

Metropolitan



Study Area



Spatial Development Framework



Precinct Plan

The Role Of Integrated Spatial Planning In Restructuring Cape Town:

The Redevelopment of Wingfield

*Dissertation for a Master In City And Regional Planning
University Of Cape Town*

October 2014

Björn Samuel Larsen

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The Role Of Integrated Spatial Planning In Restructuring Cape Town: The Redevelopment of Wingfield

Dissertation presented of part fulfilment of the degree of Masters of City and Regional Planning

*School of Architecture, Planning and Geometrics
University Of Cape Town
October 2014*

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Acknowledgements

I hereby express my sincere gratitude to the following people who assisted me throughout this dissertation:

- *Professor David Dewar*

I would like to thank my research supervisor, David Dewar, for his assistance, guidance, inspiration and theoretical knowledge surrounding various planning issues and design principles.

- *Janine Meyer*

for her assistance in administration matters.

- *Ansie Viljoen (NuPlan Africa)*

for her assistance with AutoCAD designs.

- *Jurie Viljoen (Council for Geo-Science)*

for his provision of data regarding the geological and soil conditions surrounding my study area.

- *Rudy Schwaeble (Bau Afrika Engineers)*

for his assistance regarding engineering matters

- *MCRP students*

I would like to thank my fellow MCRP students for their camaraderie and support throughout the course of the MCRP programme. I wish them success in their future planning careers.

- *My Family*

I hereby extend my sincere gratitude towards my family for their enduring support and encouragement throughout this dissertation and MCRP programme.

Abstract

Many South African cities, including Cape Town, have inherited an skewed urban form which is intensified by the current high levels of in-migration and urbanization which cause great socio-economic and spatial structural urban problems. In a response to these urban issues, this dissertation argues for strategic integrated infill developments on well located, vacant land parcels which are believed to serve as the restructuring mechanisms and urban management tools for reversing Cape Town's inefficient urban form.

This dissertation presents a spatial framework for the Wingfield site that will include a dense, integrated infill development proposal which potentially will pave the way for similar future integrated development proposals. Collectively, these infill-pockets of developments will shape the Cape Town Metropolitan Area (CTMA) into a positive and integrated urban environment that is ecologically sustainable, economically durable and socially just.

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Chapter 1

1.1 Introduction

1.1.1 Problem Framing

Pre 1994 South African cities were shaped by modernist planning paradigms and apartheid social policies that left these cities with a highly inefficient urban form that reflects: fragmentation, separation and a high degree of lateral urban sprawl. These urban issues have major socio-economic and spatial consequences resulting in high levels of inequality, poverty and informality. These issues are especially effecting the urban poor who are forced to live on the peripheral areas of cities. The poor finds it extremely hard to access socio-economic opportunities which are primarily located in the urban centres and affluent areas. The inefficient and costly public transportation system and local threshold conditions are not conducive for local socio-economic generation. As the skewed urban system generates a large amount of movement, of which are mostly fossil fuel based, it leaves the country extremely vulnerable to fuel price increases and carbon-induces climate change. In short, South African cities are in a state of emergency and are known to be amongst some of the most inefficient cities in the world.

The situation in Cape Town, “the crown jewel of South African cities”, is no exception as it depicts a similar skewed urban form that has resulted in similar urban issues. This is reflected by Cape Town’s large population increases, low level of education and high levels of unemployment, poverty, inequality, crime and resource consumption patterns.

This project proposes bold urban restructuring interventions into this troublesome situation facing South African cities and Cape Town in particular. The aim is to reverse the skewed urban form into a positive urban environment that will attain social justice.

1.1.2 Strategic Intentions

During the last 20 years of post-apartheid democracy, the Cape Town Spatial Development Framework (CTSDF) and supporting planning policy documents, have argued for the reversal of the skewed urban form found in Cape Town. These documents call for the implementation of various urban restructuring tools which include: densification, intensification and different infill mechanisms to integrate the CTMA with the emphasis of giving the poor better access to socio-economic opportunities and social justice.

However, these integrated planning mechanisms have been rather slow and little spatial integration between the rich and the poor has materialised. This is especially concerning as there are sufficient under-utilised land that can be utilised for strategic infill developments, resulting in the location of the poor closer to socio-economic opportunities.

It is in this regard that this dissertation argues for the potential utilisation of these well located and under-utilised land parcels for implementing dense mixed-use infill developments that will integrate the poor and improve their access to socio-economic opportunities. This will not only contribute to social justice, but at the same time positively contribute towards a more dense, integrated and accessible City as a whole.

This dissertation thus primarily focus on a redevelopment proposal for the Wingfield site. Wingfield was chosen for this project as it is one of the most strategically located and suited vacant land parcel to kick start this urban restructuring process. This infill project intends to serve as a “pilot project” that could inspire similar metropolitan restructuring proposals to address the current pertinent structural inefficiencies of the metropolitan region which include the following:

- Infill development on under-utilised land parcels to support metropolitan-wide densification and integration
- Relocate the urban poor to well located areas that are more accessible to socio-economic opportunities.
- Creation of higher threshold levels to generate local small scale economic activity.
- Moving away from a car-based mobility system to one which is centred around public transport.
- Investment in the public realm to create an urban identity and sense of place.

The implementation of the Wingfield Development Proposal (WDP) as an integrated infill project, addresses all of these urban issues at a local scale.

1.1.3 Location Of The Study Area

In a metropolitan context, the site is centrally located within the existing metropolitan urban fabric. The site is currently under-utilised as a military air force training facility and contain little urban development that will avoid the loss of existing infrastructure.

On a more localised level, the Study Area covers approximately 650 ha of land which includes the site together with a 3km radius of urban development surrounding it (Figure 1). The primary movement routes, which meander through the study area, include the N1 highway in the North, the N7/Vanguard drive to the East and the Voortrekker corridor in the South. The two residential neighbourhoods within the study area include Kensington and Goodwood with Century City and N1 City as the two major commercial nodes in close proximity to the site.

1.1.4 Current Land uses

The Wingfield site currently houses a number of public institutions which include the following (Figure 1): the Bellville correctional facility that makes up the north eastern portion of the site, Acacia Park that functions as a parliamentary residential estate and makes up the northern section of the site, the Wingfield Aerodrome (air force training base) which is centrally located and is the largest portion of the site and the Goodwood cemetery forms the southern boundary of the site.

1.1.5 Wingfield - A Brief History

The greater Wingfield area is owned by the Graaff Trust who seeded the land to National government for exclusive military use with the provision that if the land is no longer used as such, it will revert back to the Graaff Trust. This has been an ongoing obstacle for the redevelopment of the site.

A second obstacle in the development of the site, is a successful land claim involving 55 ha of the Site which was awarded to the Ndabeni Community Trust in 2004.



Figure 1:
Study Areas

1.2 Method

As previously mentioned, this dissertation focuses on the redevelopment of the Wingfield site as the first step in the urban restructuring process for the reversal of Cape Town's skewed urban form into a dense and integrated urban environment. Prior to formulating development and urban design proposals, a series of analyses were undertaken at different levels within the City to understand the holistic urban situation within Cape Town, as well as the role which Wingfield will play within this context. The analysis and design-led processes are undertaken at four different levels:

- Metropolitan and City wide context
- Local context - Study Area
- Site Level
- Precinct level.

1.2.1 Metropolitan Analysis

Before any design and development proposals can be implemented, a holistic understanding of the role which Wingfield will play within the metropolitan context, has to be established. The metropolitan analysis included an evaluation of the relevant interrelated structuring elements as discussed in the CTSDF (2013). Structuring elements range from unique natural assets such as the biodiversity networks, higher order movement systems and accessibility grids, higher order institutions within the metro region, as well as areas of land use intensification which collectively form the primary urban structuring elements at this level.

The purpose of this analysis is to understand the significant impact which these structuring elements have on the functionality of the metropolitan region and how their inefficiencies contribute towards the skewed urban form of the Metropolitan area.

Here the first design-led intervention is introduced where a concept is put forward for the possible restructuring of these elements to improve their functionality within the Cape Town metropolitan context.

1.2.2 Site and Environs Analysis

The next step in the analysis drops to the more localised level, (also referred to as the Study Area) to understand the local ecological and structural context surrounding the site. Here an analysis was conducted on the structural and biophysical elements on, and in close proximity of the site, to determine the relevant development restrictions and opportunities which will inform the latter design process.

Lastly, the Site was analysed to identify opportunities and constraints to guide and direct development proposals.

1.2.3 Design process and Development outcomes

This section of the dissertation follows a "package of plans" approach to guide the reader through the design process. This approach incorporates different design layers, starting with broader conceptual design principles leading to detail implementation proposals. The design process thus builds on one another throughout the design process towards the final development outcomes. It guides the reader through the boarder conceptual movement and open space systems down towards the fine-grained detail precinct designs which incorporate potential subdivisions and building typologies.

The first layer of the design process includes the conceptual layers of the spatial framework. These incorporate: the super block structure and establishment of the activity spines, the placement of the open space hierarchy and the connection of these open spaces via the higher order movement system.

The conceptual layers are then refined to develop the spatial framework for the WDP. The WDP is presented as a set of plans depicting the open space and movement systems, the internal public transportation system, the non-motorised transport (NMT) system, the internal green system and the intensities and mixed land-use allocations.

The final layer in this package of plans approach, includes the identification and planning of a precinct area that provides a glimpse of the fine-grained detailed design outcomes, that in reality, will persist throughout the entire site.

This includes the breakdown of four superblocks to a sub-divisional level and the allocation of building typologies, land mark buildings and intensities.

1.2.4 Implementation

The implementation procedure is the final step within the planning process. It involves an enabling strategy for putting the various development proposals into reality.

1.3 Structure Of Document

The first 5 chapters of this dissertation are non-contextual as they lay down the theoretical arguments and give direction to the purpose of the WDP.

Chapter 2 thoroughly investigates the urban issues which are experienced in Cape Town. It identifies the problems associated with the high levels of urban growth and the major socio-economic and structural consequences which result from it. These issues establish the dire need for urban growth management and restructuring to improve the dismal situation within the city.

Chapter 3 identifies the main historical forces which gave rise to these urban problems, as well as identifies the current forces which are persisting and even worsening the situation. It confirms the need to contextualise and address these historical forces at a national level before it can be adequately dealt with at a local scale.

Chapter 4 investigates the appropriateness of urban densification as the primary theoretical model for addressing the current urban issues. Secondly, this chapter identifies Transit Orientated Development (TOD) and Activity Corridors as non-mutually exclusive strategic urban management tools to achieve densification which is required to address the various urban issues faced by South African cities.

Chapter 5 Identifies the various global trends and conventions which, in general, give direction to planning principles. These trends and conversions guide the development proposals for the Wingfield site as an urban management tool for addressing Cape Town's urban issues. This chapter identifies three sources that gives direction to planning:

- global trends and issues
- International planning conventions
- legislative and policy context

From chapter 6 onwards, the theoretical models and urban management frameworks which were considered in the former chapters are applied to the Cape Town context and more specifically, the WDP.

Chapter 6 consists of a metropolitan analysis and present a concept for improving the functionality of Cape Towns movement systems at a metropolitan scale.

Chapter 7 includes the site and environs analysis at the study area scale that identifies the development opportunities and restrictions within which the WDP must take place.

Chapter 8 presents the concept and spatial framework for the WDP.

Chapter 9 Identifies the location of the detailed precinct design and provides a glimpse of the fine-grained detailed design outcomes that will persist throughout the entire site.

Chapter 10 puts forwards the implementation and phasing of the WDP.

Chapter 2

Socio-Economic and Spatial Structural Issues in Cape Town

Cape Town's urban structure is characterised by low density urban sprawl and a coarse-grained urban fabric. This has resulted in spatial and structural fragmentation and socio-economic and spatial separation between different population groups and activities in the city (Dewar, Louw & Povall, 2012). These overarching issues are continuously being reinforced and aggravated by the major demographic increases resulting from rural-urban in-migration and inappropriate urban management practices and policies to deal with this. This section will analyse the interrelated socio-economic and structural issues existing in the Cape Town Metropolitan Area (CTMA) with the aim of understanding the problem as a whole before any intervening mechanisms can be considered.

The City of Cape Town, with its current total population of 3,750 000, is experiencing rapid population growth, estimated at around 2.5% annually, which is caused by two main forces (Stats SA, 2011): the natural increase of the population which has significantly decrease in recent years, and the rapid rural-urban in-migration of the rural poor, mainly from the Eastern Cape, who travel to the city in search of a better life through accessing better quality socio-economic opportunities (Smith, 2003). The most significant issue surrounding this high level of urbanisation, relates to the increased demand for housing and services usually resulting in the form of low-density urban sprawl. Figure 2 shows the future population projections for the CTMA and figure 3 shows the urban expansion dynamics of the CTMA between 1860 and 2020.

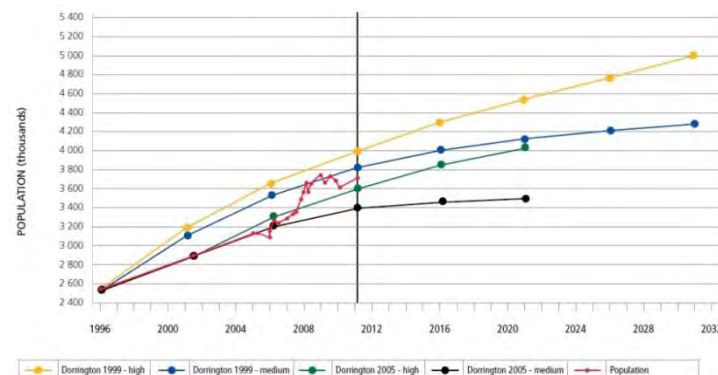


Figure 2: Current population and future population trajectory scenarios
Source: CTSDf, 2012

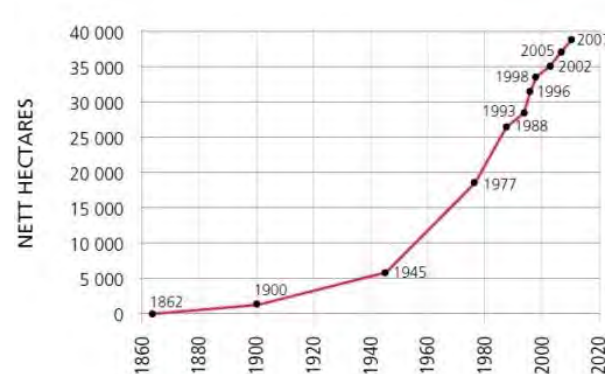


Figure 3: Urban expansion from 1860 to 2020
Source: CTSDf, 2012



Figure 4: Cape Town's various radiating growth Axes
Source: CTSDf, 2012

Urban sprawl in Cape Town occurs in directions primarily following the main transportation axes which include the eastern axis along the N1, the west-coast axis along the R27 and the south-eastern axis along the N2 (Dewar & Uytenbogaardt, 1991) as shown in Figure 4. The eastern and west-coast axes in particular are experiencing rapid linear growth, comprising private high-end suburban developments which are systematically decreasing the urban density in that direction. However, the rapid increase in the urban poor, mainly because of rural-urban in-migration, has also caused urban expansion and increased densities in the Metro South-East (Cape Flats) which houses the largest concentration of poor residents in the city and poses major risks (Figure 5).

This sprawling and fragmented urban form has major socio-economic and spatial implications for the urban performance of Cape Town and its impact is most felt by the poor. The sprawling and fragmented urban structure has resulted in a skewed distribution of socio-economic opportunities within the CTMA. As urban expansion radiates outwards towards the eastern and West-coast regions, the socio-economic opportunities are also steadily gravitating towards these suburbs. This dynamic, together with the clustering of opportunities at a few central point locations, such as the CBD and Century City, restraints the urban poor from accessing these opportunities, as they are located on the periphery far from these areas. Turok (2001) states that "the Cape Town CBD, together with the northern and southern arms, houses some 37% of the population but contains over 80% of all jobs in the CTMA." (Turok, 2001: 2352).

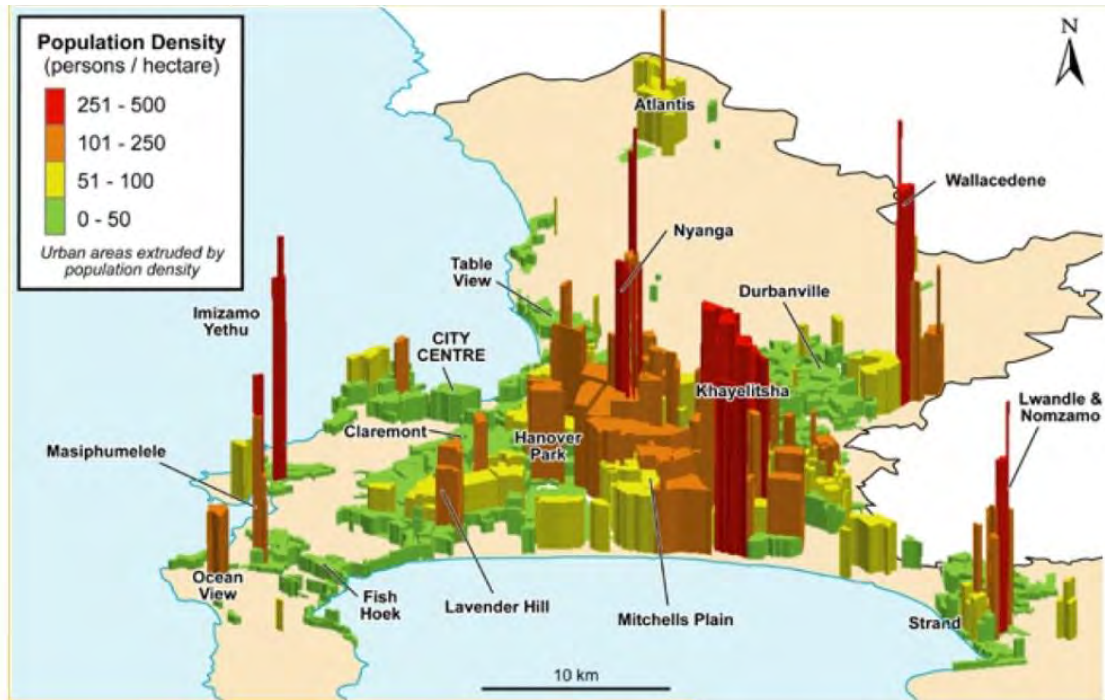


Figure 5: Highest Densities occurring in Metro South East
Source: CTSDf, 2012

This spatial mismatch is highly alarming and is causing major socio-economic polarisation, poverty and social conflict (Dewar, forthcoming). Figure 6 illustrates this notion graphically by comparing the population sizes of different areas and the location of economic opportunities in the CTMA.

The problem here is what is known as the Property Market Dynamism in affluent areas (Turok, 2001). This notion rests on the rational, objective and reflective preferences of the market in determining where the private investors will invest. Inevitably, the private sector will invest in the location most accessible to its core market, which in most cases are in the affluent suburbs far from the poor who are located on the Cape Flats. Developers are “leap-frogging” investment past the Metro South-East, as the area is viewed as unsafe, having limited parking, inefficient ICT infrastructure and limited capital generators (Watson & Turok, 2001: 121).

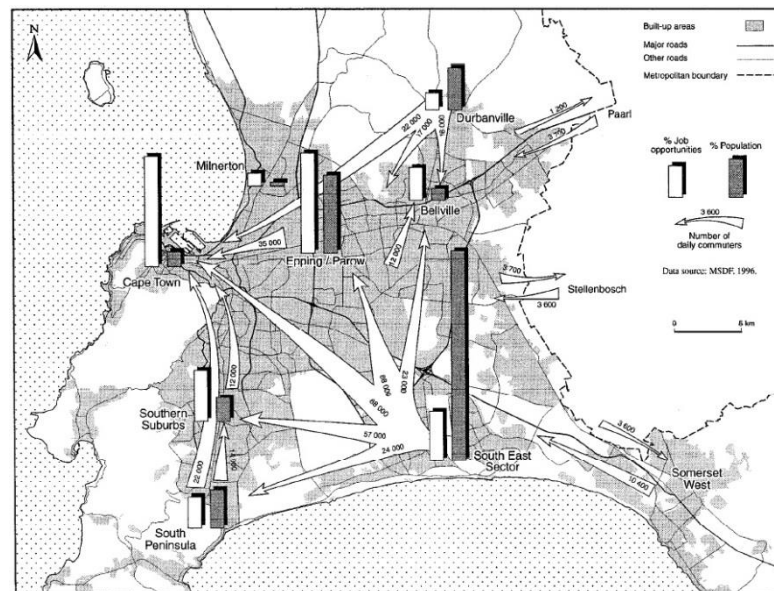


Figure 6: Skewed Allocation of Socio-economic opportunities and population size
Source: Turok, 2001

Figure 7 illustrates the polarisation between private investment and low-cost housing development.

Further, because of the limited public resources and the enormous housing backlogs, investors in low-cost housing projects are forced to seek out the cheapest land available. The cheapest sites are unfortunately located on the peripheral areas in the Metro South-East, far from the major socio-economic opportunities. The poor are thus excluded from the prosperous investment cores and suburbs through the operation of the land markets (Turok, 2001).

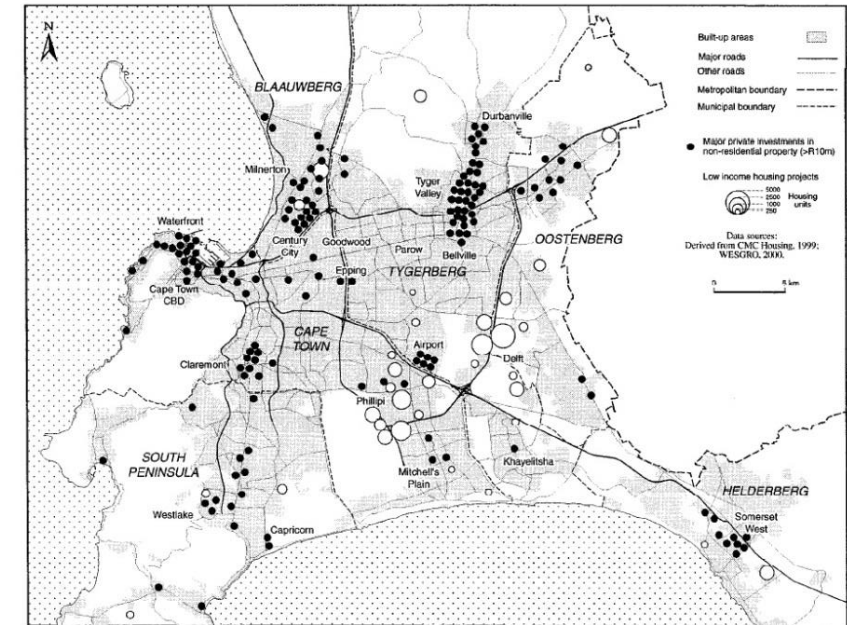


Figure 7: Separation between private investments in the North-West opposed to Low-cost housing developments in the Metro South-East
Source: Turok, 2001

The large increase in the urban population had a major influence on the informal and formal property markets in the CTMA. The growing demand in the formal housing market and limited supply of land and resources for housing have resulted in a steep increase in the price gradient of the housing and land markets in the CTMA (Turok & Watson). These price increases in the property markets have a major impact on the urban poor who wish to enter the formal property market with the aim of residing in areas with better access to socio-economic opportunities and escaping the social issues experienced in the informal areas. These market mechanisms result in the poor being caught up in a poverty trap. They are unable to achieve upward social mobility within the formal markets and this forces them to seek opportunities in the informal economic and property markets (Smith, 2003).

The sprawling urban form of Cape Town also makes transportation inefficient, inconvenient and non-sustainable, especially for the poor who are the main users of the public transportation system. They have to travel considerable distances to access socio-economic opportunities which is time consuming and very costly (Dewar, Louw & Povall, 2012).

Cape Town's transportation system is largely based on private vehicular usage, which causes major traffic congestion during peak hours and result in large carbon emissions, causing significant air and noise pollution (Table 1). This, in turn, has an impact on the spatial desirability and scenic beauty of the city (Dewar & Todeschini, 2004).

Means of Transport In Cape Town	
Bus	8%
Taxis	16%
Rail	15%
Motorcar	42%
walk	8%
Motor Cycle	0.7%

Table 1: Different Modes of Transportation
Source: CoCT Statistics, 2012

Another factor which reinforces concerns about the inefficient public transportation system, is the fact that the Cape Town's rail system is not closed. Because of this, the majority of the poor, who are the primary users of the rail system, waste valuable time and money because of the system does not offering direct routes to core destinations from the Metro South-East. A further problem with the transportation system is the fact that all the different public and private transportation modes compete against one another (Turok & Watson, 2001). The rail, BRT, minibus taxis and private vehicles compete for long haul passengers rather than supporting and reinforcing one another to create an integrated and more efficient transportation system. Further, as a result of the limited access routes, the inaccessible street grid of the CTMA, operates as an obstacle, forming isolated neighbourhood cells which reinforce the fragmentation and separation within the city.

The sprawling nature of Cape Town also makes the provision and maintenance of infrastructure and service delivery extremely costly, and thus straining the public sector's limited resources which could have been utilised for other public functions (Dewar & Uytenbogaardt, 1991).

The radial and concentric urban expansion is destroying valuable agricultural land and undisturbed wilderness areas located on the outskirts of the metropolitan region. Although there is a badly established "urban edge" intended to serve as a barrier to prevent urban expansion into valuable natural resources, many new development still venture beyond this threshold (Dewar, Louw & Povall, 2012). These tendencies are alarming as they have major implications for future food security, ecological biodiversity and the rights of the urban poor to access nature (Gasson, 2007). It has been estimated that between the year 1993 and 1998, 2,4 hectares of agricultural land were lost per day due to expansive sub-urban development (Watson & Turok, 2001).

As a result of the sprawling, fragmented and segregated nature of the CTMA's urban form, the combination of issues discussed above are causing and reinforcing widespread poverty, inequality and unemployment in the metro south-east and poor areas located on the outskirts of the city (Dewar, forthcoming). Cape Town's formal unemployment rate is 24% and 35,7% of households are classified as living under the poverty line (CoCT Statistics, 2012) (Figure 8). As a result of these communities not having access to socio-economic opportunities because of the inefficient public transportation system at skewed allocation of opportunities and the relatively inaccessibility of the formal property market, many of the poor living in the Metro South-East are facing a poverty trap from which they struggle to escape.

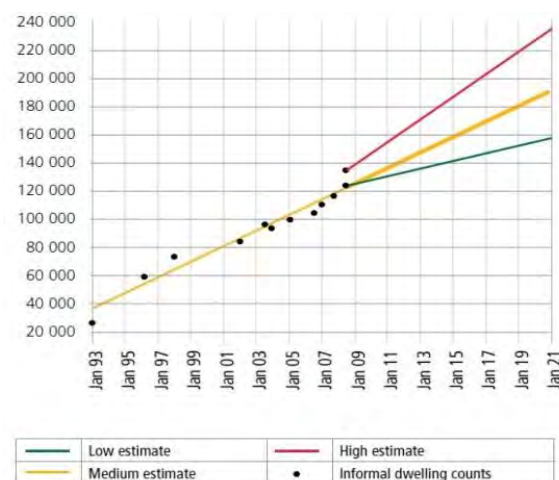


Figure 8: Existing Informal Dwellings in CMA
Source: CTSDF

Safety and security are also a great concern in the city, especially in the Metro South-East, because of the limited resources and large distances emergency services have to travel to reach the poor areas on the CTMA's periphery (Turok & Watson, 2001). The overcrowding in the majority of the informal settlement also cause major health and safety threats. Many of these settlements are located in flood prone areas and do not have access to sufficient basic services. The suffocating overcrowding and lack of access to safe energy sources poses great fire hazards in these informal settlements (Govender, Barnes & Pieper, 2011).

Because of the limited resources and inappropriate planning, urban design and architectural performance by urban management professionals, the spatial quality of informal settlement upgrades and low-cost housing developments in the Metro South-East, are largely sterile and inhumane. As stated by Dewar & Todeschini (2004: 25), the design and planning failure of low-income housing estates leave these areas with "bleak wind-blasted landscapes", "little or no vegetation", "non-differentiated free standing houses", "no defined public space", and poor "qualities of road". These design and planning failures contribute to the fragmented nature of the CTMA thus further resulting the poor from accessing socio-economic opportunities.

The low density and fragmented urban fabric of the CTMA, aggravates the city's inability to generate sustainable economic growth (Dewar & Uytenbogaardt, 1991). The long traveling distances to the markets and points of freight distribution, such as the Cape Town Port and International Airport, tremendously increase the distribution costs and have the greatest impacts on small business enterprises and small scale farmers. The clustering of economic activities at a limited amount of points only, prevents the generation of a vibrant local economy by promoting the monopolisation of key silos by large economic enterprises and by isolating smaller enterprises (Dewar & Uytenbogaardt, 1991).

The way forward for the CTMA, calls for intensive spatial and socio-economic densification which are only possible through an improvement in the public and private sector's spatial urban growth management policies and practices. These urban management changes will improve the city's urban performance through providing more favourable conditions for an effective public transportation system. This will give the poor, who are largely located on the urban periphery, better access to socio-economic opportunities and will foster environmental and ecological sustainability.

However, these improvements in urban performance are only possible through understanding the historical and contemporary socio-political and spatial management issues within the wider South African context as well as the consequences of these issues for the South African city.



Figure 10: Floods in low-income settlements are a typical site in the winter months
Source: www.groundup.org.za



Figure 9: A fire in an informal settlement on the Cape Flats
Source: westcapenews.com



Figure 11: One-house one-plot model of low-cost housing on the Cape Flats
Source: gettoverit.wordpress.com

Chapter 3

The South African City

The South African city is facing generic overarching issues which include skewed and dysfunctional urban forms, rapid urbanization and population growth resulting in ever increasing poverty, inequality and unemployment. These interrelated spatial-structural and socio-economic issues are largely a result of the “historical development trajectory” during the Apartheid regime, together with the current prolonged ineffective urban management policies and practices during the post Apartheid Era (Dewar, Louw & Povall, 2012). These various dynamics have left the current South African city with major spatial and structural inefficiencies and have generated a plethora of socio-economic challenges.

This chapter will firstly give an overview of the current urban realities facing South Africa. Secondly, it will discuss the historical and contemporary management practices which have contributed to these urban challenges. Finally, it will identify the spatial-structural and socio-economic consequences of these management practices in order to understand the generic urban problems facing the South African city. This is necessary before various urban management interventions for rectifying these issues can be considered.

3.1 Urban reality facing the South African City

South Africa has an estimated 51million inhabitants of whom more than 60% are urbanized (Stats SA, 2012). This figure has escalated tremendously over the past decades from 52% in 1990 to 62% in 2011 (SouthAfricanfor.com). Urbanisation is a relatively new phenomenon for South African compared to the rest of the world, as the majority of urban growth has occurred during the past 50 years (Dewar, forthcoming).

South Africa has become the most urbanised country in Africa. This is a result of mass in-migration and high fertility rates, a further consequence of improved health care and decreasing mortality rates (Stats SA, 2012). Furthermore, because of the historical race-based policies, different urbanisation patterns for different race groups have emerged, causing further socio-spatial polarisation with regard to the urban-rural breakdown of South Africa (Dewar, forthcoming).

Rapid urbanisation and the ever increasing urban population have brought new challenges for urban management in South African Cities. There are two main implications deriving from these identifies demographic dynamics.

The first is the structural implications of the urban growth which accompanies rapid urbanisation (Dewar, forthcoming). The legacy of the Apartheid Planning Model (discussed in section 2.2.2, together with the mismanagement of the rising demand for housing and social service infrastructure, has resulted in an urban form characterised by low density urban sprawl, a fragmented coarse-grain urban fabric and the separation of various social groups (racial and income) and urban land-uses (Dewar, Louw & Povall, 2012). This skewed urban form prevents positive urban performance: an efficient transportation system, a vibrant economy and a sustainable natural environment. The form effectively prohibits the urban poor from accessing socio-economic opportunities, a factor which contributes to social polarisation and conflict.

The second is the social implications which include increasing poverty, inequality, unemployment and informality levels within the cities (Dewar, forthcoming).

A relatively unskilled labour force, the inability of the national economy to provide a sufficient number of jobs, a shift in the structure of the economy resulting in a decrease in low-skilled job opportunities and the increasing forces of globalisation are contributing to high levels of unemployment in South African cities.

South Africa has an alarming unemployment rate of over 25% which is among the highest in the world (International Labour Organisation, 2014). It also reflects steep inequality: it has an extremely high gini-coefficient of 63.1%, which is among the highest in the world (world bank, 2009). The gini-coefficient index is a measure of equality based on the level of income distribution throughout a country. It is based on the “Lorenz curve” where 0% indicates complete equality and 100% complete inequality (Businessdictionary.com).

High levels of poverty, inequality and unemployment, have resulted in a major increase in the informal economy and housing sector within South African cities (Dewar, forthcoming). Many South Africans have no option but to seek out alternative means of livelihood through informal self employment and settlement formation, as they are excluded from the formal socio-economic opportunities (Smith, 2003).

3.2 Causes of the Generic Problems in South African Cities

This section will identify the causes which have brought about the plethora of urban challenges facing South African cities today. The first section will include the forces which were adopted before and during the Apartheid era and secondly, the more current causes will be considered.

3.2.1 Pre -1994 Causes

Before 1994, South African urban management practice was based on two theoretical forces. Firstly, Modernism, which was an international planning paradigm and Apartheid, which was a South African socio-political ideology. These two pre-1994 urban management models will be critically discussed as the primary forces that shaped South African cities.

Modernism

Pre- and during the Apartheid regime, South African planners adopted imported urban management theories hailing from the United States of America and various other Western European countries (Dewar, Louw & Povall, 2012). The primary theory on which the South African planners rested their practices, was that of modernism which at the time was seen as progressive and extraordinary radical style from the traditional and orthodox incremental processes of settlement-making (Dewar, forthcoming). This alternative approach to settlement-making rested on the belief that it would unlock what was thought to be “the good life” for all and a “sense of community” (Dewar, forthcoming: 4). However, its practices and underlying principles would prove to be the normative base on which the Apartheid planning model was rooted and proved to be one of the main drivers which contributed to the various urban issues facing South African cities today. The key ideas on which the Modernist approach rest, include the following:

- The idea of separation between land-uses (live, work, play and move), in order to reduce “functional conflict” (Dewar, Louw & Povall, 2012: 2).

