



FROM VACANT SPACE TO ACTIVE PLACE: LEVERAGING STATE-OWNED LAND FOR AFFORDABLE HOUSING

A CASE STUDY OF YOUNGSFIELD

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Abstract

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From Vacant Space to Active Place: Leveraging State-owned Land for Affordable Housing.

A Case study of Youngsfield

Access to affordable housing in well-located areas across Cape Town is a pressing issue faced by low-income households. Attempts have been made at addressing the issue through affordable and free housing subsidies being implemented, but these have not improved access to opportunities for low-income households. These land distribution patterns are a result of recycled apartheid policies perpetuated by an unequal urban land market that does not allow low-income groups to participate.

This research focuses on the spatial fragmentation of apartheid planning and its effect on low-income households in accessing subsidised housing in well-located areas. Through the collation of a spatial development framework, this study addresses the accessibility to affordable housing for low-income households by utilising state-owned land at Youngsfield Military Base and Royal Cape Golf Course in Wetton and Ottery, suburbs bordering the southern suburbs and Cape Flats district.

The research process began with a spatial analysis which outlined the metropolitan, sub-metropolitan and site context for potential affordable housing development on well-located state-owned land. This supplied a detailed context for the needs of the site, the environmental context and confirmed the good location of the study area in relation to opportunity areas.

Spatial design principles were then chosen to inform the creation of a quality urban environment with high-density mixed-use affordable housing and other economic and amenity opportunities. Relevant housing policies were analysed and ample existing policies were found which address affordable housing implementation in South Africa. Unfortunately, other affordable housing options such as social housing and subsidised loan housing are happening at a slower pace than Breaking New Ground (BNG) subsidised housing. Precedents of affordable and social housing were identified, many of which have been successfully implemented, but some still lack the incorporation of essential spatial concepts that create quality urban environments in residential developments.

The concept proposal plan illustrated the use of literature and key spatial concepts informing the development of the site. Essential aspects of development were calculated to facilitate thorough planning for public facilities, public transport and affordable housing implementation.

The research included an implementation section which identified the relevant stakeholders who would be engaged with during the planning process and affordable housing implementation. Using the package of plans process, the site was divided into precincts to easily streamline the development of the entire site. Appropriate social housing institutes and affordable housing companies were considered as possible institutions to manage and partially fund developments. Feasibility of cross-subsidisation was considered as a major option during implementation of the long term phasing of the development.

The research and implementation illustrates that by using existing policies and appropriate stakeholders and institutions efficiently, the creation of quality urban environments for affordable housing is possible. With the proper city officials in place and the political will for the development, housing developments on this scale can provide large numbers of affordable housing opportunities in better located areas.

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Acronyms

BNG	Breaking New Ground
BRT	Bus Rapid Transit
CoCT	City of Cape Town
CBA	Critical Biodiversity Area
CRU	Community Residential Units
CSIR	Council for Scientific and Industrial Research
CTCHC	Cape Town Community Housing Company
DAFF	Department of Agriculture, Forestry and Fisheries
DEADP	Department of Environmental Affairs and Development Planning
DoH	Department of Health
DTPW	Department of Transport and Public Works
du/ha	Dwelling unit per hectare
FLISP	Finance Linked Individual Subsidy
GABS	Golden Arrow Bus Services
GIS	Geographic Information Systems
GDCI	Global Designing Cities Initiative
HDA	Housing Development Agency
IHP	Inclusionary Housing Policy
IHSF	Integrated Human Settlements Framework
IRDP	Integrated Residential Development Programmes
KRCA	Kenilworth Racecourse Conservation Area
LB	Local Business (zoning)
LUPA	Land Use Planning Act
ML	Megalitres
MSDF	Municipal Spatial Development Framework
MU	Mixed Use (zoning)
NDoHS	National Department of Human Settlements
NHFC	National Housing Finance Corporation
NIMBY	Not In My Backyard
NMT	Non-motorised Transport
OESA	Other Ecological Support Areas
PoP	Package of Plans
PRASA	Passenger Rail Agency of South Africa
RDP	Reconstruction and Development Programme
SANBI	South African National Biodiversity Institute
SDP	Site Development Plan
SHI	Social Housing Institute
SHP	Social Housing Programme
SHRA	Social Housing Regulatory Authority
SPA	Special Planning Areas
TCT	Transport of Cape Town
TDA	Transport and Urban Development Authority
TPC	Town Planning Compliant
UISP	Upgrading of Informal Settlements Programme
USDG	Urban Settlements Development Grant
VPADD	Voluntary Pro-Active Deal-Driven
VPUU	Violence Prevention Through Urban Upgrading
WCG	Western Cape Government
WCED	Western Cape Education Department
WWTW	Wastewater Treatment Works

Chapter 1: Introduction

1.1 Introduction

This chapter introduces the essence of the research problem and related interventions explored in this dissertation. The rationale and aim of the research is also discussed, ending with an explanation of how the remaining chapters will unfold.

1.2 The Problem: Lack of state intervention in the urban land market to provide well-located affordable housing

Cape Town is dealing with compound issues in respect to: the spatial mismatch between residential areas and areas of economic and social opportunity, subsidised housing backlogs, increased urban sprawl and, densifying of informal settlements on the periphery of the city¹. The deep socio-spatial disconnect between the location of low-income residential areas in the Metro South East and major economic areas in the city centre of Cape Town, is a great challenge for low-income groups in Cape Town. Coupled with an unequal urban land market that does not make space for low-income groups to participate (Brown-Luthango, 2011). These structuring elements are of great significance as they determine if cities, and in this case, Cape Town, functions efficiently and equitably (Turok, 2001; Turok & Watson, 2001).

Housing subsidies and low income housing programmes have attempted to redress apartheid spatial planning but there is little evidence of state intervention in urban land markets in well-located areas. This has meant that subsidised housing has been located on the outskirts of the city where land is cheapest (see Figure 1.1). This disparity is deepened further by the poor quality of subsidised provision, specifically by Breaking New Ground (BNG), a former Reconstruction and Development Programme (RDP) model which has perpetuated the large-scale low density character of apartheid planning investment in low-income areas (Turok, 2001). The character of the settlements are also focused on quantity instead of quality, and this reflects in the inferior urban environments (Tomlinson, 2006). These institutional practices and market forces have reinforced spatial fragmentation and maintained the ongoing challenges low-income households face. In addition, they have also, maintained the urban land market inequality for the marginalised, as well as advancing urban sprawl for the entire city. Wide income gaps arrange households across the city according to their competitive bidding power in the urban land market (McGaffin & Kihato, 2013; Turok, 2001: 2350). Cape Town's property values are the highest in South Africa, and continue to increase year-on-year at a rate beyond inflation (Ndifuna Ukwazi, 2017: 17). The lack of intervention from national and local governments in the urban land market has worsened the challenges to acquire available affordable, well-located land in the city (Bhana, Hendricks & Tonkin, 2009).

