University of Cape Town

Faculty of Engineering & the Built Environment

School of Architecture, Planning and Geomatics

TOD IN THE CONTEXT OF CAPE TOWN: A CASE STUDY OF BELLVILLE

Jason Juries

JRSJAS001

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Faculty of Engineering & the Built Environment

School of Architecture, Planning and Geomatics

University of Cape Town

Rondebosch, Cape Town, 7701

Telephone 1: + 27 (0)76 3080432

Telephone 2: + 27 (0)21 981 4476

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SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS

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Abstract

This paper investigates Transit Oriented Development (TOD) in the context of Cape Town focusing on the case study area of Bellville. This investigation seeks to answer questions relating to the implementation of TOD such as: How to translate metropolitan TOD principles and development objectives into local area interventions? How to implement TOD on the ground in the Bellville Central Area? How do we get buy-in from the private sector?

The research was conducted using the case study method and various primary and secondary data collection techniques were used. These techniques comprised of a policy analysis, a contextual analysis of the case study area, a conceptual framework that included a targeted literature review, international and local precedent studies, semi-structured interviews with key informants, and surveys. These techniques assisted with the formulation of the TOD local area spatial development framework and associated catalytic projects for the Bellville Central Area.

This dissertation proposes TOD catalytic projects geared towards the established vision for the Bellville Central Area to become a vibrant, diverse and an interconnected TOD node, with a unique sense of place within the city. Furthermore, policy recommendations in the form of a TOD district overlay zone are proposed in order to ensure effective regulatory controls for the Bellville Central Area which includes: development zones (Intensification zones, active zones and transition zones), pro-active planning and streamlined development applications, transport management tools such as a parking management system and pricing strategy, as well as informal street trading, and crime and safety strategies geared towards improved urban management for the area.

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List of acronyms

BCA	Bellville Central Area
BEPP	Built Environment Performance Plan
BRT	Bus-Rapid Transit
CBD	Central Business District
CITP	Comprehensive Integrated Transport Plan
COF	Corridors of Freedom
COJ	City of Johannesburg
CPUT	Cape Peninsula University of Technology
CTIA	Cape Town International Airport
CTMSDF	Cape Town Municipal Spatial Development Framework
DMS	Development Management Scheme
EIA	Environmental Impact Assessment
FAR	Floor Area Ratio
HIA	Heritage Impact Assessment
ICDG	Integrated City Development Grant
IDP	Integrated Development Plan
IPTN	Integrated Public Transport Network
IZs	Integration Zones
LASDF	Local Area Spatial Development Framework
MSDF	Municipal Spatial Development Framework
MSEIZ	Metro South-East Integration Zone
NMT	Non-Motorised Transport
PT1	Public Transport Zone 1
PT2	Public Transport Zone 2
PTI	Public Transport Interchange
PRASA	Passenger Rail Agency South Africa
SARS	South African Revenue Service
SRA	Special Rating Area
SDF	Spatial Development Framework
TAPS	Transit Accessible Precincts
TDA	Transport and Urban Development Authority
TDM	Transport Demand Management
TIF	Tax-Increment Finance
TOD	Transit-Oriented Development
TOD-C	Transit-Oriented Development Comprehensive
TNR	Tygerberg Nature Reserve
UNISA	University of South Africa
UDZ	Urban Development Zone

US	University of Stellenbosch
UWC	University of the Western Cape
VRCIZ	Voortrekker Road Corridor Integration Zone

List of definitions

Activity street: These streets are characterised by strip and/or nodal urban development along the route supported by a mix of land uses and medium-higher density development.

Active zone: A high density, mixed use development orientated towards non-motorised transport area situated around BRT and public transport stops.

Articulated densities: The strategic distribution of density across space.

Cape Tonianised: A unique and localised Cape Town product.

Integration zones: A spatially defined area that gives effect to the performance related Integrated City Development Grant.

Intensification zone: A proposed high density, mixed use development area located within the heart of the BCA.

Multidirectional accessibility grid: The hierarchy grid of structuring routes that facilitates convenient public transport access and multidirectional movement between and within the district and other parts of the city.

Overlay zone: A category of zoning applicable to a particular area which stipulates zoning scheme regulations in addition to the underlying zone or base zone requirements.

Package of Plans: Consisting of an integrated set of hierarchical plans showing the link between strategy and implementation.

Tidal flow: Is a periodic variation in the pattern of transit commuting associated with centralised employment location and peak travel demand.

Transit accessible precincts: A spatially defined area confined to a 500m radius from a higher order public transport station.

Transitional zone: A medium to low-medium density area that signifies the transition from the high density intensification zone.

Urban development zones (UDZ): A spatially defined area in accordance with the Income Tax Act (No 58 of 1962). It is a development incentive for taxpayers who construct, improve or purchase a building or part of a building from a developer within the UDZ and will be allowed to claim for a reduction in taxable income.

CHAPTER 1: INTRODUCTION

This chapter provides a brief introduction into the research problem, the dissertation objectives, the main research questions, and the research methods and techniques applied throughout this dissertation. This chapter concludes with the dissertation structure.

1.1 Introduction

Like metros around the globe, South African cities are central to the country's development path. More than 60% of the country's population is presently concentrated in the urban centres and this figure is anticipated to increase to approximately 71,3% by 2030 (Republic of South Africa, 2016). Thus, South African development initiatives seek to attain the United Nations Sustainable Development Goal 11 to make its cities and human settlements inclusive, safe, resilient, and sustainable. Moreover, South African cities have been driving considerable growth, generating nearly two thirds of the country's economic activity and just over half of national employment (City of Cape Town, 2016). However, despite strong growth, South African cities are considered to be some of the most unequal, spatially fragmented, and unevenly developed in the world, with extreme differences in living standards within and between regions (Christopher, 2001; Todes et al, 2010b; Todes and Turok, 2017). The unequal, spatially fragmented and unevenly developed urban context in South African cities is largely due to the country's historical exclusionary policies during the apartheid regime, which limited access to cities for non-white people by locating and restraining them to peripheral areas. The apartheid spatial structure marginalised non-white individuals and resulted in a disproportionate amount of time and money having to be spent on commuting from the urban periphery to distant areas of opportunity (Behrens and Wilkinson, 2003). Additionally, these peripheral areas also had limited access to socio-economic opportunities and were severely disconnected by physical infrastructural barriers such as railway lines and urban freeways (Christopher, 1987; Todes et al, 2010b). Goebel (2007) identifies post-apartheid neo-liberal macro-economic policies as a root cause of failures in addressing marginalization and poverty problems in South Africa.

These macro-economic policies limited the amount of capital funding available for public and welfare-oriented programs such as the post-1994 RDP housing program. This meant that low-cost subsidised housing development was underfunded, resulting in considerable delays in housing delivery with long waiting periods, poor construction quality, and cheap, peripheral land being used, thereby entrenching the apartheid regime ideology of spatial segregation (Goebel, 2007). Today, these challenges persist as a reality for the majority of urban dwellers in South African cities. The phenomenon exacerbates inefficiency and poverty levels, with transit and its associated infrastructure as well as the housing delivery dilemma being perceived as separating mechanisms that enforce the apartheid regime's spatial inequality and injustices (Beg et al, 2014).

1.2 Problem under investigation

The arduous challenge to re-engineer the spatially fragmented apartheid urban structure has constantly been at the centre of post-apartheid South African urban policy. Yet, irrespective of transformative city restructuring goals and efforts, the apartheid spatial pattern has obdurately remained. The Apartheid socio-spatial legacy which limits movement, access and integration within and around Cape Town is a fundamental challenge and of high priority for the City of Cape Town in terms of urban restructuring (City of Cape Town, 2012a). However, the complication is that the previously disadvantaged, highly dense, and poorly serviced black and coloured communities are located on the urban periphery furthest away from economic and employment opportunities as a direct result of the Group Areas Act (Refer to figure 1). The previously disadvantaged urban poor unreasonably bear the burden of the city's current unsustainable urban form and are forced to travel at great cost from unfavourable and often informal areas located on the periphery to the well-serviced, low density employment opportunity locations within the city (City of Cape Town, 2017b).

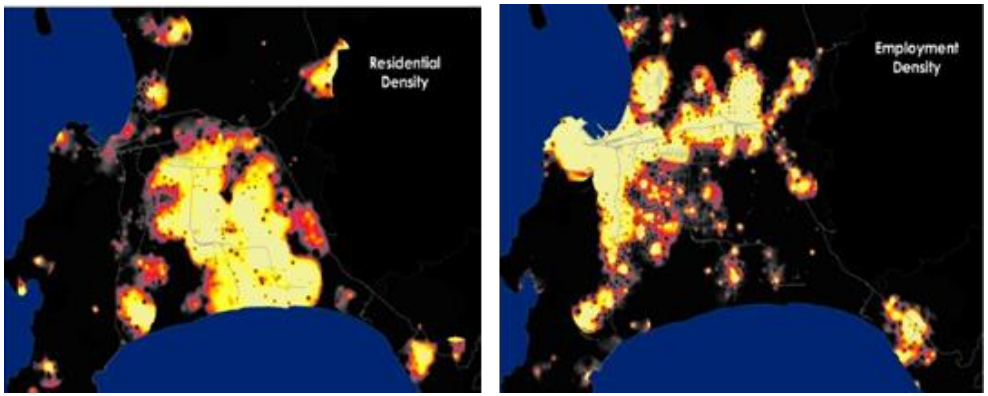


Figure 1: Cape Town residential and employment density. Source: City of Cape Town, 2017b

The City of Cape Town's Transport Development Index (TDI) indicates that an astonishing 95% of public transport users are low to low-medium income groups and that the average direct transport cost for this public transport user group is 45% of their monthly household income (City of Cape Town, 2017b). The 45% average cost is awfully high in comparison to other African cities that spend between 5.1% to 27.5% of budget shares on direct transportation costs (Lall et al, 2017). The direct cost of transport has a direct implication on disposable income for the poor and disadvantaged communities, entrenching inequality and exacerbating the past socio-spatial injustices. Cape Town's Gini coefficient, which remains high and has continued to rise over recent years (refer to figure 2), clearly illustrates the unequal living conditions in the city.

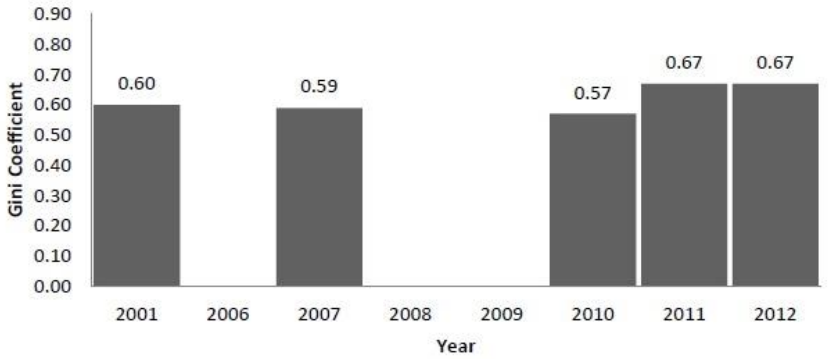


Figure 2: Cape Town's Gini coefficient for the 2001-2012 period. Source: City of Cape Town, 2016a

Cape Town continues to experience high rates of urbanisation which directly impacts on the availability of natural, human and financial resources. Competition and the increased demand for available resources is becoming a tremendous problem due to the cumulative pressure on the urban systems and the ability to provide efficient services. The ongoing operational costs necessary to endure an acceptable level of public transport in the current urban form of Cape Town has become financially unsustainable, which is particularly evident in the City's roll out of the MyCiTi BRT system (City of Cape Town, 2016a). Cape Town's current land use patterns result in longer distance trips which make it very difficult to generate adequate revenue returns to stay within a realistic level of subsidisation. Furthermore, Cape Town's tidal flow aggravates the cost of providing a financially sustainable public transport system as the peak travel demand and pattern of commuting associated with the city's employment nodes is completely skewed (City of Cape Town, 2017b).

The high concentration of public transport trips inbound to Cape Town's CBD during morning peak and outbound during evening peak leaves the bus almost empty during CBD outbound morning trips and evening inbound trips. This inefficient spatial structure has hindered the roll out of the 2015 MyCiTi Business Plan for Phase 1 and the N2 Express BRT service, with an unacceptable R52 million unfunded deficit having been reported for the 2016/2017 financial year (City of Cape Town, 2016a). The unfunded deficit is a direct result of a public transport response to the travel demand based on existing fragmented spatial patterns of the city.

In 2014, the City of Cape Town took drastic steps and turned towards Transit-Oriented Development (TOD) as a solution to these pressing challenges by approving the Integrated Public Transport Network Plan (IPTN). The IPTN recommended exploring TOD as a means of addressing the above mentioned urban inefficiencies in Cape Town through a TOD Comprehensive land use scenario. The TOD Comprehensive land use scenario is an indicator of the TOD assumptions and accompanying principles of the IPTN. Furthermore, the land use scenario was specifically developed to assess all future development based on TOD principles and it also depicts the optimised locations of future growth to support the City's IPTN and TOD principles accordingly (City of Cape Town, 2016a). The investigation into TOD has culminated in the adoption of the TOD Strategic Framework in March 2016 which is perceived to be the driving tool to implement TOD in the city. In pursuing the TOD agenda, the City of Cape Town restructured internal departments and established the Transport and Urban Development Authority (TDA) to accelerate efforts to create a more equal society based on integrated communities, economic inclusion and access to opportunities. The TDA essentially brings fundamental functions such as transport planning, spatial planning and housing together to align policy to be responsive and proactive in dealing with the city's growing urban challenges.

In addition, the City of Cape Town's TDA recently received the International Public Transport Strategy Award at a UITP World Summit in Montreal, Canada (UITP Global Summit, 2017). Furthermore, The TOD Strategic Framework was approved as one of the primary informants for the review of the City of Cape Town strategic and built environment plans (City of Cape Town, 2017b:31) and the city is now undertaking the process of reviewing their strategic plans to align with the TOD development strategy.

The new TOD-based Municipal Spatial Development Framework (MSDF) has been drafted and was undergoing public participation at the time of writing this dissertation. Once the Municipal Spatial Development Framework (MSDF) has been finalised and approved, the City will then need to review their district and associated policy plans to align with TOD. Questions remain, however, regarding (i) how TOD can be implemented 'on the ground' / how to get the private sector to 'buy-in' to TOD, and (ii) how to translate the metropolitan-scale objectives of TOD down to a local scale.

"TOD is a new label and it's something we have been trying to do for quite some time. There is a renewed energy around TOD, but is it that much different from what we've seen in policy as they all portray similar nodes, similar areas, similar transport routes etc. We are not going to change the city overnight. Are we trying to do a difficult thing in a short period of time? Are we being too ambitious?" (Rob McGaffin, 2017)

1.3 Aim and purpose of the dissertation

Many attempts have been made to eradicate Cape Town's urban problems through comprehensive sustainable development policies and associated catalytic projects targeted at achieving equity and spatial justice. Whilst noteworthy progress has been made, the pace of improvement has been rather sluggish.

As a response, the recently approved City of Cape Town TOD strategic framework (along with a suite of associated built environment policies) aims to provide interventions to alleviate and eradicate many of the identified urban problems. However, as mentioned above, TOD guidelines for implementation within a Cape Town local area is unclear and lacking. Thus, this dissertation seeks to answer the questions above by undertaking a case study of the Bellville Central Area (BCA), Cape Town, and developing a TOD-based local area SDF for the area, with a particular emphasis on implementation. A more detailed motivation for the selection of the case is provided in Chapter 3.

1.4 Objectives

Considering the aims of this study, various milestones need to be identified to ensure that the research adequately addresses the research problem and to ensure that the research method applied does not adjust the outputs of the relevant findings and information pertained in this dissertation. These milestones are depicted in the form of objectives. The objective is to provide:

(i) An analysis of relevant policy documents
(ii) A contextual analysis of the sub-metropolitan and the case study area
(iii) A targeted literature review
(iv) An interview analysis drawing from interviews with key informants,
(v) A local area spatial development framework for Bellville in accordance with the research findings.

1.5 Establishing the main research questions

Considering the overarching aim, purpose and objectives of this dissertation, the main research questions asks:

- How can we translate metropolitan TOD principles and development objectives into local area interventions?
- How do we actually implement TOD 'on the ground' in the Bellville Central Area?
- How do we get the buy-in of the private sector?

It is important that the main research questions correlate with the overarching aim, purpose and objectives of this study. In order to answer the main research questions, the case study method is used coupled with the associated research techniques such as a literature review, semi-structured interviews and spatial mapping to assist in answering the main research questions.

1.6 Research methods and techniques

1.6.1 Case study research method

The choice of this method is informed by the main research questions as well as the overall aim and purpose of this research. The case study method is specifically used to answer the main research questions: "How can TOD be realised in a Cape Town context?" and "How do we actually implement TOD in the Bellville Central Area?" as well as "How do we get the buy-in of the private sector?". This method allows and assists researchers to produce context-dependent, value-driven knowledge and enables the researcher to reveal the way numerous factors interact to create the unique character of the case under study which creates more context specific information (Flyvbjerg, 2006; Flyvbjerg, 2011). Yin (2009) states that the case study research method does not require a specific kind of qualitative or quantitative evidence and that information can come from numerous sources. This is particularly useful for the purpose of this dissertation due to time constraints which limit quantitative data collection. Furthermore, this research is less concerned with generalising from one case study, instead, one of the aims of this research is to understand and learn as much as possible from one case study to establish planning interventions and policy recommendations for the case under study and not necessarily for other contexts.

Thus, applying the case study method allows this dissertation to provide recommendations and suggestions, linking TOD strategies to Bellville through the research.

1.6.2 Policy analysis

This technique informs the approach to analysing written, verbal, and supplementary texts to inform the research (Fischer and Forester, 1993). Policy discourse analysis will be used to investigate the City of Cape Town's policies regarded as relevant to the case study area of Bellville Central. Furthermore, the analysis will assist in forming a holistic understanding about the case study area and will assist in formulating context specific spatial planning principles and objectives geared towards TOD implementation and the main research questions. Additionally, the principles and objectives will be context specific and will assist in informing spatial planning interventions and contextualised design strategies.

1.6.3 Data analysis and interpretation

The necessary data will be collected from a variety of sources to inform the contextual/ site analysis which will be used to generate development opportunities and constraints for the case study area. Furthermore, the contextual/ site analysis coupled with the conceptual framework will be interpreted to inform local area strategies for TOD implementation in Bellville Central.

1.6.4 Desktop research technique and literature review

The desktop study technique will assist in gathering specific data relating to TOD and the need for spatial planning to intervene. Furthermore, this desktop study will analyse recent TOD implementation projects in literature. This dissertation will comprise of a conceptual framework in which a targeted literature review will be used to analyze theory related to TOD and implementation. Furthermore, the literature review will incorporate international and local TOD precedent in order to establish appropriate spatial planning principles and objectives for local area planning interventions. Additionally, the literature review will inform the themes that are used to guide the semi-structured interview questions and associated discussions.

1.6.5 Semi-structured interviews

The types of interviewees which will be targeted for interviews are urban planning practitioners, government officials and academics involved with spatial planning, land use planning, transport planning, TOD, real estate development, and urban design. This will provide a broad array of perspectives which will add depth to the research. Semi-structured interviews, with the absence of a predetermined questionnaire, will allow for open debates and the sharing of professional and personal ideas related to TOD in Cape Town. These interviews will be used to gather information about TOD implementation in a Cape Town context and specifically related to the case study area of Bellville Central. Moreover, semi-structured interviews allow for the flow of ideas through open dialog rather than structured guiding questions which could potentially limit the scope of the interviews. Furthermore, the contestations around the adoption and formulation of the recent suite of policy plans, personal experiences and expectations of the various role players influencing and implementing TOD in Cape Town will be explored. These interviews will allow for a range of data collection sources and will assist in the policy analysis, contextual analysis and the conceptual framework chapters of this dissertation.

1.7 Ethical considerations

The ethical considerations included getting participants' consent to participate in the research; getting consent to record the interview; getting consent to use their names; allowing them to veto data collected and my interpretation of this data.

Furthermore, it was necessary to ensure that the research was ethically responsible and did not cause any harm to the participants. Additionally, it was essential to develop and gain the participants trust in order to gain deeper insights into the perceptions around TOD implementation within Cape Town and what the fundamental challenges were in order to bring TOD into fruition. (Annexure A)

1.8 Structure of the dissertation

The structure of this dissertation is organized so as to provide a logical sequence of research techniques and analysis to align with the aims, purpose and objectives of this study and to answer the main research questions. Therefore, the structure of this dissertation is as follows:

Chapter 2 provides a policy analysis of the built environment policy's that influence Cape Town and specifically the Bellville Central Area (BCA). The chapter outlines the purpose of each policy and highlights the main objectives and ideas that guide and inform spatial planning interventions in Cape Town and how it relates to BCA. This chapter concludes with spatial planning principles and development objectives for local area planning.

Chapter 3 provides an in-depth contextual analysis of the case study area to provide context specific development informants.

Chapter 4 provides a conceptual framework comprising a targeted literature review of TOD and its associated objectives that seeks to ensure a thorough understanding of theoretical ideas. Furthermore, the identified ideas will be used to inform the interview and survey questions accordingly. Additionally, this chapter will discuss international and local precedent studies which seeks to contribute towards a more nuanced understanding about TOD implementation.

Chapter 5 provides a TOD local area spatial development framework

Chapter 6 outlines and discuss the spatial development framework phasing, catalytic projects, institutional responsibilities, capital funding and policy recommendations.

Chapter 7 provides this dissertations limitation and discusses further research to be conducted and conclusion.

CHAPTER 2: POLICY ANALYSIS

This chapter provides a strategic policy analysis and highlights the various built environment policy plans that relate to the area of Bellville. This chapter concludes with development objectives taking the TOD Strategic Framework's development principles into consideration.

South African strategic spatial planning seeks to enable greater socio-economic and spatial flexibility by replacing the emphasis on detailed site-planning guidelines with broader development concepts (Todes et al. 2010a; Steenkamp and Winkler, 2014). Thus, the 'Package of Plans' approach was adopted in Cape Town as a land use management mechanism to assess large, complex development applications. The 'Package of Plans' is essentially used as a tool that facilitates a connection between high level city planning principles and strategies with the land use management system (Steenkamp and Winkler, 2014). Furthermore, the 'Package of Plans' consists of a hierarchy of urban planning frameworks and associated approvals that provides for an increased level of planning and overall design detail to realize the overall vision for a particular development area. Additionally, the hierarchy of plans descends from a high-level policy to building plans, with each subsequent plan reflecting the intentions of the higher-level plan with increasing detail (Steenkamp and Winkler, 2014). The 'Package of Plans' demands that the hierarchical set of plans includes a contextual framework, development framework, precinct plans, site development plans, and building plans and that 'lower order' plans must be in keeping with 'higher order' plans (Steenkamp and Winkler, 2014). Hence, this chapter seeks to identify the key objectives in each policy plan that will be considered and included in the formulation of the local area spatial development framework plan for the case study area of BCA.

2.1 Policy informants

The following section analyses Cape Town's previous and most recent built environment policies. It should be noted that while there are many development policies, only the policies that are the most pertinent in relation to the main research questions were chosen and discussed below.

2.1.1 City of Cape Town TOD Strategic Framework

The TOD Strategic Framework is a metropolitan-wide strategy that identifies the necessary tools and mechanisms to be employed by various role players who collectively impact on Cape Town's development landscape in order to support the TOD Comprehensive Land Use Scenario (TOD-C).

The TOD-C was essentially developed to optimise trip generations from future land uses embracing TOD as an approach to development. TOD-C considers an optimum mix and intensity of trip generating and trip attracting land uses along public transport corridors (City of Cape Town, 2016a). The fundamental objective is to address the city's spatial inequality, improve public transport affordability, and reduce urban sprawl, which is all driven by the integration of sustainable public transport and land uses. The fundamental principles embedded in the TOD Strategic Framework are affordability, accessibility, efficiency, and intensification, which implies that new urban developments in the city must be strategically located around public transport coupled with an appropriate mix of land uses, and must be inclusive in well-located areas (City of Cape Town, 2016a).

The TOD Strategic Framework recognizes differentiated scales of TOD interventions and provides opportunities to effect and achieve TOD products at the metropolitan, corridor, nodal and precinct scales. For this dissertation, the nodal/ local area is identified as the scale of intervention in order to prioritise and guide TOD implementation at the precinct and project level scale accordingly (Refer to figure 3). The policy states that urban nodes are characterised by the intensity, mix and clustering of land use with the aim to define the role of the node within the corridor and to determine the desired density and mix of land use (City of Cape Town, 2016a).

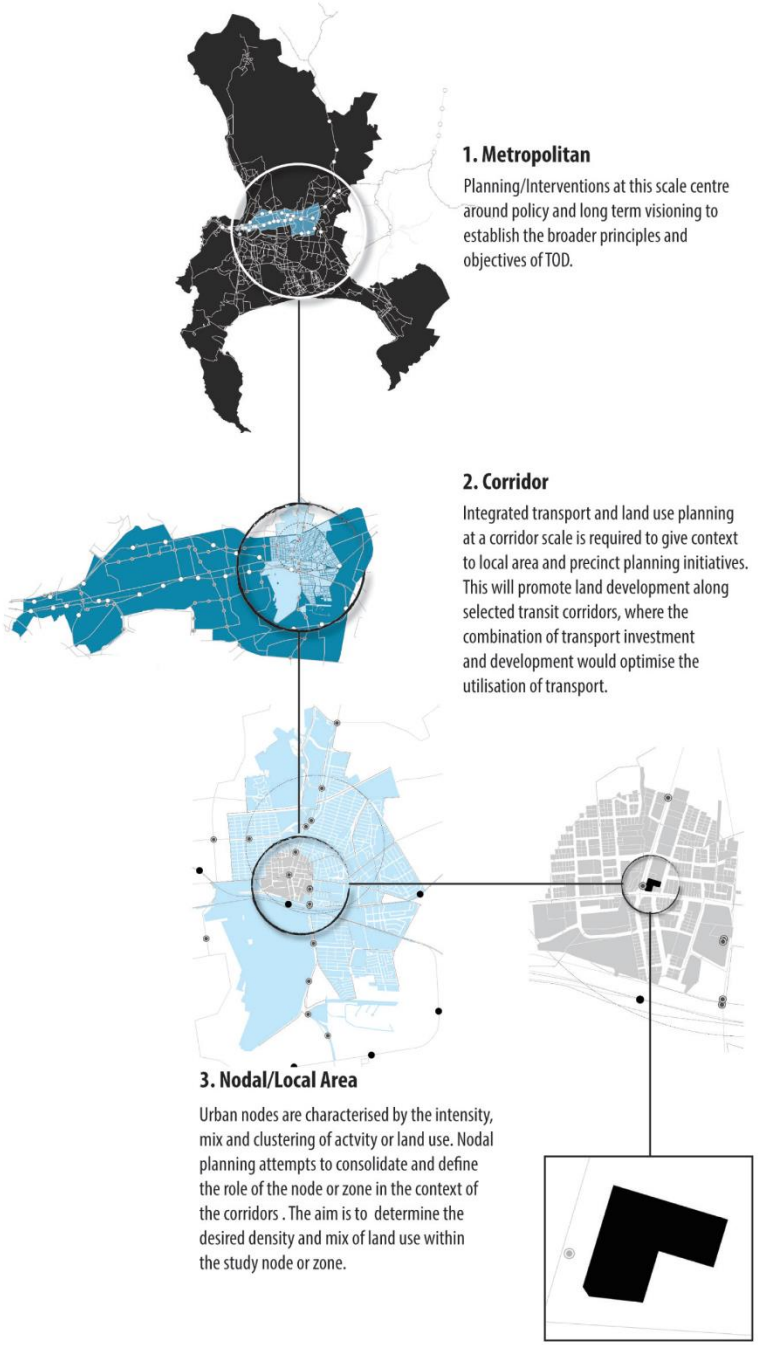


Figure 3: TOD at different scales of planning. Source: City of Cape Town TOD Strategic Framework.

As mentioned above, the TOD-C was developed to optimise trip generations from future land uses embracing TOD as an approach to development. Thus, it is important to recognise the current spatial distribution of trips within the City of Cape Town. The current situation in Bellville indicates a predominantly non-residential land use scenario (Refer to figure 4). However, following the transport optimisation process, the demand indicates that more residential land uses are required in Bellville (Refer to figure 5). Moreover, the TOD Toolkit identifies interventions necessary to implement strategies which should be applied at a nodal/ local area to facilitate the outcome of TOD-C (Refer to figure 6 and figure 7).

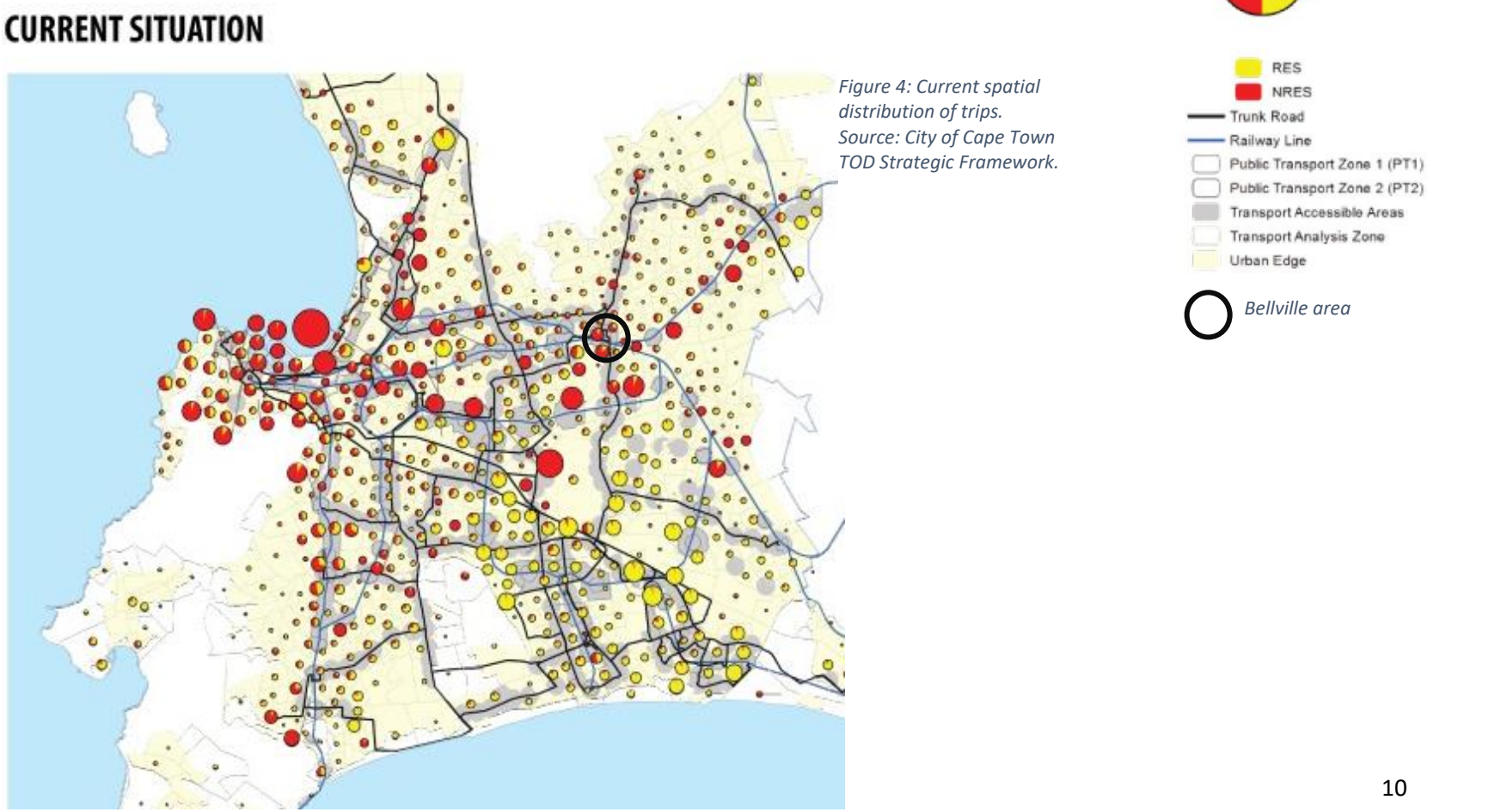


Figure 4: Current spatial distribution of trips. Source: City of Cape Town TOD Strategic Framework.

