such as the city centre, Selby, Booysens, City Deep and Kaserne freight terminals. The surrounding residential neighbourhoods consist of Turfontein, Kenilworth, Rosettenville and the district node of La Rochelle and further south are the higher income suburbs of Oakdene and Linmeyer including shopping malls that are located along the N12. The clustering of recreational and sporting facilities such as the racecourse, football, rugby, tennis, and stadium, Hector Norris Cycling Velodrome, Wemmer Pam and associated water sports such as canoeing, sailing and rowing are evident.

Map 10: Turfontein BRT and Metro Rail



Source: Johannesburg Development Agency, 2014

Unfortunately, the current zoning, land use configuration and low densities in the area do not support the Rea Vaya BRT and thus it is being serviced by the Metrobus. The transport infrastructure is inadequate to radically transform and re-stitch the area into the city therefore, the identification of a new high quality public transport route linking Turfontein with the wider Rea Vaya to unlock the full potential of the corridor was necessary as illustrated in Map 9. It is envisaged that future population growth and densification along the corridor will make the BRT system more viable. Future projects include an over R2 billion mixed use and social housing development (South African Cities Network Report, 2016). The city is also currently pursuing the acquisition of land for future private sector development, reviewing its rates policy and exploring further support and partnerships with property sectors and investors to strengthen and reinforce the corridor. Other development projects along the corridor includes the Rotunda Park upgrade, clinics, a library, and a sports centre.

The City of Johannesburg (COJ, 2012) research indicates that the Rea Vaya BRT has become a catalyst for land use transformation and has changed the Apartheid spatial legacy of the city. Although it is still separated into a developed wealthy north and much neglected south, the effective BRT system provides transportation to over one million people that equalises their rights suffered from the inequalities of Apartheid. The City's Transport Department developed a Strategic Public Transport Network (SPTN) in 2006 with the aim of connecting economic nodes to residential areas through an integrated transport network system. With South Africa, winning the World Cup Bid in 2010, grant funding from national and provincial government provided the strategic support for the implementation of the Rea Vaya BRT system. It was argued that it was a more feasible, cost effective and time efficient option to construct the BRT in comparison to the rail systems. The Rea Vaya provides an efficient, reliable, frequent service, and affordable fares. It is safe and secure, accessible to the disabled, mothers and children, decreases traffic congestion and energy consumption. The system promotes containment of urban sprawl, densification and social inclusion instead of isolation. It has segregated dedicated exclusive bus lanes and roadways, separated stations that are convenient and comfortable, State of art stations have been designed to enhance easy access and quick boarding, commuters receive benefits of rail in a BRT system; pre-boarding fare collection and verification; integration among routes, corridors and feeder services.

Other technical aspects which make it unique and efficient includes high floor designs with access to stations level floor heights, three boarding doors that allows access to a greater number of passengers to get on and off more quickly, feeder buses are equipped with wheelchair lifts and parking areas in the bus and also equipped for disabled passengers. Closed-circuit television (CCTV) camera surveillance is

linked to central control with message screens and all buses are fitted with Euro compliant-environmentally friendly propulsion systems, electrically operated doors, stations accommodates two-way flow of passengers adequately staffed with cashiers, smart card ticket system and security marshals to assist passengers. The Rea Vaya boasts a sophisticated transit system but more importantly switching from a car oriented to bus system was made easier facilitated by governments strategic initiative, the strategic corridor work that was completed and its rapid implementation in order to meet the 2010 World Cup deadlines. These critical elements contributed to laying the groundwork for the successful implementation of system in the city. The BRT has been a catalyst in changing the city through the formulation of land use policies that have corrected the skewed spatial legacies of apartheid and has facilitated the building of a vibrant, liveable urban environment that forms a physical link between the city's economic and residential nodes through the *"Freedom of Corridors"* concept implementation.

4.1.4.3 Successful Elements and Lessons for Practice

I. Political Will and Inter-Governmental/Institutional Alignment

Once of the requirements for successful development projects is the need for political support and emergence of a champion. An analysis undertaken by the City of Johannesburg (CoJ) officials indicated that both of these requirements emerged during the Corridors of Freedom Project (CoJ, 2012). The convergence of the need for additional infrastructure to support the 2010 World Cup impacted on this process. There was political support across the various spheres of government for the new system. This support was underpinned by financial inputs that ensured it success. These factors allowed the mayor to ensure the system was prioritised and given the attention needed to get it off the ground. The political champions leading the project were the Executive Mayor Amos Masondo and Transport Minister Councillor Rehana Moosajee. The national government Department of Transport's role in support of public transport set the overall strategic framework thereafter followed by the implementation of the Rea Vaya project that was driven at city level, which required a greater level of commitment and involvement. In providing financial resources through public grants, the national government created the means that enabled the implementation of the project. The city also demonstrated its commitment by investing in provision of infrastructure and services to facilitate private sector investments in the corridors. The South African Cities Network report indicated that in 2014/2015 the city's capital expenditure in the *"Corridors of Freedom"* project amounted to over 550 million rand (SACN, 2016). Over a three-year period, the city will spend over R2.6 billion on BRT, bulk infrastructure health and social and community developments.

II. Integration of Public Transportation and Land Uses

The BRT concept was incorporated into both transport and spatial planning. Land use legislation and policies that promoted mixed uses located along the corridors was utilised to approve plans. The system was used as an instrument that provided a link and accessibility between the nodes. Furthermore, the various plans developed at national level informed the local strategic framework plans that were integrated with the transportation plans. Their aim was to knit together the spatial frameworks and transport plans.

III. Efficient and Affordable Public Transport

The Rea Vaya provides safe, affordable, reliable transportation to passengers providing access to a wide range of social and economic opportunities to members of the public especially the urban poor. The BRT routes have facilitated social cohesion and economic investments along the corridors especially in terms of providing job opportunities for the effective functioning of the system. Furthermore, those engaged in formal employment have seen a significant improvement in their salaries receiving benefits such as pensions, medical aid and insurance (CoJ, 2012). The integrated system has allowed a significant reduction in the travel times and costs especially for passengers living in the remote peripheral areas that needed to take up to three taxis to places of work and shopping. The upgrades have contributed to the aesthetic improvements in terms of landscapes, street furniture and lighting, pedestrian walkways, which guided and attracted investment along the corridors.

IV. Environmental Impacts

Positive environmental impacts include reduction in energy consumption, air pollution, greenhouse gas emissions and traffic congestion

V. Public and Community Consultation and Negotiations

The Mayor of Johannesburg drove the public campaign to facilitate the buy in from all role players and stakeholders. Anti-BRT groups such as the taxi industry (associations and operators) that were sceptical and argued that it threatened their livelihoods where given the opportunity to engage a dialogue and participate in discussions with him. This collaborative approach was lauded with accolades and tributes flowing from national government regarding his tenacity in convincing and obtaining buy-in from the various stakeholders. His efforts in taking risks and being instrumental in working behind the scenes to bring about cooperation, agreements and partnerships between the public and private sector was a key factor in the projects successful implementation. Moreover, the city entered into contracts that created

a formal bus company out of the informal taxi operators. New drivers received technical support and training from the city to run the newly formulated multi-million-rand bus operation, which represented a major paradigm shift for the taxi industry.

4.2 CONCLUSION

The best practice case studies provide excellent examples, which reveal that under the right conditions corridor development, can promote economic and social development including various benefits such as a less congested, sustainable, equitable, efficient, socially inclusive and a truly compact city that can inspire other cities around the world to adopt its principles and innovations. Contrarily, they can also serve as a forewarning that very different outcomes can be anticipated based on the political, historical and economic conditions of each city. Nonetheless, all these case studies indicate that some of the common elements necessary for the success of corridor development are strong government intervention and political support that includes funding. There is a need to develop a long-term vision through forward planning of cities linked to institutional change. A critical part of this process is the demise of silo mentality in government agencies. The linkage of spatial, transportation, environmental and infrastructure planning is a fundamental requirement, as corridors are most successful when land use such as mixed uses, intensifying densification, transportation systems including high quality transit and sufficient well managed infrastructure investment and maintenance are integrated. Community support and consensus, and strong partnerships with stakeholders are also essential to bring about behavioural change for them to acknowledge the benefits of corridor projects in creating more liveable cities. The importance of choosing corridors with strong land development potential and the planning for strategic sites is critical as has been illustrated in the case study of Ankara.

However, as demonstrated above even though the successes and failures of cities are unique to their contexts, these examples do set benchmarks for future planning of cities. Of relevance to this dissertation is the South African planning landscape, which is influenced by its own historical and socio-economic factors such as rapid population growth, income disparities, extreme persistent poverty, diseases, high unemployment, deteriorating environments and low economic growth rates. Therefore, all forms of development need to be pro-poor facilitating accessibility and affordability to urban activities. The creation of a safe attractive walking, cycling environments that are vital to the welfare of the poorest as demonstrated in the Johannesburg case study. More importantly all forms of development must pass the litmus test of alleviating poverty. Although it will be challenging to achieve

short-term success, a long-term view that fits the political, historical and economic contexts of cities will be necessary. The transformation of cities such as Curitiba, Cleveland, Ankara and Johannesburg cannot be simply replicated as proven in the Euclid corridor case study where only certain components of the Curitiba system was assimilated into its local context.

Furthermore, fully understanding these challenges calls for creative innovations consistent with current settings and conditions. Planners, politicians and policymakers are compelled therefore to select the most appropriate solutions relative to prevailing social, political, and economic circumstances. Finally, as planning experts have warned "*corridors cannot be artificially imposed but that vital pre-conditions must be in place for corridors to develop with success. Accordingly, it is imminent that corridors as a sustainable transport strategy is a long term approach, or a way of thinking, rather than a quick-fix solution"* Dewar and Todeschini (2004:67). Therefore, as municipalities in South Africa are confronted with fiscal constraints and significant challenges, the corridor development concept does present the possibility to catalyse and stimulate development to bring about spatial restructuring to promote compact city development patterns with the main objective to alleviate poverty in areas of absolute disadvantage.

CHAPTER FIVE: CASE STUDY-EDENDALE-NORTHDALE CORRIDOR AND NEW TOWN CENTRE

5.0 INTRODUCTION

The purpose of this chapter is to undertake an analysis that is geared toward an evaluation of the specific attempts of the Msunduzi Municipality to implement a corridor development strategy and to determine whether it would facilitate and contribute to achieving a compact-integrated urban form, which is the primary objective of this study as outlined in Chapter One. Of importance is the need to verify the key opportunities that corridor development present in meeting the social, economic and recreational needs of the poor. Therefore, in an attempt to illustrate, the path of Msunduzi has taken in forging a new urban space post 1994; an overview of the morphology of the city, which summarizes the historical and geographical development within the local context, will now be presented. It will provide an understanding of the changes that have taken place in the city over the past century and half. The discussion will justify the need for spatial transformation and urban restructuring. A desktop review of policies, frameworks and plans that were developed in response to challenges with the goal to creating a sustainable, integrated, vibrant, viable environment that is easy accessible and pedestrian friendly where people can live-work and play will be discussed.

Given the limited nature and scope of this research with reference to the Edendale Northdale Corridor (ENC) within the context of Msunduzi, the analysis will focus on the area officially known as the Edendale New Town Centre (see Map 1 on Page 8). This urban node consists of the Edendale Hospital, the Shopping Centre Mall and its immediate surroundings. This chapter will also briefly refer to the relationship between Msunduzi's corridor initiatives with reference to the concepts, theories and precedent studies outlined in the preceding chapters. More importantly, the viability of using corridors to achieve the broader goal in terms of restructuring the city, integrating land uses and promoting a compact urban form will be evaluated. The final section will interrogate and analyse Msunduzi's planning and development interventions in relation to the key theoretical considerations adopted by the researcher. In addition, a series of maps and graphical representations will be used to illustrate the urban growth patterns, socio-economic factors and planning frameworks within the context of the Msunduzi Municipality.

5.1 HISTORY AND BACKGROUND

5.1.1 Regional and Local Dynamics

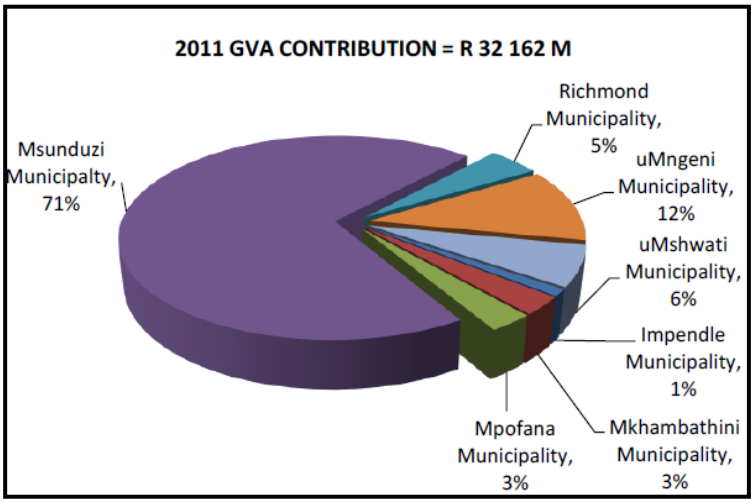
The Msunduzi Municipality commonly known as Pietermaritzburg or the *"City of Choice"* is located along the N3 at a junction of an industrial corridor eighty kilometres inland from Durban on the major road route between the busiest harbour in Africa (Durban), and the national economic powerhouses of Johannesburg and Pretoria. The municipality covers an area of six hundred and thirty five square kilometres with an estimated population of 618,533 people. As highlighted in the Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of 2015, the city of Pietermaritzburg is located within the Msunduzi Local Municipal Area. It is the second largest city after eThekwini and is the provincial capital city of the KwaZulu-Natal (KZ-N) Province. The confirmation of the capital status has not only entrenched its role and position as the administrative and legislative centre of the provincial government since it also performs important commercial and industrial functions in the economy of the District and the Province.

Map 11: Locality Map for Msunduzi Local Municipality

Source: www.google.co.za

The Provincial Spatial Economic Development Strategy (2006) identifies the city as contributing to the economy in terms of industrial, tourism and agricultural development.

Graph 1: Msunduzi Gross Value Added Contribution



Source: Quantec, 2012

Msunduzi's contributions to the District economic output (measured in terms of Gross Value Added- 71%) is graphically illustrated in Graph 1. This confirms the dominant role of Msunduzi in terms of the uMgungundlovu District economy and population, which constitutes 61%. The District contribution to the economy of KZ-N in 2011 totalled R32.162 billion. This is 8.7% of the R279 billion that constitutes the provincial economy. The N3 corridor links the city with a number of key intra -provincial and inter-provincial transport routes, which includes the Midlands and Eastern Cape link via Bulwer, Underberg and Kokstad; the Midlands and north coast via Wartburg and Greytown; the Midlands and the Eastern Cape via Richmond and Ixopo (See Map 10). The city has functioned as an urban centre providing a wide range of services to the adjacent towns and villages of Howick, Mooi River, Impendle, New Hanover, Camperdown and Richmond. It serves as a gateway city to the surrounding tourist destinations. The city and surrounds are a prime tourist attraction that offers economic opportunities and investment returns. Therefore, Msunduzi's location has a strong influence on regional channels of assets development, movement and the structuring of the provincial spatial framework for growth and development. Its

strategic location, which facilitates a high degree of functional integration across a large geographic area, has favoured and helped the city establish and develop a strong economic base.

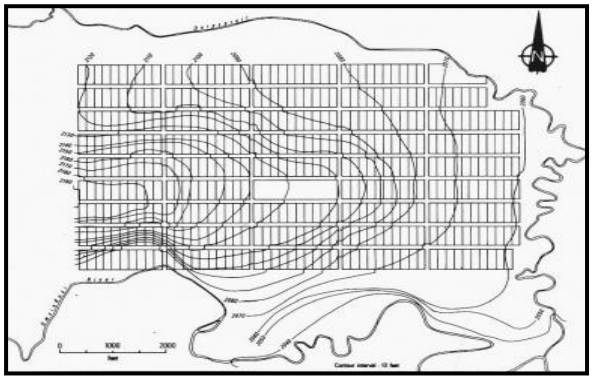
5.1.2 A Historical Overview of the Planning and Development of Msunduzi

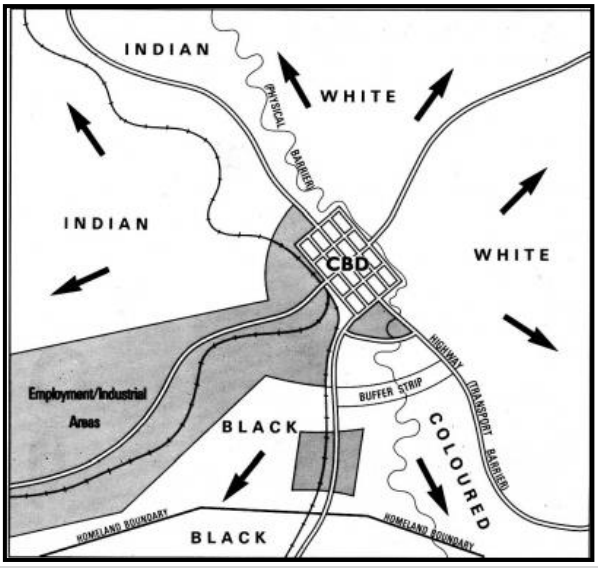
Msunduzi's Spatial Development Framework (SDF, 2015) has stated that the spatial structure of Pietermaritzburg that emerged over a period of one hundred and fifty years. Like other urban areas in KwaZulu-Natal, colonial and Apartheid settlement policies have influenced the city.

5.1.2.1 Pre 1994 History

Wills (1988) pointed out that as early as the Voortrekker period in 1838, the city structure was being shaped where a spur bounded by the Dorpspruit and the Umzinduzi Rivers called the Bosmansrand was chosen as a site for settlement. The town was officially named Pieter Mauritz in 1839. It started with one main street with the church as the central focus. The settlement was developed and laid out on sloping ground so that water could be diverted from the Dorpspruit for other uses. The original layout plan for the city led to the development of the grid-iron street pattern laid out in an East /West and North /South grid-pattern. The British left the grid-iron pattern intact and created additional pedestrian lanes, which is still evident in the current structure of the city (see Maps 11 and 12). The spatial legacy of Apartheid has also sculptured the spatial distribution of people in and around the city. During the 1850's, development was concentrated mainly in the central grid which together with the surrounding townlands made up the Borough of Pietermaritzburg; a market square, administrative precinct, military and commercial uses made up the structure of the colonial town.

Map 12and Map 13: The Grid Layout and Model Apartheid City Structure of Msunduzi (Pietermaritzburg)





Source: Trevor Wills in Laband and Haswell, 1988

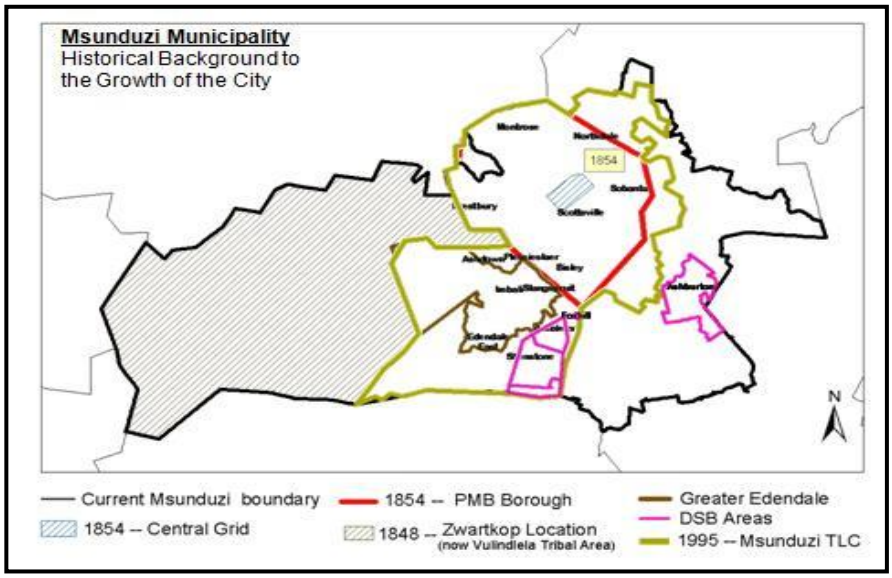
In 1950, the government's Group Areas Act changed the social geography of the city. The Act enforced the segregation of the different race groups to specific areas within the city. Whilst the White population occupied the central core, the Black population where expelled to the outskirts of the city with the majority located in townships on the periphery. However, over a period of time the White population moved into the suburbs however, job opportunities remained concentrated in the Central Business District with industrial development in close proximity. In some instances, industries located in close proximity to residential areas to capture the immediate workforce. The Msunduzi SDF 2015 emphasized that much of this spatial context and historical patterns persist today with the marginalised communities located far from economic, social and recreational opportunities.as depicted graphically in Map 12 above. Moreover, the city's radial structure is focused on the CBD, which is the main economic hub with low levels of connectivity between the peripheral areas.

Consequently, the city structure has created islands of spatial affluence, and a distorted fragmented inefficient settlement pattern that has excluded certain race groups from social, economic and recreational opportunities. Furthermore, the existing spatial pattern and corridors are composed of predominantly residential land use activities structured along transportation routes, which radiate outwardly from the central area. As a result, the entire population is dependent on the CBD for social and economic services. Therefore, in order to reach the objective where activities and facilities are closer to the people, it is important that the spatial organisation shifts away from the existing radial form towards a more accessible system that facilitates convenient access and movement within the city. The need to create a new spatial form and structure for the settlements to improve their performance that will counteract the low density, sprawling, fragmented and a largely mono-functional settlement form that resulted under the apartheid system and to reverse and improve access to a range of services, resources, facilities and amenities for all its citizens is essential.

The Msunduzi's Spatial Development Framework (SDF), 2015 underscored that history has significantly shaped the city, which is evident by the Apartheid city model that is still manifest over twenty years after achieving democracy. Linked to this is the clear disparity of wealth, employment opportunities, plot sizes, levels of neighbourhood planning and access to basic services, which needs to be corrected in the peripheral areas that are located in the west, east and south-west of the CBD. Msunduzi epitomises a typical Apartheid town in the sense that it embodies most if not all the attributes. Therefore, in order to understand the challenges associated with the current city and the planning and development interventions required, one needs to take cognisance of how the current municipal boundaries came about. The SDF 2005 indicated that Msunduzi consisted of three former district areas namely the

Borough of Pietermaritzburg, Greater Edendale and the Vulindlela Tribal areas each with a population of approximately 200, 000 people.