Accessing well-located land is crucial in contributing to potential upward mobility for low-income households. The housing initiatives on the outskirts of the city have given people land but have not attempted to solve other costs weighing down low-income households such as, transport costs and access to major economic centres. Well-located land has been sold off to developers in an attempt to gain funds for housing provision on cheaper land. This has made the land issue even more contentious

¹ In this dissertation 'city' refers to the spatial area of Cape Town and 'City' refers to the City of Cape Town Municipality.

(Ndifuna Ukwazi, 2017). At the same time there are several large parcels of well-located and state-owned land currently unused and the development of these for lower income housing could address the issues identified above.

Another major issue surrounding affordable housing provision in the City has been the struggle to produce housing for the gap market, which is not subsidised in terms of the national housing policy. This group earns more than lower income brackets, who are able to qualify for subsidised or free housing. Unfortunately, they do not earn sufficient to qualify for home loans from banks to purchase property on the urban land market. (CoCT, 2016b). These issues have influenced my choice of research in an attempt to analyse and address these spatial challenges.

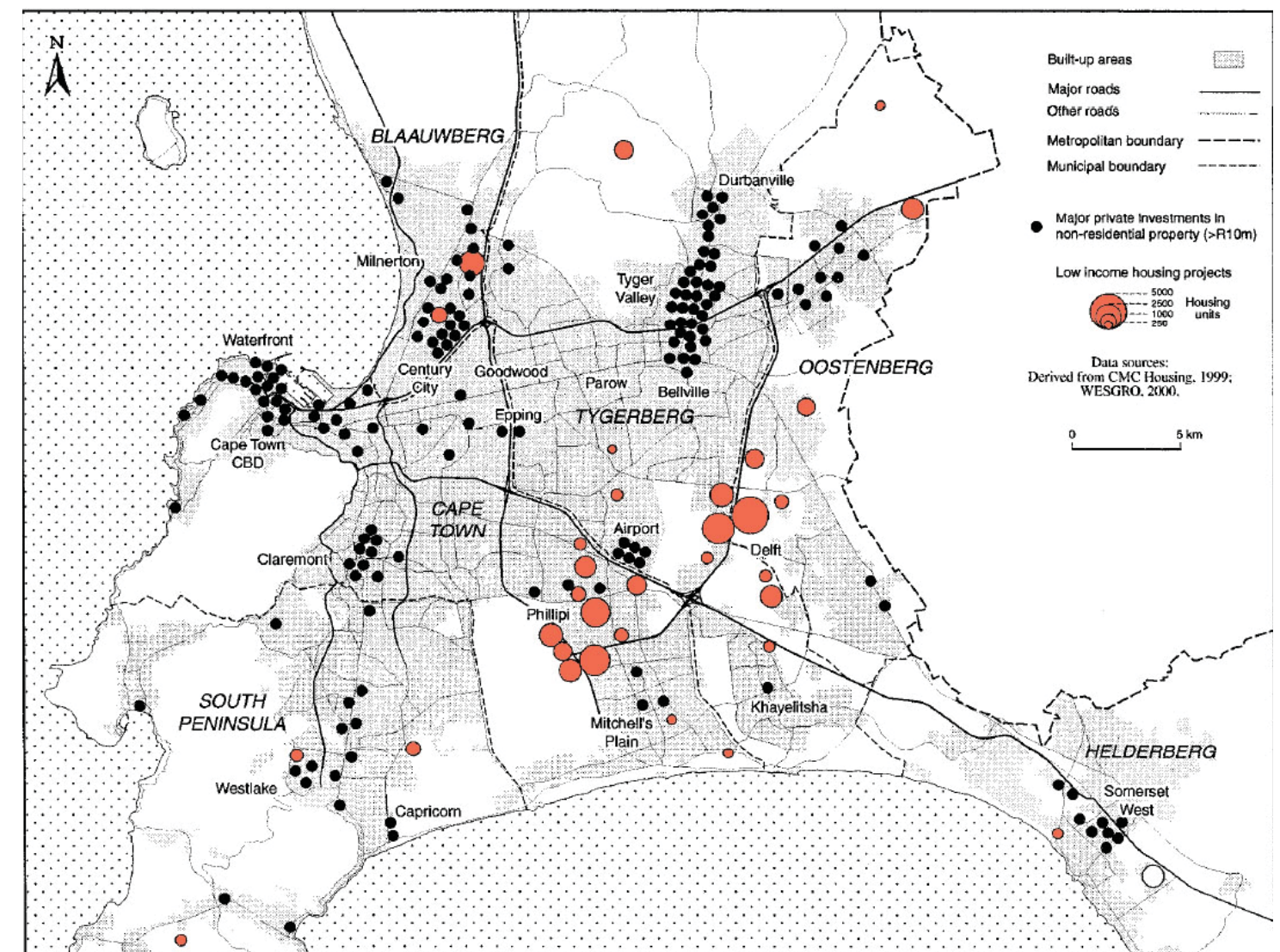


Figure 1.1 Subsidised Housing since 1994 (Source: Adapted from Turok, 2001)

1.3 The Rationale for undertaking the study

The role of this research is to address the spatial mismatch of poorly located subsidised housing. It will be done by exploring how state-owned, vacant or underutilised land, in well-located areas of Cape Town, could be utilised for mixed use high-density, affordable housing provision. There are many low-income housing opportunities subsidised by the government, however within social housing the major challenge is the implementation of the next phase of housing subsidies or partial subsidies for low-income households and the gap market. Therefore, Youngsfield is ideal for affordable housing provision. Youngsfield Military base is located between the middle to high-income suburbs of Wynberg and Plumstead on the west and lower to middle income suburbs of Ottery, Wetton and Lansdowne on the east. The land is currently used as the School of Logistics for the Department of Defense, with the majority of the site being unused and overgrown.

1.4 Aim of this research

The main aim of this research is to find better ways of enforcing the objective of the Inclusionary Housing Policy (National Department of Human Settlements (NDoHS), 2007) which is to: “provide accommodation opportunities for low-income and lower middle income households in areas from which they might otherwise be excluded because of the dynamics of the land market” (NDoHS, 2007: 11). In order to restructure the city, social and affordable housing can be used as a tool to locate low-income groups in well-located areas, close to economic, retail and amenity opportunities. The use of publicly owned land will also encourage stronger government intervention in urban land markets.

Another aim of this research is to encourage developments to incorporate high-density mixed-use and mixed-income spaces. This has always been an issue for Cape Town as the apartheid legacy still finds suburbs segregated along racial and class lines with a low-density sprawl character. Mixed-income developments will encourage the inclusion of numerous income groups living together. The use of appropriate spatial design principles will encourage good quality urban environments. This is crucial in designing a settlement with different income groups as high quality urban design changes the way residents interpret a space.