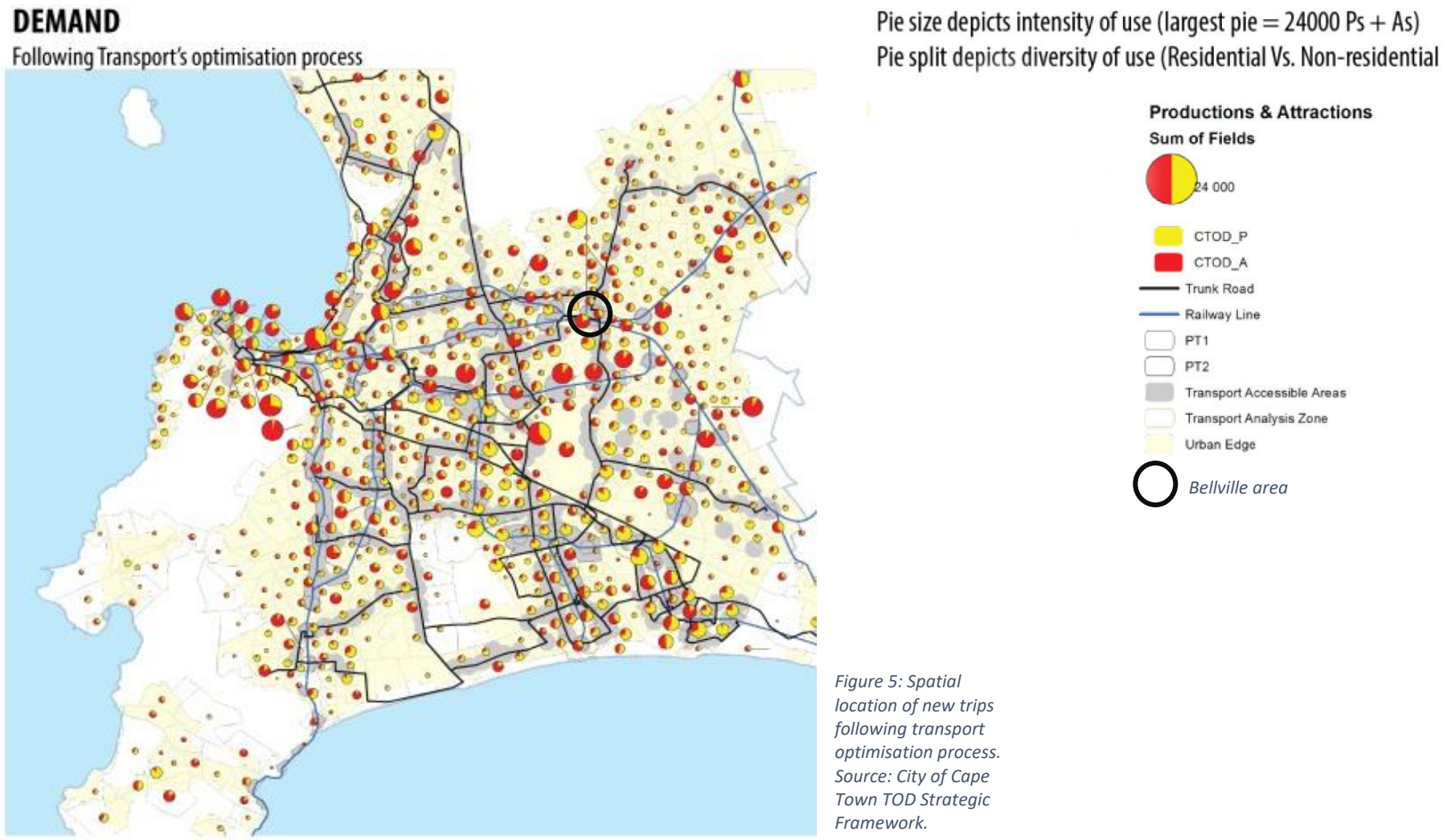


Figure 5: Spatial location of new trips following transport optimisation process. Source: City of Cape Town TOD Strategic Framework.

CATEGORY	TOOL/MECHANISM	PURPOSE	EXAMPLES
Strategic Planning Frameworks New (and changes to existing) development frameworks aligned to TOD principles and objectives to the extent that they are not already embedded ins said policies/frameworks	New Development and/or urban design frameworks at applicable scales and changes to existing frameworks (DSPs, LASDFs, Local Plans etc.). All planning frameworks must identify mechanisms to mitigate the impacts of gentrification in TOD precincts and Nodes.	To establish specific land use and design guidelines to manage and guide the growth and form of corridor, nodal and precinct development in line with TOD principles and strategies (including NMT Strategy).	• Corridor plans • District Spatial Plans • Local Area Development Frameworks • Urban design frameworks
Appropriate Infrastructure Design	Flexible Transit Infrastructure	To ensure that the design and construction of infrastructure allows for operations to respond to appropriate passenger demand volumes and the external contextual environment as they materialise over time, to ensure (to the extent reasonably possible) that such operations is affordable to the City from available resources in every financial year.	• Ramping up for demand • Adaptability for different operations
	Integrate social amenities with Public Transport infrastructure at appropriate transit locations or where opportunities exist based on the context of the node of precinct. i.e. stations and public transport facilities.	To promote better utilisation of resources, improve ridership, passenger convenience and improve the overall quality of life of residents at a nodal and precinct scale.	• Libraries, Clinics, Post office located on top of IRT station or at PTIs.
Development Incentives: mechanisms to stimulate private sector development and leverage public	Tax incentives/discounts to property developers	Incentivise development in TOD precincts.	Urban Development Zones
	Government funding	Subsidise catalytic private sector development. No developer or investor will elect to build in an undesirable location unless it yields a profitable return on investment or in this case receives a subsidy to compensate for its underperformance. Engagement with the private sector is	Private sector subsidies and loans

Figure 6: Nodal/ local area interventions. Source: City of Cape Town TOD Strategic Framework.

investment.		required to determine the appropriate returns warranted and if certain return thresholds can be met.	
Public land development programmes: to leverage and expropriate land in support of transit investment	TOD land disposal/release programme	To identify, package, aggregate and condition strategically located city-owned land in support of TOD and release to the market for development.	Targeted land disposal programme including, inter alia, de-proclaimed road widening scheme (Canterbury/Maynard) in key locations
	Land Banking and Assembly	Acquire aggregate parcels of land near or within TOD precincts where local development is expected to dramatically increase the plot's value, package the land for appropriate development and sell leasehold rights to private sector to develop.	Property Acquisition Policy
	Lease and disposal of Air Rights	Leverage development above public infrastructure and facilities such as mass transit stations and other public facilities to achieve a greater density and intensification of appropriate land uses. The clustering of public facilities and convenience facilities in close proximity to transit will allow trip chaining which is key to effective TOD.	TOD land disposal programme
Proactive planning: anticipatory planning mechanisms to fast-track development in TOD precincts	Pre-packaging land	Predetermine the form, type and mix of development in support of TOD linked to the TAPs. Change the applicable development rules of erven to ensure appropriate development-intensification of TOD precincts.	Proactive/Blanket rezoning (Langa) Overlay zones Amending height restrictions, etc.
Public Private Partnerships	Establish better forums for engagement	To ensure alignment of proposed development with phasing of transit infrastructure. Open lines of communication. Actively pursue development.	Private Sector engagement forums
Value Capture: tools to ensure the City recovers	Higher taxation of land (rates)	Retain greater interest on the investment of public infrastructure projects and upgrades.	• The identification of Special Assessment Districts[1] aligned to existing and new public

Figure 6 extended. Nodal/ local area interventions. Source: City of Cape Town TOD Strategic Framework.

some or all of the value that public infrastructure generates for private landowners, to offset high operational costs			investment/infrastructure projects. • Development contributions • Land value increment taxes
	Parking levies, congestion tax	To disincentivise private vehicle use, whilst generating additional income to offset operational costs associated with the provision of high quality public transport	• Parking levies • Congestion tax
	Improved management of parking and setting of parking tariffs	To capture the best value of City owned parking (managed, park and rides, and off-street)	• Revised Parking Tariff
	Improve commercialisation (formal and informal) in and around public transport stations, precincts, nodes and PTIs in the design of IRT Infrastructure and pre-packaging of land	Commercialisation of stations improves ridership, passenger convenience and generates a greater level of seat renewal. Furthermore it provides additional revenue generating opportunities for the City, through leasing or disposal (during the boom phase of the property cycle).	
Development Controls: regulatory tools to manage urban development processes in support of transit investment	Maximum parking requirements in areas where there is an imbalance between development and parking.	To prevent an additional supply of parking and discourage the use of private vehicles.	
	Monthly Operational Levy incorporated into the City's Development Contribution calculation	To offset the costs of operating public transport infrastructure in unsustainable locations.	
Marketing Tools: Improve political and public palatability of TOD	Media Campaigns	To effectively depict what TOD could potentially look like (high density and mixed use development) and communicate the benefits associated with TOD	3D visual aids across scales of TOD.

Figure 6 extended. Nodal/ local area interventions. Source: City of Cape Town TOD Strategic Framework.

CATEGORY	MECHANISM	PURPOSE	EXAMPLES
Projects and Programmes	BEPP Catalytic Projects	Champion projects to: • kick start development interest from private sector in key locations along higher order public transport infrastructure; • facilitate local (formal and informal) economic development. • Improve access to public facilities and social amenities.	Refer to list of projects in the BEPP and the TOD Game Changer Model.
	NMT Improvement (walkability and cycling)	Improve walkability, to and around IRT stations and PTIs. To improve the assessment private and public sector development applications .	Provide direct pathways
	Urban Regeneration aligned to the appropriate stage of the property cycle	To improve the quality of the urban environment – improve market responsiveness.	• Public space upgrades • Safety and security initiatives (i.e., VPUU). • Involving supporting/streamlining establishment of CIDs, and giving these greater scope for intervention (e.g. physical security improvements, CCTV, etc.).

Figure 7: TOD toolkit projects and programme scale. Source: City of Cape Town TOD Strategic Framework.

2.1.2 Cape Town Integrated Development Plan 2017-2022

The Integrated Development Plan (IDP) is a five-year plan required in terms of the Municipal Systems Act, Act no.32 of 2000. The Act states that an IDP is the main strategic planning instrument guiding and informing all planning, development and decision making within a municipality. Furthermore, the IDP is required to align with the national and provincial strategies and is to be operationalised through various strategic policies and business plans (City of Cape Town, 2017a). These strategic policies and business plans focus on implementing a vision, objectives, and the various projects and programmes of the IDP.

Central to the City of Cape Town's overall vision as set out in the 2017-2022 IDP is that of being "an opportunity city that creates an enabling environment for economic growth and job creation, and to provide assistance to those who need it most"; "to deliver quality services to all residents"; and "to serve the citizens of Cape Town as a well-governed and corruption free administration" (City of Cape Town, 2016a: 4)

The IDP identifies 5 strategic focus areas for the municipality, which they have termed 'the opportunity city', 'the safe city', 'the caring city', 'the inclusive city', and 'the well-run city'. These are then in turn broken down into 11 priorities (refer to figure 8). Strategic focus areas 1 ('the opportunity city') and 4 ('the inclusive city') are particularly pertinent in relation to the research questions to which this dissertation responds. Both focus areas align with priority 9 which strives for an efficient, integrated transport system, while 'the inclusive city' aligns with priority 8 which strives for a dense and transit-orientated growth and development approach. Furthermore, the strategic narrative of the IDP specifically makes mention of TOD principles that seek to create a more efficient urban form to assist with climate change mitigation by ensuring shorter trips through efficient transport systems.

Moreover, the IDP mentions that TOD will provide people with affordable and accessible public transport and will assist in providing greater access to economic opportunities, services and leisure activities (City of Cape Town, 2017a). Based on the abovementioned vision, the City of Cape Town's IDP has developed guiding principles that seek to inform all the city's activities such as resilience, sustainability, transformation of the built environment through TOD, governance reform, customer-centricity, and a transversal approach (City of Cape Town, 2017a). For the purpose of this dissertation, the transformation of the built environment through TOD principles, described in the quote below, is of particular importance:

> *"The City intends to build a more inclusive, integrated and vibrant city that addresses the legacies of apartheid with regards to the built environment, rectifies existing imbalances in the distribution of different types of residential development, and avoids the creation of new structural imbalances in the delivery of services. Key to achieving this spatial transformation is transit-oriented development (TOD) and associated densification. TOD is a data-driven strategy that underpins all development for the City of Cape Town, whether in response to growth or urbanisation. TOD is about changing, developing and stimulating the built form of the city so that the movement patterns of people and goods are optimised to create urban efficiencies and enable social equality and economic development. Densification further aids TOD by locating new development strategically around public transport, and having the right mix of intensity and land uses to optimise the efficiency of the public transport network and the provision of services and positively influence the urban form of Cape Town" (City of Cape Town, 2017a: 28).*

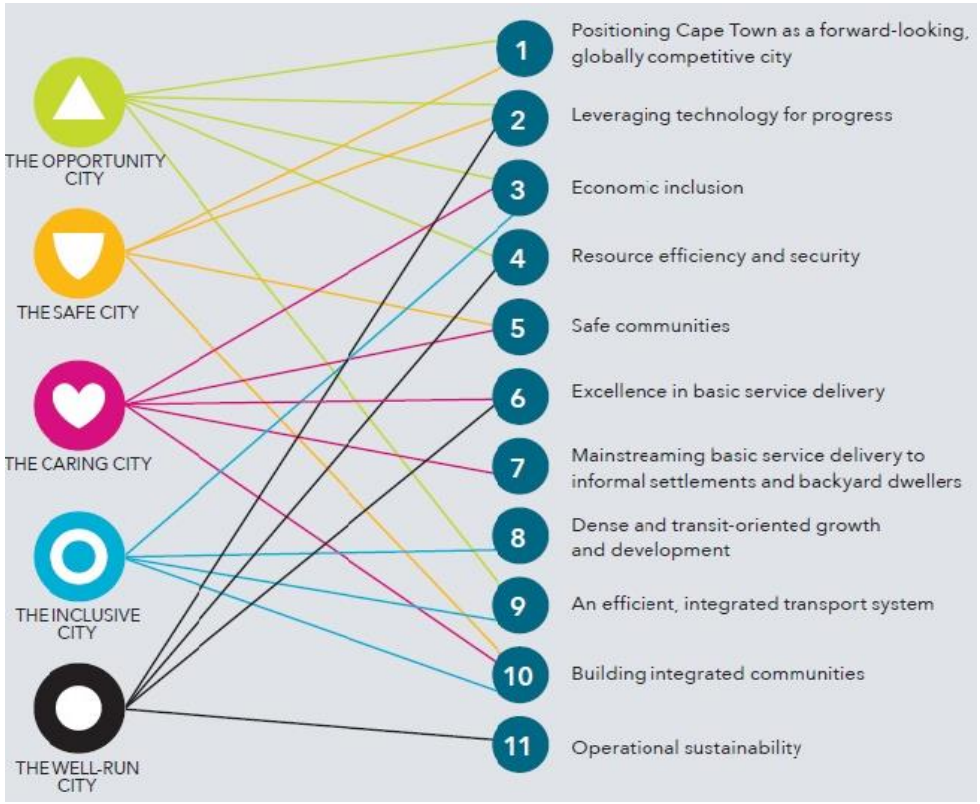


Figure 8: Relationship between the five strategic focus areas and the 11 priorities. Source: City of Cape Town IDP 2017-2022.

The abovementioned statement clearly indicates the City's commitment to TOD as an approach to rectify its fundamental urban challenges through spatial transformation.

2.1.3 Cape Town Municipal Spatial Development Framework 2012 (CTMSDF)

The role of the CTMSDF is to spatially determine, prioritise and align Cape Town's public investment in accordance with the Integrated Development Plan. Furthermore, the CTMSDF is subject to a full review every 5 years and is required in terms of Section 35 of the Municipal Systems Act, Act 32 of 2000. The CTMSDF that was approved in 2012 will be analysed first before looking at the 2017-2022 CTMSDF that has been drafted but not yet approved.

The Cape Town Municipal Spatial Development Framework 2012 (CTMSDF) is a policy plan established to guide long-term growth and development which includes a spatial vision, specific policy parameters and development priorities that will assist Cape Town in achieving its desired spatial form and urban structure (City of Cape Town, 2012a). The CTMSDF argues that the multidirectional accessibility grid will assist to establish a more equitable pattern of access for inhabitants. Furthermore, the accessibility grid encourages a hierarchical, multidirectional, open-ended, legible movement system that seeks to enable efficient multidirectional movement throughout the city. Additionally, the idea of accessibility is regarded to be an all-encompassing concept which includes three interconnected functions of land use proximity, transport network connectivity, and system performance (City of Cape Town, 2012a).

Figure 9: Multidirectional accessibility grid. Source: Cape Town MSDF, 2012.

Figure 10: Areas of land use intensification and nodes along the accessibility grid. Source: Cape Town MSDF, 2012.

Thus, the accessibility grid identifies routes from a land use and public transport perspective which are fundamentally characterised by higher levels of accessibility. What is of importance is that the urban core corridor is considered as the most accessible and mature corridor in the city and is strategically concentrated along the broad band stretching from Cape Town CBD to Bellville CBD. The broad band entices a wide range of investment and development opportunities along its length, and accommodates a significant proportion of the city's employment opportunities.

The CTMSDF states that Cape Town CBD and Bellville CBD nodes play a pivotal role in the existing economic structure of the city and that the location and development of Bellville provides significant potential to balance the space economy and to integrate the city's urban structure (City of Cape Town, 2012a). The CTMSDF designates Bellville as a civic precinct that is of citywide significance and that the area should be a focus of public investment. Additionally, the area of Bellville is strategically located within a metropolitan node, bordering the Voortrekker Road activity corridor. The CTMSDF recognises the importance of supporting the development of economic areas such as Bellville central. Thus, the City of Cape Town intends to support intensification of business services, financial, information and technology, office and retail functions in Bellville CBD and prioritise the revitalisation of the Voortrekker Road area (City of Cape Town, 2012a). These objectives seek to increase investor and property owner confidence in the well-located but declining area of Bellville. Furthermore, the City of Cape Town intends to improve urban management and prioritise public investment in infrastructure, transport, social amenities and the public realm within Bellville and promotes the development of publically owned land through public-private partnerships for affordable/ gap housing in the area.

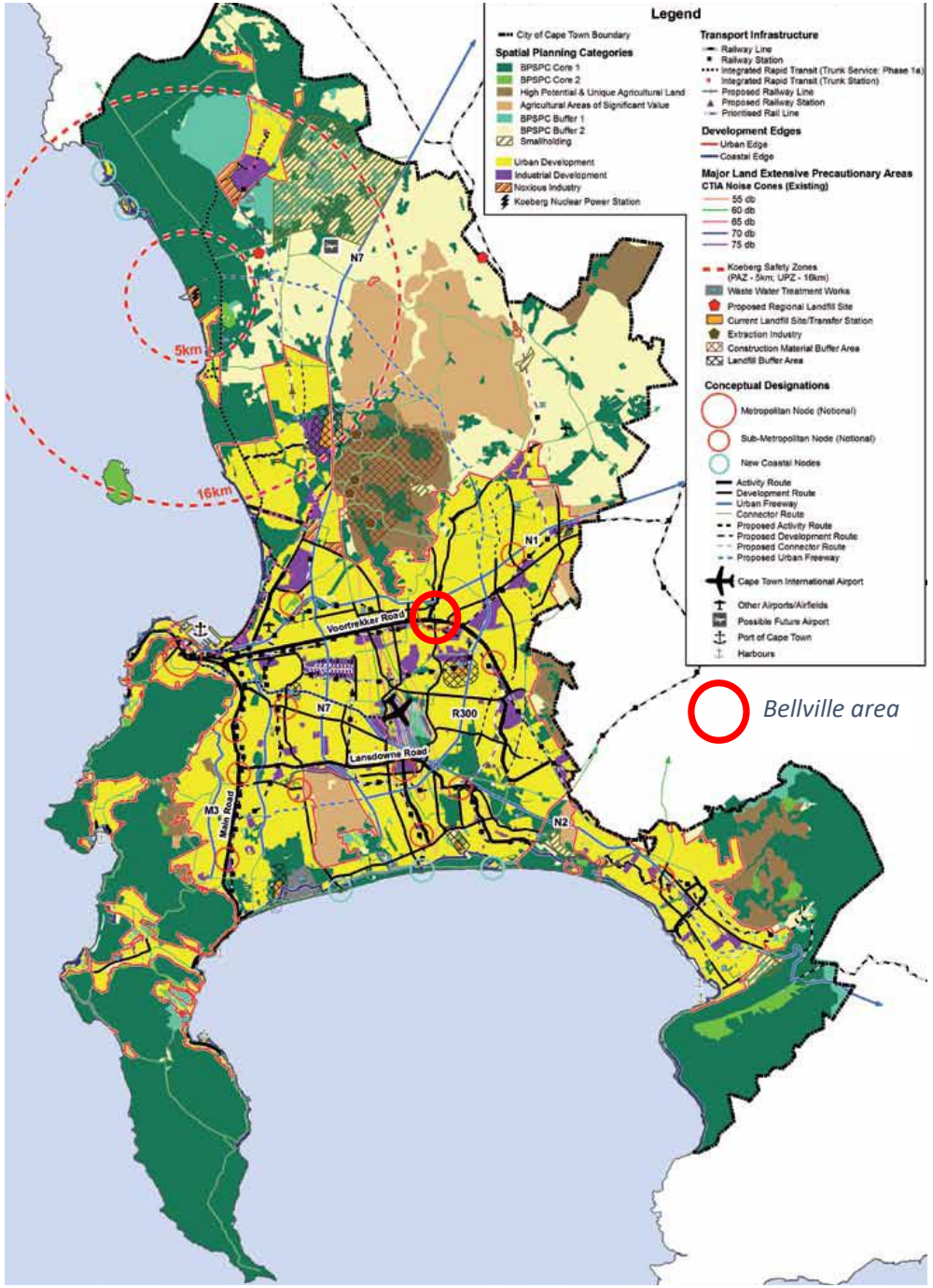


Figure 11: Cape Town MSDF. Source: Cape Town MSDF, 2012.

2.1.4 Cape Town Municipal Spatial Development Framework 2017-2022 Draft

The draft Cape Town Municipal Spatial Development Framework (CTMSDF) argues that the apartheid urban structure will not be addressed and transformed unless the City of Cape Town adopts a proactive approach to restructuring the city. The City's new development approach is premised on the ability to provide unique opportunities for housing, transit, recreation, and employment to ensure equity and spatial justice (City of Cape Town, 2016a). Furthermore, the City's TOD Strategic Framework is an important informant for the draft MSDF which advocates for connected inward growth (Refer to figure 12).

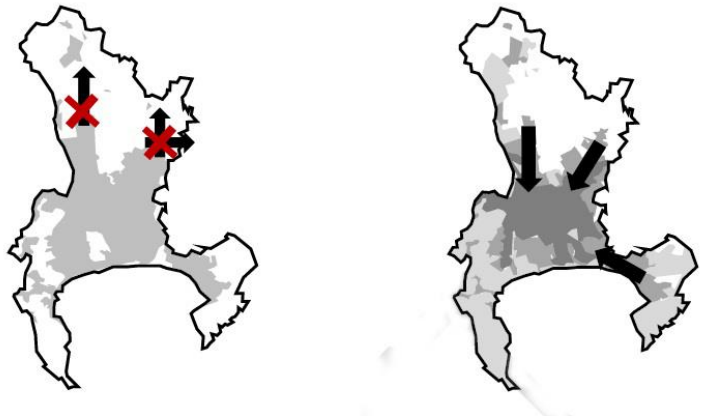


Figure 12: 2012 versus 2017 long term vision. Source: Cape Town MSDF, 2017 Draft

The CTMSDF seeks to implement TOD as the City of Cape Town's basis for mixed land use intensification, higher densities in close proximity to high capacity with quality public transport, and adopts affordability, accessibility, efficiency, and intensification as TOD principles. Additionally, the framework recognises that transit accessible precincts (TAPs) are fundamental restructuring elements.

It is noteworthy that numerous TAPs are already demarcated as Public Transport (PT) Zones which are included as an overlay zone in the Development Management Scheme (DMS), with the on-site parking requirements having recently been significantly reduced as an intervention to encourage densification in accessible public transport areas (City of Cape Town, 2017b). Furthermore, the MSDF outlines Bellville as an anchor for both the Voortrekker Road Corridor and Symphony Way Corridor (depicted conceptually in figure 13, and labelled in the MSDF in figure 12) and establishes the Urban Inner Core which comprises of land use intensification corridors premised around the City's integrated public transport network, the City's three integration zones, the City's priority TOD projects, the full extent of Urban Development Zones and TAPs.

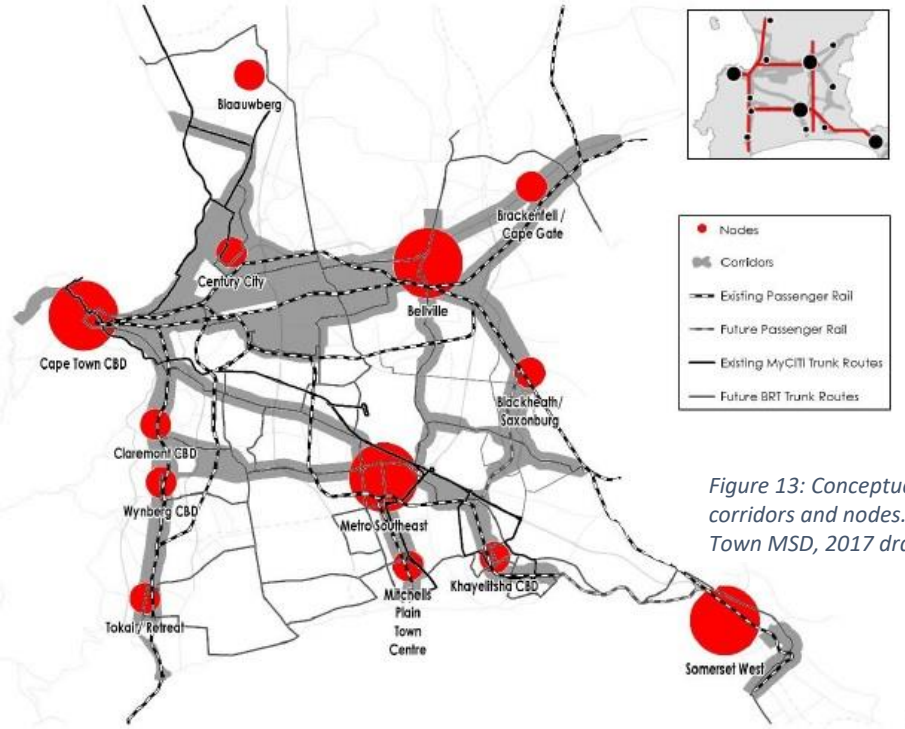


Figure 13: Conceptual development corridors and nodes. Source: Cape Town MSD, 2017 draft.

Figure 11: and Nodes draft.

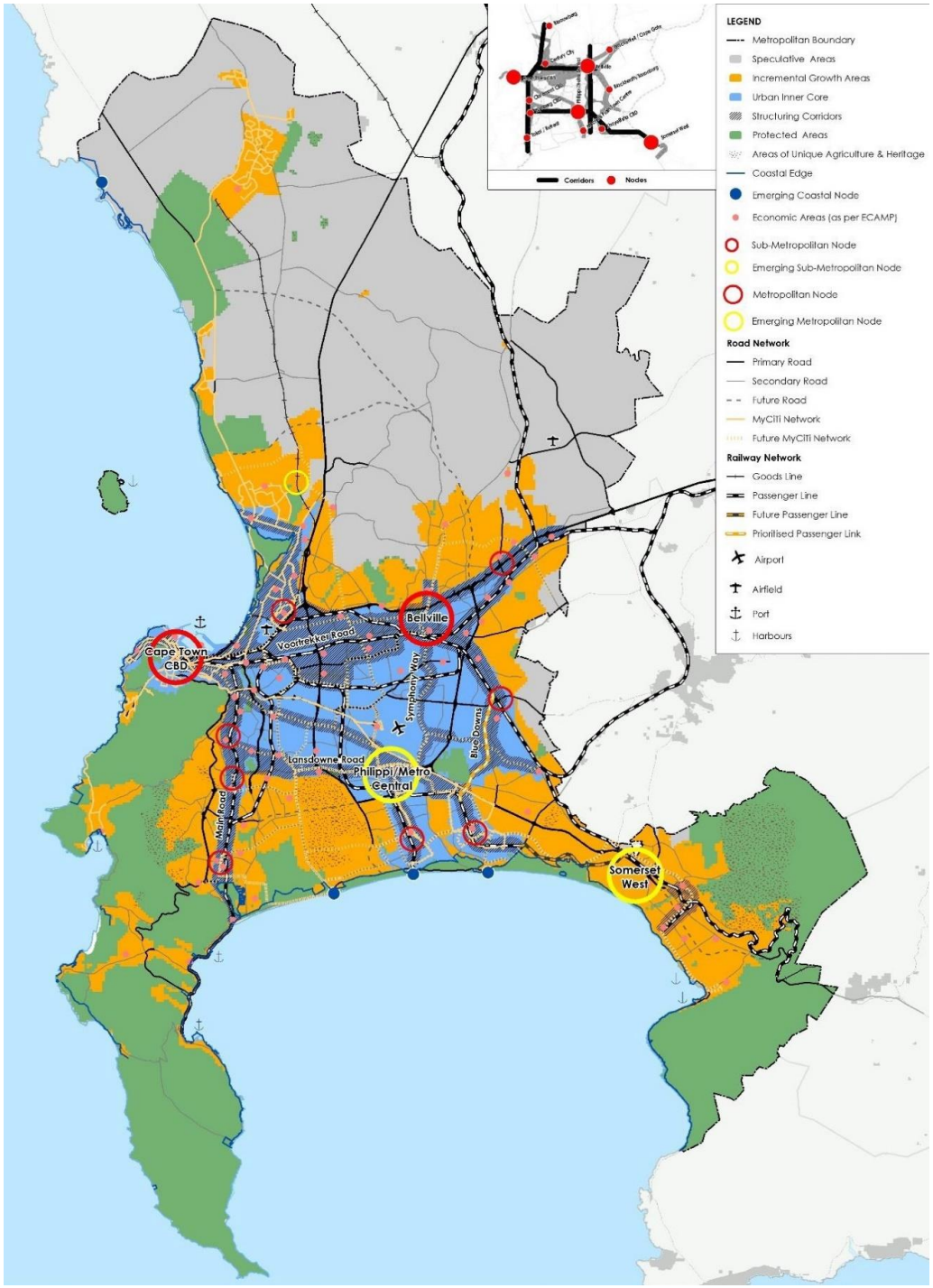


Figure 14: Spatial Development Framework. Source: Cape Town MSDF, 2017 Draft

2.1.5 Comprehensive Integrated Transport Plan 2017-2022 draft (CITP)

The CITP is the City of Cape Town's Transport and Urban Development Authority's policy response to their mandate for the transport network and everything that impacts on it. (City of Cape Town, 2017c). Furthermore, the CITP guides the TDA commitment to build on the progress made in delivering an integrated, intermodal and interoperable transport system. The City's delivery of integrated transport is not just confined to transport infrastructure, but to integrate transport with land use by using TOD to bring about the necessary spatial restructuring (City of Cape Town, 2017c). The CITP argues that intermodal transport cannot be delivered in Cape Town unless all functions and modes of transport are under the jurisdiction of a single authority. Thus, the City continues to acknowledge that rail is considered to be the backbone of the city's transport system, and that this important transport mode is currently in a predicament in the city (City of Cape Town, 2017c).

The CITP considers an interoperable transport system to provide the delivery of an integrated ticketing and timetable system for key modes of transport in the city. Essentially, the "CITP aims to deliver implementable plans for transport to create an equitable society based on integrating communities, to ensure economic inclusion and access to opportunities in Cape Town" (City of Cape Town, 2017c: i)

Bellville is strategically located as it provides the critical link between the Voortrekker Road Integration Zone and Blue Downs Integration Zone. Thus, it is imperative to understand the role of Bellville within the context of TOD and how it will be integrated with the planned and required proposals within the city.

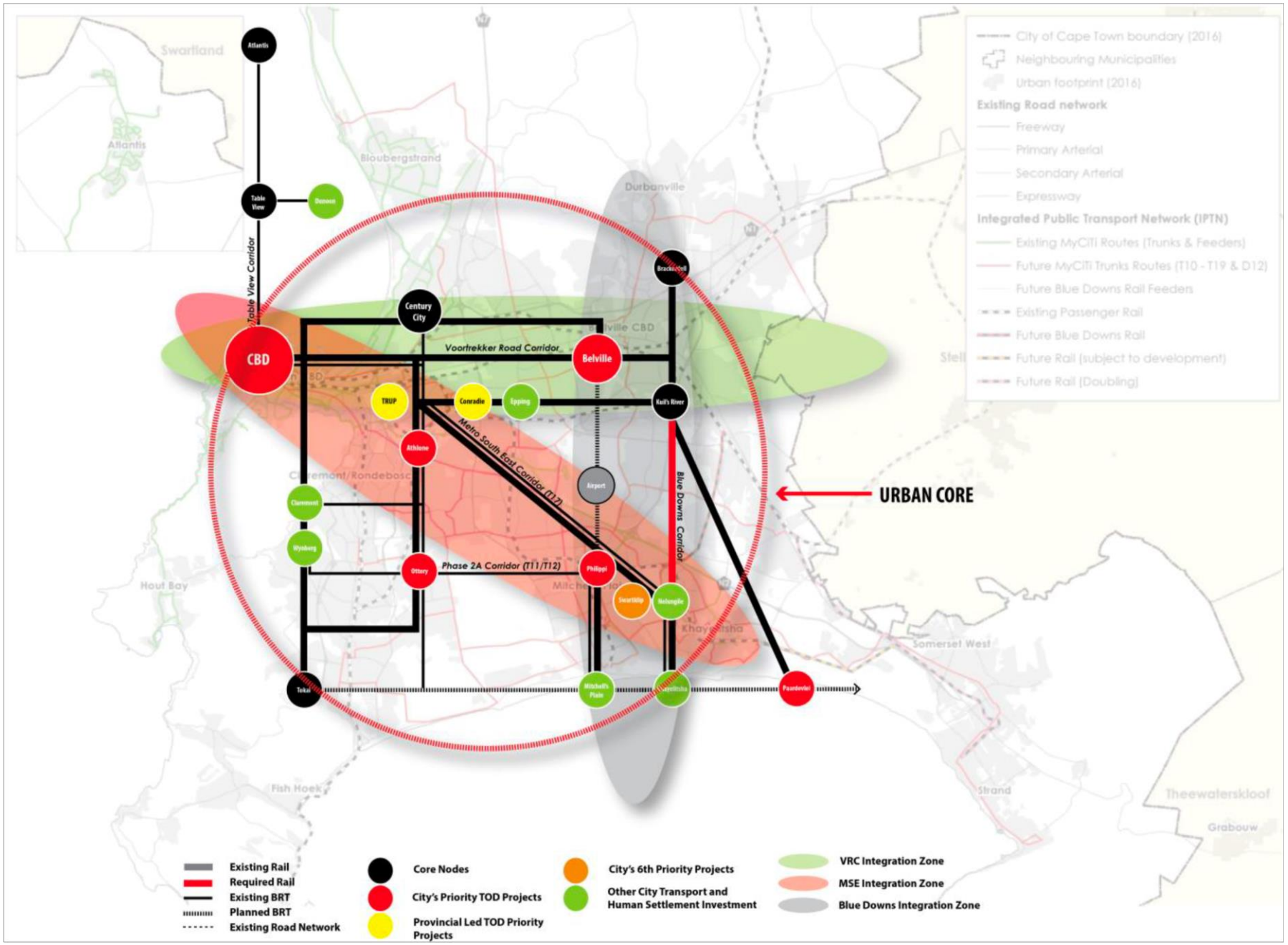


Figure 15: Proposed corridors, integration zones and precincts. Source: Comprehensive Integrated Transport Plan.