Map 14: The Apartheid City Structure



Source: Msunduzi Municipality SDF, 2009

In 1848, the Zwartkop location to the west of the Borough was declared and this area subsequently became the Vulindlela Tribal Area as reflected in Map 13. During the 1850's development was concentrated mainly in the central grid, which coincided with the city centre and together with the surrounding townlands this made up the Borough of Pietermaritzburg. During the 1970's, the Edendale area was established as a separate administrative entity as part of the government's Apartheid policy. At the same time and in an effort to force people out of townships, investment in these areas were constrained which led to the deterioration of amenities. Four different authorities i.e. the Pietermaritzburg Municipality, the KwaZulu Government (Vulindlela), the Department of Co-operation and Development[4] (Greater Edendale) and Development and Services Board (Ashburton and Fox Hill)The

[4] Later known as the Department of Development Aid (DDA), which was disbanded in 1991.

administered the city. As a result of the fragmented nature of administration, these areas were planned and developed in isolation despite their functional and economic interdependence.

5.1.2.2 Post 1994 History

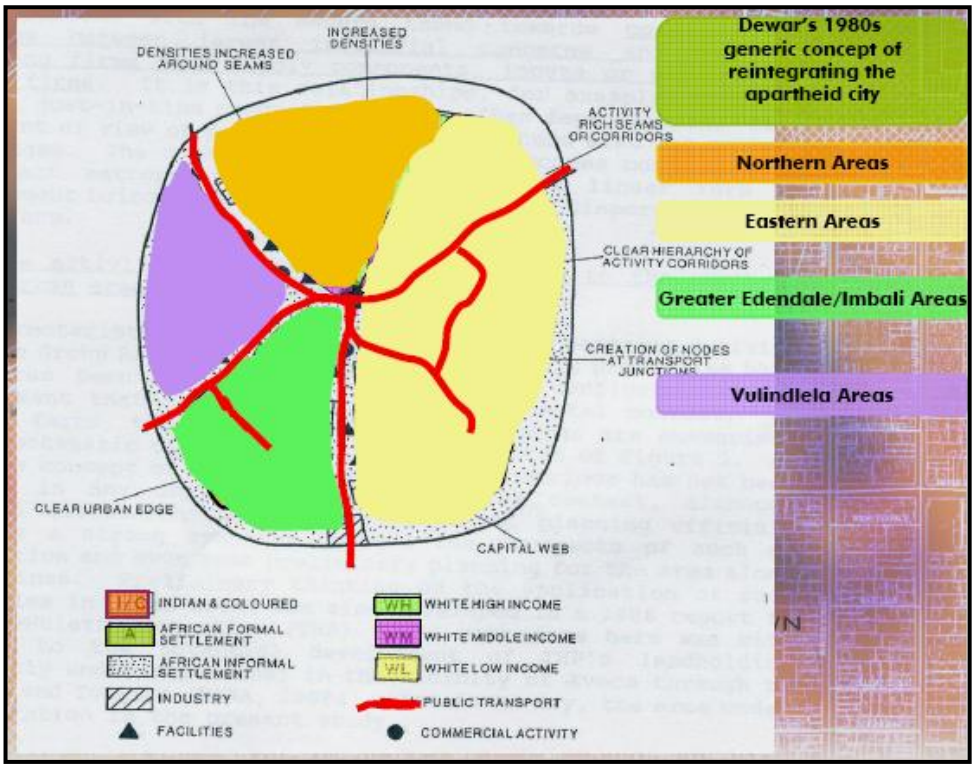
The establishment of the Transitional Local Council (TLC) in terms of the Local Government Transition Acts (No. 209 of 1993 and No 97 of 1996) brought the Greater Edendale area together with the other areas under the jurisdiction of the Pietermaritzburg Municipality as per the Municipal Structures Act (No 113 of 1998). This was followed in 2000 by the creation of the present municipal area where these interdependent areas where consolidated into one administrative entity. However, the outlying areas still functioned as dormitory areas separated from most of the economic activity concentrated in the main city area. Therefore, one of the primary objectives of planning is to reduce the racial separation, spatial segregation and development inequality produced by colonial and Apartheid planning. Msunduzi's SDF (2009) noted that since the advent of democracy in South Africa in 1994, the process of transformation and restructuring commenced with respect to the management and planning of municipalities throughout the country. This also ushered in a period of numerous policy and legislative changes as outlined in preceding Chapter Three, which has had a profound impact on planning theory and practice that influenced a new approach to planning and land use management.

The Urban Development Framework 1997, which represented the first comprehensive post-apartheid policy statement reflecting four programmes that were divided into three broad categories namely; spatial restructuring; social and economic development and institutional restructuring. As mentioned above, restructuring of the apartheid city, through the spatial integration of segregated areas was a key urban development goal for a variety of reasons: "*the spatial integration of our settlements will enhance economic efficiency, facilitate the provision of affordable services, reduce the costs that households incur through commuting, and enable social development. Spatial integration is also central to nation building, to addressing the locational disadvantages which apartheid imposed on the black population, and to building an integrated society and nation."* (RSA, 1997:24). These ideals were a direct result of the planning theories put forward by academics such as Dewar and Uytenbogaardt (1991). They emphasized the benefits of a compact city and spatial integration through the promotion of planning concepts such as corridors, nodes, higher density and pedestrian-friendly planning layouts

Fundamental to their approach was the notion of using public transport as a mechanism for integrating all areas within a city, which contains a diverse mix of income and race groups. The creation of nodes at transport junctions, increased densities around major nodes and activity corridors. An application of Dewar's generic concept of integrating the Apartheid city within the context of Msunduzi is graphically

illustrated in Figure 38 as proposed in Msunduzi's SDF 2009. This subsequently presented the need to develop a polycentric city with the creation of new and additional nodes within the system to provide new economic opportunities. The polycentric city model is characterised by a range or series of various nodes and smaller centres located beyond the centralised core (CBD) that exhibits diversity and complexity.

Figure 38: Dewar's Concept of Integrating the Apartheid City

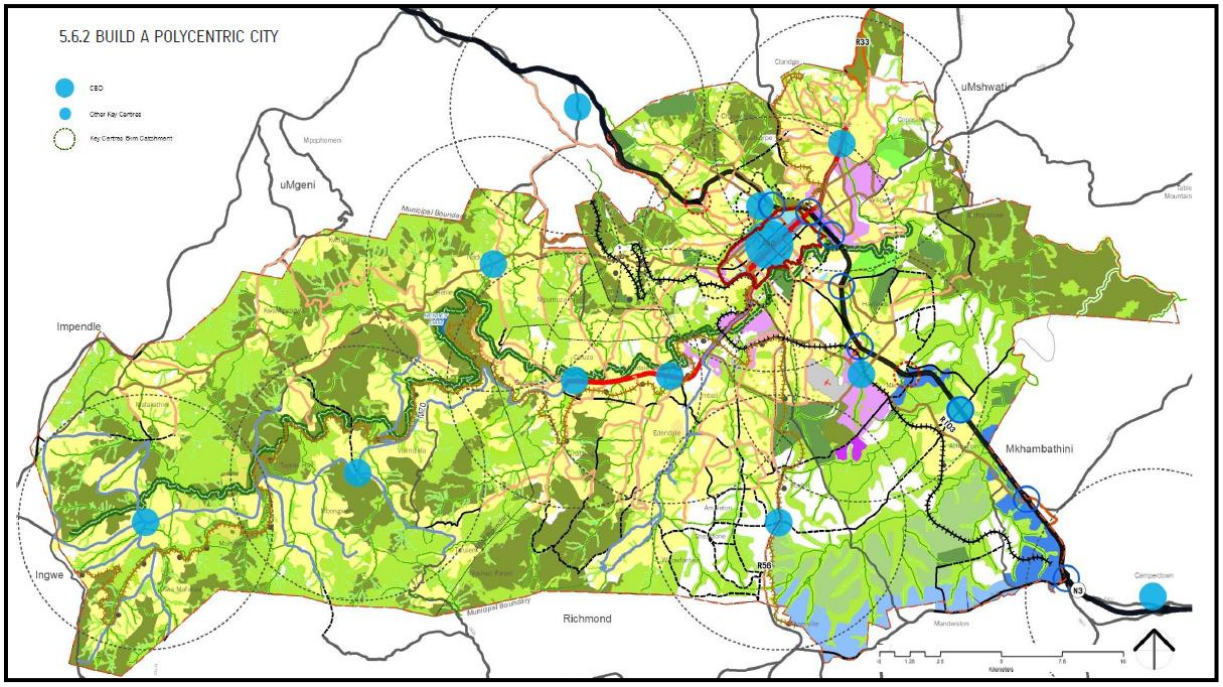


Source: Msunduzi SDF 2009

Schmitt (2013) has noted that according to the Commission of European Community, polycentricism is a concept that has been adopted in European policy, which claimed success in promoting economic growth and equality across Europe. A polycentric structure is also asserted to promote links between industrial clusters, encourage innovation and induce economic growth. Within a polycentric urban structure competitiveness and cohesion is encouraged through developing connectivity between the various centres within a city by good transport links. It is underpinned by public transport, which is an

important driver of change towards establishing a more equitable and high performance city. The nuclei of the polycentric city comprises a series of centres located outside of the centralised core that exhibit high levels of diversity and complexity. These centres are within a fifteen to twenty kilometre radius from the core and from each other, thus allowing sufficient independence to one another containing a wide spectrum of urban land uses. A sustainable urban form is based on this series of interlinked compact nodes or neighbourhoods. Together they make up the polycentric city, which can then be defined as a network of neighbourhoods each with its own public spaces accommodating a diversity of mixed use activities around transportation routes carrying high volumes of public transportation that operate on a stop-star rhythm. Therefore, the significance of the polycentric model adopted for Msunduzi as illustrated in Maps 14 and 15 is in the ability of the system to generate opportunity for those settlements located in the periphery that are currently socially and economically bound to the core of the city. Each node containing its own economic, social and public amenities that is within walking distance with a supportive public transport strategy.

Map 15: Building a Polycentric City



Source: Msunduzi SDF 2015

5.2 MSUNDUZI'S INTEGRATED DEVELOPMENT PLAN AND SPATIAL DEVELOPMENT FRAMEWORK

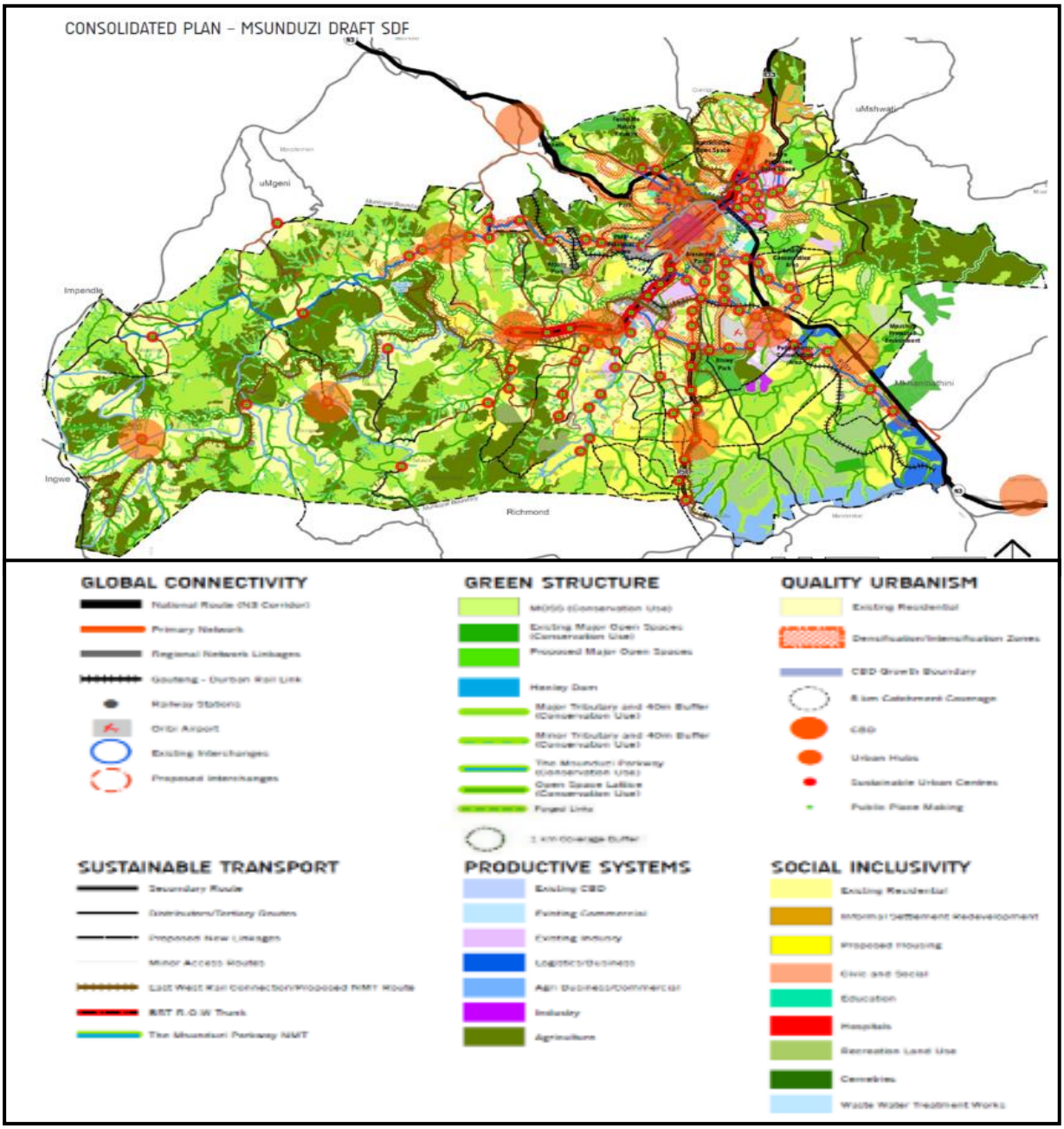
The Msunduzi Municipality's IDP 2013/2014 to 2015/2016 presents a compelling vision that is encapsulated in the statement - '*City of Choice, Second to None'*. The Municipal Manager expressed the opinion that the IDP creates a strategic framework for the city, which is based on its 2030 City Development Long Term Strategy. This strategy encapsulated a vision to develop a city where the entire citizenry can live peacefully; move freely in a cost effective manner; are able to work to generate a livelihood thereby reducing poverty, unemployment, inequality and playing to lead a healthy lifestyle thus increasing life expectancy. In order to achieve this vision, the municipality aims to be:-

- A well-serviced city (i.e. water, sanitation, energy supply for all);
- An accessible, connected city (i.e. roads construction, transport management, telecommunications and social infrastructure for all);
- A clean, green city (i.e. renewable energy, open space creation/recreation and greening promotion);
- A friendly, safe city (i.e. social cohesion, safety and security for all) and,
- An economically prosperous city (i.e. job creation) and a financially viable and well-governed city.

Msunduzi's SDF is also being used as a powerful urban management tool that provides a spatial strategy to achieve the municipal vision for future city development to reduce the imbalances of the past by improving the city structure. It utilises a sustainable urbanism framework, which is reinforced by key philosophies of transformation; equity/equality; restructuring; recycling/ upcycling; reinventing; and public place making. The SDF promotes a forward thinking, a sustainable vision and a strategy for the growth and redevelopment of the city over the next thirty-five years. The planning focus is on creating improved connections, a better movement circuit, linked with the creation of polycentric nodes within the system to better connect people to an increased range of economic and social opportunities within a walking distance. The plan proposes key centres, sustainable urban centres (nodes), networks, and linkages (corridors) where all centres are supported by a certain level of investment to reach a minimum baseline in terms of facilities. It also promotes densification and intensification of land uses with an increase in residential and commercial development intensity within the CBD, key centres and sustainable urban centres located along transportation corridors. These corridors are to be supported by the IRPTN (i.e. Integrated Rapid Public Transport Network or BRT system). The notion of a

polycentric structure within the Msunduzi context recognises the need to break down existing distribution of opportunities through the development of new centres throughout the Municipality as illustrated in Map 15.

Map 16: The Application of Planning Principles and Concepts



Source: Msunduzi SDF 2015

The city's thirty-five year Spatial Development Framework acknowledged that the existing structure does not promote integrated live, work and play environments. As a result, residents commute long distances incurring great costs for transportation between places of work and residence. Hence, the introduction of a polycentric structure will see the establishment of industrial, commercial and retail sectors within specific, desirable places throughout the Municipality, complementing the existing CBD. The former township areas situated in the south and south-west quadrants of the city centre such as Greater Edendale and Vulindlela were found to have a lesser variety and concentration of services and facilities. The plan proposed the need for innovative, robust ideas, which would allow improvements for economic, social and recreational facilities in these areas. The primary intention being to see the Municipality develop into a place of economic power, an investment location, a place aimed at integration and social interaction for all its citizens.

5.3 MSUNDUZI PUBLIC TRANSPORT SYSTEM: INTEGRATED RAPID PUBLIC TRANSPORT NETWORKS

Chitauka (2014) has stated that Bus Rapid Transit (BRT) systems have emerged as a solution to problem associated with urban mobility and various other developmental challenges such as lack of adequate infrastructure. In part, it has addressed the negative effects of rapid urbanisation and the historical legacy of segregated urban planning of Apartheid era across municipalities in South Africa by providing increased access. This is being achieved in Msunduzi through the implementation and roll out of the Integrated Rapid Public Transport Networks (IRPTN) (Department of Transport, 2007). The benefits of this new transportation system, which have been documented in the preceding case studies (See Chapter Four). The most cited examples is Curitiba in Brazil. The IRPTN promotes an improved public transport network when compared to the existing bus and rail systems as it includes physical and operational components that enable higher capacities, good public perception and better performance. Local municipalities are integrating them with other complementing modes of transport such as rail, non-motorised transport (NMT), cycling and to a lesser degree private cars. A legislative framework underpins this initiative. The National Land Transport Act (NLTA) (No. 5 of 2009) stated that all municipalities have been delegated the responsibility of operating the IRPTN which implies that the cost of the operations is their primary responsibility despite the initial capital funding which is sourced from provincial and national government. Therefore, the challenge of financial self-sufficiency is critical to ensuring its long-term sustainability and immunity to political interference.

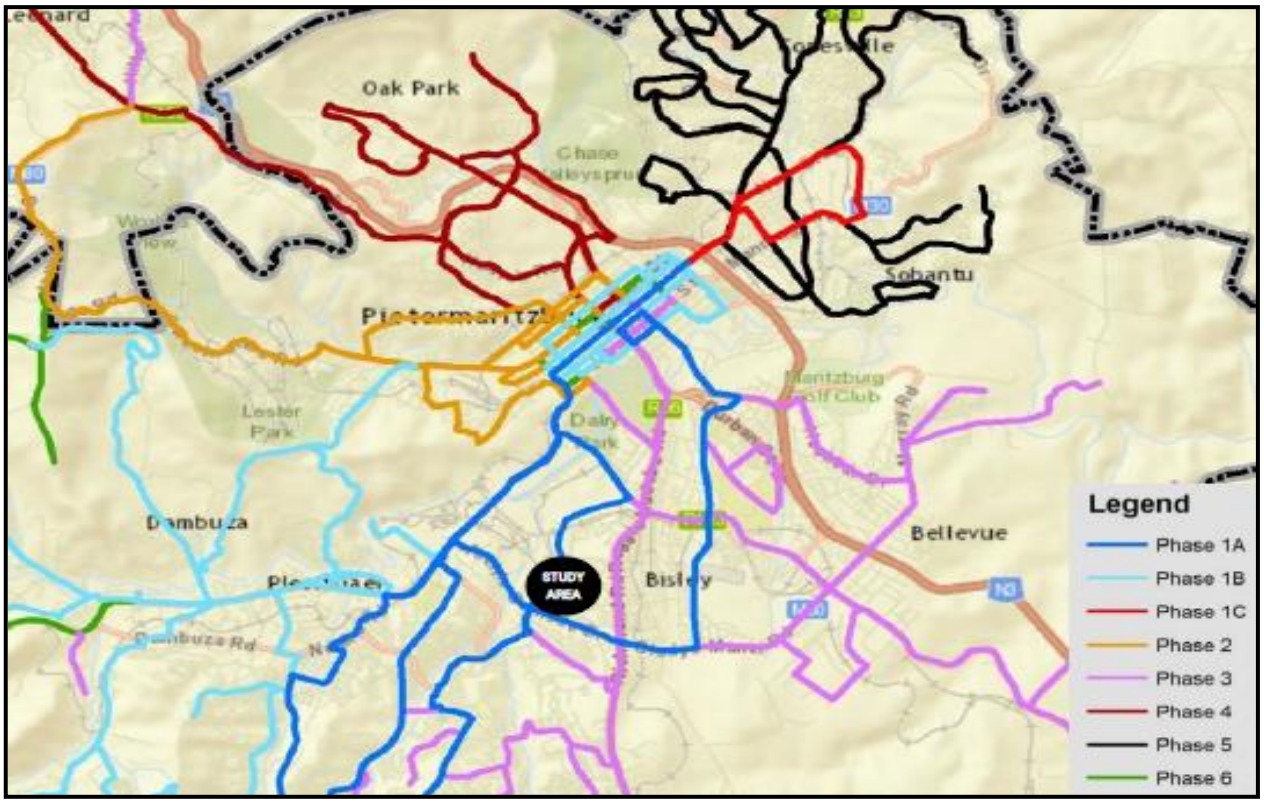
Msunduzi's recent drive to implement the IRPTN system, has provided an impetus for spatial change, which emphasises integration, extending existing opportunities and identification of possible new social and economic opportunities where appropriate in the periphery. The IDP 2015-2016 has indicated that the Msunduzi Local Municipality was selected as one of the cities to receive national support and funding for the restructuring of their public transport system in terms of the IRPTN. Planning and preliminary design for the IRPTN commenced in August 2011. The project is well underway as result of the grant funding received from the National Department of Transport (DoT). It is envisaged that the new system would facilitate the integration of various forms of public transport and create a more efficient and reliable transport network. In general terms, it is an integrated system of high demand public transport corridors, referred to as trunk routes, which are fed by a comprehensive system of feeder routes. This provides effective coverage and frequent service for all users of the network. The objectives and goals of the Msunduzi IRTPN are as follows:-

- To create a transformed city with a high level of mobility for accessibility to employment, education, and hospitals;
- To build a modernized/vibrant transport system with a high quality priority network, with a modern reliable fleet,
- To construct architecturally pleasing infrastructure, and convenience, that embodies safety and efficiency;
- To increase environmental responsibility;
- To facilitate economic spin-offs such as job creation, investment, and business opportunities;
- To create visual awareness of the city's commitment to the poor and marginalised; and,
- To Increase in-house technical skills and the capacity of officials through the mastery of state-of-the-art transport modelling tools.