The main research outcome is the drafting of a spatial development framework for Youngsfield and the adjacent Royal Cape Golf Course. This will include recommendations for the provision of a significant proportion of affordable housing opportunities on the site and will incorporate spatial concepts and principles to contribute to a high quality urban environment. An implementation framework will outline the mechanisms to be used for mixed-use affordable housing provision and explain how to execute partnerships between the City and developers appropriately.

1.5 Structure of dissertation

The dissertation chapters are organized as follows: Chapter 2 outlines the research methods and techniques used during the research process. Chapter 3 contextualises the spatial problems and status quo for Cape Town starting with a metropolitan analysis. This is followed by a sub-metropolitan analysis and finally a site analysis. These analyses are integrated in order to develop a position on the role of the site. Chapter 4 sets out the guiding spatial concept principles essential for creating quality urban environments. Affordable housing precedents and relevant housing policies were identified to guide the concept plan. Chapter 5 sets out the population size and required density for the site. The programme follows, setting out new public facilities needed for the additional population numbers. A spatial development framework then makes proposals for land use and affordable housing provision. Chapter 6 outlines the implementation framework. This comprises the package of plans process, which sets out the approach in detail as well as a detailed housing implementation framework. Chapter 7 concludes the main objectives and goals of the research conducted.

Chapter 2: Research Methods

2. Introduction

This chapter outlines the research methods that have guided the production of the dissertation. The main research methods along with the research techniques used in each chapter are explained below. The outcomes of these methods and techniques are given.

2.1.1 Guiding Values of The Research

The overarching values shown in Figure 2.1 have guided the overall research process. They are socio-ecological sustainability, and socio-spatial equity and justice. The value of socio-ecological sustainability is that it promotes a sensitive approach to urban development at all scales. It ensures that resources are used responsibly and that they are preserved for current and future generations. It also promotes compact development so that resources are shared effectively to avoid urban sprawl. Another aspect of socio-ecological sustainability is the overarching principle of symbiotic human-nature relations, which is that humans and nature are dependent on each other. Socio-ecological sustainability also promotes the idea of communities having resilience to changing social, economic and political environments due to appropriate ecological planning. This should be considered in conjunction with social realities to ensure that marginalised communities are protected by ecologically sustainable strategies. Informal economies and environments should be a high priority and should be protected and sustained. Appropriate sustainable initiatives that impact positively on marginalised groups should be of deep importance (Pieterse, 2011; Evans, 2011). This is an essential value to guide development in a time of limited resources.

2.1 Research Methods and Steps

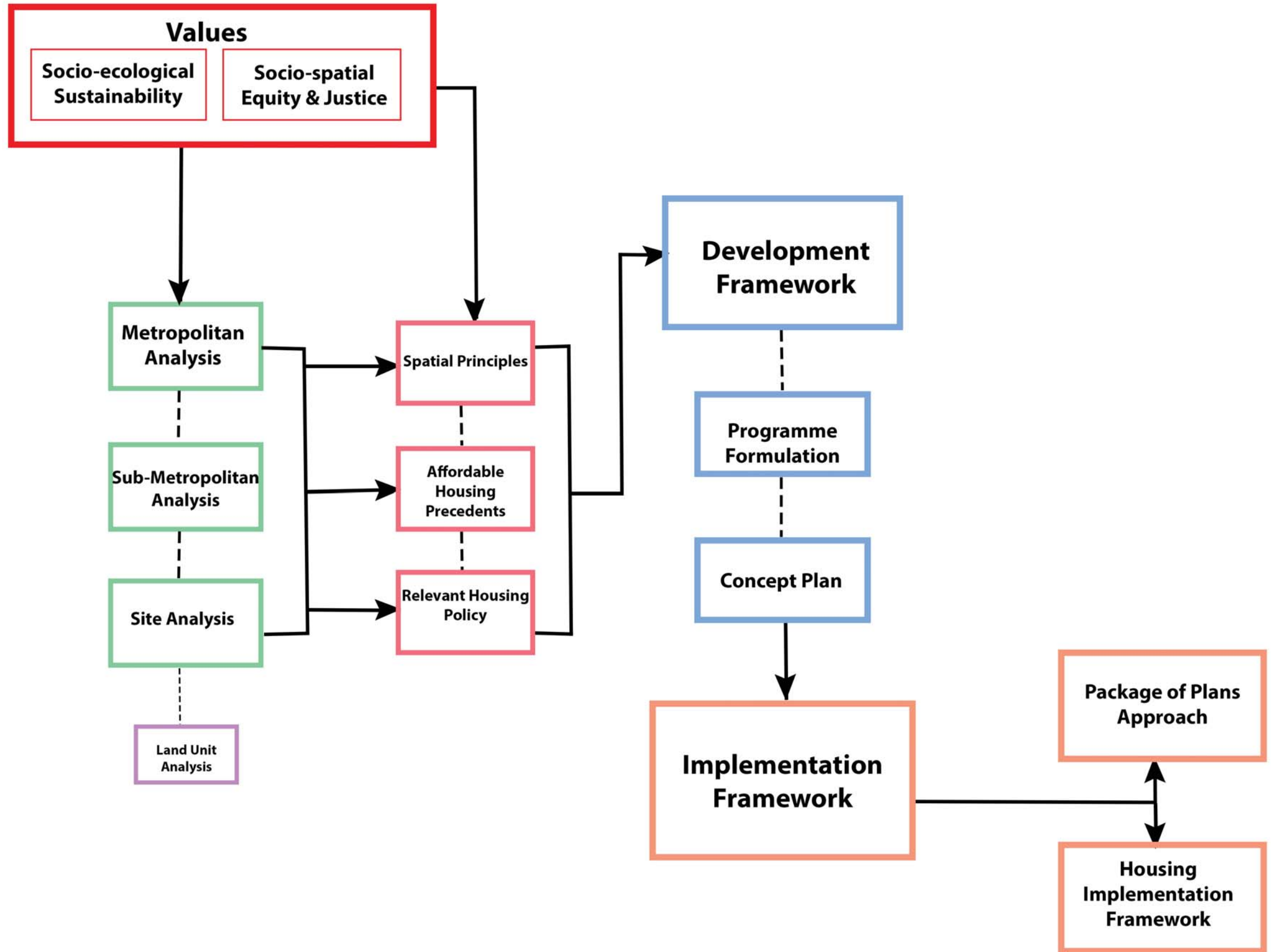


Figure 2.1 Research Methods Diagram (Source: Author, 2017)

Socio-spatial equity and justice promotes the fair and equitable distribution in space of socially valued resources such as land and the opportunities to use them (Soja, 2009: 2). Spatial justice issues such as “locational discrimination, political organisation of space and unequal distributive outcomes of capitalist urbanisation” (Iveson, 2011: 253) need to be understood and addressed to create a more just city. These spatial injustices have continued and created worse conditions for marginalised groups that have little power to remove themselves from these systemic realities. Therefore, socio-spatial equity and justice is essential in redressing previous spatial injustices and the continued injustices still being imposed on low-income communities. These values have guided the approach to this research and have influenced the response to redressing spatial inequalities.