2.1.6 The Built Environment Performance Plan 2016- 2017 (BEPP)

The Built Environment Performance Plan (BEPP) provides the City of Cape Town's planning and financial arrangements such as the grant funding of the city's capital expenditure (City of Cape Town, 2016b). Performance-related grant funding such as the Integrated City Development Grant (ICDG) is triggered via the city's identified Integration Zones (IZs) such as the Metro South-East Integration Zone (MSEIZ) and the Voortrekker Road Corridor Integration Zone (VRCIZ). The identified IZs represents a joint commitment between the City and the National Department of Treasury to plan, fund and implement spatial restructuring projects within the city. Moreover, the IZs are premised on the potential opportunities afforded by public transport to restructure the city's urban form along TOD principles, the capacity to link economic opportunities and settlement patterns, opportunities to intensify land uses and to improve infrastructure (City of Cape Town, 2016b) ***[NB: Any direct quotes here? If so, provide quotation marks and page reference]*** . Additionally, the VRCIZ's primary spatial restructuring objective is to link Bellville CBD with the Cape Town CBD and the MSEIZ boundary. The VRCIZ identifies Bellville as a significant growth node and highlights the University of the Western Cape (UWC), Cape Peninsula University of Technology (CPUT) and Tygerberg Hospital as strategic nodal points (City of Cape Town, 2016b). Additionally, the Bellville transport interchange provides significant development prospects from a public transport and urban development perspective as there are significant public land holdings in the surrounding precinct. The BEPP argues that the increase in supply of affordable rental housing stock is a key intervention towards integration and urban renewal of the Voortrekker Road Corridor.

The BCA is located within a transit accessible precinct, an urban restructuring zone, Public Transport 2 Zone (PT2), an integration zone and consists of TOD gamechanger projects (Refer to figure 14).

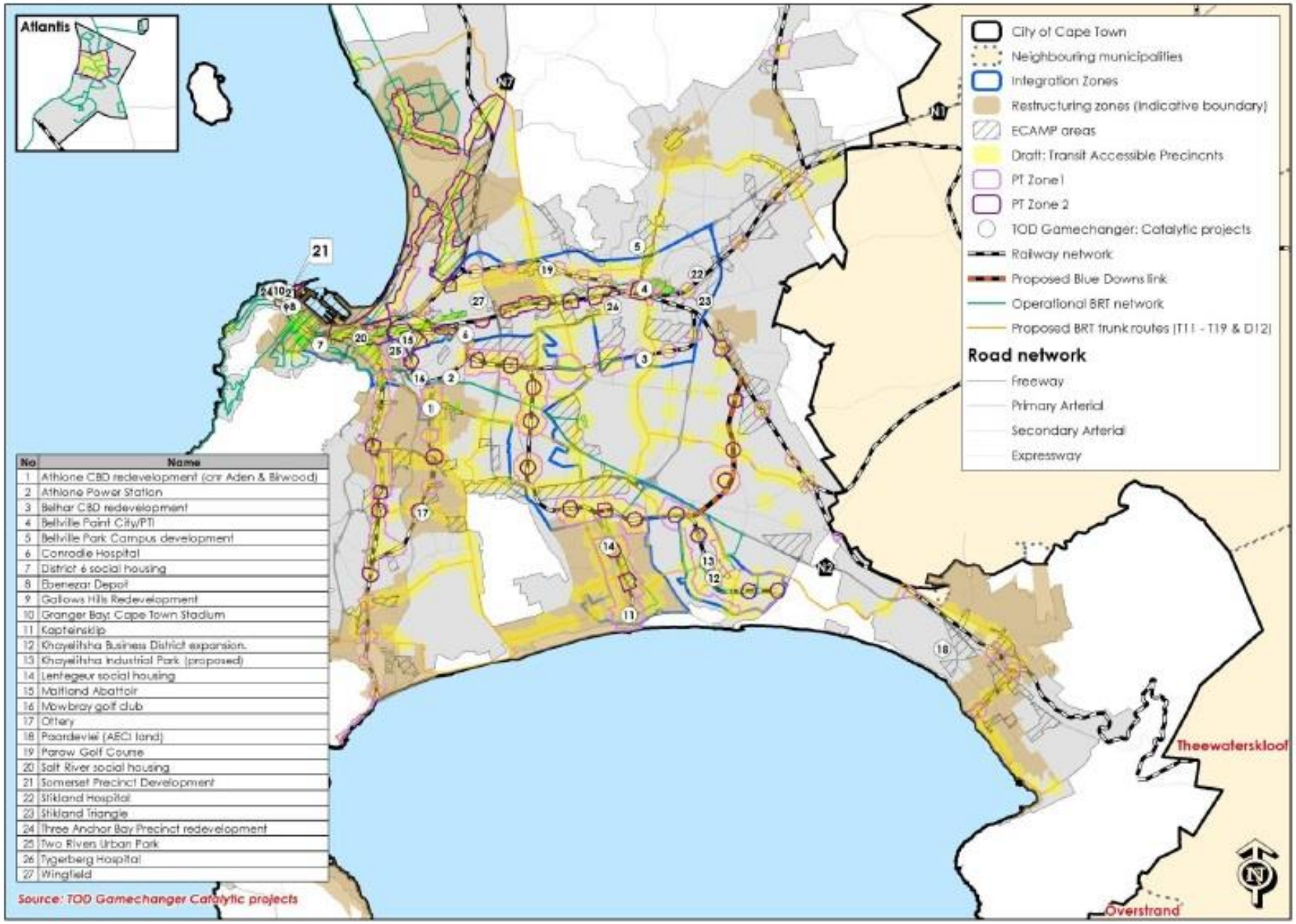


Figure 16: Spatial analysis of catalytic projects in relation to spatial targeting initiatives. Source: Built Environment Performance Plan, 2016.

2.1.7 Tygerberg District Plan

The Tygerberg District Plan forms one of 8 district plans formulated for the planning districts within the City of Cape Town. The district plans are informed by the city-wide Cape Town Metropolitan Spatial Development Framework (CTMSDF) to ensure strategic alignment and to guarantee that high-level policy objectives materialise at site level proposals. The District Plans "promote a more responsive, flexible and policy-driven approach to land use management, in which a broader range of instruments and policies set the development guidelines against which all land use decision-making takes place across the city" (City of Cape Town, 2012b:2). The Tygerberg District plan identifies Bellville CBD, a section of Voortrekker Road and Van Riebeeck Road as well as the Durban Road Activity Corridors area as sub-district 3. Furthermore, sub-district 3 has specific local area objectives and associated development guidelines that are listed in table 1.

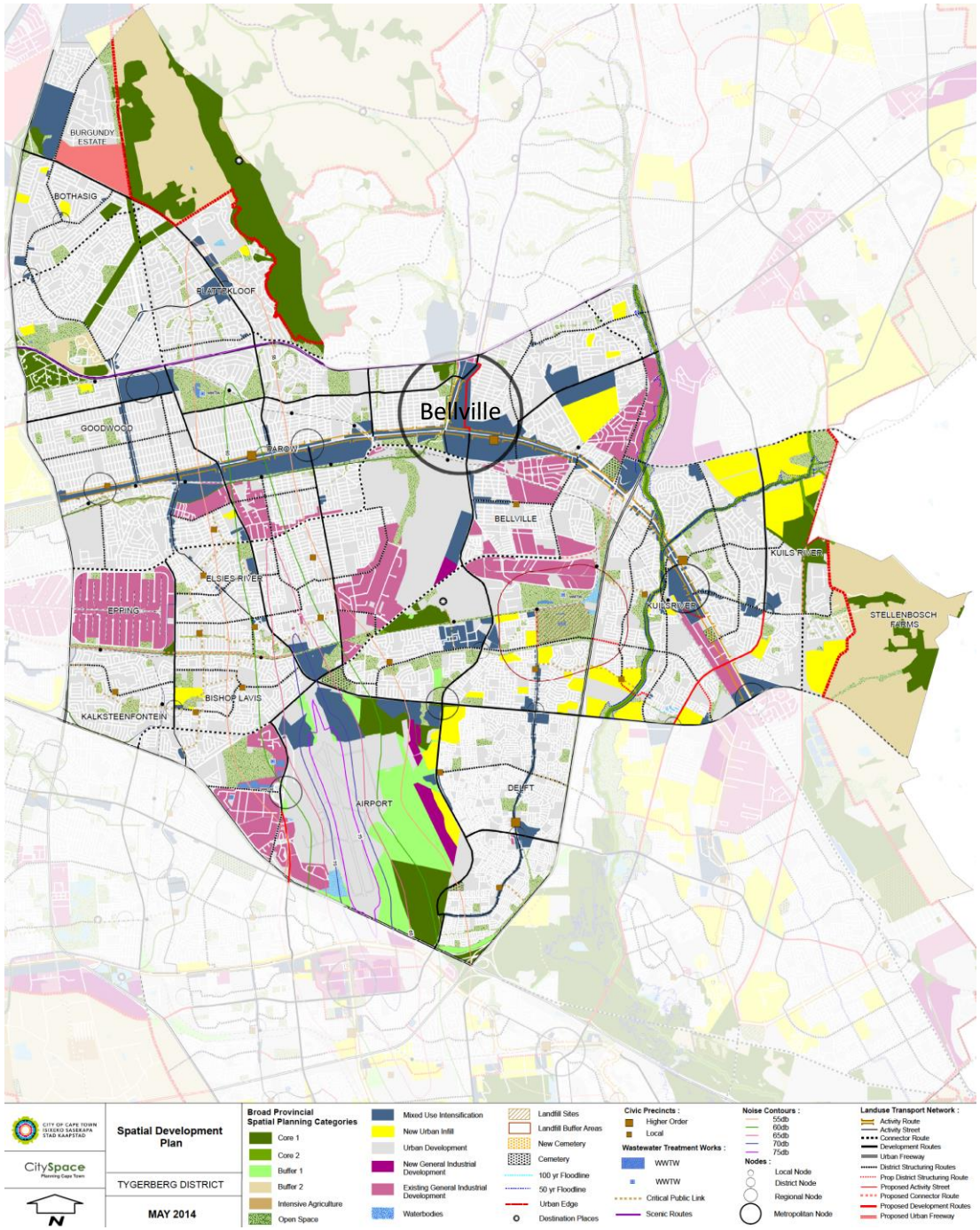


Figure 17: Tygerberg District Plan. Source: Tygerberg District Plan Technical Report, 2012.

Local objectives	Development guidelines
(a) Intensification & urban form/character - Enhance the development potential of the activity corridor by promoting redevelopment of land for high density mixed-use development. - Ensure the establishment of a mix of uses including residential, commercial and community uses within the corridor area. - Support the upliftment and renewal of the area with public sector investment where possible. - Facilitate the development of a mix of high density uses that can support public transport.	- Encourage the development of high density mixed-use development in the form of residential and commercial activities within the first development block to the north and south of Voortrekker Road and Van Riebeeck Road. A bulk of 3.0 with a building height of between 7 to 8 storeys can be achieved. - Promote the provision of consolidated, accessible public parking areas in close proximity to the activity spine to support the waving of parking requirements for developments fronting directly onto the activity spine. Consolidated parking areas would preferably be located behind buildings fronting onto Voortrekker Road/Van Riebeeck Road. - Promote the establishment of high density, general residential development up to the second development block to the north of the activity spine to act as a buffer between the high density, mixed-use development directly adjacent to the spine and single residential development. A bulk of 1.5 with a building height of 3 storeys can be achieved, however, higher densities can be considered where appropriate. - Where general residential development abuts single residential development, the design and layout of the general residential development should ensure a maximum of 2 storey interface with such single residential properties. In this area, low impact commercial activities such as offices can also be accommodated. - Promote the establishment of high density, general residential development, mixed with low-impact commercial uses such as offices in the area between the zone directly adjacent to the activity spine and the railway line up to a bulk of 1.5 with a height of 3 storeys. - Within the immediate areas around railway stations, the development of a mix of high density commercial and residential uses can be accommodated with a bulk of 3 and a maximum height of 7 storeys. These parameters should be applied with a radius of ±400m from stations along the Bellville Railway, the distance between most stations and Voortrekker Road. - Promote an appropriate mix and density of development within the corridor area, including Durban Road and Van Riebeeck Road. - The Belrail Residential Estate to the east of Modderdam Road represents a strategic redevelopment opportunity for residential densification (high density) within close proximity to the Bellville CBD and transport interchange. Limited mixed-use activity should be permitted on the ground floors of residential buildings in more accessible locations, such as along Reed Street. - The realignment of Durban Road south of the N1 is likely to have a major impact on land uses along this part of the corridor. The area between the existing Durban Road and the proposed realignment is proposed as a mixed-use intensification area. The intensity and scale of redevelopment is envisaged to be similar to that which is located along Durban Road north of the N1 freeway (Edward Street). - Bellville Station: Erf 10854, Bellville, located to the south of the station, also offers limited infill development. Portions of the site located directly adjacent to the rail lines offer the opportunity for high density infill housing development. Vehicular access to that portion of the site should be investigated, but it is believed that some of the rail tracks are not utilised anymore and may present an opportunity. Furthermore, it is also reasoned that the end-users would be solely dependent on rail transport, and limited vehicular access should therefore be required. The opportunity to provide public rental housing opportunities within the Bellville CBD should be investigated on Erf 26364 (c/o Charl Malan Road and Belrail Road). Densification boundaries for Durban Road south of the N1 freeway should be determined in local area planning.
(b) Managing urban development	- The Hardekraaltjie site should retain its current function as a camping site. However, should development be pursued, the cluster of mature trees on the site should be retained. - Ensure that Elizabeth Park in Bellville CBD is safe and well-maintained.

Table 1: Sub-district 3 local objectives and development guidelines. Source: Tygerberg District Plan, 2012.

2.2 Conclusion

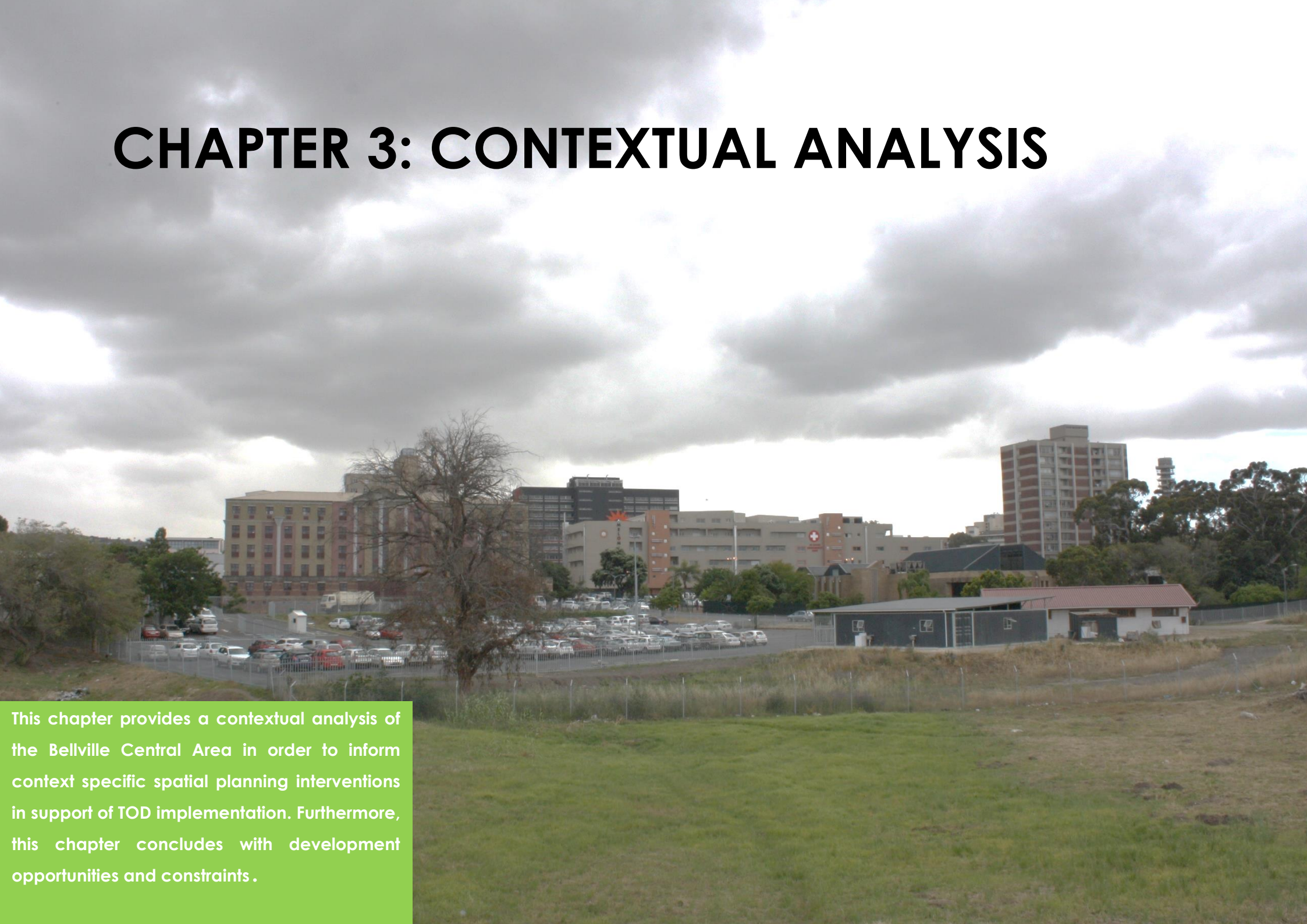
This chapter provides a review of Cape Town's built environment policy objectives and serves as a guide for the preparation of the local area SDF. As mentioned above, there are many development policies and only the most pertinent policies related to the main research questions were selected to be reviewed.

The case study area of Bellville Central is strategically located and emphasised as an area that has significant catalytic urban restructuring potential for the city. Thus, it is imperative to ensure that spatial planning principles and development objectives are aligned throughout the scales in order to provide the basis for the contextual analysis and the local area SDF formulation. Therefore, the City of Cape Town's TOD Strategic Framework's normative principles will be used to align high level policy to the local area scale in order to inform the following development objectives below:

TOD principles	Development objectives
- Affordability - Accessibility - Efficiency - Intensification	- Facilitate the development of mixed land uses with a specific focus on increasing the supply of high density affordable housing. - Identify and develop public land holdings for affordable housing in the area through public-private partnerships. - Locate new development around public transport, and ensure an appropriate intensity and mix of land uses to optimise the efficiency of the public transport network and the provision of services. - Support intensification and connectivity of business services, financial, information and technology, office and retail functions in Bellville CBD and prioritise the revitalisation of the Voortrekker Road Corridor. - Increase investor confidence by improving urban management and prioritise public investment in infrastructure, transport, social amenities and the public realm within Bellville. - Promote densification by seeking opportunities to further reduce on-site parking requirements and by extending the physical area to which reduced on-site parking requirements apply. - Reinforce Bellville as a significant growth node and anchor for both the Voortrekker Road Corridor and Symphony Way Corridor and provide connections to the University of the Western Cape (UWC), Cape Peninsula University of Technology (CPUT) and Tygerberg Hospital.

Table 2: Bellville TOD development objectives. Source: Author, 2017.

CHAPTER 3: CONTEXTUAL ANALYSIS



This chapter provides a contextual analysis of the Bellville Central Area in order to inform context specific spatial planning interventions in support of TOD implementation. Furthermore, this chapter concludes with development opportunities and constraints.

3.1 Introduction

This chapter builds on the Policy Analysis by incorporating further information and analysis to enhance the understanding of the BCA, the current systems in place, the functioning, the potential for positive change, and the requirements to drive the envisioned change. This understanding has been used to develop a TOD Local Area Spatial Development Framework in chapter 5 to guide spatial planning, TOD implementation and government investment in order to grow confidence and attract private investment in Bellville.

3.2 Study Area motivation

Bellville is referred to as the second metropolitan node of the city and forms an essential part of the infrastructure and transport development plans for the Voortrekker Road Corridor, with particular focus on the Bellville public transport interchange (City of Cape Town, 2012a; City of Cape Town, 2012b; City of Cape Town, 2017b; Uppink, 2016:12). Furthermore, Voortrekker Road Corridor is identified as an Integration Zone in terms of National Treasury's Integrated City Development Grant (ICDG) programme. Thus, it is widely viewed that the case study area of Bellville is strategically located and emphasised as an area that has significant catalytic urban restructuring potential for the city. A key question guiding the contextual analysis is that of how metropolitan scale TOD principles and development objectives can be translated into implementable TOD projects on the ground. Therefore, the case study area will be analysed in order to reveal the local context, relevant planning proposals, current initiatives, location potential and market performance, business characteristics, social demographics, urban structure, with these considerations being synthesised into a set of opportunities and constraints that are used to guide the formulation of the TOD Local Area Spatial Development in chapter 5.

Figure 18. Cape Town's urban core corridor. Source: City of Cape Town MSDF, 2012.

3.3 Locality

The case study area of Bellville Central is located in the City of Cape Town, South Africa (Refer to figure 19). Cape Town is the capital city of the Western Cape Province in the south-western region of the country. The Western Cape is the fourth largest of the nine provinces in terms of both area and population, with an area of 129,449 square kilometres and 5,8 million inhabitants, with an estimated 4,2 million of these inhabitants residing within the municipal boundary of Cape Town (Statistics South Africa, 2012).

Bellville is situated approximately 20km east of the Cape Town CBD and in close proximity to Cape Town International Airport (CTIA) and Tygerberg Nature Reserve (TNR) (Refer to figure 20) Importantly, the case study area is located at the junction between two major corridors – the east-west Voortrekker Road Corridor and the north-south Symphony Way Corridor displayed in greater detail in figure 21. Most notably, the site contains the area of convergence between the northern and central railway lines.

Figure 19: Locality. Source: Author, 2017.

Figure 20: Case study area locality. Source: Author, 2017.

3.4 Wider Context

The BCA has exceptional regional connectivity as it is centrally located in the wider Cape Town functional region and serves as a cross-axis for the east-west Voortrekker Road Corridor and the emerging north-south Symphony Way Corridor. Additionally, BCA is situated within a 8 kilometre radius from Cape Town International Airport and 7 major industrial areas, and is located along a primary rail route (Refer to figure 21).

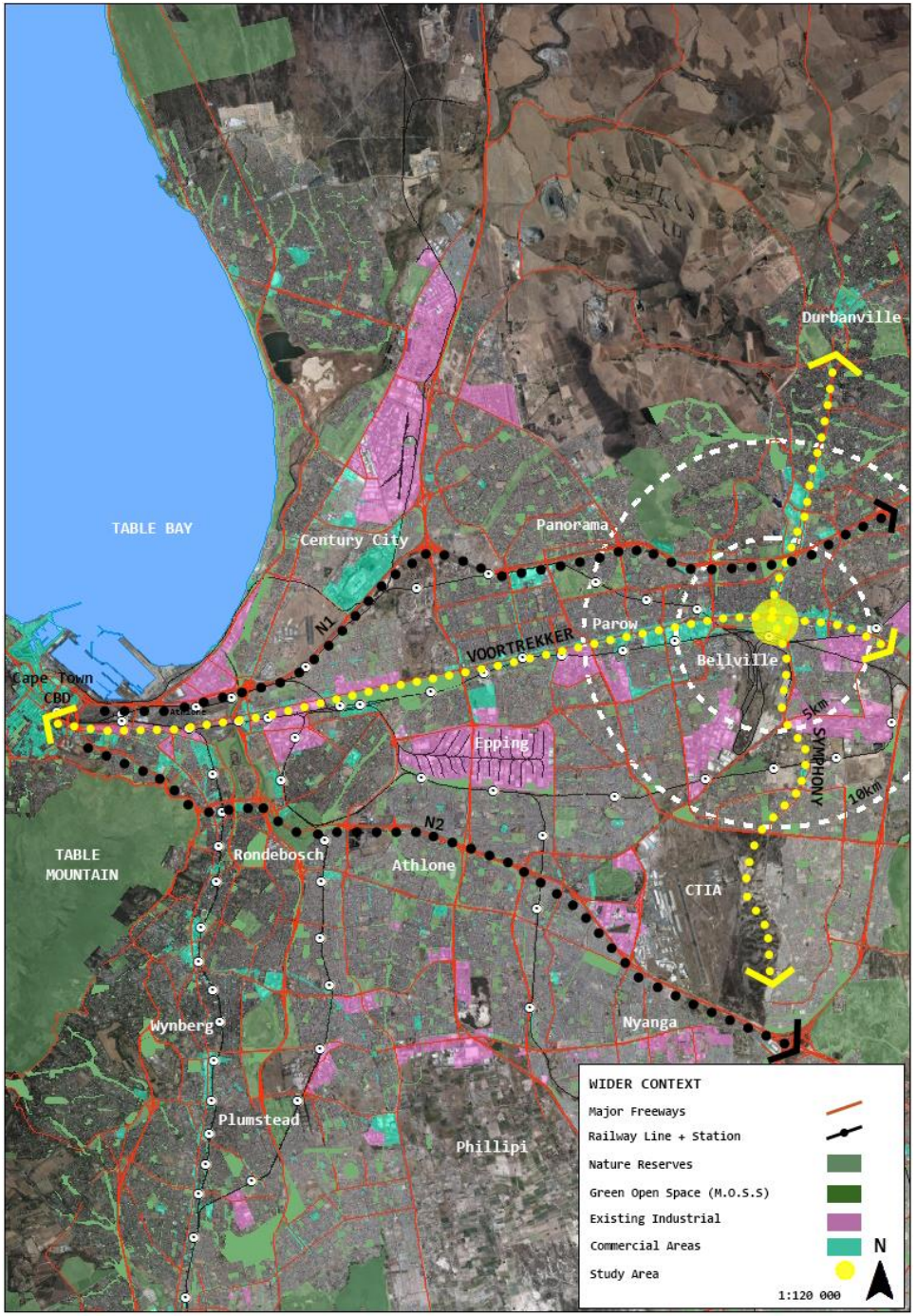


Figure 21. Wider context. Source: Author, 2017

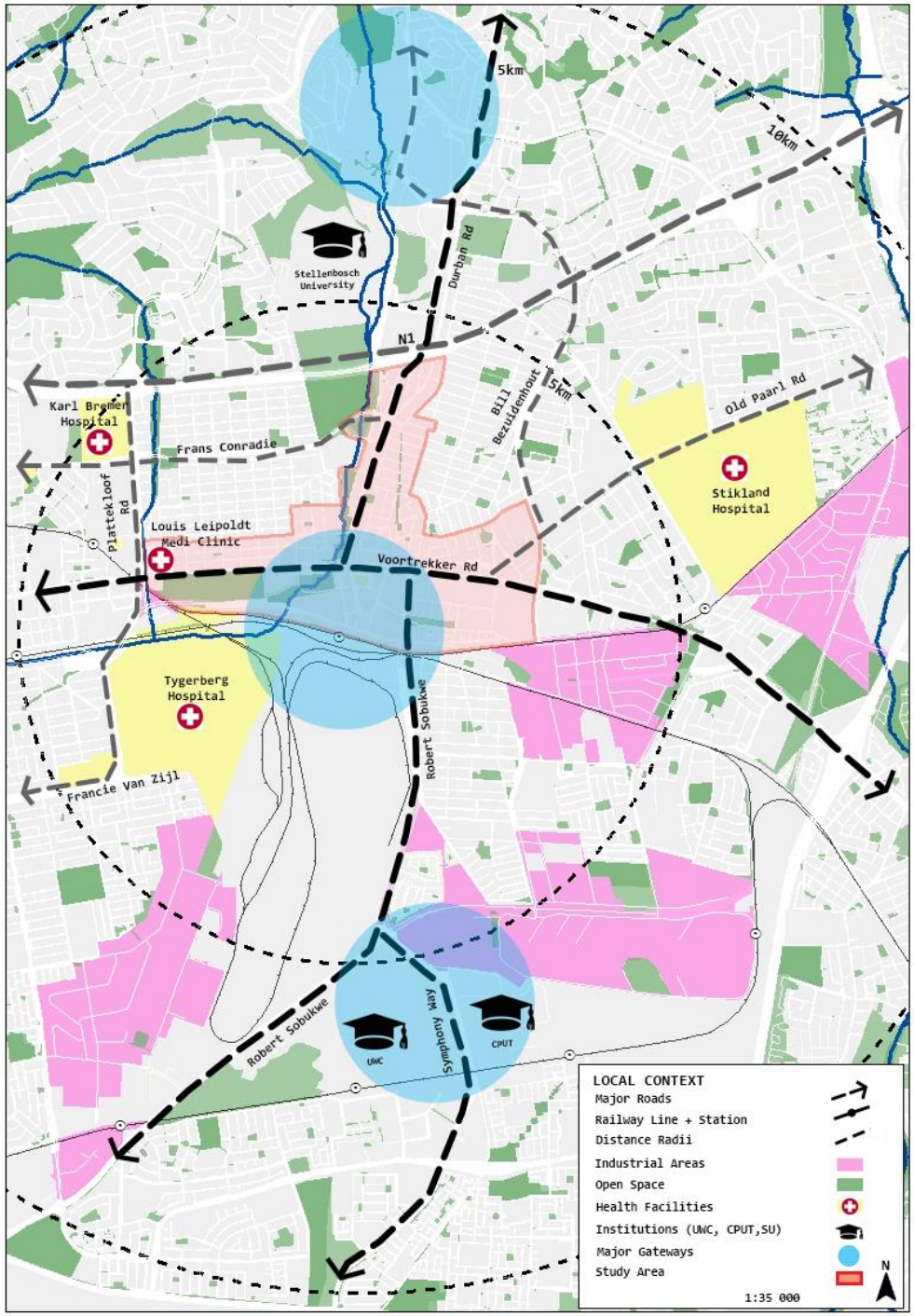


Figure 22: Local context. Source: Author, 2017

3.5 Local context

The Bellville public transport interchange (PTI) serves as an interchange and significant gateway to the broader area. Many commuters move through the area to access various opportunities elsewhere in the city and in the nearby vicinity such as the several tertiary education institutions of the University of the Western Cape (UWC), the Cape Peninsula University of Technology (CPUT), the University of Stellenbosch (US), the University of South Africa (UNISA) and Northlink College, and high order health facilities such as Tygerberg Hospital, Melomed Hospital, Stikland Hospital, as well as numerous civic facilities such as the Bellville Civic Centre and the South African Revenue Services (SARS), to name a few (Refer to figure 22).

3.6 Current initiatives

3.6.1 Urban Development Zone (UDZ)

The UDZ is a tax incentive administered by SARS which seeks to encourage private sector-led residential and commercial development in inner-city areas with developed public transport facilities. It is essentially a tax mechanism which allows a developer to write off an asset within the urban development zone faster when he/ she claims for the erection, extension or improvement of a building for the purposes of trade. While this incentive is a positive for TOD implementation, further cost cutting mechanisms should be implemented to assist developers with the initial profit making in order to entice development appetite (Refer to figure 23).

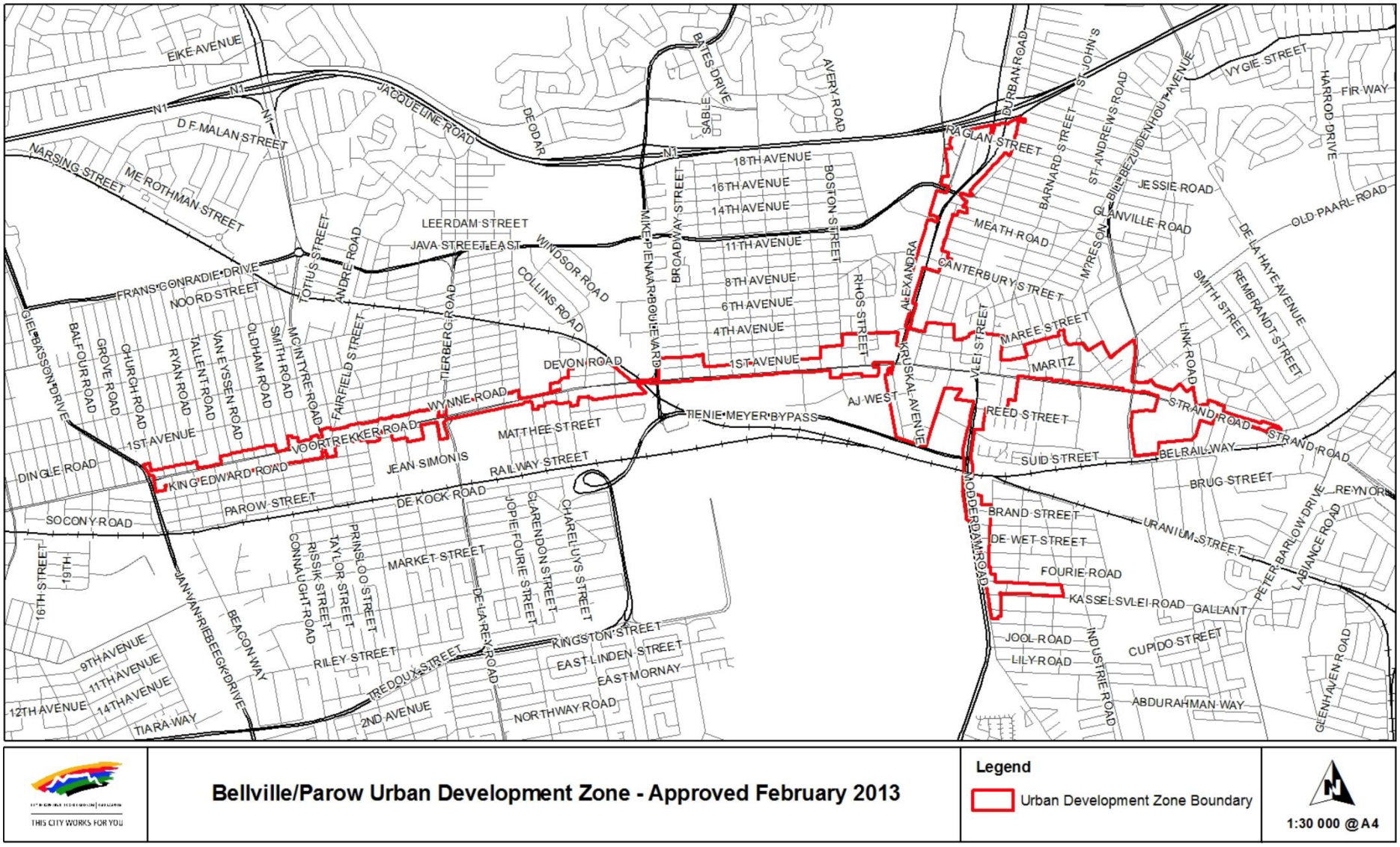


Figure 23: City of Cape Town Bellville/Parow UDZ. Source: City of Cape Town website, 2017.