- A “strong anti-urban or suburban ethos” which was gifted by the Garden Cities Movement – a strong belief in the neighbourhood unit concept- single free-standing dwelling units clustered together into small discrete mono-functioning neighbourhood cells or villages orientated inwardly towards central clusters of communities facilities (Dewar, forthcoming: 4).
- Settlement-making based on a positivist, rational comprehensive approach to planning which entailed programmatic calculations for pre-determined quantities and locations of settlement elements (Dewar & Todeschini, 1999). This approach is firmly rooted in blue print type planning which is driven by scientific fact apposed to traditional vernacular approaches to settlement-making, which allowed for choice and complexity (Dewar & Todeschini, 1999). This is clear in South African cities and public authorities where the engineering discipline still has a firm hand in urban management practices. This is concerning, as engineers are primarily concerned with “technical efficiency” as apposed to spatial, social or environmental considerations (Dewar, forthcoming: 5).
- The false belief that “technology would set the society free” (Dewar, Louw & Povall, 2012: 2). In an urban sense, the motor car was the most important technological advancement which will allow for untamed lateral growth and settlement-making which were scaled for the car as opposed to formally being scaled to accommodate human activates. This kind of settlement-making de-emphasised the structural and spatial role of the street as an generator of activates such as walking, socializing, trading and playing (Dewar, Louw & Povall, 2012). This was emphasised by the Le Corbusier who is acknowledged as one of the fathers of modernism and who stated, “we must kill the corridor street” (Dewar, Louw & Povall, 2012: 2).

Apartheid Planning Model

Apartheid was a South African political ideology which was primarily concerned with “racial separation but equal development” (Dewar, Louw & Povall, 2012: 3). The policy was formalised by the Nationalist Government in 1948 and experienced its demise in 1994 with the emergence of Nelson Mandela as the first Democratic president (Dewar, Louw & Povall, 2012: 2). The Apartheid policy had major influences in shaping South African cities as its urban management practices were based on some of the core principles of Modernism.

However, many of these modernist principles were distorted in a number of ways.

- The concept of separation was primarily race-based rather than separation of land-uses as intended by Moderism (Dewar, forthcoming). The scale of separation was also largely distorted as non-white groups were forcefully located in low-cost suburbs, either on the periphery of urban areas, or in the “homelands” far from socio-economic opportunities. These non-white suburbs were sterile and inhumane environments lacking green spaces and urban design (Dewar, Louw & Povall, 2012).
- The modernist notion of inwardly functioning “neighbourhood units “ with limited points of access were used as measures for control and security during times of unrest rather than fostering a sense of community (Dewar, Louw & Povall, 2012: 3).
- A distorted concept of movement where high speed mobility routes were used to link the fragmented neighbourhood units. These mobility routes were largely private car-oriented and high speed rail systems linking poor peripheral areas to the few centres of opportunities. However, only a limited number of households living in poor areas have access to a private motor vehicle (Dewar & Todeschini, 2004).

- Green spaces and the high speed mobility routes function as buffer zones and spatial obstacles between the various neighbourhood units rather than functioning as positive ecological assets and “space-integrators” (Dewar: 5). These buffer zones tend to become dangerous spaces and dumping grounds for rubbish (Dewar, Louw & Povall, 2012).

3.2.2 Post-1994 Causes

The post 1994 period saw the call for an integrated urban management model, however the mismanagement by urban professionals and the policy and institutional complexities worsened the urban issues faced by South African cities.

Policy and Institutional Complexities

There are three major issues with regard to the spatial planning policies in South Africa which are hindering spatial integration and extending the fragmented nature of South African cities.

Firstly, despite the fact that political rhetoric theory calls for spatial policies and urban strategies at both national and local level of physical, social and economic integration, these call for integrated planning initiatives that do not materialise in practice (Turok, 2001). Lastly, this is because of contradictory policy clashes between different government departments. One clash, for example, relates to densification: the Department of Transport calls for a denser settlement form. This is, however, not possible as the current housing policies promote a one-house-one-plot housing typologies strategy.

The second issue is the lack of integration and cumbersome, multi-dimensional development approval processes (Dewar & Todeschini, 2004). The vast amount of red tape hinders the transformative processes towards more integrated South African cities.

The third fact is that South African planning authorities still use inefficient mono-centric land-use planning mechanisms such as “zoning” as the primary tool for regulating urban management. These rigid land-use planning mechanisms stem from the rational comprehensive approaches to present pre-defined outcomes which do not create integrated, vibrant and well performing cities.

The institutional complexities surrounding urban management in South Africa, results from the fact that each department functions as isolated silos: no integration takes place in the decision-making process, to the benefit of the whole (Dewar & Uytenbogaardt, 1991). Another problem is orthodox development managers and planners who resist progressive urban paradigms and continues to implement modernist management principles (Dewar & Todeschini, 2004).

Private Developer-led investment

Economic globalisation and neo-liberal policies have brought changes to the allocation of land-use management rights in South Africa. The controls are continuously becoming more market-driven and developers no longer have obligations to show that the proposed development will contribute to the benefit of the public and city as a whole. These changes have given private developers greater freedom to disregard the public good and to exploit and maximise profits (Dewar, forthcoming).

For developers to maximise their profit they usually seek out the cheapest land available which is normally located on the metropolitan periphery or outside the urban edge. This in turn, contributes to additional urban sprawl, loss of arable- and wilderness areas and spatial fragmentation as these private developments usually take on a suburban forms.

Further, these forms contribute to continuing settlement inefficiency and an increased demand for infrastructure and social facilities. Private-driven investment in economic opportunities also leap frogs poorer areas in South African cities, despite the best efforts and intensions of spatial frameworks to attract investment to poor areas (Turok & Watson, 2001). Private investments are rather gravitating to upper class suburban areas and a few centralized locations such as business parks, resulting in further fragmentation within cities and making it more difficult for the poor to access these opportunities (Turok, 2001).

These practices are driven by four generic dynamics (Turok, 2001: 2358- 2360):

- Decentralisation where private-driven investment shifted away from the traditional CBD areas towards suburban centres such as Century City in Cape Town and Sandton in Johannesburg.
- Deconcentration which involves a net shift in economic opportunities away from established business centres towards a more dispersed pattern of development.
- northern Drift where centres of economic opportunities tend to gravitate northwards of the traditional CDB’s of South African cities.
- Differentiation, “where there is a growing tendency for economic centres to specialise in different segments” and locate in the areas which fit their market profile.

Housing policy and property markets

South African housing policy continuously reinforces the apartheid low-cost housing suburban model which results in low-densities, segregation and fragmentation (Wilkinson, 1998). This is because low-cost housing is still primarily located in peripheral areas on the outskirts of South African cities, as a result of housing agencies seeking the cheapest possible land for optimising profits (Huchzermeyer, 2001).

The Low-density housing model creates infrastructural inefficiencies for servicing, and maintenance, which would not have been a problem if an integrated infill development model was pursued.

South African housing policy still promotes one-house-one-plot housing typologies with mono-functional separation of land-uses. This creates a sterile, fragmented and inhumane environment (Dewar & Todeschini, 2004). There is a need for an alternative approach where the people have greater choice, “to decide what their needs actually are rather than some public agency” (Wilkinson, 1998: 227). Vacant land parcels are a common sight in these neighbourhoods as a result of insufficient funds and mono-functional zoning for public facilities such as schooling, health care and industrial uses.

Another issue with regard to housing policy is that the national government makes unrealistic promises with regard to the roll-out of housing. The once-off housing subsidy and limited capacities of the public sector lead to the local governments to focus on quantity rather than quality in meeting the housing demands for the poor (Huchzermeyer, 2001). This results in major cost cutting per dwelling unit which ultimately leads to sub-standard housing and height maintenance and administration costs.

The South African property market is another factor contributing towards the fragmented urban form found in South African cities. Because of high rates of urbanisation and population growth, the demand for housing is constantly increasing. This rising demand creates a “steep price gradient” which makes upward mobility nearly impossible for the poor who cannot afford to reside in higher income areas with better access to socio-economic opportunities (Turok & Watson, 2001: 122). This leaves the poor stuck in a “poverty trap” on the periphery of the South African cities (Turok & Watson, 2001).

Continues Investment in Road Infrastructure

Another factor which entrenches the skewed urban form of South African cities, is the fact that the public sector continuously invests in road infrastructure aimed at giving the poor access to opportunities rather than implementing integrated infill low-cost housing developments which places the poor closer to the places of opportunities (Turok & Watson, 2001). This is troublesome as the poor has limited access to private motor vehicles and is the largest users of public transportation such as rail and busses. It has been established that the skewed urban form has resulted in a very inefficient public transportation system and therefore public investment should rather be geared towards improving public transport apposed to road infrastructure.

3.3 Consequences for South African Cities

The Apartheid Planning model, together with the distorted implementation of the core principles of the Modernist planning paradigm resulted in a legacy of urban sprawl, social-political and spatial fragmentation and racial separation. Furthermore, the reliance on neo-liberal ideologies and continuous implementation of orthodox planning policies during the post apartheid period, have reinforced this distorted urban form, which have a number of spatial and socio-economic consequences. This increases spatial inefficiencies, especially for the poor in accessing opportunities. This increases social inequalities within South African cities. This section will identify some of these consequences.

3.3.1 Large Amount of Movement

The sprawling nature of urban growth and the low-density, coarse-grain urban fabric, generates large amount of movement as passengers migrate from the fragmented isolated neighbourhood cells to access services and socio-economic opportunities.

This excessive amount of movement is a direct consequence of the inefficient urban form which fails to create the conditions needed for a viable, efficient and widely accessible metropolitan transportation system (Dewar & Uytenbogaardt, 1991).

The inefficient transportation systems impose severe burdens on household budgets, traveling time and labour productivity of daily commuters. This is especially true for the poor who are the primary users of the unreliable and inefficient public transportation, as they cannot afford private vehicular modes.

The long distances which the poor must endure are reinforced by the sprawling nature of South African cities, together with opportunities continuously gravitating towards the high-income suburban areas which are very inaccessible to the poor. (Turok, 2001). These dynamics deepen inequality and social polarisation.

The large amount of movement also puts pressure on public sector resources and capacities, as additional infrastructure investment and maintenance are needed to accommodate these flows (Dewar, Louw and Povall, 2012). Because of the inadequate pre-conditions for public transportation, the South African transportation system is primary road based. Together with a few concentrated locations of movement generators, this result in serious traffic congestion which has major environmental costs such as air and noise pollution and greenhouse gas emissions (Dewar, Louw and Povall, 2012).

3.3.2 Economic Inefficiency and lack of vibrant and diverse local economic markets

The low density, fragmented urban form of South African cities is economically inefficient, it accelerates inflationary mechanisms and it militates against economic growth (Dewar & Uytenbogaardt, 1991). The low density and fragmented urban form results in major distribution costs for enterprises - especially small enterprises (Dewar & Todeschini, 1999).

The concentration of economic activities at limited, well located points, discriminates against small enterprises and creates monopolisation, as larger enterprises dominate the markets. This together with diffused and diluted thresholds and the limited purchasing power of local residents within the separate neighbourhood cells reduce the capacity of South African cities to generate vibrant local economies (Dewar, forthcoming). Vibrant local economies are essential for employment and poverty alleviation (Dewar & Todeschini, 1999).

3.3.3 Inefficient and inaccessible social facilities

The low densities and fragmented urban fabric of South African cities are unable to generate and support high level of social and community facilities (Dewar & Uytendogaardt, 1991). This is because of the isolated and inward functioning neighbourhood units which are dependent on their own internal resources and facilities. The limited resources and capacities of the public sector to deliver and maintain facilities have left many poor neighbourhoods with inadequate facilities or none at all (Dewar, Louw & Povall, 2012). The isolated neighbourhood units and various accessibility barriers within South African cities, make it difficult and costly for these poor residents to access facilities in other neighbouring areas which are better serviced and maintained (Dewar, Louw & Povall, 2012). This in turn can cause these well served neighbourhood facilities to be over-utilised, causing major strain and higher maintenance costs.

Demographics also play a large role in terms of facility delivery and utilisation. As the demographic structures of neighbourhood units change over time, either towards a younger or older population, some facilities will be over-utilised and others under-utilised depending on the demographic structure (Dewar, Louw & Povall, 2012).

3.3.4 Environmental and Resource Depletion

The sprawling nature of South African cities have a major impact on the natural and ecological resources of South Africa. As the cities grow, they consume arable land and land with high amenity which poses major consequences for the local residents and South Africa as a whole (Dewar, Louw & Povall, 2012). Arable land gets depleted on the outskirts of cities which poses a major threat to future food security and to local small scale farmers (Dewar & Uytendogaardt, 1991).

Vital employment opportunities as well as export potential of agricultural goods which contribute to the local and national GDP, are lost. South Africa is a natural resource rich country, with unique biodiversity and landscapes which contribute to tourism and the general aesthetics of South African cities. As urban sprawl consumes this wilderness landscape, it becomes more difficult for tourists and local residents to access these areas as the scenic beauty of South African cities continuously erodes (Gasson, 2007). This has a negative impact on the standard of living and spatial desirability of South African cities.

3.3.5 Lack of place-making and urban identity

Urban sprawl and fragmented coarse-grained urban patterns deny the promotion of urban identity and sense of place within South African cities (Dewar & Uytendogaardt, 1991). Urban sprawl destroys the natural landscapes which are the aesthetic elements that contribute towards the uniqueness of cities and therefore hindering place-making and the establishment of a sense of place.

Suburban sprawl creates a sense of monotony and standardisation as it denies urban complexity and uniqueness which gives a city its sense of place and identity (Dewar, forthcoming). This is especially visible in low-cost housing settlements located on the periphery of

South African cities, as a result of monotonous matchbox-like housing typologies, modernist architectural and the lack of urban design. (Dewar & Todeschini, 1999). The consequences of these planning and design failures are sterile urban environment which is characterised by bleak wind-blasted landscapes, no visible landscaping or vegetation, free-standing community facilities, virtually no defined public spaces and car orientated streets which are neither legible nor pedestrian friendly (Dewar & Todeschini, 2004).

Urban managers should consider turning back to traditional forms of settlement-making, as these are the urban environments which allow for choice, complexity and identity to be made.

3.3.6 Increasing Poverty and Informality

The result of the skewed urban form found in South African cities is highly “inconvenient and expensive places to live”, as they contribute to increasing poverty, inequality and informality, with the poor who are the most affected (Dewar, forthcoming: 6). The spatial obstacles which hinder accessibility (the inefficient transportation systems and skewed location of opportunities) and the fact that the poor are forced to live in peripheral areas, because the exclusionary forces of the formal property markets, are resulting in the poor being trapped in a poverty trap and unable to achieve upward social mobility (Smith, 2003; Dewar, Louw & Povall, 2012). This notion is reinforced by a United Nations State of The World Cities Report (2008/2009), that found that “South African settlements are the most inequitable and (by implication) inefficient in the world”.

Unemployment and continued poverty give these poor residents in South African cities no choice but to seek out livelihoods elsewhere in the informal economy and property markets (Smith, 2003). However, these informal markets pose new risks of harassment and criminality as they are not supported and protected by the formal authorities and legislation.

Therefore, it is essential for the South African authorities to realise the importance of the informal sector as a means of employment and poverty alleviation and to put the necessary structures in place to accommodate these informal activities (Dewar & Todeschini, 1999).

3.4 Towards Higher Densities and socio-economic intensification

The highly fragmented urban form, the segregation of land-uses and low density urban sprawl all add to the poor generic urban performance of South African cities. Further, these issues are resulting in an inefficient transportation system, degrading natural and cultural environments, declining local economies and increasing poverty, inequality and unemployment among the poor.

In response to this, Dewar (2000: 6) calls for urban decision-makers “to restructure South African settlements at a variety of scales, to make them more efficient, equitable and sustainable.” This can, however, only be achieved through high levels of densification, intensification and diversification of socio-economic activities around strategically significant lines and points, by integrating these activities with currently segregated communities and giving the poor greater access to socio-economic opportunities (Dewar, Louw & Povall, 2012).

Chapter 4

Strategic Urban Growth Management

It was established that South African cities are in trouble in terms of their skewed urban form, resulting in major socio-economic and spatial issues. There are a number of urban management approaches that can be considered in response to these various urban issues. The approaches that will be considered, include a theoretic model known as the Compact city model and two urban restructuring tools, namely Transport Orientated Development and Activity corridors.

This section will analyse these possible, non-mutually exclusive urban growth management responses for restructuring the South African city through fostering densification, compactness and intensification, in order to achieving a more accessible, socially equitable and environmentally sustainable urban performance.

The section will start by unpacking the benefits and challenges relating to the Compact City debate, followed by the two restructuring mechanisms for achieving strategic densification.

4.1 Densification and Socio-Economic Intensification

The Compact City concept was popularized during the 1980's, as a response to the "automobile mobile dependency" and major suburban sprawl during that period (Newman & Kenworthy, 1996: 6). The primary aim of the concept was a "first world" attempt at fostering global sustainability against the growing awareness of global climate change. The field of study was initially exclusively focused on the developed world: it did not, at the time, take consequence conditions in the third world contexts into account (Jenks & Burgess, 2000).

However, the recent interests around the ability of the concept to promote greater social equity, has become more aligned with the Third World context (Burton 2000).

In this regard, the Compact City model is highly relevant to the South African context, as transport inefficiency, carbon emissions and growing socio-economic inequality are stark realities. This section will analyse the characteristics of the compact city model as a sustainable urban form to promote an environmental sustainable and more equitable society within South African cities.

There are various definitions for the "Compact City", but, the general consensus that it is "a relative high density, mixed-use city, based on an efficient transportation system and dimensions that encourage walking and cycling" (Burton, 2000: 1969)

The process for achieving urban compactness involves intensification, consolidation through re-use and infill development, the intensified use of urban buildings and an increase in the population densities in an urban area (Burton, 2000).

This Compact City model promises many socio-economic and environmental advantages which include the following: the conservation of the countryside; less need to travel by car; reduced fuel usage and emissions; support for public transport and non-motorised transport uses (walking and cycling); better access; provision and maintenance of social services and infrastructure; generation of a vibrant local economy; and inner city rejuvenation (Burton, 2000). There has been a major discourse about whether the Compact City model promotes the benefits as advocated by its promoters. However, it is acknowledged that little empirical data is available to support these critiques. This section will analyse these perceived benefits and costs in relation to the South African context.

4.1.1 Environmental benefits

Gasson (2007: 7) calls on urban managers to make the "correct decisions about urban form so that land is not lost to sub-urban sprawl". Gasson (2007) & Dodman (2009) call for a compact urban form which consists of higher densities which will reap the benefits of reduced consumption of open land and valuable natural resources, decrease carbon emissions and the threats posed by global climate change. These environmental benefits will be analysed more closely below.

Protection of the Country Side

Gasson (2007: 3) points to "the accelerating rate of conversion of agricultural and wild and beautiful lands to urban and sub-urban sprawl". It is in this regard that agricultural and valuable wilderness land should be protected through the promotion of urban management policies which encourage densification, intensification and physical development controls in and around South African cities. These urban controls are especially important in securing future food security and sufficient clean air and water supplies for current and future generations (Gasson, 2007). A denser urban form and the preservation of urban agricultural land ensure shorter trips for farmers in accessing their markets. Thus, in turn, may stimulate the local economy and secure the livelihood of many citizens living in South African cities (Dewar & Todeschini, 1999).

Decreased Emissions

Dodman (2009: 2) states that "low-density car-orientated suburbs will become unsustainable long before fossil fuels run out". This is a reference to greenhouse gas emissions and use of gasoline which increase as densities decrease and visa-versa (Newman & Kenworthy, 1989). Dodman (2009) argues that Compact Cities such as Barcelona and London emit between 30% to 60% less CO₂ emissions per capita in comparison to the Spanish and English averages.

It is therefore essential that urban managers foster higher urban densities and land-use intensification as this increases the viability of public and NMT usage. These modes are said to decrease private car usage by 20% to 40% (Dodman, 2009). These actions will inevitably reduce green house gas emissions, making the city more environmentally sustainable and healthy for the citizens who reside in it.

Reduced Threats of Climate Change

Dodman (2009) and Mirza, (2003) acknowledge that current sprawling urban forms contribute disproportionately towards climate change as green house gas emissions and loss of valuable natural resources cause rising average annual temperatures and increase the occurrence of catastrophic events. Therefore a compact urban form and intensification of land-uses must be implemented for protecting and preserving natural assets, such as arable land and ecological biodiversity, which can protect the vulnerable urban poor from catastrophic events such as floods, fires and famine. A compact urban form can also minimise the amount of paved urban surfaces which will reduce surface runoff and greenhouse gas emissions which accompany auto-dependent urban models (Newman & Kenworthy, 1996).

4.1.2 *Densification and Social Equity*

South African cities are characterised by high trends of poverty, unemployment, inequality, poverty and high levels of informality. They could benefit largely from the compact city paradigm in achieving greater social equity. Burton (2000: 1971) defines social equity as offering every citizen an equal opportunity to access “primary goods”. He believes that a higher-density city and integrated mixed land-use management promote social equity. This section will investigate these various elements of social equity which are promised by the Compact City model as well as some disadvantages which are believed to be caused by a denser urban form. These will be considered in terms of a South African context.

Better Access to Social and Commercial Facilities

Compact city form improves access to social facilities because of higher thresholds that accommodate more facilities and households being located in closer proximity to these facilities. A dense urban form also allow a greater choice and freedom for accessing different facilities, as higher population thresholds support the diversification of facilities.(Burton, 2000).

A dense urban form is a great mechanism for breaking down the fragmented coarse-grain urban fabric as found in South African cities. Densification gives a significant advantage to low-income households which do not have access to a private car, as closer proximity makes for shorter trips and less expensive public transportation costs. Densification also allows for greater tax base to share and improve maintenance efforts which in turn will minimise facility degradation and inevitably improve social equity (Dewar & Uytendogaardt, 1991).

Improved access to Job opportunities

As stated by Burton (2000), the Compact City model “reduce(s) the separation between home and work”, making job opportunities more accessible and reduces the time and money spent on every day commuting. This is especially beneficial for the poor living in South African cities as they often spend in excess of 15% of their wages on commuting between place of residence which are located in peripheral areas, and places of work located in the up market suburban areas or business parks (Turok & Watson, 2001). However, a critique of this proposal is the fact that it is argued that access to jobs is one thing, but job availability is another (Burton, 2000). As a response, Dewar and Todeschini (1999) argue that a compact urban form promotes local small-scale enterprises and allows for economic diversification and specialization. This also allows for the functioning of an informal sector which, in the South African context, amounts to a large portion of household livelihoods, especially among the poor.

Increased Viability of Transportation and NMT Uses

It is widely accepted that higher densities increase the propensity for NMT and public transportation compared to a sprawling urban model. This is because of a higher concentration of people located in closer proximity to transit stops, resulting in more convenient access to public transport facilities (Burton, 2000).

This point is proven by empirical studies done by Newman & Kenworthy (2006) who found cities with gross densities above 35 units per hectares, together with increased land-use intensification, reduce automotive dependency and increase the viability of public - and NMT usage. South Africa can benefit from this notion as the majority of households do not have access to a private motor vehicle and have to utilise public transport and NMT. A dense urban form will shorten trips and reduce transport costs.

4.1.3 *Perceived Disadvantages of Densification*

Reduce Living Space

It is argued that the Compact City model leads to reduced living space as dwelling and plot sizes are reduced because of limited space (Burton, 2000). Burton (2000) claims that it is the poor who will lose out the most in this regard, but in the South African context this can be debated. The South African poor mainly live in shanty towns which are in reality extremely dense and consist of tiny plots. Therefore, this critique on the compact city model is debatable to the South African context.

Lack of Affordable Housing For The Poor

Another critique on the compact city model is the perception that higher densities and compact city policies and management tools, such as an urban edge, will lead to economic benefits on many levels (Burton, 2000). Critics debate, on the contrary, that higher densities will lead to the lack of affordable housing for the poor (Burton, 2000).

Therefore, in this regard, less developable land, increasing housing scarcities and a higher demand for housing will increase the price gradient and ultimately cause further price increases. However, in the South African context, the government attempts to counter this phenomenon by providing the poor with subsidies and affordable housing. Unfortunately, the lack of monetary resources are prohibiting well located developments of this sort and force them onto the urban periphery.

Lack of Access To Green Spaces

Critics state that “in cities with high densities of households, residents are likely to live further away from the nearest areas of green space” (Burton, 2000: 198). However, on the contrary, it is also acknowledged that while in dense urban settlements residents are located further away from urban green spaces, they are relatively closer to the surrounding country side (Burton, 2000). In the South African context, the lack of resources to maintain urban parks and similar “green spaces”, as well as the fact that they are commonly regarded as unsafe and becoming dumping grounds, a dense urban form which allows greater access to the countryside, is more fitting.

Safety and security

Burton (2000) rises the concern around higher densities and its relationship with crime and various health implications. It is perceived that there is a positive relationship between settlement compactness and the likelihood of being victim to crime, especially as a result of the increasing population thresholds. However, others argue that higher densities promote community surveillance which in turn should decrease the occurrences of criminal activity. Burton (2000) concludes that the relationship between compact settlement form and crime is rather a case of location, building form and relative income levels, than that of net densities and urban compactness.

4.2 Strategic Tools for Densification

The previous section outlined the need for densification of South African cities and analysed the benefits and challenges surrounding the Compact City debate in relation to the South African context. This section will look at two strategic urban restructuring tools (TOD and Activity Corridors) for achieving structural densification and activity intensification which are believed to improve the poor’s access to socio-economic opportunities and achieve social upliftment and poverty alleviation. It must be noted that TOD and activity corridors are not mutually exclusive concepts and should be implemented in an integrated manner to achieve urban densification and intensification. As argued by Wilkinson (2006: 223), the best way for achieving “smart growth and compact city development patterns”, is through “mixed-use public transport corridors”.

4.2.1 Transit Orientated Development

Transit Orientated Development (TOD) first arose in the United States during the late 19th and early 20th century as part of many rail and tram development projects to achieve highly sustainable neighbourhoods and efficient public transport systems in cities such as San Francisco and Salt Lake City (Mineta Transportation Institute, 2010). TOD was advocated by Peter Katz and the supporters of the “smart city” and “New Urbanism” movements with which TOD shared the progressive principles of “mixed land-use, narrow streets laid out in tight grid mesh”, reduced parking and increased walkable settlements (Mineta Transportation Institute, 2010: 6). TOD is defined as a compact, mixed-use community which is centred around public transit stations that by design invite residents, workers and shoppers to reduce private vehicular transport usage and increase walkability and public transportation usage (Mineta Transportation Institute, 2010).

Features of TOD

TOD has many unique features. These include the following (Wilkinson, 2006: 224):

- It incorporates neighbourhood development which is centred around a local transit station and extends to an easy walking distance radius of around 400m-800m.
- An urban fabric developed at high densities, but remains human scaled by including significant public and civic spaces, mixed-use residential-, commercial- and retail activities, especially in the station precinct.
- The clustering of socio-economic activities around major transport interchange points. This allows for convenient access to these services and a large variety and choice of activities within close proximity.
- A road layout which is based on a “topologically open grid system” which provides for extensive pedestrian and cycling movement allowing for ultimate accessibility within the precinct.

Benefits Associated with TOD

The benefits which are associated with TOD, firstly include a reduction in per capita motor vehicle usage which leads to reduced congestion levels, more efficient energy usage and a decrease in the use of fossil fuels and greenhouse gas emissions (Wilkinson, 2006).

Secondly, TOD makes public transportation usage more viable because of the increased population thresholds as a result of the increased densities and close proximities of transit and land-use allocation which promote accessibility (Newman & Kenworthy, 1996).

Thirdly, it is argued that TODs are more liveable settlement environments, as the human scaled grid-like layout promotes non-motorised transportation usage. This is, according to Wilkinson (2006), to enable healthier lifestyles and a cleaner overall living environment.

Fourthly, TODs are believed to bring major economic benefits: the close proximity and increased densities are believed to create higher population thresholds to enable and support efficient local markets and businesses (Linders & Moodley, 2011). This is also believed to increase the competition and choice within the local markets which will reduce prices and benefit local residents.

Lastly, TODs can be used as a “larger strategy” for urban restructuring by enhancing city-wide integration of various TOD “sub-centres” through the promotion of activity corridors which ultimately promotes urban densification and limits metro-wide urban sprawl (Newman & Kenworthy, 1996: 7).

Application in the South African context

Wilkinson (2006: 227) points to the fact that TODs have largely been developed in the context of “North American urban development” and little attention has been drawn towards the application of TOD in terms of a third world context, where TOD can be used as a tool for strategic urban restructuring and social justice. However, it is acknowledged that South African planning and urban management policies incorporate many principles which align with the “compact city model” and TOD (Wilkinson, 2006). These include the encouragement of corridor development, infill projects and mixed land-use allocation. Nonetheless, what is hindering the realisation of TOD, is the implementation of these policies, as transportation and spatial planning strategies are operating in isolation rather than in an integrated manner as proposed by TOD (Wilkinson, 2006). Further, it is clear that South African cities are in dire need of urban densification and integration and therefore the revision of South African urban management policies are essential to achieve TOD and activity corridor formation.

4.2.2 Activity Corridor Development

Warnich and Verster (2005:344) state that, “corridors seemingly present a particularly powerful and effective planning strategy for the purpose of restructuring the spatial inequity of the city, as well as initiating economic growth points in close proximity to low-income communities”. Therefore, activity corridors are believed to function as tools for restructuring the fragmented South African cities into more intensive and integrated urban environments that allow for equitable access to socio-economic opportunities and ultimately allow for poverty alleviation and social justice (Lotz, 1995).

Nature of Activity Corridors

Activity corridors are broad bands of dense mixed-use linear urban development which promote intensive social interaction and economic activity. They operate along a public transportation route with the function of integrating two or more activity nodes (Warnich and Verster, 2005). It is however important to note that activity corridors are not “elongated nodes of activity”, but rather take on a “string of beads” approach where there are different concentrations of activity clusters located along a corridor (Dewar, & Todeschini, 2004). The most accessible locations usually take on the most concentrated activity clusters of high order activities and the less exposed areas accommodate lower order activities (Dewar, & Todeschini, 2004).

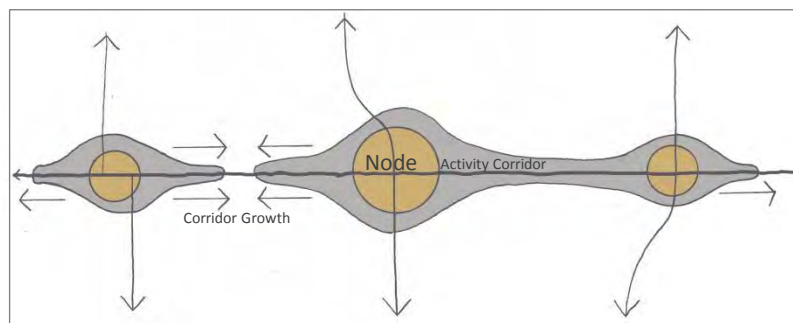


Figure 12: Corridor development
Source: Adapted from Dewar & Louw, 2013

Activity corridors must occur naturally and cannot be artificially imposed. They should develop as a series of points along a natural line of movement and naturally grow towards each other (Dewar, & Todeschini, 2004) (Figure 12). Corridor development must allow for intensive activities to respond naturally to the movement flows of the specific corridor and allocate along them according to each activity’s generative requirements (Dewar & Uytendboogaardt, 1991).

The success of an activity corridor therefore lies in its ability to promote accessibility through decentralised activity patterns and the frequency of its “stop-start” nature and congestion (Dewar, & Todeschini, 2004). Success also relies on the corridor’s ability to create the required densities to promote the population thresholds necessary for accommodating the generative capacities of both small and large enterprises alike (Dewar, & Todeschini, 2004). Another requirement for ensuring the success of an activity corridor, is its ability to reclaim the street as the “epicentre of the social, cultural and economic life of the city” (Curtis & Tiwari, 2008: 106) This is only possible if the corridor is legible and pedestrian friendly (Dewar, & Todeschini, 2004). This underlines the necessity for transforming well located mobility-orientated roads into activity streets and corridors which will function as “space integrators” rather than “space bridgers”.

Space Integrators vs Space Bridgers

“Space Bridgers” are linear movement systems which are designed to move large numbers of people rapidly for long distances. These routes are usually limited access routes and points and accommodate direct fast moving private vehicular movement between centralized nodes of opportunities (Dewar, & Todeschini, 2004: 61). These “space bridgers” can act as “space dividers” that create physical barriers as they allow for limited pedestrian crossing and add to the fragmented nature of South African cities. This is because these type of roads places the urban fabric into discrete boxes which function as isolated neighbourhood cells and villages (Dewar, & Todeschini, 2004).

Dewar & Todeschini (2004) therefore argues for integrated routes which they call “space integrators”. This type of route contains the attributes which are favourable for well performing activity corridors which include the following: they allow for “stop-start” movement along them and promote the integration between efficient public transportation and intensive mixed-use activities and exchange (Dewar, & Todeschini, 2004).

Benefits of Activity Corridors for South African Cities

Activity corridors hold the power for restructuring the skewed settlement form found in South African cities and contribute to the rectification of their many problems which include: sprawl, poverty, inequality and fragmentation.

Firstly, as activities densify along these activity corridors, they hold the potential to function as urban integrators to break down the introverted neighbourhood cells which are created by the former “space bridgers”. This concept is shown in figure 13.

Secondly, activity corridors allow for the “maximum generative capacity inherent in the urban agglomeration” (Dewar & Todeschini, 1999: 18). This allows for economic enterprises and activities of various sizes, which inherit different generative capacities to find a suitable location along a corridor, according to their specific requirements (Dewar & Todeschini, 1999). These dynamics eliminate large enterprise monopolisation and contribute towards economic equality and efficiency as the increased population threshold allows smaller enterprises to benefit from the energies created by larger economic enterprises. This will result in employment, and ultimately poverty alleviation in South African cities.

Lastly, activity corridors can promote great social equity within South African cities as they hold the potential to reach a greater number of people, especially the poor, who are located on the urban periphery as apposed to the previous “centralised node-based form of development” which could only be accessed by a few (Dewar & Todeschini, 1999: 19). Activity corridors act as metro-wide integrators, binding the previous “cellular” inward functioning neighbourhoods together towards an integrated urban network. This allows for facility efficiency as well as facility and activity sharing which again contributes to social equality and to improve the general standards of living of residents living in South African cities.