2.1.2 Research Methods

The research methods used in this research flowed as an iterative process. As this was a desktop study, all the research was conducted using available quantitative and GIS data, in addition to published sources for analysis. Statistical analysis and GIS mapping were the main methods used.

Starting with grounding the challenges and issues from relevant sources, the research process began with a spatial analysis of the metropolitan, sub-metropolitan and site scale. Electronic journals were accessed through UCT Library and available online reports were used for the analysis. The main report used was the State of Cape Town report (2016). GIS data was acquired from multiple sources; online data portal on the City of Cape Town’s website, bgis from South African National Biodiversity Institute (SANBI) and UCT GIS technical library. Maps were analysed using ArcMap GIS software. The data needed for this section was what was relevant for the location of employment areas and low-income residential areas in order to see where these spatial concentrations are located and to position Youngsfield in relation to these areas. The relevant GIS data assisted with locating this data spatially.

The sub-metropolitan analysis focused on the surrounding neighbourhoods of the study area, movement systems, economic opportunities, land values, surrounding public facilities and environmental analysis. This would reinforce the potential and the constraints related to the location of the study area. The methods mentioned above electronic journals, online resources and GIS were also used.

The site analysis did a more in-depth environmental analysis to identify the state of indigenous vegetation, fauna and wetland areas of the study area. This was done through a partial land unit analysis, which identified different environmental layers, and land uses on site to specify which pieces of land were suitable for development. This followed the ordinal combination method or McHarg method. This was done on GIS using available data from the City and SANBI to map the different environmental layers (Hopkins, 1977). The Municipal Spatial Development Framework (MSDF) (2017) draft copy also informed the site analysis as the requirements of developable land needed to align with the MSDF. Finally, a synthesis summarised previous scales and functions of the site and identified the opportunities and constraints of the site.

The next phase of research focused on spatial concepts and principles that apply to the proposed site. Online sources were accessed from the UCT library website and library books were used for this section, specifically Responsive Environments (Bentley, 1985), Life Between Buildings (Gehl, 2011),

Making Urban Places (Behrens & Watson, 1996) and Guidelines for Human Settlement Planning and Design: Vol 1 (2005). This provided appropriate spatial principles essential for creating quality urban environments for affordable housing provision. Affordable housing precedents were also identified. These would inform the final product of affordable housing provision, which is essential for a high quality standard of design that is lacking in many of the subsidised housing provision. These precedents were selected from online resources.

The final section of concepts and principles identified the relevant housing policy that relates to affordable housing. All acts and policy documents were available online and could be accessed that way. Other government presentations on acts and policies were available online as well. The Housing Act 107 of 1997 and National Housing Code set out the foundation for the policies which apply to affordable housing provision. This grounded the research better as it created a guideline for the concept plan.

The concept plan aligns with the previous chapters, as those chapters set out the guidelines that are essential for equitable and sustainable development. The plan consists of the population calculation and the programme outlining new public facilities needed. This is followed by a concept plan that draws from the previous principles, precedents and relevant policies. The main data used for the programme section was accessed from the CSIR’s Social Facility Provision Toolkit (2017), an online tool that calculates the amount of public facilities needed for a specific population size. The previous site analysis set out the process for the plan. Starting with the environmental and infrastructure constraints of the site, these were identified as non-buildable areas. The movement routes were identified and explained the roles of each route and points of access to determine the highest order locations. Detailed sections illustrated the roles of each route and the activities that should occur there. Public spaces were located along highest points of access and explained the role of each hard and green open space. Public spaces were then located along the highest points of access and followed the structure of hard open spaces. Residential built form was then explained in terms of where high and medium densities should locate. Finally, the precincts divisions were allocated to continue into the implementation phase. Other sources such as the CSIR Guidelines for Human Settlement Planning and Design, Volume 1 (2005) and Making Urban Places (Behrens & Watson, 1996) identified the relevant principles and the guidelines to execute a layout plan. Execution of maps and models were done using Photoshop, AutoCad and SketchUp software.

The implementation framework then followed to explain how affordable housing provision would occur. The main sources used in this section were the Cape Town Municipal By-Laws (2015), to outline the zoning scheme and package of plans process, and the Inclusionary Housing Policy Framework (NDoHS, 2007) which outlined the objectives of the policy. These sources identified the proper processes and policies needed for implementation.

2.3 Research Techniques and Analytical Tools

The main research techniques used were mapping on GIS and statistical analysis, this was done after collating data from relevant sources. Mapping was further analysed with relevant data sources such as those of SANBI. The advantages of using mapping techniques was the spatialisation of statistical data, and showing manipulated data to exact scale for mapping.

2.4 Conclusion

The research methods used during the dissertation process enabled the research conducted to be thorough and well analysed. Access to online resources allowed for easier analysis of the research. Many of the documents dealing with statistics related to Cape Town had been updated in 2016, and this made the data relatively recent. The use of statistical analysis and GIS mapping allowed for thorough analysis and exploration of the issues of the study. The research process of each chapter moved through an iterative process of constant back and forth, as all the data influenced each outcome as new issues and ideas arose from the spatial analysis and plan making process. As the affordable housing topic is quite current, new data and policy changes influenced the planning making process.

Chapter 3: Spatial Analysis

3.1 Metropolitan Analysis

This section undertakes a spatial analysis of the Cape Town Metropolitan area in order to spatialise the disconnect between work opportunities, retail areas, public facilities, low residential areas and public transport routes. It will indicate the implications of this for low-income groups. Historical spatial policies have left a legacy of spatial inequality, and these have been further entrenched by current market forces. This metropolitan analysis will develop and explain the spatial pattern of land uses, and what is driving these. It will firstly analyse the main areas of attraction of movement in Cape Town, then the areas from which movement is taking place, and lastly, the transport and movement routes, which connect them. The purpose of this analysis is to locate the site of Youngsfield in relation to the spatial functioning of Cape Town, and to argue for the kind of role, which it should play in a future Cape Town.

3.1.1 Major Employment Sectors and Skills: Growth and Decline

Cape Town's economy is largely service-driven with the tertiary sector contributing over 80% to the city's growth (CoCT, 2016a: 46). The major employment sectors within the tertiary sector have remained consistent in their contribution to job opportunities during the period of 2013-2015. This specifically refers to the wholesale and retail trade, finance, and community and social service sectors, see Figure 3.1 (CoCT, 2016a: 52). The sectoral employment growth levels from 2004 to 2015, seen in Figure 3.2 increased in agriculture, construction and private households. These sectors, however, do not contribute significantly to high employment levels. They were also the only sectors to not decline from 2004 to 2015 (WCG, 2016a). The growth in those sectors masks the recent job losses experienced in the primary sector, specifically agriculture towards the end of 2015, where low rainfall affected yields and led to retrenchments. Employment in the manufacturing sector has declined over the past three years and experienced job shedding. Although the tertiary sector is the largest contributor to the economy, the manufacturing sector is an important job creator. This sector is essential for employment in the city's economy as the sector is labour intensive. (Western Cape Government (WCG), 2016a; CoCT, 2016a).