3.6.2 Voortrekker Road Corridor Improvement District (VRCID)

The Bellville Chamber of Commerce initiated the establishment of a Special Rating Area (SRA) which is a spatially defined area where property owners within the defined area pay an additional rate to fund top-up services which typically includes the provision of additional public safety, cleansing services, maintenance and upgrading of the urban public environment, infrastructure and services that address social issues in the area (Voortrekker Road Corridor Improvement District, n.d.). The initiative is deemed to be a positive step for TOD implementation due to the existing crime and grime concerns along the Voortrekker Road Corridor and within the Bellville Central Area. Urban management could restore the overall functioning and ensure a more attractive area to live, work and play for all users of space (Refer to figure 24).

Figure 24: VRCID area. Source: VRCID website, 2017.

3.6.3 Voortrekker Road Corridor Integration Zone

The VRC has been susceptible to urban decay and is in need of structured management approaches to support and stimulate both investment and re-investment due to the decline of commercial and industrial areas. The decline saw reputable businesses relocating to more contemporary developments located in close proximity to the N1 near highway off ramps and junctions (Century City, Tyger Valley, Cape Gate). In partnership with National Treasury, the City has identified and endorsed an Integration Zone namely, the Voortrekker Road Corridor Integration Zone based on the corridors public transport linkages that connect both Cape Town and Bellville nodes. The Integration Zone (IZ) is a performance-related funding allocation tool that also ensures the monitoring of targets within the corridor. There are numerous proposed Catalytic Urban Development Projects within the IZ which seek to facilitate TOD opportunities along the Voortrekker Road Corridor. Bellville is located within the IZ which indicates the government's commitment to extensive infrastructure investment particularly in relation to public transport, which is positive for TOD implementation. The commitment provides developers with clarity and a level of predictability in terms of capital investment for TOD within the area (Refer to figure 25).

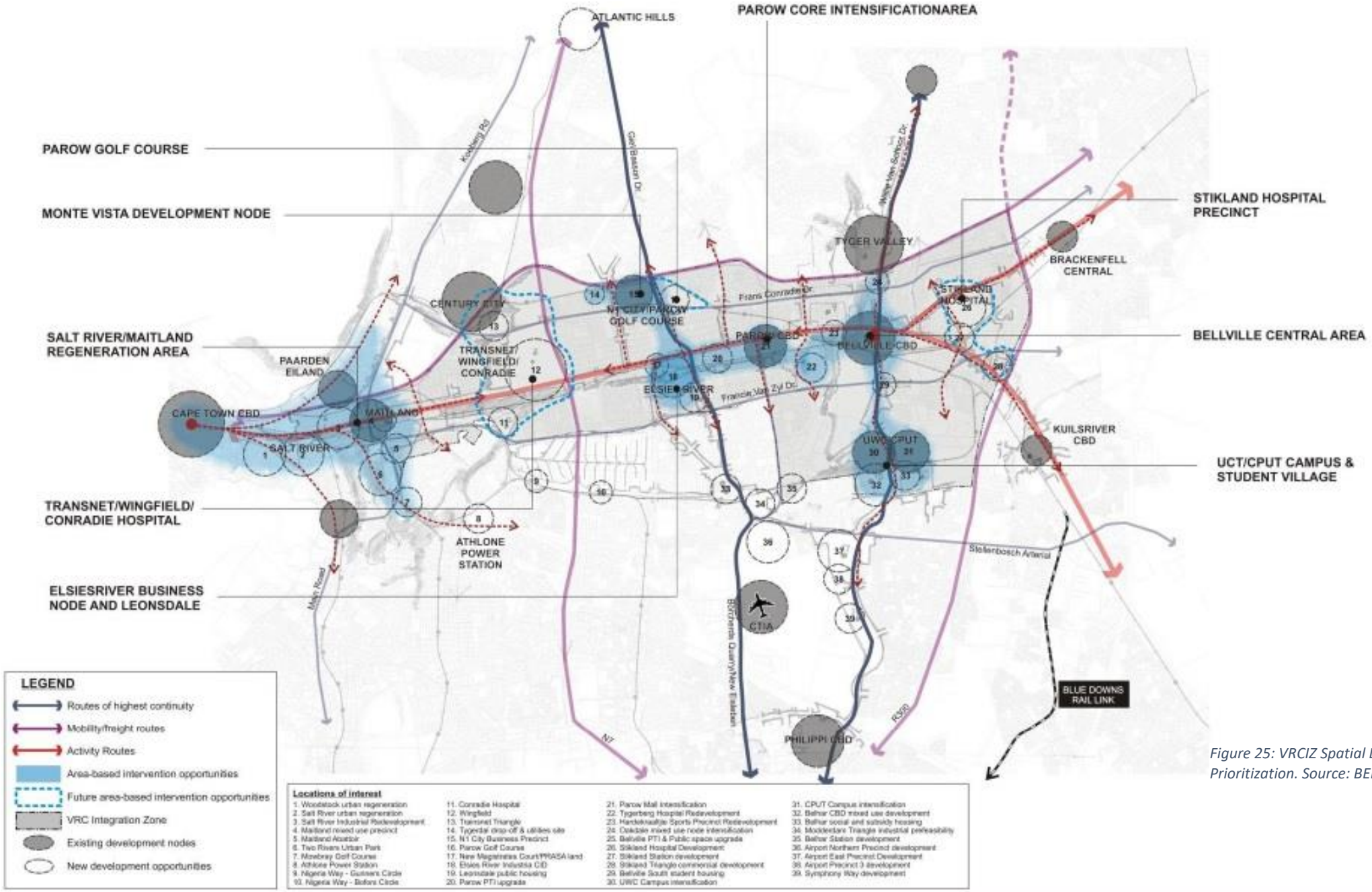


Figure 25: VRCIZ Spatial Logic for Prioritization. Source: BEPP, 2016.

3.7 Economic development

3.7.1 Economic Areas Management Programme (ECAMP)

ECAMP is considered as a revolutionary policy support initiative and a business intelligence tool which tracks and assess market performance and long-term growth potential of business precincts across the city region. Furthermore, the tool will assist to identify local interventions which support business precincts to perform optimally given its particular locational attributes (City of Cape Town ECAMP, 2017).

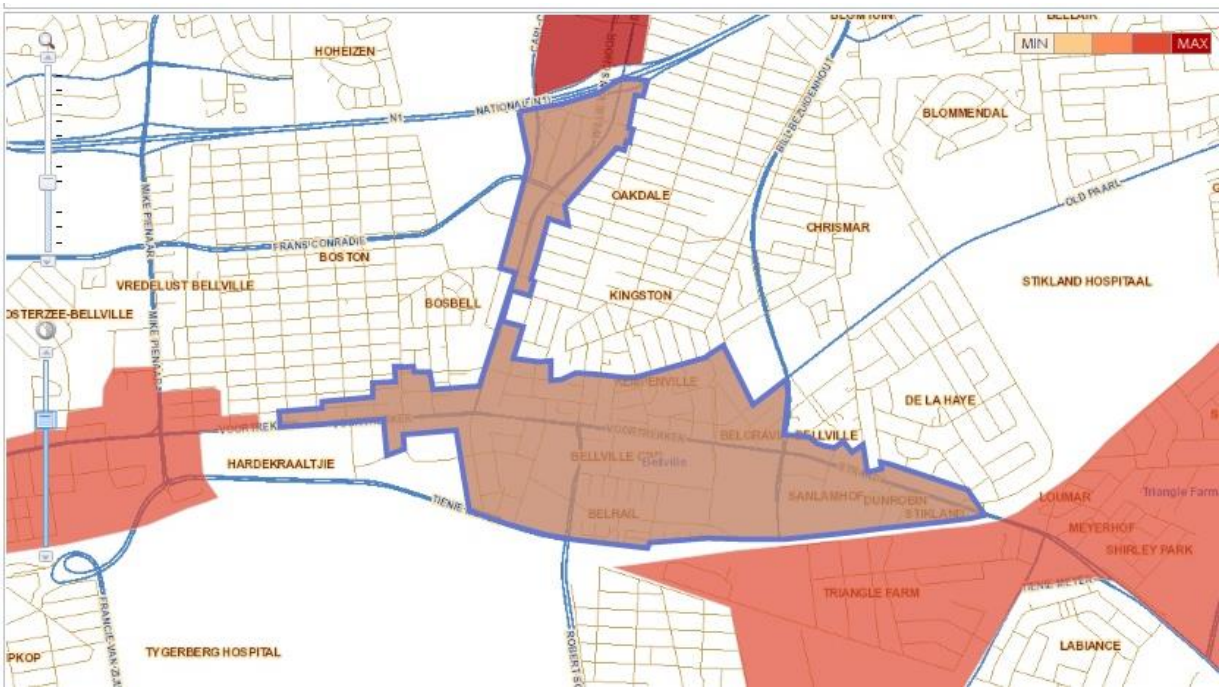
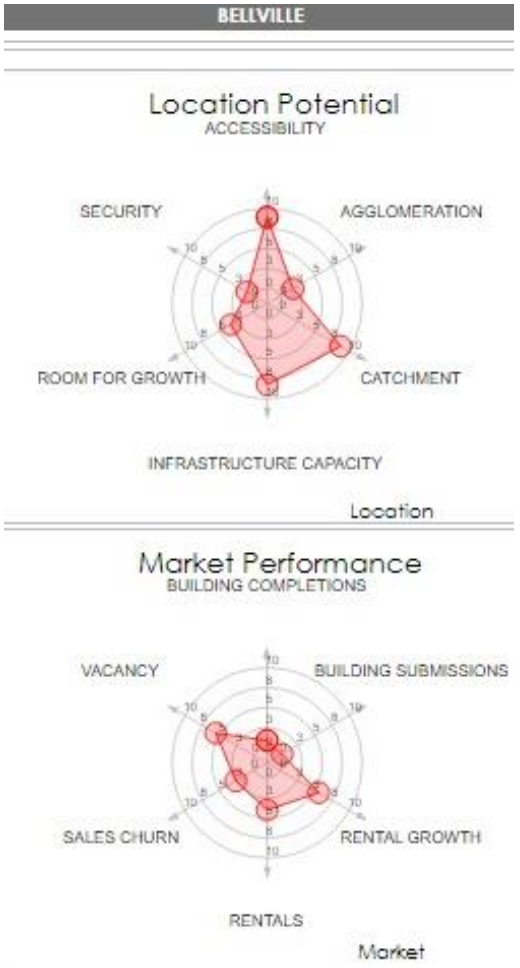


Figure 26. ECAMP market performance. Source: City of Cape Town website, 2017.



While the BCA was found to have a poor market performance in terms of building plan submissions, building completions, sales churn and rental growth (Refer to figure 26) with a relatively deprived market performance, the area of Bellville is deemed to have positive location potential in terms of accessibility and infrastructure capacity (Refer to figure 27). Thus, it could be argued that security improvements and the encouragement of agglomeration interventions could help translate the area's location potential into improved market performance.

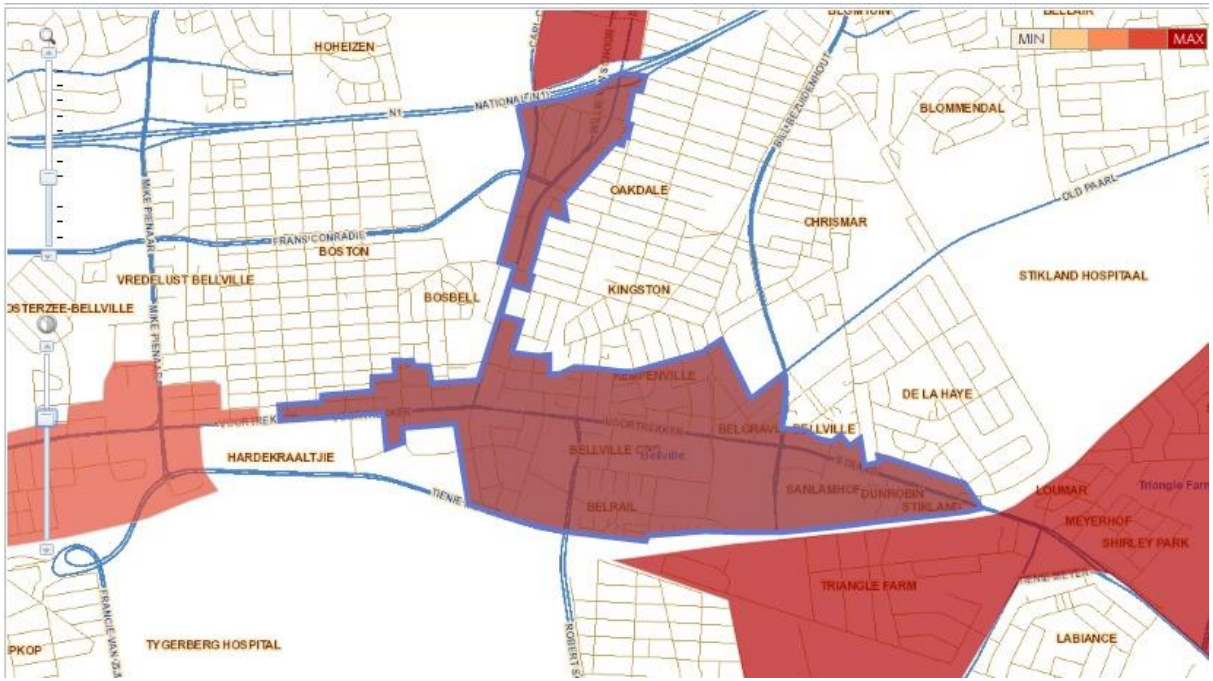
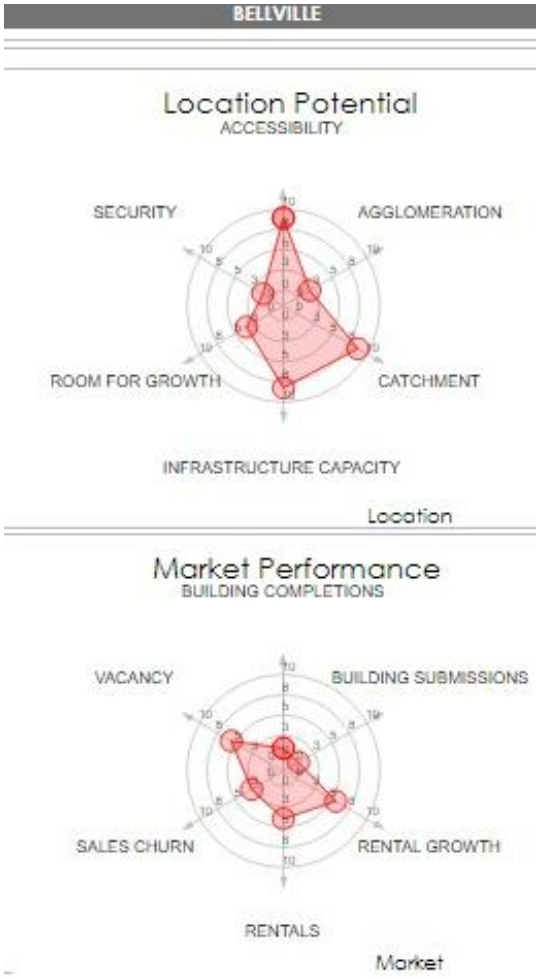


Figure 27: ECAMP location potential. Source: City of Cape Town website, 2017.



3.7.2 Average annual household income

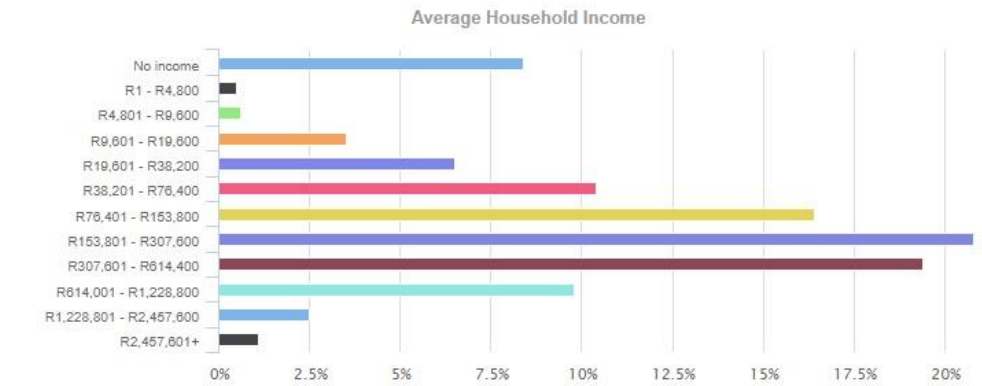


Figure 28. Average annual household income. Source Statistics South Africa, 2017.

The entire area of Bellville displays a considerable percentage of people (15% - 22%) that earn relatively medium to high average annual household income between R153, 801 – R614, 400 per annum. However, data for the BCA is unavailable and so the above figures will be used as a general indication for the area (Refer to figure 28).

3.7.3 Business characteristics

The improvement of staff skills is regarded to be the main factor that could improve business performance in Bellville which is a clear indication that development and associated skills upliftment programmes should be prioritised in order to ensure an educated labour supply (Refer to figure 26). Additionally, the local context plan (refer to figure 22) indicates that Bellville Central is situated in close proximity to the thriving commercial/ retail Tygervalley node that could complement the current wholesale and trade land use activity south of the N1. Moreover, Bellville and the surrounding area includes a number of tertiary institutions such as UWC, CPUT, University of Stellenbosch and Northlink College with Health institutions such as both Tygerberg Hospital and Stikland Hospital. Thus, the area is deemed to be a prominent emerging hub for tertiary education, health, finance and institutional services.

Wholesale and trade is the dominant business type in the area, comprising 58,1% of total business in the area. This is a clear indication of the current land use activities within the area and these activities should be retained and strengthened (refer to table 3). Additionally, BCA has tremendous advantages for business such as it's location in relation to reliable public transport, and it's close proximity to markets, suppliers, and a loyal customer base.

Figure 29. Business improvement factors. Source: Greater Tygerberg website, 2017.

Figure 30. Advantages of doing business in Bellville. Source: Greater Tygerberg Partnership website, 2017.

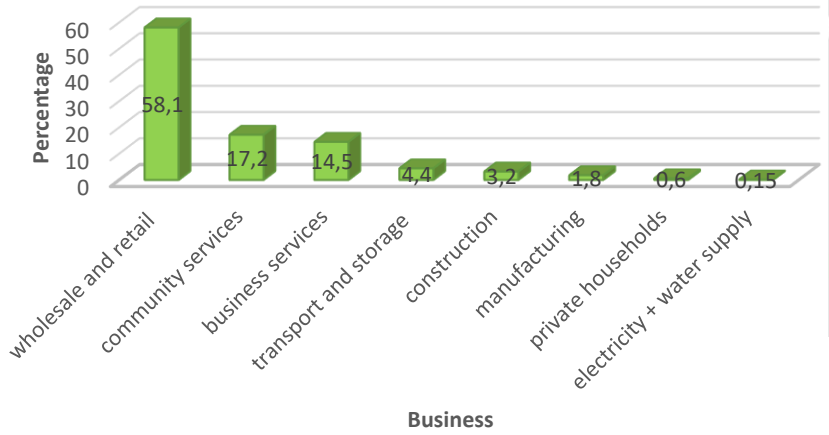


Table 3. Business percentage. Source: Adapted from Greater Tygerberg Partnership website, 2017.

3.8 Social demographics

3.8.1 Population, age, and sex distribution

The population of Bellville indicates a majority white and coloured population group with the Black African and Indian population groups being the minority. Furthermore, the age and sex distribution displays a relatively even split between males and females, and a young population with the majority falling between the 20 – 24 and 25 – 29 age group categories (Refer to figure 31).

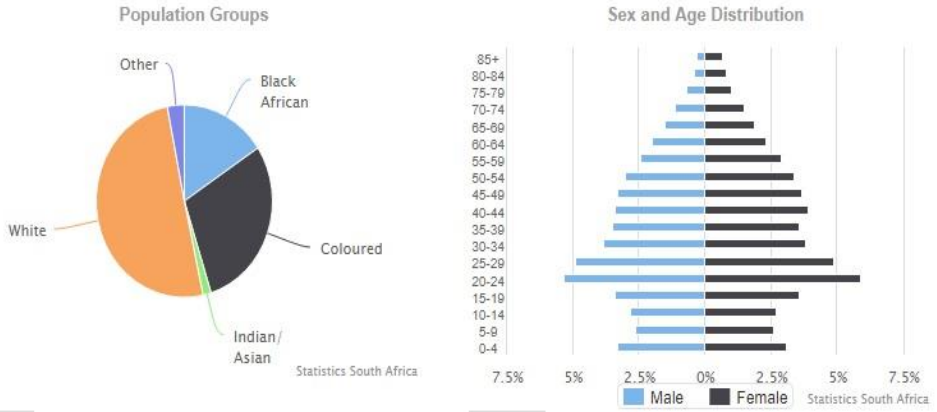


Figure 31. Population, age, and sex distribution. Source: Statistics South Africa, 2017.

3.8.2 Racial mix and income

The area north of Voortrekker Road is characterised by predominant white population group and the areas south of Voortrekker Road dominated by coloured and black inhabitants (Refer to figure 32). Furthermore, the BCA demarcated within the encircled area is characterised by a diverse mix of races with income levels signifying similar a similar spatial distribution to the racial mix where the areas located north of Voortrekker Road generally display higher income levels than the areas situated south of Voortrekker Road (Refer to figure 33).

Additionally, the BCA displays a diverse range of income levels ranging from both R0 - R4800 to R307601 – R1228800 respectively. This diverse range of indicators for BCA creates a cosmopolitan type of environment which requires that housing, products and associated services cater for diversity.

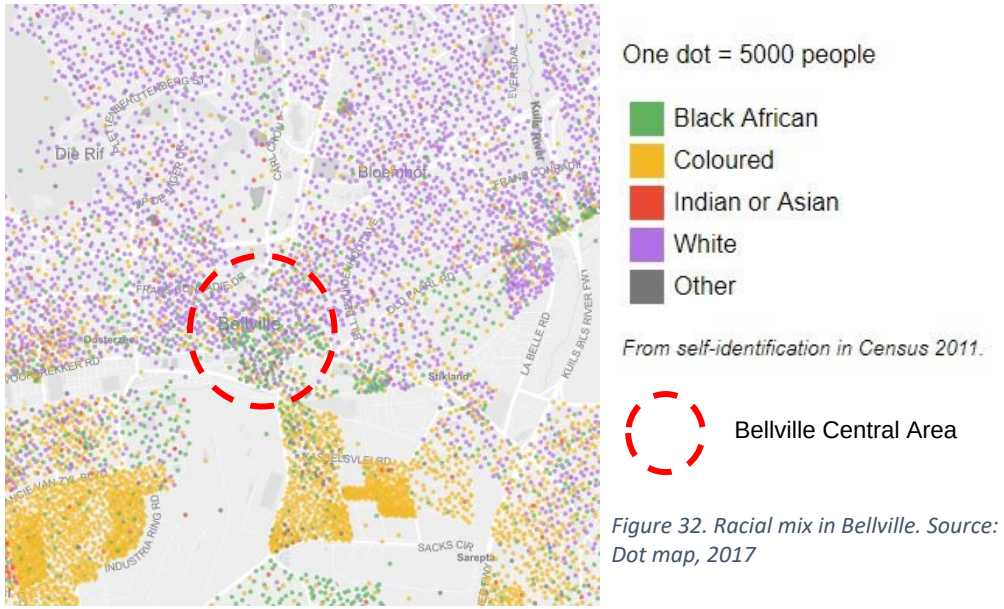


Figure 32. Racial mix in Bellville. Source: Dot map, 2017

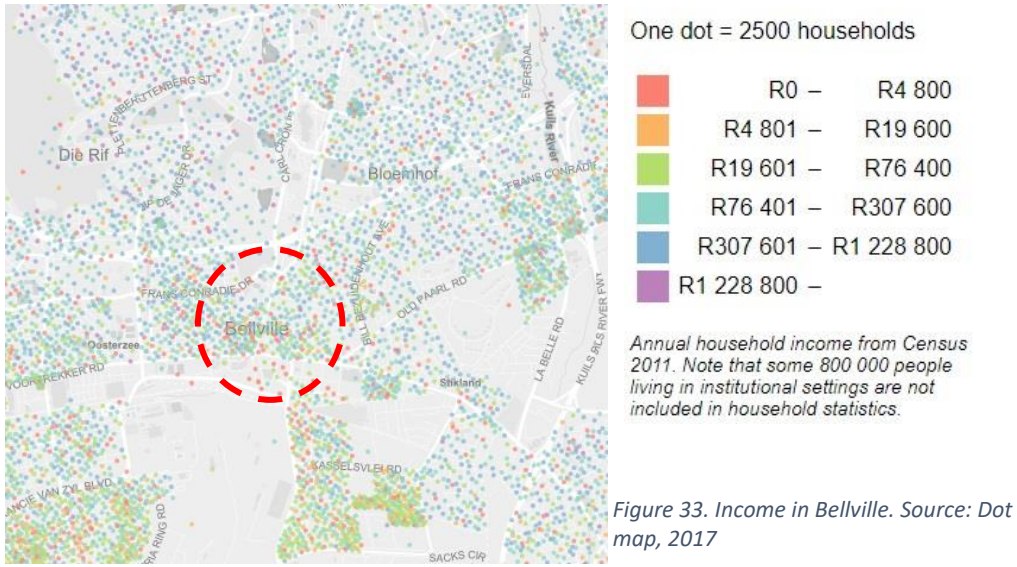


Figure 33. Income in Bellville. Source: Dot map, 2017

3.8.3 Education levels

Bellville displays a relatively high proportion of the population having an education level of matric and higher which indicates a high level of literacy within the Bellville region.

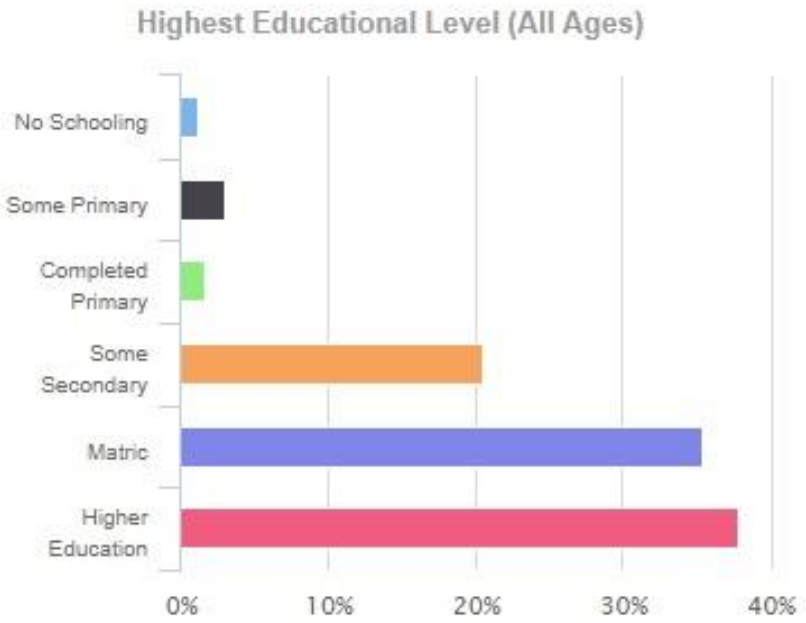


Figure 34. Education levels. Source: Statistics South Africa, 2017.

3.8.4 Access to internet

Figure 35 indicates quite an unequal access to internet in the Bellville area, which is a concern. While a large proportion of the population has access to the internet at home, a similar proportion of the population has no access to internet whatsoever.

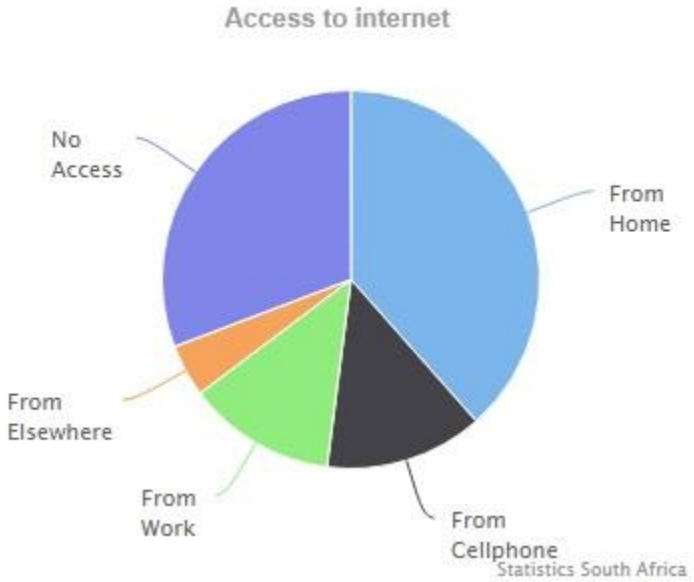


Figure 35. Access to internet. Source. Statistics South Africa, 2017.

3.9 Urban Structure

3.9.1 Green structure

The site is traversed by the Elsieskraal river and has a prominent linear open space system along a north-south axis. There are critical biodiversity areas located north of the study area that should be celebrated and protected. However, the study area disconnects the open space network and neglects the existing potential of the unique natural features that it offers as the parks are underutilised and derelict (Refer to figure 36).

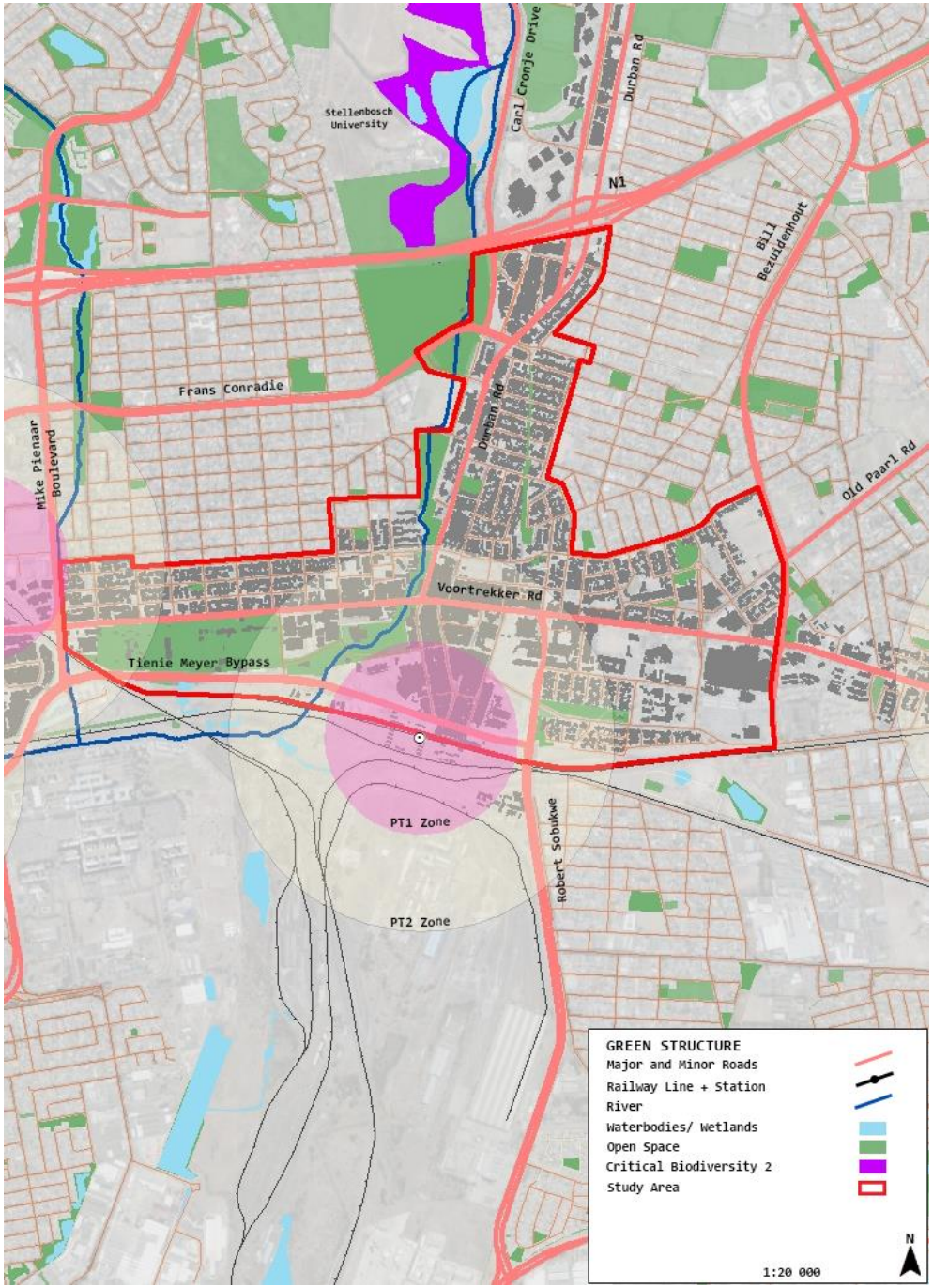


Figure 36: Green structure. Source: Author, 2017.

3.9.2 Movement structure

The study area is nested within an extensive movement structure, and portions of the site are within PT1 or PT2 zones in which reduced on-site parking requirements apply for proposed developments. The area is well-served with bus stops and sufficient bus and taxi routes, especially along Durban Road, Robert Sobukwe Road and Voortrekker Road. It is also noteworthy that there are a number of cycle routes proposed for these three roads. Furthermore, BCA enables and supports north-south and east-west movement through it's road network and public transport that connects north-south and east-west movement (Refer to figure 37).