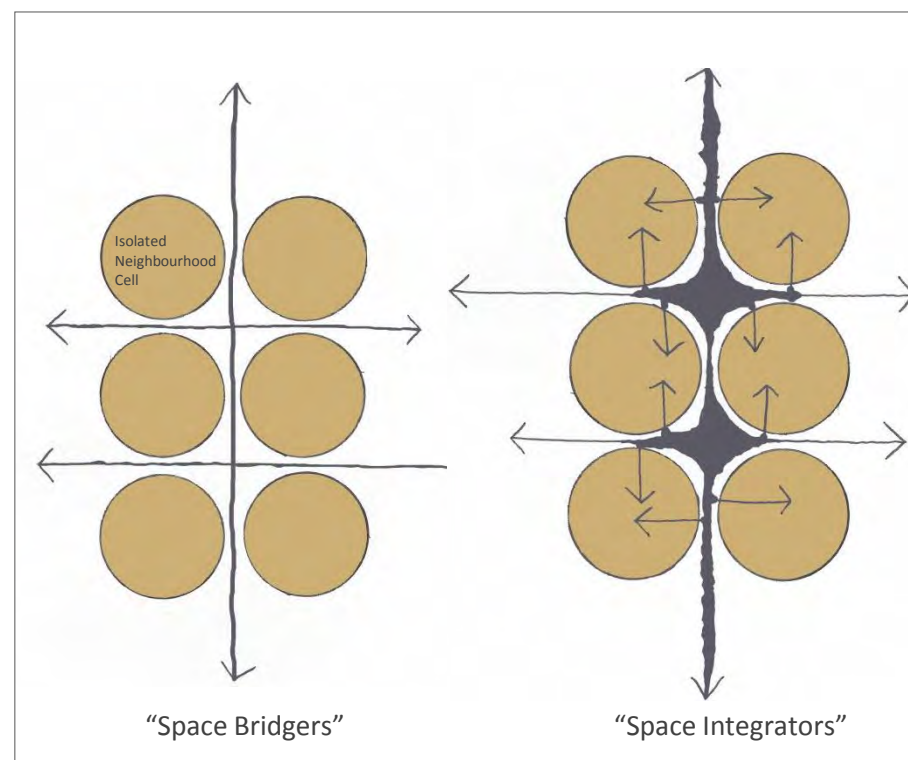


Figure 13: From Space Bridgers to Space Integrators
Source: Adapted from Dewar & Louw, 2013

Chapter 5

Giving Direction

It has been argued in the previous section that South African cities are in great need of strategic urban growth management that promotes urban densification and integration. However, before any urban management practices can be considered, it must be understood what gives direction to these practices to create positive urban environments and ultimately to resolve the urban problems facing South African cities.

This section puts forward the three sources that gives direction to urban management namely: the global issues which are currently hindering the sustainability of urban life, the various international convention which include value-based and generic performance qualities that serve as criteria for addressing the various global issues and lastly, the legislation and policy context within which urban management takes place.

5.1 Global Tendencies and Issues

There are a number of emerging tendencies relating to population dynamics, economic restructuring, rapid global climate change which need to be addressed in all spatial plans. These issues are influencing the sustainability of urban life especially cities of the Global South. These tendencies are discussed below.

5.1.1 Global Population Growth and Urbanisation

According to the UN Habitat Annual report (2009: 4) "In 2008, for the first time in history, over half of the world's population lives in urban areas and by 2050 this will have risen to 70%". The most rapid rates of population growth are taking place in the Global South and East, especially in "secondary cities" such as Cape Town, South Africa which is absorbing mass rural-urban in-migration as a result of agricultural transformation, rural unemployment and the high proportion of young adults (Watson, 2009b; UN Habitat, 2009) (Figure 14) (Table 2). The major problems associated with these rapid rates of urbanisation in Global South

cities, are their local economies, natural resources and governmental systems which are unable to accommodate such rapid rates of urban population growth. This results in major horizontal urban expansion because of cheap and relatively unregulated peripheral conditions resulting in urban sprawl, informality, structural unemployment, environmental degradation and poverty (United Nations Habitat, 2009).

Further, planning should be geared towards people with few resources. It should implement innovative planning solutions for dealing with these poverty-related issues facing the world and particularly cities in the Global South. Urbanisation should be perceived to be a problem, but rather as a positive and natural process; "urbanization should be seen as a positive phenomenon and a pre-condition for improving access to services, economic and social opportunities, and a better quality of life for a country's population" (United Nations, 2009: 11).

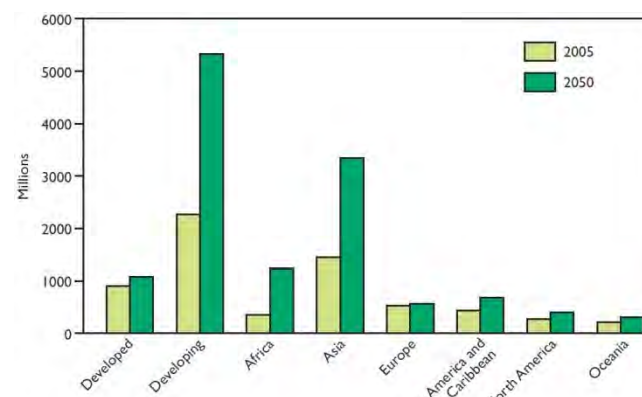


Figure 14: Urban population size by region
Source: UN Habitat, 2006

Region	Urban population (million)					Percentage urban				
	1950	1975	2007	2025	2050	1950	1975	2007	2025	2050
World	737	1518	3294	4584	6398	29.1	37.3	49.4	57.2	69.6
More developed region	427	702	916	995	1071	52.5	67.0	74.4	79.0	86.0
Less developed region	310	817	2382	3590	5327	18.0	27.0	43.8	53.2	67.0
Africa	32	107	373	658	1233	14.5	25.7	38.7	47.2	61.8
Asia	237	574	1645	2440	3486	16.8	24.0	40.8	51.1	66.2
Europe	281	444	528	545	557	51.2	65.7	72.2	76.2	83.8
Latin America and the Caribbean	69	198	448	575	683	41.4	61.1	78.3	83.5	88.7
North America	110	180	275	365	402	63.9	73.8	81.3	85.7	90.2
Oceania	8	13	24	27	31	62.0	71.5	70.5	71.9	76.4

Table 2: Global Trends in Urbanization
Source: UN Habitat, 2006

5.1.2 Environmental Threats and Resource Depletion

The changing trends in global population dynamics and urban development patterns are causing major environmentally-related issues. These include climate change, resource exploitation, high levels of pollution and water and food insecurity. These issues result from mass industrial activities and an increasing demand for consumer goods (Watson, 2009a). These patterns of development and resource consumption are rapidly reaching a point where earth's natural resource and absorptive capacity can no longer support the demand, which could cause a collapse (Acosta, 2010).

Global Climate Change

Global climate change and increasing average annual temperatures are directly related to human activity because of the changing patterns of land cover and the burning of non-renewable fossil fuels through industrial, transport and energy generation activities (Hoel & Koverndokk, 1996). According to the United States Environmental Protection Agency (USEPA) (2013), those three activities are the major contributors towards CO₂ and green house gas emission, accounting for 28%, 20% and 32% of all emission respectively. Total emissions have increased by 80% from 1970 to 2004 and are still increasing according to USEPA (2013).

Climate change has major consequences in terms of global well-being, as it contributes towards global food - and water insecurity and therefore threatens the existence of global ecological biodiversity and arable land. Climate change also contributes to the increasing frequency of natural disasters, putting billions of global citizens at risks, It especially influences those located in costal and low-laying areas, as a result of increasing floods, see level rise and drought.

The over arching issues contributing towards greenhouse gas emissions and climate change are the exploitable use of non-renewable resources and the skewed geographical distribution of production and consumption patterns of resource intensive goods which have resulted in global socio-economic inequality (Caney, 2009). Greenhouse gas emissions can directly be associated with socio-economic well-being, as the Global North and China accounted for over 75% of green house gas emissions in 2007 and the Global South a mere 23% (USEPA, 2013) (Figure 15). This raises Caney's (2009) concern that the developing world has the right in utilising non-renewable resources for fostering industrial development in an attempt to "catch-up" with the developed world. Because of limited global non-renewable resources, "catching-up" is being hindered as a result of global emission restrictions and taxation,. It is in this regard that renewable and more sustainable energy sources should be used in an attempt to reduce global climate change while at the same time, offering developing countries the development opportunities which they deserve.

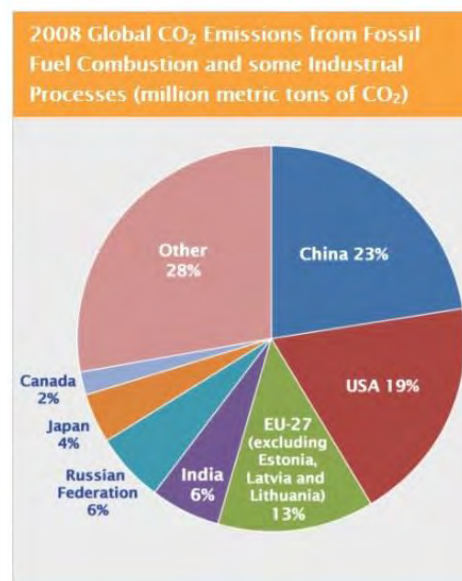


Figure 15: The skewed distribution of green house gas emissions between the Global South and North
Source: USEPA, 2013

Food Security

The World Health Organisation (1996), defines food security as, "all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life". According to Gregory, Ingram & Brklacich (2005), it is food systems that underpin food security. "Food systems encompass food availability (production, distribution and exchange), food access (affordability, allocation and preference) and food utilization (nutritional and societal values and safety)". External forces including, climate change, urbanization and global population growth places stress upon these various food systems diminishing global food security (Gregory et.al., 2005: 2139).

"Food access" is a very important aspect in terms of the global food security debate. There are sufficient net global food supplies, and some regions will experience an increase in productivity as a result of global warming (Gregory et. al., 2005). It is, however, the accessibility to these supplies, especially by areas that experience greater negative pressure from climate change, that are causing many Global South countries to experience situations of famine and food shortages.

Another issue that relates to food insecurity in many global south countries, involve agricultural subsidies. Many farmers in global north countries, receive agricultural subsidies which allow for relatively cheap and efficient food production and exports. This, in turn, hinders local food production in global south countries as farmers cannot compete on an even footing. This results in food shortages and the need for food imports. These imports are usually expensive and directly undermine the poor from accessing these food supplies.

It is therefore essential that planners ensure the protection of valuable agricultural land and seek out local food production opportunities. They must encourage, especially in Global South countries, innovative planning solutions, such as urban agricultural schemes, to ensure local food security. These innovations can also be used for stimulating local economic markets, providing employment opportunities and as a means of poverty alleviation.

Water Security

Vörösmarty et. al. (2013: 284) states that a large portion of the world population is experiencing "water stress" as a result of rapid geographic changes in water demand and extreme pressures exerted by climate change on the global water supply. Some areas are experiencing increasing occurrences of droughts where other are enduring ever more frequent floods. These are all pressures working against global water security which makes the future management of the global water supply extremely important.

Currently, this water crisis is managed through the construction of big engineered dams that pump water over great distances to reach drought stricken areas., This approach is very costly and in many cases worsen the problem because dams are losing million of litres as a result of surface evaporation and pipe leakages.

With regard to the above, provision must be made for local water capture, grey water recycling schemes and protecting existing water sources against pollution to ensure sustainable future water security. This is important, as water is an essential human requirement which is critical in all areas of life: the production of food and industrial process, for personal hygiene and ecological systems.

Fossil Fuel Depletion

Droege (2002) argues that a century-long reliance on fossil fuels for economic development and transportation, gave a false hope of global progress. Non-renewable energy resources are becoming ever more scarce and this development paradigm merely contributes towards constant fuel price increases, climatic disasters and sprawling urban settlements due to the reliance on private motor vehicular transport (Droege, 2002). It is the poor who will suffer the most from these consequences and therefore planners must cater for people with few resources by encouraging the use of alternative sources of energy generation and transportation. This calls for local initiatives by changing local demand patterns. Pertinent issues include the implementation of mixed land-use allocation, the usage of public and non-motorised transportation, the use of renewable sources of energy such as solar, wind, hydro and nuclear energy generation, as opposed to fossil fuels. These progressive forms of energy generation and transportation are more environmentally justifiable and will ensure inter-generational sustainability.

Globalisation and Economic restructuring

The rise of economic globalisation and modern “neo-liberal” macro-economic policies have caused major global economic restructuring. These economic paradigm shifts have revolutionised the flows of people, finance, information, labour and goods to move flexibly and efficiently through space and time (Amin, 2002). However, these restructuring mechanisms have caused a third industrial revolution which saw a decline in the global agricultural and manufacturing sectors because of increased mechanisation and a rise in the service sector and information technology. This in turn have resulted in major “global socio-economic polarisation of occupational and income structures” (UN Habitat, 2009: 3).

Another consequence of economic globalisation has been the rise of multi-national corporations who seek out cheap and flexible labour in order to cut production costs and to maximise profits (UN Habitat, 2009). This type of organisation usually focus on areas where labour unions are weak and governments have little control over socio-economic affairs. This leads to labour exploitation, child labour-sweatshop conditions and the disempowerment of the working class as a whole.

These consequences affect both developed and developing countries alike, depending on the specific country’s macro-economic policies and the power of the state to intervene in labour and trade orientated affairs (UN Habitat, 2009). The overarching problem is that, for countries to be competitive within the neo-liberal global economic system and to attract direct foreign investment, they have no option but to relax labour laws and trade restrictions.

The consequences of these issues have been strongly felt during the 2008 global recession which saw structural unemployment, informality and poverty rise as economic restructuring continues in its wake (UN Habitat, 2009). States are also using “spatial targeting” (infrastructure and social service investment techniques) which further deepens national socio-economic polarisation as these investments usually by-pass the working class and urban poor (Todes, 2013).

The implementation of the “Global” concept, will counter these macro-economic problems. The Global concept refers to thinking globally, but acting local. This requires a dense and fine-grained urban fabric that generates high population thresholds to accommodate vibrant and sustainable local markets that are less dependant on global economic conditions.

The primary implication of the global issues discussed, is that planning and urban management processes must be geared towards local sustainability to encourage local resources and socio-economic generation, rather than relying on global and external forces. This will ensure intergenerational sustainability and improve global equality.

The next section will present various performance qualities which are accepted as criteria by which settlement-making and urban management schemes must abide for accommodating these global issues. These performance qualities must be implemented in a generic way to overcome global, national and local issues and create positive urban environments which are socially, economically and ecologically sustainable.

5.2 Value-based Performance Qualities

Balance

There are two forms of balance. Firstly, settlement-making seeks equilibrium between human development and the surrounding landscape (Dewar, forthcoming). Harmony must be attained between urban settlement-making, the rural hinterland and wilderness areas to ensure that each realm operates in association with each other and no realm dominates the other (Dewar, forthcoming). Secondly, balance refers to the association between people and settlement opportunities, where settlement form promotes convenience and equity for all people to access a full range of urban opportunities and activities (Dewar, forthcoming).

“Balance” is structurally reached through the enforcement of urban development parameters to contribute to the preservation of ecological sensitive and bio-diverse areas. Development parameters inform where development should go, as apposed to where it should not go (Dewar, forthcoming). These parameters include the enforcement of an “urban edge” which acts as a tool where balance is maintained through containing urban development to protect valuable ecological and agricultural areas.

Balance, in terms of socio-economic opportunities, can be achieved through an integrated and accessible settlement structure. The predominate structuring element which contributes towards such an urban form, is an efficient and cheap transportation system which allows equal accessibility of all residents to equally socio-economic opportunities.

Efficiency

Efficiency, in terms of settlement-making, refers to the efficient use of resources and urban infrastructure within an urban settlement. The urban structure of a settlement informs and determines urban and social efficiency through the implementation of various services and structural design principles which include a compact urban fabric and the integration and intensification of various urban land-uses. A compact urban fabric is more efficient compared to a traditional sub-urban model, as it holds major advantages to public facility provision and utilisation. In a compact settlement form, fewer facilities reach more people within a smaller proximity, making service and facility provision more economical and easier to maintain. These benefits can be maximised through the clustering of facilities to encourage resource and facility sharing (Behrens & Watson, 1996). Clustering of resources, together with a compact urban structure, hold significant social benefits. A compact urban form minimises social costs of traveling time and money as shorter distances are required to reach more services, facilities and employment opportunities to make a settlement more efficient and sustainable (Behrens & Watson, 1996).

Choice

Positive urban environments consist of an urban structure that allows people a wide range of choices and alternatives, “regarding housing consolidation, service provision, urban surroundings, movement modes” and a choice of life style (Behrens & Watson, 1996: 86). Choice rich environments are not “impositionary” in dictating “either-or choices”, but allow for the freedom and variety of life style opportunities from which people can choose, while at the same time, maintain equality within a settlement (Dewar, forthcoming : 11). Choice can be created by providing contrasting urban spaces of intense activity and calming relief (Behrens & Watson, 1996: 86).

Another way of creating choice, is by offering various residential building typology options which can vary in location, density, size, shape, height and levels of privacy. Choice can also be generated within a settlement, by offering different modes of transport opportunities without hindering equality of access, socio-economic opportunities and services. Choice within a settlement structure, allows for a variation in urban opportunities and prevents monotony and tediousness in providing a greater array of stimuli towards which people can respond to find a suitable place according to their specific life style needs and requirements.

Place-making

Good settlement-making creates a sense of place within urban environments. Place-making incorporates elements of uniqueness and memorability and rejects themes of uniformity and standardisation (Dewar, forthcoming). There are structural factors that contribute towards place-making. One is the appropriateness of settlement form in relation to its surrounding landscapes conformed by elements such as water flows, climate and landform (Dewar, forthcoming). Another includes the quality and coherence of the public spatial environment, together with the clarity and legibility of the public urban structure and the use of landmarks to promote orientation and remembrance (Dewar, forthcoming).

The structuring element for achieving place making, is through the placement of public institutions and facilities around public spaces to function as focal points in community life (Behrens & Watson, 1996). These public spaces take on different forms which include hard open spaces to accommodate public institutions, markets and various other public uses. Streetscapes become the focal points of social interaction, community events and street trading (Behrens & Watson, 1996). Lastly, soft open spaces provide visual relief and soften the hard texture of urban environments to provide a sense of nature.

These public spaces take on the role of “special places” where people feel comfortable, which promote a sense of belonging and in terms of soft spaces provide the opportunity where one can escape the intensities of urban life.

Access

Positive urban environments enable an urban structure which creates the optimal level of convenience for its inhabitants through breaking down barriers which could hinder direct and equal access to activities, facilities and socio-economic opportunities (Behrens & Watson, 1996). Equality is at the forefront to achieve an accessible urban environment where all the inhabitants can equally and conveniently access the available socio-economic opportunities.

An efficient and flexible transportation system is an essential structuring element to achieve an accessible settlement form (Behrens & Watson, 1996). This includes an integrated street network with its surrounding movement systems, an efficient and cheap internal public transportation system and an urban structure which prioritises pedestrian movement (Behrens & Watson, 1996). These transportation initiatives will improve the integration among different neighbourhoods to allow facility and resource sharing. This holds large social benefits in saving traveling time and costs and offer a good choice of alternative modes of transportation. Together it will improve the overall standard of living and accessibility within a settlement.

Another structuring element to foster an accessible settlement form, is through facility efficiency and mixed land-use patterns (Behrens & Watson, 1996). This involves the integration of different land-uses and transportation modes, where public facilities are strategically located, clustered together and integrated with the transportation network.

This results in facility efficiency, the exposure of different facilities and increases the convenience of accessing various facilities and socio-economic opportunities within a settlement (Behrens & Watson, 1996).

Safety and security

Positive urban environments foster a settlement form which is safe and secure. There are various forms of safety and security which includes: security of tenure, food security and safety from hazards, accidents and crime (Dewar, forthcoming). Safety and security in an urban environment, is complex as they involve subjective elements of spontaneity, vitality and vulnerability (Dewar, forthcoming). However, an urban settlement can incorporate structural design elements to contribute towards a safer and secure settlement.

Criminal activities and deviant behaviours can be prevented through settlement design to allow surveillance and well illuminated environments. This involve good lighting of disclosed areas during night time, such as NMT routes, alley ways and vast open spaces. Various residential building typologies such as parameter housing, allow for community surveillance and supervision. The buildings envelop the public courtyard to allow community supervision and surveillance of their property and social activity which takes place in the open space.

Hazards can be prevented through avoiding the location of people and activities in low laying areas, steep slopes or within the flood line areas of rivers and streams. This will avoid flooding and landslides during the rainy season to avoid maintaining vegetation on steep slopes and ensuring construction that allows sufficient drainage throughout the settlement. Drainage can be promoted through soil corrugation and drainage channels.

Food security can be managed through the protection of valuable agricultural land and the promotion of local urban agricultural schemes. These initiatives will not only contribute towards food security, but hold economic opportunities in terms of exchange and providing employment opportunities.

Urban Sustainability

Urban sustainability involves a positive performing urban environment to allow favoured socio-economic conditions to persist as a result of good urban structure and practices (Maclaren, 2007). These involve the three urban realms (ecological, social and economic) to operate optimally and in harmony with one another (Allan, 2009). This appeals for settlement formation and operation to take place in such a way that it takes all three of these realms into account and to ensure that no one dominates the other. There are various planning and urban management tools to prevent this domination from occurring to ensure urban sustainability for future generation (Maclaren, 2007).

The most important management tool with regard to urban sustainability, involves settlement-making and functioning without hindering the natural environment (Maclaren, 2007). Such a settlement requires a compact urban form which promotes economic intensification, efficient use of resources and (that) hold large social benefits, while limiting the impact on the surrounding environment (Gasson, 2007). Sustainable urban environments preserve their surrounding natural and cultural landscapes, as these characteristics are essential to maintain a unique settlement identity and timeless qualities in sustaining its sense of place.

Another important element to ensure urban sustainability, lies in the ability of a settlement to foster a vibrant self-sustaining local economy which is not dependent on the erratic globalized economic markets. This requires a settlement form which prioritises the requirements of small economic enterprises over large multi-national corporation to ensure local employment and economic sustainability (Dewar & Todeschini, 1999).

A sustainable urban environment does not rely on non-renewable sources of energy, but rather move towards renewable modes of transportation and sources of energy generation. This involves a settlement that prioritises NMT modes and encourages the use of wind, solar and hydro energy generation techniques above fossil fuels.

Urban sustainability involves current settlement-making and functioning which do not compromise the needs and abilities of future generations, but rather accommodate future change, urban growth and promote the favoured urban conditions which are required for residents to achieve self-reliance and socio-economic sustainability (Maclaren, 2007).

5.3 The Nature of Plan

According to Dewar & Uytendogaardt (1991) plans are central tools for guiding urban management in an attempt to structure and order urban growth and change. In this, 'structure' designates the "spatial geometry of settlements" to which human activities respond and 'order' is the spatial outcome when a conscious physical response occurs to dynamics such as urban growth and change (Dewar & Uytendogaardt, 1991: 23). In this regard, the ultimate purpose of plans are to create rich and complex positive urban environments whereby overall direction is given to ensure holistic coherence and continuity, while at the same time creating maximum meaningful manoeuvring space for individuals to operate in their own self interest (Dewar & Uytendogaardt, 1991).

For plans to create positive and complex urban environments they require the "exercise of both freedom and constraints" (Dewar & Uytendogaardt, 1991: 23). Freedom is the essential ingredient for creating complexity and diversity through allowing the expression of self interest (Dewar & Uytendogaardt, 1991). However, freedom purely exists in the context of choice and choice on the other hand is created through constraint. Therefore constraint is the other essential ingredient in plan, as it controls the amount of freedom released for preventing the exploitation of self interest that may hinder the coherence and continuity of the whole (Dewar & Uytendogaardt, 1991).

There are two opposing approaches, where the imbalance between freedom and constraint is illustrated well. The Laissez faire approach, which allows great amounts of freedom in letting the capitalist market forces and private action determine the outcome of development. However time and time again this approach have proven to leave to much freedom and the ability to express individual interest is exploited which results in inequality and poverty. The opposing approach is known as the Rational comprehensive or Blue print planning approach. This approach puts forward "excessive controls and restraints" which allows for very limited freedom of individual expression (Dewar & Uytendogaardt, 1991: 23). This approach on the other hand fails to create complexity and diversity and ultimately result in development that is sterile and monotonous (Dewar & Uytendogaardt, 1991).

In this regard this dissertation calls for an intermediate approach that reaps the benefits from both freedom and constraint for optimising the benefit for the entire society as a whole. This is know as the Non Programmatic approach to plan making, which was "concerned with optimisation of the whole rather than focusing on the separate parts" (Dewar and Todeschini, 2004: 39).

It was realised that for the whole to operate optimally there must be integration between the separate parts, "driven by a search for lasting qualities reflected in living environments that work well for all its inhabitants (Dewar and Todeschini, 2004: 40). This approach accommodates growth and change as it strives to understand and evaluate, to accommodate human need (Dewar and Todeschini, 2004).

The Non programmatic approach strive to achieve the following (Dewar and Todeschini, 2004: 41):

- It strives to define good urban life, but enable choice to create itself.
- The approach does not strive for idealised urban form, but rather identifies performance qualities to allow vernacular ideals to create urban structure.
- The approach does not attempt to influence spatial distribution directly, in a "top-down fashion, but rather manipulates the logic of access to which activities respond to generate predictable outcomes.

5. 4 Legislative and Policy Context

This section will put forwards the various legislative and policy informants that will need to be considered for the implementation of the WDPs.

- *Constitutions of RSA*

The Constitution of the republic of South Africa (NO.108 of 1996) is the primary legal framework whereby all legislation and policies must abide. So to does planning Laws and policies that are enacted by the constitution.

The primary objectives of the constitution is to ensure the human rights and dignity of the people while at the same time advance human equality and progress.

- *Spatial Planning and Land-use Management Act (SPLUMA)*

On the 5 of August 2013, SPLUMA (Act 16 of 2013) was introduced to replace the Development and Facilitation Act (67 of 1995) as the national planning and land-use management act.

SPLUMA is enacted by the Constitution of RSA, making it a national act that applies to the entire area of the Republic. It regulates national, provincial and municipal planning, in providing uniform, effective and comprehensive systems of spatial planning and land-use management.

The Act put foreword several normative objectives which include:

- *Promote social and economic inclusion and social justice*
- *Providing development principles, norms and standards*
- *Sustainable and efficient land-use management*
- *Cooperative government and intergovernmental relations*

- *Land-use Planning Ordinance (LUPO)*

The Land-use Planning Ordinance (15 of 1985) “regulates land-use planning and provides for matters incidental thereof”. These include:

- *Structure Plans*
- *Zoning Schemes*
- *Subdivision of land*
- *Planning advisory*
- *General provisions*

- *Municipal Systems Act*

The Municipal Systems Act (32 of 2000) was introduced on the 20 of November 2000 to empower local government with strong systems to be capable of exercising the functions and power assigned to it.

With regard to planning the Municipal Systems Act, obligates local government the power to undertake Integrated Development Planning which involves the adoption of an Integrated development plan every 5 years (IDP).

- *Integrated and Development Plan*

An IDP is a long terms vision and strategic plan for the development of a municipality. The plan involves a review of existing developmental conditions, strategic budget allocations to pre identified social and economic development initiatives and prioritised future development objectives.

- *Spatial Development Framework (SDF)*

The IDP includes a spatial component that is known as a SDF. A SDF represents the goals put forward by an IDP spatially and provide spatial guidelines to the IDP’s development objectives. A SDF gets reviewed ever 7 years.

- *National Environmental Management Act (NEMA)*

The National Environmental and Management Act (62 of 2008) is the general framework within which environmental management and implementation plans must be formulated.

This Act includes core principles:

- *Sustainable development*
- *Environmental Justice*
- *Community empowerment*
- *Equal access to environmental resources*

Chapter 6

Metropolitan Framework

The previous chapters put forward the theoretic analysis to understand the urban challenges currently facing South African cities, together with the theoretical urban management tools to restructure and achieve social justice. These challenges are primarily associated with rapid urbanization and structural inefficiencies which cause wide spread inconvenience, inequality and poverty throughout South African cities. These urban challenges are especially of concern in the context of Cape Town and major densification, intensification and integration initiatives are needed to achieve a more efficient and integrated metropolitan region.

This chapter consists of a metro-wide analysis of the Cape Town Metropolitan Region (CTMR) to identify the contextual opportunities and constraints regarding the redevelopment of the Wingfield site. Firstly, this chapter identifies the ecological and structural inefficiencies currently facing the CTMA, followed by a conceptual framework for strategic metropolitan restructuring to address the various urban challenges presented in the previous chapters.

6.1 Metropolitan Analysis

For a holistic understanding of the role the WDP will play within Metropolitan Cape Town, a metro-wide analysis will be undertaken to identify the wider contextual opportunities and constraints which will influence the outcomes of the WDP. This analysis includes a critical evaluation of Cape Town's biodiversity network, various movement systems and higher order institutions which are some of the structuring elements currently shaping Cape Town's inefficient urban form.

Metropolitan movement System

One of Cape Town's, primary structural elements includes a vehicular movement system, that takes on a failed radial urban form (Figure 16).

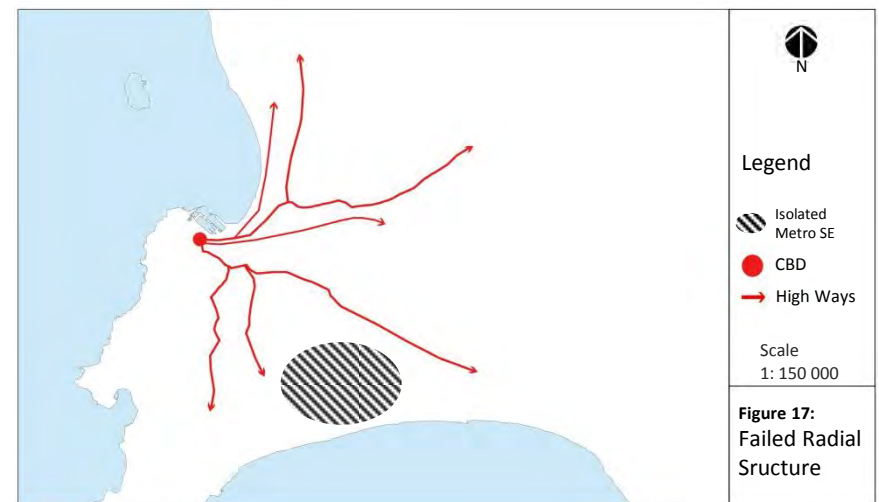
The traditional radial city is characterised by a web-like street structure which radiates out of an urban centre, in all directions, bounded by various circumference ring-roads (Anderson, Kanaroglou & Miller 1996). However, unlike the traditional radial model, Cape Town is enveloped by impenetrable mountainous terrain and two oceans and thus lack the vertical integration of concentric ring roads.

This failed radial form is highly inefficient as it generates large amounts of linear movement and congestion, and directs the majority of socio-economic opportunities towards the northern and western part of the city. This results in the isolation of the areas in the metro South-East, because of the lack of North-South integration (Figure 17). This can be seen in the majority of socio-economic opportunities situated along the East-West oriented N1 and Voortrekker corridors which connect the Cape Town and Bellville CBD's as shown in figure 20. Recent economic growth is drifting towards the Durbanville and West-coast corridors which are both located along the current radial metropolitan structure.

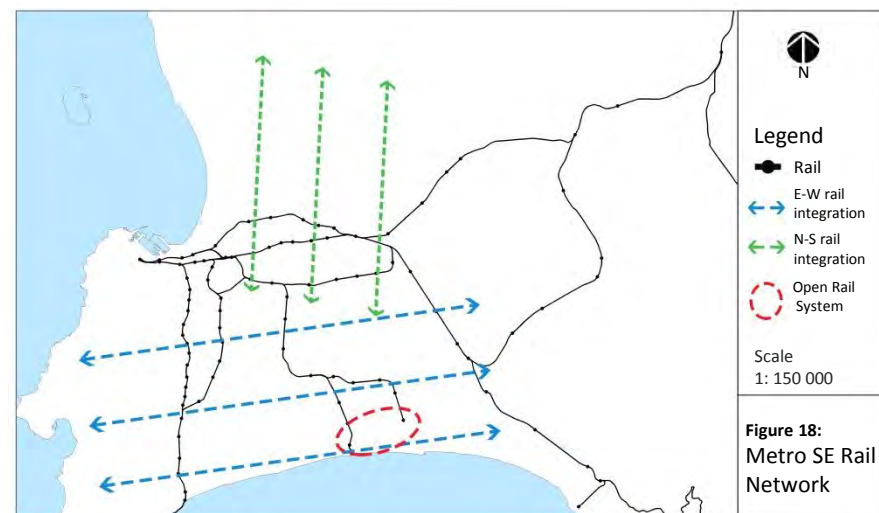
Another hindering structural issue Metropolitan Cape Town faces, is the lack of transport linkages between the Metro South-East and the rest of the city. The rail network which is the primary mode of public transportation in this region, lacks direct connection with the major economic nodes located in the metro North-West. This rail network is not closed and lacks internal East-West linkages which amounts to long and inconvenient traveling distances and expensive trips. In this regard there is a large need for internal movement integration and regional integration between the metro South-East and the rest of Metropolitan Cape Town as illustrated in figure 18.