Figure 3.1 Sectoral Employment Levels 2013-2015 (Source: CoCT 2016a)

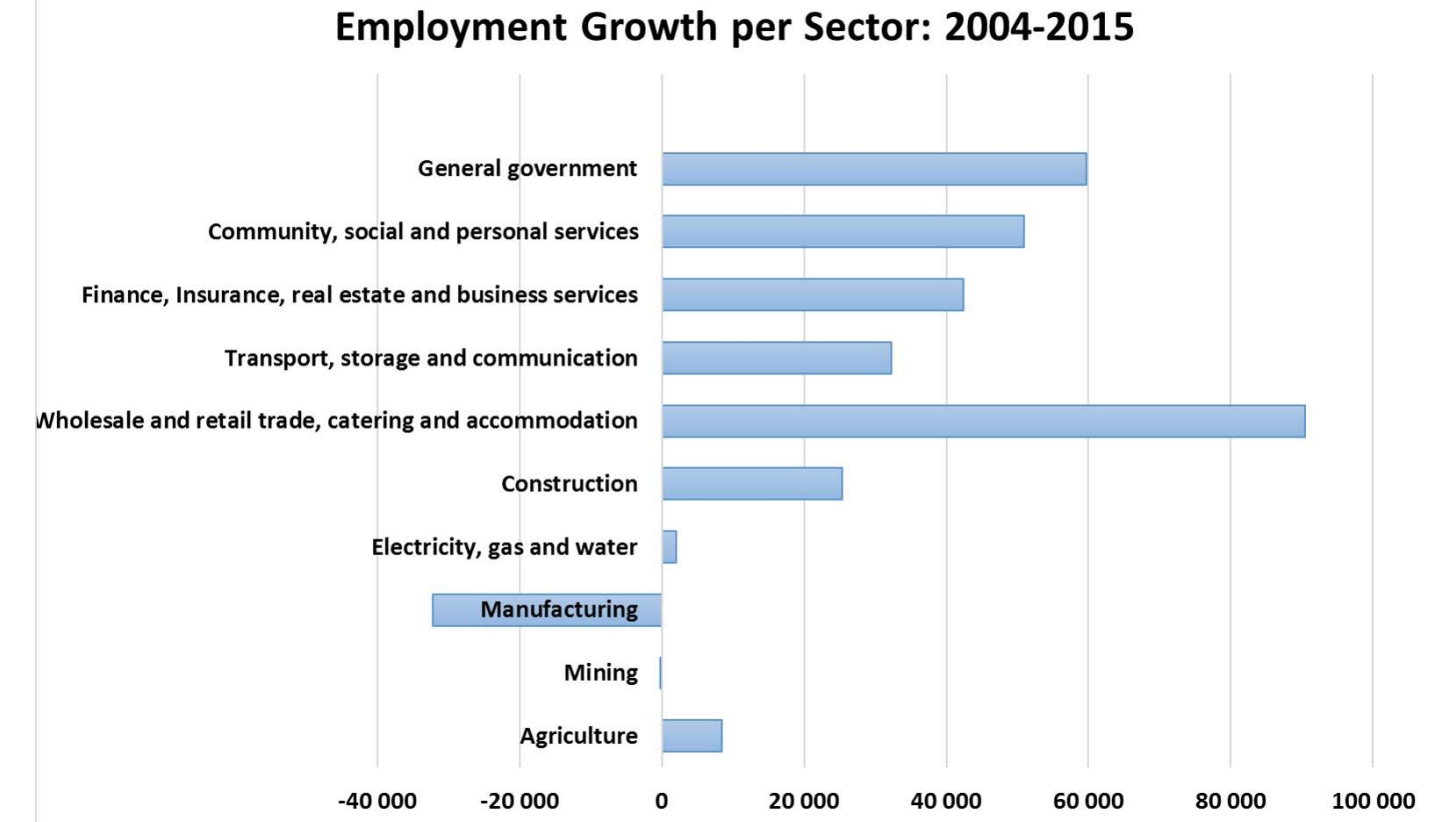


Figure 3.2 Employment Growth 2004-2015 (Source: WCG, 2016a; Quantec Research, 2016)

Informal Sector

Within the informal sector, employment opportunities seem to have increased over the period from 2001-2015. The employment option in this sector is mainly informal trading dominated by food trade (Skinner & Haysom, 2016). Domestic work, which forms a large portion of informal work, is regarded as being part of the private households sector and not the informal sector. The informal sector plays a significant role in providing job opportunities for low skilled individuals and buffering unemployment. Seen in Table 3.1, the total employment in 2014 was 10.09%, which, when calculated alongside the other sectors, is the 5th largest employment sector in the city. Informal food and clothing traders are located at major transport interchanges around the city and are located where high levels of foot traffic ensure better sales. Informal 'spaza' shops are also dispersed randomly in residential areas in the Metro South east, specifically informal settlements (Skinner & Haysom, 2016).

Table 3.1 Employment estimates for informal sector in Cape Town (Source: WCG, 2016a; StatsSA, 2001-2015)

Data Source	Total People Employed in informal sector	% of employment in informal sector
Census 2001	47 020	5,01
Census 2011	122 013	9,44
QLFS 2011:1-20	145 315	10,09
QLFS 2015:2	161 000	11,30

Skill Contribution

Different employment sectors create the demand for different kinds of skills and this is greatly influenced by the working population and the skill levels available. According to the State of Cape Town report (CoCT, 2016a), the largest proportion of new entrants to the job-market of the city are young semi-skilled to unskilled individuals, who have difficulty in accessing the job opportunities for finance and business services. Figure 3.3 shows the skills contribution in 2015, with semi-skilled workers dominating the majority of the planning districts. Figures 3.3 and 3.4, (planning districts) show that the areas with the highest number of highly skilled jobs are the Tygerberg and the Northern (Durbanville) districts, although the Cape Flats also has high numbers. Most lower-skilled jobs are in Khayelitsha and Mitchells Plain.