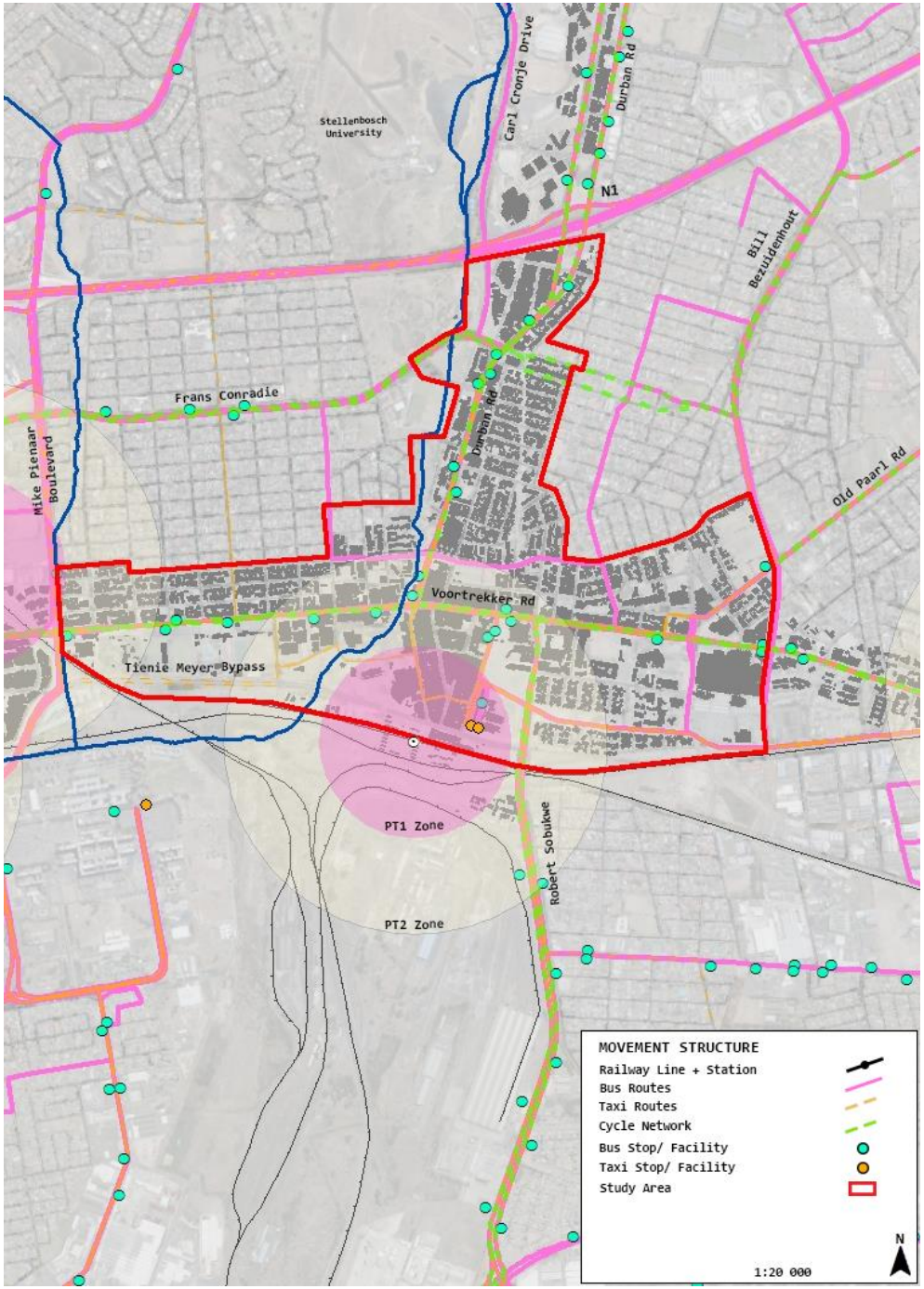


Figure 37: Movement structure. Source: Author, 2017.

3.9.3 Civic structure

The BCA is relatively well-served with public facilities including 2 private hospitals, 1 government hospital, a substantial number of schools, 2 libraries, 3 clinics, and 1 police station, and is also in close proximity to a number of tertiary education facilities and a diverse range of institutions. The area provides significant opportunity to connect these facilities in order to provide logical spatial clustering and locations for capital investment, which is currently lacking (Refer to figure 38).

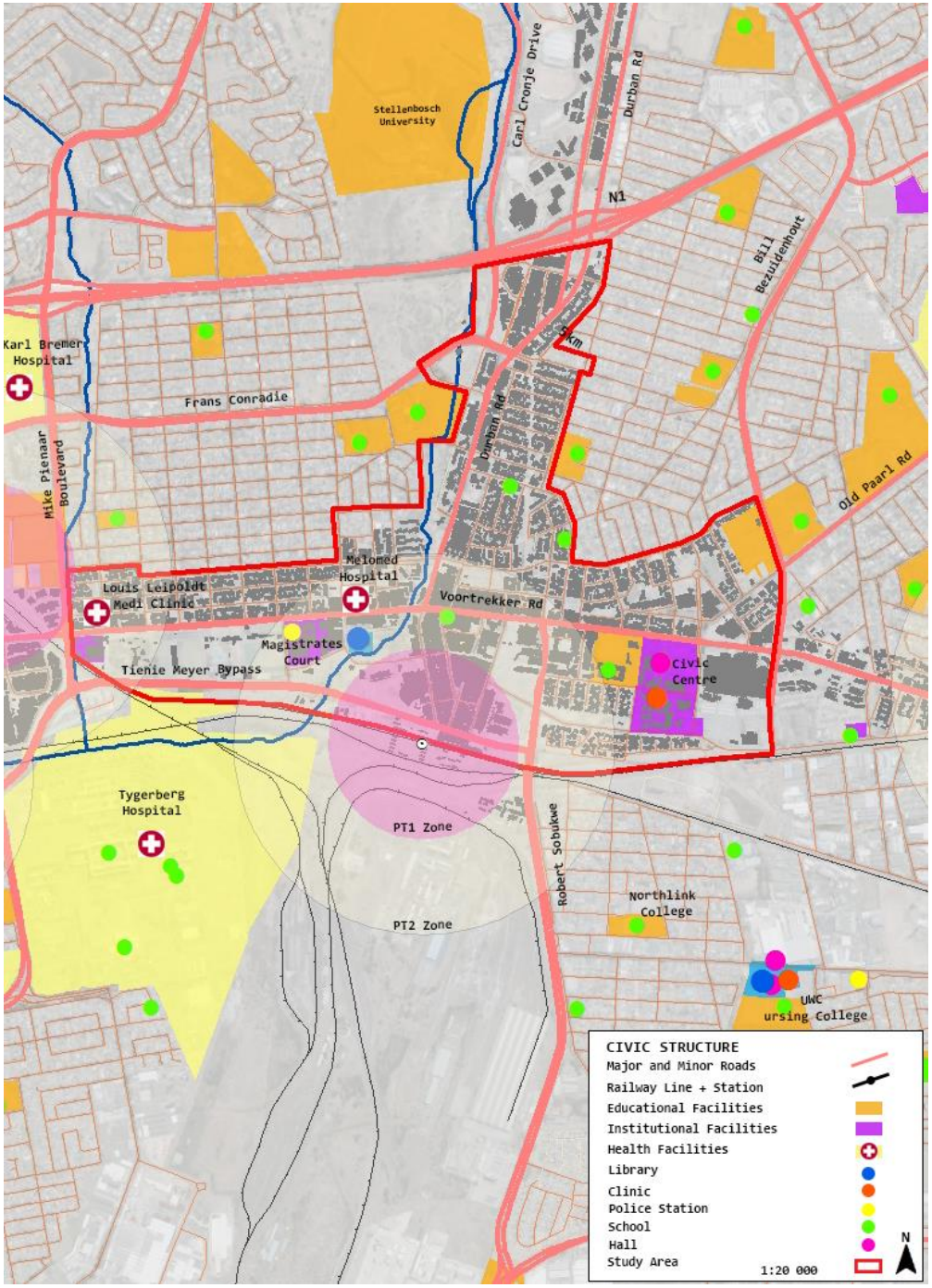


Figure 38: Civic structure. Source: Author, 2017.

3.9.4 Zoning

The BCA has a strong commercial focus along Voortrekker Road, Durban Road and to a lesser degree along Robert Sobukwe Road. The residentially zoned properties are located along the outskirts of the study area and minimal within the public transport interchange area (Refer to figure 39).

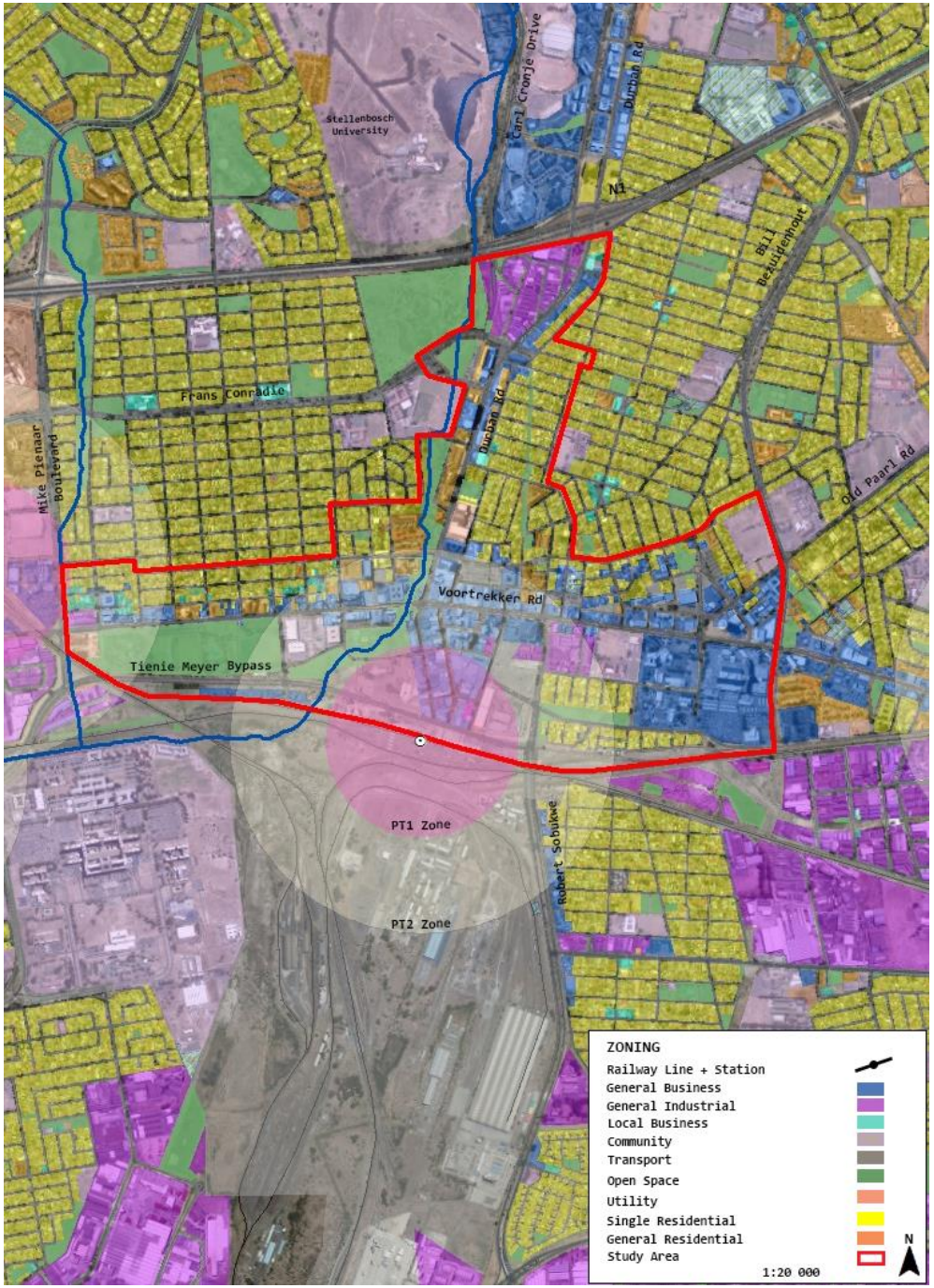


Figure 39: Zoning. Source: Author, 2017.

3.9.5 Ownership

The case study area is endowed with government-owned land, much of which is severely underutilised. There is therefore substantial potential to develop the subject land parcels within and adjacent to the case study area in order to stimulate the Bellville area (Refer to figure 40).

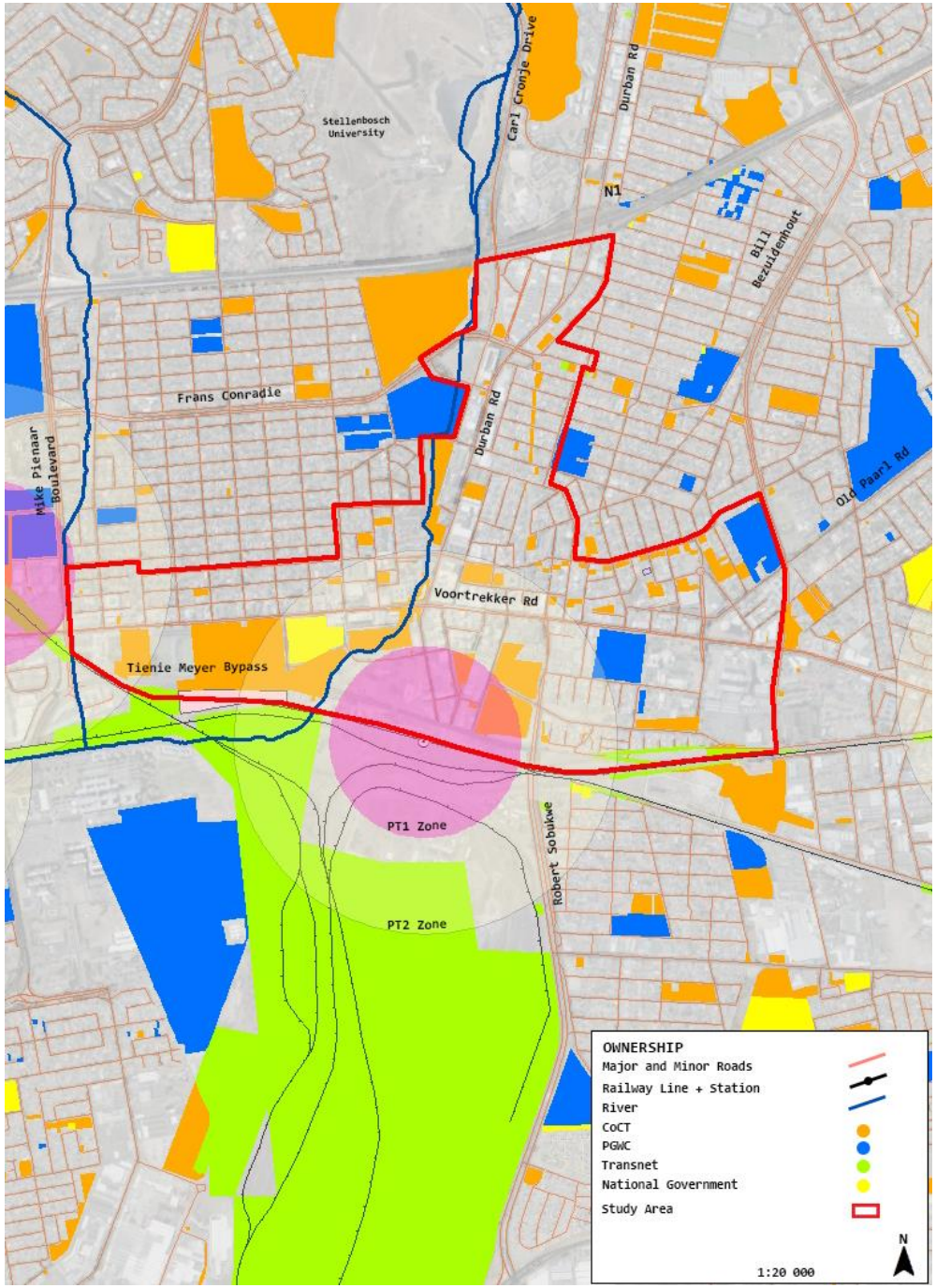


Figure 40: Ownership. Source: Author, 2017

3.9.6 Character Areas

The BCA comprises of unique character areas such as the N1 gateway precinct, a sport and recreation precinct, a CBD and transport precinct as well as the commercial and institutional precinct. Each precinct does not function in the same way, thus it is necessary to celebrate each precinct's unique and prominent land use activities in order to promote and harness the BCA's full strength and potential. However, what is of concern is that the character precincts are not well connected and suffer from a general lack of functional integration (Refer to figure 41).

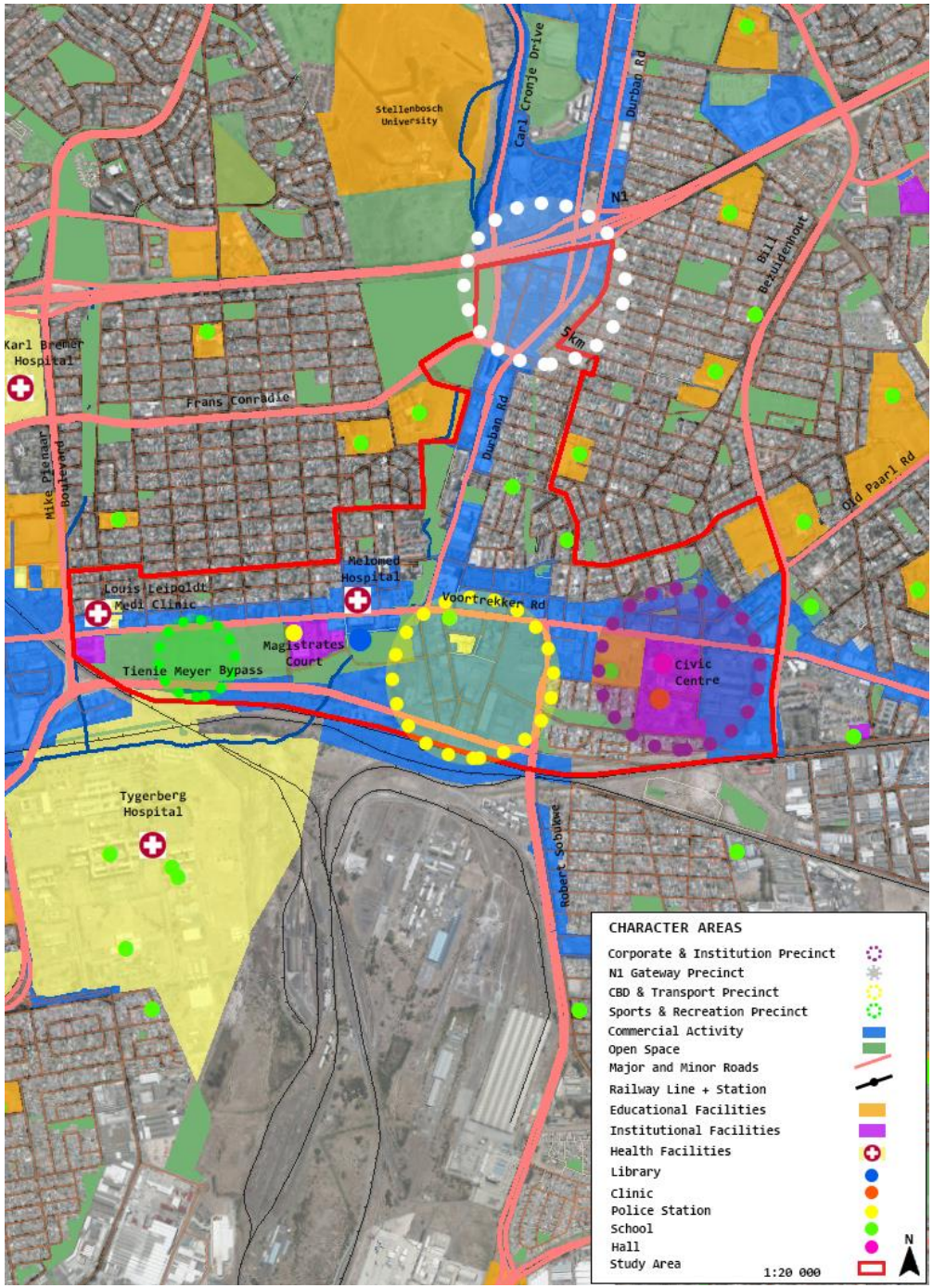


Figure 41. Character areas. Source: Author, 2017.

3.10 Photographic overview

Image 1. View down Voortrekker Road in an easterly direction. Source: Author, 2017.

Image 2. View from the parking lot opposite SARS and Shoprite. Source: Author, 2017.

Image 3. View from Voortrekker Road in a southward direction down Kruskal Avenue. Source: Author, 2017.

Image 4. View from Voortrekker Road Southwards down Durban Road toward the station. Source: Author, 2017

Image 5. View from Charl Malan Street opposite the bus terminals. Source: Author, 2017.

Image 6. Bellstar Junction. Source. Author, 2017.

Image 7. View from Charl Malan Street towards Paint City site. Source: Author, 2017.

Image 8. View from Belrail Road towards the bus terminals. Source: Author, 2017.

The area does not function efficiently due to the poor-quality transport hub design. Additionally, there is limited residential development within the PTI area with a general lack of attractors for future residents and public transport users as most of the peak trips at the interchange are transfers. Furthermore, the area is regarded as unsafe and is deemed to have a poor quality public environment with a general lack of connectivity between local nodes within the area. There are however positives such as the vibrancy and the diverse range of land use activities related to informal trade, retail and wholesale businesses with a considerable number of public transport users.

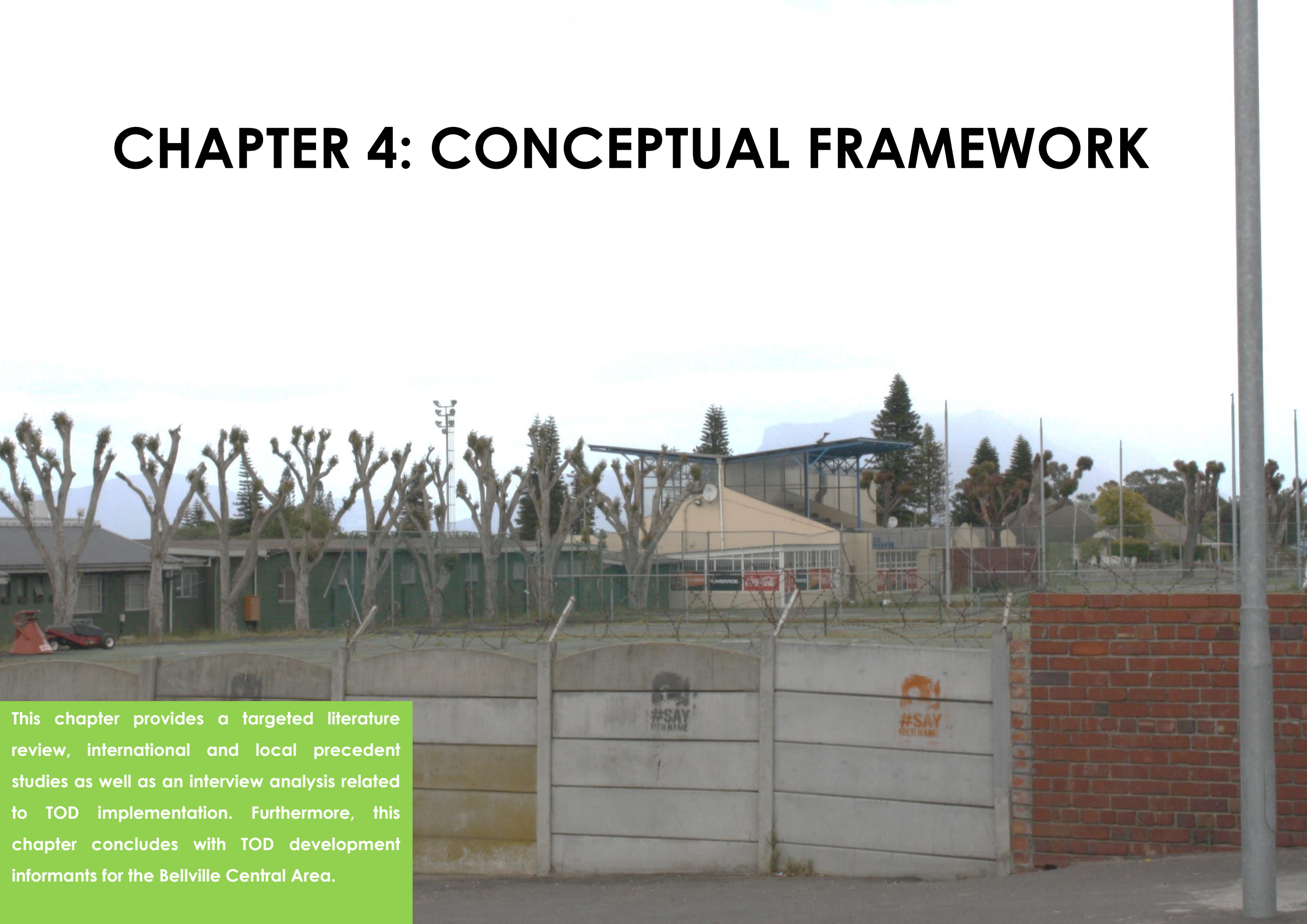
3.11 Opportunities and constraints

The development opportunities and constraints for the BCA will be listed below in order to inform the strategies and interventions within the local area spatial development framework.

Opportunities	Constraints
- Central location within the metro and wider region that connects the eastern and western sections of the city via Voortrekker Road and Symphony Way. - BCA is situated in close proximity to the thriving commercial/ retail Tygervalley node that could complement the current wholesale and trade land use activity south of the N1. - Extensive industrial areas surrounding Bellville which provides a range of employment opportunities. - Existing energy and extensive investment in the area. - BCA is located within a UDZ and an IZ which assists with capital funding and returns for developers. - BCA is located within the VRCID which helps facilitate urban management. - BCA has location advantages for business such as reliable public transport, a close proximity to markets and suppliers, and a loyal customer base. - Good education levels and income distributions in the greater Bellville area. - Existing informal trading activities, formal retail activities which caters for a range of income groups, and strong wholesaling activity. - Mixed and diverse income groups and nationalities which creates a multicultural and cosmopolitan urban environment and stimulates a varied demand for housing, products and services. - The area is traversed by an existing open space network that could be re-energised to promote and celebrate Bellville. - Strong daily movement of people due to the range of public transport which ensures customers for local markets and commercial activity. - Strong clustering of health and institutional facilities. - Much of the area is located within either a PT1 or PT2 Zone which allows for reductions in the on-site parking. requirements for proposed developments. - Extensive state-owned land for infill development and densification.	- Congested local access due to poorly functioning and poor-quality transport hub. - Lack of attractors for public transport users as most of the peak trips at interchange are transfers. - Underutilised and poorly managed green networks. - Lack of internet access for a considerable proportion of the population. - Unsafe and poor quality public environment. - Limited residential development close to the PTI. - Poor market performance in terms of building plan submissions, building completions, sales churn and rental growth, thus limited projected commercial/ retail take-up for the area. - Poor connectivity between the gateways/ local retail nodes.

Table 4. Opportunities and constraints. Source: Author, 2017

CHAPTER 4: CONCEPTUAL FRAMEWORK



This chapter provides a targeted literature review, international and local precedent studies as well as an interview analysis related to TOD implementation. Furthermore, this chapter concludes with TOD development informants for the Bellville Central Area.

This chapter seeks to provide a clear understanding of the TOD rationale and how it attempts to guide sustainable development by integrating mobility, land use and urban form. The conceptual framework comprises of a targeted literature review, international and local precedent, and an interview analysis, and concludes by identifying a list of development informants that need to be considered for TOD implementation.

Literature Review

The integration of land use and transit is considered as one of the most important strategic interventions for creating a more sustainable urban future (Suzuki, Cervero & Luchi, 2013). Over the years, TOD has been growing in prominence as a strategy for cities seeking to improve and rectify urban issues related to traffic congestion, environmental degradation, urban sprawl, and socio-spatial and economic exclusion (Suzuki, Cervero & Luchi, 2013; Croese, 2016). However, TOD requires considerable enabling conditions such as political championing, sustained technical support, and strong stakeholder partnerships in order to realise the substantial benefits of the concept. International precedent indicates that there are implementation challenges associated with TOD initiatives (Croese, 2016). Thus, this literature review will specifically target and focus on the TOD rationale, transit and land use integration barriers, finance, strategies to stimulate the market and effective implementation mechanisms to respond to the main research questions.

4.1 TOD definition, rationale and development principles

For the purpose of this dissertation, TOD could be defined as a land use-transit integration tool that is grounded within a particular context which seeks to promote places for people to live, work, play and pause that includes a range of high density mixed-land uses and affordable housing centred around efficient public transport.

While transit is essential to TODs, access for pedestrians, bicycles and automobiles is considered just as important. According to Wilkinson (2007), TOD could be described as a typical neighbourhood centred around a rail or bus station extending to a walking radius of approximately 400-800m, that is developed at high densities with adequate provision of public amenities, social facilities and mixed land uses with an open road network comprising of pedestrian and bicycle paths. Wilkinson (2007) states that TOD neighbourhoods are presented as elements within a larger metropolitan smart growth strategy which could be described as significant nodes within a city-wide transport corridor.

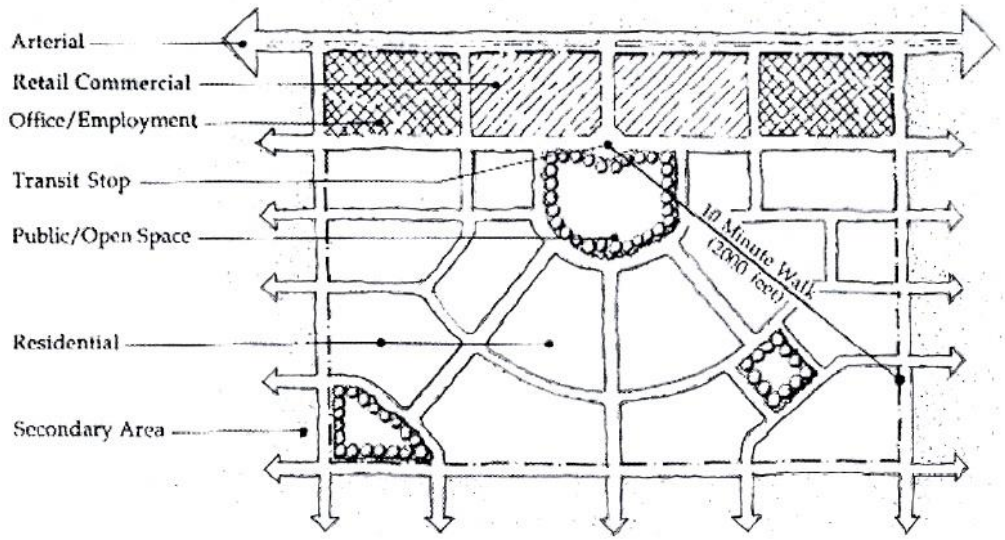


Figure 42: TOD neighbourhood context. Source: Wilkinson,

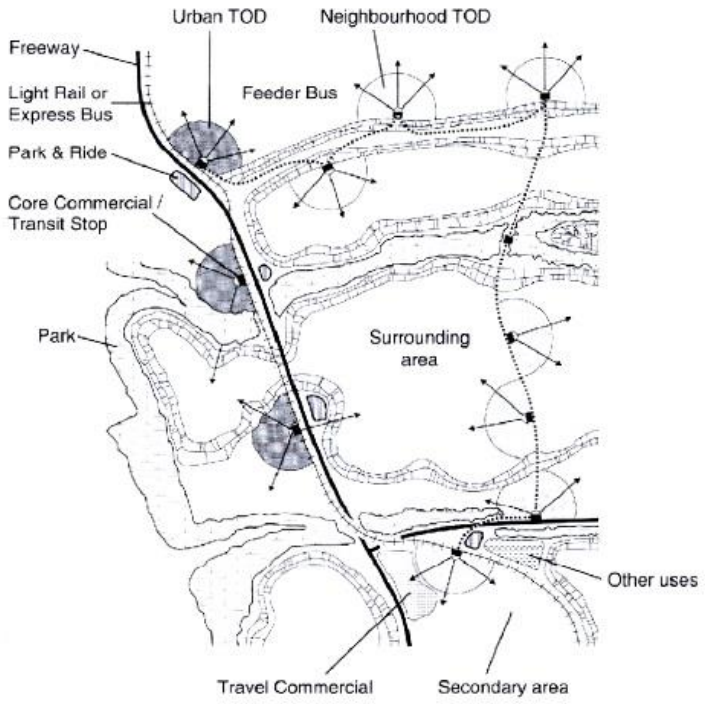


Figure 43: TOD city-wide context. Source: Wilkinson, 2007.

The concept of TOD emerged in the United States in the early 1990's as a direct response to appalling traffic congestion and suburban sprawl triggered by the advent and rise in private motor vehicle use since the 1940s (Croese, 2016). Peter Calthorpe saw TOD as a guide for sustainable community design that had the potential to address numerous social issues (Carlton, 2007). However, it could be argued that TOD is a 're-branding' of older urban planning concepts and that transport and the built environment are mutually dependant entities that have constantly fought to create urban forms (Carlton, 2007). Lately, the concept has grown in popularity amongst urban planners across the globe as a sustainable urban growth management approach (Bickford, 2016).

The TOD concept is commonly associated with "mixed-use, walkable, location-efficient development that balances the need for sufficient density to support convenient transit service with the scale of the adjacent community" (Dittmar et al 2004: 4). Moreover, TOD embraces the idea that "locating amenities, employment, retail shops, and housing around transit hubs promotes transit usage and non-motorized travel" (Suzuki, Cervero & Luchi, 2013: xxl).