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009

Higher Order Institutions

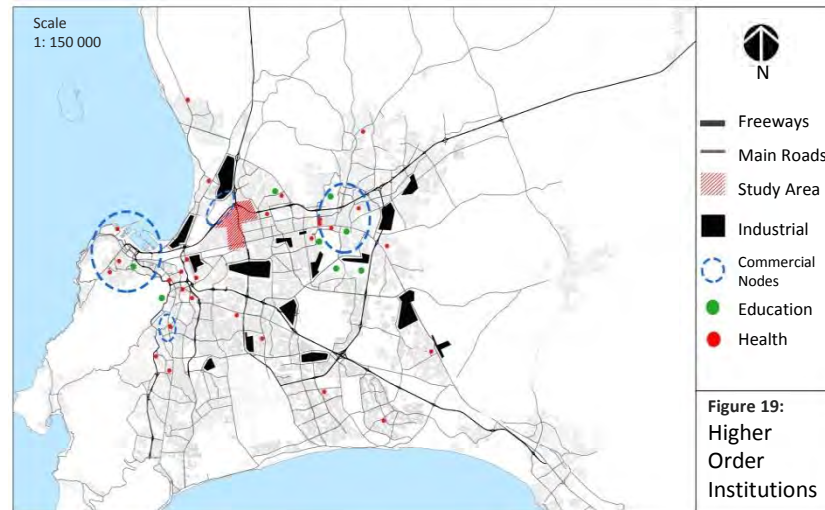
The issues relating to the failed radial urban structure of Cape Town and the lack of transport integration between the metro South-East and the rest of the city, are illustrated by the location of higher order institutions throughout the Metropolitan region. Figure 19, shows the majority of tertiary education and health faculties, industrial activities and large commercial nodes situated along the N1 and Voortrekker corridors, and thus isolate the Metro South-East region which houses the majority of residents in the city. These notions support the large need for integration within metropolitan Cape Town to give the residents located in the South East, access to socio-economic opportunities.

Biodiversity

As shown in figure 21, the CTMR is rich in ecological biodiversity. The protection of these ecological assets is essential to, contain urban sprawl and to sustain the cultural and natural landscape which adds to Cape Town's sense of place and thriving tourism industry. The biodiversity areas consist of natural vegetation, wetlands and fertile agricultural land. The health and integrity of these biodiversity areas, are ensured by integrating them via green corridors to promote species migration and prolonged ecological reproduction (Yahner, 1988). These corridors are essential to provide visual relief from the extensive urban development in the CTMR. These biodiversity areas are currently under threat as proactive protection and the implementation of green corridors are limited. The protection of these biodiversity areas and implementation of green corridors between these areas, are essential for ensuring the ecological sustainability of the CTMR.

Metropolitan significance of the WDP

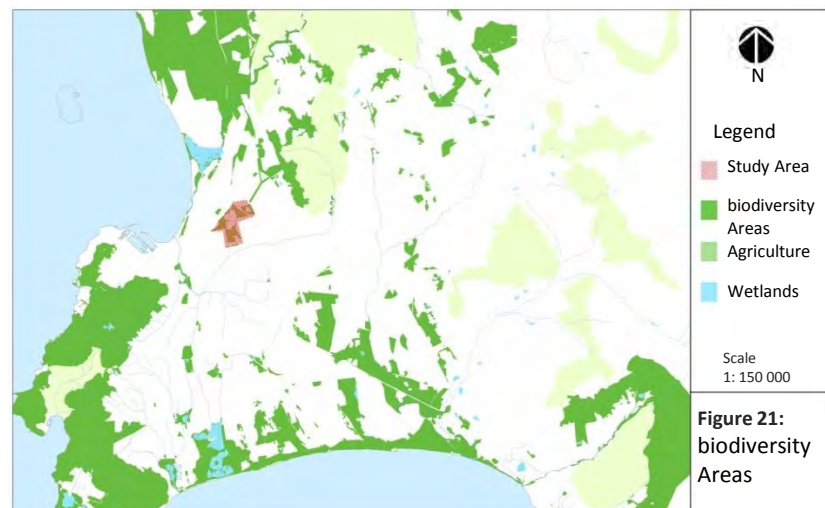
The primary issue regarding metropolitan Cape Town, is that the poor, located in the metro South-East, lacks efficient accessibility to the majority of socio-economic opportunities in the North-West and along the N1 and Voortrekker corridors. The Wingfield study area is therefore well located within the N1 and Voortrekker activity corridors and holds great potential to operate as an infill development for those with few resources. It can function as an integration mechanism to give the poor access to the diverse socio-economic opportunities which they currently lack, and are available in this region. However, as shown in figure 21, the Wingfield study area is located along the current Cape Town biodiversity network and an in-depth EIA assessment will be needed to prevent the destruction of valuable ecological resources because of the development.



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009

6.2 Metropolitan Concept

In response to the metropolitan issues discussed above, a metropolitan concept is presented. Firstly, this concept will establish green corridors which bind the various metropolitan biodiversity areas in an integrated manner. Secondly, the metropolitan movement network, which resembles a failed radial urban form, is restructured by using a grid-like concept to create linkages between the current linear movement channels to ensure a more integrated metropolitan region.

Biodiversity Corridors

The protection of Cape Town’s biodiversity areas is essential to restrict urban sprawl, to direct urban growth, as well as to ensure the sustainability of Cape Town’s natural landscape which adds to its cultural identity and spatial desirability. It is in this regard that this metropolitan concept identifies various biodiversity corridors to ensure the ecological health and integration of Cape Town’s biodiversity areas .

These conceptual biodiversity corridors are created to identify the various “biodiversity rooms” which are shown in figure 22. These “biodiversity rooms” hold ecological significance within the Cape Town biodiversity network and consist of indigenous species, wetland areas and fertile agricultural lands.

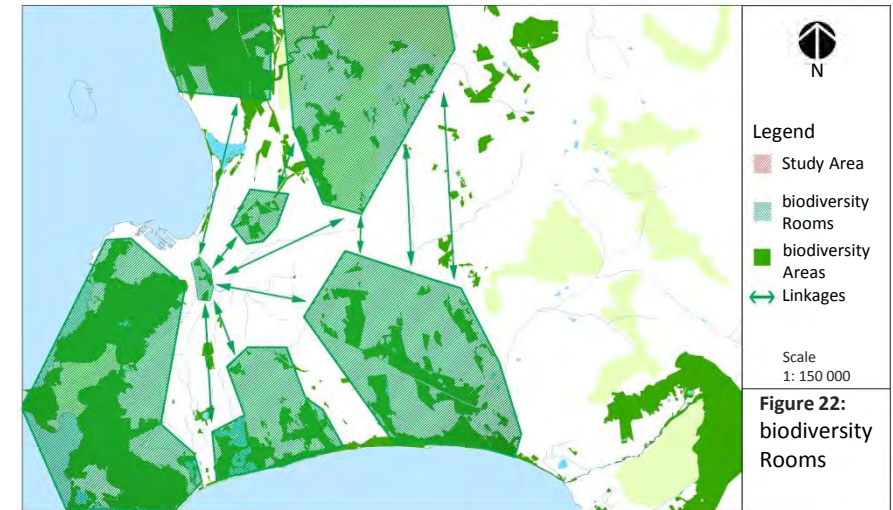
These “biodiversity rooms” were further strategically connected through identifying suitable watercourses and ecological pathways to function as biodiversity corridors. The outcome presents an integrated metropolitan biodiversity network consisting of various biodiversity ecosystems which are connected via biodiversity corridors, as shown in figure 23.

Metropolitan Movement system

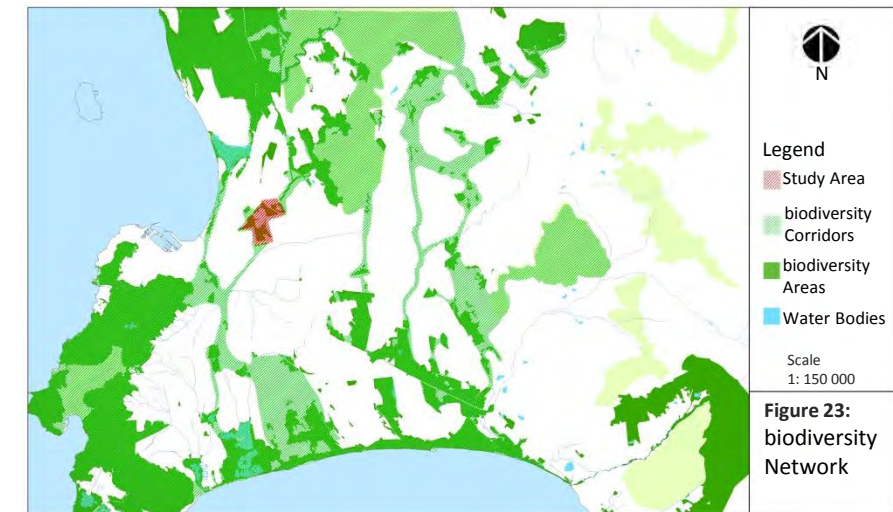
The current Cape Town metropolitan movement system takes on an inefficient radial form which needs restructuring to achieve a more integrated metropolitan region. This concept prioritises the restructuring of the public transportation network, especially rail, as this is the most widely used mode in the metro context. The concept introduces additional BRT linkages to close the gaps in the existing “open” rail network by transforming the linear railways into a more efficient grid-like structure. These added BRT linkages, will improve the metropolitan public transportation network to ensure a more convenient and cheaper closed-circulating system to allow shorter and more direct trips. This system will promote trans-metropolitan integration to offer the poor, located in the metro South-East, direct access to the socio-economic opportunities situated in previously inaccessible locations.

Metropolitan Spatial Concept

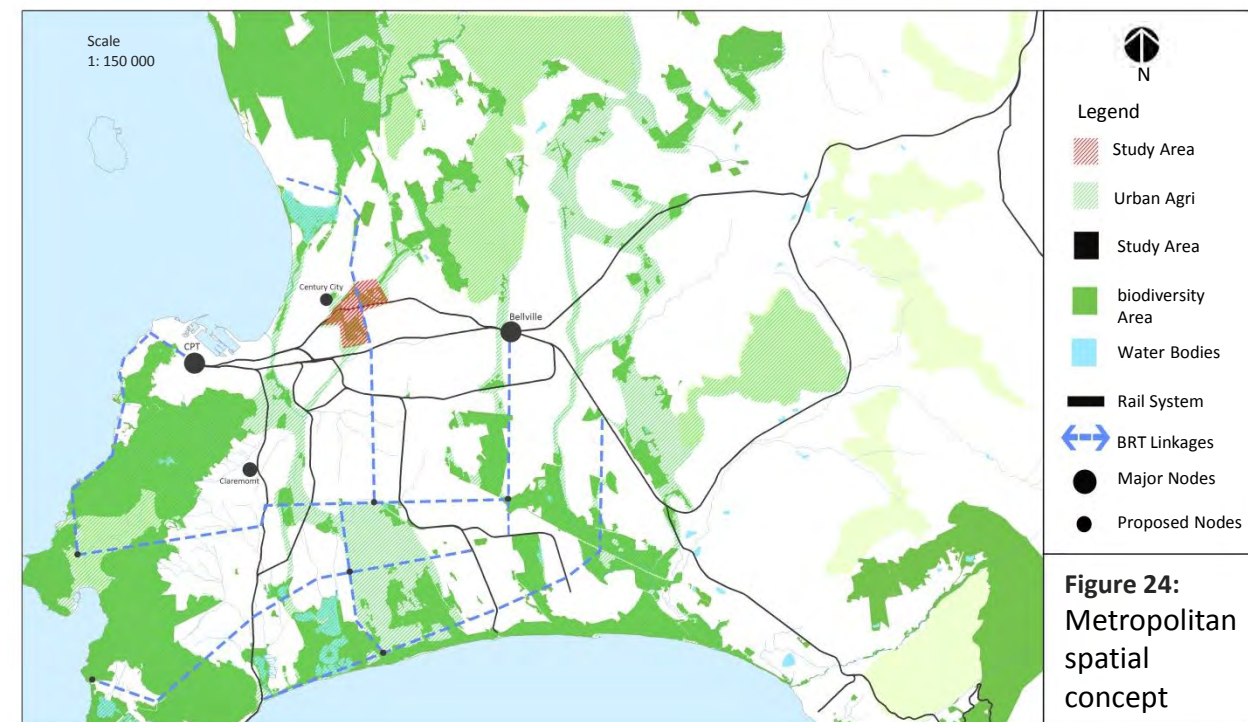
Figure 24 shows the compilation of the two concept layers to inform the outcomes of the WDP in terms of the relevant metropolitan structuring elements.



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009

Figure 24: Metropolitan spatial concept

Chapter 7

Site and Environs

For the purpose of this analysis, we drop a level in scale to analyse the site in terms of its surrounding environmental and structural informants. These informants identify the relevant opportunities and constraints which directly impact the outcomes of the WDP. This analysis will partake in a systematic fashion. It begins with a thorough introduction of the study area, followed by an investigation of the ecological and biophysical components of the site. Lastly, the structural and institutional components, in immediate proximity of the site area, will be evaluated.

7.1 The Study Area

The study area (Figure 25) consist of the 650ha Wingfield site and a 3km radius of urban development surrounding the site. The primary movement routes, which meander through the study area, include the N1 highway in the north, the N7/Vanguard Drive to the east and the Voortrekker corridor in the south. The two major residential neighbourhoods within the study area, include Kensington and Goodwood, while Century City and N1 City are the two major commercial nodes.



	Reasoning	Criteria	Indicators	Development Restrictions
Geology	Avoiding geological hazards	Construction and foundation purposes		No-Go
Soils	Construction and Foundation conditions	Clay content	< 15%	Suitable
	Construction and Foundation conditions	Soil depth	> 750 mm	Suitable
	Preserving natural resources	Agricultural potential	Medium or Higher potential	No-Go
	Preserve natural resources	Mining	feasible quantities	No-Go
Topography	Avoid Steep slopes for construction		< 9%	Suitable
	Avoid construction of Ridges	Fault Lines		No-Go
Climate	Avoid exposure to prevailing winds	High points/Hill tops	SE/NW Axis	No-Go
		Low lying areas/Valleys		
	Avoid cold/damp slopes	Human comfort	South Facing	No-Go
	Capitalise on warm slopes	Human comfort	North Facing	Suitable
Hydrology	Protect and Preserve Hydrological resources	Wetlands	Preserve and protect	No-Go
		Rivers	15 to 30 m Buffer	No-Go
		Aquifers	Preserve and protect	No-Go
Biotic systems	Protect Ecosystems and Bio-diversity	Critical Biodiversity Areas	Core 1	No-Go
			Core 2	No-Go
		Open Space Areas and Graves Yard	Seek and reascue	Tread Lightly
		Biodiversity Area	Compromised	Suitable

Table 3: The method used to assess the various constraints of each biophysical element
Source: Author

7.2 Biophysical Analysis

The biophysical elements existing within the study area, include the geological and soil make-up, topography and hydrology, local climate and biotic systems. As shown in Table 3, these elements are analysed in terms of various criteria to establish the biophysical opportunities and constraints that will establish the design and development outcomes of the WDP. The analysis is done in a systematic fashion, identifying each Biophysical element separately to establish the individual development constraints offered by each element. The various development constraints are categorised according to development restrictions to determine which development can or cannot be supported by each Biophysical element. Finally, a composite map combines all the individual Biophysical development restrictions for informing the development potential of the Wingfield site.

Development Restriction	
No Go	Prohibits all urban development as development cannot be supported by biophysical elements
Suitable	The biophysical elements can support urban development
Tread Lightly	biophysical element support development if mitigation measures are under take n

Soil content and Geological make-up

The soil contents covering the top layers of the study area consist of what is known as light-grey to red sand soil (Figure 26 & 27). Sampling tests have indicated that the soil mainly consist of interwoven sandstone lenses and weathered Malmesbury rocks, but traces of shell-bearing dune sand, thin clay lenses and peat are irregularly distributed throughout the region (Theron, 1984).

Table 4 shows that the soil found in the study area, consists of low clay content which amounts to high levels of permeability and stable soil conditions. The soil layers reach average depths of between 6 and 15 meters, however, upper surface conditions display loose sand deposits because of wind erosion, which requires soil compaction for urban development to succeed. These issues result in low level cost implication as shown in Table 4. The study area does not include fertile soil suitable for urban agricultural activities and soil fertilisation processes required for such activities to commence.

As shown in figure 28 & table 5, the overall geological conditions display a high level of urban development potential and include the most desirable development option. This is because of the geological conditions offering little engineering-geological problems. No geological hazards, such as fault-lines, are present near the study area.

7.2.1 Geology and Soil

An analysis of the soil and geological characteristics of the study area is essential to determine the subsurface condition's stability and suitability to accommodate intensive urban development, to allow filtration, drainage, and urban agricultural practices.

The soil stability and depth are important in terms of building foundations. These are determined by calculating the clay content of the soil. The lower the clay content the more stable and suitable the soil conditions are for intensive urban development. The clay content in the soil influences the filtration rate of the soil. As the clay content increases, the infiltration rate of water decreases. This has large implication for drainage, If high clay content is present, alternative measures for improving surface water drainage must be undertaken. The preservation of fertile soil for potential urban agricultural practices, is important for ensuring local food security.

The importance of the geological conditions of the study area depends on the underlying bedrock and its distance from the surface which are both important for the piling and anchoring of building foundations. A geotechnical study is critical to determine the geological condition and to establish if there is geological constraints, as urban development should not occur near fault lines or other geological hazards.

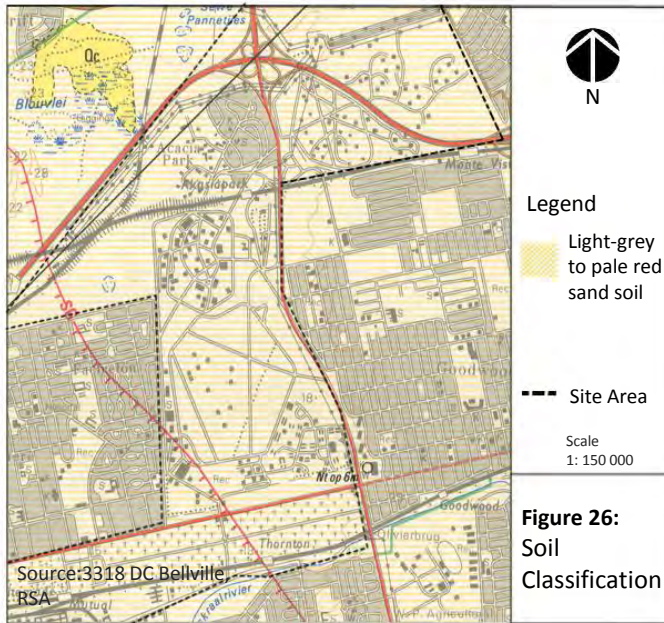


Figure 26:
Soil
Classification

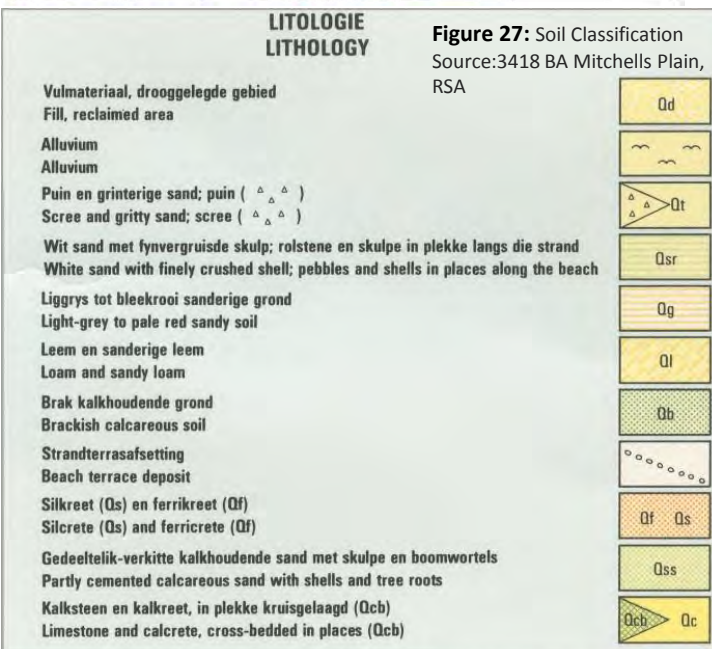


Figure 27: Soil Classification
Source:3418 BA Mitchells Plain, RSA

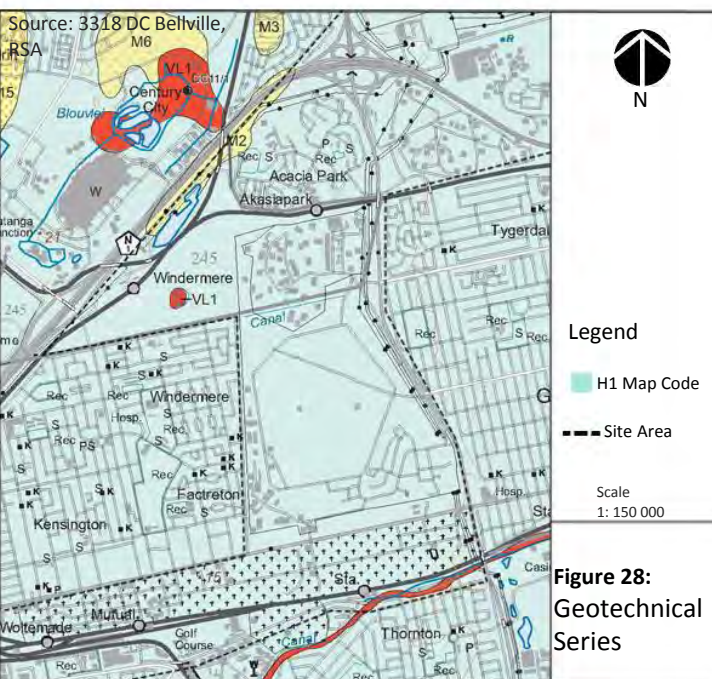


Figure 28:
Geotechnical
Series

CODE	GEOTECHNICAL PROPERTY	DESCRIPTION	SEVERITY CLASS	RESULTING COST IMPLICATIONS
Per2	Permeability	Permeability measures the flow of water through saturated soil. This is determined by the grain size and shape and the degree of compaction of the soil.	Low permeability (<3 x 10 ⁻⁶ cm/s)	Low
Per3-Per4			Medium to high permeability(>3 x 10 ⁻⁶ cm/s)	Low
Act1	Aggressive soil	Acidic soils. The chemical composition of these soils increases corrosion of metaliferous materials and causes deterioration of reinforced concrete.	Moderately aggressive	Low
We	Loose sand (wind erosion)	Loose surface soil susceptible to wind erosion. Mainly of aeolian origin. Non-cohesive sands.		Low
Ero	Erodible soil (water erosion)	Loose/dispersive soil occurring in areas of steep surface slope and susceptible to erosion by surface water.	Clayey soils classify as "dispersive". Sandy soils not laboratory tested - dongas observed in field	Low
Con	Loose sand (consolidation)	Material susceptible to excessive consolidation when used as foundation horizon. Non-cohesive sands.		Low
Sha	Shallow water table	Water table occurring at shallow depth - often seasonal.		Moderate
Col	Collapse potential	Collapsible soils are open-textured, sandy to silty soils with a low clay content. The soils may consolidate rapidly when under load and near saturation point.	Collapsible fabric deduced from grading curve. No oedometer testing performed.	Moderate
Act2	Active clay	The degree of expansion experienced when dry clayey soils are moistened to full saturation. In addition to the activity, the clay horizon depth and thickness contribute towards determining the amount of surface movement (expansion/contraction).	Low expansiveness	Low
Act2-Act3			Low to medium expansiveness	Moderate
Exc3			Slight excavatability problems (can be hand dug)	Low
Exc4	Excavatability of ground	The ease with which ground can be dug to a depth of 1,5 metres.	Moderate excavatability problems (backactor required)	Moderate
Exc5			Severe excavatability problems (blasting or power tools required)	High
Slo	Slope instability	Area comprising unstable materials that are subject to creep, slumping or sliding.	Severity not determined	High
Inu	Flood risk (probably below 1:50 year flood line)	Low-lying areas surrounding pans, rivers and streams, flat marshy areas, and coastal strips are subject to periodic inundation.		High

Table 4: Geological Properties
Source: Stapelberg, 2009

MAP CODE	COMBINATION OF GEOTECHNICAL RESTRICTIONS	SUBURBAN DEVELOPMENT POTENTIAL CLASS	DESCRIPTION OF DEVELOPMENT POTENTIAL CLASS
H1	Con/Wu/Per3-Per4	High	Class with the least engineering-geological problems. (The most desirable development option)
H2	Con/Wu/Per3-Per4/Act1		
H3	Con		
M1	Col/Con/Per2	Medium	Some precautionary measures needed to overcome engineering-geological problems. (Cost implications will render parts of this class unfavourable for informal and semi-formal development.)
M2	Sha/Per2/Ero		
M3	Sha/Con/Per3-Per4		
M4	Sha/Con/Per2		
M5	Sha/Con/Wu/Per3-Per4		
M6	Sha/Col/Con/Per2		
M7	Act2-Act3/Sha/Con/Wu/Per2		
M8	Act2-Act3/Per2		
M9	Act2-Act3/Ero/Per2		
M10	Act2-Act3/Sha/Per2		
M11	Act2-Act3/Sha/Exc3/Ero/Per2		
M12	Act2-Act3/Col/Per2		
M13	Exc4		
M14	Exc4/Per2		
M15	Exc4/Sha/Per2		
M16	Exc4/Act2-Act3/Sha/Per2		
M17	Exc4/Col/Per2		
M18	Exc4/Act2-Act3/Per2		
M19	Exc4/Act3-Act5/Per2		
L1	Exc5	Low	Specific measures needed to counter expected engineering-geological problems. (Suitable for high-cost development only.)
L2	Slo		
L3	Slo/Exc5		
L4	Slo/Sha/Per2		
Inu	Inu	Very low	Development extremely costly and possibly hazardous. (Development should not be considered.)

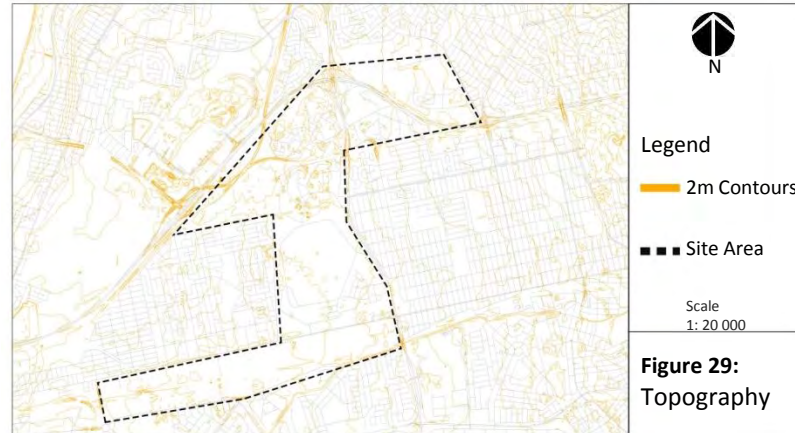
Table 5: Geological Development Potential
Source: 3318 DC Bellville, RSA

7.2.2 Topography and hydrology

The topographic and hydrologic characteristics surrounding the study area work in tandem with one another, as the topographic slope and the location of hydrologic features, inform the drainage patterns throughout the study area. Drainage is very important for construction purposes, especially to ensure service efficiency for storm water drainage. This section will investigate these two forces individually and then analyse them together as a hydrological unit.

Topography

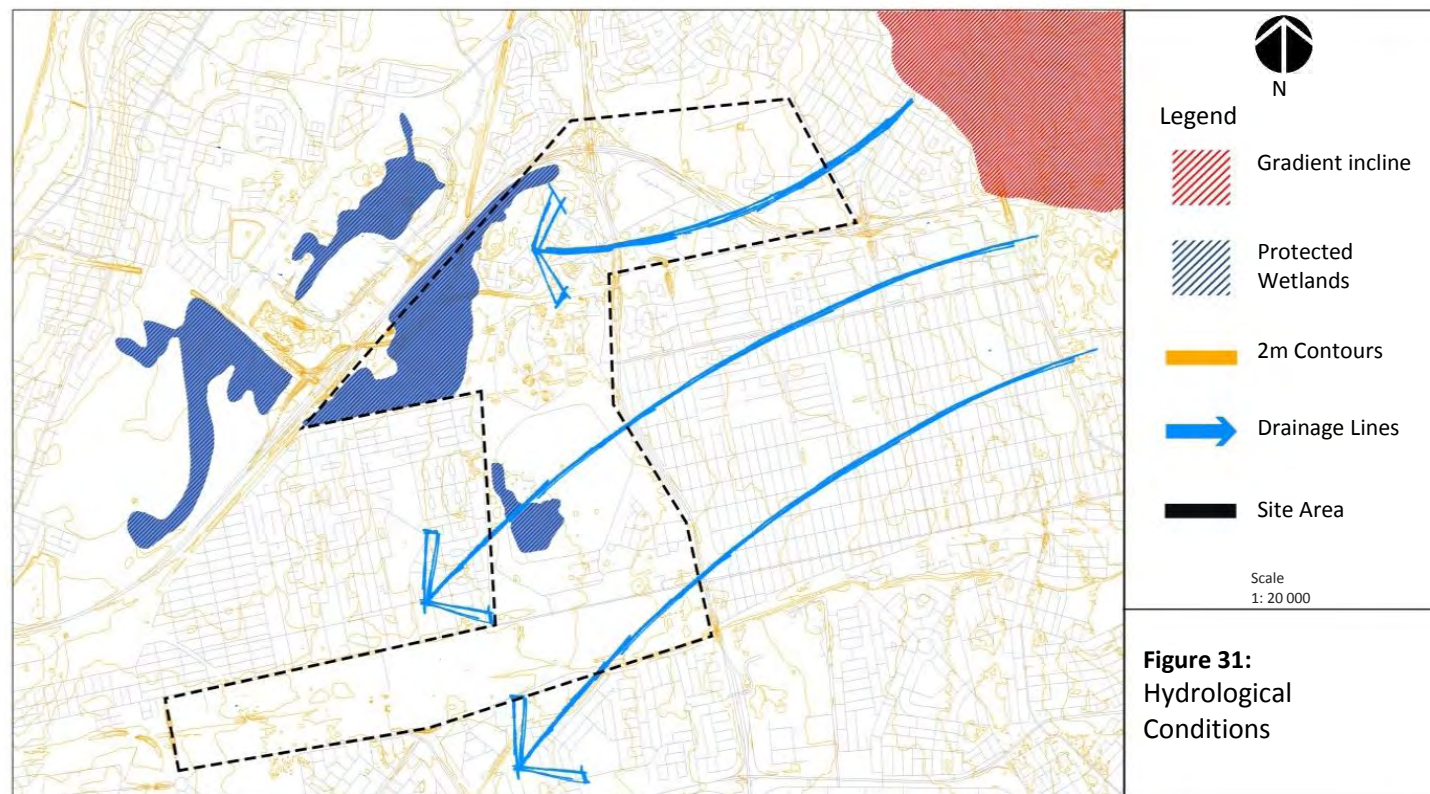
The topography of the study area is extremely flat, except for the rise of gradient in the north-eastern corner which signifies the foot of the Tygerberg Hills. The site then gradually slopes towards the south-west as indicated by the 2m contour configuration shown in figure 29.



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009

Water Bodies

The hydrological features presented throughout the study area, include extensive wetland areas which are mainly situated towards the western and south-western portion of the study area (Figure 30). The Black River is the most significant river in the study area draining through the southern portion of the study area. The Black River drains from east to west as it is a confluence of the Elsies Kraal River, which is situated towards the north east study areas. It enters the Atlantic Ocean at Paarden Island in Table Bay (City of Cape Town - State of Rivers Report, 2005).

Hydrology

As shown in figure..., the Topography and the flow of the Black River clearly indicates that water slowly drains through the study area, from the north-east in a south-westerly direction. However, the large amount of wetlands and the very slight gradient indicate that natural drainage will not be sufficient throughout the study area and structural modification of the Wingfield site will be essential for intensive urban development to be viable. The extensive wetland areas in the western portion of the study area, need protection from urban development, as they hold biodiversity and flood control significance (Figure 31).

7.2.3 Climate

The Local Cape Town region has a Mediterranean climate, which means that the study area experiences warm dry summer and cool wet winter conditions. The study area, being very flat and vast, is constantly exposed to the predominant winds which blow consistently throughout the year.

During the winter months, the wind, which is associated with cold fronts and rain, blows out of a north-westerly direction. This holds flood risks for the very flat study area and artificial drainage mechanism will be needed to accommodate intensive urban development.

The south-easterly wind is the predominant wind which occurs during the summer months and although the North-Westerly wind is associated with rain, the South-Easter is the most problematic. This is because of the South-Easterly wind reaching speeds in excess of 50km/h, resulting in high levels of human discomfort in areas associated with loose sandy soil, such as the study area. (Capetownmagazine.com)

The study area is situated in the Southern Hemisphere, where the sun rises in the east and sets in the west. This has implications for building design and orientation as north facing buildings will collect the most natural light and heat.



Figure 33: The South -Easterly wind creating a sand storm on Sandy Bay Beach
Source: iol.co.za



Figure 32: South-East Winds in the CBD of Cape Town
Source: capetownmylove.com



Figure 34: Floods on the Cape Flats after a winter storm
Source: groupup.org

7.2.4 Biotic Systems

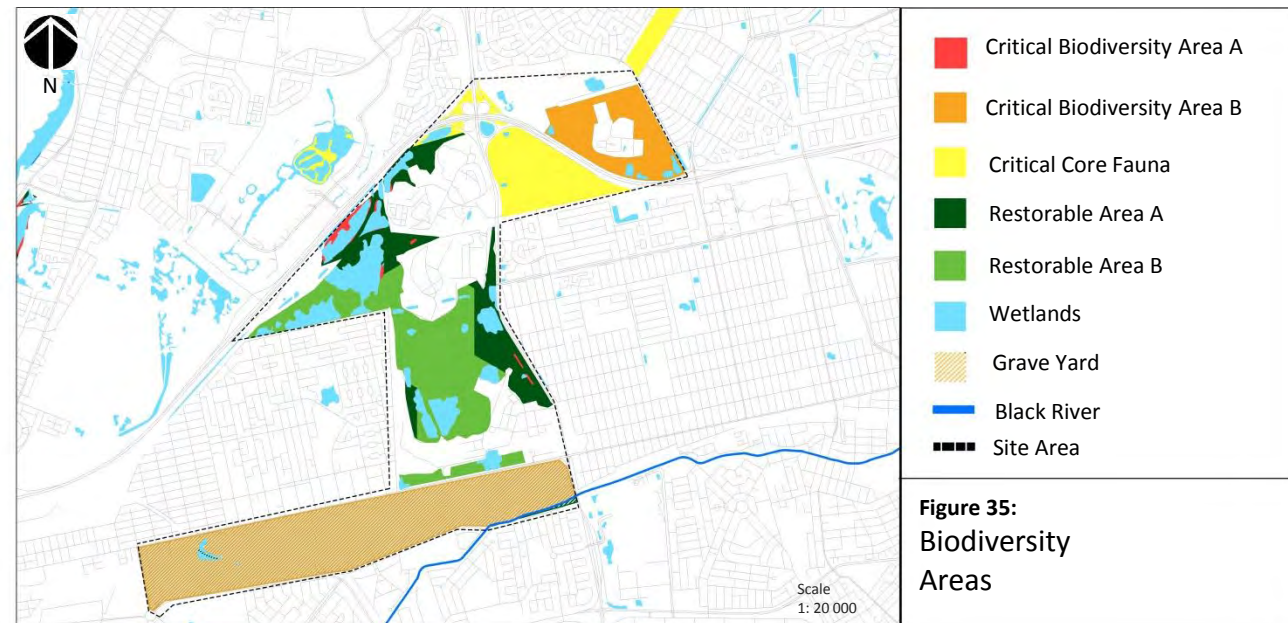
The Biotic analysis was undertaken by categorising the various biodiversity areas within the study area, according to their biodiversity significance within the metropolitan context, as shown in the metropolitan analysis. These various biodiversity areas are shown in figure 35. The aim of this analysis, is to determine which of these biodiversity areas are “critical” and not able to accommodate urban development and which have little or no biodiversity significance to accommodate intensive urban development.