The first phase of the network considers the following types of routes Trunk - the core route with the highest demand using a segregated right of way. One such route has been identified for the initial phase running from Edendale in the west through to Northdale in the east, a distance of some seventeen kilometres. The Edendale-Northdale Corridor has been illustrated in Blue (Phase1) in Map 15 and in Red (BRT) in Map 16. Other complementary strategic bus routes branded as quality bus routes are linked to the main road. Feeder roads serve areas that are more isolated where the road network may comprise gravel roads. Fourteen seater minibuses would provide these services and link up with trunk and

complementary routes, and services. The IRPTN and Phasing Plan for the routes are shown in Map 17 below.

Map 17: IRPTN Route and Phasing Plan



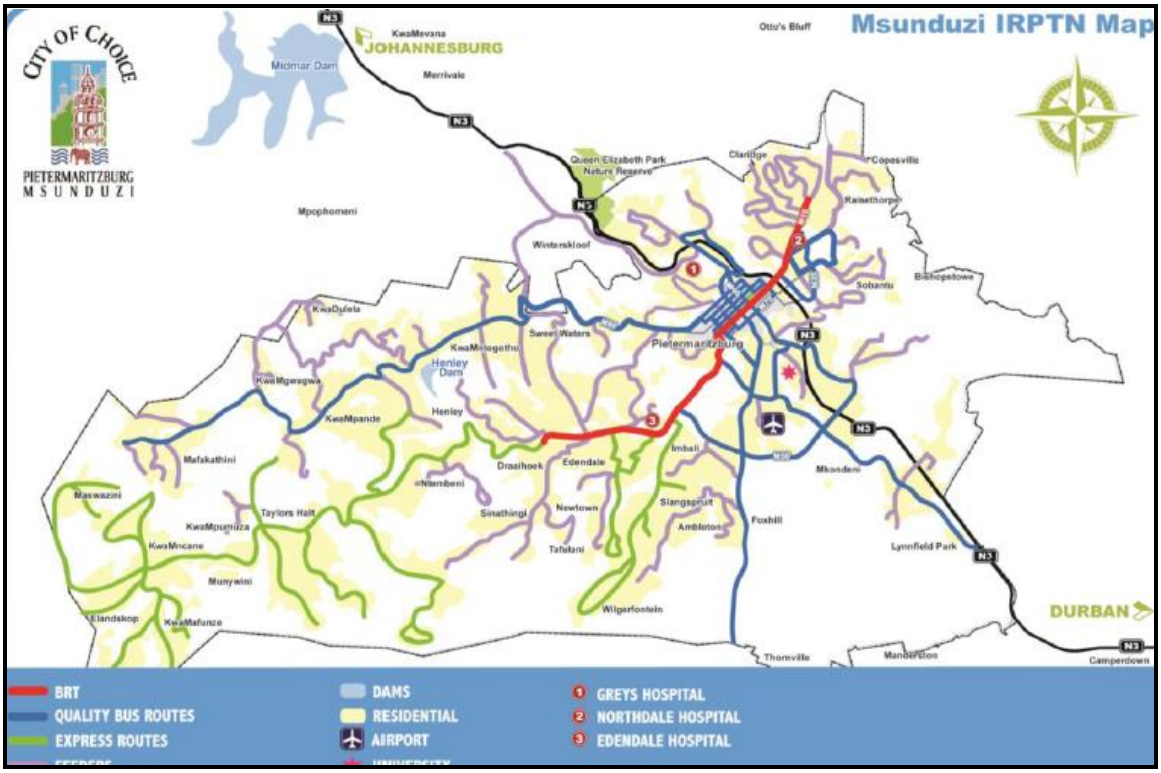
Source: Msunduzi Municipality, 2016

5.3.1 Non-Motorised Transport (NMT)

Non-Motorised Transport includes walking, cycling, and wheelchairs; however, the Msunduzi NMT is limited mainly to pedestrian and cyclist movement over short distances. The KZ-N Department of Transport has initiated a pilot project to construct a five kilometre long and three-meter wide dual use cycle and footpath along the Edendale-Northdale Corridor, which was constructed along Edendale Road. Msunduzi's Non-Motorised Master Plan (2009) intends to improve accessibility of people who cannot afford private or public transport. The plan provides primary cycle and footpaths linking the primary

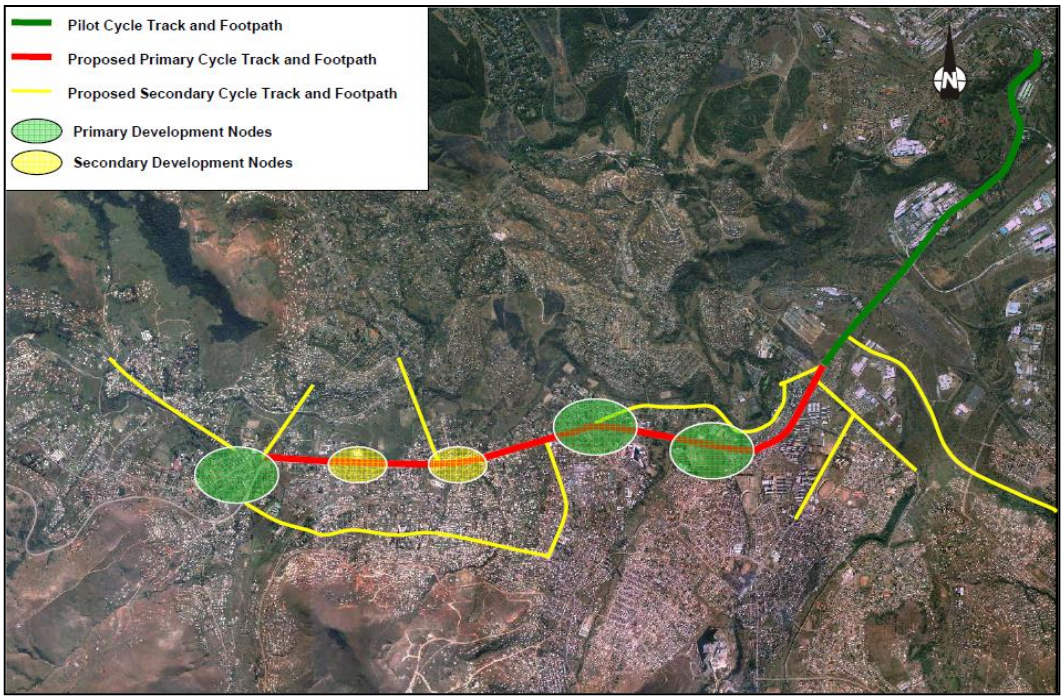
development nodes along the corridor from major residential areas. Map 18 provides a graphical presentation of the NMT Master Plan and associated projects. However, the plan identified a number of pedestrian problems, which included a lack of sidewalks in residential areas; intersections where informal trading is taking place; a lack of sidewalk maintenance; the high speed of vehicles approaching pedestrian crossings; and trading activities blocking sidewalks and other problem areas on several busy roads in the city. Of significance is that the Msunduzi's IRPTN project is also based on the development of an improved transportation corridor along the same route. It is envisaged that the project will promote public transport and non-motorized transport along the corridor. NMT upgrades will include new infrastructure to establish new links, upgrading of existing networks to provide pedestrian and cycling networks and connections, and services through integrated transport and land use developments.

Map 18: IRPTN Phase 1 Route



Source: Msunduzi, 2015

Map 19: NMT Edendale section of ENC



Source: Msunduzi NMT Master Plan, 2009

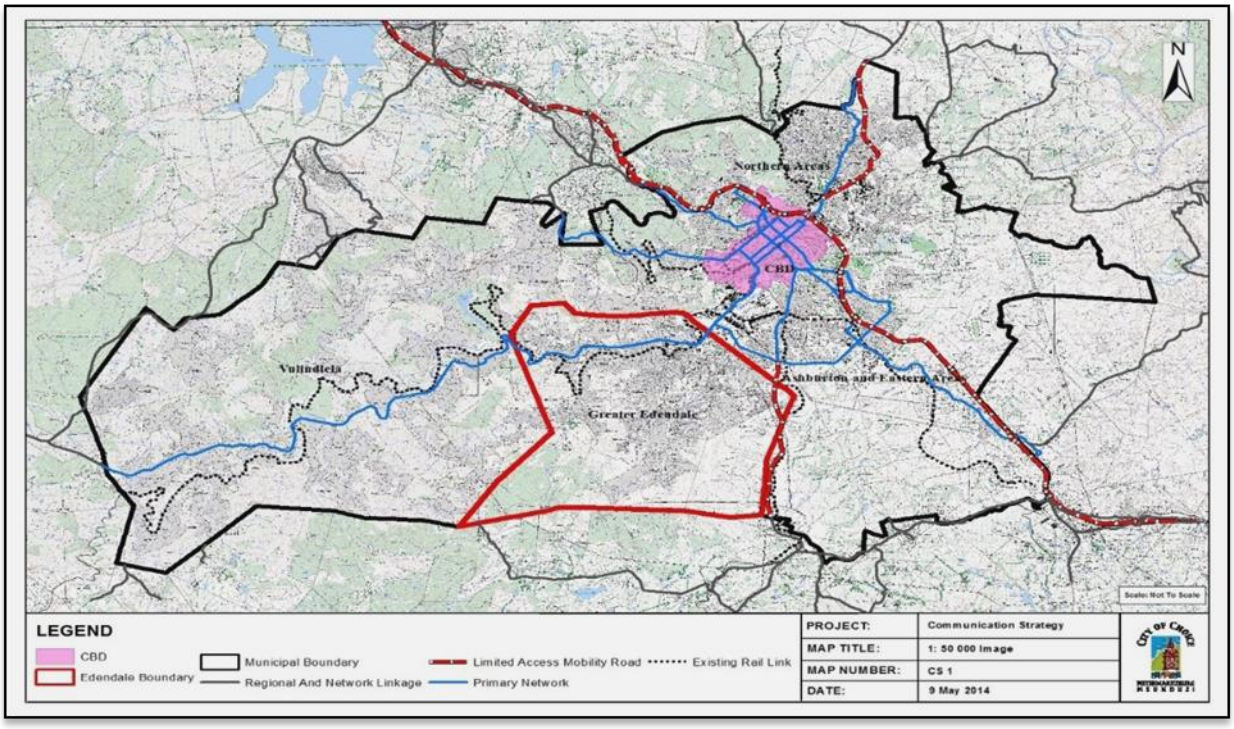
5.4 THE GREATER EDENDALE AREA (GEA)

5.4.1 Locality and Historical Overview

As outlined in the Greater Edendale Development Initiative (GEDI) Business Plan 2006-2007, the Greater Edendale Area (GEA) bordered red in Map 20 is situated some ten kilometres south-west of the city centre (CBD) and measures approximately a hundred square kilometres. The area is accessed from the city centre by a four-lane dual carriageway, which is popularly known as the Edendale Corridor and included main roads such as the M70, Moses Mabhida Road. The M70 provides the main linear structuring element, stretching through the area in an east-west direction linking Edendale to the regional access route R 617 in the west. This route links Msunduzi with Impendle and onwards to Bulwer and Underberg. It is classified as a major urban arterial and a primary network as depicted in blue in Map 20. This route is the main arterial that extends beyond Edendale and serves not only as a path for economic growth, but also as a connection between various outlying surrounding rural areas in

the west such as the Vulindlela Traditional Council areas. Furthermore, it bisects the city extending to the northern suburbs. In terms of the IDP, it is a primary corridor in terms of restricting the city.

Map 20: The Greater Edendale Area



Source: Msunduzi Municipality, 2014

In its entirety, Greater Edendale Area (GEA) is divided into two areas, the first of which is categorized as the traditional area of Edendale proper, where local landowners privately own virtually all land. The second area is regarded as the more contemporary area. It is here that all land vests within the ownership of either the state or the provincial government. According to the updated Greater Edendale Business Plan 2016, the administration of the area came under the jurisdiction of Msunduzi Municipality. Post 1994, the Minister of Rural Development and Land Reform [5] transferred all state land

5 Previously known as the Department of Land Affairs.

to the municipality in terms of Section 10 of the Local Government Act 209/1993 which was promulgated Proclamation 84/1996.

Following this process, the Greater Edendale Development Initiative (GEDI) was established in 2004 to facilitate development of the GEA, which was crucial to correcting the dire landscape of impoverished areas lacking infrastructure, formal housing, basic municipal services and tenure security. Isibuko SE-Africa, (2009) emphasized that GEDI was established as an urban reconstruction initiative by Msunduzi Local Municipality to drive reconstruction and to oversee land acquisition. Most of land within the area is community and state-owned and that there was a need for transformation of the area from a dormitory suburb into vibrant, urban mixed-use area. The area is divided into Wards 10-23 and the political mandate of the Ward Councillors (WC) and the Msunduzi Executive Committee are to ensure that the municipality fulfils its obligation to upgrade the township.

The Edendale SDF 2009 emphasizes that due to the period of neglect that had to be reversed in the area, the transformation challenges were formidable. These challenges needed to be addressed whilst acknowledging that there were constraints. High levels of poverty, unemployment; rapid population growth; the AIDS pandemic; land legal complexities; inadequate services and infrastructure provision and the rapid advancing rate of informal settlement development characterise the area. To ensure that the attention of all levels of government were focused on Edendale and to co-ordinate and facilitate integrated planning, development and fundraising for the area; the Municipality recognised the need to consider GEDI as a specialised Area Based Management (ABM) mechanism. In 2013, GEDI was further extended to incorporate the Vulindlela Tribal Council[6] area hence, the renaming of the Initiative to Greater Edendale and Vulindlela Development Initiative ('GEVDI'). The majority of the area previously designated under Apartheid accommodates the lowest income sector of the Black population. Past negative development practices and the elements of apartheid planning are reflected. It is separated and segregated from the central part of the current municipality and lacks many infrastructural services; There are few employment opportunities and lacks social services, particularly of higher order types. As such, the municipality is striving to address high levels of inequality within the context of widespread and deeply entrenched imbalances.

The topography of the area is moderately steep rolling hills with relatively wide river plains in the many of the valleys. Development has taken place on the flatter areas nearest to the main access roads. This implies that a lot of development has occurred in the valley bottoms and up the valley slopes, with very

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6 Previously known as the Vulindlela Tribal Authority Area.

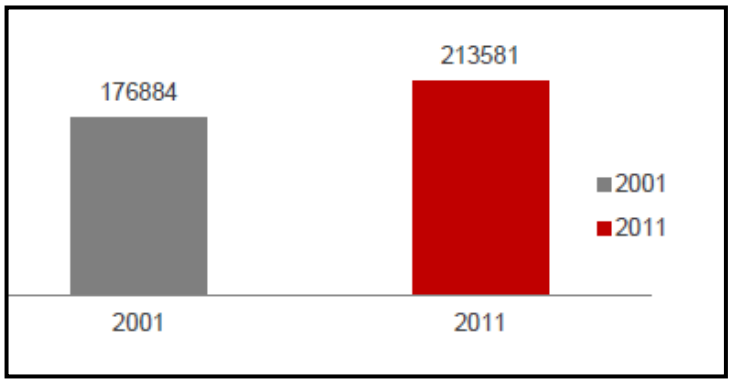
little development having taken place on the ridgelines. The development pattern has resulted in the encroachment of development into river floodplains, destabilization of these areas, and consequent stream bank erosion and flooding. The open spaces that do exist are placed under pressure for grazing and natural resource harvesting. There are four main tributaries flowing into the Msunduzi River from the southern side in the Greater Edendale Area: the Slangspruit, Willow fountain, KwaPata and Sinathingi Rivers. A number of smaller tributaries drain the northern and southern lands adjacent to the uMsunduzi. Much of the Greater Edendale Area is densely developed with both formal and informal housing, supported in some areas by ancillary land uses and facilities. Only a limited number of commercial outlets and business enterprises operate in the area. The further development and expansion of these sectors is fundamental to the sustainable growth of the GEA.

5.4.2 Socio-Economic Profile

5.4.2.1 Population Demographics

According to StatsSA 2011, the population of Edendale experienced a 1.9% growth rate between 2001 and 2011. This figure represented the highest percentage growth in comparison to all the other areas in Msunduzi. The population increased from 176884 to 213581, an increase of 36 697 people as graphically illustrated in Graph 2, which will have an overall impact on social, and economic service provision and facilities.

Graph 2: Population Profile



Source: Census, 2001 and 2011

5.4.2.2 Population Composition

In terms of gender distribution, the area has a higher percentage of women than men do. From a planning perspective, this confirms the importance of gender equity in planning decisions. The age composition confirms that the area is characterised by a large youthful population who could be potentially economically active. This will have significant impact on social, economic and recreational service provision. Also noted is that 41% of the population that will be moving into the job market are below the age of twenty years of age. This potentially large and relatively unskilled workforce base places a greater demand on job creation/employment opportunities. It poses a huge challenge to economic growth and development to absorb the growing labour force (see Table 4 below).

Table 4: Age Structure and Gender Distribution

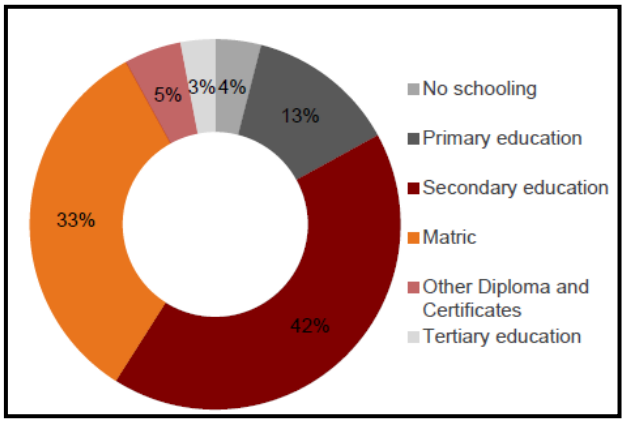
AGE GROUP	PERCENTAGE
0-20	41%
21-40	38%
41-60	16%
61 and Above	5%
MALE	**FEMALE**
47%	53%

Source: Census, 2011

5.4.2.3 Education Levels

As reflected on the graphic majority (42%) of the workforce are only educated as far as high school level whilst only 3% have received tertiary education which impacts on employment opportunities and income levels. It is noted that 4% of the employees who do not possess any formal schooling (see Graph 3 below).

Graph 3: Education Levels

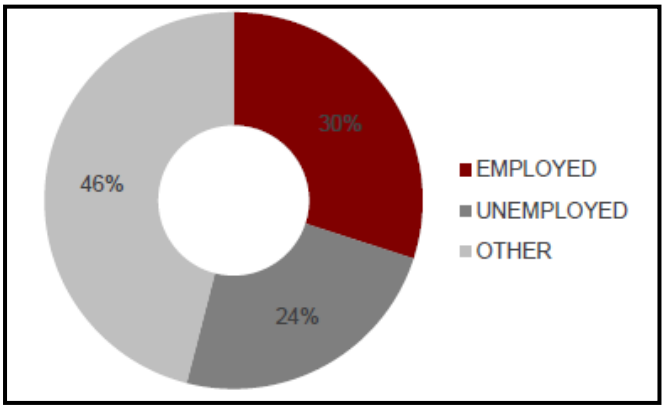


Source: Census, 2011

5.4.2.4 Employment and Unemployment

As reflected on the above employment status graphic, the employment level is 30%, which is low. This confirms that the majority- representing 46% of the economically active workforce (between the ages 15 -64) within the GEA are not employed whilst 24% are not actively seeking work.

Graph 4: Employment Status



Source: Census, 2011

5.4.2.5 Income Levels

Recent South African statistic estimate that nearly 55, 5 % of the population can be termed as living in poverty. Of this number, approximately 12 million can regarded as living in extreme poverty (R321 per capita per month in 2011 prices). Table 5 clearly reveals that majority of the population in the GEA fall within the-low income category, which confirms the high levels of poverty and unemployment experienced in the area. Approximately 9% earn less than R1, 600 per month that is far below the household subsistence level, which indirectly implies that there is a high dependence on grants and other sources of income such as the informal sector for people to survive.

Table 5: Monthly Incomes

TOTAL WORKFORCE	R1- R1 600	R1 600- R6 400	R6 401- R12 800	R12 801- R25 600	R25 601- OR MORE
66 153	69%	22%	6%	3%	1%

Source: Census 2011

5.4.2.6 Social Services

The Msunduzi SDF 2015 indicates that the built environment supports higher-level regional land uses such as the Edendale Hospital, two Further Education and Technical (FET) colleges and the Durban University of Technology (DUT) campus. Two police stations service the area. There is a home for the aged and a number of clinics. While there are a number of schools in Edendale, it is evident that the operation and maintenance of these schools are affected by a lack of funds.