The Institute for Transportation and Development Policy (ITDP) identifies eight core principles of TOD such as walk, cycle, connect, transit, mix, densify, compact and shift (ITDP, 2014) (Refer to figure 41). Essentially, ITDP's principles of urban development for transport aims to develop and foster efficient spatial configurations that enables a high quality, car-free lifestyle (City of Cape Town, 2016a). Additionally, these principles are linked to smart growth and new urbanism concepts which strive to move back towards city building practices which predated the automobile (City of Cape Town, 2016a; Carlton, 2007; Bickford, 2016). Whilst all the principles identified by ITDP are pertinent to TOD in general, context specific TOD principles need to be identified to respond to Cape Town's unique urban problems. Therefore, it is important to confirm the approach to the application of TOD, as it is a new approach for developing cities that is currently being advanced both internationally and in the City of Cape Town. The application of TOD in Cape Town will specifically be informed by the TOD definition, principles and objectives as set out in the recently approved City of Cape Town TOD Strategic Framework, as well as best practice to ensure that nuanced, practical and credible solutions are identified for the BCA.

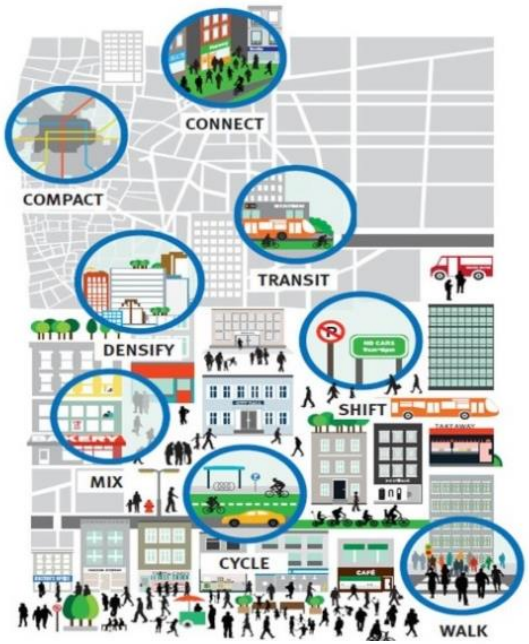


Figure 44: The Eight core principles of TOD. Source: ITDP, 2014

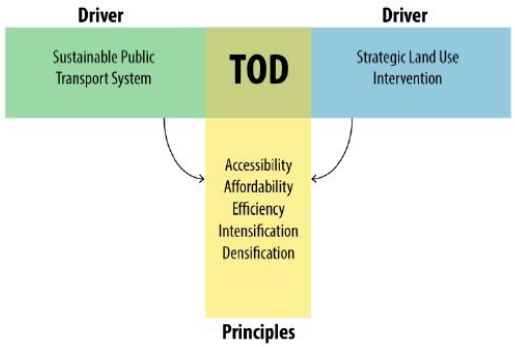


Figure 45. Cape Town TOD principles. Source: TOD Strategic Framework, 2016.

These principles attempt to guide development towards the City's vision for TOD in Cape Town as outlined in the TOD Strategic Framework' (City of Cape Town, 2016a):

> "To progressively move toward a compact, well connected, efficient, resilient urban form and movement system that is conducive to economic and social efficiency and equality whilst providing cost effective access and mobility, with the least possible negative impact on the environment."

The City of Cape Town's TOD Strategic Framework attempts to deal with a range of urban issues such as the entrenched spatial inequality, public transport unaffordability, and urban sprawl by integrating public transport and land use interventions through the principles and objectives outlined below (Refer to table 5).

TOD principles	Principle definition
Accessibility	- Facilitate equal access to social and economic activity through strategic urban development and the provision of safe public transport.
Affordability	- Reduce the cost of public transport to commuters and the cost of providing public transport to the City.
Efficiency	- Provide an environment and level of service that reduces trip lengths and dependence on private vehicles.
Intensification + densification	- Manage the desired form, composition and location of urban development conducive to affordable, accessible and efficient public transport.

Table 5. TOD principles. Source: TOD Strategic Framework, 2016.

TOD objectives
- Maximise "location efficiency" so that people can walk, cycle and use public transport. This can be achieved through a comprehensive approach to land use density, mix and intensity, as well as a focus on prioritised public transport at a metro, corridor, nodal and precinct scale.
- Boost ridership and minimize congestion thereby ensuring that the public transport system becomes more viable.
- Provide a rich mix of housing, shopping, recreational and transportation choices.
- Enable cost and operational efficiencies in the provision and design of urban infrastructure.
- Drive down the cost of the User Access Priority for both new and existing residents.
- Create a sense of place.

Table 6. TOD objectives. Source: TOD Strategic Framework, 2016.

Furthermore, a range of TOD programmes have been identified to support the realisation of the City's TOD principles and associated objectives, and to lead to effective urban growth and travel demand management. Key focus areas include institutional alignment, an integrated business model, private sector collaboration and civil society participation, as indicated below (Refer to figure 46).

Cape Town's TOD principles provide the foundation for long term development and aim to ensure that the above-mentioned objectives are met. These TOD principles and the associated development objectives will direct TOD implementation across the city. Thus, it is imperative to highlight the barriers associated with land use and transit integration first, and thereafter to discuss the appropriate TOD financing tools, strategies for TOD market stimulation and implementation considerations in order to move towards effective TOD implementation.

Figure 46. TOD programmes. Source: TOD Strategic Framework, 2016.

4.2 Transit and land use integration barriers

4.2.1 Government silos and the lack of coordination

At the metropolitan scale, governments need to coordinate land-use planning, infrastructure investments, and services while balancing political and economic competition (Suzuki, Cervero & Luchi, 2013:9). This balancing act becomes extremely challenging for metros when national governments devolve decision making powers without providing adequate regulatory and institutional coordination mechanisms. In Cape Town, the management of the city is extremely challenging as it involves and requires coordination between the different levels of government, departments, and navigation between conflicting political agendas. Furthermore, government departments have different priorities, objectives, capacity, budgets, and management styles (Suzuki, Cervero & Luchi, 2013). These differences frequently hamper the types of cross-sector coordination required for land use and transit integration. In this regard, the City's organisational restructuring including the formation of the Transport and Urban Development Authority (TDA), which brings together spatial planning, transport planning and housing, is a noteworthy step in support of the implementation of TOD.

4.2.2 Densification and infrastructure

Cities in developing countries are experiencing rapid population growth with carrying capacity constraints that hamper the quality and supply of urban infrastructure services (Suzuki, Cervero & Luchi, 2013). Rapid urban expansion and densification are generally associated with poor quality and deteriorating service provision coupled with the tendency to favour peripheral greenfield developments instead of brownfield sites due to development complexities and initial costs associated with urban infill development (Suzuki, Cervero & Luchi, 2013).

This tendency encourages and accommodates urban sprawl which neglects the significantly high life-cycle costs associated with providing infrastructure networks to peripheral locations. This phenomenon influences policy makers who then apply uniform floor area ratios (FAR) without capitalizing on locational attributes such as proximity to transit stations or corridors. Therefore, the control of densities without considering the land's economic value hinders land use management and TOD implementation potential (Suzuki, Cervero & Luchi, 2013).

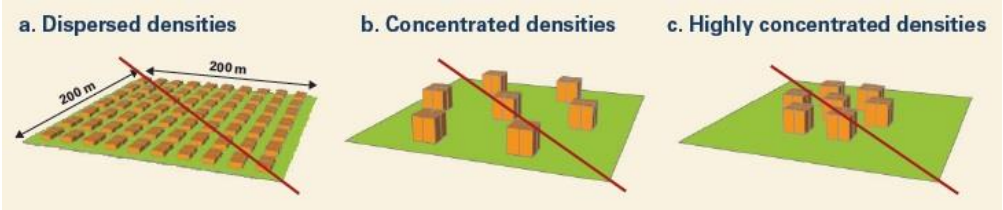


Figure 47: Importance of articulated density for mass transit. Source OECD, 2012

In other words, policy makers encourage dispersed densities which does not promote land use and transit integration. This phenomenon is highly problematic, therefore articulated densities should be encouraged and promoted due to the benefits associated with concentrated densities that are strategically distributed across specific nodes within the city. These articulated density nodes tend to promote land use and transit integration and mass transit opportunities. Thus, articulated densities should be encouraged over dispersed densities especially within a city like Cape Town where spatial plans should strategically distribute density cross space.

4.2.3 Planning mechanisms to stimulate redevelopment

Developing cities tend to invest in and prioritise transit in urban areas in order to reduce congestion and unmet travel demand, which requires urban infill development to respond to potential opportunities created by the transit investment (Suzuki, Cervero & Luchi, 2013). Planning mechanisms therefore need to be employed to catalyse redevelopment around stations as generally the majority of the land is privately owned. Furthermore, urban infill development often requires demolition of some sort which has tremendous cost implications and therefore serves as a major barrier for TOD implementation.

4.2.4 Financial constraints

The current unprecedented rapid urban growth occurring in developing cities has placed severe pressure on local governments to both provide basic services and also to finance infrastructure investments such as the BRT system. The tremendous upfront capital investments required for transit systems is a huge barrier for transit and land use integration. Besides the initial upfront capital investments, local governments need to subsidise operational deficits for low-income riders, as has particularly been the case in the initial roll-out of the MyCiTi BRT system in the City of Cape Town. Subsequently, the scarcity of financial resources tends to influence transit system design towards a desire to minimize construction costs and right of way acquisitions (Suzuki, Cervero & Luchi, 2013).

4.3 Towards TOD implementation

4.3.1 TOD finance tools

It is widely viewed that articulated densities are more suitable for transit operations and that TOD will lower a municipality's long-term infrastructure costs (Croese, 2016; Suzuki, Cervero & Luchi, 2013).

However, higher densities and transit services necessitate additional or upgraded infrastructure which requires considerable upfront capital. In light of restricted budgets, the initial upfront capital and operating costs associated with BRT and TOD is therefore often one of the main obstacles for cities seeking to implement major transit systems. Therefore, cities are increasingly adopting various tools and incentives that aim to secure adequate financial resources and revenue in order to mitigate and share risk. Value capture, travel demand management, public-private partnerships and the role of finance institutions will be discussed below in this regard.

4.3.1.1 Value capture

Value capture is regarded as one of the most promising and capable fiscal tools available for generating new revenue (Urban LandMark 2012; Hogarth, 2016; Suzuki, Cervero & Luchi, 2013). Value capture is defined as "a public financing technique that captures a part or all of the increases in private land values that result from new public investment by imposing a tax on the property or requiring an in-kind contribution, such as land or improvements" (Urban LandMark 2012: 5). Value capture ensures and retains the maximum value of assets when sold or leased to the private sector (City of Cape Town, 2016a). Value capture can be implemented through direct measures such as the sale of properties, and through indirect methods including the extraction of surplus value from private property owners through a betterment tax or through obtaining higher earnings from regular property taxes (Suzuki, Cervero & Luchi, 2013). However, land value capture financing schemes require a strong real estate market, institutional capacity, clear policy guidelines, and high densities to be successful (Suzuki, Cervero & Luchi, 2013: 185).

The potential success of the value capture tool in a low density and informal Cape Town context is therefore rather questionable and requires further investigation.

4.3.1.2 Travel demand management (TDM) and improved parking management

Travel demand management (TDM) seeks to discourage private car use by implementing measures such as decreasing subsidies on fuel, parking control, congestion pricing, and higher car registration costs (Suzuki, Cervero & Luchi, 2013). It is widely viewed that TDM reduces and redistributes travel demand and that the measures should be coupled with TOD in order to be more effective. Additionally, the integration of TDM and TOD has the potential to change the physical design of a precinct through the incorporation of non-motorised design such as pedestrian and bicycle friendly street designs (Suzuki, Cervero & Luchi, 2013). Parking management is regarded as a strong value capture mechanism which could be used to sustain a government's transit investment by generating supplementary income through establishing competitive parking tariffs. Furthermore, increased public parking tariffs can significantly support TOD and TDM objectives to manage the impact of parking on land use and to incentivize certain travel behaviour in order to reduce road congestion (City of Cape Town, 2016a).

4.3.1.3 Partnerships and the role of financial institutions

Private-public partnerships are regarded as a mechanism to stimulate transit value capture in developing countries (Suzuki, Cervero & Luchi, 2013). The private sector will inject the necessary initial capital and assist with risk sharing for TOD development projects. Thus, the role of financial institutions is important and should seek to provide financial assistance for TOD projects which could also support and influence a national government's own sustainable transit development programs (Suzuki, Cervero & Luchi, 2013).

Additionally, financial institutions could support cities to cultivate institutional capacity and provide the initial upfront capital loans required to design and implement prototype TOD projects.

4.3.2 Strategies to stimulate the TOD market

Given that the majority of land surrounding public transport interchanges is generally privately owned, TOD will need to mainly be driven by the private sector. However, the developer's expertise is usually knowing the local market, observing opportunities in a specific location and resolving constraints in order to develop the product in time (Adams et al 2012). Thus, the supply side incentive approach undertaken by government to persuade the property sector to act in a certain way is merely based on assumptions about the government's ability to create the right opportunities for TOD (Insight from interview with Rob McGaffin, 21 September 2017). The assumptions and a general lack of understanding about the demand side factors and the drivers of development could be the reason for the lack of developer interest and low market take up within areas such as Bellville central, despite government's supply side incentives and catalytic investment offerings. The ability of government to demonstrate demand for developments will be the most effective tool through which to attract developers (Insight from interview with Rob McGaffin, 21 September 2017). Furthermore, the less risky a development opportunity becomes, the more likely it is to attract the right developers (Harrison, 2016:16). It should be noted that if there is no demand for new developments, the property sector will remain watchful (Insight from interview with Rob McGaffin, 21 September 2017; Harrison, 2016).

Like many similar public sector-led capital investment projects that are dependent upon partners, the investment and development upon which TOD depends is profoundly influenced by the economy, developers and the property market (Harrison, 2016:16). Thus, the strategies that could potentially stimulate the property market towards the types of development envisioned by TOD will be discussed below.

4.3.2.1 Infrastructure investment

The City's public infrastructure investment and TOD strategy would be optimised under favourable macro-economic conditions, however, the capability of government to shape market forces and direct private investment into certain underperforming areas in the face of various other factors such as the City's dire water crisis, is uncertain. It is therefore necessary to consider the City's infrastructure interventions and how these could play a role in stimulating the market and catalysing the desired development. Another area of concern is the uncertainty with regard to the point at which public infrastructure may become a pull factor for developers (Harrison, 2016). Thus, it becomes imperative to undertake a comprehensive analysis of the current and proposed TOD densities and how it relates to the current and required infrastructure upgrades and investments along the Voortrekker Road Corridor, Bellville central, and within TAP areas, in order to guide and direct development with confidence and to consider future land use applications accordingly (Insight from interview with Chad Newman, 20 September 2017). The proposed densities required for TOD viability should be matched by market research and a viability study of the property market in order to demonstrate future demand for the area so as to engage and entice the private sector (Insight from interview with Rob McGaffin, 21 September 2017; Harrison, 2016). However, given current economic trends, the property sector is not in an ideal position to support TOD within a declining node such as Bellville (insight from interview with Rob McGaffin, 21 September 2017). Stronger incentives therefore need to be considered in order to trigger developer interest.

4.3.2.2 The property market

It is widely viewed that property developers will move to areas of the urban land market where barriers to development are the least burdensome and where profits are optimised (Harrison, 2016). The question is how to attract developers to parts of the city, especially Bellville central, where they may not have gone before (Insight from interview with Rob McGaffin, 21 September 2017; Harrison, 2016). Thus, it becomes imperative to demonstrate demand, supply and yields which are believed to have the greatest influence on investors and developers alike (Insight from interview with Rob McGaffin, 21 September 2017; Harrison, 2016). Additionally, the City intends to use catalytic projects as an instrument to shape the market, however, Adams et al (2012) and Harris (2016) argue that developers and investors have a strong commitment to specific areas and sectors of the market, which limits their capacity to jump to other property sectors and locations. Thus, developers already investing in similar markets would be more likely to invest within BCA and the Voortrekker Road Corridor, and it will therefore come down to a matter of risk appetite, access to finance and how established the developer is (Harrison, 2016).

4.3.2.3 Development costs

As argued above, the City should ensure a better understanding of the drivers of development, developers and the property market sectors in order to shape the market interventions in favour of TOD. Thus, development cost cutting will be discussed as it could convince real estate developers to invest in government targeted areas such as the Voortrekker Road Corridor, BCA and within TAPs. According to Coleman et al (2013: 146) the most significant development costs are associated with construction, infrastructure, professional fees, finance, marketing and planning obligations.

The public sector therefore has the opportunity to intervene and stimulate TOD markets through land use planning processes and decisions (conditions of approval and development charges), infrastructure provision and finance (alignment Treasury grants) (Harrison, 2016).

There are potentially two types of developments that would take place in BCA, namely brownfield development which requires land assembly in order to be viable, and conversions, which requires a very unique approach by purchasing cheap and accessible buildings. At present, the City tends to provide supply-side incentives such as rates rebates through National treasury's location-based incentives such as the urban development zone (UDZ). However, the supply-side incentives occur mainly at the end of the development process once the development is constructed instead of providing demand side-incentives which would benefit the developer immediately in terms capital flow (Insight from interview with Rob McGaffin, 21 September 2017). The demand-side relates to having a ready market (tenant, investor, buyer) to occupy a new development while the supply-side refers to the actual construction of the development (Insight from interview with Rob McGaffin, 21 September 2017). Therefore, strong influencing development incentives related to cost cutting include bulk infrastructure provision, streamlined development applications coupled with lenient development rights and rates rebates (Harrison, 2016).

4.3.2.4 Bulk infrastructure provision

The availability of bulk infrastructure for new developments and redevelopments, especially along the Voortrekker Road Corridor, BCA and areas demarcated as TAPs, has been of considerable concern to property developers (Insights from property developers at the MSDF draft discussion at Urban Dynamics, 07 September 2017; Chad Newman, 20 September 2017).

Not being able to access sufficient bulk infrastructure, or having to wait a considerable period of time for adequate bulk infrastructure capacity increases development cost risk, often resulting the development being deemed unfeasible (Insights from property developers at the MSDF draft discussion at Urban Dynamics, 07 September 2017; Insight from Chad Newman, 20 September 2017, Harrison, 2016). The City should thus invest in bulk infrastructure in advance in areas of significance in order to facilitate development within the Urban Inner Core area (as designated in the draft MSDF), the Voortrekker Road corridor, BCA, and areas demarcated as TAPs along corridors to facilitate increased densities (City of Cape Town, 2017b). Furthermore, development contributions should be area specific where developments that align with TOD objectives can have reduced DCs while developments that are contrary to TOD can be charged higher DCs as they are sustaining and exacerbating urban inefficiencies.

4.3.2.5 Pro-active planning and streamlined development applications

Pro-active planning should consist of overlay zones in which rezoning's on behalf of public and private land owners can be permitted and in which development applications can be fast-tracked (Insight from interview with Chad Newman, 20 September 2017; City of Cape Town, 2016a). Additionally, the objective of streamlined development applications within TAP's should be explored in order to establish best practice for development facilitation where the Land Use Management Department leads the process of identifying development-ready sites (sites that have zoning and development rights pre-approved), to conduct technical investigations such as environmental impact assessments (EIA's) and heritage impact assessments (HIA's) on behalf of the developer, and to undertake public participation and respond to objections in order to streamline the development processes ((insight from interview with Chad Newman, 20 September 2017; Harrison, 2016).

The City would therefore remove the risk and uncertainty associated with planning processes and cut considerable development costs associated with time. Furthermore, pro-active planning should seek to utilise local area spatial development frameworks (LASDF) to align TOD principles and development objectives. This should be done in order to mitigate potential gentrification impacts and to establish land use and urban design guidelines to direct development. Furthermore, LASDF's should seek to integrate social amenities and public transport infrastructure as this allows for optimal utilisation of public resources (City of Cape Town, 2016a). Moreover, the pro-active planning approach should seek to pre-package land to a specific mix and form of development in support of TOD.

4.3.2.6 Municipal land development

One of the major catalytic (gamechanger) projects in Bellville includes the release and development of municipal land (Paint City site) to achieve TOD development objectives (City of Cape Town, 2016b). The strategic use of public land is widely viewed as an important tool that cities around the world could utilise in order to secure spatial transformation (Harrison, 2016). Furthermore, municipalities have this particular strategic lever to pursue it's own particular interests and could potentially shape the market accordingly through the ability to purchase, hold and develop land (Harrison, 2016). However, there is a disjuncture around the status and utility of state-owned land and it's parastatals such as the Passenger Rail Agency of South Africa (PRASA). It is therefore imperative that the City proactively engages with these state-owned enterprises, particularly in relation to specific strategic sites. There is widespread agreement that the most important advantages of TOD will not be realised until the power to regulate, plan and implement infrastructural and operational changes across commuter rail systems is realised (Wilkinson, 2007).

Thus, it is critical to ensure that these powers are devolved to metros and that sufficient and supportive funding frameworks are put in place to support and ensure overall viability in order to harness the full range of TOD advantages (Wilkinson, 2007).

4.3.2.7 Alignment of grants and cross-subsidisation

The alignment of departments such as Human Settlements, Transport and Urban Planning within the City is a bold move to ensure that funding is prioritised and aligned in order to give effect to TOD. Furthermore, the City makes use of the Built Environment Performance Plan (BEPP) which is a plan that aligns grant funding allocated to municipalities for infrastructure development (City of Cape Town, 2016b). However, public funding structures require more flexibility to cross-subsidize projects that have an impact on the overall sustainability of the City's urban form.

4.3.2.8 Development incentives

Tax increment finance (TIF) is a method of mobilizing financial resources for the redevelopment of spatially targeted areas by issuing bonds against future incremental tax revenues because of the improvement of the targeted intervention areas (Suzuki, Cervero & Luchi, 2013). The property tax revenue gains will be rechannelled into the redevelopment zone to repay the bonds in order to finance future infrastructure maintenance and upgrades. However, cities require a well-functioning property tax system to adopt TIF (Suzuki, Cervero & Luchi, 2013). Additionally, another mechanism such as the urban development zone (UDZ) should be employed. The UDZ is a tax incentive instrument deployed to entice private sector development and to encourage development within TOD precincts.

Government funding could be used to subsidise catalytic private sector developments in order to ensure that businesses receive a profitable return on investment, especially for underperforming locations where profitable yields are infrequent (City of Cape Town, 2016a). These catalytic projects are regarded as champion projects that aim to kickstart private sector development interest in key TOD locations. The projects seek to promote and facilitate economic development and increase access to public facilities and social amenities (City of Cape Town, 2016a). However, Harrison (2016) states that the UDZ has historically not been considered important to investment choices. The UDZ was perceived as a bonus for developers who had selected the area already (Harrison, 2016).

4.3.3 TOD implementation considerations

Many factors such as regulatory and incentive based-tools must be in place in order to ensure land use and transit integration around transit stops.

4.3.3.1 TOD typologies and prototypes

Cities in developing countries should not implement a standardised TOD approach, but should seek to create and implement a TOD typology which is realistic and backed by market assessments and user preferences (Suzuki, Cervero & Luchi, 2013). Thus, it is important that TOD prototypes be implemented as an initial market and political test, especially given Cape Town's unique context. The TOD prototype would be contextualised and could potentially ensure greater buy-in as Cape Town requires a dualistic approach to TOD implementation due to the differences between wealthy and poorer areas. Furthermore, TOD in wealthy areas would be private sector-led and would be concerned with lifestyle choice, while TOD in marginalised areas would be public sector-led where people have no lifestyle choice. Therefore, TOD implementation should seek to consider a dualistic process in order to respond to the unique Cape Town context.

4.3.3.2 Affordable housing

While TOD in developing cities is largely about trying to achieve a model shift from private car use to public transport (and therefore can seek to respond to upper-income users), in Cape Town TOD is about trying to change the movement patterns of existing and future public transport users so as to create a more viable public transport system. Given that 95% of public transport users in Cape Town are in the low to low-middle income range, this de facto means that you need to make an impact on where affordable housing units are being built. However, Cape town's housing problem is multi-dimensional and extremely complex due to (i) the substantial backlog in the supply of affordable units, (ii) the rollout of housing densities that are too low to generate the required thresholds to support public transport, and (iii) the fact that many settlements are poorly located in terms of access to economic opportunities and social facilities (Massyn et al 2015: 1). It is widely viewed that for housing to be developed at scale on well-located land, the final value of new housing must exceed the cost and profits required to develop it, and the housing must be targeted at the low to middle income submarkets which contains a large percentage of the city's households (Massyn et al, 2015:1). However, it is imperative to understand factors influencing value such as low and irregular incomes as the value of a residential building is a function of the rentals or selling price that households are willing and able to pay to occupy it (Massyn et al, 2015; Hogarth, 2015). Since lower-income households have limited spending power, the amount available to spend on housing is often too low to compensate the developer for the costs and profit required to develop it (Massyn et al 2015). Therefore, low incomes and/ or low effective demand present an innate challenge to the development of affordable housing units (Massyn et al, 2015; Hogarth, 2015). TOD should therefore strive to intervene in land markets by targeting factors that influence the cost of development in order to deliver well located affordable housing (Suzuki, Cervero & Luchi, 2013; Massyn et al, 2015; Hogarth, 2015).

4.3.3.3 Informality and urban management

Urban management is imperative to advance safety and security and to ensure overall attractiveness of areas, specifically for areas such as Bellville central. Urban management is well positioned to facilitate relationships with government on issues such as law enforcement, informal trading, taxi and utilities management in order to improve crime and grime issues, local economic development, as well as potential urban regeneration (Rogerson, 2006; Berg, 2004; Harrison, 2016). The fundamental lack of safety in public spaces within Bellville consistently weakens the likelihood of dwellers to engage in the public realm, and so fear in the public realm is a major urban management issue (Silverman and Zack, 2007). Similarly, perceptions of crime and a lack of safety can discourage new businesses from locating in Bellville. Given that densification and land use intensification are central to the implementation of TOD, issues that discourage businesses from locating in an area undermine the implementation of TOD in that they contribute to a lower demand for new commercial space.

As shown in the contextual analysis in chapter 3, Bellville is declining as an economic node and has a market performance that is lower than it's location potential. This, combined with the fact that Bellville contains a busy public transport interchange that is of regional importance, means that informal economic activity is an important consideration for the area. Cape Town's 2013 Informal Trading Policy emphasizes the importance of the informal economy to the city and states that:

> *"The City acknowledges the legitimacy and role of the informal economy in terms of its employment and economic growth prospects. Urbanising cities and towns globally are experiencing growth in the number of entrants to the informal sector. The informal economy also has low barriers to entry and serves as a social safety net: it also often sustains the livelihoods of foreign nationals who seek refuge from war torn countries. The informal economy is thus important socially and economically. The response to the sector will determine how well it thrives" (CoCT 2013: 10).*

It is imperative to understand both the formal and informal economic dynamics within Cape Town, and specifically Bellville, in order to provide and ensure a more nuanced hybrid TOD implementation approach. The informal sector is active and engages in similar activities as the formal sector with the only perceived difference being visibility in terms of policy and law (Haysom et al, 2017). Moreover, the informal sector remains mainly illegal, even though they are directly connected and often dependent on the formal sector and vice versa (Haysom et al, 2017). This mutuality is possibly most evident in the fact that recently Massmart (the South African Walmart subsidiary) stated that as much as 50% of it's business comes from the informal sector (Haysom et al, 2017). Therefore, TOD implementation should seek to include and build on the existing energy in Bellville central and should also aim to encourage informal activities. In addition to informal economic activity, informality in housing is also common in Cape Town with 56% of dwellings in the municipality being formal houses and 21% being informal shacks according to the 2011 Census (Table 3). Thus, a contextually appropriate form of TOD implementation in Cape Town would also need to consider informality in terms of housing.

	No.	%
House	601,956	56.3
Shack	218,781	20.5
Apartment/flat	106,161	9.9
Semi-detached house	74,484	7.0
Others	67,194	6.3

Table 7: Cape Town dwellings. Source Hungary Cities Report No.3, 2017.

4.4 TOD Precedent

This section examines two international case studies and two South African case studies in order to provide insight into the practice of TOD and corridor planning, financing, and implementation to highlight key features and findings with TOD implementation.

Curitiba, Brazil and Ottawa, Canada are examined in terms of international precedent, while Johannesburg and Warwick Junction, Durban are analysed in terms of local precedent.

4.4.1 International precedent

4.4.1.1 Curitiba Brazil

The Brazilian city of Curitiba used the BRT system to successfully promote and brand the city on the international stage as one of the most liveable cities in the world and a model of urban sustainability (Lindau et al 2010b). The BRT system has since been followed and adapted by cities on the South American continent and South African cities such as Cape Town and Johannesburg. Curitiba started the BRT system in the year 1974, specifically established as a cost-effective answer to rapid urban growth, overcrowding and traffic congestion (Cervero, 1998). The initial BRT system evolved from a transport solution to a wider urban development vision and strategy by integrating land use and transport investments before TOD was a known concept (Cervero 1998; Croese, 2016). The city's successful BRT system has resulted in higher densities along corridors, and has successfully reduced car use, transportation costs, congestion and air pollution (Goodman et al 2007; Suzuki, Cervero & Luchi, 2013).

The fundamental tools in the planning and implementation was the adoption of overarching spatial plans, zoning regulations and development incentives to encourage higher densities and mixed land use development along the BRT corridors (Cervero, 1998; Suzuki, Cervero & Luchi, 2013). The trinary road system was the design that specifically enabled the high density mixed land use developments in the city. The trinary road system design comprised of three parallel roadways with compatible land uses and building heights that taper with distance from the BRT corridor (Refer to figure 48).

Furthermore, car-free pedestrian malls and the clustering of services and retail activity within walking distance of BRT corridors were important factors (Macedo, 2013). The city also promotes ridership by utilising a single flat fare which enables cross-subsidisation between short and long trips, supported by a national policy that mandates employers to subsidise a share of worker's transportation costs (Cervero, 1998; Lindau et al 2010b). Curitiba also received incredible state funding for corridor development capital costs. Financial incentives such as transferable development rights have been successful in directing private investment into specific locations in exchange for preserving the unique culture and heritage of the city (Croese, 2016). Moreover, new development levies in the form of development charges are deposited into a Municipal Housing Fund which is used to implement affordable housing projects along corridors (Macedo, 2013). More importantly, the key enabling conditions considered imperative to the success of the BRT system in Curitiba is the political championing, institutional alignment and co-ordination, the central role of the planning agency which ensures political continuity, and the Urban Development Authority which manages all transportation modes within the city (Lindau et al 2010a; Lindau et al 2010b).

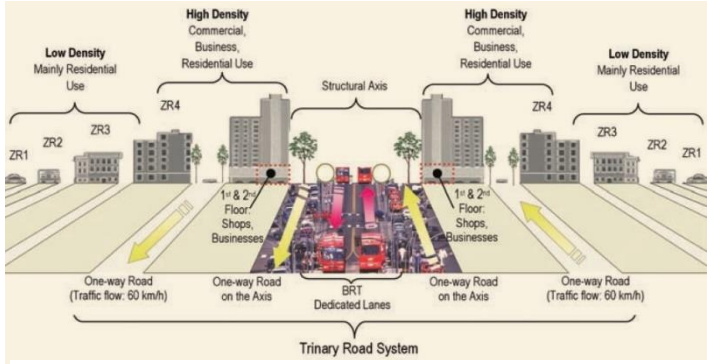


Figure 48: Curitiba conceptual trinary road system. Source: Cervero, 2013

Lately, Curitiba has faced a number of growing challenges such as the incredible demand for BRT which overshadows the supply leading to delayed services, severe overcrowding, amplified operating costs and rising fare prices (Cervero, 2013; Croese, 2016:12). Extreme overcrowding has resulted in middle-class persons that live alongside the high-density corridors buying cars (Cervero, 2013). Furthermore, the BRT system failed to integrate peripheral suburbs with the core nodes of the city and failed to consider the informal sector and settlements outside of the city boundary (Scruggs, 2013; Croese, 2016). However, in January 2017, the City of Curitiba adopted a new BRT system called City 'Vehicle Interconnected' which includes electronic and hybrid buses connected to five corridors and 300 stations. The buses will provide passengers with free Wi-Fi and cell phone applications that provide real time information about the bus services. This new system is an attempt at eradicating the growing issues and attempting to position Curitiba back as a leading sustainable city (Bazani, 2017; Croese, 2016).

Figure 49: Curitiba's trinary road system. Source: Croese, 2016.

4.4.1.2 Ottawa, Canada

Ottawa, the capital city of Canada, started the BRT system in 1983 and has one bus priority corridor comprising of 35 km and benefiting 220 000 commuters every day (Croese, 2016). Like Curitiba, Ottawa implemented the BRT system as a response to rapid urbanisation, growth and cost inefficiency (Cervero, 1998). Much like Cape Town, the BRT system was seen to be the favoured and more suitable option for the city's future land use vision of concentrated employment centres with retail destinations encircled by low-density, single-family detached housing (Suzuki et al 2013). The city conceptually designed movement axes and began to invest in the high quality, high capacity bus system to direct growth along the axis corridors. The tools for planning and implementation of the Ottawa corridor development consist of a comprehensive legal framework with a zoning scheme guided by a regional spatial plan. The regional spatial plan aimed to generate higher densities for a transit supportive built form (Croese, 2016). The plan required that employment opportunities such as shopping centres were located within walking distance of existing or future transitway stations (Cervero, 1998; Croese, 2016). As a result of supportive zoning scheme regulations and high-quality bus services, development grew towards the bus corridors (Suzuki, Cervero & Luchi, 2013). The funding of the Ottawa BRT system is interesting in that while most of the initial operating and capital costs were provincially funded, more than half of the operating costs are now recovered through passenger fares (Croese, 2016). The remainder is funded through property tax and provincial gas tax transfers (OC Transpo, 2015). TOD design guidelines played a tremendous role in directing investment towards the corridors by translating the overall vision into development principles. Most notably, Transit Demand Management (TDM) is used as a tool to decrease the amount of parking supply in order to promote reduced car use.

TDM was specifically used to limit parking around stations which freed up significant land for commercial and mixed-use development and enabling value capture in return (Suzuki et al 2013). Despite strong tools and TOD guidelines, the key enabling conditions for the city's BRT success comprise of political support, institutional alignment and co-ordination (Croese, 2016).

Figure 50. Typical transitway station in Ottawa (St. Laurent station). Source: http://www.wikiwand.com/en/Ottawa_Rapid_Transit.

4.4.2 Local precedent

4.4.2.1 City of Johannesburg's TOD programme: Corridors of Freedom (COF)

An important difference between the implementation of TOD in South Africa compared to international case studies is that in South Africa municipalities are turning to TOD as a response to broader challenges relating to spatial justice and social inequality.