The above analysis is categorised into three classes of development restrictions which are overlaid to create a composite map that shows the biotic opportunities and constraints existing in the study area (Figure36). The first class, namely the “protected area”, has major biodiversity significance and restricts any development in these areas. This includes all of the “irreplaceable Biodiversity Areas”, wetlands and Black River.

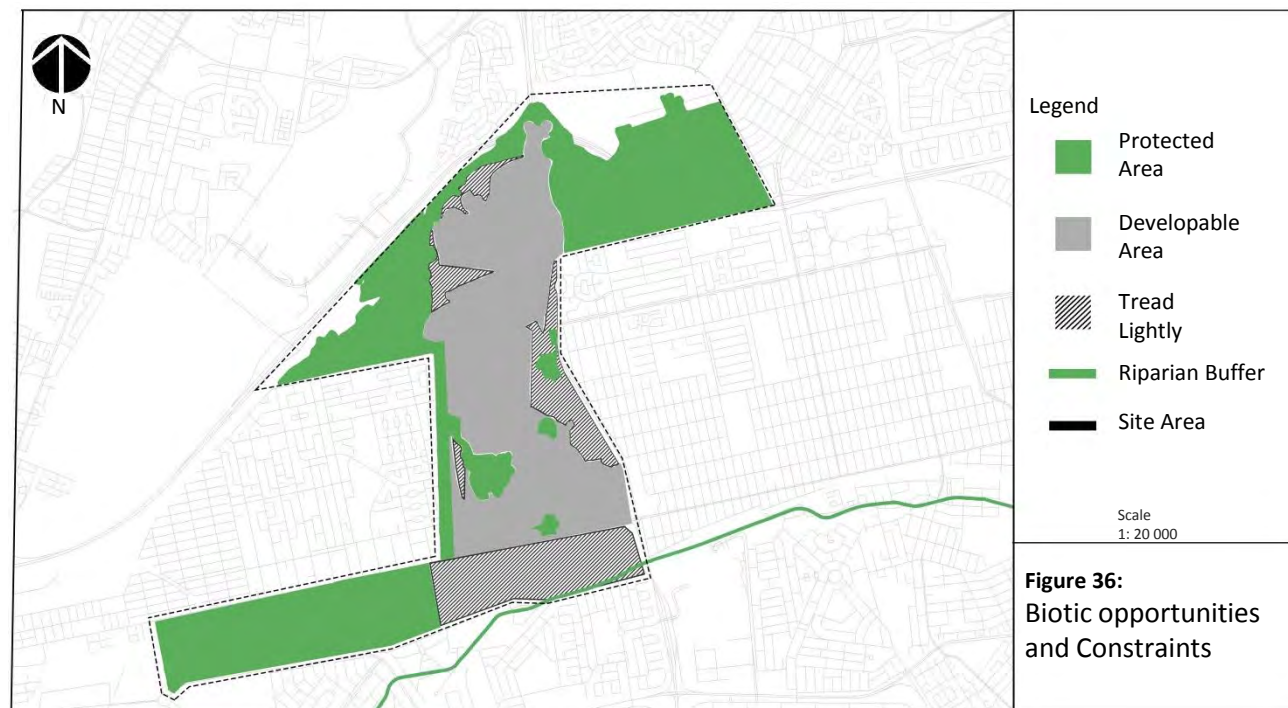
The second class is classified as “tread lightly” which allows selective urban development when certain mitigation measures are undertaken. The third class is classified as “developable area” and holds relatively little or no biodiversity significance for intensive urban development.

It must be noted that the study area falls within the Cape Town metropolitan biodiversity network. It is in this regard that an ecological corridor is maintained along the western portion of the site to ensure metropolitan wide ecological integrity.

The southern portion of the study area currently functions as a graveyard. The eastern portion of this grave yard is classified as “tread lightly”, because of the graves had to be moved towards the western portion of the graveyard, to allow development potential along both sides of the Voortrekker corridor. The western portion of the grave yard has the potential to function as a great park and forms part of the metropolitan biodiversity network.



Source: Data from CoCT GIS, 2009



7.3 Biophysical Opportunities and Constraints

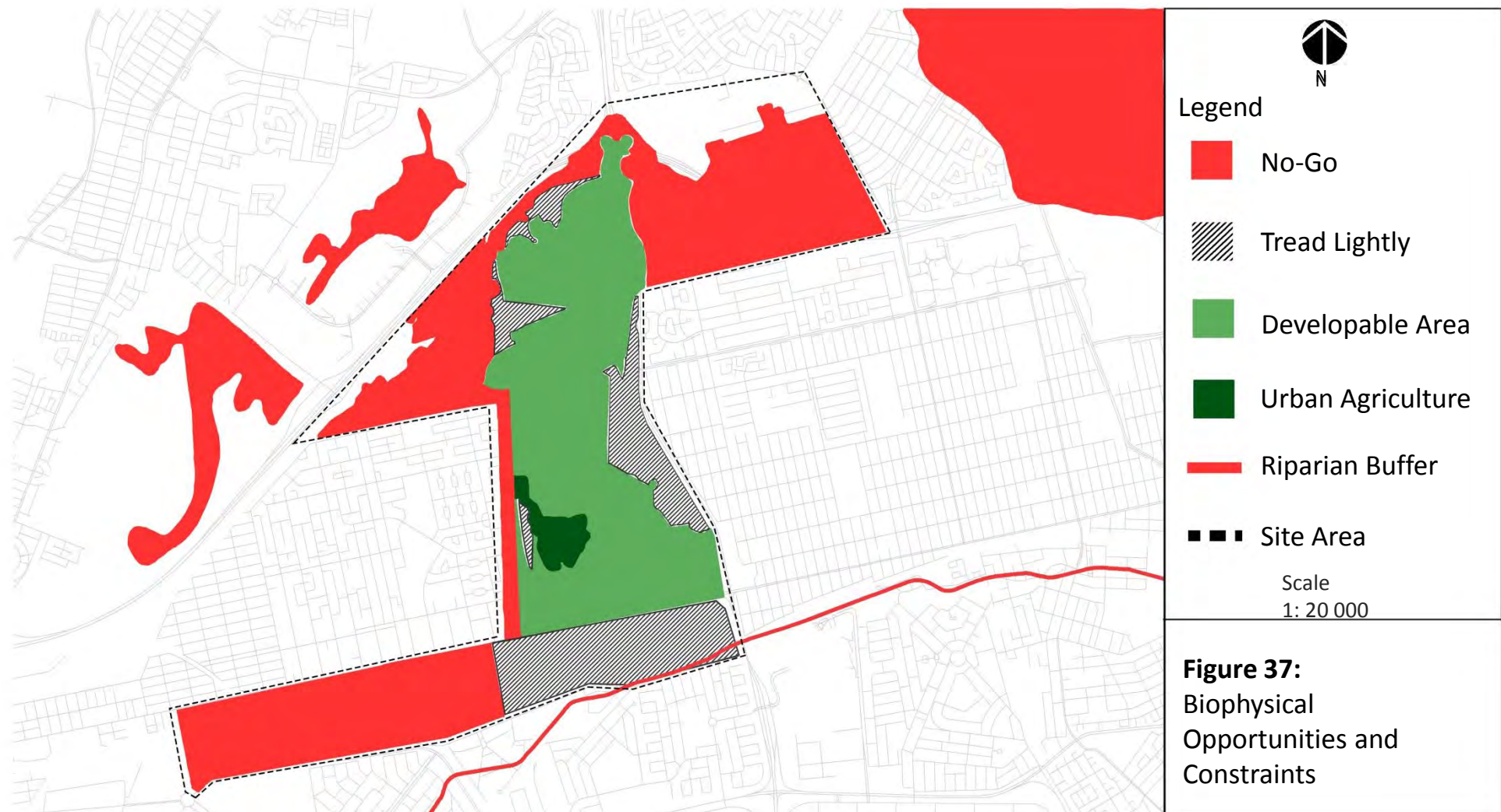
Figure 37 shows a composite map of the various biophysical opportunities and constraints existing in the study area is derived from the various individual biophysical analyses. This composite map includes three classifications of development restrictions.

The first class incorporates the critical biodiversity areas and wetlands which are classified as “NO-GO” in terms of urban development. These areas hold metropolitan biodiversity significance and the wetlands are natural tools for managing surface water drainage to prevent flooding.

As the study area holds no significantly fertile soil suitable for urban agricultural, a small portion of the biodiversity area will be utilised for urban agricultural practices. This land is strategically located not to break the biodiversity corridor running through the site.

The map includes “tread lightly areas” where development can take place only if certain mitigation measures are undertaken. These areas include specialist knowledge and practices, such as biodiversity search and rescue procedures, to support urban development. The Black River is a significant risk for pollution and a riparian buffer zone must be implemented to protect the river from any damage inflicted by urban development.

The third classification includes the “developable area”. This is land that has no development restrictions. This land classification has the potential to fully support intensive urban development.



7.4 Movement Analysis

The movement analysis considers the various modes of transportation operating within the study area. These include the hierarchy of roads within the vehicular movement grid and the different modes of public transportation.

Movement Grid

Figure 38 shows the local vehicular movement grid present within the study area, which consist of different levels of vehicular movement hierarchies. Each level inhabits variation in terms of offering opportunities for access. This will impact the design and development outcomes of the WDP and its ability to integrate with the surrounding areas. The higher order roads offer less opportunities for access and lower order streets offer more opportunities for access and local integration.

The first level includes the highways, the N1 and N7/Vanguard Drive, which function as regional and national integrators. Highways promote fast mass vehicular movement and offer limited opportunities for access and integration. The second level includes express ways which are local high speed movement channels. They offer limited opportunities for local access and integration.

The primary arterials, on the other hand, are higher order activity streets which allow relatively high speed vehicular movement, but also offer great opportunities for access and activities. Frans Conradie Drive is a good example of such a street, that offers the opportunity for a vast horizontal activity spine through the Wingfield development site, linking N1 City and Century city. The lower order streets include secondary arterials which function as local activity spines and offer opportunities for access and local level integration. Voortrekker Road is a good example of such a secondary arterial and holds significant opportunities for the WDP.

Public Transportation

Figure 39 shows the different modes of public transportation operating within the study area. These include the regional rail network, the local bus and the mini bus taxi routes. This analysis is important to ensure the integration of the proposed Wingfield public transportation system with these surrounding public transportation networks. The two rail transit stations located on the Wingfield site, offer great opportunity for a large vertical activity spine connecting these two stations through the site.



Source: Data from CoCT GIS, 2009



Source: Data from CoCT GIS, 2009

7.5 Structural Informants

There are several structural informants within the study area that surround the Wingfield site (Figure 40). These structural informants offer various development opportunities and constraints which will inform the design and development outcomes of the WDP.

The structural constraints are fixed development barriers that cannot be altered and thus help define the site area. These include the N1 corridor that frames the Wingfield site in the north, the N7/Vanguard Drive that borders the site to the east and Nottingdale Drive to the west. These structural constraints are development restrictions which hinder integration and accessibility of the site to its surrounding areas.

The structural opportunities of Wingfield, on the other hand, include fixed socio-economic institutions and facilities that offer various development opportunities to which the WDP can respond. These opportunities are positive structural elements on which the development proposal can lean to contribute towards improved development outcomes.

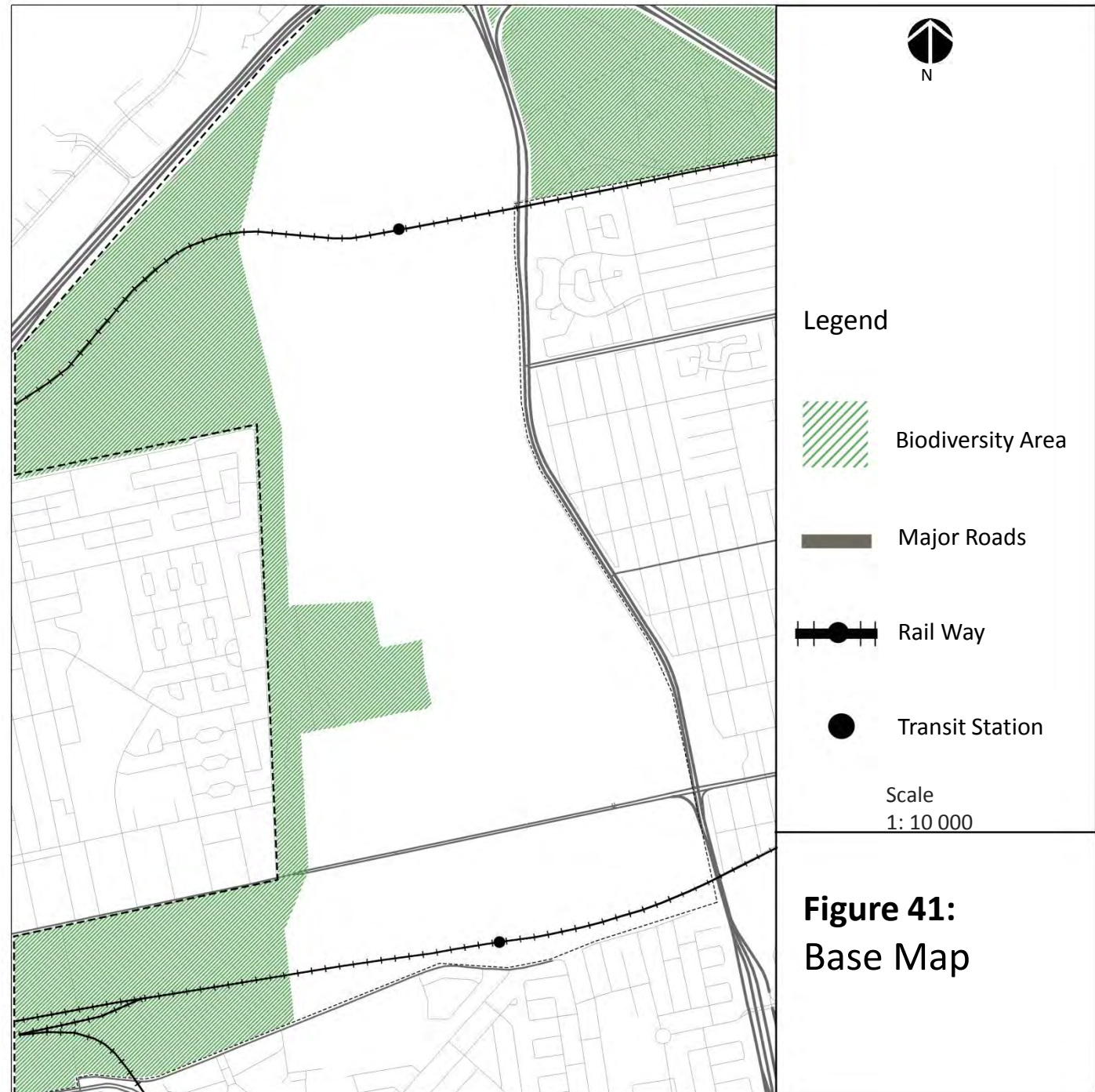
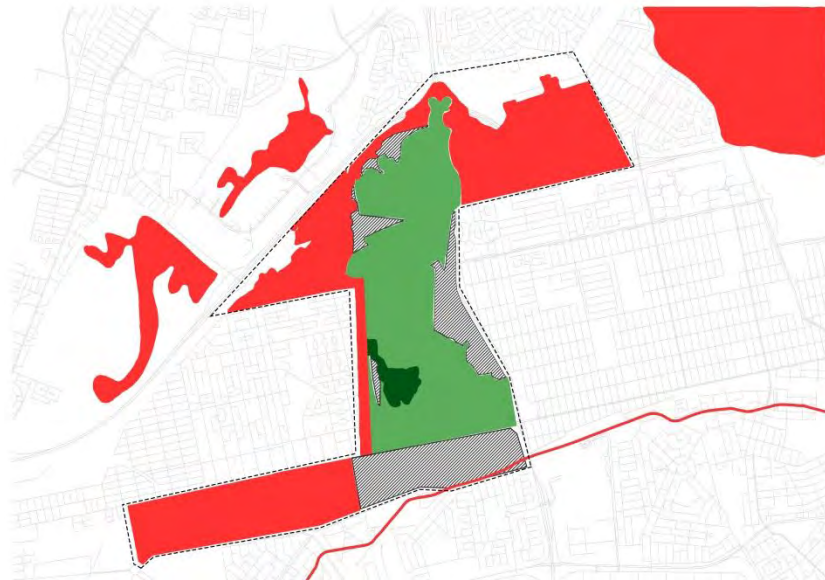
These opportunities include Voortrekker activity corridor, that is the primary activity spine in the CTMR. The Frans Conradie spine can create a linkage through the Wingfield site, to connect the N1 City and Century City commercial nodes. There are two train Stations one situated in the north and the other in the southern portion of the Wingfield site. These stations offer great development potential for institutional and commercial activities in the form of transit hubs which extend along a horizontal activity spine, connecting the two station.



7.6 Implication for the WDP

The site and environ study include the critical analyses of the biophysical elements and the structural informants currently working in the Wingfield study area. These analyses were done to identify the various biophysical development restrictions within the study area, to indicate where development cannot take place, and to identify the different structural informants which present the various structural opportunities and constraints that will impact the design and development outcomes of the WDP.

Figure 41 shows the base map information that will be used for the design phase of the WDP. This base map is a final composite map of all the information gathered from the site and environ study.



Chapter 8

Wingfield Development Proposal

The WDP consists of a spatial development framework for the redevelopment of the Wingfield site. This spatial framework includes a systematic presentation of various conceptual layers which informs the final designs and development outcomes of the proposal. The purpose of the “package of plans approach”, is to guide the reader through the systematic design processes followed.

8.1 Purpose of Development Proposal Overview

This development proposal, strives to achieve the following development objectives through good settlement-making and design practices which include:

Increase Densities and Urban Intensity

The purpose of the WDP is to create a dense mixed-use infill development. It aims to be a catalyst for similar future infill developments, which will contribute towards the integration and intensification of the CTMR and reverse the current fragmented and inefficient urban form.

Ecological Sustainability

The development proposal aim to protect and preserve the critical biodiversity areas on the Wingfield site that form part of the metropolitan ecological biodiversity network. The proposal also strives to create the required conditions and provide the needed facilities for ensuring local food and water security.

Equality and Accessibility

The WDP will seek to create a dense and intense urban environment which, at the same time, is pleasant, comfortable and legible. The proposal seeks to provide equality of access and socio-economic opportunities for all its residents. This will be achieved by developing an urban structure that prioritises NMT movement in conjunction with an efficient internal public transport system.

Economic Sustainability

The development proposal aims to create a self-sustaining urban environment that offers its residents sufficient social and structural conditions to create sustainable internal socio-economic opportunities. It will, at the same time, provide its residents with efficient access to the rest of the metropolitan region, especially to areas with higher order socio-economic opportunities such as the Cape Town CBD, Bellville and Century city.

Create Choice Rich Environment

The development will offer dwelling units that consist of different residential typologies and prices for a multiple choice of lifestyle. However, the development will primarily cater for families with limited resources.

Elements of the Proposal

This chapter will consider the following elements which contribute towards the WDP

- Protected Areas
- Internal Green system
- Public open space system
- Street Grid Structure and Legibility Elements
- Public Transportation
- Mixed Land-use Allocation
- Building Intensities

8.2 The Conceptual Grid

The WDP is based on an 300x300 meter conceptual grid, which provides the base-line structuring canvas on which the design and development outcomes are based (Figure 42).

The conceptual grid provides the structuring framework for the establishment of superblocks, which are defined by an internal higher order road network. These higher order roads are the vehicular integrators that tie the Wingfield development with the surrounding areas of Goodwood, Kensington and Century City. Where these internal roads intersect, good opportunities for institutional clusters and socio-economic hubs are created.

The superblocks are derived from a conceptual model which follows variations of 20 meter and 10 meter streets to create approximately 65x65 meter internal development blocks. This conceptual model provides the platform for a fine-grained grid-like structure on which plots will be allocated at the detailed precinct scale. The conceptual model is shown in figure 43.

Because of its numerous benefits, a gridiron structure is used as the structuring element of the WDP, which include (Knight, 2013):

- *Walkability*

Providing the correct block sizes, the grid structure is inherently walkable and accessible.

- *Legible*

The grid give an immediate sense of direction and distance.

- *Efficient*

A grid allows for economical and convenient service delivery due to direct linear access and service placement. The rectangular shape of a grid allows for the efficient placement of buildings, maximising the developable area.

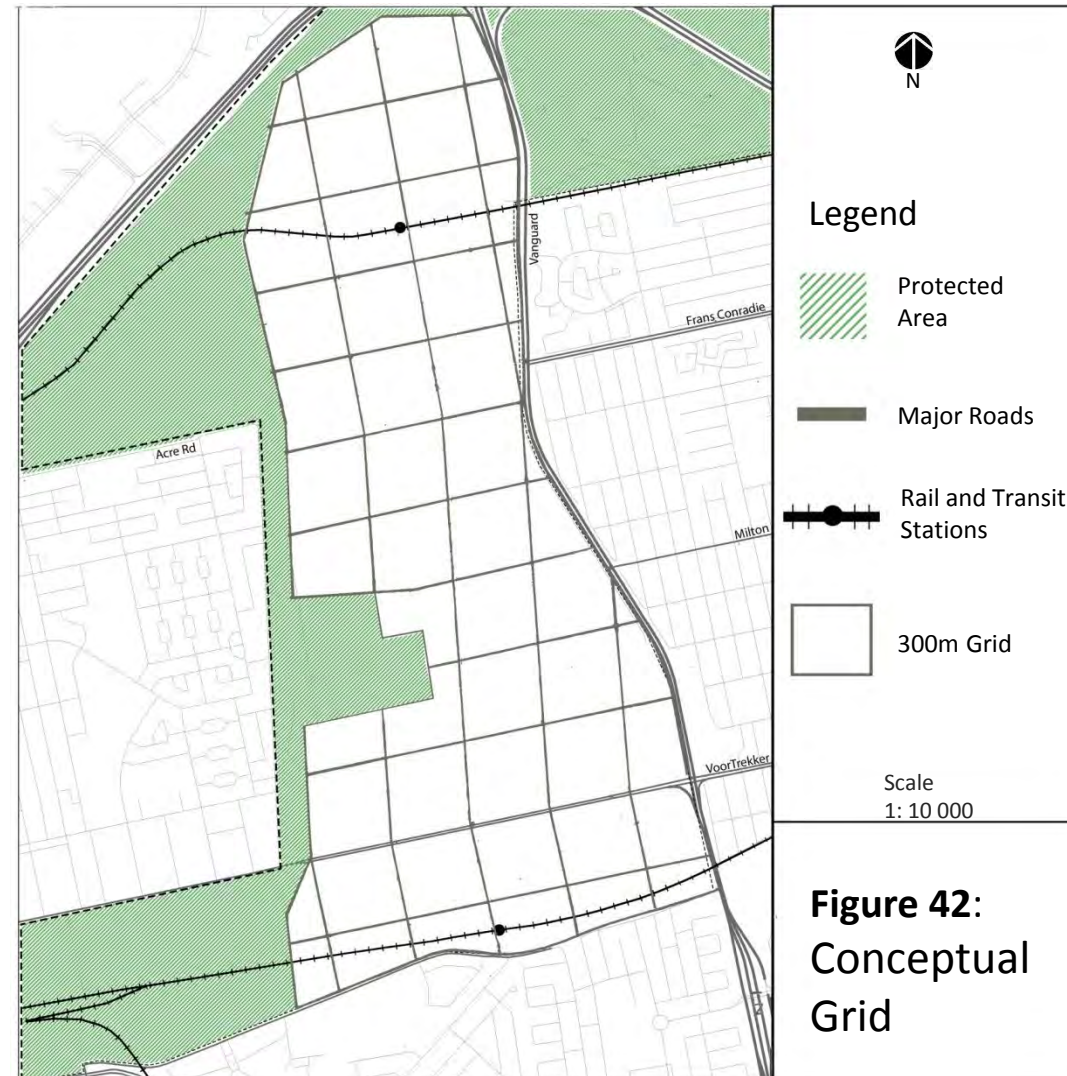


Figure 42:
Conceptual
Grid

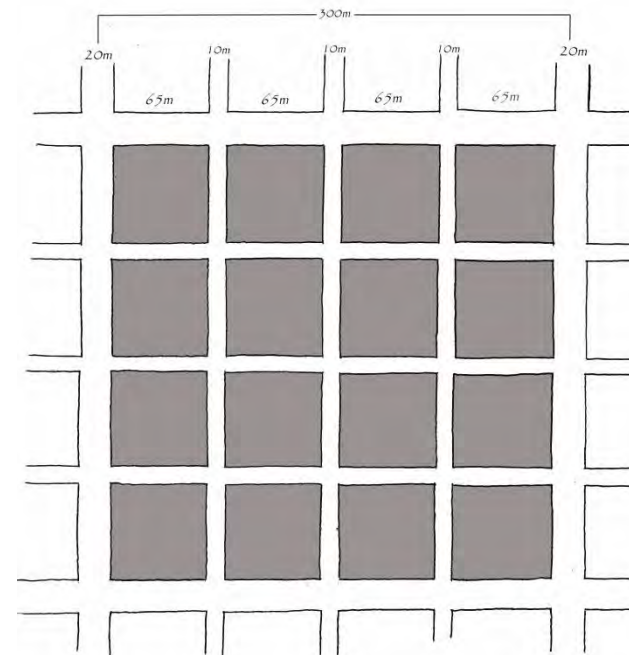


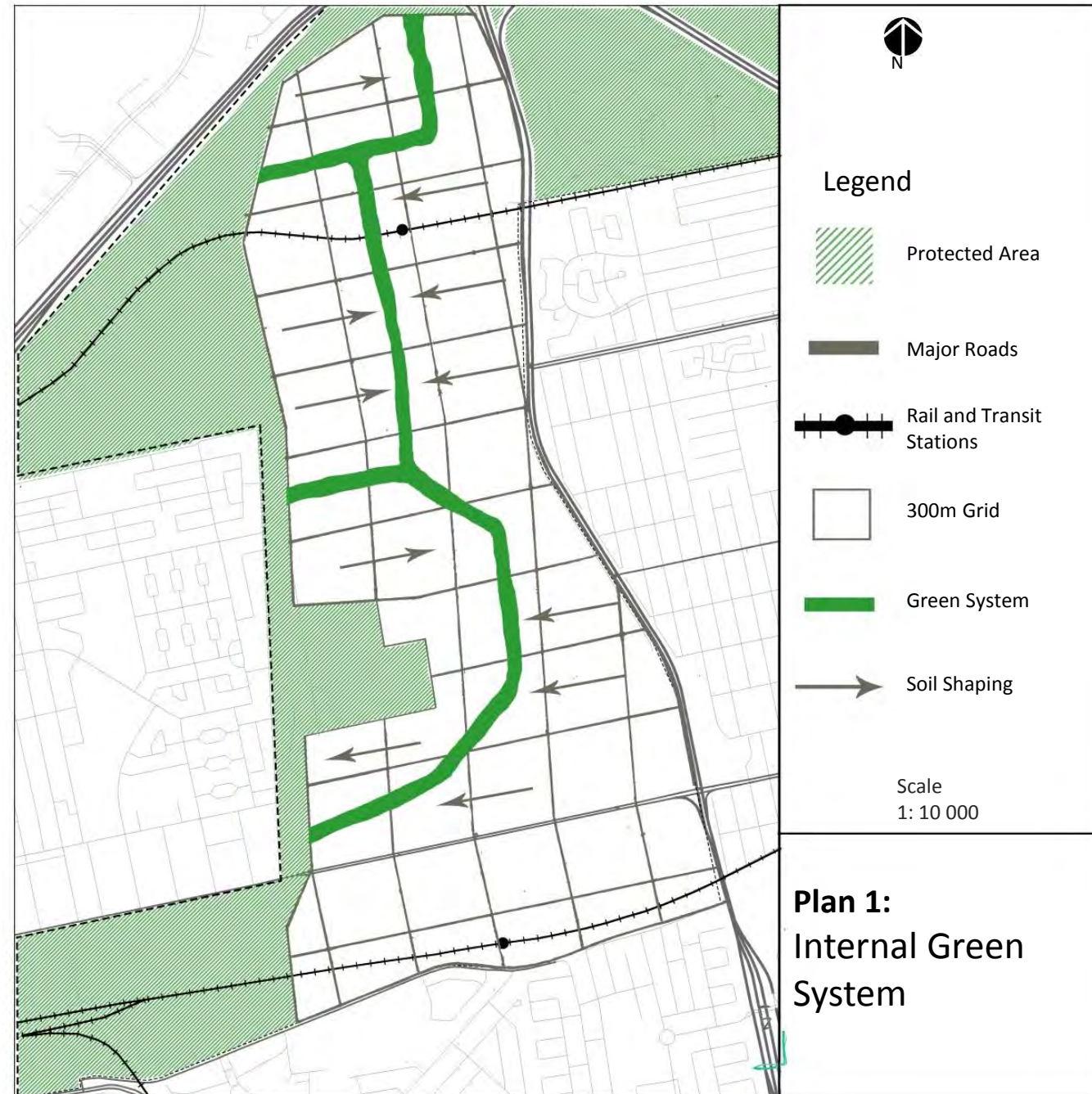
Figure 43: Conceptual make-up of a superblock

8.3 Conceptual Internal Green System

Because of the extremely flat topography of the site, re-contouring will be required to achieve sufficient drainage conditions. As the site naturally drains from north to south, this development proposal calls for the shaping of the soil to slope and drain inwards from east and west to the centre of the site. From there the site will naturally gravitate drain in a southerly direction via the proposed green system.

The local green (Plan 1) system is a 30 meter wide ecological corridor that stretches from the northern portion of the protected biodiversity area through the centre of the site to its outlet in the south western portion of the protected area.

This green system has five primary functions: it functions as a mechanism for improving the surface drainage of the site by incorporating an artificial channel in the centre of the system; it functions as the primary scenic NMT route through the site; the green system provides contrasting space of visual relief from the very dense and intense urban environment (Beherns & Watson, 1996); it functions as an ecological corridor that form part of the metropolitan biodiversity corridor and lastly it incorporates a water retention system. This incorporates retention facilities which are allocated where the green corridors intersect or make a 90 degree turn. These retention facilities function as water features which add to the scenic beauty of the development and amenity together with ensuring local water security by recycling grey storm water drainage.



8.4 Conceptual Public Space Allocation

Any settlement design should start with the strategic placement of public spaces within a conceptual grid. This is important as public spaces are the focal points of community life and therefore settlement-making should prioritise human activities appose to vehicular movement. This notion is supported by Behrens & Watson (1996: 67) who argues that

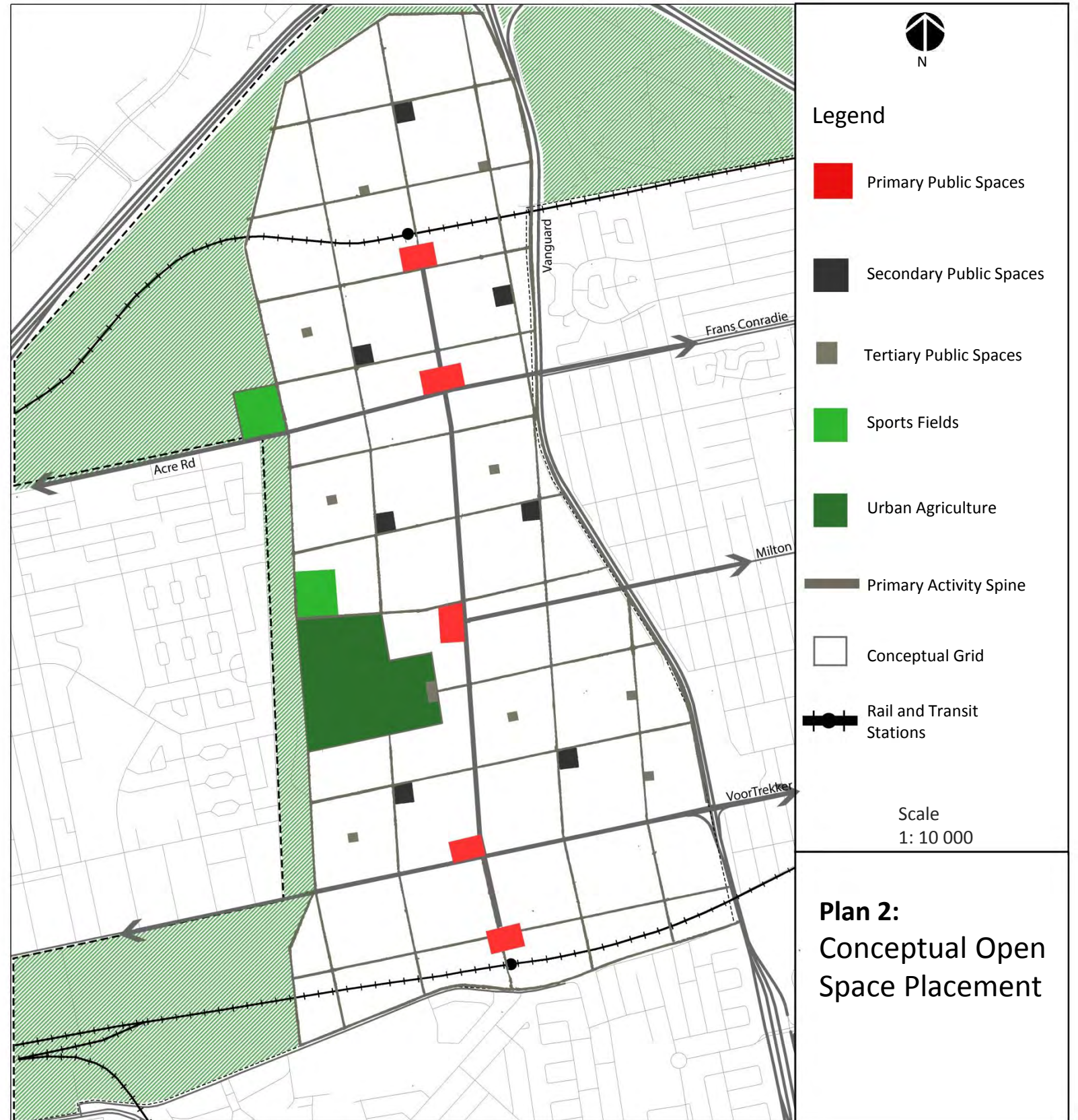
“A hierarchical system of public spaces should form the main organising structure of urban settlements – as opposed to vehicular movement channels dictating settlement structure”.