5.4.2.7 Infrastructure and Service Provision

The Census data 2011 showed that the southern portion of Edendale has low levels of electricity whilst majority of the population have poor access to water and sanitation (Msunduzi SDF 2015). This reveals that services are not evenly distributed across the municipality. The formal urban areas of the

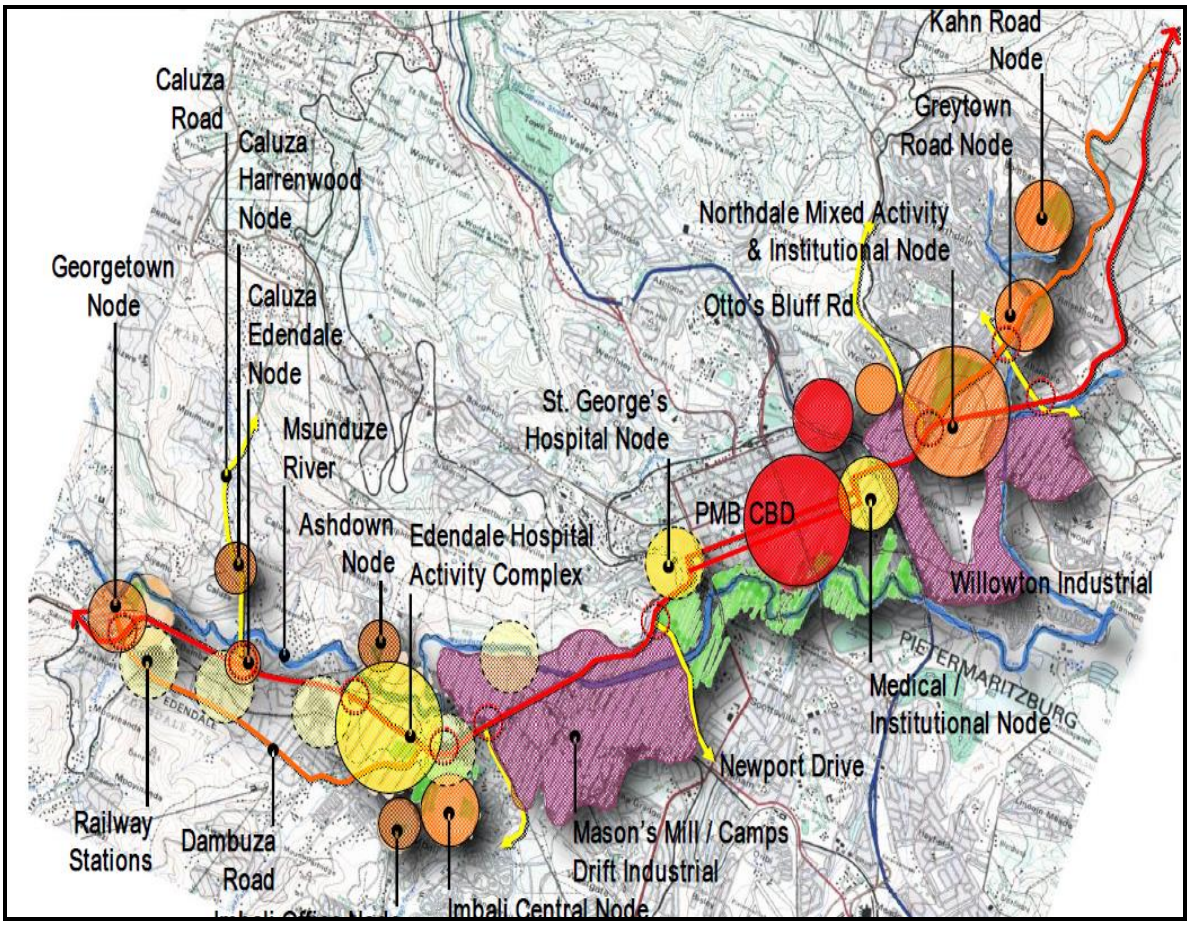
municipality are better serviced than the rural and peri-urban areas such as Edendale. A lack of adequate water and sanitation could lead to health and financial implications to those communities that are inadequately serviced.

5.5 EDENDALE-NORTHDALE CORRIDOR (ENC)

The Greater Edendale Area (GEA) as an element of a cohesive urban system has been the subject of a number of planning studies, which included the Edendale/Northdale Corridor Study, Edendale Spatial Development Framework (SDF), Physical Development Frameworks, Edendale Land Use Framework and the more recent adoption of GEA into the Msunduzi Town Planning Scheme. However, in order to advance development of the area in an integrated and coordinated manner, the Executive Committee identified the Edendale Corridor Functional Area. It is a priority project. In this regard, the council recognised the Edendale Corridor as the Civic Centre and heart of the GEA that will promote access to a wide range of social, community, shopping and industrial activities and equity to a greater number of people. In addition, the need for transformation could be achieved with the corridor concept to create opportunities for economic development and employment. Arup (2006) pointed out that the Msunduzi SDF identified the east-west corridor from Georgetown in the west through Edendale, across the Pietermaritzburg CBD extending towards the Northdale area in the north, as the most prominent corridor in the municipal area. The private consulting company Iyer Urban Design also noted that this was largely because well-developed residential, commercial and industrial areas were located along the corridors supported by the concomitant patterns of public transport. These factors created the preconditions to enhance and develop through innovative BRT system and integrating these with the promotion of appropriate land uses (Iyer Urban Design, 2007)

The corridor therefore comprises the main transportation axis through the Msunduzi municipal area between Edendale in the southwest and Northdale in the northeast which includes the main public transport hubs that service the city. It measures approximately seventeen kilometres as depicted in Figures 39 and 40. The ENC incorporates four distinct sections, which includes Edendale, Masons Mill, Pietermaritzburg CBD and the Northdale sections.

Figure 39: Urban Structure of the Edendale-Northdale Corridor (ENC)

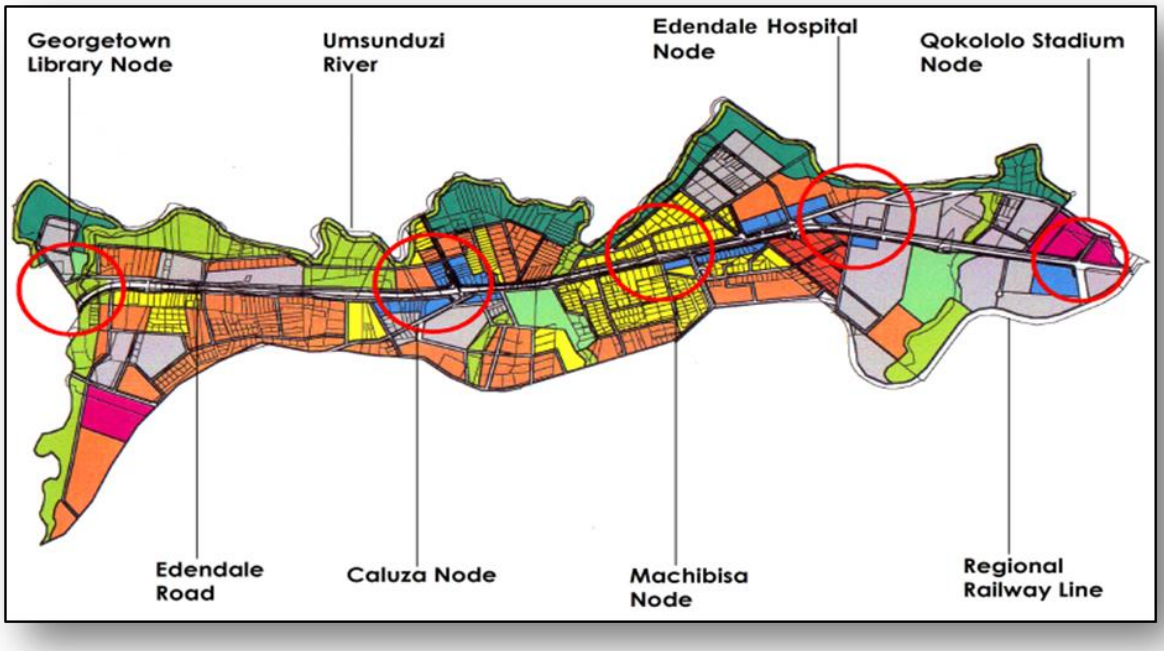


Source: Arup, 2006

The M70 (Edendale Road) forms the main structuring element in Edendale, and follows the valley line of the Msunduzi River that runs parallel to the north. The primary mobility route traverses the township. To the south running parallel is the Dambuza Road, a collector road culminates at the Qokololo Stadium Node. However due to the steep landscape that limits development, most of the residential township is located to the south of the corridor. The Edendale corridor is dominated by the Edendale Hospital Node and its associated sporting, institutional and community facilities, which is the primary node in the area. The rest of the nodes are classified as secondary, which includes the Georgetown, Caluza, Machibisa and the Qokololo Stadium Nodes as illustrated in Figures 39 and 40. Furthermore, the role of the Edendale section of the corridor was identified as a primary economic zone suitable for retail, industrial activities

and public zone to serve the rural hinterland. However, all the nodes including Georgetown where Edendale originated are severely underdeveloped and under resourced.

Figure 40: Nodes along the Edendale Section of the ENC



Source: Msunduzi, 2006

The CBD section of the corridor forms the core of the corridor and comprises all the characteristics of a typical central business district. Structured around the Old Greytown Road (M10), the Northdale section is a newer parallel mobility route known as the New Greytown Road (R33). This section of the corridor traverses the Willowton industrial area, the Northdale Hospital Node and splits into two parallel routes. The old Greytown Road is a residential collector and provides access to the residential suburbs in Northdale. It has two activity nodes namely the Northdale Hospital Node and the Greytown Road Node. Both the Edendale and Greytown Roads function as the major arterials and primary mobility roads with the several nodes located along them. At major intervals, major distributor and arterial roads intersect with the Edendale (M70) and Old Greytown Roads (M10) as access roads.

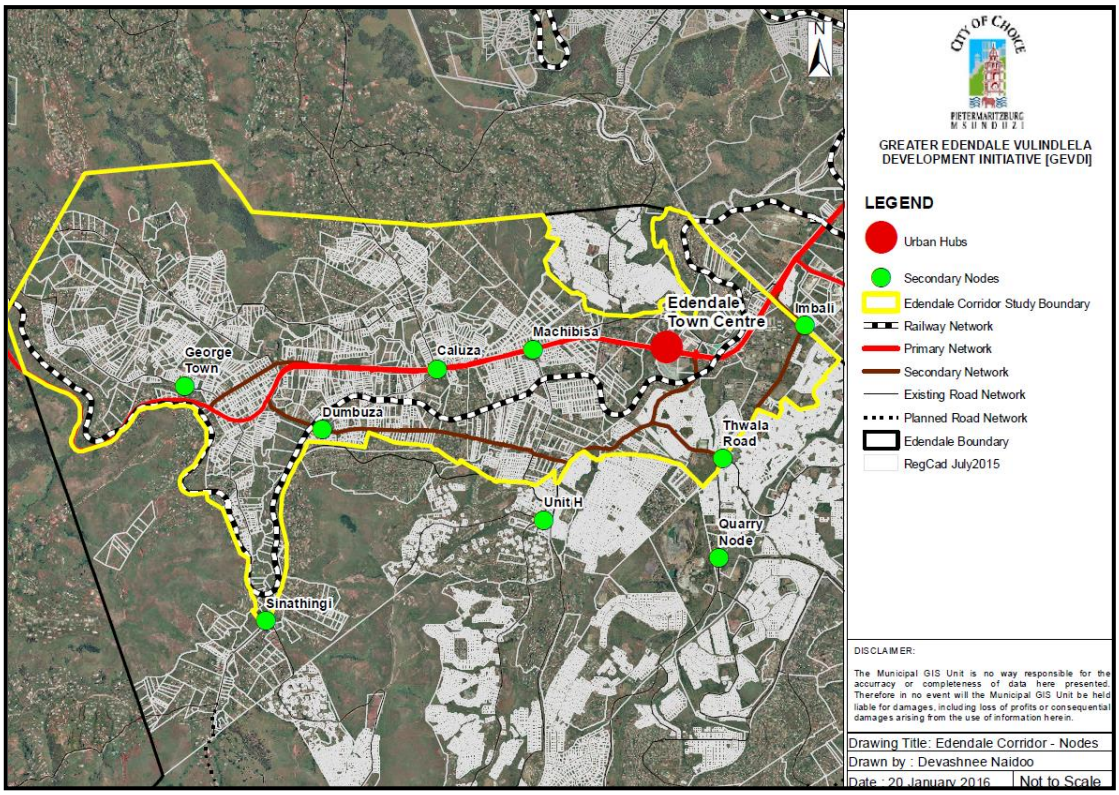
The urban structure of the corridor functions as a mobility route and comprises various nodes at different scales of intensity along the corridor as illustrated in Map 20. Hence, the corridor can be likened to the analogy as *"beads on a string"* as described in Chapter Three of this dissertation. The concept is explained as the string component represents the mobility route between the centres and the beads are the various nodes along the corridor. Iyer Urban Design (2014) indicated that a test of the Edendale Hospital Node revealed that there is a need for greater densities, appropriate land uses and a more permeable settlement structure. Similar characteristics were found in all the other nodes along the corridor since increased densities are critical in order to ensure that the proposed BRT system is viable. A significant findings from the assessments revealed that the areas lacked connections to the corridor.

5.5.1 The Edendale New Town Centre

5.5.1.1 Background

Based on the assessments of the socio-economic conditions prevalent in the Edendale area, the Edendale Hospital Node located within the GEA along the corridor identified as a Primary Node i.e. "*a primary economic zone suitable for retail, industrial activities and public zone to serve the rural hinterland*'. It is linked to a diverse range of areas and nodes within the Msunduzi Municipality including the rural, traditional, semi-urban, and suburban to urban and industrial areas and provides the opportunity for future development of the area. Studies commissioned by Msunduzi have also concluded that there is a critical need for public investment and upgrading in these nodes. In response to these challenges, the Neighbourhood Development Partnership Grant (NDPG) was made available by the Department of Treasury to the Municipality with the primary aim to stimulate and accelerate investment in poor, underserved areas and neighbourhoods such as the Edendale Township. After having followed a vigorous criteria evaluation, the Edendale Hospital Node was earmarked for the development of an Urban Hub (i.e. Town Centre) as part of the Neighbourhood Development Partnerships (NDP) Urban Network Strategy for improving the spatial structure of the city in the quest to advance transformation and reconstruction

Map 21: Edendale New Town Centre Node



Source: Msunduzi, 2016

The Neighbourhood Development Partnership (NDP) introduced the Urban Network Strategy (UNS) to reshape the urban spatial form, which is based on an approach that builds on an urban network model that is transit oriented namely the corridor development approach. Hence, the Edendale Hospital Node was identified for the establishment of a New Town Centre within the prescripts of this policy. The grant has been structured to support and facilitate planning of neighbourhood development programmes and projects that provide catalytic infrastructure to leverage public and private sector development towards improving the quality of life of previously disadvantaged communities located in townships. Furthermore, it is driven by the notion that public funding can be used creatively to leverage private and community investment in order to unlock the social and economic potential within neglected townships and neighbourhoods. This strategy will contribute to South Africa's macro-economic performance. The urban hub is envisaged to function as a Town Centre for the surrounding residential areas that will provide access to the rest of the primary urban network. As such its location

acts as a gateway linking the secondary networks within the townships to the primary network that stretches across the entire urban area, which consists of primary nodes such as the CBD, public transport linkages connecting the nodes and main movement networks.

5.6 EDENDALE PROJECT PROPOSALS

This next section provides a brief overview of the project proposal for the new Edendale Node.

5.6.1 The New Town Centre Boundary

A SWOT analysis confirmed that all the necessary preconditions in terms of quality urbanism, transportation, economic and environmental opportunities already existed for the successful implementation of the New Town Centre located along the Edendale-Northdale Corridor. Given the fact that it is in the vicinity of existing shopping centres like the recently constructed Edendale Mall which measures some 25 000 square metres and the Crossing Mall which stand as landmarks together with informal businesses; there is an economic base on which to build the node. Another key strength is that commercial and manufacturing areas are located on flat land that will make the centre highly visible and accessible.

The recent acquisition of land by the municipality presents the potential for future investment and development and the environmental zones located within the centre are seen as a positive asset that could be transformed into active recreational spaces that could add value to the area. The core of the centre is at 400m, 5-minute walking radius, and the Frame is at 800m-10-min walking radius. The Edendale Road serves as the primary mobility route together with secondary routes of Mt Partridge and Old Edendale Roads that creates linkages to the broader area. There is also vacant and under-utilised land that is available for development. The existing concentration of commercial, retail and manufacturing uses within the core and the frame will therefore contribute to the New Town Centre concept (See Figure 41 below).

Figure 41: New Town Centre

Source: Msunduzi, 2014

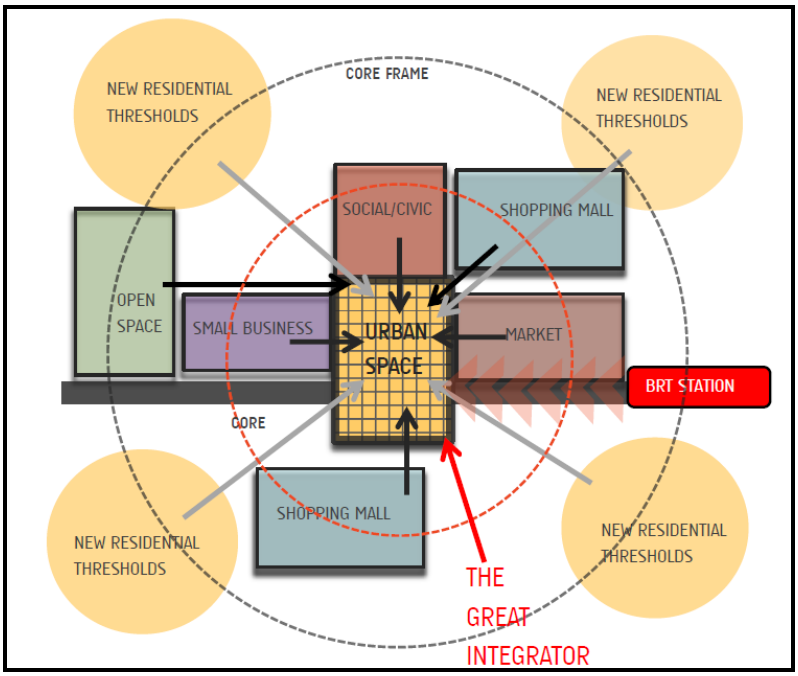
5.6.2 Defining the Character of the New Town Centre Concept

Based on the comprehensive assessment of the Town Centre area, the findings of the analysis suggested that the character of the new Town Centre be centred on the notion of defining an *"African Urbanism.* This concept creates a vision where planning will facilitate the development of a space that is true to the identity of the user's context in which it is set (Iyer Urban Design, 2014). It is to facilitate the development of an environment that will allow this natural growth to take place.

However, the fundamental drivers that are considered important in establishing the character of the proposed Town Centre included the informal economy that will set the platform for other land uses that will grow organically and are responsive to different circumstances. In addition, the design of the centre is to acknowledge the Centre's dependence on public transportation; that the majority of users are pedestrians, the way in which economic activity needs to engage with the public realm and the dual identity of the Centre as both a place of economic activity but also a place of social gathering. The guiding design philosophy above and the character must therefore be enshrined in: a vibrant informal economy; a centre of employment; a diverse manufacturing sector; a place of celebrated quality spaces;

a place of multiple uses; a place of well-connected spaces; a place building of the CBD's energy and a place of innovation. In designing the new Town Centre, the BRT becomes the catalyst in the area bringing in additional foot traffic at regular intervals. The aim is to direct movement into common areas. Urban space will promote new land uses and more importantly integrate existing land uses. Therefore, the key is to ensure that a vibrant set of land uses are proposed that will activate the urban space, which is graphically illustrated in Figure 42.

Figure 42: Defining the New Town Centre



Source: Msunduzi, 2014

5.6.3 Movement Framework

The movement framework as indicated in Figure 43 plays a critical role to promote a vibrant active centre/node. It is designed to ensure the town centre is easy accessible and permeable for motorised and non-motorised transportation as such it will attract a wide variety of users. The creation of linkages to key landmarks such as Edendale Hospital, BRT station, District Park and proposed Market. The road structure and hierarchy includes the Edendale Road which is the main mobility linking the centre to the

CBD and the hinterlands. Old Edendale Road and Mount Partridge Roads serve as secondary collector roads and other new linkages are proposed to allow for greater access and permeability. All secondary routes are to be developed as boulevards with tree-lined roadways serving pedestrian and cycle paths and an NMT bridge that would function as an iconic gateway into the core of the node. The plan also proposes pedestrian walkways, traffic calming measures, pavements, sidewalks, pedestrian crossings and spaces in support of the BRT and NMT.

Figure 43: Movement Framework

Source: Msunduzi, 2014

5.6.4 Land Use Framework

The framework plan proposes a diverse mix of vibrant land uses in order to activate the urban space. These include the following land uses:-

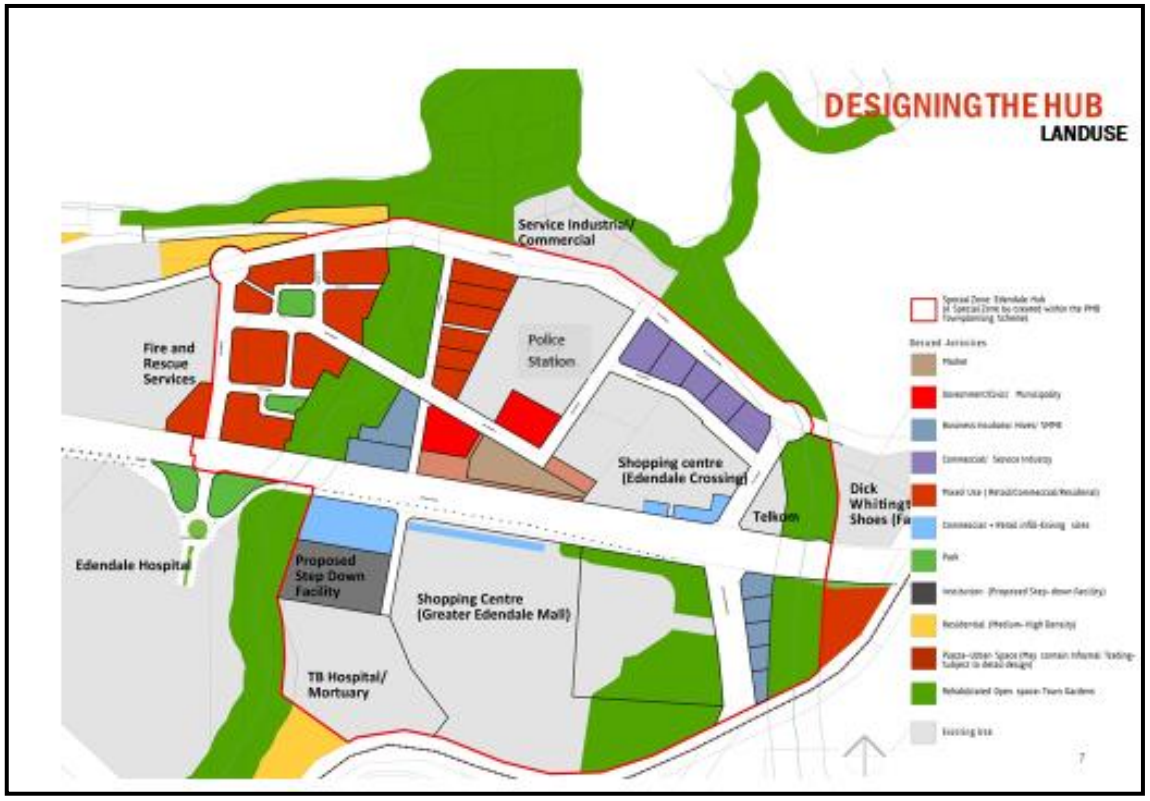
- A Market;

- Government/Civic/Municipality; Business Incubator Hives/Small Micro and Medium Enterprises (SMME's);
- Commercial/Service Industry;
- Mixed Use (Retail/Residential/Commercial);
- A Park;
- An Institution (Step-down Facility);
- Residential development;
- A Piazza (may contain Informal Trading) and
- Open Space (Town Gardens).