Similar to Cape Town, the City of Johannesburg's (CoJ) turn to TOD was provoked by the ever pressing need to rectify and manage the unprecedented socio-economic challenges borne from the previous apartheid spatial legacy. Thus, the CoJ's Corridors of Freedom (COF) initiative aims to restructure numerous neighbourhoods across the city by implementing a high quality BRT system along main transport corridors linked to interchanges. Corridors of Freedom (COF) strives to create safe neighbourhoods designed for NMT with attractive streets coupled with minimal parking provision, clustered mixed-use developments and integrated human settlements that provide a range of housing typologies and prices (Rubin and Appelbaum, 2016:4). The CoJ believes that the initiative will stimulate inclusive economic growth and social upliftment across the city that will contribute to addressing the ever-increasing spatial mismatch between employment centres and the peripheral places of residence (Rubin and Appelbaum, 2016). The COF programme has a 2040 time horizon and has been running for less than 5 years. Despite the initiative still being in it's early phases, it has seen a number of achievements such as the implementation of the Rea Vaya BRT system which is very similar to the City of Cape Town's MyCiti BRT system. The initiative has political support and an autonomous highly skilled planning department driving the TOD agenda. However, the greatest challenge is the alignment and co-ordination of the departments of government. The departments have not bought into the TOD concept which makes implementation extremely problematic (Rubin and Appelbaum, 2016).

Figure 51. City of Johannesburg'ss Rea Vaya. Source: https://images.enca.com/encadrupal/styles/600_383/s3/busbrt.jpg

4.4.2.2 Warwick Junction urban renewal project

Very similar to Bellville public transport interchange, the Warwick Junction precinct contains a confluence of rail, taxi and bus based transport and is regarded as the primary transport node feeding the inner city. By the mid-1990's, it was estimated that an average of 300 000 commuters travelled through the area daily, and due to the high volume of pedestrian movement, the area became a natural market space for street traders (Skinner, 2008). As is the case in Bellville central, the area had serious urban management concerns with regards to crime and safety, and so the Warwick Junction project was mandated to focus on issues such as the efficiency of public transport, cleanliness, safety, and trading and employment opportunities (Skinner, 2008). What was unique about this specific project is that it focused on operations, thorough consultation and ongoing management. The area based team dealt with operations and initiated considerable capital works and established numerous operations teams to deal with kerbside cleaning, ablution facilities, childcare facilities and people sleeping on the pavement (Skinner, 2008: 236). Furthermore, the capital works focused on public transport facility upgrades, improvements to the public realm including street lighting, as well as the provision of street trading facilities, a dedicated market space for medicine traders, improvements to the fresh-produce market and the allocation of a warehouse for community centre purposes (Skinner, 2008: 236). The project achieved success due to thorough negotiations and participation which ensured buy-in from relevant stakeholders (Skinner, 2008). Additionally, ongoing management and consultative forums promoted and supported high levels of volunteerism and initiatives such as the "Traders Against Crime", which was formed between the traders and the Durban Metropolitan Police. Members of the organisation patrolled areas and ensured that crime activities were kept under control, which improved the overall functioning of the area (Skinner, 2008).

However, in light of the above, the unique approach of the urban renewal project was the thorough consultation which ensured that the infrastructural and activity-specific needs of the street traders were accommodated in the upgrade plans (Skinner, 2008). Thus, TOD implementation should consider these successful interventions for BCA.

Figure 52: Warwick Junction. Source: https://thecityateyelevel.com, 2016

4.5 Interview analysis

This interview analysis aims to extract TOD findings in order to inform TOD implementation in Cape Town and specifically the case study area of Bellville central. The interview analysis comprises of interviews with relevant government officials who know the case study area of Bellville Central and who are active in the implementation of TOD. Additionally, academics were interviewed to diversify the TOD approach which is imperative to ensure multiple voices and thoughts about TOD implementation are incorporated. Survey questions were also used to target transport users and local business owners in Bellville central, which provides a better understanding of the realities and issues on the ground.

It should be noted however that there were limitations during the collection of primary data through the survey process due to mini-bus taxi strikes that took place on the 18/09/2017 (Monday)and 19/09/2017 (Tuesday) which contributed to a limited sample size and influenced the responses from participants of the survey. The mini-bus taxi strikes created an intimidating environment for respondents and it was clearly evident due to their reluctance to engage with the survey and associated questions related to transport and the area of Bellville at the time.

The interview process was initiated from the 20/09/2017 up until the 28/09/2017 with the findings summarised below. Due to ethical considerations, interviewees that did not approve that their names could be used within this dissertation will be referred to as "respondent", however, their designation will be provided accordingly.

4.5.1 Development appetite and lead mechanisms

The character of BCA is a typical example of a vibrant mixed-use precinct centred around public transport with land use activities dominated by a diverse range of foreign national and local formal and informal trading. Thus, the intention of TOD in Bellville should not be to attempt to bring back big business and compete with the Tygervalley area, but to respond to the existing conditions and energy of the area (Insight from interview with Principal Spatial Planner, City of Cape Town, 20 September 2017). The current energy does not relate to any bulk take up and even though there is existing additional bulk available within the Voortrekker Road corridor and Bellville Central area, the lack of market take-up could be a result of the changing market demands of the area (Insight from interview with Principal Spatial Planner, City of Cape Town, 20 September 2017; Insight from interview with Chad Newman, 20 September 2017; Insight from interview with Rob McGaffin, 21 September 2017).

Furthermore, strong incentives need to be employed to encourage private sector market appetite for development within the area (Insight from interview with Principal Spatial Planner, City of Cape Town, 20 September 2017; Insight from interview with Chad Newman, 20 September 2017; Insight from interview with Rob McGaffin, 21 September 2017). Moreover, there are two types of investors namely, turnkey (short term) and area managers (long term) who seek to push certain agendas and TOD should enable both of these players (Insight from interview with Lance Boyd, 21 September 2017). What is important is to determine who the lead players and mechanisms for medium to long term TOD implementation would be (Insight from interview with Lance Boyd, 21 September 2017). Additionally, the UDZ incentive is spatially targeted, but does not include development tracking which should be implemented within the area to provide rich data in order to strengthen and better understand the City's role in terms of interventions within the UDZ (Insight from interview with Lance Boyd, 21 September 2017). What is important is to understand the role of the City, and when the City should step back (Insight from interview with Bronwen Jillings, 21 September 2017). Thus, TOD implementation would need to include a management policy in order to determine who does what, and when it should commence (Insight from interview with Bronwen Jillings, 21 September 2017).

4.5.2 TOD implementation concerns

Rob McGaffin, an urban land economist, offered a strong critique of TOD, suggesting that TOD seeks to impose an alternative urban form onto a city in order to address current issues, but in a way that does not adequately take land economics and the drivers of development into account (Insight from interview with Rob McGaffin, 21 September 2017). According to McGaffin, TOD is responding to the wrong thing and is regarded to be highly unrealistic (Insight from interview with Rob McGaffin, 21 September 2017).

In areas of Cape Town where TOD is already happening, such as Gugulethu, it is occurring in a form does not fit into the sanitised view of the world which is considered highly problematic within a Cape Town context (Insight from interview with Rob McGaffin, 21 September 2017). Furthermore, there are a few concerns with regards to the lack of communication and collaboration between the strategic spatial planning and land use planning departments with regards to TOD implementation in Cape Town (insight from interview with Chad Newman, 20 September 2017). Land use planning should be involved from the onset in order to understand the TOD strategic policy formulation and implementation process in order to guide developers and assess and process development applications accordingly (insight from interview with Chad Newman, 20 September 2017). Furthermore, there seem to be concerns with regard to the vision of TOD between the City of Cape Town, the Transport Department, and Human Settlements Department (Insights from interview with Sean Cooke, 20 September 2017). The fragmentation currently experienced needs to be sorted out in order to deliver well-located affordable housing in close proximity to public transport (Insight from interview with Chad Newman, 20 September 2017; Insights from interview with Sean Cooke, 20 September 2017). Nevertheless, National Treasury is a strong supporter of TOD, especially from a financial viability and an efficient built environment perspective (Insights from interview with Sean Cooke, 20 September 2017). Another concern is that the draft Cape Town MSDF (which is not prescriptive) will be problematic for land use planning in terms of giving clear guidance to decision making (Insight from interview with Chad Newman, 20 September 2017). However, TOD planning in Cape Town seems to be taking on a more discretionary than prescriptive approach which allows for more flexibility (Insights from interview with Sean Cooke, 20 September 2017). Furthermore, TOD is regarded as the flavour of the year, and the level of commitment from the City of Cape contributes to a degree of certainty that is desired by developers (Insights from interview with Sean Cooke, 20 September 2017).

4.5.3 TOD on the ground

TOD is only a tool and not an end state in itself, and so TOD implementation in Cape Town should take it's people into consideration (Insights from interview with Yunus Petersen, 28 September 2017). Law enforcement, safety and security is a fundamental issue when it comes to TOD on the ground for an area like Bellville Central, therefore TOD should seek to promote self-regulation through creating a sense of place through good urban design (Insights from interview with Yunus Petersen, 28 September 2017). Furthermore, TOD should build on the existing energy within Bellville through small changes (Insights from interview with Gareth Haysom, 26 September 2017; Insights from interview with Yunus Petersen, 28 September 2017). What is important is the spirit of TOD and what it is trying to achieve within a Cape Town context. TOD should have the distribution of social interactions at heart and must be "Cape Tonianised" to work (Insights from interview with Yunus Petersen, 28 September 2017).

4.5.4 Survey

The following questions were directed at the business owners in the Bellville central area:

1. Why do you choose to do business in Bellville?
2. What is it like to do business in Bellville?
3. What are your main concerns when doing business in Bellville?
4. Do you travel to Bellville?
5. Would you live in Bellville?
6. What would you change about Bellville?

The following questions were directed to the transport users of the Bellville central area:

1. What is the main mode of transport
2. Is Bellville your destination or point of departure?
3. Do you live or work in Bellville?
4. What is it like to travel to and from Bellville?
5. What are your main concerns when travelling to and from Bellville?
6. Would you live in Bellville? Why?
7. What would you change about Bellville?

As discussed above, the mini-bus taxi strikes were a major limitation for the collection of primary data, thus, only two local business owners were willing to undertake the survey while the transport user survey only comprised of 3 individuals. The local business owners preferred to do business in Bellville due to it vibrancy and the number of pedestrians moving throughout the area on a daily basis, however, the biggest concern is crime and safety. Furthermore, local business owners would like the informal trading practices along the streets to be improved and to see security measures increased so as to make the area safer for business practice. Moreover, the similarities with regards to the transport user findings are related to questions 5,6 and 7. The main concerns when travelling to and from Bellville is safety. Additionally, the leading reasons for not wanting to live in Bellville relates to noise and safety. The transport users would like to see improvements to the issue of crime, safety and general upgrading of public facilities, buildings and the public realm.

4.6 Conclusion

This chapter provides a TOD conceptual framework which comprises of a targeted TOD implementation literature review that was used to identify ideas that were explored in the interviews and in the survey questions. Additionally, this chapter outlines international and local precedent studies and concludes with the summary below.

TOD planning takes place at varying scales and includes different goals, a range of tools, and actors (Croese, 2016). While TOD can extend between the site, precinct, corridor and metropolitan scales, the essential success factor is to ensure that TOD objectives are aligned and co-ordinated throughout the scales (CTOD 2010:3). TOD can be planned to serve a variety of goals and objectives through successful alignment, however it is imperative for stakeholders to be involved in the early stages of planning to avoid potential implementation barriers such as a weak market demand, community resistance and developer hesitancy. Additionally, TOD tools essentially become useless if there is no clear vision, institutional support, and an adequately flexible metropolitan regulatory framework (Schuetz, 2016; Suzuki, Cervero & Luchi, 2013). Thus, it could be argued that the success of TOD implementation manifests through a holistic vision, institutional collaboration and coordination, the creation of a single transport owner-operator, autonomous planning agencies, and high levels investor support through collaboration between government, the private sector and the community. International case studies show that TOD implementation must be a long-term and continuous effort and cannot be implemented as a quick fix intervention (Croese, 2016). Additionally, similarities exist between the international precedent in terms Cape Town's contextual realities and TOD implementation. Both Curitiba and Ottawa turned to TOD as a cost-effective answer to rapid urban growth, urbanisation and traffic congestion.

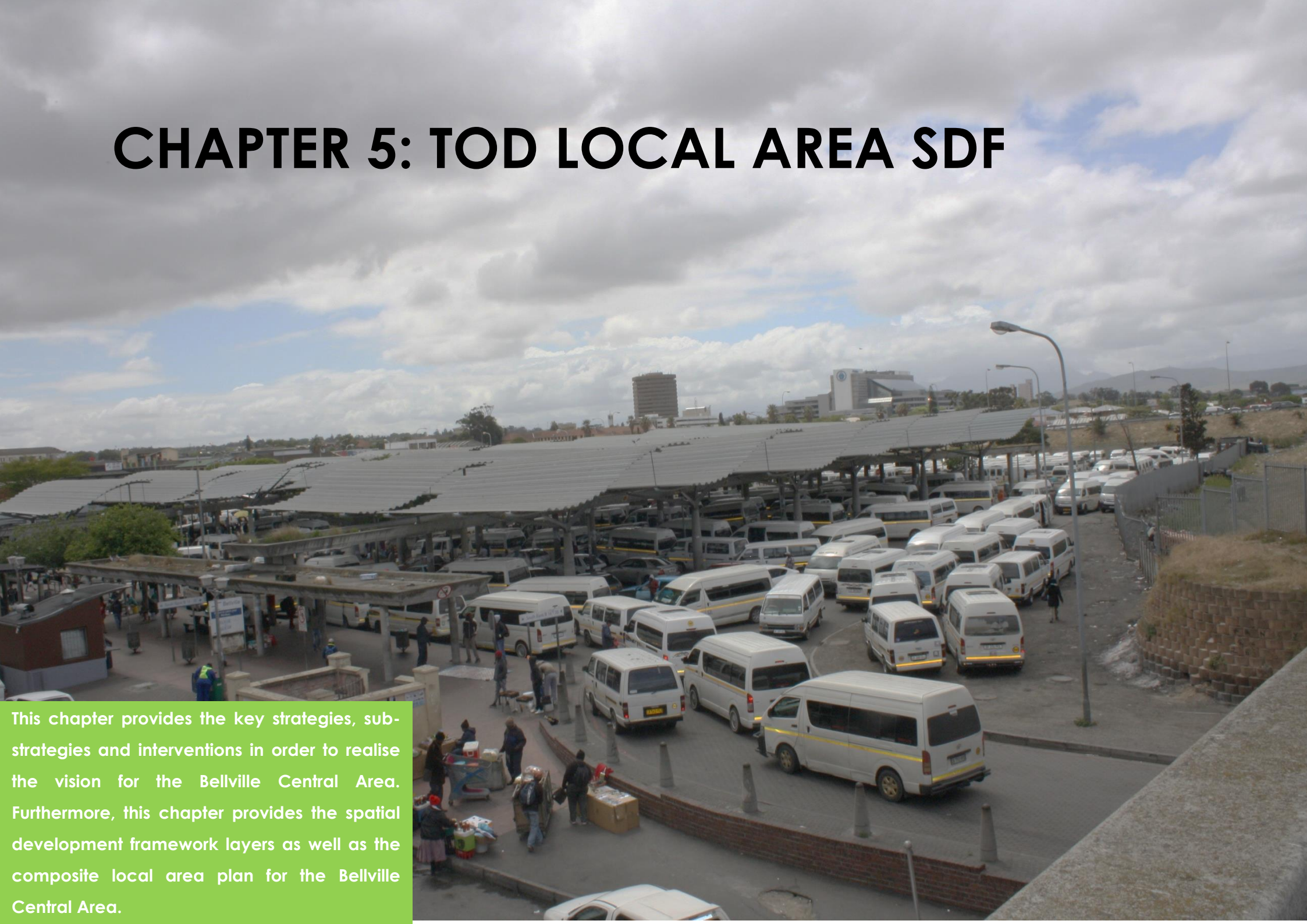
Nevertheless, both cities outline key and similar enabling conditions and tools for successful TOD implementation which include a clear spatial vision, institutional alignment and coordination, political support, communication and collaboration between various stakeholders, a single operating transport authority, and an autonomous planning agency. Given that TOD in Cape Town is seeking not only to address similar contextual challenges as existed in Curitiba and Ottawa, but also broader and more entrenched challenges of spatial injustice and social inequality, these factors are of fundamental importance.

Key tools for implementation also include a comprehensive legal framework that promotes TOD and that includes zoning regulations coupled with development incentives encouraging higher density, mixed-use development along transit corridors, as well as TOD design guidelines. The tools to finance transit investments include transferable development rights, density incentives as well as land value capture schemes. Moreover, TOD seeks to discourage car use, thus, TDM should be implemented to encourage NMT. Thus, it could be argued that TOD implementation must be a long-term and continuous effort that's driven by context-specific solutions. Therefore, the joining of international lessons and local context experiences coupled with on-going research, learning and adapting will ensure effective TOD implementation.

TOD implementation informants for Bellville
- Urban management and regulation programmes. - Informality promotion strategies. - TOD typologies and prototypes which should include affordable housing provision. - Strategies for market stimulation (Demand side incentives, cost cutting, and TDM). - Public-private partnerships and cross-subsidisation. - Pro-active planning and streamlined development applications.

Table 8: TOD implementation informants for Bellville. Source. Author, 2017.

CHAPTER 5: TOD LOCAL AREA SDF



This chapter provides the key strategies, sub-strategies and interventions in order to realise the vision for the Bellville Central Area. Furthermore, this chapter provides the spatial development framework layers as well as the composite local area plan for the Bellville Central Area.

This chapter outlines a number of prioritised strategic issues and associated performance criteria, and identifies TOD performance criteria, objectives and key strategies, for the Bellville Central Area (BCA). Furthermore, this chapter provides a holistic vision with a coherent narrative of spatial interventions that seek to clearly answer the main research questions. Additionally, the spatial vision provides an investment agenda based on an envisioned future for BCA.

5.1 Strategic issues

BCA is strategically located within the metro and comprises significant public transport infrastructure leading to it's primary role as a transport interchange within Cape Town. The transport interchange as well as the area's substantial clustering of institutional and tertiary education facilities, and the area's historical role as a robust commercial centre, has led to its identification as the city's 2nd CBD. However, BCA today has substantial deficits in terms of the required amenities necessary to make it an attractive destination of choice for living and working. The following table below provides a list of pertinent strategic issues in relation to these opportunities and challenges:

Strategic issues	Performance criteria
- Poor connectivity between gateways/ local nodes within the area. - Poorly functioning and poor-quality transport hub. - Lack of investment confidence in the area. - Underutilised and poorly managed green networks.	Connectivity, accessibility and imageability. 
- Poor liveability levels, which relates to the lack of and poor-quality facilities and amenities in the surrounding area. - Lack of diversity in terms of residential and recreational land use activities. - Lack of land attractors for public transport users as most of the peak trips at the transport interchange are transfers.	Diversity, choice and intensity. 
- Poor sense of place with a general lack of identity. - Lack of vibrancy as business and public parking facilities are underutilised after hours. - Lack of internet access. - Unsafe and poor quality public environment.	Vibrancy, safety and identity. 

Table 9. Strategic issues and performance criteria. Source: Author, 2017

The vision is for **Bellville Central Area to become a vibrant, diverse and interconnected TOD node, with a unique sense of place within the city.**

5.3 TOD performance criteria, key strategies and sub-strategies

TOD principles and development objectives must be identified in order to respond to the strategic issues and to direct the previous chapters' development informants towards TOD implementation and to establish a holistic vision for the case study area of BCA. The contextual analysis identified existing elements within the BCA that are supportive of TOD, but the current functioning of the node in terms of TOD is not yet fully optimised. Thus, the priority should be directed towards the optimisation of the areas existing strengths to deliver the critical missing links that will permit the BCA to reach its full potential. To achieve this, it is recommended that the following key strategies be prioritised.

Performance criteria	Key strategies	Sub-strategies
• Connectivity, accessibility and imageability. 	- Support and improve the quality of linkages to destination places and public spaces to and within Bellville.	- Improve metropolitan linkages and connections that support connecting corridors. - Improve connections to surrounding local nodes and destination places. - Establish a clear and connected movement structure hierarchy. - Improve existing NMT accessibility throughout the area and around the PTI. - Establish an integrated, high quality, multifunctional open spaces network.
- Diversity, choice and intensity. 	- Encourage the increase of choice and diversity through maximising the area's locational attributes.	- Prioritise the development of vacant and underutilised public land holdings and locate new development around public transport. - Facilitate and promote mixed-used development with a focus on increasing the supply of higher density affordable housing. - Increasing the number and range of land use attractors.
- Vibrancy, safety and identity. 	- Promote the vibrancy and the unique identity of the area and support the making of safe public environments.	- Significantly increase the range and extent of residential opportunities through public-private partnerships. - Reinforce Bellville as a significant growth node and increase urban management initiatives. - Develop a range of safe, comfortable and active streets and outdoor spaces.

Table 10: Performance criteria, key strategies, and sub-strategies. Source: Author, 2017

5.4 Spatial strategies, interventions and structuring elements

Performance criteria	Key strategies	Sub-strategies	Interventions
• Connectivity, accessibility and imageability. 	- Support and improve the quality of linkages to destination places and public spaces to and within Bellville.	- Improve linkages and connections that support metropolitan connecting corridors.	- Improve north-south connections with the extension of Robert Sobukwe Road to the N1 and improve east-west connectivity with the extension of Tienie Meyer to Bill Bezuidenhout Road.
		- Improve connections to surrounding local nodes and destination places.	• Establish new attractive links from BCA to Tygerberg Hospital, Transnet site and towards the CPUT/ UWC hub • Create new and better-quality links from BCA towards the Tygervalley node • Establish BRT routes to improve north-south linkages between the Tygervalley node and the CPUT/ UWC hub. • Establish BRT trunk and feeder stops within the BCA and include it as active zones.
		- Establish a clear and connected movement structure hierarchy.	• Durban Road to function as an activity street that links to Carl Cronje. • Teddington Road to function as a pedestrian street. • Improve east-west connections with Church Street functioning as a pedestrian route that connects the sport and recreation precinct with the commercial precinct.
		- Improve existing NMT accessibility throughout the area and around the PTI.	• Upgrade the PTI. • Develop an integrated high quality NMT network that connects primary transport routes, character precincts and facilities to produce an accessible, attractive, and vibrant movement structure.
		- Establish an integrated, high quality open space network.	• Re-design and upgrade the Elsieskraal river corridor as a continuous, accessible, attractive, and active linear park from Elizabeth Park towards Jack Muller Park.

Table 21. Connectivity, accessibility and imageability. Source: Author, 2017.

5.4.1 Connectivity, Accessibility and Imageability

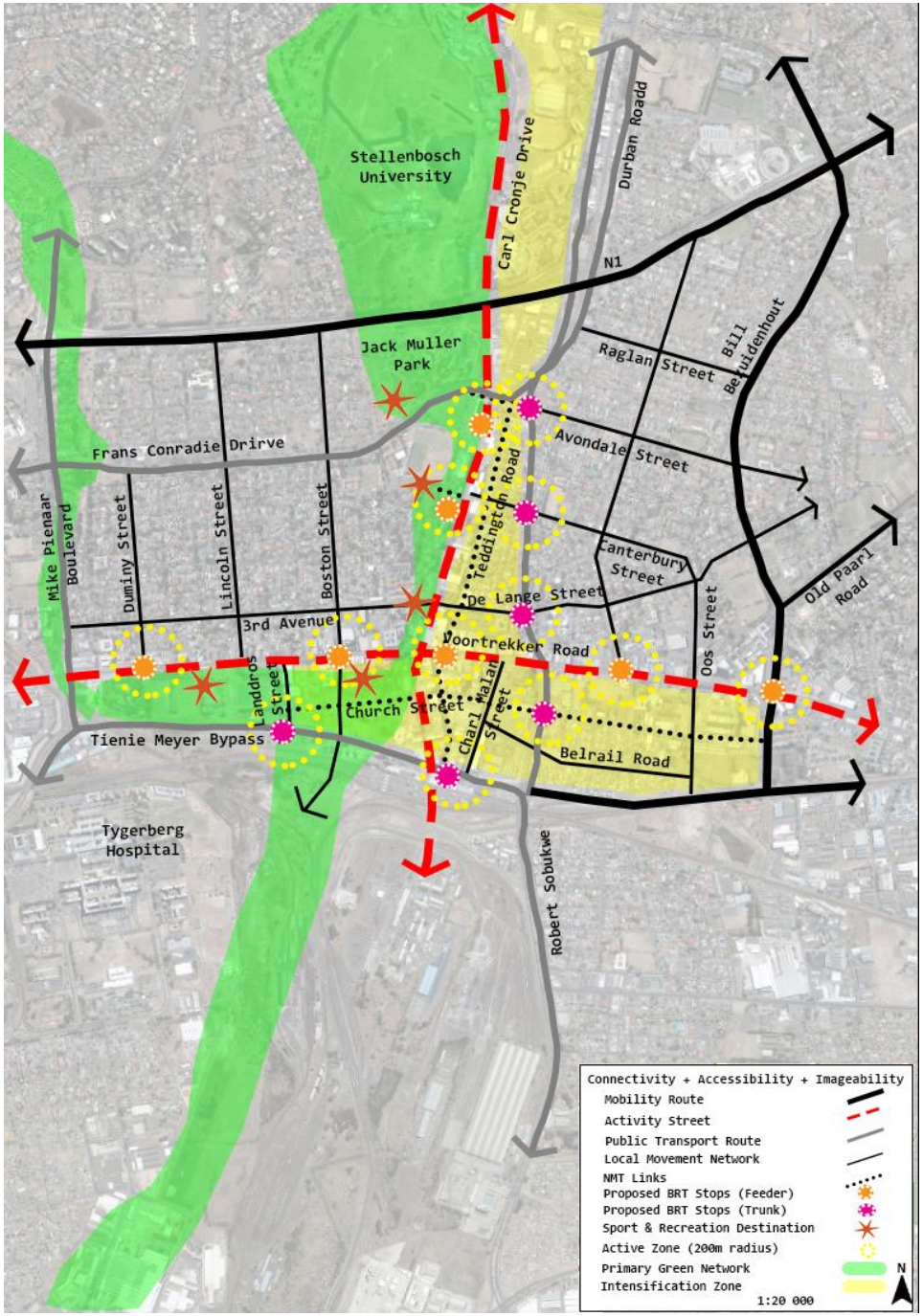


Figure 53: Connectivity, Accessibility, and imageability plan. Source: Author, 2017

Performance criteria	Key strategies	Sub-strategies	Interventions
- Diversity, choice and intensity. 	- Encourage the increase of choice and diversity through maximising the areas locational attributes.	- Prioritise the development of vacant and underutilised public land and locate new development around public transport.	- Develop and intensify vacant and underutilised land holdings, directly adjacent to the transport hub - Incentivise consolidation of landholdings with spare bulk capacity around the hub and public transport routes
		- Facilitate and promote mixed-used development with a focus on increasing the supply of higher density affordable housing.	- Support and promote informal trading - Incentivise the diversification of residential options in the BCA - Sites for government-led housing developments need to be identified. - Create an intensification zone and transition zone within the BCA in order to promote high density development, and medium to low-medium density development.
		- Increasing the number and range of land use attractors	- Develop a gateway node into the BCA from the N1, to bridge the divide created by the N1. - Support the consolidation of emerging character areas into a range of specific character precincts across the BCA. - Upgrade the sport and recreational character precinct as a high-performance sports-science precinct.

Table 32. Diversity, choice and intensity. Source: Author, 2017.

5.4.2 Diversity, Choice and Intensity

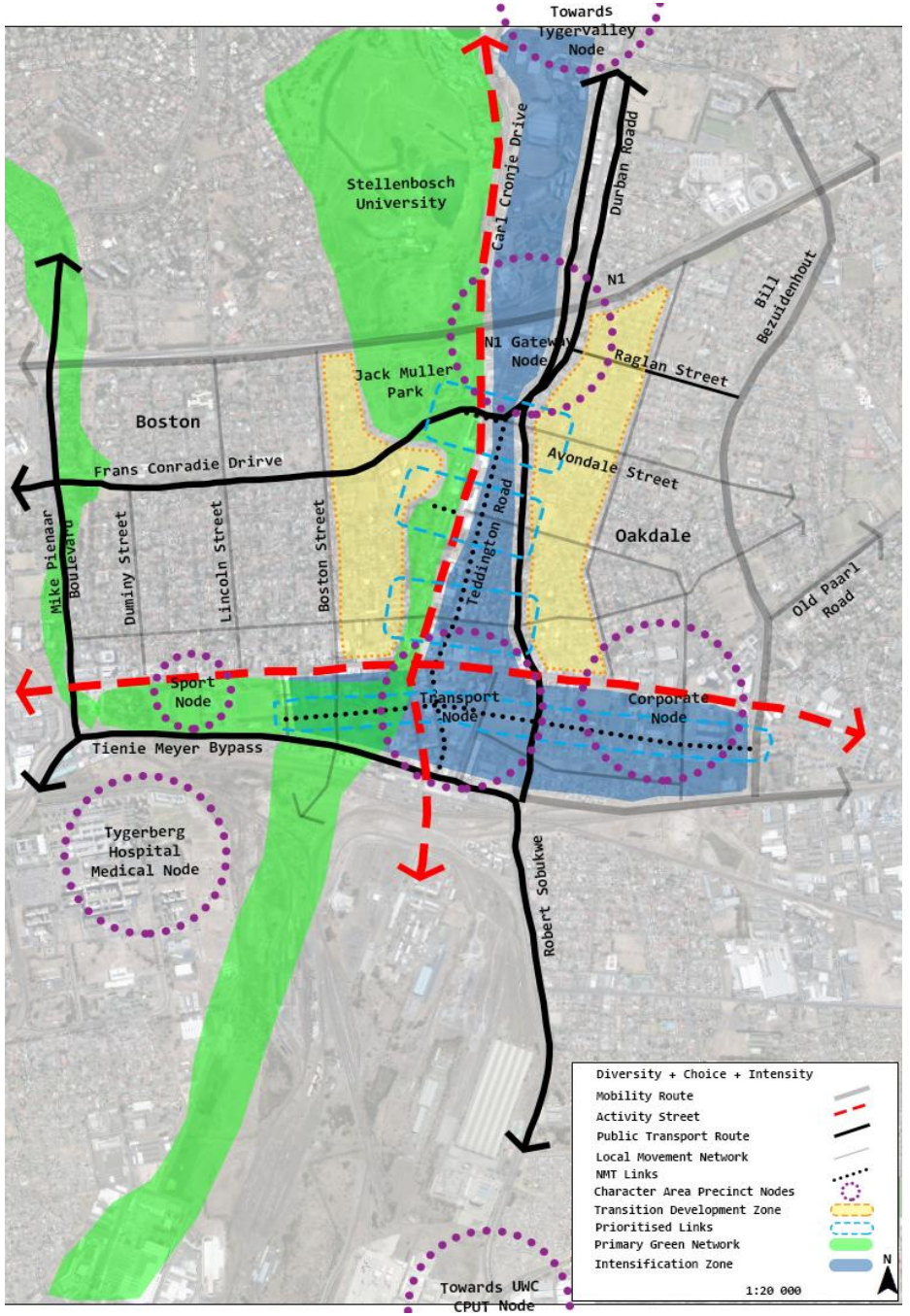


Figure 54: Diversity, choice and intensity plan. Source: Author, 2017

Performance criteria	Key strategies	Sub-strategies	Interventions
- Vibrancy, safety and identity. 	- Promote vibrancy and the unique identity of the area and support the making of safe public environments.	- Significantly increase the range and extent of residential opportunities through public-private partnerships.	- Prioritise the development of high density, mixed use, mixed income, residential developments along primary public transport/ NMT routes.
		- Reinforce Bellville as a significant growth node and increase urban management initiatives.	- Identify state-led catalytic projects to increase and entice investor confidence. - Prioritise public Wi-Fi initiatives within the BCA. - Increase the range and quality of recreational and community amenities and facilities. - Amplify urban management initiatives and support self-regulating programmes.
		- Develop a range of safe, comfortable, active streets and outdoor spaces.	- Design key public transport and NMT routes with intersecting nodes that act as multifunctional spaces. - Upgrade the Elsieskraal open space network into a safe and attractive linear park that contains a range of recreational activities.

Table 43. Vibrancy, safety and identity. Source: Author, 2017.