Plan 2 shows the placement of the public space hierarchy within the WDP. These public spaces were strategically allocated within the 300 meter conceptual grid in accordance with the two primary activity spines which are 30 meters wide.

The allocation of the public spaces were done in accordance with the hierarchical classification. Primary public spaces are located at the major intersections of the primary activity spines, the secondary spaces are located along the higher order roads and the tertiary public spaces are located at the intersections of lower order streets.

The activity spines are determined according to the external structuring elements presented in the previous structural informants section. The two primary activity spines were established in accordance with the major existing structural opportunities surrounding the site. The vertical activity spine links the two transit stations located within the site and the horizontal spine is an extension of Frans Conradie Drive, to create a link between Century City and N1 city.

Soft spaces, such as urban agriculture and sport fields, are strategically located next to the protected area and close to major routes, for convenient access. An informal agricultural market space is allocated in a similar fashion.



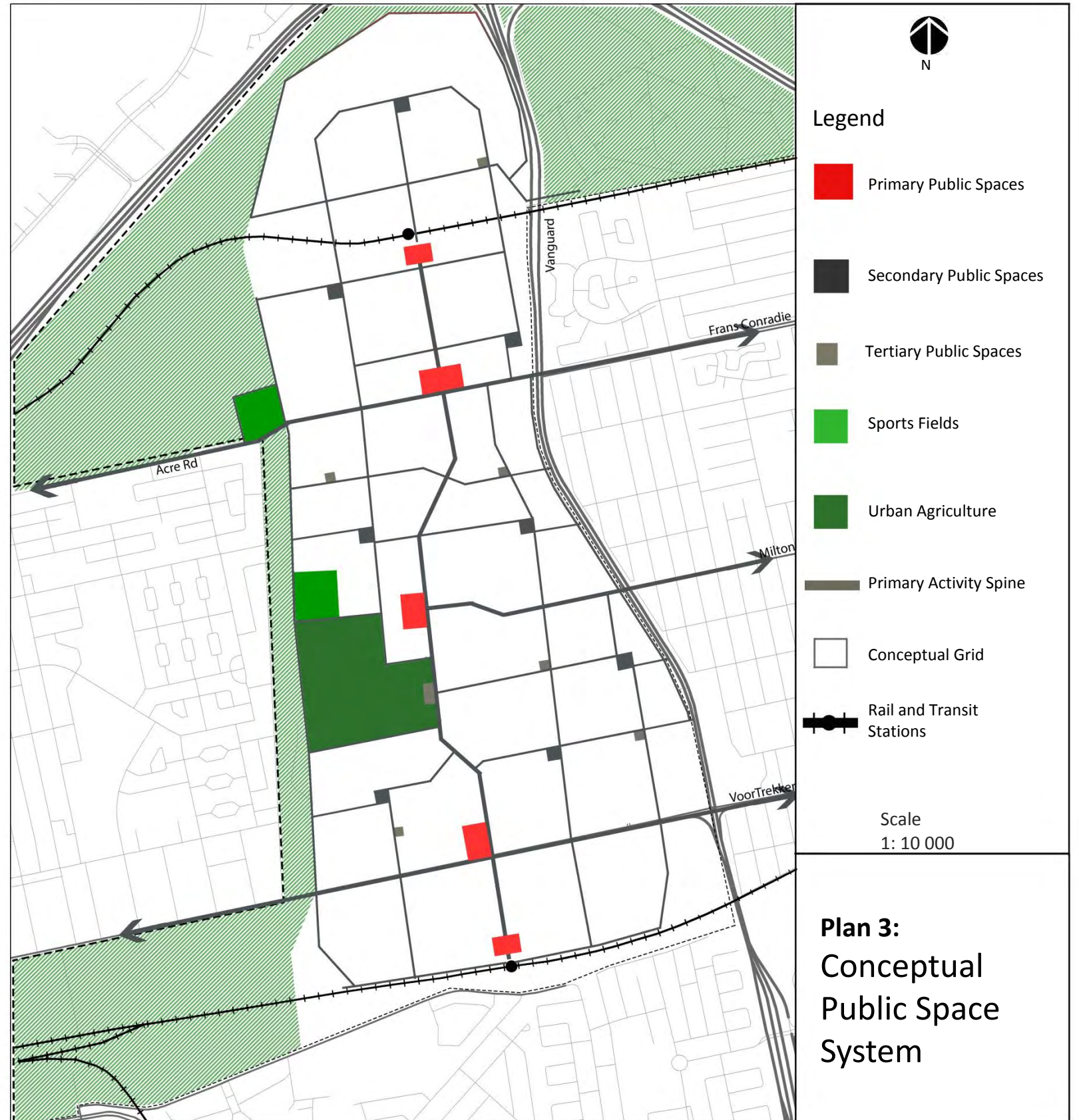
8.5 Conceptual Public Space System

Plan 3 shows the conceptual public space system for the WDP. It must be noted that, after the placement of the public space hierarchy, each hierarchical class accommodates a different order of public institutional clusters. This is made clear by Beherens & Watson (1996: 67) who states that

“The second principle structuring elements of urban settlement are public institutions and facilities, and public spaces are the main mechanisms for gathering and ordering of these”.

In this regard, primary public spaces accommodate higher order civic institutions. Secondary spaces accommodate lower order institutions and tertiary public spaces accommodate low order institutions and facilities. Table 6 shows the public institutional hierarchy and how the different order of institutions fit into the public space hierarchy. The allocation of the institutional hierarchy stems from the fact that different order institutions require different levels of exposure to fill their different threshold requirements. In this sense higher order institutions require greater levels of support and needs to be located at locations that offer more exposure and lower order institutions requiring locations with less exposure (Dewar & Kiepiel, n.d).

The purpose of the urban agricultural land in the western portion of the site, is to ensure sustainable local food security and livelihoods. The produce can either be utilised in a subsistence manner, or can be sold as a means of income at the informal agricultural market. The urban agricultural land is strategically imbedded into the urban fabric to allow the potential of an urban agricultural village to emerge in the urban area surrounding the agricultural land.



The community will share the sports fields that are located along major routes to ensure the convenient access for schools during daytime and for adults during the evening. This will require good lighting for night time use and security reasons. The fields will incorporate a clubhouse and additional sport facilities such as a gymnasium and swimming pool. These facilities can be utilised by the public as amenities and for social events.

The final structuring element includes an internal movement system. Local streets are essential for linking the various public spaces and for completing the public space network. The public street also functions as a “public space” and therefore play a central role in social interaction, community events and street trading (Beherns & Watson: 1996).

This notion is supported by Beherns & Watson (1996: 68) who states that “the location of the public spaces should be closely integrated with the internal movement system”.

It is in this regard that the placement of streets and activity spines act as integrators between the various hard and soft public spaces, to offer pedestrians, vehicles and all public transport modes, efficient and equal access to public institutions and facilities.

For achieving this, the conceptual grid was softened by implementing various design initiatives to create an interesting, yet integrated, movement system within the WDP.

These initiatives include the allocation of pin-wheels at certain intersections and a deviation along the primary vertical activity spine to create an appealing, yet functional, streetscape throughout the site. The pinwheel concept functions as a structural element for traffic management. It does not only soften the grid, but also regulate vehicular speed to safeguard pedestrian movement.

However, the underlying 300 meter grid-like superblock structure, is still visible because of the major benefits that the grid offers as mentioned before .

Public Institutional Hierarchy	Primary Public Institutional Clusters	Secondary Public Institutional Clusters	Tertiary Public Institutional Clusters
Tertiary Institutions (Tertiary Education, Day Hospital)	√	*	*
Resource Centres (Civic Hall, Library, Skills centre, Municipal Office, Magistrate Court, Sport Centre)	√	*	*
Secondary Schools	√	√	*
Primary Schools	√	√	*
Pre- Primary Schools	√	√	√
Clinic	√	√	√
Police Stations	√	√	√
Fire Stations	√	√	√
Traffic Offices	√	√	√
Post Offices	√	√	√
Places of Worship	√	√	√

Table 6: Institutional Hierarchy

8.6 Programme

Table 9 shows the allocation of the different order public institutions and facilities within the public space hierarchy according to the Western Cape threshold parameters (2012) shown in table 8. The method which was followed during the calculations is shown in table 7 .

The site was divided into a number of blocks (Figure 44). Each block was evaluated broadly in terms of its development potential (character and location) to determine the theoretical allocation of public institutional facilities.

In Table 7 the Calculated area (column2) represents approximately 70% of the gross area, as 30% are deducted as norm for the allocation towards movement and open spaces. The potential for commercial activities (column3) represents the areas allocated towards this use.

Column 4 depicts a ratio between residential and public facilities varying between a 50/50 and 40/60 split, depending on the location and potential of the specific block.

Column 5 depicts the nett potential residential extent available per block. Column 6 summarises the potential number of residential units in the block (calculated at an average of 200 units / ha) that provided the population thresholds to calculate the number and hierarchy of public facilities in each block.

Calculation	Total Plot Size (ha) gross	Calculated Area (ha) nett	Commercial Activity (ha)	Residential/ Public Facilities Ratio	Calculated Residential area (ha)	Calculated Dwelling Units/Hectare
Block 1	54	38	none	60/40	23	4600
Block2	54	38	1	60/40	22	4400
Block 3	63	44	3	50/50	21	4200
Block 4	63	44	4	50/50	20	4000
Block 5	25	18	3	60/40	9	1800
Block 6	45	31,5	7,5	none	None	24ha Industrial
Developable total	304					
Green area	350					
Total	654					

Table 7: Programme Calculations

Threshold Parameters		
Facility Categories	Population Threshold/Facility	Site Criteria/Facility
Education		
Pre-Primary School	900 Dwelling Units	900m2
Primary School	1000 Dwelling Units	2ha
Secondary School	2500 Dwelling Units	3ha
Tertiary Education Facility	37500 Dwelling Units	3 - 5ha
Health		
Clinic	5000 - 40000 Dwelling Units	0.125 - 1ha
Day Hospital	112 500 Dwelling Units	2- 5ha
Civic		
Place of Worship	500 Dwelling Units	1000 - 1500m2
Library	8800 Dwelling Units	0.1 - 0.2ha
Post Office	2500 Dwelling Units	100 - 500m2
Traffic Office	6250 Dwelling Units	5000m2
Police Station	6250 Dwelling Units	0.1 - 1ha
Fire Station	15000 Dwelling Units	1.2 - 2ha
Community Hall	2500 Dwelling Units	0.2 - 0.5ha
Municiple Office	12500	0.3 - 0.5ha
Magistrate Court	n.a	0.5 - 2ha
Recreation		
Swimming Pool	n.a	1ha
Sports Stadium	25000 Dwelling Units	2 - 3ha

Table 8: Western Cape Threshold Parameters

Facility Allocation						
Blocks Nr.	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
Education						
Pre-Primary School	5	5	5	4	2	*
Primary School	4	4	4	4	2	*
Secondary School	2	2	2	2	1	*
Tertiary Education Facility	*	*	1	*	*	*
Health						
Clinic	1	1	1	*	*	*
Day Hospital	*	*	*	*	*	*
Civic						
Place of Worship	9	8	8	8	4	*
Library	*	*	1	1	1	*
Post Office	*	*	1	1	*	*
Traffic Office	*	*	1	*	*	*
Police Station	*	*	1	*	*	*
Fire Station	*	*	1	*	*	*
Community Hall	*	*	1	*	1	*
Municipal Office	*	*	*	*	1	*
Magistrate Court	*	*	*	*	1	*
Recreation						
Swimming Pool	*	1	*	1	*	*
Sports Stadium	*	1	*	1	*	*

Table 9: Institutional Allocations

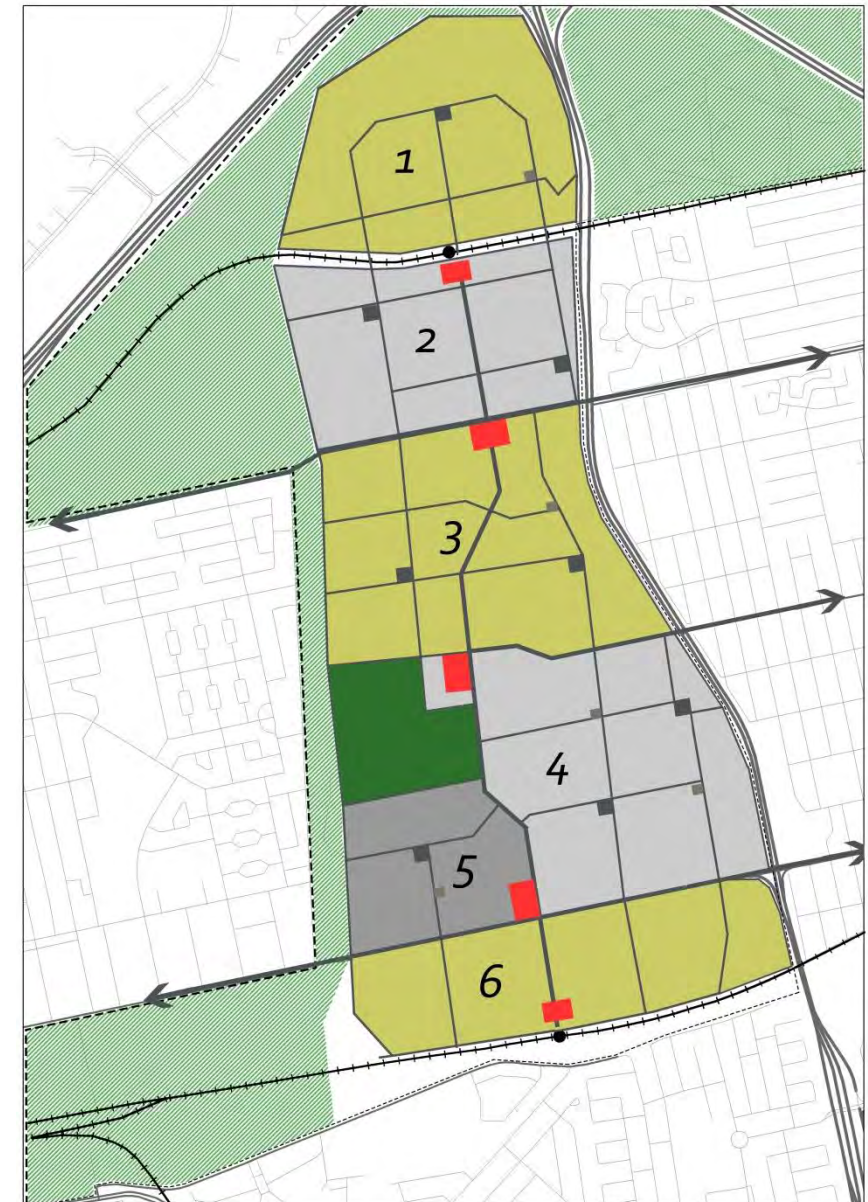


Figure 44: Allocated Blocks

8.7 Wingfield Development Framework

Drawing from the various conceptual layers presented in the previous section of this design proposal, Plan 4 to 9 illustrates the overall spatial framework for the Wingfield development.

Plan 4 presents the hieratical public space system that includes the various hard and soft open spaces which will function as the focal points of community life. This public space system is integrated with the proposed internal movement system, which provides equal access to socio-economic activities throughout the site. This section will discuss the key design and development outcomes of WDP.

Great Public Squares

Plan 4 incorporates two primary public spaces which will function as the two social and institutional hearts of the Wingfield development. They will operate as the central points of community life functioning as great public squares which are surrounded by intensive high-rise, mixed-use buildings which house the highest order institutions in the proposal.

The first great civic node is an approximately 100x110 meter plaza, located where the vertical and horizontal activity spines intersect. This public space is essential in the entirety of the public open space system, as it is located at the most accessible location within the WDP. This great square will be discussed in more detail at the detail precinct level.

The second major public square, is a 80 x 100 meters hard public open space which is located where the Milton Road corridor intersects with the vertical activity spine. This space will be enveloped by intensive high-rise mixed-use activities which will include some of the highest order public institutions. This public square will accommodate infrastructure for informal activities to stimulate the local economy and add to the vibrancy of the space.

Primary Activity Spines

In plan 4 the movement system is based on two primary activity spines to create internal and external socio-economic linkages through the Wingfield site.

The vertical spine moves through the centre of the site, binding the two major transit hubs, which anchor the public space system, in the north and south. These two transit hubs provide residents access to the major socio-economic centres throughout the CTMR, as they form part of the Cape Town Metropolitan rail network.

The vertical spine functions as the primary activity corridor that promotes fine-grained intensive mixed-use activities along the entire route. The spine promotes preconditions which favour small-scale economic activities in stead of larger enterprises.

The horizontal activity spine is the primary external integrator, knitting the site to its surrounding urban fabric. It creates a horizontal linkage between two of the major commercial nodes in the CTMR, namely N1 City and Century city .

These activity spines will function as major linear public spaces to promote intensive commercial, social and movement activities by prioritising on-street pedestrian movement. For this purpose, they take on the form of multi-functional boulevards that promote efficient conditions for an internal public transportation system, as well as accommodate private vehicular access. However, for these boulevards to function as great linear public spaces, they are landscaped with colonnaded street frontages to promote convenient, yet efficient and vibrant ,pedestrian activities.

The WDP incorporates core characteristics derived from the principles related to transit orientated development which promotes the integration of mixed land-use activities and transportation infrastructure to ensure equal, efficient yet convenient access to socio-economic opportunities.

Precedents

Great Boulevards

Market Street San Francisco is a prime example of a multi-functional boulevard that provides NMT infrastructure, efficient space for pedestrian activities and accommodate both public and private transport.



Public Squares

Piazza Della Repubblica Italy is a fitting precedent for the two great public squares. The piazza is approximately the same size and serves a similar civic purpose.



Activity Routes

The various activity routes, which define the internal superblock structure, function as secondary movement integrators within the site, as depicted in plan 4. They function as east–west connector routes and north-south orientating secondary activity corridors, which function as linear public spaces and promote conditions for potential intensive mixed-use activity. The primary role of these activity routes is to improve the accessibility and integration throughout the Wingfield development.

These routes connect the lower order public spaces to the primary activity spines, as well as providing secondary external access routes to the surrounding areas of Goodwood and Kensington.

These streets accommodate both public transport and private vehicular access and provide non-motorised transport infrastructure to ensure efficient, convenient and safe pedestrian movement. This will be complemented by on-street building frontages to ensure community surveillance, as well as street lighting for night time activities.

Ontario, Canada

Ontario Canada has promoted a longstanding TOD policy that encouraged dense mixed-use development along the Yonge Street transit corridor and its various transit stops.



Transit Orientated Development

Curitiba, Brazil

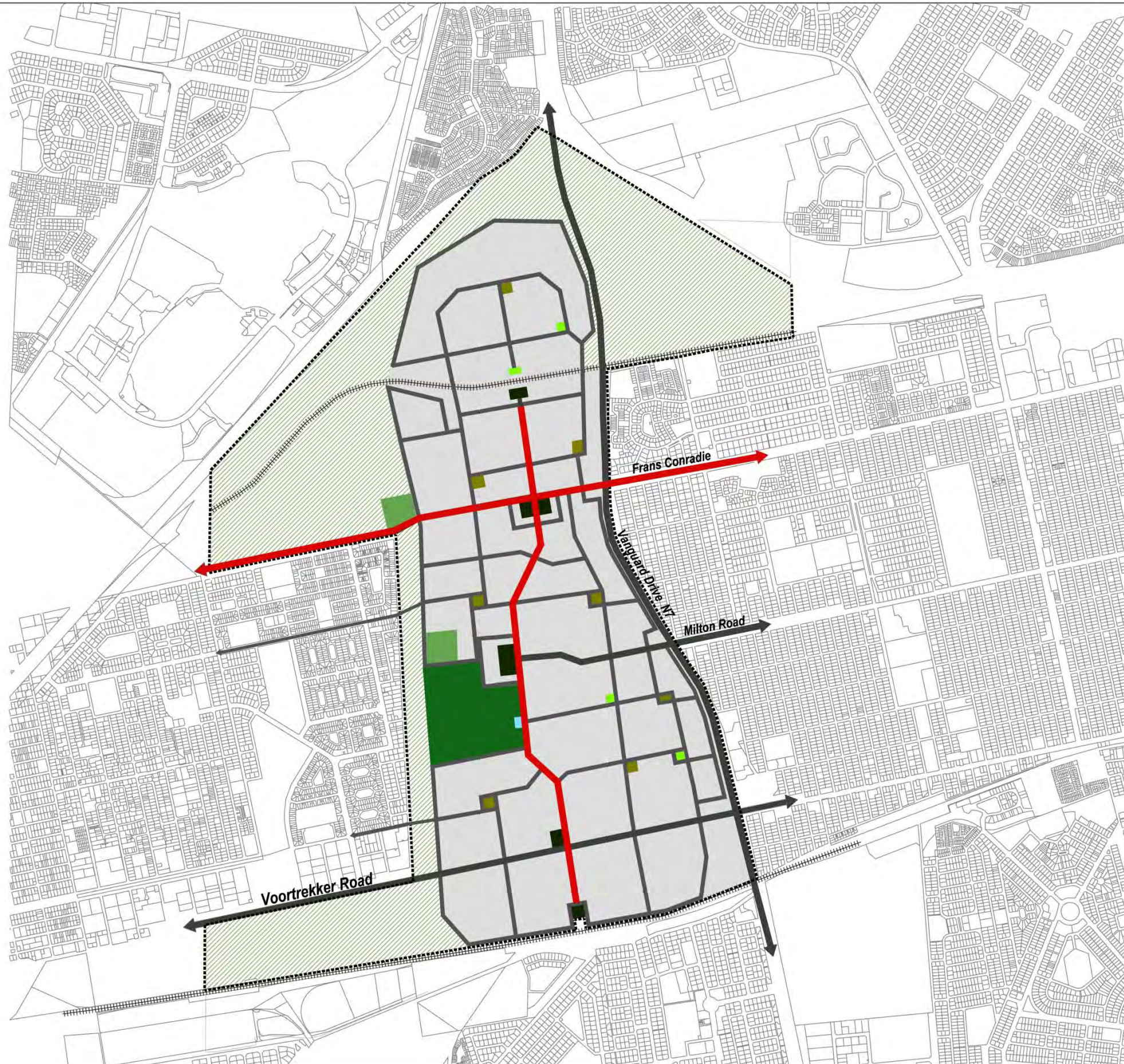
The Integration of mixed land-uses and transport infrastructure promote dense high-rise development and intensive commercial activity along the Curitiba BRT corridor.



Portland, USA

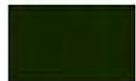


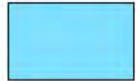





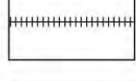
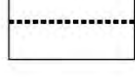
The Portland “transit mall” integrated its transit station with commercial activities which resulted in a high density TOD node.





LEGEND

Hierarchy of Open Spaces

-  Primary Open Space
-  Secondary Open Space
-  Tertiary Open Space
-  Informal market
-  Protected Area
-  Sports Field
-  Urban Agriculture
-  Access Routes
-  Activity Corridor
-  Railway line
-  Study area



Scale 1:20 000

**OPEN SPACE &
MOVEMENT PLAN**

PLAN 4

Tram Systems

The Toronto Streetcar System, Canada

The Toronto tram network is the largest integrated “streetcar” system in North America. The tram runs within the street grid and does not operate in its own lane.



BRT Systems

Curitiba BRT, Brazil

Implemented in 1974, the Curitiba BRT system was the first of its kind and paved the way for other third world countries to implement similar integrated transport systems.



8.7.1 Public Transport Plan

Plan 5 presents the two proposed internal public transportation modes that operate within the context of Plan 4. The dense urban fabric of the development proposal provides the pre-conditions for an efficient public transportation system.

The primary mode includes a linear tram line that functions as the main distributor throughout the site. The line operates along the vertical activity spine in a north-south orientation creating a dynamic linkage between the two major transit hubs and the various public spaces and institutional clusters located along the spine. The tram system operates as a linear trunk route which is supported by the BRT and NMT networks.

The secondary mode includes an internal BRT system operating in various loops as a feeder system linking the peripheral areas to the primary socio-economic and institutional opportunities along the vertical activity spine.

The TransMilenio, Columbia

The TransMilenio is the most extensive BRT system world-wide, stretching over 160 km and carrying over 2 million passengers per day (TransMilenio Statistics, 2013).

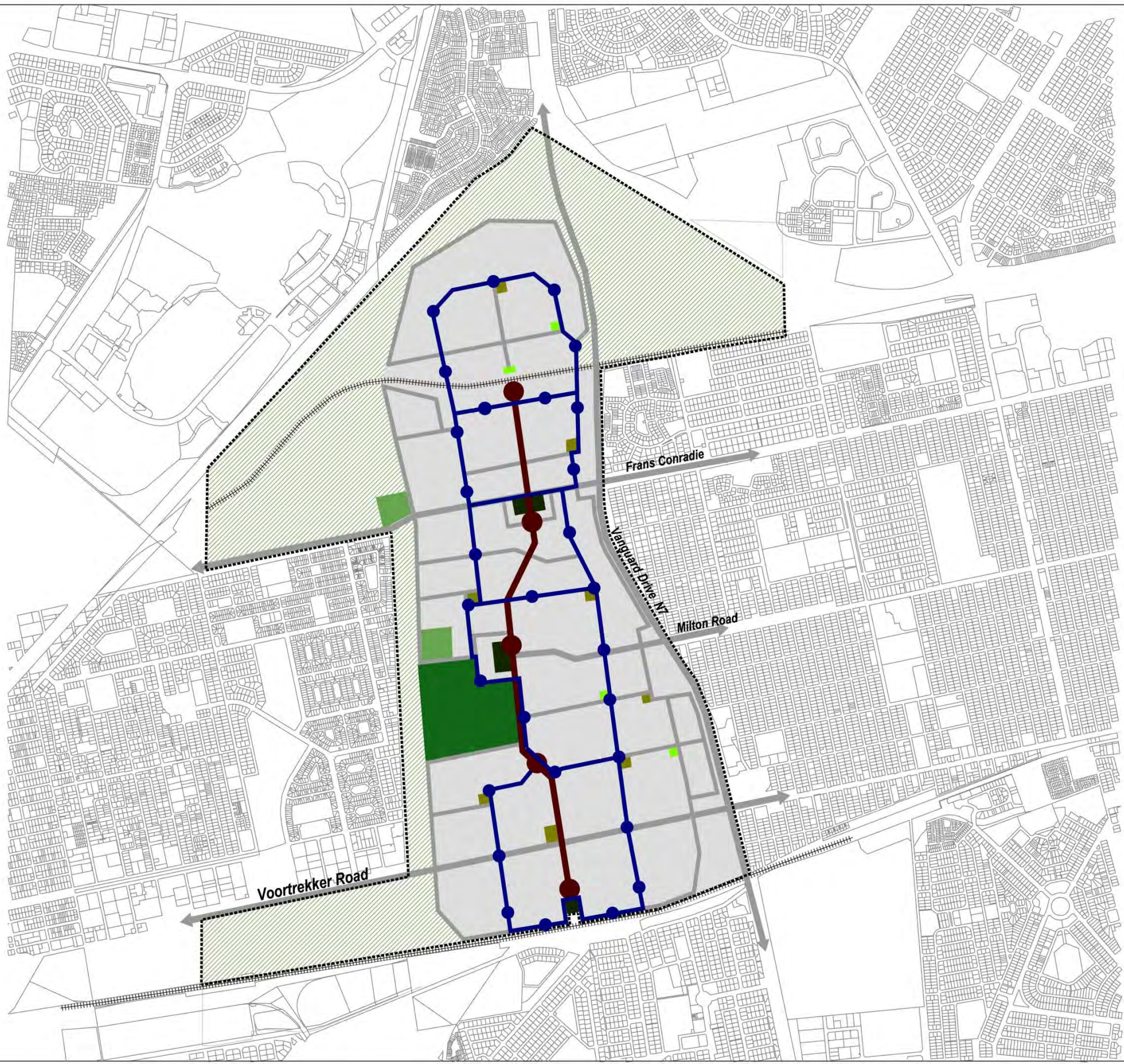


The BRT network operates within the activity routes to improve the accessibility throughout the site by providing flexible and efficient public transportation in all directions.




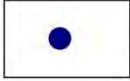
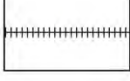
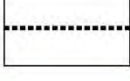






The system as a whole, functions as a closed-loop internal public transportation system, where the two modes operate in an integrated manner to reinforce and compliment each other.

The system also promotes external linkages, as it is integrated with the metropolitan rail system and the surrounding street grid. Informal mini-bus taxi's, that act as collector feeders, feed passengers from surrounding areas to the internal system. The two major transit hubs further provide external access, as they form part of the metropolitan wide rail network.

The tram stops are located every 600 meters while the bus stops are located at 300 meters intervals, to conform to the acceptable walking distance between pick-up points. The tram stops are further apart compared to the bus stops, because of the tram offering more direct trips compared to the more flexible stop-start trips offered by the BRT system. The system promotes stop-start conditions by integrating the transit stops with the proposed NMT network linking the various public spaces and institutional clusters throughout the site. This promotes convenient pedestrian access to the public transportation system and various internal socio-economic opportunities.



LEGEND

-  Internal Tram Route
-  Tram stops (every 600m)
-  20m Internal Bus Route
-  Bus Stops (every 300m)
-  Railway line
-  Study area
-  Sports field
-  Protected area
-  Urban agriculture
- Hierarchy of Open Spaces**
-  Primary Open Space
-  Secondary Open Space
-  Tertiary Open Space



**PUBLIC
TRANSPORT
PLAN 5**

Urban Greenways

Brooklyn-Queens Greenway, New York

The Brooklyn-Queens Greenway is a landscaped bicycle and pedestrian corridor which links various parks and streets, providing NMT access throughout the New York City boroughs.



Minneapolis Greenway, Minnesota

The Minneapolis greenway is a rail corridor which is integrated with NMT infrastructure to promote public and NMT usage within the city.



8.7.2 Non-Motorised Transport Plan

The Non Motorised Transport (NMT) network (plan 6), forms part of the public transportation system depicted in Plan 5. The primary NMT system is exclusively for pedestrian and cyclists.

The NMT system includes various dedicated movement pathways which consist of specific pedestrian-oriented infrastructure to promote safe, convenient and efficient pedestrian movement. The infrastructure includes bicycle and pedestrian lanes with pathway lighting to ensure secure and safe night time journeys. The NMT network operates within the proposed street network and green system presented in Plan 7. The green system provide scenic conditions and un-restricted movement which contribute positively towards the NMT experience.

The NMT network consists of a primary corridor that is embedded within the primary green corridor. This creates a direct NMT linkage between the two major transit hubs and the various public spaces and higher order institutions along the vertical activity spine.

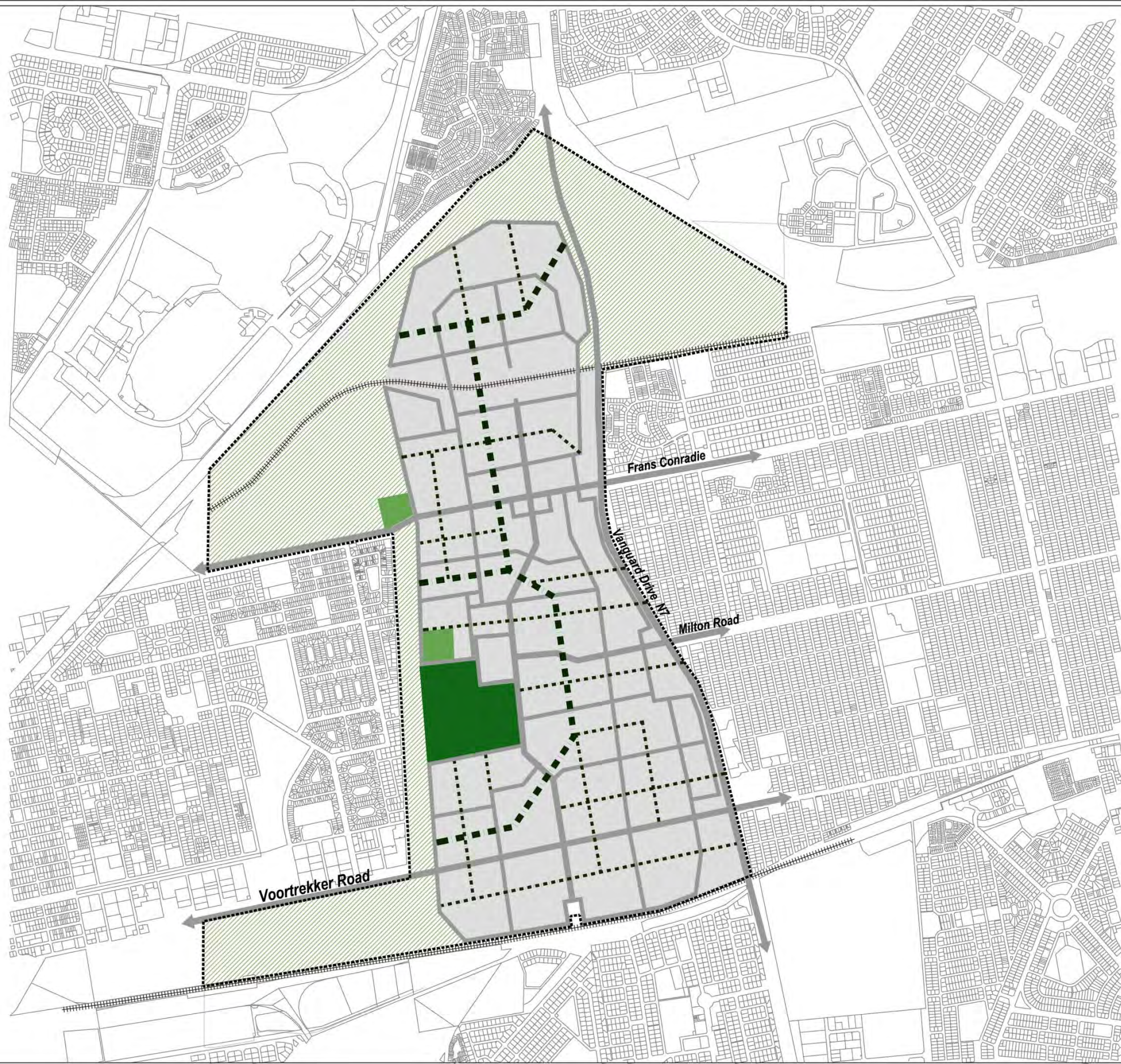
The primary corridor is supported by various secondary pathways to promote vertical and horizontal pedestrian access throughout the site. These secondary NMT pathways operate within the internal street network and secondary green corridors to provide pedestrians with direct access to the various soft open spaces and protected biodiversity areas surrounding the site.