The aim is to direct movement into a common area designated Urban Space (see Figure 44), which becomes the centre where all uses and people start to gravitate towards. The urban space will become the area that promotes new land uses but more importantly integrates existing land uses. The creation of an informal economy is seen as the key driver to start the development of the town centre. Uses such as a market, informal trading and the development of business hives are the possible triggers that will open up new opportunity in the precinct.

Retail and commercial uses are located on the ground floor and residential on upper floors. The SMME's/incubator hives are allocated space as follows: 11 718m² for SMME/Informal Sector 27 878m² for Commercial Formal and 41345m² for Residential. Approximately 699 units at an average unit size of 55m² are proposed within the Hub. The main public spaces proposed for the site are the Market and the main Urban Space covering a combined area of 7 000 m². Trading stalls for informal business have been considered along main urban spaces at an average of 10m² per stall.

Figure 44: Land Use Framework



Source: Msunduzi, 2014

Over 3, 2 hectares of land have been allocated for mixed use (retail/ commercial/ residential) activities. Sustaining public transportation will involve increasing densities within and around the hub to ensure the system is operating at its optimum. The rehabilitation of the green spine and development of a town garden will serve as an ecological lung and recreational space for beautification of the centre. See mixed housing typologies graphically illustrated in Figure 45.

Figure 45: Mixed Housing Typologies

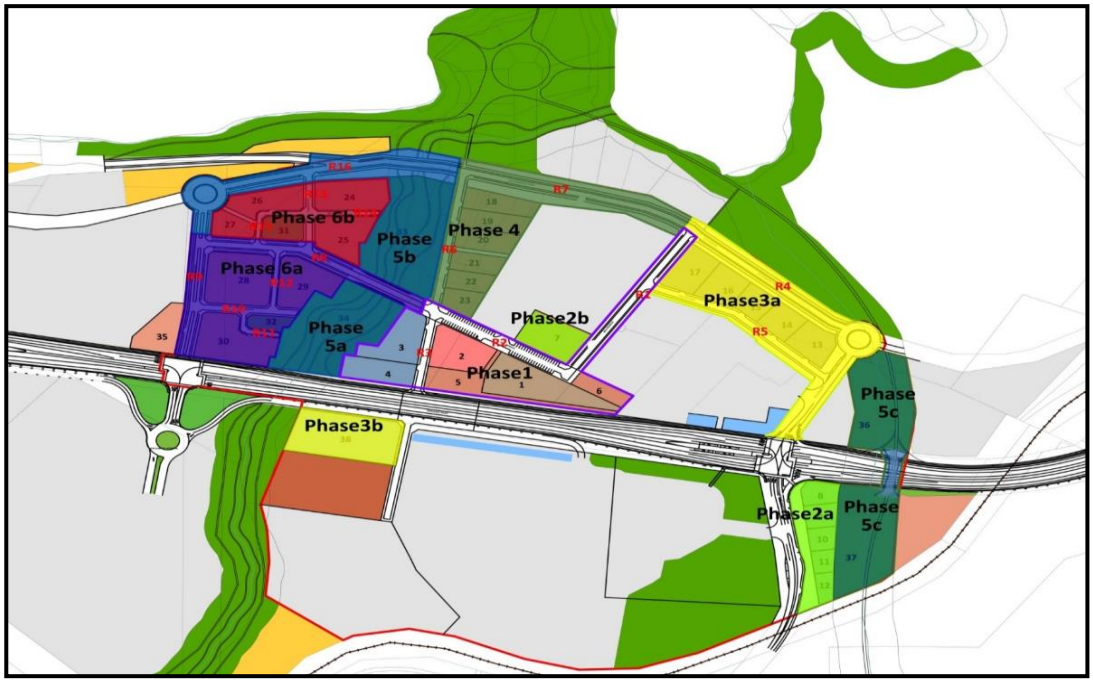
Source: Msunduzi, 2014

5.6.5 The Implementation and Phasing of Development

Funding made available by national government has been earmarked by the municipality towards the implementation of projects in the region of over one hundred and fifty million rand for the development of the market area, government and institutional buildings are intended to be symbolic of the public sector investment. A public piazza space, pedestrian walkways; informal trading stalls, bus and taxi shelters with facilities; business incubators and small to medium micro enterprise hives will be developed over time. The construction and upgrade of roads, provision of new linkages, a public space realm and infrastructure services are included as part of the development. In terms of land acquisition and phasing, some parcels of land are still privately owned. In order to unlock the development potential of Edendale corridor funding of over twenty million rand has been made available by the Department of Human Settlements for the purchase of the private land for housing developments. There is also significant private investment in the area. Public sector investment will serve as a catalyst to draw more investment and employment opportunities for the people within the area. An,

incremental-phased project implementation approach has been adopted for the Edendale Town Centre to affect the desired transformational change envisioned for the area as indicated in the Figure 46.

Figure 46: Phasing of Development



Source: Msunduzi, 2014

5.7 CONCLUSION

The above chapter has highlighted the development of Msunduzi over the past hundred and fifty years and the desktop review of Msunduzi's documents, policies and spatial framework plans which clearly reveal that the attempts being made to implement the corridor development strategy through the coordination of public and private investment. The strategy is aimed at achieving a compact integrated urban form as the final end product. This move towards a new compact city model, which advocates mixed-use developments, ensures that the urban poor have better access in the city. Since 2000, attempts have been made to reshape the city structure in order to address major strategic issues identified in reaction to unsustainable urban sprawl and spatial disjuncture with a view to reducing poverty and unemployment. Simultaneously the plan intends to reduce travel distances and transport costs, decrease air pollution by using green technology and bringing various urban amenities and

facilities to communities living in mono-functional areas. Msunduzi's adoption of the corridor development strategy is therefore aimed at addressing problems and issues of separation of people and activities, urban sprawl, low densities, inefficient layout of townships, prioritization of public and non-motorized transportation.

CHAPTER SIX: RESEARCH METHOLODY AND FINDINGS

6.0 INTRODUCTION

The primary aim of this study is to validate whether Corridor Development as a strategy has the potential to achieve an efficient, compact-integrated quality urban environment with the broader goal of restructuring post-Apartheid cities in South Africa. In addition, the objectives of the research were stated as being to critically assess, investigate and examine how the concepts are being applied in theory and practice in order to realize the desired compact urban form. To this end, the Edendale Hospital Node (i.e. New Town Centre) was identified as a primary node located along the Edendale-Northdale Corridor within Msunduzi Municipality was selected as the subject of this investigation.

Chapter Two explored, inter-alia, corridor development through the lenses or theoretical foundations of New Urbanism and Smart Growth. Chapter Three provided a detail discussion on the wide range of definitions, the main characteristics and elements of corridors as an integrator. The role of a corridor as a restructuring tool capable integrating the critical components of the city such as the socio-economic and environmental aspects has been critically examined. In Chapter Four, a review of various case studies, which demonstrated the critical factors necessary for the successful implementation of corridor development, has been presented together with lessons learned from practice which could inform the current research analysis.

As indicated in the literature review an urban node is a place of high accessibility and through proper development can act as a catalyst for the development of corridors which provide maximum access to various land uses and create opportunities for sustained growth and development through significant public and private sector investment (See Chapter Three). They are linked by public transport systems, which facilitate mobility and the efficient functioning of urban areas. With the foregoing in mind, the preceding Chapters Two to Four, provided a comprehensive review of the corridor concept and its theoretical underpinnings, which identified a number of principles and iterative key performance criteria, which will form the basis against which the case study will be analysed.

This chapter draws on the interview component of the methodology, which includes discussions with key stakeholders who play an integral part in the planning, and development processes of Msunduzi Local Municipality. The comments and opinions received will reveal how the strategies and concepts are understood, promoted and applied by the employees of Msunduzi Municipality, Provincial Government, private sector planning professionals and non-government sector of society who have over a period of time produced numerous planning documents and have been actively engaged in the

planning and development processes for the city. The data collected will test the hypothesis as recorded in Chapter One of this dissertation, which stated, '*Corridor Development as a strategy has the potential to achieve a Compact Urban Form in Edendale'*. The interviewees from each of the above institutions included: -

- Msunduzi Municipality: Town Planners (2);
- Msunduzi Municipality: Transport Planner (1);
- Msunduzi Municipality: Ward Councillor (1);
- Provincial Government: Town Planners (2);
- A Non-Government Organisation – The Edendale Development Forum (1) and,
- Private Sector Consultants: Town Planners (2).

None of the nine interviewees objected to be named and thus a detailed list is provided in Appendix Two.[7] The data sample for a Master's degree dissertation which utilises qualitative research techniques is suggested to be N = 10-15 for extrapolation purposes. It was decided that the nine interviews provided a sufficiently robust overview that it would satisfy the research methodology.

6.1 RESEARCH DESIGN AND METHODOLOGY

The research design chosen for this dissertation is the case study approach. This approach allows the researcher to utilise an in-depth study of a specific research problem e.g. nodes and corridors for urban reconstruction and integration. It allows the research to be narrowed down from a larger study to a smaller component in order to test specific theories, concepts and models. In this instance, the focus area or case study is the Edendale-Northdale Corridor and Edendale Town Centre Node, which will, allows for a critical evaluation of the implementation of the corridor development strategy in the South African urban context. Since this strategy is one of the key underpinnings of urban restructuring and integrated development planning used in contemporary practice in South Africa, it is important to test its viability in places, which need urban integration due to the legacy of Apartheid. Edendale in Msunduzi Local Municipality is one of these fractured areas. The key question being posed through the

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7 Some researcher and examiners propose that interviewee's identities should remain anonymous and other indicate that it is necessary to view the details of the research participants. In this instance, a compromise has been reached. They are not named in the main text of the dissertation but their details are provided in an Appendix to the dissertation.

research is - how effective will the corridor development strategy be in addressing the integration of Edendale into the wider Msunduzi urban fabric?

6.2 INTERVIEW QUESTIONS AND RESPONSES (SEE APPENDIX 1)

The interview questions used in the research will be outlined followed by the comments and views of professionals within their respective sectors in a table format, which will facilitate an easy comparative analysis. Although most of the questions posed were common to all interviewees however, some of the questions were structured around their specific areas of involvement with Msunduzi Local Municipality. Each questionnaire comprises of 9-10 questions per sector. Each respondent will be identified according to their respective positions within their institutions for the purpose of confidentiality where the alphanumeric code R1 and R2 denotes the Respondents. As indicated above the interviewees were selected based on their knowledge, particular areas of responsibility and interaction with the Msunduzi Local Municipality. Formal interviews were conducted between September 2016 to November 2016 and further engagements in 2017. However, pursuant to these interviews informal discussions and follow-ups through emails and telephonic conversations occurred for clarity and filling in of gaps that were identified during the process.

6.3 KEY FINDINGS FROM THE INTERVIEW MATERIAL

The interview material clearly indicated that although the responses are not similar, the various actors and professionals have differential levels of understanding of Corridor Development and Compact Urban Form concepts. All respondents affirmed that the Corridor Development strategy is critical to the restructuring of Msunduzi Local Municipality and is likely to succeed in achieving a compact urban form. The vision, strategic plans and policies adopted by Msunduzi Local Municipality encourages higher densities, and public and pedestrian oriented transport development. This is a strategy to address and transform imbalances in terms of the distribution of economic and social services. This distribution will take place in a manner that reinforces a sustainable vibrant compact urban form. Furthermore, as indicated by the municipal officials, all key interventions are aligned to national and provincial transformation and restructuring imperatives. The radical city spatial structure that focused towards the CBD is now being transformed through the implementation of the Edendale Corridor Development initiative. All respondents concur that the implementation of corridor development finds expression through a wide range of projects as proposed within the New Town Centre, which is identified as a

catalytic project that has the potential to unlock development of the entire corridor. This will provide a wide range of social, economic and recreational opportunities hence contributing to poverty alleviation, reducing unemployment, and improving the quality of life for the previously disadvantaged communities.

It is also significant to note that some of the key elements suggested by the respondents correlate with those that emerged from the analysis of the precedent case studies in Chapter Four. This includes the need for land acquisition along the corridor, strong political and institutional will and commitment and commitment to a transformative agenda to support the plan. It was noted that in the absence of a plan, it is not possible to allocate and commit the necessary budgets and financial resources for corridor development. Other important factors stressed included issues such as:-

- Stakeholder engagement and community participation;
- Technical approvals e.g. Environmental Impact Assessments (EIAs), SPLUMA, planning, land surveying, and land legal issues that form part of the procedural aspects of the process;
- Public transportation and road linkages;
- Internal road network system especially Non-Motorised Transport;
- Infrastructure provision (i.e. roads, water, sanitation, electricity);
- Funding and budgeting; marketing and branding:
- Creating an awareness to attract involvement of locals and businesses;
- The integration of internal-municipal sector departments (Planning, Transport, Infrastructure and Environment);
- Appropriate phased planning approach;
- Frameworks to be vision driven and not politically driven;
- Densification promoting various typologies; linking existing uses by developing the Core/ Town Centre; Developing and enhancing the public realm so it will induce private sector response;
- Having a sound in-depth knowledge of your markets such as informal and local entrepreneurship; and,
- Flexible and enabling town planning zoning regulations and promoting incentives for corridor development.

Some of the key challenges and shortcomings highlighted by the respondents during the interviews included:-

- A lack of inter-departmental and inter-governmental relations/collaboration;
- Environmental sensitive areas,
- Informal settlements located on strategic portions of land,
- Addressing land legal issues and land ownership,
- Institutional priorities that differ among internal sector departments and politicians which affects budget allocations,
- Political influence that has an impact on development priorities in the city, conflicts between politicians and planners;
- Planning that should be leading the city forward does not appear high on the city's agenda and lack of community participation.

The Ward Councillor argued that foreigners have come and opened businesses in the townships, which have disadvantaged the local community due to the lack of local skills and knowledge. Another key challenge underscored was the lack of funding to support locals to start-up businesses. It was noted that there is an urgent need for integration and alignment between sector departments such as Planning, Transport, Infrastructure, Human Settlements and Environmental. The argument was made that implementation remains the collective responsibility of all sectors of the municipality. A major concern expressed by the municipal officials was the city's static zoning regulations that controls property development is outdated, archaic. It is not aligned with the city's spatial vision and plans, which propose the restructuring of the city to achieve a more integrated city form. Provincial government officials acknowledged their limited role in the facilitation and implementation of corridor development programmes and project. They highlighted factors such as the lack of buy-in from politicians, the taxi associations and the Local Municipality, which was evident in their failure to tie their capital expenditure and budgets to corridor development projects; and unrealistic planning and designs for the area.

The interview with private consultants revealed that corridor development is often misapplied and misunderstood therefore a common understanding is necessary in the planning realm or else if used incorrectly it could lead to failure. Strong leadership and the materialisation of the Integrated Rapid Public Transport Network system was seen as another challenge to success. The Non-Government

Organisation representative stressed that the lack of road linkages in the road network impact negatively on the communities' access to various services and facilities and more especially to the planned development envisaged for the Edendale corridor. Other factors identified included the lack of community capacity building through participation so they can become proactive in their involvement of all future opportunities presented through development of the corridor. There was a consensus among all informants that it would take a long period of time between 10-30 years to a lifetime for the corridor to realise its full potential and achieve the desired outcomes. This point coincides with the reality of the precedent case studies where it was emphasized that a long term planning vision must be linked to budgets.

6.4. AN EVALUATION OF EDENDALE TOWN CENTRE IN THE ENC

In the following part of the dissertation, a critical analysis of the Edendale Town Centre is undertaken. This evaluation is placed within the context of the preceding chapters in order to link the case study with the principles and key performance criteria identified which forms the basis against which the Edendale Town Centre is analysed.

6.4.1 Chapter Two: The New Urbanism and Smart Growth Principles

The corridor development concept has been informed by the New Urbanism and Smart Growth theories. The relationship between the case study and the principles outlined in Chapter Two are tabulated and discussed below.

6.4.1.1 Movement Network/Connectivity

The movement framework as discussed in section 5.2.4.2 clearly indicates that the Edendale Node is well positioned, connected and is designed to facilitate accessibility, mobility and permeability for motorised and non-motorised transportation that will attract a wide variety of users. The creation of new linkages to key landmarks such as Edendale Hospital, BRT station, District Park and proposed Market. The road structure, hierarchy and creation of additional linkages to other parts of the city will also boost accessibility of the area.

6.4.1.2 Public Transportation

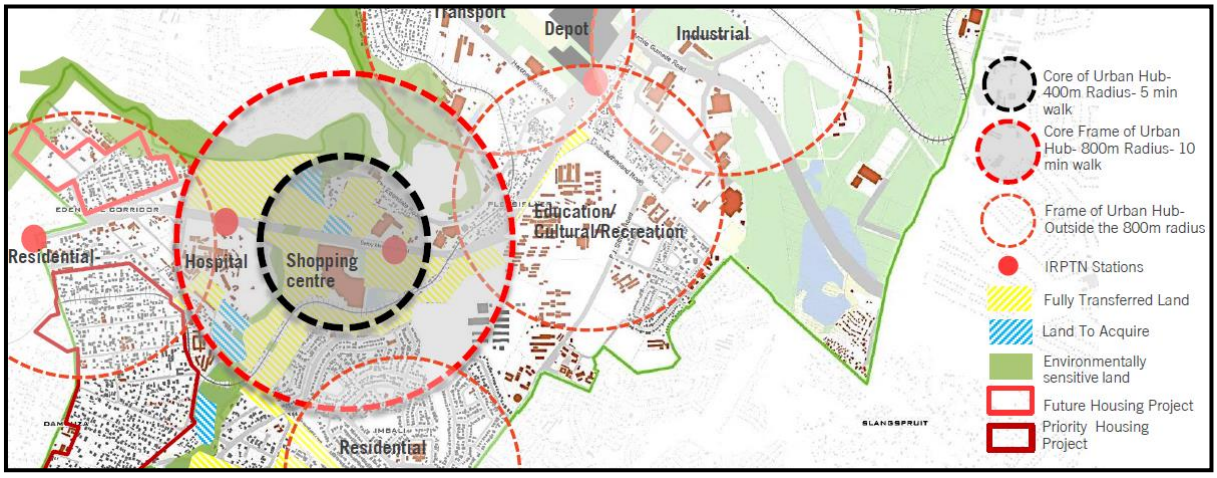
The New Town Centre is premised and designed on the principle of dependence on public transportation. The introduction of the IRPTN and the BRT System ensures large numbers of people will have access to safe, reliable and affordable transportation. This will also provide better connections

between the various parts of the city. These connections will act as a catalyst in creating vibrant, lively neighbourhoods that will attract residents, visitors and businesses along the corridor, which is also linked to pedestrian networks.

6.4.1.3 Walkability

Msunduzi has a Non-Motorized Transport (NMT) Masterplan in place, which promotes walking and cycling. The movement framework plan for the proposed New Town Centre has been designed to ensure that pedestrians are given high priority along the corridor since the majority of users are pedestrians. This includes appropriate infrastructure such boulevards with tree lined roadways; pedestrian and cycle paths; traffic calming pavements, sidewalks; pedestrian crossings; bus shelters and walkways in support of BRT and NMT viability. Furthermore, the core of the urban centre is at a 400m radius, a 5-min walk whilst the Core Frame is at 800m radius, a 10 min walk as illustrated in Figure 47.

Figure 47: The Core and Frame of New Town Centre



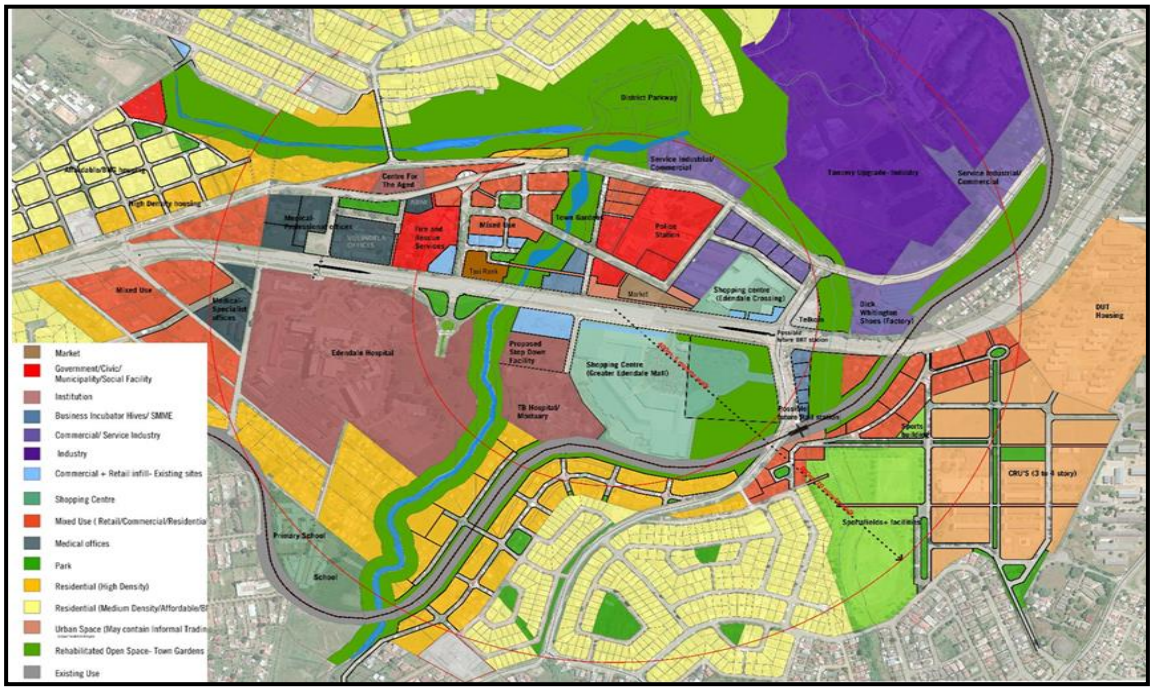
Source: Msunduzi, 2014

6.4.1.4 Mixed Land Uses

Msunduzi's IDP and SDF is based on the principles of compaction, integration, densification, restructuring with the aim to create greater density within vibrant, efficient urban areas. Hence, the New Town Centre Node promotes a diverse mix of land uses that includes commercial, retail; light

industrial on the ground floor and residential on upper floors. The Land Use Framework in Figure 44 (Chapter Five) indicates the mix of proposed land use for the new node. This greater mix is within walking distance and residents can access a wider range of series within walking distances at a 5-10-minute radius.