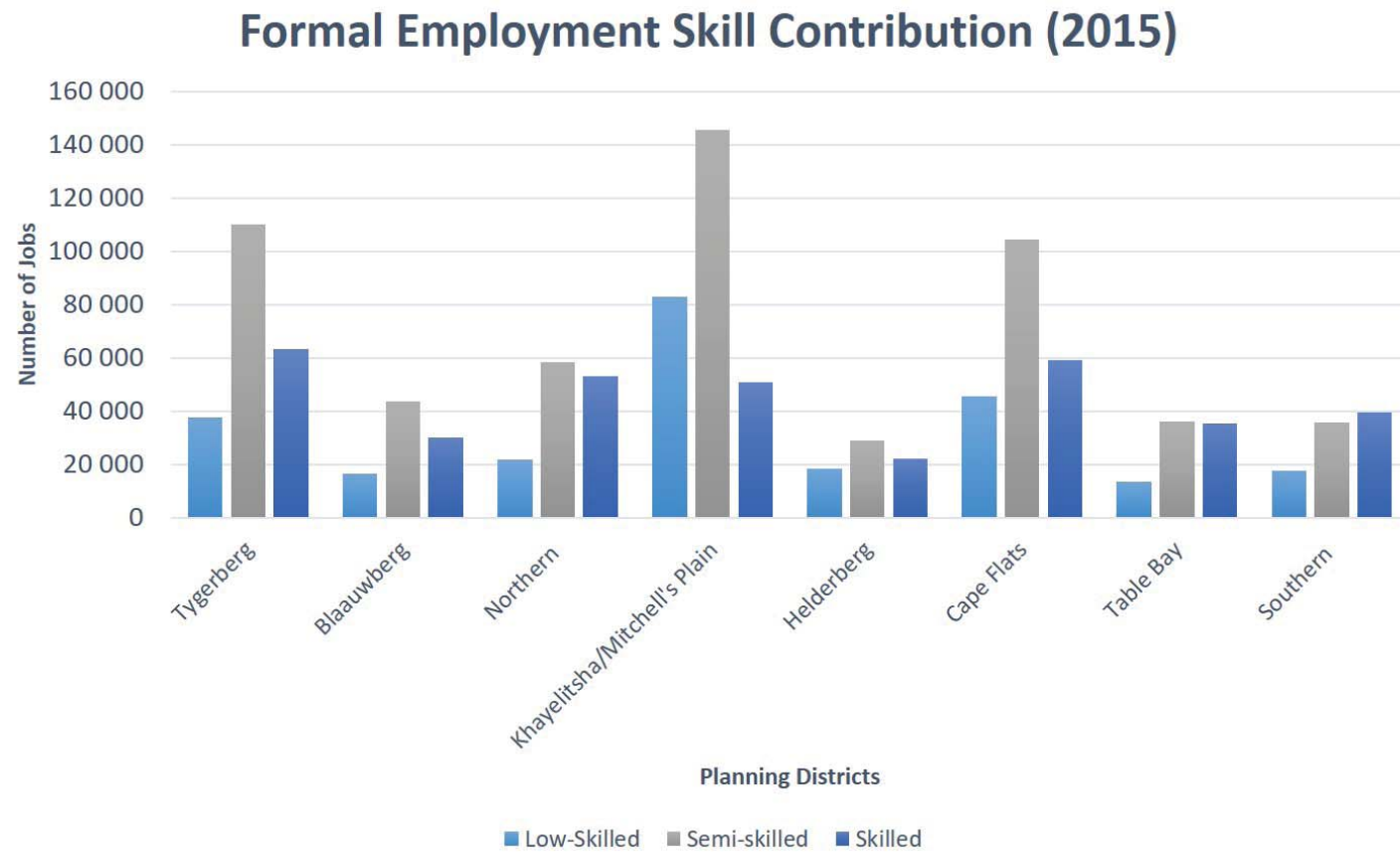


Figure 3.3 Formal Employment Skill Contribution (Source: WCG, 2016a; Quantec Research, 2016)

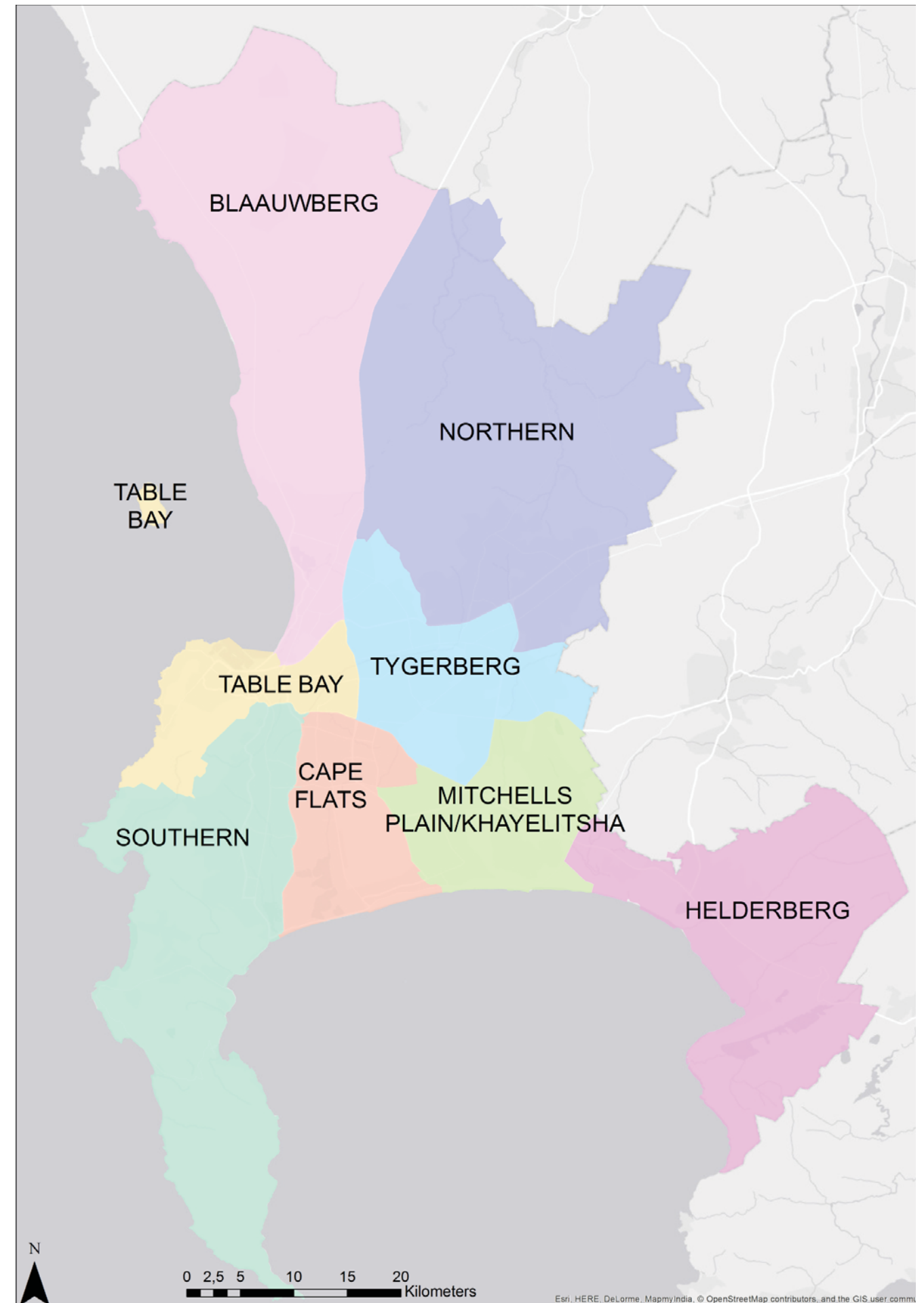


Figure 3.4 Planning Districts (Source: Author, 2017; CoCT GIS, 2016)