This proposal promotes NMT usage as it is a sustainable addition and alternative to motorised transportation, while stimulating on-street movement and activity to create a vibrant atmosphere throughout the settlement.

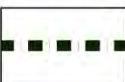
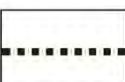
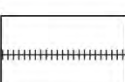




Ulu Pandan Corridor, Singapore

Supporting infrastructure is important to promote NMT usage, as illustrated by the solar powered lights along the Ulu Pandan green corridor.





LEGEND

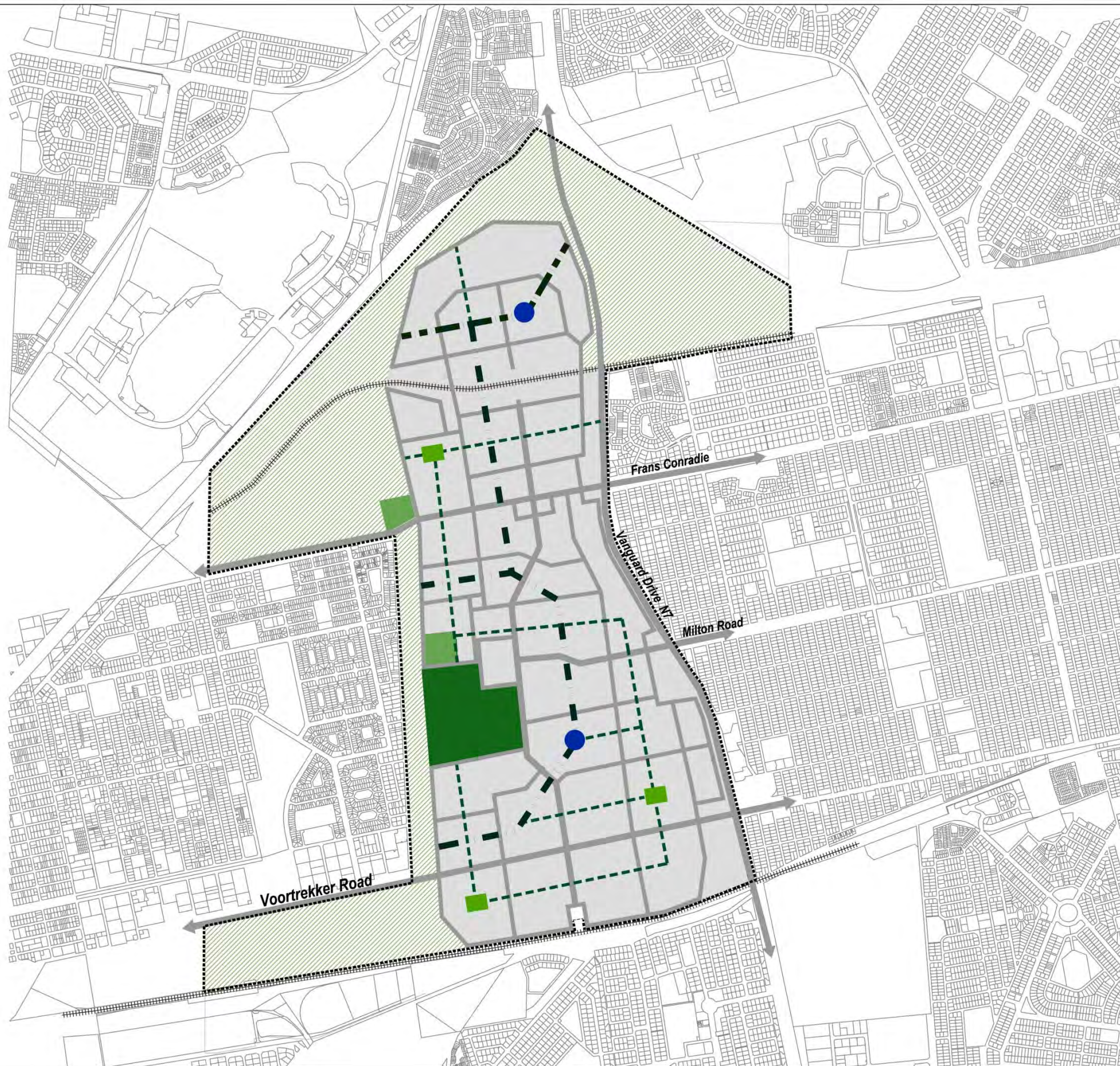
-  NMT Corridor - Primary
-  NMT Corridor - Secondary
-  Railway line
-  Study area
-  Sports field
-  Protected area
-  Urban agriculture











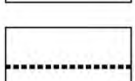
Scale 1:20 000

NMT PLAN

PLAN 6



LEGEND

-  Primary green corridor and drainage system (35m)
-  Secondary green corridor (20m)
-  Soft open spaces (40m x 40m)
-  Water features
-  Sports field
-  Protected area
-  Urban agriculture
-  Railway line
-  Study area



Scale 1:20 000

**GREEN SYSTEM &
SOFT OPEN SPACES**

PLAN 7

8.7.4 Mixed Land-use Allocations

Plan 8 shows the mixed land-use allocations for the WDP. It must be noted that the entire proposal holds mixed land-use opportunities, whilst the different land-use variations depend on the proximity of the area to the different socio-economic elements in the proposal. The mixed land-use allocation must be interpreted together with the building intensities as discussed in the following section (8.7.5).

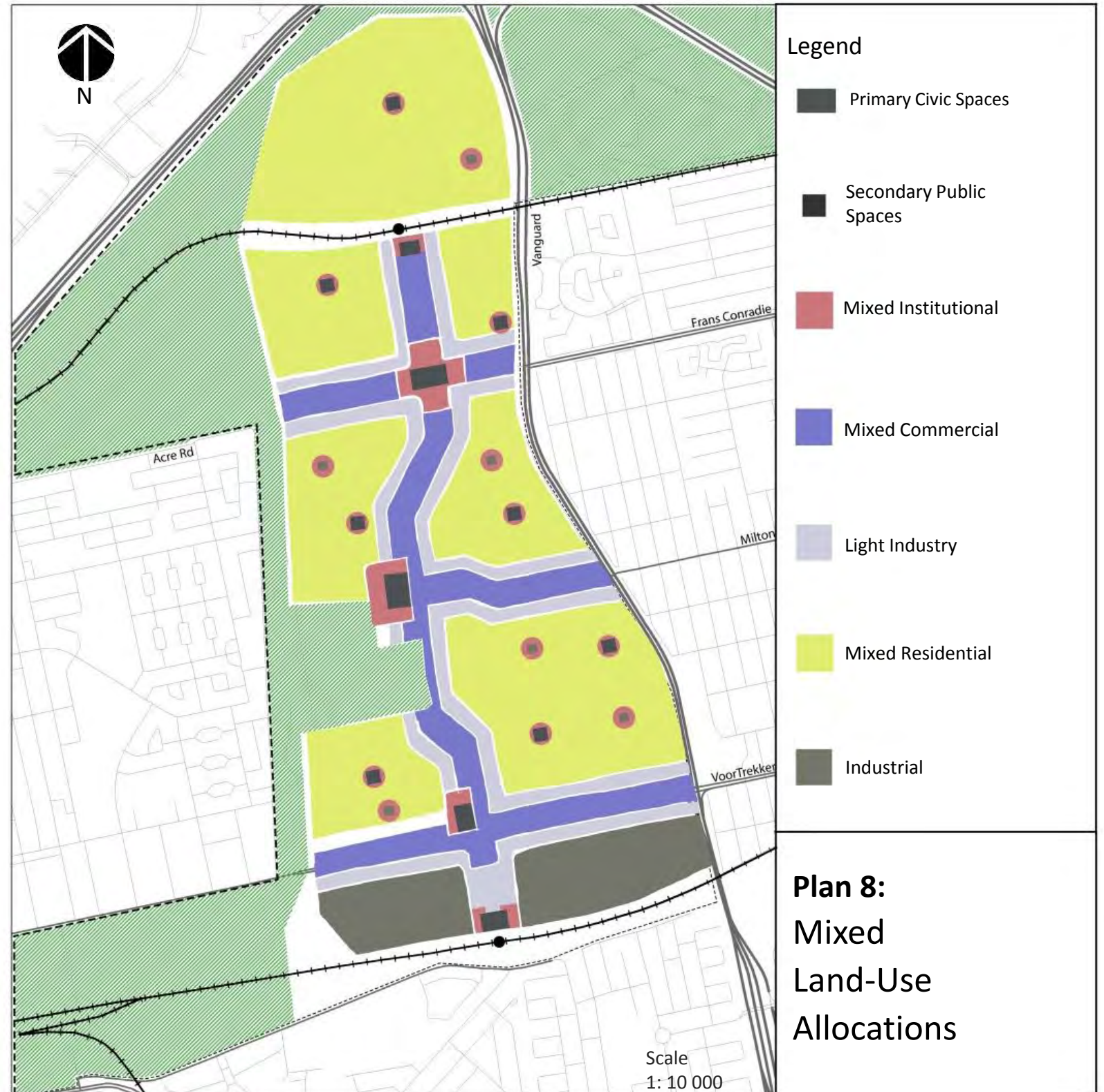
Mixed institutional land-uses primarily include clusters of civic institutions which encompass public spaces. However, as a result of the high buildings intensities and threshold requirements at these locations, they also hold the potential for commercial, office and residential activities.

The primary vertical and horizontal activity spines, consist of intensive mixed commercial activities as a result of the intense socio-economic opportunities along these spines. Mixed commercial uses include small-scale economic enterprises, office and residential activities.

Light industry is proposed abutting the two commercial spines as these activities have fewer threshold requirements. Light industry includes service industry activities together with office and potential residential uses.

Mixed residential use, predominantly incorporates residential pockets which include a variety of housing typologies. These areas hold few commercial and institutional opportunities, because of their proximity in relation to the two activity spines and civic spaces.

The mixed industrial area is located in the southern portion of the site. This area predominantly includes industrial activities with possible opportunities for commercial and office uses. Unfortunately, as a result of the various hazards posed by the industrial activities, few residential opportunities exist.



8.7.5 Building Intensities

Plan 9 shows the conceptual building height allocations for the WDP. The conceptual intensity allocations take on a bell shape. The highest buildings occur along the central spine where the greatest amount of activities take place and then flatten towards the peripheral areas where residential uses dominate.

The highest intensities are found along the primary activity spines and civic nodes, as these areas require high population thresholds to function optimally. These areas have the highest potential to accommodate a variety of land-uses.

The medium intensities are allocated along the areas of mixed light industry, just off the primary activity spines. These activities require fairly high population thresholds and also hold the opportunity to accommodate a variety of different uses.

The lowest intensities are found in the residential pockets and along the peripheral areas, where little socio-economic and civic activities are found.

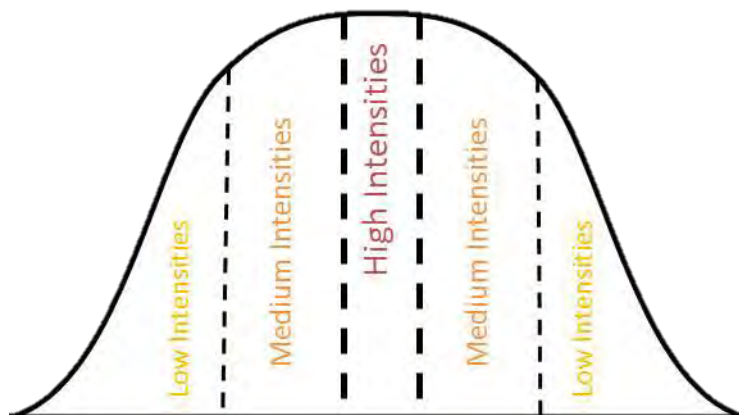
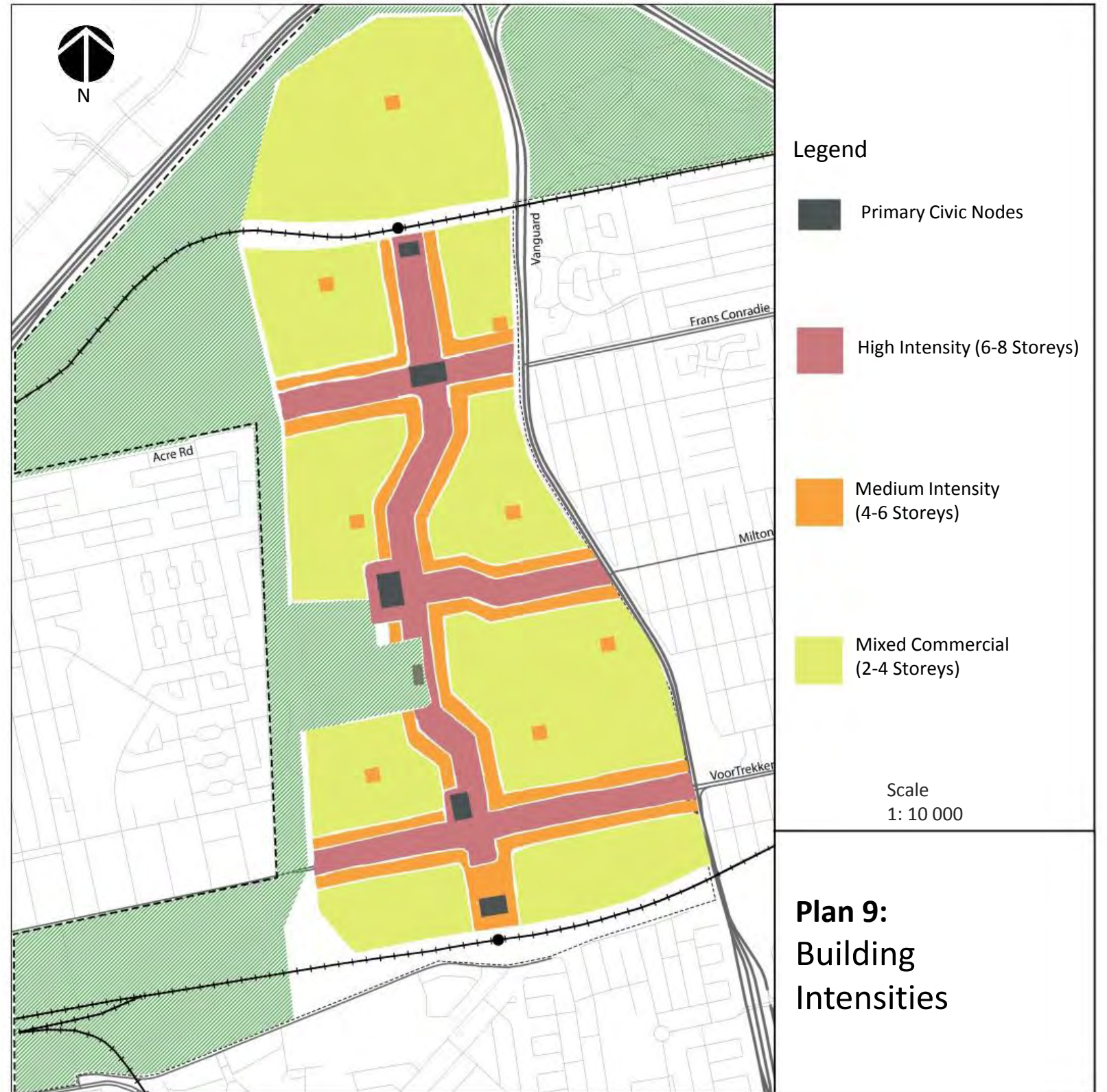


Figure 45: The proposed Building Intensities take on a conceptual bell-shape

Chapter 9

Detailed Precinct Design

This section puts forward a detailed design of a development precinct situated within the WDP. The precinct design takes place within the context of the structuring elements proposed in the spatial framework. Here, a package-of-plans approach was used to present the various layers which were processed for deriving at the final plan and to guide the reader through the design process which was followed.

Purpose of design outcomes

The precinct design will provide a glimpse of the fine-grained design and development outcomes that will proportionately continue throughout the proposal. The precinct design incorporates core urban design principles to produce an urban form that allows for the following:

- *Place-making*

An urban form that ensures the sustainability and resilience of the site by creating timeless places and spaces.

- *Permeability and Legibility*

A permeable urban form that prioritises NMT and Public transportation, together with structural legibility elements to provide direction and orientation. These movement elements will promote equal access to all socio-economic opportunities throughout the site.

- *Choice*

Design outcomes that maximise the range of lifestyle choices and allow a diversity of people to find a suitable location within the development proposal according to their personal lifestyle requirements.

9.1 Location Of Precinct Area

Figure 46 identifies the precinct area chosen for the detailed precinct design. This area was chosen as a result of its role as the socio-economic and civic heart of the WDP. This area has amongst the highest densities in the development proposal, thus confirming the wide range of institutional facility clusters and the need for a diversity of housing typologies.

Structuring elements

The structuring elements framing the precinct area, consist of four 300 meter superblocks that cover approximately 36 ha of developable land which is framed by 5 secondary activity routes. It also includes the primary civic hub, where the vertical and horizontal activity spines intersect, as well as four secondary public places encompassed by various institutional clusters. Lastly, the internal green system moves vertically through the western portion of the precinct. (Figure 47)

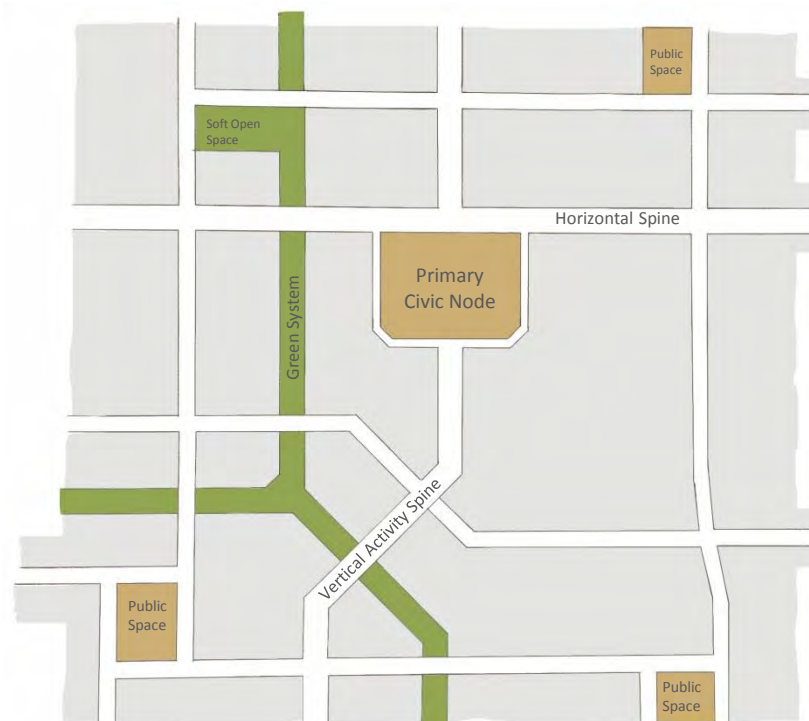


Figure 47: Structural elements within Precinct

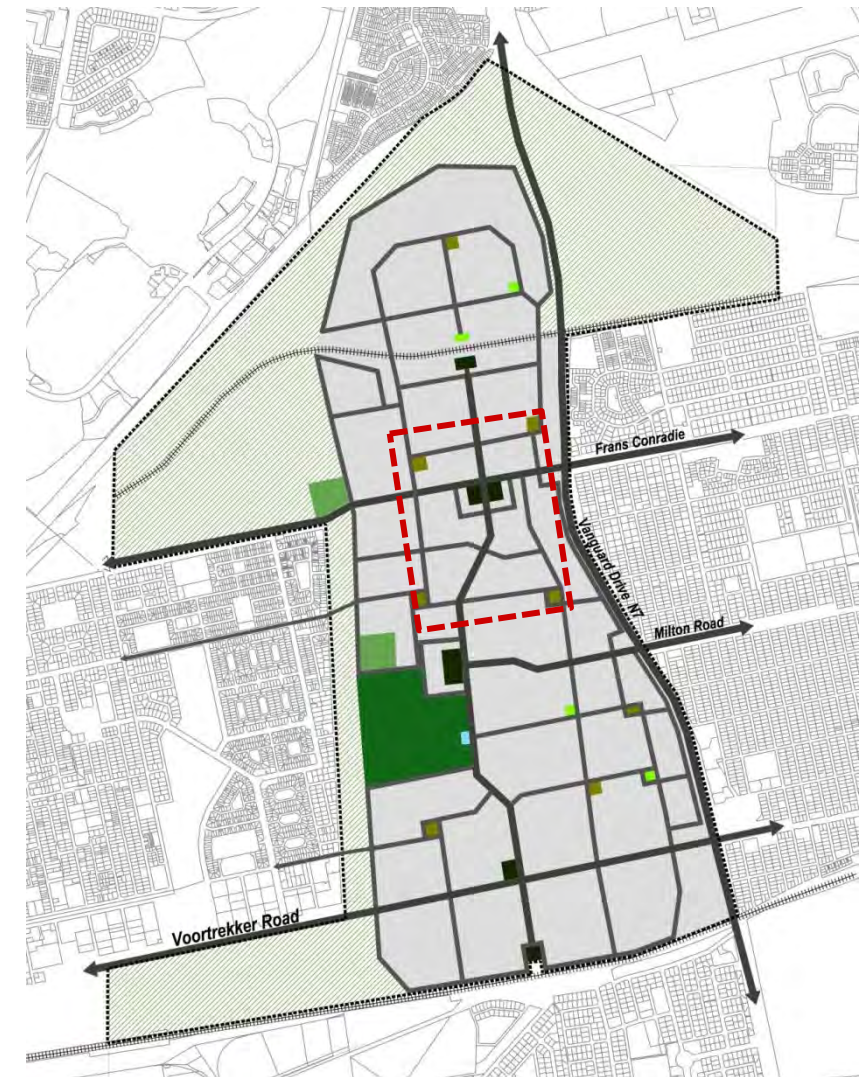


Figure 46: Precinct Area within the Development Proposal

9.2 Braking The Superblocks

The first step in the precinct design process, was to break down the course-grain 300 meter superblocks to achieve a fine-grained urban fabric that will allow for the implementation of urban design elements to create a positive urban environment.

The four superblocks were carved-up in accordance with the 20-65-10 meter conceptual grid-iron model, shown in figure 48. The 65 meter blocks are derived from the grid found in the historic Cape Town CBD.

20 meter wide secondary activity routes, frame the outer perimeters of the super blocks and 10 streets define the 65 meter fine-grained developable blocks. This will create a continuous fine-grained urban fabric that promotes permeable and legible conditions to optimise on-street social and pedestrian activities. At the same time, it will allow direct and efficient circulation to ensure equal access to a variety of socio-economic and public institutions encompassing the various public spaces.

Plan 10 shows the fine-grained blocks structure of the precinct layout. The blocks sizes were kept relatively small and consistent, varying between 50 meters and 75 meters, depending on the location and context within the super block structure.

The rigid grid was modified slightly to allow marginal irregularities within the layout, as to create closed vistas and deviating bends that facilitate interesting spaces and geometries. These locations will offer the opportunity for the placement of structural urban design elements (landmarks) to create structural exclamation points and spatial variations to ensure a legible, yet appealing, fine-grained urban structure.

The block sizes and layout structure allow for a variety of building and residential typologies to settle in locations throughout the precinct in accordance to their specific spatial and structural logic. This provides choice and variations throughout the precinct. The blocks will accommodate elongated plots with narrow frontages, to ensure efficient conditions for service and infrastructure provision.

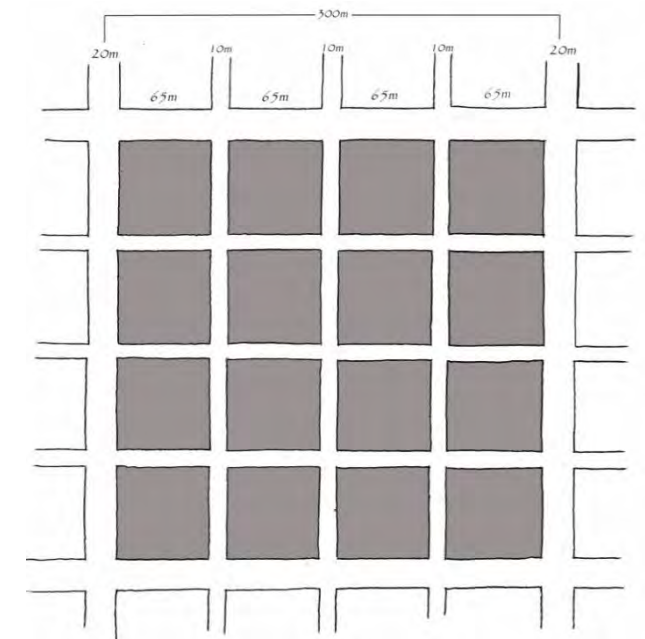
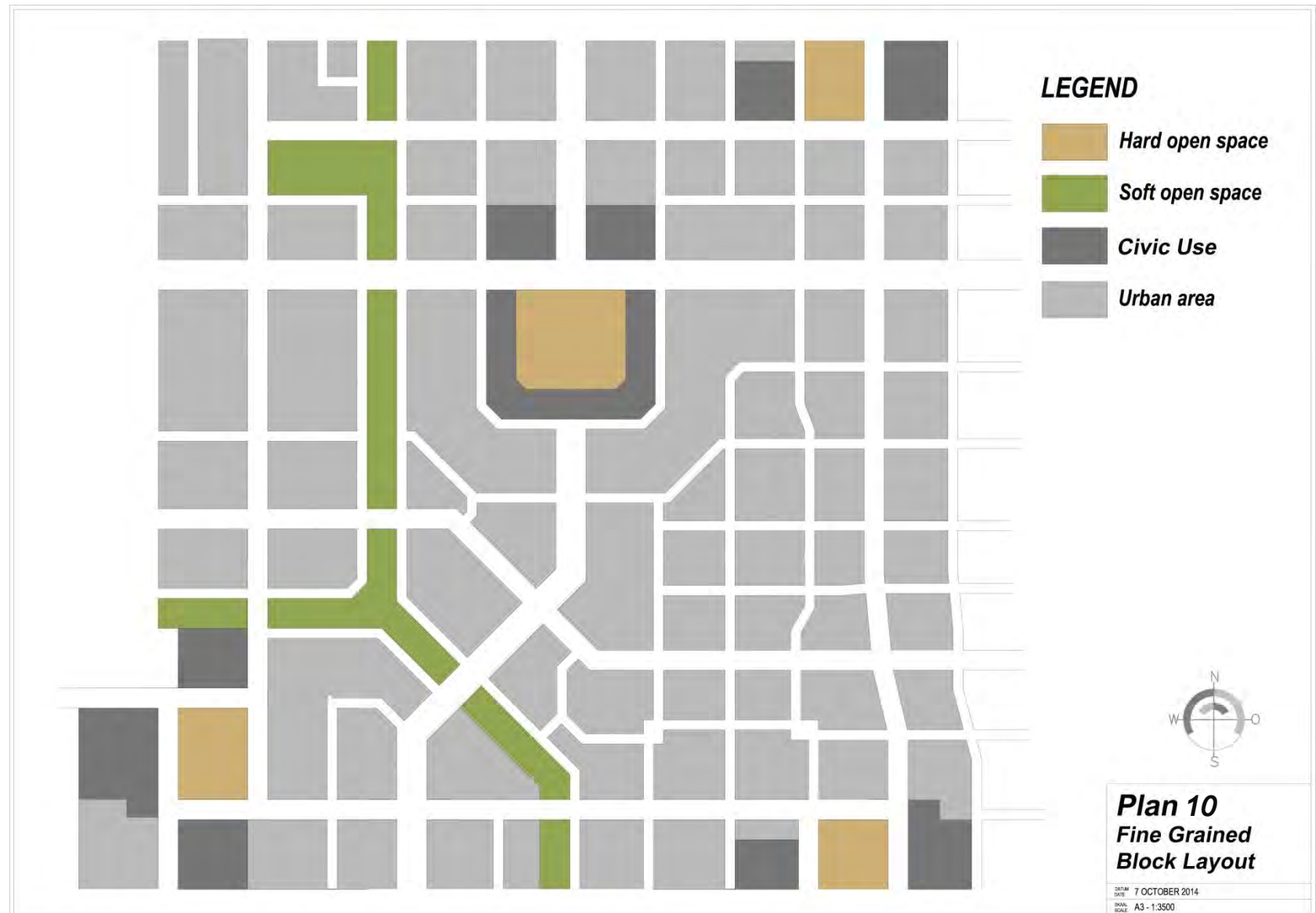


Figure 48: Carving-up the super block

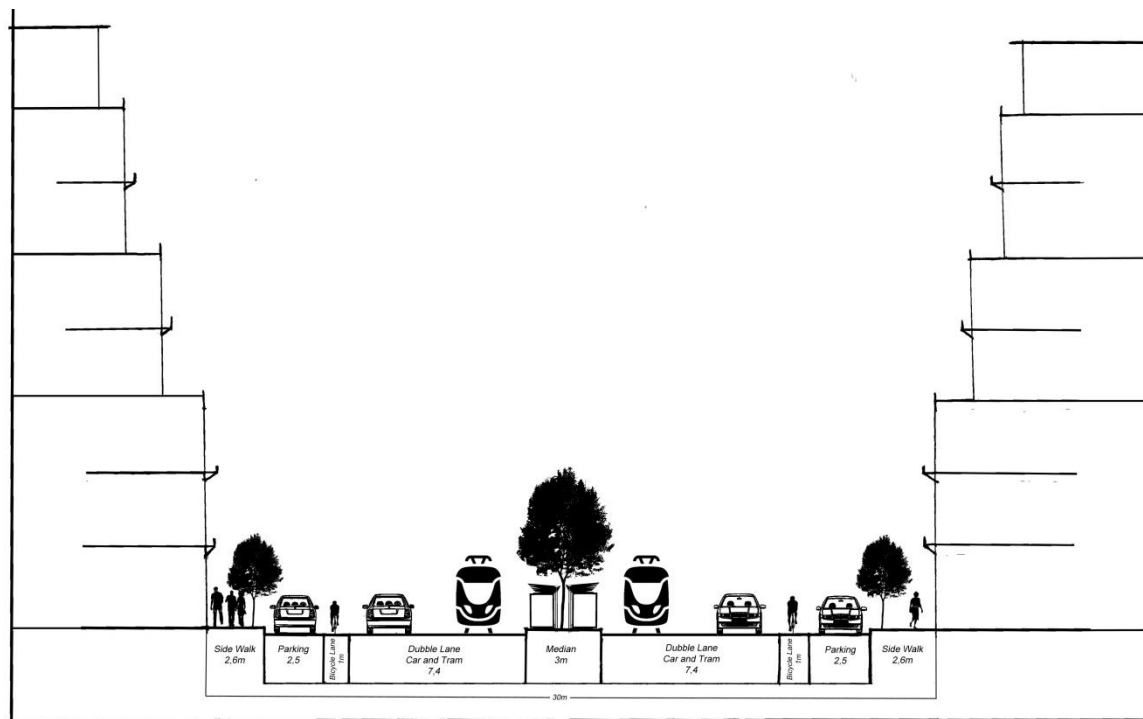


9.3 Detailed Precinct Design

Plan 9 shows the detailed precinct design for the WDP. The plan builds on the previous “block layout” by allocating a variety of different plots within the blocks. The different plots take on different dimensions, depending on the building and residential typology they hold and the location they take within the layout, depending on its spatial structural logic and role within the precinct.

The plan consists of three different residential building typologies to create a variety of life style choices that will accommodate a diversity of people to find a suitable location within the precinct according to their specific life style requirements. There are also plots that will hold public institutions and facilities which cluster around the four public open spaces within the precinct.

The following section systematically presents and discusses the various structural element and design concepts which collectively compose the detailed precinct plan. These various concepts are numbered on the plan and will be discussed accordingly.



Section AA: Primary Activity Corridor

Scale : 1 : 150

9.4 Structural Elements And Design Concepts

(refer to numbers on Plan 11)

1 Vertical and Horizontal Activity Corridors

The first structuring element includes the Vertical and Horizontal activity corridors as shown in section AA. These activity corridors take on the role as the primary mixed-use activity spines that cuts through the site perpendicularly to creates the primary mixed – use activity hub where they intersect.