Map 22: Land Uses and Key Landmarks



Source: Msunduzi, 2014

6.4.1.5 Increased Density

The housing layout plans includes 3- 4-storey walk-up buildings designed around courtyards as depicted in Figure 46, which are predominantly residential and will ensure increase in thresholds in foot traffic. The proposed ratio of residential to retail is 80%:20%. The municipality has also acquired land for social housing in close proximity to the New Town Centre that will promote high-density residential development, which will increase patronage for the BRT, and thresholds for additional land uses along the corridor hence creating a more compact sustainable urban form. The success of the New Town

Centre will therefore be facilitated by multi-storey high-density developments that will surround the area, which will ensure social and economic vibrancy, and the permeable network will offer ease of movement and choice.

6.4.1.6 Quality Architecture and Urban Design

A critical component of the New Town Centre project is the integration of sustainability, which includes architecture, landscape, infrastructure design, and social environment that promotes beautification, aesthetics, attractiveness and sense of place that reflects the culture, distinctiveness and heritage of the community. It is a vision of *"African Urbanism"* that facilitates the true identity of the users' context. Some of the key aspects of architecture includes the orientation of buildings, solar control, rainwater collection for irrigation, and reuse of grey water, solar energy utilization and the use of alternative green technologies. These mechanisms especially address the challenges of access to water and sanitation within the area Landscaping issues include use of indigenous landscape material, creation of good quality public environment through street lighting, signage, appropriate tree planting, seating area; creation of an environment that encourages pedestrian movement and provides safe sidewalks and public open spaces. This also includes building guidelines in terms of coverage, setbacks and floor area ratios that are proposed.

6.4.1.7 Quality of Life

According to Iyer (2014) future projections indicate that the New Town Centre will accommodate over 600 000 people by 2050 and has the potential to offer unprecedented job opportunities and access to surrounding educational, health and recreational facilities for the community. The implementation of the various development projects as discussed under the phasing and implementation of projects in Section 5.2.4.2 will further enhance the quality of life through the rehabilitation of open spaces, upgrading of roads, efficient public transportation, infrastructure, establishment of NMTs and access to a wide array of various services. Phase 1 includes the development of the market and SMME's incubator, which reflects the importance of the informal sector in the area. The government buildings in respect of the existing police station reinforces the symbol of the role of the public sector in terms of safety and security, the urban square which emphasizes the notion of social gathering were people can interact together with the landscaped streets will become a place of celebrated spaces with quality streets.

6.1.4.8 Community Participation and Collaboration

The Neighbourhood Development Partnership Grant (NDPG) focuses on public investment funding with the aim of leveraging community and private investment to unlock and stimulate economic and social development in poor, disadvantaged townships located on the periphery. As such, the plan for the New Town Centre has been designed to attract private investors and community involvement as all projects have been aligned to specific stakeholders. The Msunduzi Municipality is currently in the process of appointing a Communications Specialist who will facilitate the process of ensuring all citizens, affected public agencies, representatives and interested parties are kept informed, are able to share responsibility, take ownership and get involved in the development of the Edendale New Town Centre. The target audience includes Ward Councillors, Ward Committees, and the public and affected communities.

6.4.2 Chapter Three -Corridor Development

As indicated in the previous discussions modernist principles and apartheid planning have profoundly influenced the economic, social and physical landscape of Msunduzi hence, the need for transformation. Planning responses and interventions have recognized the corridor development strategy as a key spatial restructuring element to guide and manage the future growth and development of the city in order to overcome the spatial, social and economic inequalities that have been produced through the legacy of Apartheid. It is planning and development initiatives are informed by the corridor development concept over its entire area of jurisdiction. All future settlements, social and economic development opportunities are encouraged to be directed and channelled into development corridors and nodes that are adjacent to or that link to the main growth centre. Transportation networks leading into and out of the Central Business District promote a mix of land uses fronting onto major road arterials in order to better connect communities to services, jobs, recreational activities and opportunities. The road network system through the introduction of new road linkages will create a network of well-connected urban centres. This will also open up previously disadvantaged isolated areas to new opportunities that will integrate the city as a whole thus supporting change in the nature of Msunduzi's urban form. A series of nodes have been identified at significant intersections along transportation corridors, which will serve to support and reinforce the corridor. More importantly, the establishment of a new polycentric city with a multi-nuclei structure will create an integrated compact city system where roads/public transport and land uses are mutually reinforcing. This will facilitate access to social, economic and recreational facilities to the poor living in the townships. As outlined in

various strategic plans and policies the principles of sustainability, integration, urban densification and quality environment is central to restructuring the city into a sustainable compact urban form.

The Msunduzi SDF promotes development nodes as areas with potential for economic development and the provision of a range of services. As indicated in the case study, the Edendale-Northdale Corridor provides the linkage of the previously disadvantaged township in the south-west with the north-east quadrant of the city. Furthermore, significant nodes have been identified along the length of the corridor. The Edendale Hospital Node, which is the subject under investigation, is currently being planned and developed into a New Town Centre within the Edendale Township. It is envisioned that the major investments being made into the New Town Centre will result in a high density-mixed use, high quality environment supported by an efficient public transportation system that will provide the thresholds in support of social, economic and recreational activities. As outlined in the Chapter Three, for corridors to function optimally some of the critical elements required are public transport, major transportation routes, and human interaction, linkages between nodes, available services, and public investments, which are characteristic of the proposed New Town Centre. Section 5.2.4.1 clearly outlines that after having followed a vigorous criteria based evaluation, the Edendale Hospital Node was earmarked for the development of a New Town Centre as part of the NDP-Urban Network Strategy. The decision was based on an urban network model that is transit oriented for improving the spatial structure of the city in the quest to advance transformation and reconstruction.

6.4.2 Chapter Four- Precedent Studies and Lesson Learnt from Practice

The success elements and learning lessons extracted from Chapter Four precedent studies include:-

- The **i**mplementation of long term planning; the integration of transport and land Use Planning;
- Enabling legislative frameworks in the form of Land Use and Planning Schemes;
- Efficient and affordable public transport, community/public participation and consultation;
- Political will or leadership in the form of a champion; and,
- Leadership in governance, and Institutional Support.

Some of these points have already been covered in the above discussion therefore only those, which have not been addressed, will be discussed below.

6.4.2.1 Implementation of Long Term Planning

At a strategic and conceptual level Msunduzi's IDP 2030 vision and the SDF 2050 vision which spans over a 35-year period elaborates and emphasizes on the restructuring of the post-apartheid city and the consequential integration of social, economic, institutional and physical aspects of development. In addition, various transportation plans and strategies such as; the Comprehensive Integrated Transportation Plan, Edendale-Northdale Corridor Plan, Non-Motorised Transport Master Plan and the IRPTN/BRT indicates a profound influence on the development of the proposed New Town Centre. These higher order policies and strategic plans have been translated into the New Town Centre planning and development initiatives, which reinforce the spatial vision of the city. This includes the Concept Plan, the Movement Framework, the Land Use Framework and urban design and layouts aimed at practical, sustainable and high quality environments.

6.4.2.2. The Integration of Transport and Land Use Planning

Msunduzi's Comprehensive Integrated Transport Plan (CITP) 2010-2015 is aligned to the National, Provincial and District transport vision that has a strong emphasis on improving the quality of life for transport users and the sustainability and support for economic and social upliftment. Msunduzi's development vision is '*To provide a high standard, accessible, efficient, integrated transportation system with a public transport focus, for the movement of people and goods, providing a high level of mobility and accessibility to services and opportunities in a safe, sustainable and affordable manner'. (CITP, 2010:9).* This has been translated into four goals and is one of the key focus areas with the emphasis on integration of land use and transport activities. It seeks to promote public transport and non-motorized transport along the Edendale - Northdale Corridor by improving infrastructure and services through integrated transport and land use developments. To this end, the New Town Centre proposals together with the various transportation studies indicated above proposing intersection upgrades, public transport stops, public transport hubs, pedestrian safety crossing among others. Msunduzi's Spatial Framework Plans advocate the establishment of nodes and corridors as spatial structuring elements to manage and guide future development to fulfilling the IDP Vision. Arup (2006) described a corridor *as "a movement system where activities gain from the accumulation of traffic"*. Activities along road access promote ease of access to these activities and equity to a greater number of people.

Nodes are described as areas where high intensity land uses, people and activities are concentrated and that corridors provide linkages between these areas of social and economic activities placed within nodes and efficient access to opportunities, as such corridors include transport routes. The application

of these concepts results in a new polycentric structure, which facilitates access to employment opportunities, retail/shopping, various social services and recreation areas. The transportation networks by means of existing and new linkages integrates the city as a whole creating an integrated, compact city system whereby road/public transport and land use arrangement is mutually reinforcing. Hence, redressing imbalances inherited from the Apartheid legacy. Studies have revealed that the IRPTN will be the driving force that will transform the city bringing a range of transportation, land use and densification opportunities. The IRPTN therefore forms the backbone of the Edendale New Town Centre making the various land uses highly accessible and vibrant. Therefore, the area has been designed on the principle of a 5-10 -minute walk from the proposed BRT station.

6.4.2.3 Legislative Frameworks

The Urban Design Plan proposes the introduction of Form Based Codes (FBC) into the Planning Scheme that will regulate developments to achieve a specific urban form with an emphasis on the relationship between street and buildings, pedestrian and motor vehicles, public and private space, multiple buildings, a block and a neighbourhood. They create predictable public realm by controlling physical form with a focus on land use regulations. Their goals include mixed uses that are walkable distances of commercial, offices and residences; promotes walking through greater emphasis on pedestrian spaces and promotes transit by establishing nodes of greater intensity concentrations.

6.4.2.4 Political Will and Leadership

The viability of the corridor development strategy is clearly dependent on the political will and institutional/inter-governmental relations in order to facilitate the necessary planning, allocation of requisite public resources and the focus of local government development interventions around the implementation of project proposals. As indicated above, the national government are playing a major role through the provision of multi-million rand grant funding towards the implementation of the urban network strategy. Corridor development will be implemented through major investments being channelled into the New Town Centre development. Furthermore, provincial, local government officials and politicians in partnership are actively involved in driving reconstruction of the city and bringing economic, social and recreational uses in close proximity to the marginalised sector of society.

6.5 CONCLUSION

From the ensuing discussion and the researcher's perspective it is noted that corridor development cannot be applied in isolation but in relation to other concepts such as nodes, land uses, public

transportation, high density and pedestrian-friendly planning layouts. Furthermore, the interconnectedness between these concepts complements each other in shaping the urban environment, which is viewed as the glue, or the stitching together of all parts of the city. It is important to acknowledge that the implementation of corridor development is not only trying to correct the spatial issues of Apartheid planning, but the end product - which is a more integrated sustainable city form bringing people closer to where they live, work and play. The intention is *"to increase built area and residential population densities; to intensify urban economic, social and cultural activities and to manipulate urban size, form and structure and settlement systems in pursuit of environmental, social sustainability benefits derived from the concentration of urban functions."* (Burgess, 2000:9).

The interviews and research findings that have been reviewed in this section were found to complement the theoretical component of the research methodology. This framework intended to test the hypothesis of the research. It was linked to the initial questions presented in Chapter One. The meanings, application, challenges and issues based on the professional opinions of the various actors were probed. All respondents corroborated that the development of the Edendale-Northdale Corridor has the potential to create a well-defined compact urban form, which will address various social and economic deficiencies experienced by the poor and low-income areas in Msunduzi.

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS

7.0 INTRODUCTION

In order to conclude the research this chapter will concisely summarise whether the main aim and objectives as set out in Chapter One have been successfully achieved. This will be done by consolidating the research data collected, key findings, and then linking them to the main aim, objectives, initial questions and hypothesis. This will be followed by concluding remarks and recommendations.

As outlined in the starting chapter the primary aim of this dissertation was to research *"corridor development as a strategy, its history and expressions in theory and practice; and to evaluate whether it can achieve a compact urban form in Edendale".* The conceptual framework lenses, which underpinned the research, were based on the elements of the New Urbanism and Smart Growth theories as identified and discussed in Chapter Two. A detailed literature review explored the corridor development concept and the compact city model among other interconnected concepts, which presented a number of key success elements in Chapter Three. An extensive analysis of both positive and negative precedent case studies, which comprised both international and national examples, generated several valuable lessons learnt as outlined in Chapter Four. The desktop data gathered from secondary sources in the preceding Chapters Two to Four identified critical elements against which the Edendale New Town Centre case study was analysed and the outcomes discussed in Chapter Five. Further case study research in Chapter Six highlighted the key findings of the structured interviews with selected informants in an attempt to test the hypothesis as outlined in Chapter One.

7.1 RESEARCH FINDINGS IN RELATION TO THE AIMS AND OBJECTIVES

The main aim of this study was to research *"corridor development as a strategy, its history and expressions in theory and practice; and to evaluate whether it can achieve a compact urban form in Edendale".* As outlined in Chapter One, the analysis has been undertaken based on a qualitative research methodology where secondary and primary sources of data were used as tools to analyse the case study. The Edendale Township was chosen due to its location on the periphery of Msunduzi Local Municipality. It epitomises a typical South African dormitory town far removed from other parts of the city due to decades of modernist and Apartheid planning ideologies. The city's distorted spatial urban structure characterised by racial and socio-economic segregation; the consistent perpetuation of urban sprawl by informal settlements. Low-density residential estates reinforce an unsustainable, inefficient

city form, which presents a key challenge to urban planners and development specialists. The quest to radically restructure and transform the current inefficient spatial form by connecting and integrating places of live, work and play gave rise to the central focus of this dissertation. The research aim therefore acknowledges that corridor development can be an effective strategy that has the capacity to build a new compact-integrated, sustainable post-Apartheid city. It has the potential to improve the living standards of the majority poor living in disadvantaged areas. If managed optimally, a development corridor can ensure equity of access to quality services and facilities located in close proximity to social amenities and economic opportunities. In order to address fully the main research aim adequately, multiple objectives were outlined in the first chapter, each of which addressed a specific facet of the overall research. While each of these was unpacked in detail in the various chapters of this research, a synthesised discussion of each is provided as part of this chapter.

7.1.1 Understanding Corridor Development and Compact Urban Form Concepts

The literature review in Chapter Three presents an in-depth investigation on the Corridor Development and Compact City urban concepts. The source documents and studies reviewed attempted to understand how these concepts have been developed, were understood, adopted and applied within the broader international-national to local historical contexts. However, before probing any further the researcher acknowledged the need to conceptualise the meanings of other interrelated concepts underpinning the research topic. In this regards the meanings and underlying dynamics of urban sprawl, urban form and urban structure were identified and interrogated. Urban sprawl was described as a dispersed, uncoordinated, uncontrolled urban expansion that was triggered by the Industrial Revolution in the late eighteenth-early nineteenth century. Although, a phenomenon that occurred under very different circumstances in both the global North and South, the associated consequences were similar in that it contributed to an unsustainable, undesirable, inefficient city form and structure. Therefore, in reaction to the critical urban problems provoked by urban sprawl the need to restructure cities into more compact integrated urban landscapes was inevitable.

The research then moves on to discuss the Compact City urban form with the consensus that it is opposite to urban sprawl, more energy efficient and less polluting, with dwellers living closer to work and shopping facilities that promotes community-oriented social patterns. In the United States [US] is known as Transit-Oriented Developments (TOD) and in neo-traditional towns promoted through the smart growth movement. Burton (2000) goes highlighted the need for sustainable models for towns and cities, defines it as a high-density-mixed use city, based on an efficient public transport system, and

encourages walking and cycling in contrast to car-oriented urban sprawl. The methodology proposed to achieve compactness was through intensification, consolidation, infill and densification. As such, this description pertinently encapsulates the focal elements of this research. Furthermore, in pursuit of environmental, social and sustainability, the benefits derived includes; reduced travel, social equity, and better access to services, efficient utility, infrastructure provision and revitalisation of inner cities. Within the South African context, the need for compaction and integration emerged during the 1980's in academic circles. Professionals, academics and theorists supported this approach. It has promoted the integration of urban activities and thus, has been recognized as an effective tool to achieve the corridor development. As discussed in Chapter Three, the quest to overcome the socio-spatial fragmented and skewed urban form left by the legacy of apartheid policies and modernist planning paradigms, corridor development received considerable support to promoting a compact city urban form model.

It is evident from the analysis that the corridor development concept emerged as early as 1880's and was linked to major transportation networks, which led to the notion of linear suburban development or linear cities. Later the concept evolved in the 1900's to be described as the stringing together of villages along major roads to the more recent '*necklace of beads approach'* that described the stringing together of larger settlements or growth centres/nodes and/or regions along transportation corridors called sustainable development corridors. However, within the South African context movement corridors were defined as high volume transport routes that linked major urban centres that are highly concentrated with passenger and freight movement. In contrast, lower order arterials or main roads could be used as development corridors. The desktop review further emphasised that these corridors support the principles of integration, intensification and containment, and to function optimally the critical elements needed includes public transport, transportation routes, nodes/urban centres, linkages between nodes, human interaction, services and public investments. In addition, various economic, political, institutional and physical preconditions are necessary. It is further emphasized that in order for corridor development to be successful, it cannot be implemented in isolation of these interrelated key concepts and elements. The research also highlighted that in the 1990's corridor development was statutorily prescribed in various key policy documents, legislation and strategy frameworks, which emphasized the prioritisation of public transport in support of the compact city agenda of urban spatial restructuring.

The discussion finally underscored that these models are powerful tools that encompass critical elements that promote greater physical and socio-economic integration, compaction, urban intensification, high-density development, mixed use development linked by efficient high quality public

transport and non-motorised transport. The key potential being to integrate and bring places of live-work-recreation together that would facilitate a desired sustainable urban form and transport pattern development. It was acknowledged that whilst a wide range of spatial ideas and concepts influenced planning during the post-1994 period in response to the problems that resulted from the legacy of Apartheid, which included spatial fragmentation, deep economic and social inequalities and poverty. It is evident that these approaches emerged as the most prominent, innovative mechanisms in response to the major social, economic and environmental problems that confronted cities throughout history. The origins, historical significance, academic debates and key elements that underpinned these approaches as discussed in the preceding chapters attested to this fact.

7.1.2 Learning Lessons from the Precedent Case Studies

The research incorporated a precedent best practice study on experiences of cities on a global and national scale. The scope of the investigations included four cities namely - the City of Cleveland in Ohio (United States of America), Curitiba in Brazil (South America), Ankara in Turkey, and the City of Johannesburg in South Africa. The main aim was to understand and assess how cities across the globe implemented the corridor development concept. More importantly, drawing learning lessons from the valuable insights and challenges that led to their success or failure. The analysis identified best practice benchmarks and criteria against which the Msunduzi Local Municipality's case study was assessed. The discussion captured the historical backgrounds, long-term vision, planning and development initiatives and approaches adopted.

These experiences revealed that the implementation of corridor development have been widely initiated and promoted in reaction to population growth, urban sprawl, congestion, pollution, social exclusion, climate change, health and well-being amongst others. It further demonstrated that the shift to a compact city urban form could be facilitated through the integration of high density, mixed land uses, which are based on efficient public/pedestrian transport networks. Such an approach has created more equitable, accessible, liveable, vibrant and sustainable societies i.e. giving people access to a diverse range of social, economic and recreational opportunities, and more importantly ensured the effective and efficient utilisation of resources, land, infrastructure and services.

In the case of Curitiba, many cities in the world have benefitted from their experiences, which provided useful lessons that served as a catalytic example promoting the corridor development concept. Studies revealed that the success of Curitiba was attributed in part to a mixture of an autocratic political leadership approach, innovation, pragmatism, technocracy and continuity. In addition, a number of

difficult decisions had to be made which were unpopular with local businesses and communities. In the instant of another success story being Cleveland, the plan for the Euclid Corridor was based on mass transit that linked two major urban centres, which served as a catalyst to regenerate and revive the city. This included a compelling long-term vision and strategic goals that promoted long-term economic growth, public transit efficiency and community development. However, contrary to these case studies, the failure of Ankara's South Western Corridor (SWC) was attributed to the lack of public investments; continued dependence on private car rather than the shift to public and on-motorised transportation; and, a less dense urban form that was predominantly residential in character rather than mixed land uses.

A key lesson learnt from the above examples is that the transformation of cities cannot be simply replicated. As proven in the Euclid Corridor in Cleveland, only certain components of the Curitiba System could be assimilated into its local context. What is clearly demonstrated is that even though the successes and failures of cities in the implementation of corridor development are unique to their contexts in terms of political, historical, social/demographic, economic spatial structure and environments yet, these examples do set benchmarks that offer ideas that can be used for sustainable planning of cities.

7.1.3 The Application of the Findings to the Local Case Study (Establishing the Evaluation Criteria)

As highlighted in the preceding chapters the following set of assessment criterion was identified to be used as a tool for evaluating and establishing the performance of the Edendale Town Centre Node, which was selected as the subject of this investigation. Chapter Two comprised a detail discussion of the key theories namely - the New Urbanism and Smart Growth theories that provided a theoretical grounding and a lens/ framework through which the research was guided. As such, these theories mirrored many key spatial principles of corridor development and the compact city concepts against which the Edendale Town Centre was assessed. These included-

- The movement network/connectivity;
- Public transportation, walkability;
- Mixed land uses;
- Increased density;
- Quality architecture and urban design;
- Quality of life; and,

- Community participation and collaboration.

Chapter Four highlighted the common elements that particularly influenced the success and failure of corridor development initiatives at a global and national scale. The success elements and learning lessons extracted from the precedent studies included:

- The implementation of long term planning;
- The integration of transport and land use planning,
- Enabling legislative frameworks in the form of Land Use and Planning Schemes;
- Efficient and affordable public transport,
- Community/public participation and consultation; and,
- Political will or leadership in the form of a champion, leadership in governance, and Institutional Support.

7.1.4 An Evaluation of the Edendale Case Study Area

The case study looked at the historical evolution of the Msunduzi Local Municipality over the past hundred and fifty years. It is quite evident that the spatial consequences of apartheid characterized by social and economic inefficiencies have resulted in unsustainable settlement patterns that has kept people trapped in poverty who are far removed from urban activities and opportunities. Since democracy, the Msunduzi Local Municipality like all other South African cities have been plagued with generic urban problems, and through the various policies and framework, plans are attempting to implement the corridor development strategy with the aim to restructure and transform. Through the coordination of public and private investments, it is anticipated that the implementation of the corridor development initiatives with the aim to restructure and reintegrate the city holds much promise to achieving a compact integrated urban landscape. The researcher has illustrated through the evaluation of Edendale New Town Centre case study, which is currently under construction, that the various planning and development project proposals as discussed in Chapter Five are geared towards achieving this vision for the city, which will also serve as a catalyst to unlock the development potential of the entire corridor. As previously mentioned by Dewar (2004), the success or failure of corridor development relies on the existence of certain key preconditions and therefore should not be viewed as a quick fix solution. Bassa (2015) further asserted that corridors are more about beginnings rather than the end result since they develop as a series of points along a line (i.e. beads on string) and through time grow towards each other therefore, preconditions are necessary for their successful evolution.