3.1.2 Major Employment Areas

The major employment areas in Cape Town are located in the high performing commercial and industrial business nodes of the city centre, Century City, Tygervalley, Blackheath, Claremont, Brackenfell and Epping Industrial, see Figure 3.5 (CoCT, 2016a). Commercial nodes include retail and office space and industrial nodes include manufacturing spaces, logistics and storage warehouses (CoCT, 2016a). Employment sectors are concentrated in these areas and these different employment sectors create the demand for different kinds of skills. Cape Town has both a nodal and linear spatial-economic structure. The linear elements are the urban corridors such as Voortrekker Road, Durban Road in the Tygervalley area and Main Road running through the Southern Suburbs. However, the pattern of economic activity is more nodal than linear and this has spatial implications for public transport and the easy access of employment areas from low-income residential areas (CoCT, 2010).

The city centre has maintained its dominance as the main employment area. However, it has recently been challenged by emerging employment areas such as Century City and Tygervalley, which the private sector has invested in over the past 10 years (CoCT, 2016a). The major industrial employment areas are still located along the main movement route of Voortrekker Road, such as Epping Industrial and Elsies River, as seen in Figure 3.5. However, the location of Blackheath and Brackenfell on the periphery of the city does not supply large numbers of job opportunities as the industrial activity caters for warehousing and logistics that do not require many workers (CoCT, 2016a).

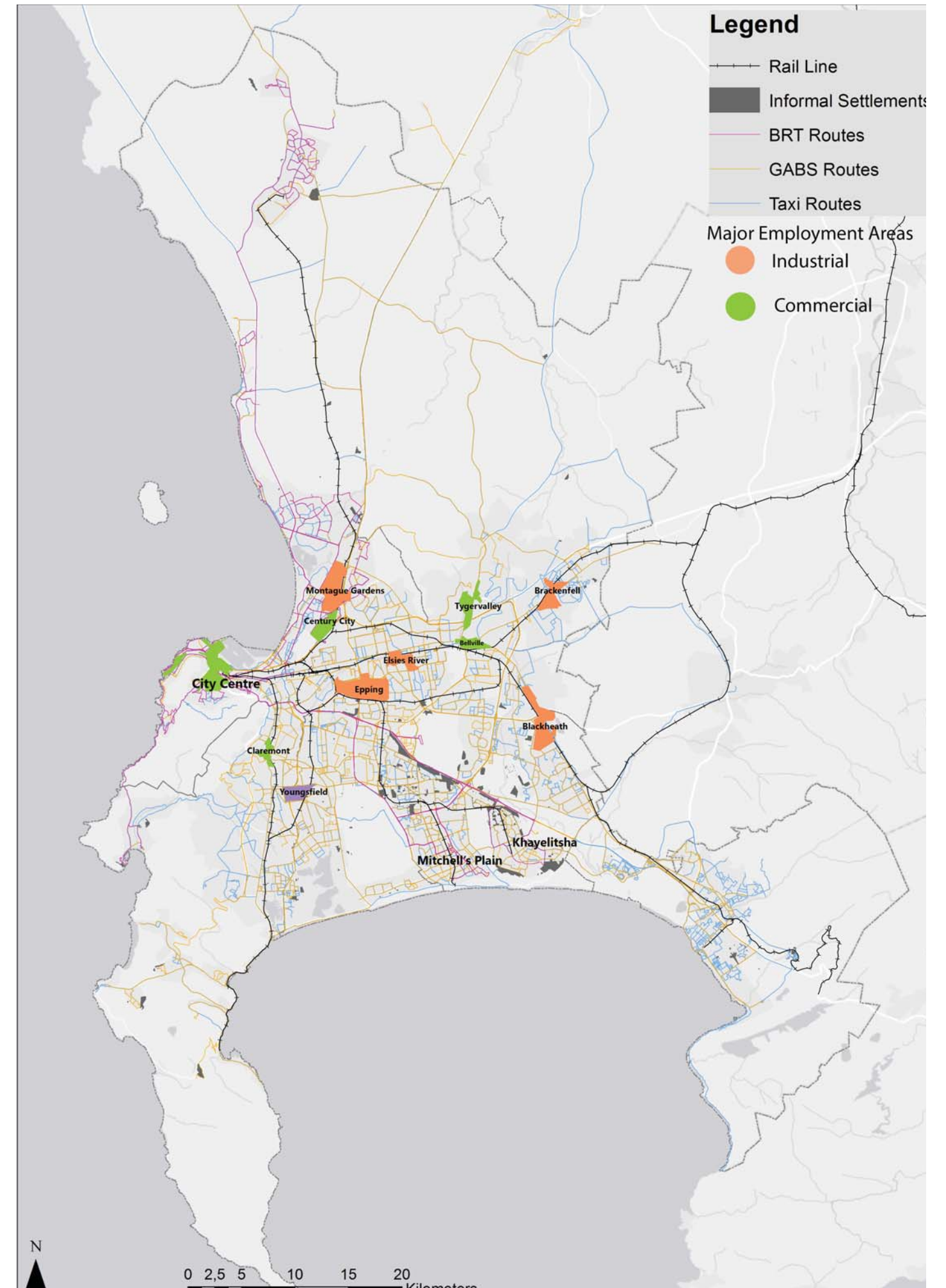


Figure 3.5 Major Employment Areas (Source: Author, 2017; CoCT GIS 2016; Rabe, McGaffin & Crankshaw, 2015)

3.1.3 Major Low Income Residential Areas

Historically, people of colour were evicted from former white areas and were relocated to the peripheries of the city away from economic, retail and public service opportunities. Government housing developments such as RDP housing (now called Breaking New Ground (BNG)) were also constructed on the periphery in the existing informal and low-income residential areas. Other government subsidised housing developments have reinforced and intensified the spatial divisions of the city (Turok & Watson, 2001). This is reflected in the income and race distribution where the majority of black and coloured people live on the outskirts of the city. Current market forces have reinforced this, which has maintained poor socio-economic conditions. Low-income residential areas are characterised by the high densities of informal settlements and overcrowding, poor basic services and maintenance of infrastructure and poorly planned suburban areas in the Metro South East. This has also been worsened by the high number housing waiting list of 345 000 households. These are made up of “143 823 informal settlements, 74 957 backyard dwelling households, and 44 581 in overcrowded formal housing” (CoCT, 2016b: 22). This number shows the magnitude of the backlog, and with the City only delivering around 6000 units annually is not decreasing that number (CoCT, 2016b: 22). Figure 3.6 shows the densities of income bands depicted in red, orange and green.