5.4.3 Vibrancy, Safety and Identity

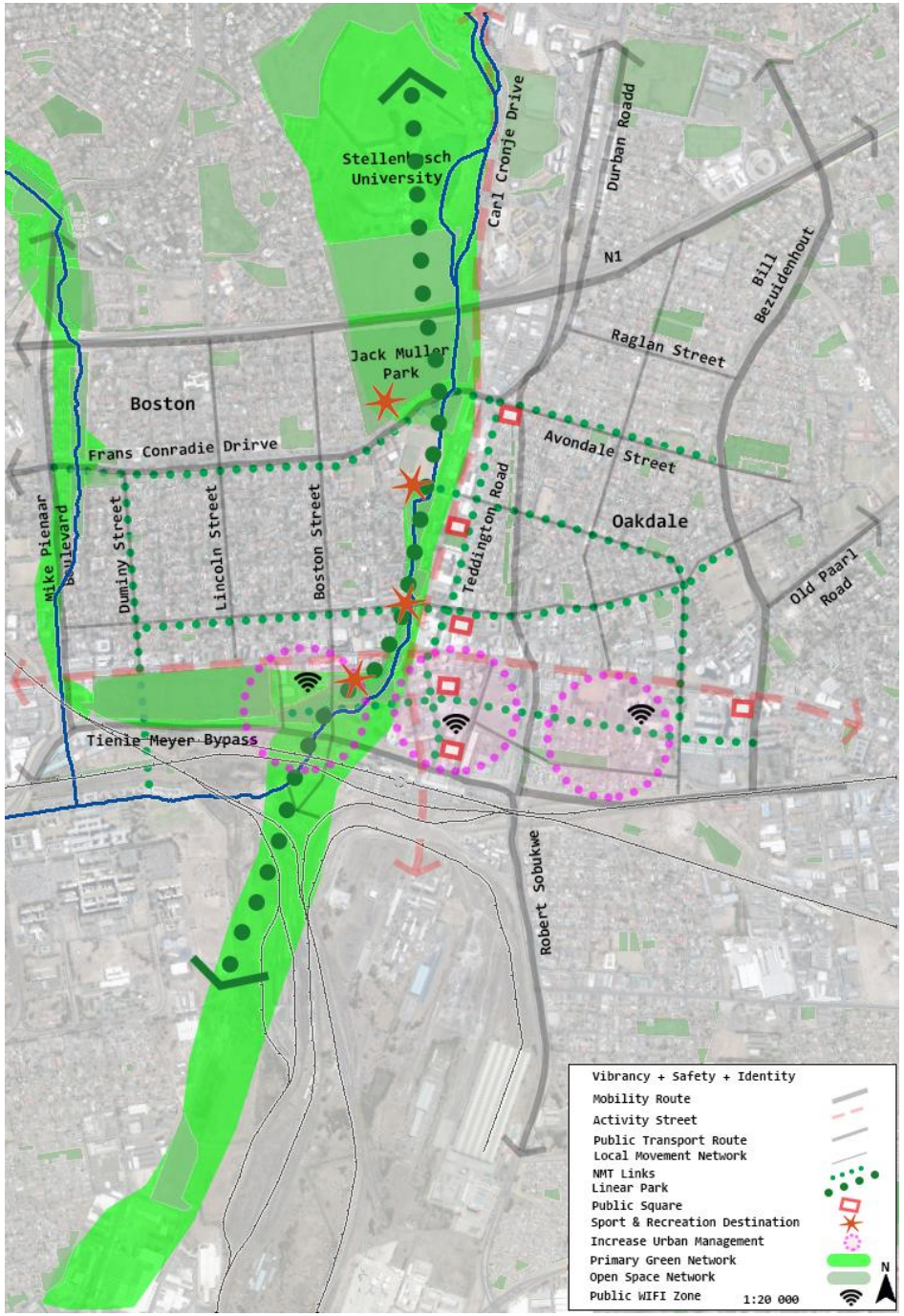


Figure 55. Vibrancy, Safety, and Identity plan. Source: Author, 2017.

BELLVILLE CENTRAL AREA TOD LOCAL AREA SPATIAL DEVELOPMENT FRAMEWORK:

The vision is for Bellville Central Area to become a vibrant, diverse and interconnected TOD node, with a unique sense of place within the city…

Connectivity, Accessibility and Imageability

Diversity, Choice and Intensity

Vibrancy, Safety and Identity

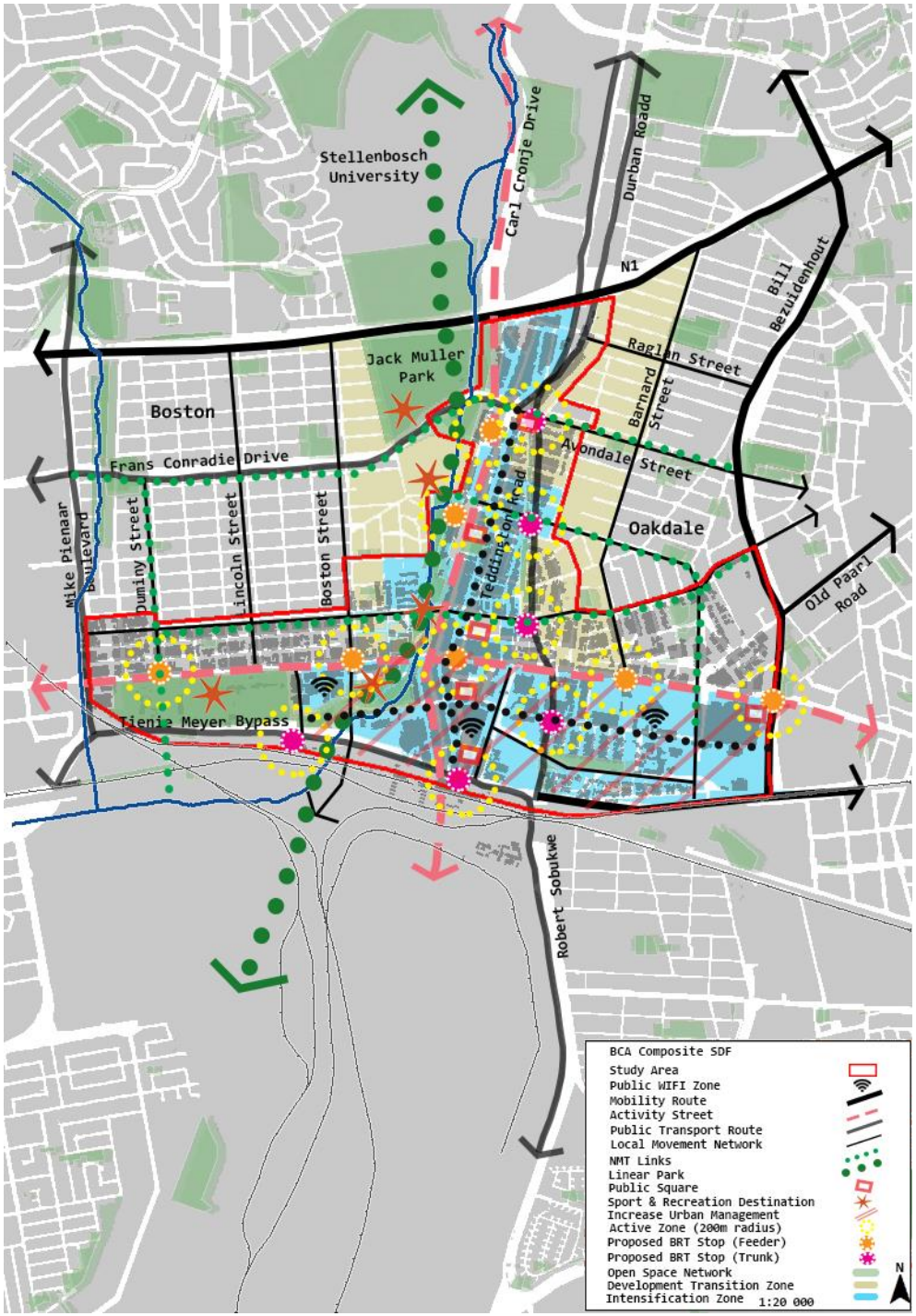


Figure 56. BCA Composite SDF. Source: Author, 2017.

CHAPTER 6: IMPLEMENTATION FRAMEWORK

This chapter provides the spatial development framework phasing and the identification of catalytic projects for TOD implementation in the Bellville Central Area. Furthermore, this chapter also outlines the institutional responsibilities and capital funding and concludes with policy guidelines.

This chapter provides the projected phasing of the SDF strategies as well as the identification of catalytic projects. These strategies have the potential catalytic characteristics to set the BCA vision into action. Furthermore, the responsibilities, capital funding, and policy recommendations will be outlined.

6.1 Phasing of SDF and identification of catalytic projects

The proposed vision for the BCA to become a vibrant, diverse and interconnected TOD node, with a unique sense of place is ambitious and requires strong political championing, support from surrounding communities, as well as substantial investment from both the public and private sectors. One of the main factors to realising the vision is to shift the general public perception of the potential of the BCA. As analysed in chapter 3, the BCA currently comprises of key elements that allow the area to function as a TOD node. Furthermore, as discussed in chapter 3 and 4, a major barrier for the BCA has been the lack of investor confidence and the poor public environment. Thus, a series of catalytic projects have been identified that will assist in improving public perception and investor confidence for the BCA. The catalytic projects out lined below demonstrate a fundamental commitment to public investment in the BCA which ensures that the capital and energy investment creates value to the current users and potential future investors. Each of the catalytic projects are numbered below and their location is indicated on the corresponding map in figure 57.

Catalytic intervention: Short term (2017-2020)	Catalytic intervention: Medium term (2020-2030)	Catalytic intervention: Long term (2030-2040)
1 Bellville Railway Station Upgrade (Mixed-Use) and the development of a new formal market square	5 Elizabeth Park + Jack Muller Park + Elsieskraal Linear Park upgrades	9 NMT upgrades along Fransconradie and Avondale Street
2 Taxi and bus terminal upgrade	6 Robert Sobukwe Extension	10 NMT upgrades along Church Street and extension to link through Charl Malan into Robert Sobukwe
3 Paint City site mixed-use development (affordable housing)	7 BCA Public WIFI roll out at each character precinct area	11 Kerkplein mixed-use development
4 Kruskal Avenue Teddington Street NMT upgrades	8 Upgrade Haardekraaltjie into a sport-science precinct and densify public facilities	12 NMT upgrades along Duminy Street towards Haardekraaltjie

Table 14. Catalytic Interventions. Source: Author, 2017.

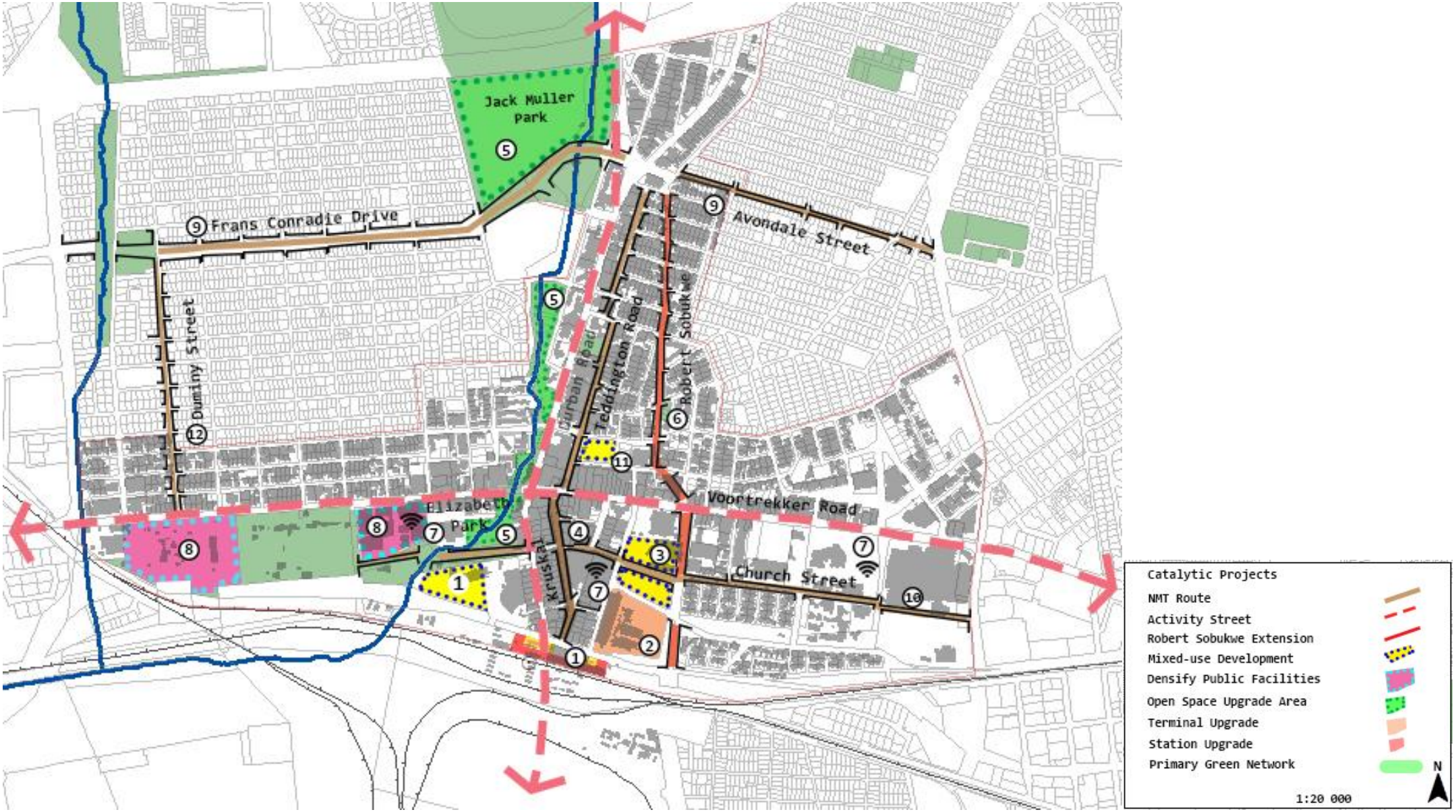


Figure 57. Catalytic projects. Source: Author, 2017.

6.2 Institutional responsibilities and sources of funding

In order to effectively implement the identified catalytic projects, the key actors, responsible departments, core responsibilities and the sources of capital funding are programmed below.

Catalytic intervention	Key actors	Department	Responsibilities	Source of funding
Bellville Railway Station Upgrade (Mixed use development) and the development of a new formal market square	Prasa, City of Cape Town, relevant NGO's, Private sector	Prasa, Transport and Urban Development Authority (CoCT), Economic Development Department, Social Development Department, Informal trading Department	Allocating funds and co-ordination between various stakeholders and allocating state-owned land release for the development of the market area	Prasa, City of Cape Town
Taxi and bus terminal upgrade	Provincial Government, City of Cape Town, Parastatals, Taxi industry leaders (Cata, Codeta etc.)	Prasa, Transport and Urban Development Authority (CoCT), Economic Development	Allocating funds and co-ordination between various stakeholders	Provincial Government, City of Cape Town, Parastatals, Taxi industry
Paint City site mixed-use development (affordable housing)	City of Cape Town, Private sector	Transport and Urban Development Authority (CoCT), Property Management Department (CoCT)	Allocating funds and co-ordination between various stakeholders and provide project management function for the release of land to be developed in conjunction with the private sector	City of Cape Town, Private sector
Kruskal Avenue upgrades	City of Cape Town, Informal traders, NGO	Transport and Urban Development Authority (CoCT)	Allocating funds and co-ordination between various stakeholders and provide project management function for the release of land to be developed in conjunction with informal traders and NGO sector	City of Cape Town

Elizabeth Park + Jack Muller Park + Elsieskraal Linear Park upgrades	City of Cape Town	Transport and Urban Development Authority (CoCT), City Parks Department	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
Robert Sobukwe Extension	City of Cape Town	Transport and Urban Development Agency,	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
BCA public WIFI roll out at each character precinct area	City of Cape Town, Network providers	Transport and Urban Development Authority (CoCT)	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
Upgrade Haardekraaltjie into a sport-science precinct and densify public facilities	City of Cape Town, Heritage Western Cape	Transport and Urban Development Authority, Heritage Western Cape	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
NMT upgrades along Fransconradie and Avondale Street	City of Cape Town	Transport and Urban Development Authority	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
NMT upgrade along Church Street and extension to link with Charl Malan and Robert Sobukwe	City of Cape Town	Transport and Urban Development Authority	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
Upgrade Teddington Street (NMT)	City of Cape Town	Transport and Urban Development Authority	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town
NMT upgrades along Duminy Street towards Haardekraaltjie	City of Cape Town	Transport and Urban Development Authority	Allocating funds and co-ordination between various stakeholders and provide project management function	City of Cape Town

Table 15. Institutional Responsibilities and capital funding. Source: Author, 2017.

6.3 Policy recommendations

6.3.1 Transit Oriented Development District Overlay Zone

Changes to the existing development management scheme (DMS) will be required in order to support an increased development intensification in the form of higher densities around the BCA area. Thus, it is recommended that a TOD planning overlay is implemented which retains the existing zonings as per the DMS and provides development guidance on land use departures and application procedures to give effect to the TOD objectives.

The TOD District Overlay zone for BCA should include the following and requires further investigations and comparisons with the City of Cape Town DMS.

6.3.1.1 Development Zones

It is recommended that the Bellville TOD District Overlay Zone be divided into zones of varying development intensity in proportion to the degree of access to public transport. The specific land use requirements will need to be discussed in each of the development zones below.

- **Intensification Zone:** This zone is the area immediately surrounding the Bellville PTI, character precinct areas and along activity streets. The intensification zone will be pedestrian oriented coupled with high levels of transit integration with the highest density and building heights in the BCA (+-70 du/ha gross).

- **Active Zone:** This zone is situated immediately adjacent to all public transport (BRT) stops along the activity and public transport routes in the BCA which includes land that is within 200m of BRT stops (+-45 du/ha gross). Very similar to the TAPs, however, these active zones will be located around future proposed BRT/ minibus taxi stops and public transport interchanges.

- **Transition Zone:** This zone is located outside of the intensification zone which forms a transitional land use boundary shift between the proposed intensification zone and residential development situated outside of the zone within the BCA. The transition zone will have the lowest density and building heights in the BCA (+-30 du/ha gross).

6.3.1.2 Pro-active planning and streamlined development applications

The pro-active planning strategy to permit land use applications on behalf of public and private land owners located within the BCA intensification zone and active zone should be included in the overlay zone. Additionally, the objective of streamlined development applications within the intensification zone and active zone should be incorporated where the Land Use Management Department leads the development planning process of identifying development-ready sites (sites that have zoning and development rights pre-approved), to conduct technical investigations such as environmental impact assessments (EIA's) and heritage impact assessments (HIA's) on behalf of the developer, and to undertake public participation and respond to objections in order to streamline the development process. The City would therefore remove the risk and uncertainty associated with planning processes and cut considerable development costs associated with time.

6.3.1.3 Transport management tools

Parking strategies should be incorporated to achieve the necessary travel behaviour shift within the city and specifically for the BCA. Thus, regulatory instruments need to be included within the overlay zone in order to support TOD development objectives.

- **Parking management system and pricing strategy**: This system will make use of policy and seeks to prioritise short-stay parking provision in commercial areas and promote long-stay parking on the peripheries of the BCA. The policy should explore the three development zones (Intensification, active, and transition zone) and potential revenue generating mechanisms such as parking tariff zoning in order to raise the much-needed capital for TOD implementation. Furthermore, the pricing strategy aims to set tariffs based on performance in relation to parking demand with the revenue generated being used for public transport infrastructure upgrades and affordable housing provision around the PTI and TAPs.

6.3.1.4 Informal street trading, crime and safety strategies

- **Informal trading:** Street trading should not be perceived as a non-conforming land use activity, but rather as an opportunity to enhance the BCA's public environment as the activity provides vibrancy and eyes on the street. Thus, street trading regulations should be incorporated within the overlay zone in order to encourage local economic development and the current informal land use activities, especially around the PTI and NMT routes.
- **Enforcement and maintenance (Urban management):** Apart from the VRCID initiatives, strong enforcement of regulations is an important tool for ensuring that the BCA functions as envisioned. Enforcement and maintenance is imperative to ensure safety and security, and maintaining a clean and attractive, well-functioning public environment. There should be incentives for locals within the BCA to check and report rubbish, broken street furniture, rough surfaces, and non-functional street lights in order to stimulate involvement and ownership of the area.

CHAPTER 7: CONCLUSION

This chapter will conclude with limitations of the dissertation and further research required in order to ensure effective TOD implementation in the Bellville Central Area.

7.1 Limitations of the study

There are numerous limitations to this dissertation which should first be considered before reflecting and concluding this dissertation. The main limitation to this dissertation was time, which had an impact on various aspects of the research. Due to the nature of the dissertation period within this degree program, time constraints during the fieldwork phase of research prevented an inclusive research process due to a lack of public participation, local community consultation and input from key stakeholders such as PRASA and Transnet as well as the Greater Tygerberg Partnership. Another limitation to this dissertation was the collection of primary data through surveys due to the mini-bus taxi strikes that took place during the survey period. Another limitation is the lack of quantitative data that would strengthen the qualitative findings. This is largely due to restrictive access to data.

7.2 Further research

As mentioned above, this dissertation has numerous limitations due to time constraints, mini-bus taxi strikes, and the lack of quantitative data analysis due to restrictive access to relevant up to date data. Thus, in order to overcome the limitations, the following further research is required:

- A detailed fieldwork study is required in order to provide input from stakeholders, interested and affected parties.
- A detailed urban design framework is required to provide TOD development principles and guidelines at the precinct and individual project level planning scale.
- A detailed study into the successes and failures of the various financial incentives that exist in Bellville/VRC, to understand why the response from the private sector has been limited and how the incentives could be improved to get a better response from the private sector. This would be a detailed research project that includes private developers, economists and government officials from the City and from National Treasury.
- A detailed study into the feasibility of value capture strategies in the context of Cape Town and specifically the BCA.
- A study into the current and proposed TOD densities and how it relates to the current and required infrastructure upgrades within the BCA.

7.3 Conclusion

In many respects the implementation of TOD at a local scale depends on implementation tools that require changes to the municipal planning system (or even systemic changes at the level of provincial or national government). For example:

- Aligning internal departments (with the formation of the Transport and Urban Development Authority in the City of Cape Town being a good example).
- Making changes to the zoning scheme (eg implementing TOD overlay zones).
- Increasing flexibility in how fiscal grants can be spent.
- Devolving control of railway down to metros.

Furthermore, TOD needs to be implemented in a way that is contextually appropriate. Proposals and interventions need to acknowledge and respond to the existing context in Bellville, aligning to existing demand so that developers are on board. The approach was one of understanding Bellville's role and function within the broader region and building on the economic activity that currently exists in the area. However, the declining nature of the local economy in Bellville presents a particular challenge to the implementation of TOD, particularly given that TOD relies in a response from developers in order to achieve densification and land use intensification within walking distance of public transport. Understanding the nature of the development process and the obstacles that developers face is therefore an important component of implementing TOD. Consequently, this dissertation has proposed solutions that seek to enable and support developers so as to stimulate the property market, including reducing on-site parking requirements (which frees up more space and allows for developments with greater floor space), streamlining planning approvals for proposals that align with and support TOD (which reduces time-linked development costs), and through incentives that aim to help developers meet the up front capital costs of developments. Additionally, urban management is a key aspect of implementing TOD in a context such as Bellville, particularly in relation to the concerns from residents and business owners about safety and crime. This is also an important factor in relation to achieving densification and land use intensification as a perceived high level of crime discourages developers from investing in Bellville.

This dissertation provides policy recommendations that will facilitate effective TOD implementation within the BCA as it responds to the unique opportunities and development constraints.

However, TOD is only a tool and not an end state in itself, and so TOD implementation in Cape Town should take its people into consideration. Law enforcement, safety and security is a fundamental issue when it comes to TOD on the ground for an area like Bellville Central, therefore TOD should seek to promote self-regulation through creating a sense of place. What is important is the spirit of TOD and what it is trying to achieve within a Cape Town context. For this reason, TOD should have the distribution of social interactions at heart and must be "Cape Tonianised" to work.

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Appendices

Annexure A: Approved Ethics Form

APPLICATION FORM

Please Note:
Any person planning to undertake research in the Faculty of Engineering and the Built Environment (EBE) at the University of Cape Town is required to complete this form **before** collecting or analysing data.The objective of submitting this application *prior* to embarking on research is to ensure that the highest ethical standards in research, conducted under the auspices of the EBE Faculty, are met. Please ensure that you have read, and understood the **EBE Ethics in Research Handbook**(available from the UCT EBE, Research Ethics website) prior to completing this application form: http://www.ebe.uct.ac.za/usr/ebe/research/ethics.pdf

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant		Jason Juries
Department		Architecture, Planning and Geomatics
Preferred email address of applicant		jasonm.juries@gmail.com
If a Student	Your Degree e.g., MSc, PhD, etc.,	MCRP
	Name of Supervisor (if supervised)	Craig Davies and Vanessa Watson
If this is a research contract, indicate the source of funding/sponsorship		N/A
Project Title		TOD in the context of Cape Town: A case study of Bellville

I hereby undertake to carry out my research in such a way that:

- there is no apparent legal objection to the nature or the method of research; and
- the research will not compromise staff or students or the other responsibilities of the University;
- the stated objective will be achieved, and the findings will have a high degree of validity;
- limitations and alternative interpretations will be considered;
- the findings could be subject to peer review and publicly available; and
- I will comply with the conventions of copyright and avoid any practice that would constitute plagiarism.

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Jason Juries		**23 Jun 2017**

APPLICATION APPROVED BY	Full name	Signature	Date
Supervisor (where applicable)	Vanessa Watson		**23 Jun 2017**
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section1, and for all Undergraduateresearch (Including Honours).	IAIN LOW Click here to enter text.		23/6/17 Click here to enter text.
Chair : Faculty EIR Committee	SITHOLE Click here to		Click here to

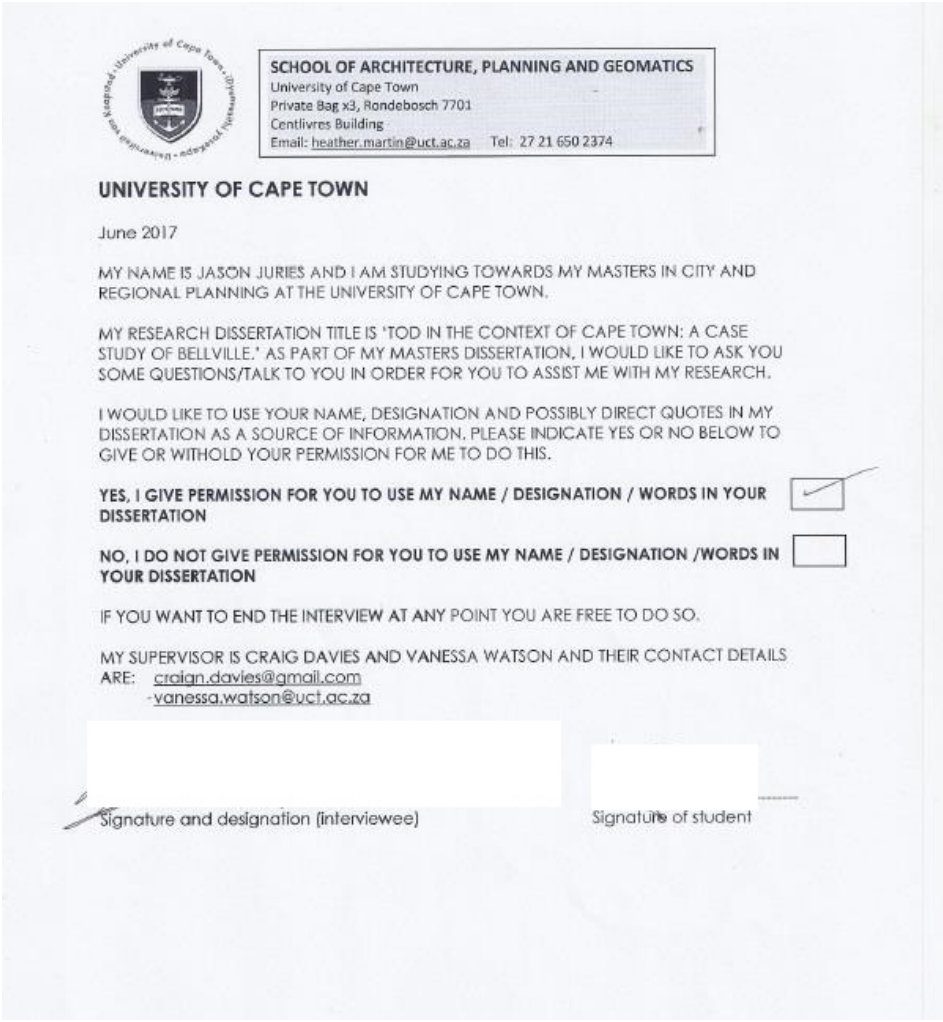
26/7/2017

For applicants other than undergraduate students who have answered YES to any of the above questions	Click here to enter text.		Click here to enter text.

Annexure B: List of interviewees

Name	Organisation
Chad Newman	City of Cape Town
Sean Cooke	University of Cape Town
Bronwen Jillings	City of Cape Town
Lance Boyd	City of Cape Town
Rob McGaffin	University of Cape Town
Gareth Haysom	University of Cape Town
Yunus Petersen	City of Cape Town

Annexure C: Signed consent forms



SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS
University of Cape Town
Private Bag x3, Rondebosch 7701
Centlivres Building
Email: heather.martin@uct.ac.za Tel: 27 21 650 2374

UNIVERSITY OF CAPE TOWN

June 2017

MY NAME IS JASON JURIES AND I AM STUDYING TOWARDS MY MASTERS IN CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

MY RESEARCH DISSERTATION TITLE IS 'TOD IN THE CONTEXT OF CAPE TOWN: A CASE STUDY OF BELLVILLE.' AS PART OF MY MASTERS DISSERTATION, I WOULD LIKE TO ASK YOU SOME QUESTIONS/TALK TO YOU IN ORDER FOR YOU TO ASSIST ME WITH MY RESEARCH.

I WOULD LIKE TO USE YOUR NAME, DESIGNATION AND POSSIBLY DIRECT QUOTES IN MY DISSERTATION AS A SOURCE OF INFORMATION. PLEASE INDICATE YES OR NO BELOW TO GIVE OR WITHOLD YOUR PERMISSION FOR ME TO DO THIS.

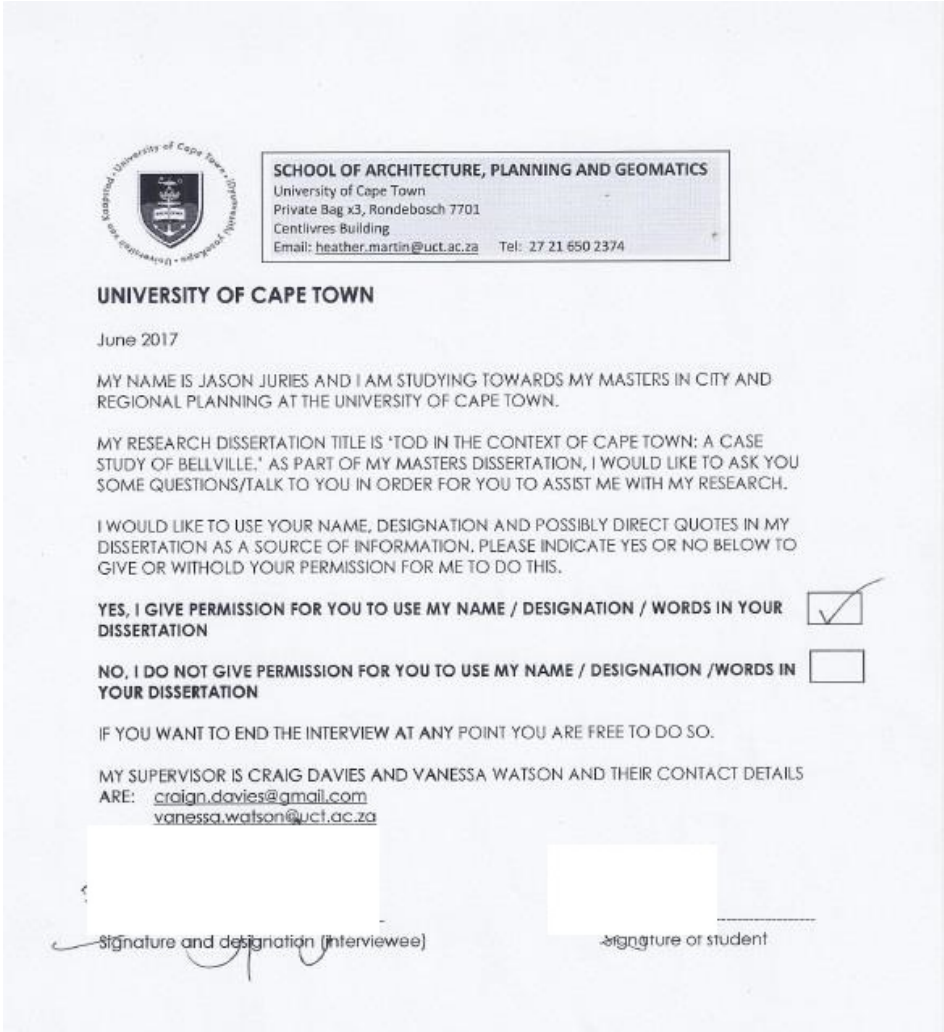
YES, I GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION ☑

NO, I DO NOT GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION /WORDS IN YOUR DISSERTATION ☐

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS CRAIG DAVIES AND VANESSA WATSON AND THEIR CONTACT DETAILS ARE: craign.davies@gmail.com
vanessa.watson@uct.ac.za

Signature and designation (interviewee) Signature of student



SCHOOL OF ARCHITECTURE, PLANNING AND GEOMATICS
University of Cape Town
Private Bag x3, Rondebosch 7701
Centlivres Building
Email: heather.martin@uct.ac.za Tel: 27 21 650 2374

UNIVERSITY OF CAPE TOWN

June 2017

MY NAME IS JASON JURIES AND I AM STUDYING TOWARDS MY MASTERS IN CITY AND REGIONAL PLANNING AT THE UNIVERSITY OF CAPE TOWN.

MY RESEARCH DISSERTATION TITLE IS 'TOD IN THE CONTEXT OF CAPE TOWN: A CASE STUDY OF BELLVILLE.' AS PART OF MY MASTERS DISSERTATION, I WOULD LIKE TO ASK YOU SOME QUESTIONS/TALK TO YOU IN ORDER FOR YOU TO ASSIST ME WITH MY RESEARCH.

I WOULD LIKE TO USE YOUR NAME, DESIGNATION AND POSSIBLY DIRECT QUOTES IN MY DISSERTATION AS A SOURCE OF INFORMATION. PLEASE INDICATE YES OR NO BELOW TO GIVE OR WITHOLD YOUR PERMISSION FOR ME TO DO THIS.

YES, I GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION / WORDS IN YOUR DISSERTATION ☑

NO, I DO NOT GIVE PERMISSION FOR YOU TO USE MY NAME / DESIGNATION /WORDS IN YOUR DISSERTATION ☐

IF YOU WANT TO END THE INTERVIEW AT ANY POINT YOU ARE FREE TO DO SO.

MY SUPERVISOR IS CRAIG DAVIES AND VANESSA WATSON AND THEIR CONTACT DETAILS ARE: craign.davies@gmail.com
vanessa.watson@uct.ac.za

Signature and designation (interviewee) Signature of student

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Signature and designation (interviewee)

Section Head : Land Use Management

Signature of student

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Signature and designation (interviewee)

HEAD: Public Transport, Statutory Planning

Signature of student

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