As reflected by the precedent examples, corridor development is indeed a long term, inevitable process that has no blueprint or broad-brush approaches, even though the elements and principles remain constant the contextual conditions within which they occur are unique and can therefore produce very different outcomes. However, it has been argued that given the current situation of Msunduzi the prospects of realising the optimum success of corridor development will require that various factors be taken into consideration and prioritized. Some of these key factors and criterion established in the research will serve as a guideline to assist the municipality in understanding, planning and implementing the corridor development projects successfully. The research findings also revealed that the corridor development concept could not be implemented in isolation of other interrelated key concepts and elements. There were also valuable insights and lessons learnt that emerged from the precedents, which again underscored the reality that corridors do take decades to reach their full potential. From the case study assessments some of the issues of concern raised included the need for a more collaborative integrated approach within internal sector line departments; inter-governmental relations, political support; public-private partnerships, community consultations, funding and capacity building were highlighted.

7.2 REVISITING THE HYPOTHESIS

As set out in Chapter One the research proposed to investigate *"Corridor development as a strategy, its history and expressions in theory and practice; and to evaluate whether it can achieve a compact urban form in Edendale*". This assertion was critically evaluated through the research process to ascertain its validity. The preceding chapters highlighted the various challenges and problems that led to the disjointed, fragmented, unsustainable, urban spatial structures of cities. This was followed by the development of a detailed and comprehensive literature review. The findings of the research were augmented through an investigation of international and national precedents and an evaluative analysis of the case study in Edendale, which included structured interviews. All of the foregoing materials have provided sufficient evidence that corridors can integrate distorted urban landscapes and create socially, spatially and economically integrated communities. It can therefore be concluded that the stated hypothesis - "*Corridor Development as a strategy has the potential to achieve a Compact Urban Form in Edendale.*" - is true and that Corridor Development as a strategy has the potential to restructure and transform Edendale within the Msunduzi Local Municipality into a compact integrated urban form.

7.3 RESEARCH LIMITATIONS

As indicated in Chapter One, a qualitative methodology has been employed in the research process. This is suited to the design approach, since this allowed the researcher to conduct interviews with key stakeholders in the public and private sector. With respect the case study, due to this being a short dissertation and the time constraints involved, the whole of the Edendale Corridor could not be investigated. As such, only the Edendale Town Centre Node was selected for the evaluative analysis. Initially it was proposed that all interviews would be conducted within two weeks in 2016. However, due to some of the consultants being out of the country, some interviews were conducted much later in 2017. Also during the interview period, there was institutional upheaval[8] in the Msunduzi Local Municipality, which contributed to the lack of availability of additional local and provincial officials being included in the project. All interviewees included were key officials and consultants who have been involved with the planning and implementation of the Edendale Northdale Corridor project and were able to provide in-depth observations about it. It should be noted that there is only one Ward Councillor actively involved in this project and thus an interview was held with him to gauge the political perspectives about the proposed corridor development project. The researcher[9] has worked on and continues to be actively involved in various planning aspects of the project and thus it is felt that the information gained was adequate for the requirements of this research. Whilst it could be argued that the personal involvement of the researcher could have led to a level of bias in the research observations, this has been counter acted by the observations of other interviewees.

7.4 RECOMMENDATIONS

The Edendale New Town Centre case study presented a good example, which confirmed that corridor development does provide a strategy to restructure cities to achieve a compact urban form. As such, the following recommendations are made in light of the above research findings:-

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[8] An investigation commenced into the actions of the then Msunduzi Municipal Management.

[9] The researcher is employed in the Planning Department of Msunduzi Local Municipality and is currently addressing the acquisition of privately owned land parcels, the SPLUMA applications for changes in land use rights and zoning, and the reviews of Environmental Impact Assessment (EIA) applications.

- **Project Delivery Unit**

The Msunduzi Municipality is encouraged to formulate a specialised Project Delivery Unit (PDU) that will coordinate the phasing, delivery and implementation of all corridor development projects through the integration of internal line departments (i.e. infrastructure, planning, transportation, environmental, human settlements). Decisions regarding project selection, prioritisation and packaging; cost-benefit analysis, sourcing of funds through public-private partnerships and budget allocations. Project management to facilitate monitoring, evaluation and that the desired outcomes ultimately realise the vision of the city.

- **Revision of Land Use Scheme Regulations**

There is an urgent need for a comprehensive review and update of Msunduzi's Land Use Scheme that will promote a diverse and intense mix of land use zones along the corridor. This change would need to be consistent with the proposed Land Use Framework for the New Town Centre. The change in zoning and land uses would need to promote high-density developments (i.e. highest densities to be along the main corridor that will serve as landmarks), building guidelines in terms of coverage, setbacks and floor area ratios that will be flexible. Of specific importance would be the promotion of mixed uses that are at walkable distances to commercial, offices and residences i.e. greater emphasis on pedestrian spaces that promotes walking and cycling. The creation of new zones or the amendment of the existing Town Planning Scheme to incorporate Form Based Codes (FBC) that permit a wide range of mixed uses such as recreational, entertainment, commercial, residential, community, service industrial and other activities. Integrated Rapid Public Transport Network: The first phase of the project is currently underway. A Project Delivery Unit should also ensure that this project runs concurrently with the implementation of the New Town Centre proposals. The promotion of high residential densities along the public transport corridor will ensure thresholds that will make the BRT system viable and will generate higher thresholds for public facilities, vibrant local markets and small-scale businesses. Policies that reinforce densification within five minutes around stations will hence increase efficiency and viability.

- **Urban Design Guidelines**

The introduction of Form Based Codes (FBC) would be incorporated into Msunduzi's Land Use Scheme that regulates developments to achieve a compact urban form with an emphasis on relationship between street and buildings, pedestrian and motor vehicles, beautification and upgrade of public and private spaces. An important aspect is the integration of sustainability across various sectors such as architecture, landscape, infrastructure design, and social environment that promotes beautification, aesthetics, attractiveness and a sense of place. This will reflect the culture, distinctiveness and heritage

of the community i.e. *"African Urbanism"* and will facilitate the true identity of the users' context. The creation of high quality public spaces through establishing tree line boulevards, greening, street furniture, lighting, paving, pedestrian signals, benches, bus shelters that will promote safety and security of pedestrians and celebrate the gateway and key entrance point into the Edendale area.

- **Design Review Committee**

The Msunduzi Local Municipality is encouraged to establish a Design Review Committee that included representative from a multi-disciplinary professional team and line departments. The function of the committee will be to evaluate all architectural plans to ensure they are consistent with the design philosophy, building codes and that the city's vision is not compromised.

- **Comprehensive Land Audit**

The Msunduzi Municipality is encouraged to undertake a comprehensive land audit of its land inventory. This can be used to verify and confirm ownership of council owned properties, which can immediately be made available for residential, commercial, industrial, and community facilities.

- **Marketing and Branding**

A Marketing and Branding Strategy needs to be formulated that will incorporate advertising and marketing of the New Town Centre's character and identity in order to attract a range of economic activities, private local investors/investment into the area.

- **Engagement with Civic Society**

Evidence from contemporary literature, case studies and practice have indicated that a key issue related to the successful implementation of project is a focused engagement process with stakeholders including members of civic society. The Edendale/Northdale Corridor development strategy impacts on a diverse grouping of residents who may have different views about the desired outcomes of projects linked to the corridor. It is important therefore that the Msunduzi Municipality formulate an over Public Participation Plan, which addresses the impacts and outcomes of the development corridor, projects on surrounding communities[10]. Such a strategy should be managed in close tandem with individual projects and the identification of affected and interested parties. At present, the Edendale Development Forum is a Non-governmental Organisation, which would be able to assist in the preparation of such a plan, but there would need to be close liaison with the Ward Councillor as well.

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[10] In some instance there may be short-term disruption to traffic whilst road are being upgraded and residents would need to know that this is a short-term inconvenience.

- **Identification of a Champion**

A key requirement is the identification of a champion to lead the implementation of the projects in the Edendale New Town Centre and later along the development corridor. Contemporary research and practice has indicated that it is necessary to have an identified personality or small group whose responsibility is to ensure that development in the corridor is sustained over a longer period. It is proposed that this person/s could be accommodated within the Project Delivery Unit (PDU) but would need to liaise with officials in the municipality so that there is evidence of political buy-in. A critical element is that there is consistency in terms of approach and implementation strategies so that the public and private investors are confident about positive outcomes regarding project completion and official cooperation in the corridor development area.

7.5 CONCLUSION

This research is based on proposed planning and development initiatives for Msunduzi Local Municipality in terms of promoting the restructuring and reconstruction of post-apartheid cities in South Africa. Substantial investments are being made into the Edendale Town Centre Node to stimulate and accelerate investment in poor, underserved townships through the corridor development strategy. Therefore, it will be useful to undertake further research in the future in order to assess the level at which these proposals and efforts have been implemented and how successful it has been in achieving its original intent. This will also contribute further to the current debates reaffirming the positive contribution of corridors as an effective urban spatial restructuring tool. Whilst Msunduzi Local Municipality is striving towards integrating places of work, live and play through the corridor development strategy, it has to be acknowledged that there are various challenges and issues that need to be reckoned with as highlighted above. This strategy will only succeed if the municipality gives priority to ensure that all necessary economic, political, institutional and physical preconditions are met prior to implementation. Finally, as stated by the private sector consultant in the interview process - *"if the municipality continues business as usual, the current fragmented form of development will continue".* This comment indicates that there will need to be a comprehensive buy-in to urban restructuring and city change if local municipalities are to redress the spatial and socio-economic legacy of the past.

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INTERNET RESOURCES

- Map of Pietermaritzburg: apartheid city model **Source: http://www.pmbhistory.co.za**
- **http://en.wikipedia.org/wiki/sustainable_design** **Sustainable design** – Wikipedia, the free encyclopedia.mhts,
- *http://**www.cnu.org/***

APPENDIX ONE: QUESTIONNAIRES

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 1: How would you describe the Corridor Development Concept?	
R1- It is the physical arrangement and organization of space based on a transit-oriented model with a focus on integration of land use and transport planning. It is used as a mechanism to improve efficiency of the city whereby capital investments are channelled into these movement routes that are linked to the CBD. It gives space a particular order and form made manifest through the application of various spatial concepts and place making imperatives.	Is development that prioritizes public over private transport in order to ensure easy access to social and economic services? It is characterized by high-density development located in close proximity to transport networks to create thresholds to support an efficient public transport system, social and economic facilities. Furthermore, corridors in this case the Edendale Corridor connects urban centres to each other i.e. nodes, which generate the mass movement of people, goods and services.
R2- This is a concept developed with the sole purpose of responding to the spatial inequality. Currently, Pietermaritzburg still reflects an apartheid City, were majority of residents, especially workers still reside in the Southern part of the city, whereas most of them work in the Northern part of the City, where there are various employment opportunities. The sole aim of the Corridor Development Concept is an endeavour by the municipality to respond to spatial fragmentation by linking the Northern Areas and Southern Areas with the objective of creating job opportunities, human accommodation, public transport facilities and other related services along this Corridor.	
Question 2: What is your understanding of Compact Urban Form?	
R1- The compact urban form responds to the reality of urban sprawl. The fragmented, ineffective mono-functional character such as the	A Compact urban form reduces travel distances and costs because of the concentration of multiple activities. This also encourages the use of other

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
separation of space, race and incomes of apartheid cities by promoting the principles of integration, compaction and densification of spaces i.e. land uses that will reduce travel distances and costs of the poor located in the outlying areas of the city. It is also attached to contemporary debates on the creation of smart sustainable and resilient cities. An approach to achieve a compact urban city form would be the adoption of the corridor development strategy.	modes of transportation like non-motorised transportation since people will be motivated to walk and cycle to their destinations without which this will not be possible. The poor who cannot afford private transport will benefit and this will alleviate traffic congestion as currently private mini bus taxis are the most popular mode of public transport in the area.
R2- compact urban form is a concept of encouraging more densification in the Central Place of the City and discourages urban sprawling. In terms of the post-apartheid legislation, like the Development Facilitation Act (DFA) and the Spatial Planning Land Use Management Act (SPLUMA), which has now repealed the DFA, a strong emphasis is made that development should be encouraged within the city centre. This is where services are readily available. Development must be discouraged at the edge, or outskirts of the city, where services are not available. In their activities of changing the development of the City, Town and Regional planners, are responding to these legislations whereby they are encouraging densification in the City Centre.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 3: Can the Corridor Development Concept be used as a restructuring tool to achieve a Compact Integrated Urban Form in Edendale?	
R1-Yes, in addition to my previous comment it is the only mechanism that can bridge the divides in our cities. In Edendale, it is being strategically applied to bridge the previously disadvantaged populations to the city through the advancement and emergence of a compact integrated city landscape. It has the potential to unlock development in the area and achieve positive place making. The far removed and isolated communities in townships like Edendale can now be linked and connected to various components of the city as a whole. It most certainly would yield a definite guiding development framework but its implementation remains the collective responsibility of all sectors of the municipality.	Yes, most definitely without corridor development we will not be able to achieve this compact urban form because it serves as an integrator that integrates land uses and urban centres located in various parts of the city. It makes it easier for the people to travel and move around.
R2- Absolutely, throughout major cities of South Africa, National Treasury, who is the custodian of budget in the country, has decided to take radical action in transforming major cities, which also includes Msunduzi Municipality by investing millions of rands into the development of townships. The sole purpose being the transformation of spatial, economic and social form of these former disadvantaged areas, especially where Black South Africans reside. Therefore, by creating a Compact Integrated Urban Form the history of Edendale will change whereby there will be job opportunities, good services, good public transport mode and proper sustainable housing provisions.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 4: What are the most important elements/factors required to promote Corridor Development and to achieve the desired compact urban form in Edendale?	
R1 a. Land arrangements and ownership b. Strong political will and commitment c. Understanding a position to radically bring about transformation d. Institutional commitment to support the plan i.e. in the absence of a plan you cannot commit to budgets e. Public and Community participation f. Technical approvals (EIA's, SPLUMA, Planning, Land Survey, Land legal issues). g. Community ownership of the plan	a. Road linkages will promote easy access and make the city more permeable b. Public transport c. Internal road network system especially non-motorised transport d. Infrastructure e. Institutional and political support f. Funding
R2- There has to be a buy in and understanding of the concept. Town Planning is all about bottom-up approach, this is because planners need to plan with the locals not to plan for the locals. Local people will need to own and understand the concept, by instilling this norm; people would own the plan. In this instance, it will become easy to implement the plan so that it becomes sustainable. Other factors include but are not limited to availability of infrastructure services, security and elimination of restrictive conditions by relaxing planning legislation. This will open up the Edendale Corridor.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 5: What projects and strategies are currently being planned or implemented to promote the development of the Edendale Corridor?	
R1- The municipality's IDP and SDF identifies and promotes the development of the Edendale Corridor through the application of various spatial planning principles and concepts translated into realistic and achievable implementation projects. Current and proposed implementation projects include: Infrastructure upgrades, Housing projects, Integrated Rapid Public Transport Network, Land Acquisition Programme, Economic Development initiatives such as a Light Industrial Park, the Upgrade of Tannery, a Private Hospital and the Tourism Node all located within the corridor. **R2-** The critical ones are the development of the Edendale Town Centre – the revitalisation or re-development of roads through the National Development Program Grant Funding (NDPG) worth billions of rand with the sole mandate of the spatial transformation of the Edendale Area. The IRPTN, with the purpose of providing safe and reliable public transport which will be a catalyst of linking Edendale and Northern Area and, the third phase of expanding the Edendale Hospital.	a. The IRPTN (Integrated Rapid Public Transport Network) - is a tool and backbone to the success of corridor development. The Edendale area was identified as having the highest demand for public transport as such the first phase of the implementation of the IRPTN has begun in this area. The IRPTN is also an important element used to promote a compact urban form, which will make the system sustainable. b. The NMT infrastructure is also linked to the IRPTN projects - that will be safe and user friendly so that community members can walk from the bus stations to shops, offices and places of residence. c. Continuous upgrade and construction of roads under the Roads and Transportation business units.

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 6: How are the planning policies and regulations promoting the Corridor Concept?	
R1- Msunduzi's Integrated Development Plan (IDP), which includes a Spatial Development Framework (SDF), promotes corridor development and the move towards a compact city, which is in alignment with national and provincial legislation and policies. However, the Pietermaritzburg Town Planning Scheme (TPS) zoning/land use regulations are not aligned with these strategic objectives. There is therefore an urgent need for a full-scale review and update of the existing scheme with a focus on changes that will support and reinforce corridor development towards achieving a compact urban form.	All local transport policies and strategies, which includes the Comprehensive Integrated Transport Plan and the Non-Motorised Transport Master Plan, have been aligned to the direction taken in our country as expressed in various pieces of National legislation, vision and objectives i.e. Land Transport Act, Moving South Africa, and White Paper on National Transport among others.
R2- In planning, the adoption of a hierarchy of plans approach includes the National Development Plan (NDP), the Provincial Growth and Development Strategy (PGDS), the City Development Strategy (CDS), the Spatial Development Framework (SDF), the Town Planning Scheme, Local Area Plans and other detail plans. Msunduzi Local Municipality has adopted this approach ensuring alignment with these plans and policies, which reinforce the development of the Edendale Corridor. The local Council is currently updating and reviewing is Land Use Scheme in order to create an enabling environment and acquiring land in, around the Town Centre, and with the sole purpose of developing the area.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 7: Are the Planning and Transport business units collaborating and adopting a coordinated approach in promoting the Corridor Development Concept in Edendale?	
R1- There is a lack of interdepartmental interaction. Planning should lead development in the city however; this has not been the case due to breakdown in communication and lack of integration between departments. In addition, the challenge of conflicts between officials and councillors causes delays in the implementation of projects. There is an urgent need for integration between other sectors such as infrastructure, human settlements and environmental. Densification will have an impact on these services, which must be well planned and coordinated in terms of budgets and timeframes i.e. Phasing.	This is an area, which is a major challenge. Although sector departments functioned in silos in the past, it is only now that there seems to be some improvement towards integration but there is still a lack of proper coordination. As a result, of this communication breakdown, officials are not fully aware of the strategic interventions and projects proposed for implementation. They are not aligned, prioritized and tied to the line department's respective service delivery budget implementation plans (SDBIP).
R2- Although there has been challenges in the past however, through the preparation of the Urban designs and IRPTN, there is collaboration and adoption of a coordinated approach in promoting the development of the Edendale Corridor Development Concept.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 8: Will the development of the Edendale Corridor contribute to economic and social upliftment that will benefit the poor/disadvantaged?	
R1- Yes: It is directed at addressing poverty, unemployment and inequality. It focuses on spatial cohesion and economic justice i.e. a mix of high-density uses that will foster social interaction between members of the community. The New Town Centre Plan is about creating economic opportunities for the target populations located in the township such as SMMEs and Informal trade. The Integrated Rapid Public Transport Network will provide affordable efficient public transport and NMT infrastructure so that people are within walking distances to access social and economic facilities, which will improve their current standard of living.	Yes- The mix of land uses will create jobs and provide social facilities, which will be in close range to the community. The poor who cannot afford to pay for transport will be able to walk to their places of work, shops, schools and government offices. Currently South African citizens spend over 50% of their monthly income for transport and travel therefore this form of development that is close to the people will free up income, which will improve their quality of life.
R2- As mentioned in Question One, the concept of developing the Edendale Corridor will not only respond to the re-enforcement of the spatial transformation but, it will for the first time in the history of Edendale enhance social and economic transformation. This will be achieved through the creation of new job opportunities, provision of sustainable housing and reliable public transportation.	

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
Question 9: What are the opportunities and constraints in facilitating and implementing Corridor Development in Edendale?	
R1- Opportunities: A number of high order land uses along the corridor includes education, health, commercial and industrial. Major upgrades to the Edendale Hospital and education precincts are planned and are funded by national treasury. The corridor has been designated and approved for a range of proposed housing projects. The Msunduzi River flows parallel to the corridor, which can be transformed through landscape designs to enhance the corridor with a central park theme; dedicated funding has been made available for land acquisition; the New Town Centre is a catalytic project that will unlock development potential of the entire corridor providing various social, economic benefits to the community. Constraints: Environmentally sensitive areas; Informal settlements that are located on strategic portions of land are problematic. There are land legal issues, land ownership, and infrastructure capacity that need addressing. Institutional priorities differ amongst the departments and politicians and this affects budgets allocated for corridor development projects (i.e. competing priorities for the allocation of scarce and limited resources). Political influence has an impact on development priorities in the city; Planning should be leading the city forward. Unfortunately, strategic planning has not been high on the city's agenda. There is a lack of a dedicated committed task team or political champions to drive corridor	Opportunities: Economic growth and development (i.e. job creation), Social upliftment, Poverty Alleviation and Improve the quality of life Constraints: Lack of Institutional and political support, Lack of Funding, Community Involvement can sometimes obstruct and delay initiatives.

MSUNDUZI MUNICIPALITY OFFICIALS : TOWN PLANNERS (2)	MSUNDUZI MUNICIPALITY OFFICIALS: TRANSPORTATION PLANNER (1)
development.	
R2- Opportunities: The area is geographically located along the Edendale Road, which is not only a corridor between Edendale and Northdale, is also a corridor from the City to Underberg as well as to the Eastern Cape. It also has an advantage of being sustainable due to large population in the area. Constraints: Includes the issue of uncertainty were many business people fear to invest in a former Black Township. Infrastructure provision can also be an obstacle if is not upgraded properly.	
Question 10: How long do you think it will take the Edendale corridor to realize its full potential?	
R1- 5-10 years: Edendale Town Centre ±10-20: Edendale Corridor. There are feasibility studies currently being undertaken by the Development Bank of South Africa (DBSA) with a focus to developing the George Town Node as a Historical Tourism that will further reinforce the New Town Centre Node.	10-20 years: We are dealing with the mind sets of people that will have to change, for example from private transport to public transport as a mode of transportation – this will be a challenge and will take time. Also making the people understand the benefits of these concepts therefore more marketing and discussions will be necessary.
R2- In the next 10 to 15 years, we will start seeing the development of the Edendale corridor, as there has been a lot of interest, both politically and administratively at a national, provincial and local level.	