These spines are lined by fine-grained high-intensity mixed-use buildings with the typical dimensions of 20 meter wide x 30 meter deep above ground level. The multi-storey buildings hold the potential to accommodate a variety of uses. These include: retail on the ground floor, offices on the first few floors and apartments on the top floors. The 20 meter wide plots ideally allow for two adjoining units to share a staircase and lift. The buildings will include intimate street frontages which operate onto a colonnaded pavement to ensure pedestrian convenience. The two spines are 30 meters wide and will accommodate an array of

different movement modes and activities. The building frontages operate onto a 3 meter wide colonnaded pavement to facilitate the majority of pedestrian activities. Alongside the pavement, a 2,5 meter wide on-street parking bay next to a 1 meter wide dedicated bicycle lane. The street consist of two dual carriage ways (7,4 meter each) that accommodates both car and in-street tram lines. The street include a 3 meter wide median on which the tram transit stops will operate.

Colonnaded Pavement, USA

A colonnaded pavement with intimate building frontages in the French Quarter, New Orleans



Mixed-Use streets, Bitola

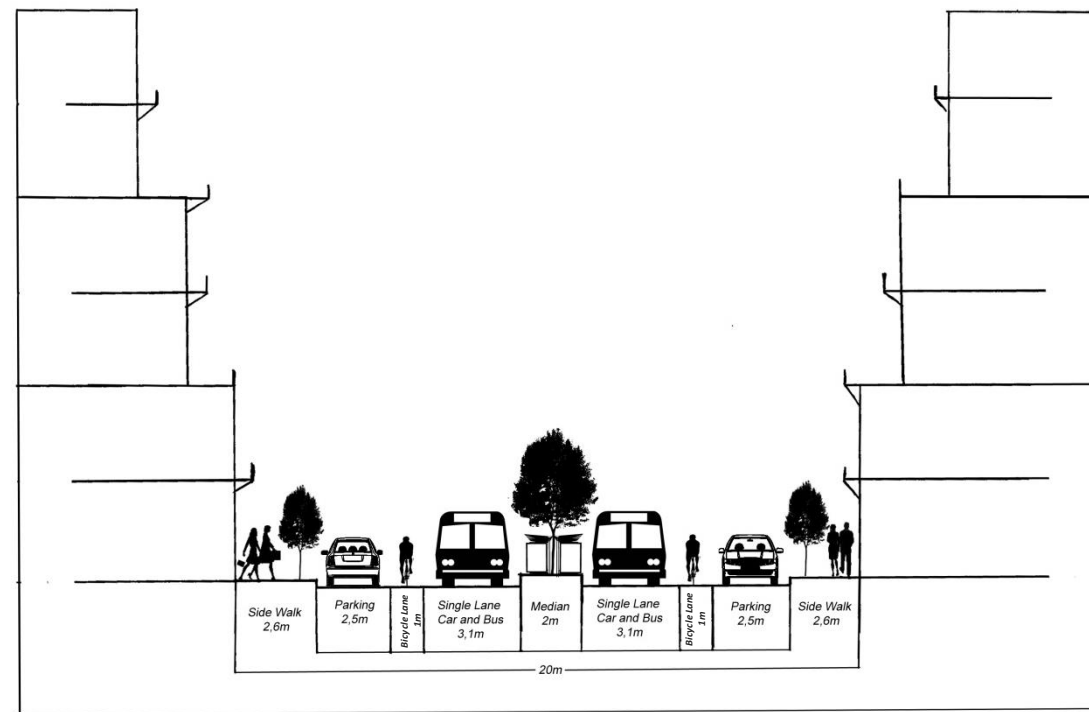
A typical traditional mixed-use street in Bitola Macedonia. These buildings typically contain retail at ground floor, offices on the middle floors and residential apartments on the top floors



2 Secondary Activity Routes

The secondary activity routes are 20 meter wide streets which frame the superblocks (Section BB). These routes primarily function as fine-grained urban residential corridors that hold the potential for small-scaled commercial activities. Street-liner buildings of medium intensity line these routes to promote intimate on-street social interaction along a 2 meter wide sidewalk.

Each route incorporates 2,5 meter on street parking bays besides dedicated 1 meter bicycle lanes. The street includes dual carriage way that accommodates both car and the BRT bus system. A 2 meter median exist in the centre of the street on which the BRT transit stops operate.



Section BB: Secondary Activity Route Scale : 1: 150

3 Pin wheels

Pin wheels are allocated where 10 meter local streets intersect. The rationale behind these pin wheels, are to soften the street grid as well as to facilitate traffic calming.

4 Pedestrian walkways

Exclusive Pedestrian walkways are strategically located to provide pedestrians with direct and efficient access to the Primary Civic Node. The walkways radiate out of the Civic Node (in all directions) to tie onto the NMT infrastructure of the Green System in the west and to provide access to the residential pockets to the east. These walkways assist in further braking down the block structure to add to the fine-grained urban fabric. The landscaped and well lit walkways, ensure security and convenience and active building interfaces.

5 Primary Civic Node

The Primary Civic Node functions as the central point of community life and civic activities (Figure 49). This great square is encompassed by various high intensity mixed-use buildings that operate directly onto the square. These building are orientated inwards to maximise natural heat and sun light, as well as to shield the space from the violent south-easterly wind.

The square will accommodate a variety of formal and informal commercial and public institutional activities. The edges of the square will be lined by cafes, restaurants and small economic enterprises. Informal trading bays will be located in the middles of the square. Office space, residential and public institutions have the potential to settle above these ground floor activities.

On the northern side, the civic node is also surrounded by other higher order institutional facilities such as a hospital and secondary school that also function onto the square from across the Horizontal activity spine.

Green Market Square, Cape Town

Greenmarket Square accommodating many uses:

- Formal and informal commercial activities



- Civic and social events



6 Pinched Tramway

Moving northwards through the Vertical Activity spine, motorised transport gets directed around the back of the Civic Square in two dual-lane one-ways. The Tram line, however, moves directly through the civic node between two landmark buildings to create a pinch point which releases into the square. Transit stops will be located in the square for convenient pedestrian access (Figure 49).

7 Secondary Public Open Spaces

There are three secondary hard public open spaces situated in the precinct, which are all surrounded by clusters of public institutions and facilities. These hard open spaces will allow for a variety of social and civic activities and also hold the potential for informal markets and trade.

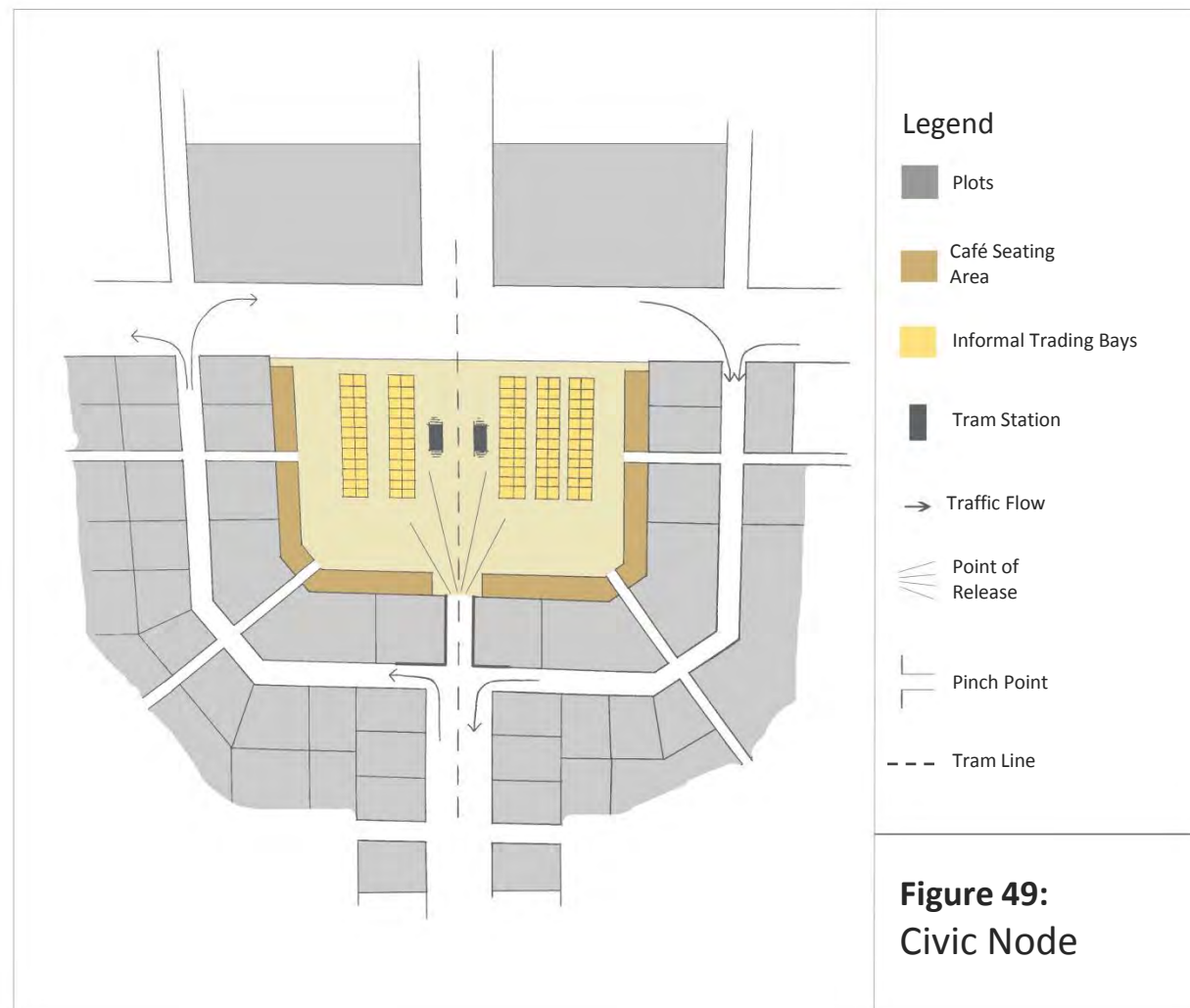
8 Civic Institutions

Additional public institutions and facilities are required within the precinct. These institutions and facilities will be clustered around the various public spaces and provide civic services to the residents. These civic institutional buildings serve as landmark buildings to promote legibility throughout the precinct.

9/10 Landmark Buildings

As stated by Lynch (1960), landmarks are familiar points of reference on which people rely to guide them through urban space. These structural elements contribute towards the “enjoyment of uniqueness and specialization” of settlements, as they have a clear form and contrast with the its background,” breaking the continuity of the urban fabric (Lynch, 1960: 4).

This precinct plan incorporates a number of landmark buildings located in strategic locations to contribute towards the structural geometry, legibility and uniqueness of the Wingfield settlement. These buildings typically should vary from their surrounding urban environment in terms of height and form to create an exclamation point of reference in space (Lynch, 1960).



The landmark buildings located in this precinct plan, take on two types of spatial structural characteristics:

- *Corner Buildings*

Corner Buildings occur where major routes intersect to create bigger corner plots with the potential to be defined by unique landmark buildings that function as reference points.

- *T-junction Buildings*

The potential for T-junction buildings exist where major routes join perpendicularly, but do not cross (Stankiewicz & Kalia, n.d). At these locations a “closed vista” is created that holds the potential to accommodate a unique landmark building that can contribute towards the legibility of an settlement.

Corner Building,

A typical landmark building which creates an exclamation point on the corner where two major routes intersect.



This precinct plan consist of three different residential building typologies. They all hold variations in terms of height, form, size density and privacy which are the structural determinants for their location within the settlement structure. These variations in residential typologies create choice of life style that ensures demographic diversity through the settlement.

11 Perimeter Housing

The Perimeter Housing type primarily consist of dense residential apartments wrapped around a defined public space (courtyard) (Milanovic, n.d). These are located in residential pockets throughout the precinct and offers the highest degree of privacy within the scheme.

The open space is usually communal and provide the opportunity for a range activities which include (Milanovic, n.d):

- Small scale agriculture
- Soft open space
- Hard open space
- Parking

The perimeter blocks usually do not exceed a maximum of 4 storeys, as not to include lifts, but walk-ups. The Blocks can be accessed by multiple transportation modes, depending on the access-ways provided. Generally this precinct plan provides both car and NMT access ways to its perimeter housing units. The perimeter buildings can define the communal open spaces in variations of L, T, U-shape buildings. However, the U-shape building is the most efficient and commonly used (Milanovic, n.d). (Figure 50).

The Perimeter housing configuration usually consist of 6 to 8 plots per block that vary between 400 to 600 m². These plots have the potential to contain units varying between 50 to 80m² (figure 50).

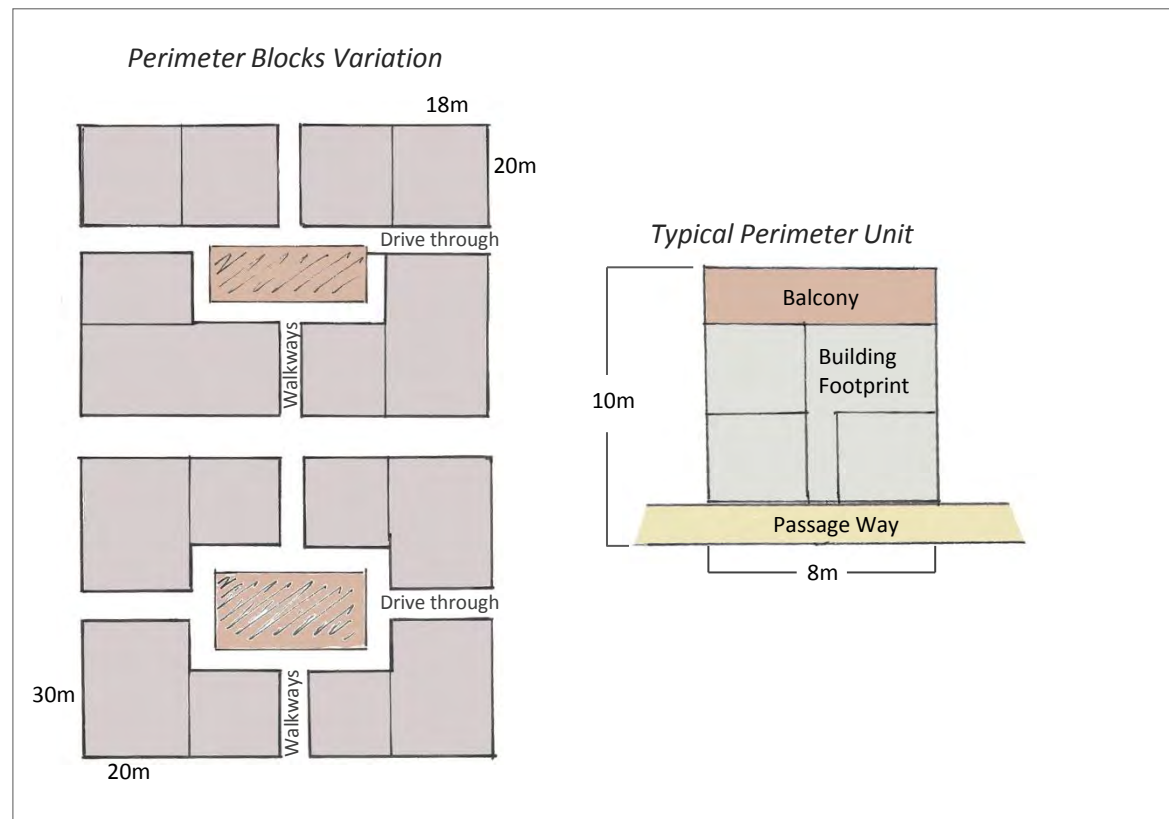


Figure 50: Perimeter Housing configuration options and a typical unit

12 Street Liners

Street Liners are a series of connected residential units that share side walls and are located along a linear movement and/or activity route. Street liners promote intensive on-street interaction and therefore provide less of a threshold between what is public and private.

The precinct plan offers three different street liner unit options that vary in terms of their building setbacks. This creates a variation in their privacy threshold levels which adds to the choice notion throughout the precinct (Figure 51 & 52).

These different setbacks create “pinch points and releases” that provides visual suspense and relief as one travels down a route or corridor (Figure 53). The street lines have the potential to be 2 to 4 stories and their unit sizes are 104m², 120m² and 160m², depending on the unit option.

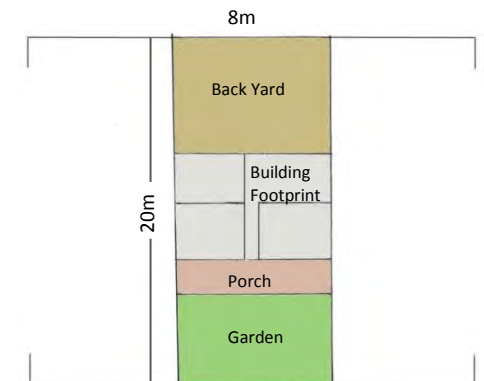


Figure 51: Layout of a typical Garden street liner unit

Street Liner options

Depth

1. On Street unit $(3+3+7) = 13$ meters
2. Porch unit $(2+3+3+7) = 15$ meters
3. Garden unit $(5+2+3+3+7) = 20$ meters

Wide

$(3+1,5+3) = 8$ meter

Figure 52: Different street liner options with varying privacy thresholds

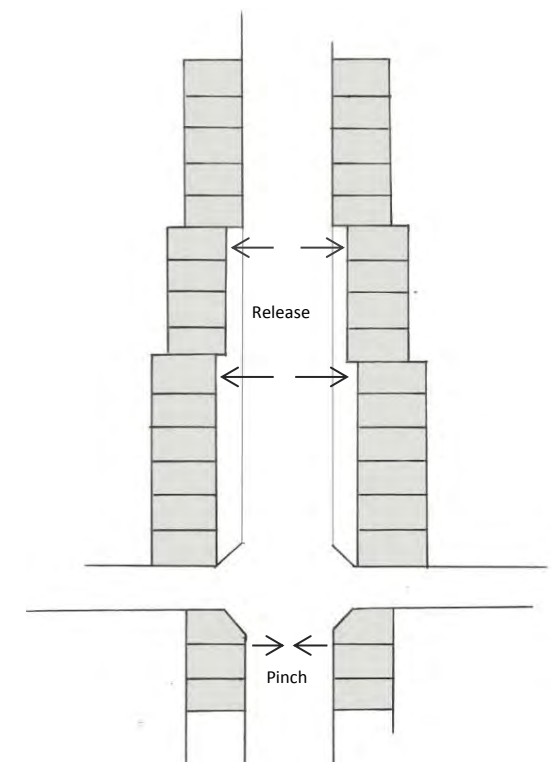


Figure 53: Different Street liner unit options proving variation in street frontages

Street liners are located along the secondary activity routes, as they hold major attributes in terms of mobilising street activity and vibrancy. The building typology have the potential to accommodate economic enterprises on ground level.

Street liner plots are elongated with narrow frontages to promote service and infrastructure efficiency. Where there are more than 5 street liner units in a row, a 10 meter break is provided for servicing.

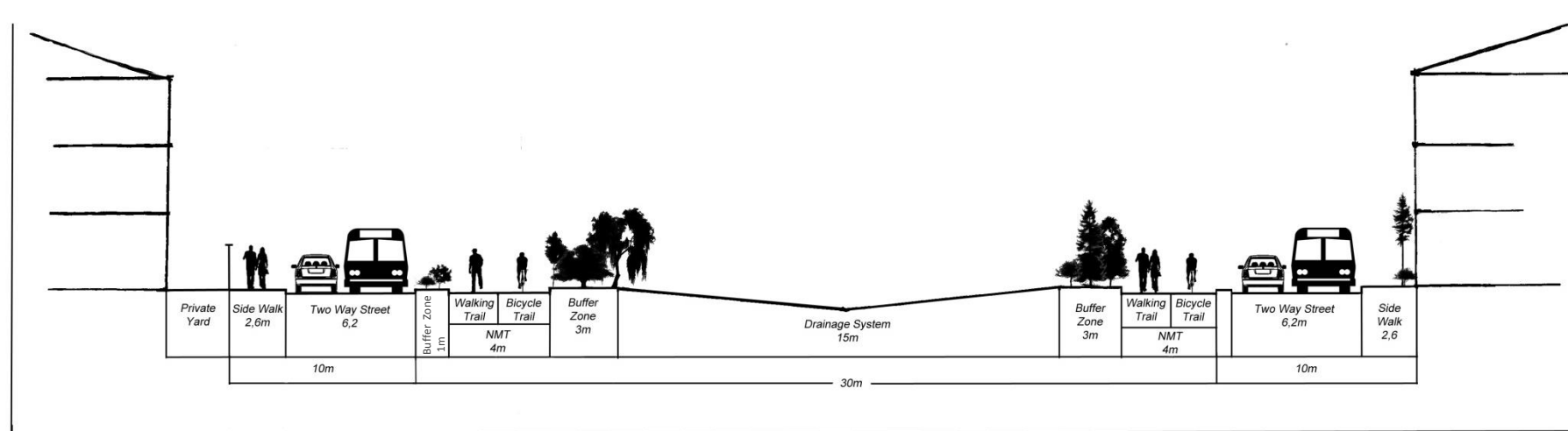
13 High-Rise Condo's

The third residential typology include high-rise condos. These are residential apartments that are located on the top floors in buildings along the high intensity vertical and horizontal activity spines. Units can vary in size and use, and will normally be accessed via lifts, as they are higher than 4 storeys.

14 Soft Open Space and Green System

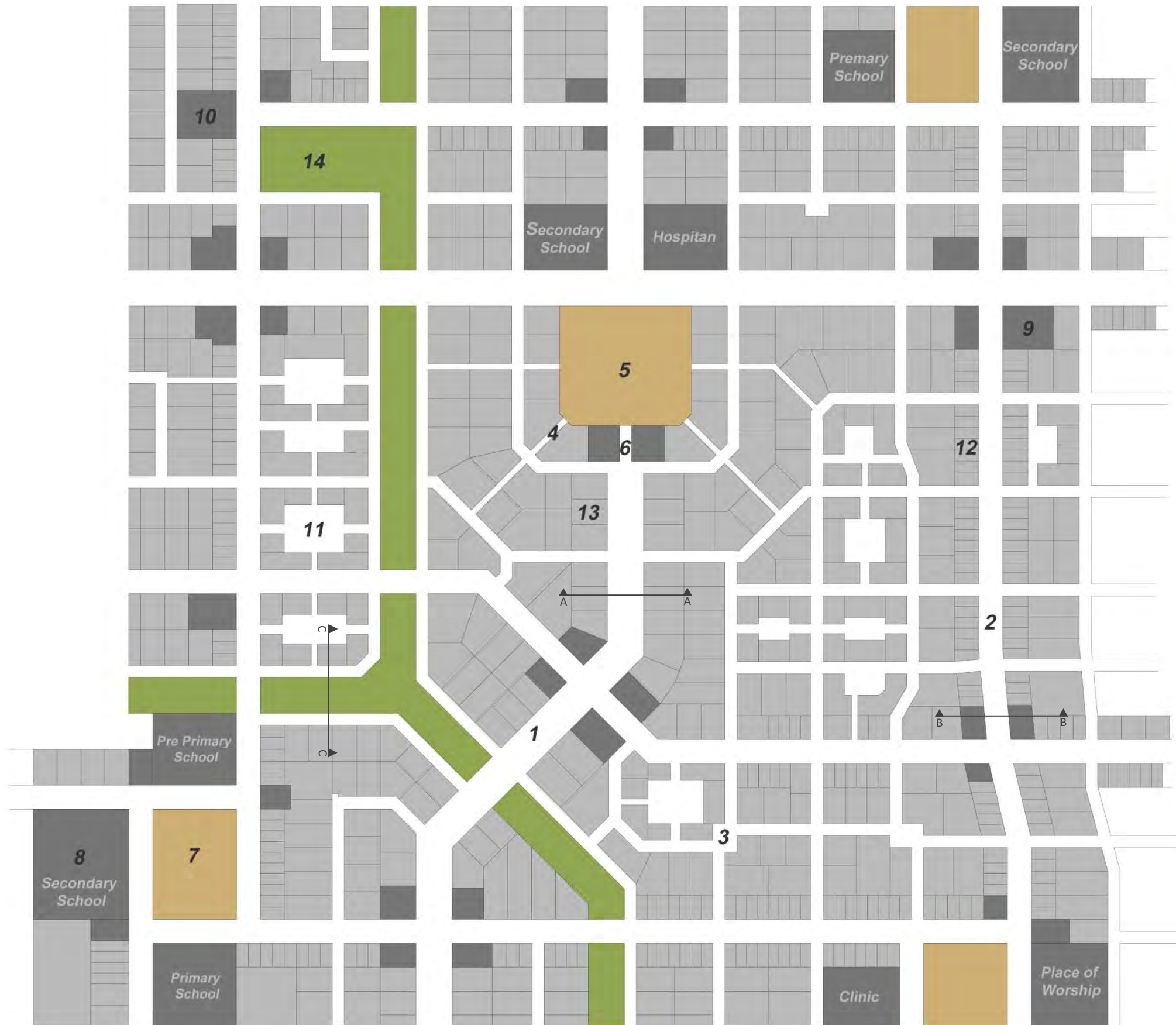
The final structuring element includes the vertical green system that moves through the western portion of the precinct. The green system promotes visual relief from the intensive urban environment and consist of the primary drainage system and NMT spine (Section CC). The section shows the 30 meter wide green system, together with its NMT infrastructure and how it interacts with the surrounding local 10 meter roads.

Part of the green system is a 4 500 m² urban park located in the north-western portion of the precinct. The park will function as a passive soft public green space that can be utilised for social, recreational and civic activities.



Section CC: Green System

Scale: 1:200



LEGEND

- Hard open space*
- Soft open space*
- Land mark buildings*
- Urban area*

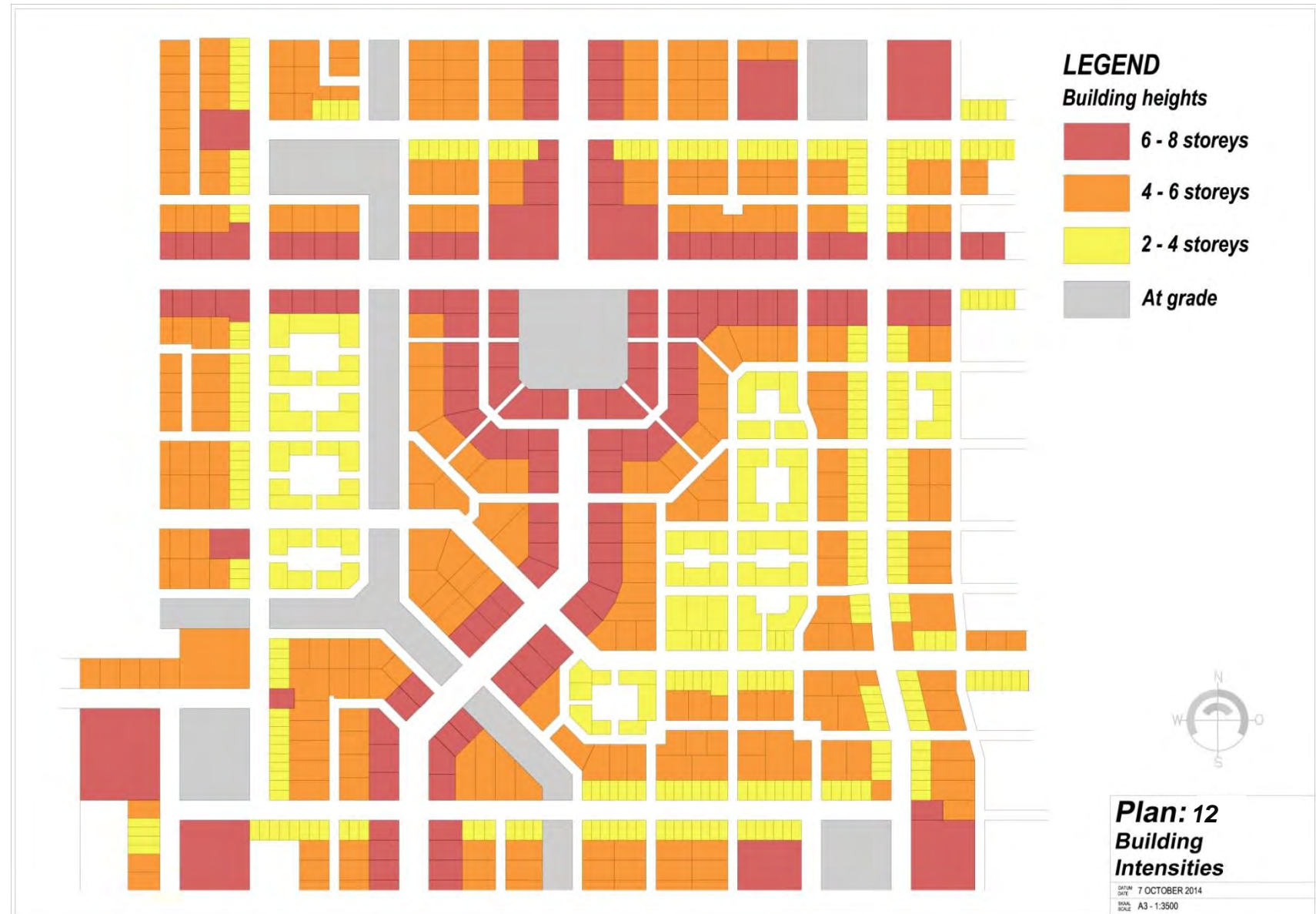


**Plan 11
Detailed Precinct
Design**

DATUM DATE 7 OCTOBER 2014
 SKAAL SCALE A3 - 1:3500

9.5 Building Intensities

Plan 12 shows the building heights for the detailed precinct plan. These building heights are allocated in accordance with the intensities proposed for the broader spatial framework of the development proposal. The highest intensities (6-8 storeys) exist along the vertical and horizontal activity spines and where landmark buildings exist for ensuring high threshold levels to support the commercial activities in these areas. The medium intensities (4-6 stories) occur just off the activity spines where mixed light-industry uses are most likely to occur. The low intensities (2-4 stories) are allocated along the residential pockets and street liners that can not be higher than 4 stories to avoid the need for lifts.



Chapter 10

Implementation

The theoretical issues, planning vision and urban restructuring proposals have been established at a variety of scales in the former sections for the redevelopment of Wingfield site. This section will take these theoretical ideas and urban restructuring proposals and propose a broad based implementation framework for turning these visions and plans into reality.

A comprehensive implementation framework for such a project is extremely complex and beyond the scope of this project. Thus, the main implementation phases for the project will simply be outlined systematically.

Phase 1

Land consolidation

The first step of the implementation process requires the consolidation and transfer of the entire Wingfield land parcel into the ownership of a single entity. The land parcel is currently under the ownership of multiple entities, with the most prominent being the Graaff Trust and a private consortium of previously marginalised people who received a land claim.

The consolidation of the land parcel will involve negotiations between these entities to either agree upon a joint ownership where the consortium will reap equal benefit from the redevelopment, or where the consortium receives some form of compensation and transfers the full rights to the entire land parcel over to the Graaff Trust.

Phase 2

Statutory Approval Process

Before any real development proposals can be put to ground, a statutory process must be undertaken. This involves obtaining the approval of the project under different legal and policy regulations that is inherent to the development process. The legal and policy regulations include the following:

- The Land-use and Planning Ordinance (LUPO)
- National Environmental Management Act (NEMA)
- The National Heritage Act

Phase 3

Project Team

The Graaff Trust, as a sole entity, cannot be the only manager or overseer for such a complex project. Public interest must remain the primary priority of the development and therefore a multi-disciplinary team is required that consist of both public and private actors to ensure universal competence. This team includes:

- Representatives of the Development Team (Graaff Trust)
- Public sector management team (Overseers)
- Planners
- Land Surveyors
- Environmentalist
- Engineers (Civil and Structural)
- Property Economists
- Legal Experts
- Architects (For broad Architectural Guidelines)

Phase 4

Bulk Services and Infrastructure

The next step involves an engineering bulk service infrastructure master plan to be produced for determining the availability and capacity of the surrounding bulk service infrastructure. This master plan will indicate where the existing available service infrastructure is located, and how the additional disposable water and waste from the Wingfield development will drain and vacate the site. This phase is essential in the implementation process to determine the location where the construction phase of the development proposal can start.

Marketing

The property economists are responsible for the marketing process that must be done in conjunction with the engineering master plan. This will give direction to determine the most rational location where the construction process of the development proposal should start. An equilibrium must be reached between market-led rationality and bulk service logic for this purpose.

Phase 5

Strategic Land Release

Many small pockets of land must be released to many different developers in accordance with the market demand that was established by the property economists. These developers will then implement development upon these small pockets in a fairly flexible manner by abiding to the proposed spatial framework and the broad architectural guidelines which were set by the architects. These architectural guidelines will be flexible enough to promote individual precinct character and avoid monotony and sterility.

The rationale behind the multiple small pockets which are developed by many different developers, is to reflect the idea of what David Crane (1964: 88) has called “the city of a thousand designers”.

A recent local precedent that followed a similar model of dispensation, is the Burgansy Estate development project that was recently developed abutting the Richwood and Bothasig Estate.

Phase 6

Construction Process of the Development Proposal

The development process will ideally begin with the construction of the vertical and horizontal activity spines to create the needed internal and external linkages between the two transit hubs extending Frans Conradie Drive through the site to create a linkage between N1 City and Century city. This will be supported by further developing abutting pocket precincts and identified public institutional and commercial activity nodes located along the two spines. Finally, development will commence outwards to complete the Wingfield redevelopment proposal.

Conclusion

This dissertation articulates a SDF for the Wingfield site, that will comprise of a dense, integrated infill development proposal. This infill development proposal serves as a response to the very fragmented, separated and sprawling urban form of the CTMA. The WDP takes on a package of plans approach to guide the reader through the analysis and design proposes which take on various levels and scales. These development and design outcomes include the following:

- A metropolitan spatial concept that provides a vision for the restructuring of the CTMA.
- A site and environs analysis of the study area that surrounds the Wingfield site, which will inform the development and design outcomes of the WDP.
- A SDF for the Wignfield site, which includes a broader spatial concept that consists of different spatial structural elements which include: An open space and movement system, an internal public transportation system and an internal green system.
- A precinct plan for the WDP which provides a glimpse of the fine-grained detailed design outcomes, which in reality will persist throughout the entire site. This includes sub-divisions and the strategic allocation of different building typologies.
- A brief overview of the project implementation process.

This WDP aims to potentially pave the way for similar future integrated development proposals which collectively will shape the CTMA into a positive and integrated urban environment that is ecologically sustainable, economically durable and socially just.

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