PROVINCIAL GOVERNMENT OFFICIALS:- TOWN PLANNERS
Question 1: How would you describe the Corridor Development Concept?
R1- Corridor Development is the integration of land use and transportation, which also takes cognizance of the environment. However, in the past it has not been very well expressed and captured in SDFs across the province as it was just a matter of legal compliance (i.e. nodes and corridors) but improved in its application over the year. The Edendale-Northdale Corridor (ENC) in Msunduzi is at the right scale. It is within which a wide range of policies and sub policies can be brought to bear to achieve a certain increase in densities and intensities of commercial and residential (i.e. mixed uses) primarily to facilitate the provision and efficient use of services and also ensure sustainable functioning of the public transport system. The corridors focus is therefore on efficient use of infrastructure services and promotions of mixed land uses created through the adoption of mini-centres (i.e. nodes) along transport routes to meet the needs of populations located in the periphery hence integrating them with the broader city.
R2- The development of a corridor is a means of connecting nodal points/areas to create a network of economic opportunities. Beyond a mechanism of commerce and transportation, corridors are used as a mechanism to integrate peripheral settlements and previously disadvantaged areas into the City's sphere of development potential and investment. In a manner, a corridor can be considered as the breadcrumbs to and from intensity points, enticing investments in either direction
Question 2: What is your understanding of Compact Urban Form?
R1- People in the periphery cannot be relocated to new locations in the city therefore we have to develop where the people are, especially that many of them have title deeds of their properties. Therefore, it is important to get increased densities to avoid pressure on infrastructure service provision. Within Msunduzi the east-west axis e.g. ENC serves as an artery along which densities will increase. We will not get the whole city to be compact but this will be achieved through the concentration of high densities within nodes along the corridor like a necklace. This will also require a high level of urban design guidelines especially in terms of height, size, floor area ratio and shape of buildings (i.e. Urban Form) so that it does not affect negatively on the surrounding amenities. A good example is the high rise buildings in Amanzimtoti located along the coastal belt/beach front that affected the visual and physical aesthetics of the surrounding amenity.
R2- Due to historical planning, many areas have an inherent fragmented and sprawled settlement pattern. The ramification of this is not only a disjointed approach to planning but also, uneven

investment and distribution of facilities, long distances to job centres, high public transportation costs, strained bulk infrastructure system, etc. A model that is used to combat this type of development is the Compact Urban Form. This model employs various tools, including the developing of an urban edge, densification, infill development, vertical expansion etc. The result is an efficient and accessible, high-density mixed-use environment where a person no longer has to work, live and play in different areas.

Question 3: Can the Corridor Development Concept be used as a restructuring tool to achieve a Compact Integrated Urban Form in Edendale?

R1- Yes, corridors supported by nodal development will change the city fundamentally. The caveat is to pay attention to land ownership. The question is - how we get the private sector on board to support and invest in development along the corridor. The key is also in trying to secure their support by renting out space and selling sectional title units (i.e. High Density Flats and Commercial).

R2- Yes. More efficient and cheaper means of transportation to employment centres means that residents will have more time and money to spend within their localised area. The result will be an increased spending power that will boost investor confidence and create rateable opportunities for the Municipality. Employment opportunities and a diverse level of uses will be easily available to residents thus bringing work and play closer to home. As the Corridor develops, more people will be attracted to living in close proximity to the area, thus densifying surrounding settlements and ensuring that more people use the available services and facilities. This will also increase the capacity of people to support government uses and the supply of bulk infrastructure.

Question 4: What are the most important elements/factors required to promote Corridor Development and achieve the desired urban form in Edendale?

R1

a. Infrastructure provision: water, sewer and electricity

b. Public transportation: Road linkages

c. Communication and Participation to get the communities and investors plugged in

d. Marketing and Branding: The New Town Centre in creating an awareness to attract involvement of locales and businesses

e. Integration of internal/municipal sector departments (Planning, Transport, Infrastructure, Environment)

f. Its more than the plan but the implementation of the plan which is key

R2-

a. Public Participation

b. Political buy-in and support for the project from the outset

c. Integrated Rapid Public Transportation Network

d. Resolving Land Legal issues along the Corridor, including deceased estates and land invasion

e. Development Incentives

f. An adopted Wall-to-Wall Scheme for the Municipality to provide the necessary control for development

g. Acquisition of unused Transnet properties for industrial development

h. Pedestrian bridges

i. Pedestrian and bicycle paths

j. Access to public spaces

k. A realistic plan to attract investment opportunities without compromising on the local space

Question 5: Are you aware of the current strategies and projects being undertaken by the local municipality to promote development of the Edendale Corridor?

R1- Yes – mostly aware of planning initiatives like the Edendale New Town Centre and the IRPTN but not so much on the actual progress towards the implementation of projects. However, the implementation of projects falls within the ambit of the Local Economic Development (LED) unit at Province who are actively engaging with the local municipalities by giving support through financial assistance.

R2- Yes. The Edendale-Northdale Corridor has been a planned intervention for a number of years and is being implemented in part. In terms of development initiatives at various nodal points along the Corridor, projects have been completed. This is augmented by the approval of the construction of a substantial interchange along Moses Mabhida Road through the IRPTN project and various other projects within close proximity of the Corridor such as priority Housing projects adjacent to the Corridor. This is however subject to land legal investigations and rectification.

Question 6: Have you been actively involved with planning initiatives undertaken by the municipality along the Edendale Corridor?

R1- Province have not played a major active role in the promotion of corridor development initiatives at Msunduzi local level, apart from assisting with the monitoring and evaluation of IDPs and SDFs in ensuring legal compliance in terms of the application of these concepts i.e. at a conceptual level. The main reason being the lack of human resource capacity in that only 35% of posts are filled whilst the balance of 65% remain vacant. This can be attributed to the negative economic climate and the lack of funding to fill these posts.

R2- Provincial Department's participation and input into the projects and programs have been limited however, some technical assistance has been provided by the economic sector towards the N3 corridor study.

Question 7: Do you believe that the development of the Edendale Corridor will contribute to economic and social upliftment that will benefit the poor/disadvantaged?

R1- Yes- If private sector investment can be leveraged and the availability of land for development released it has the prospect of working well in terms of job creation, service provision and housing developments. In addition, public sector investment in provision of adequate services can serve as a catalyst and will contribute to success.

R2- Yes. Whilst access to opportunities [jobs and investment alike] will increase, the impact will be finite. Benefits for most residents within the Edendale area will be focused on accessibility – to better public transport, social facilities, skills development centres, infrastructure, public spaces, recreational facilities, more diverse retail facilities and services. Most importantly, the development of the Corridor and the residual developments will give the people a sense of pride for the area that they live in and entrench within them a sense of place.

Question 8: What are the opportunities and constraints in facilitating and implementing corridor development in Edendale?

R1-

a. Opportunities: Levels of income will increase due to job creation and empowerment through the SMMEs and Informal Trading. The large population can provide the labour force for the implementation of projects and generate incomes that will lead to better living conditions and quality and standard of living. Of critical importance, is the provision of infrastructure, social and public facilities, promoting economic development and attracting investments to the area.

b. Constraints: Lack of funding at municipal level to undertake project implementation concerning road

construction, water, sewer, and electricity provision.

R2-The above responses note a number of opportunities. The below looks at Constraints:

- Development will attract additional informal settlements along the Corridor. The Municipality does not have the adequate resources and capacity to curb this type of development.
- The non-resolution of land legal issues along and around the Corridor.
- The inability of local residents to move away from the "one plot, one house" ideology and to embrace alternative housing typologies as well as inclusive housing options [GAP and Social Housing].
- Lack of buy-in from the local Taxi Association on the IRPTN project.
- Lack of support from the Municipality during the planning phase of the project.
- Unrealistic planning proposals and designs.
- Poor holistic planning that hinders integration with the City and beyond.
- Not undertaking a phased approach that ties in with the IDP and Municipal Capital Investment Framework.

Question 9: How long do you think it will take the Edendale corridor to realize its full potential?

R1- 20 years or more

R2- Medium to Long Term: 10-20 years. The amount of rates collected within the Edendale area is limited thus affording it a limited budget for future development and upgrades – there is more profitability for the city to invest in higher return areas. Accordingly, development within Edendale and along the Corridor is slow paced.

TOWN PLANNERS

PRIVATE SECTOR CONSULTANTS (2)

Question 1: How would you describe the Corridor Development Concept

R1- Corridor development is often misunderstood or misapplied in the context of the planning realm.

a. They are usually 2 to 5km wide
b. Predicated on public transport usually rail but more recently the development of BRT's has become the backbone of corridor development
c. They are usually less continuous when they within an urban context and broken by the natural topography/open space
d. Connected to high streets
e. Complex in the mix of uses
f. Most cases naturally occurring.

In planning for corridors you have to be mindful of:

a. A performing area may require minimal intervention, too much could strain the corridor and could lead to its dysfunction
b. Not approach it as children colouring book exercise but more driven by its existing energy;
c. That corridor takes a long time to mature
d. The public realm and how its evolving and focus resources where required to realise its full potential

R2

The concentration of land use activity around a primary access/transportation route. This concentration provides the residential thresholds (generally through the provision of high-density development) for non-residential activity i.e. social facilities, commercial retail etc., whilst placement on the access/transport route provides the ability to move between various nodes of the city/town.

It is important to note that the corridors we celebrate as good examples have very specific histories/preconditions that lead to their success i.e. land ownership under apartheid (Brickhill Road in Durban); a response to the technology of the time (Old Main Road through Hillary/Bellair etc. - linked to rail road). These corridors have developed over time!

Question 2: What is your understanding of Compact Urban Form?

R1- Usually a more sustainable way of clustering activities/buildings together both from an urban performance and infrastructural view as it reduces both time and cost. Should ideally be located around a Public Transport facility so it is easy accessible to people from outside the area as well but also should be within a walking distance to the surrounding community.

TOWN PLANNERS PRIVATE SECTOR CONSULTANTS (2)
R2- Compact urban form is a conscious decision to structure a city, city precinct, neighbourhood into a more efficient urban form that promotes higher density living, the provision of well-structured open space, the concentration of activity nodes into walkable precincts and the promotion of good public and private transport choices.
Question 3: Can the Corridor Development Concept be used as a restructuring tool to achieve a Compact Integrated Urban Form in Edendale?
R1- No if used incorrectly: If the corridor is not accessible/connected to the where people are housed, planned inappropriately, ad-hoc development along the length of the corridor that is not aligned to major concentration areas/ nodes, not aligned to Public Transport opportunity, then all it comes is a piece of road that has development on. The objective of the corridor is capitalised on its inherent character and the distribution/ impact on the areas that surround it, both from an employment generating and social amenity development opportunity. Compact urban form is not necessarily a characteristic of an urban corridor or a corridor that is well performing. Yes, the corridor has many facets; buildings that relate to the street arranged in a linear fashion and meets a junction where a higher intensity urban form is created. In some cases, the corridor may only have the nodal development which is more compact in nature "beads on string concept "and therefore areas of the corridor are loosely arranged. In the case of Edendale, due to the ad-hoc nature of development most of the development are fragmented and given that the BRT will be running through the area, it presents an opportunity to tie the individual nodes together through a densification exercise.
R2- Yes it can. As noted above, the Msunduzi Municipality has made a conscious decision to do things differently in Edendale. The investment being made into public transport through the construction of the IRPTN route, together with undeveloped land parcels along these routes provides to opportunity to apply and implement a compact urban form corridor development. If development continues with a business as usual, approach or the public transport does not materialize, and then there may be an opportunity lost.
Question 4: What are the most important elements/factors required to promote Corridor Development and achieve the desired urban form in Edendale?
R1- a. Appropriate phased planning b. Framework to be vision driven and not political c. Densification- various typologies d. Link existing uses by developing the core/ Town Centre e. Develop Integrated Rapid Public Transport Network or efficient Public Transport system

TOWN PLANNERS PRIVATE SECTOR CONSULTANTS (2)
f. Consider utilising the rail and developing precincts g. Develop the Public Realm so it will induce Private sector response h. Create opportunity for SMME and incubator uses so local community benefit – make space for them along corridor linked to industry/business i. Know your market- informal and local entrepreneurship j. Flexible planning controls but at the same time manage the area with a vision in mind k. Incentives for development l. Acquire land that is deemed essential for public interest and services to the people
R2- a. Political and community to will to live in a high density urban form b. Commitment from the Municipality to challenge the status quo of the current development delivery mechanisms e.g. American model of shopping centre developments (car park on road frontage), low density one plot one house housing models c. Functioning, efficient and affordable public transport
Question 5: What projects and strategies are currently being planned or implemented to promote the development of the Edendale Corridor?
R1- Edendale Hub project (i.e. New Town Centre) - focus should be on this over the next 10 years to bring basic/essential services to the people within a walking distance. If the municipality continues business as usual, the current fragmented form of development will continue
R2- a. The greater Edendale development initiative b. IRPTN c. Town Centre Renewal project d. SPLUMA Application
Question 6: Are the Planning and Transport business units collaborating and adopting a coordinated approach in promoting the Corridor Development Concept in Edendale?
R1- From experience very less collaboration amongst departments- everyone works in silos- should be an integrated approach
R2- Through strong project champions, this seems to be happening. This type of development requires strong leadership to fight a business as usual approach adopted by both public and private sector developers.
Question 7: Do you believe that the development of the Edendale Corridor will contribute to

TOWN PLANNERS PRIVATE SECTOR CONSULTANTS (2)
economic and social upliftment that will benefit the poor/disadvantaged?
R1- Yes, if done appropriately- as per Q1 and Q3, Q4
R2- Yes, the corridor will provide a platform on which local communities can build a better life. It does this by removing some of the basic barriers to individuals accessing the broader city and city services. The corridor cannot operate in isolation of educational support, skills development and local economic development. Corridors cannot develop people.
Question 8: What are the opportunities and constraints in facilitating and implementing corridor development in Edendale?
R1- a. Opportunities are to bring in economic and social upliftment to an area which has extreme poverty and unemployment- extends the CBD area of influence b. Constraints- if done incorrectly- it would not change the situation/profile of people living in the area and the status quo will remain. **R2-** a. Opportunities - institutional, policy and budget support to do things differently b. Constraints - existing low density impacts on thresholds - over time there we should see a change in the intensity of land use adjacent to the corridor if the public transport system materializes as envisaged
Question 9: How long do you think it will take Edendale Corridor to realize its full potential?
R1- Many years- 20years+. It takes time
R2- A lifetime - 20+ years

MSUNDUZI MUNICIPALITY WARD COUNCILLOR (1)
Question 1: How would you describe Corridor Development?
Corridor Development is development that is taking place in close proximity to the people that will not require long travel distances for economic, social and recreational activities. I.e. providing housing, services and jobs that are most needed to the poor. It is also based on good transport networks for the people to connect to other parts within the city.
Question 2: What is your understanding of Compact Urban Form?
It is the concentration of land uses that brings people, business and social services closer together that is easy accessible to the community. Places of employment and social facilities especially schools, recreation are far from the people therefore this government initiative will bring these uses within walking distances of the population.
Question 3: Are you aware that the Edendale Corridor has been identified as an important growth corridor for investment and development in Msunduzi?
Yes, the planning staff of Msunduzi have adequately informed me. This will integrate and open up the township to other areas in the city especially that the Edendale area is located in the outskirts of the city.
Question 4: Can the Corridor Development Concept be used as a restructuring tool to achieve a Compact Integrated Urban Form in Edendale?
Yes, it can by bringing places of live, work and recreation together so people can have easy access to services and facilities.
Question 5: Are you aware of the current strategies and projects being undertaken by the local municipality to promote development of the Edendale Corridor?
Yes- I am well aware and informed by the Town Planning Department. Some of these projects are like the Edendale New Town Centre, the IRPTN, also the new road construction and upgrades currently happening for the New Town Centre.
Question 6: Have you been actively involved with planning initiatives undertaken by the municipality along the Edendale Corridor?
Yes- and I have kept the communities informed however; more work is needed in this area and I have been informed that the municipality is in the process of appointing a dedicated communication facilitator who will be actively involved with the communities.
Question 7: Do you believe that the development of the Edendale Corridor will contribute to economic and social upliftment that will benefit the poor/disadvantaged?

MSUNDUZI MUNICIPALITY WARD COUNCILLOR (1)
YES, AND NO: The plan must be implemented properly so that it benefits the poor people residing in the area and not people coming from outside the area. Furthermore, it should not only address unemployment needs of the community but the local community should take ownership in the form of entrepreneurship. The informal trading in the area should be formalised with proper structures and facilities provided by the municipality for these businesses so that they can benefit and channel the profits back into uplifting the area.
Question 8: What are the opportunities and constraints in facilitating and implementing corridor development in Edendale?
a) Opportunities: The area has a high population and unemployment rate and can therefore provide labour for the construction and development of the town centre projects. National government investments in the upgrading of roads, education and health facilities. Many old historical buildings in the broader area that can be revamped as tourist for industrial and business uses. b) Constraints: Some of the challenges includes Land invasion in the area; foreigners that come and open businesses which disadvantages the local community; lack of skills, knowledge and funding to support local businesses.
Question 9: How long do you think it will take for the Edendale corridor to realize its full potential?
Approximately 10 -20 years

EDENDALE DEVELOPMENT FORUM NON-GOVERNMENTAL ORGANISATION [NGO]
Question 1: How would you describe Corridor Development?
It is trying to make use of arterial routes to concentrate development in areas where there is a lot of movement of people, pedestrians and transport. Through transit routes maximizing exposure and visibility of retail, office, employment opportunities and social services that comprises mixed-use development. It is also trying to make access of these various services to communities more convenient and cost effective so that there is no need for them to travel long distances.
Question 2: What is your understanding of Compact Urban Form?
Currently South African cities are not characterized by a compact urban form but is directly opposite to that since we suffer from a legacy of racial planning that exacerbated sprawl. This concept is used to combat urban sprawl that consumes large amounts of land area by focusing on clustering of activities, high densification, public transport, pedestrian oriented development and by using existing bulk infrastructure rather than creating a new demand for infrastructure in peripheral areas. Bringing places and spaces of work live and play close to each other to create good quality environments for residents.
Question 3: Are you aware that the Edendale Corridor has been identified as an important growth corridor for investment and development in Msunduzi?
Yes, it is a critical corridor because a large component of the population resides in this area. In addition, the Municipal IDP identified this corridor as critical to connecting the poor communities to other parts of the city. However, a major challenge is that Edendale in relation to the other areas within Greater Edendale such as Imbali operate on separate arterial routes. Communities cannot travel across or directly from Imbali to Edendale without going into the CBD and taking another taxi to come into Edendale, which is largely due to the city's radial structure. All these main routes connect to the CBD and there is a lack of road linkages connecting these areas to each other. As a result, the poor communities are spending a large proportion of their income on transport to work and to acquire convenience goods and services from mega centres like the CBD where economic and social facilities are concentrated. Therefore, the development of urban investment nodes along the Edendale Corridor is critical to communities.
Question 4: Can the Corridor Development Concept be used as a restructuring tool to achieve a Compact Integrated Urban Form in Edendale?
Yes, provided sufficient road linkages are developed to make the nodes along the corridor easily accessible to the communities in the area as the spatial structure currently focuses on the CBD. The development of multiple-diverse centres along the corridor must aim to attract investments into the

EDENDALE DEVELOPMENT FORUM NON-GOVERNMENTAL ORGANISATION [NGO]
area so that previously disadvantaged communities can have their needs and demands met. Affordable public transport is also a key factor to support this compact type of development and to linking nodes across the city to access services and public amenities, which emphasises integration.
Question 5: Are you aware of the current strategies and projects being undertaken by the local municipality to promote development of the Edendale Corridor?
There has not been much publicity about the plans and projects by the local municipality. There is a need for more public awareness and marketing to be done so that the people are aware of what developments are taking place. Other than the road upgrades and construction currently taking place along the corridor, which makes people aware that something is happening, there has not been much community consciousness and involvement in the planning phase. The municipality is therefore not proactive enough in communicating with local residents.
Question 6: Have you been actively involved with planning initiatives undertaken by the municipality along the Edendale Corridor?
Yes – the NGO was actively involved in undertaking community survey work in the Edendale Area under the Land Reform programme. We have also been instrumental by sourcing funding from the United States for monitoring and project managing and for other projects, which included housing developments, township planning, engineering project management and land survey work.
Question 7: Do you believe that the development of the Edendale Corridor will contribute to economic and social upliftment that will benefit the poor/disadvantaged?
Yes, it will definitely. There are huge housing and infrastructure backlogs in these areas therefore the development of the corridor will be instrumental in providing efficient access to commercial, community social and economic facilities. Provision of infrastructure is critical in order to attract investment along the corridor that will contribute to the development of the area. The municipality should also provide incentives to attract investors or it might fail, bearing in mind that the country is experiencing low economic growth rates. Nodal development along the corridor will help people to save their taxi fares that could free up finances that they could spend on meeting their basic needs like food, shelter and education.
Question 8: What are the opportunities and constraints in facilitating and implementing corridor development in Edendale?
a) Opportunities: To promote economic development in the area since the people travel to other areas for employment. Creating jobs since there is high unemployment in the area, Promotion of informal trade and the new integrated public transport system that would connect and integrate communities into the broader city.

EDENDALE DEVELOPMENT FORUM NON-GOVERNMENTAL ORGANISATION [NGO]
b) Constraints: The lack of sufficient land therefore land acquisition must be prioritised and a pro-active land management programme is needed. Infrastructure is also a huge challenge; the old zoning regulations restrict mixed-use development and do not promote new land uses; informal settlements that are located within the proposed IRPTN depot and other development areas along the corridor. Also the lack of funding and institutional capacity.
Question 9: How long do you think it will take the Edendale corridor to realize its full potential?
Approximately 10 -15 years

APPENDIX TWO: LIST OF RESPONDENTS

LIST OF RESPONDENTS		
NAME	**ORGANISATION**	**DATES**
Mr A N Khoali	Msunduzi Municipality (Manager Town Planning)	7 October 2016
Mr N Singh	Msunduzi Municipality (Town Planner)	12 October 2016
Ms L Mgenelwa	Msunduzi Municipality (Manager Transport Planning)	27 October 2016
Mr S C Ndawonde	Msunduzi Municipality (Ward Councillor)	9 November 2016
Mr L Sanders	Co-operative Governance and Traditional Affairs (COGTA) (Manager Spatial Planning)	25 November 2016
Ms K Sarabjiet	Co-operative Governance and Traditional Affairs (COGTA) (Town Planner)	2 February 2017
Ms T Redman	Private Consultant	22 February 2017
Mr K Gounden	Private Consultant	27 September 2016
Mr C Brisbane	NGO	1 March 2017