Although the municipality has invested in economic projects in Metro South East, such as Philippi East, to enable deconcentration of economic centres towards the Metro South East, this has not materialised because of the lack of private sector investment and established well-functioning economic centres (CoCT, 2016a: 59; Turok, 2001).

Higher land values in the city centre have reinforced the spatial fragmentation of the city as many low-income individuals cannot afford to rent or purchase property close to opportunity areas. Vacant land on the peripheries has been targeted by the city who has constructed large social housing initiatives where this cheaper land is available. This has reinforced the low-income household’s status away from opportunity areas (Turok, 2001; Turok & Watson, 2001). The spatial implication for the City of Cape Town is that the increasing number of low-income households who rely on social grants, has increased the housing backlog and they are being

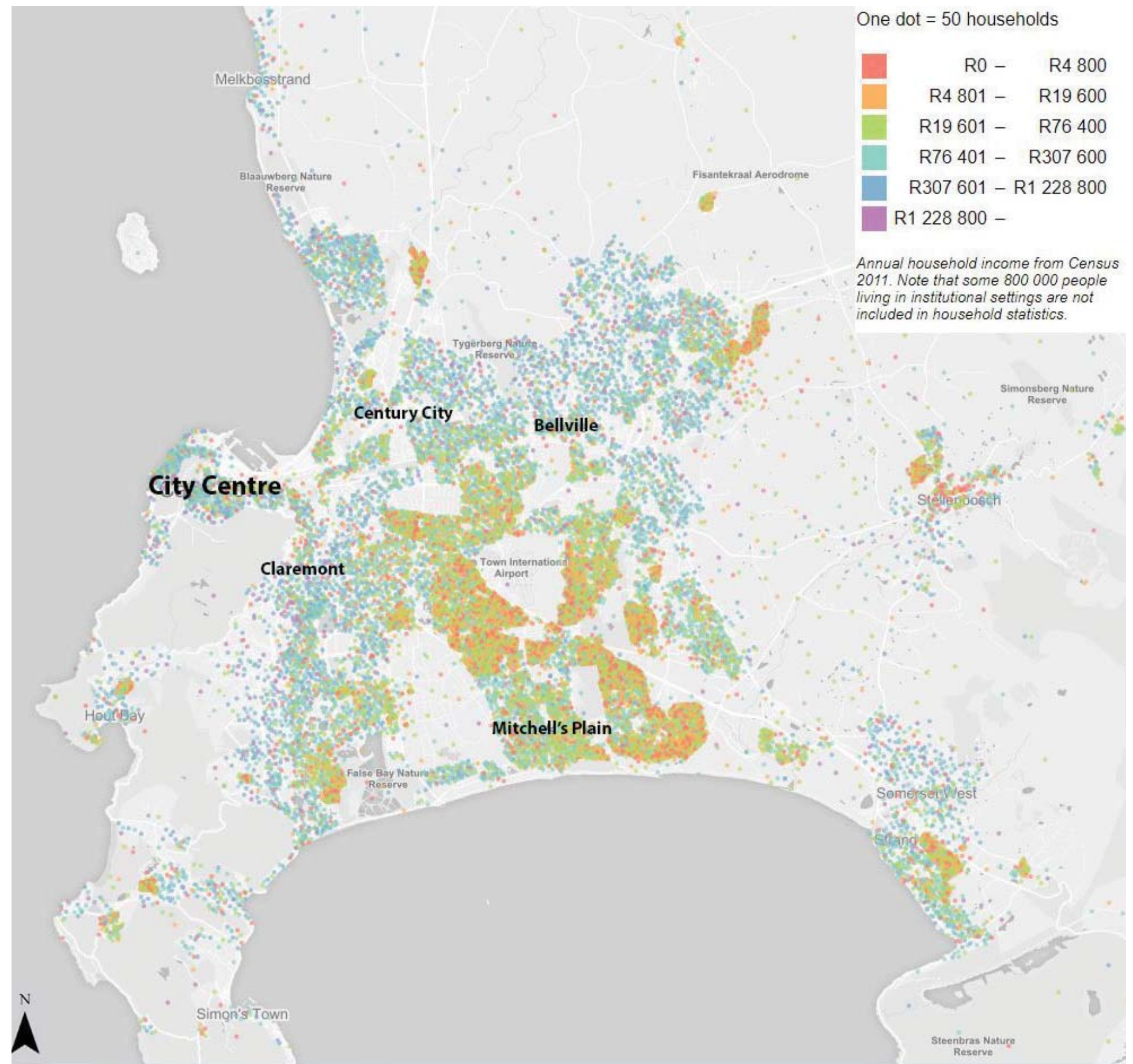


Figure 3.6 Income band distribution (Source: Adapted from <https://dotmap.adrianfrith.com/>, Census 2011)

forced into informal settlement accommodation. This places more stress onto the municipality to produce housing (CoCT, 2016a).

3.1.4 Major Movement and Public Transport Routes

The spatial structure of movement and public transport routes in Cape Town form a radial pattern converging on the city centre. The southern and northern suburbs and Milnerton are serviced with better public transport routes serviced by Golden Arrow busses (GABS), MyCiti, mini bus taxis and Metrorail. Figure 3.7 shows the large coverage of public transport routes in the Metro South East, however the issues of high transport costs and travelling time make the location of low residential areas inferior to affluent areas. Rail is accessible in the Metro South East from the Central and Cape Flats lines. These lines reach maximum capacity and cannot cope with the large numbers of passengers. They struggle with poor maintenance of rail infrastructure (Transport of Cape Town² (TCT), 2014). GABS and MyCiti also operate in the Metro South East travelling to major opportunity areas, however GABS struggles in traffic congestion but is more accessible for residential areas than MyCiti. MyCiti operates in Khayelitsha and Mitchell's Plain, however the routes are not as accessible to residential areas as they are located on higher order movement routes. The new MyCiti routes will travel along Ottery Road towards Wynberg and Plumstead train station, as well as the Lansdowne/Wetton Corridor, which will travel towards Claremont Station (TCT, 2014). Mini bus taxis also operate in residential areas and compete with GABS. It is also the most used public transport mode for low-income users (see Figure 3.8).

According to TCT (2016) 85% of the public transport user group is in the low to low-medium income group. This factor has forced low-income residents to manage high transport costs to opportunity areas, as well as use unreliable and constrained public transport to affluent areas in the North-West of the city. According to TCT (2016) low-income transport users spend 45% of their monthly household income on transport costs. High transport costs and time spent on travelling makes travelling to opportunity areas and back to low-income residential areas more difficult.

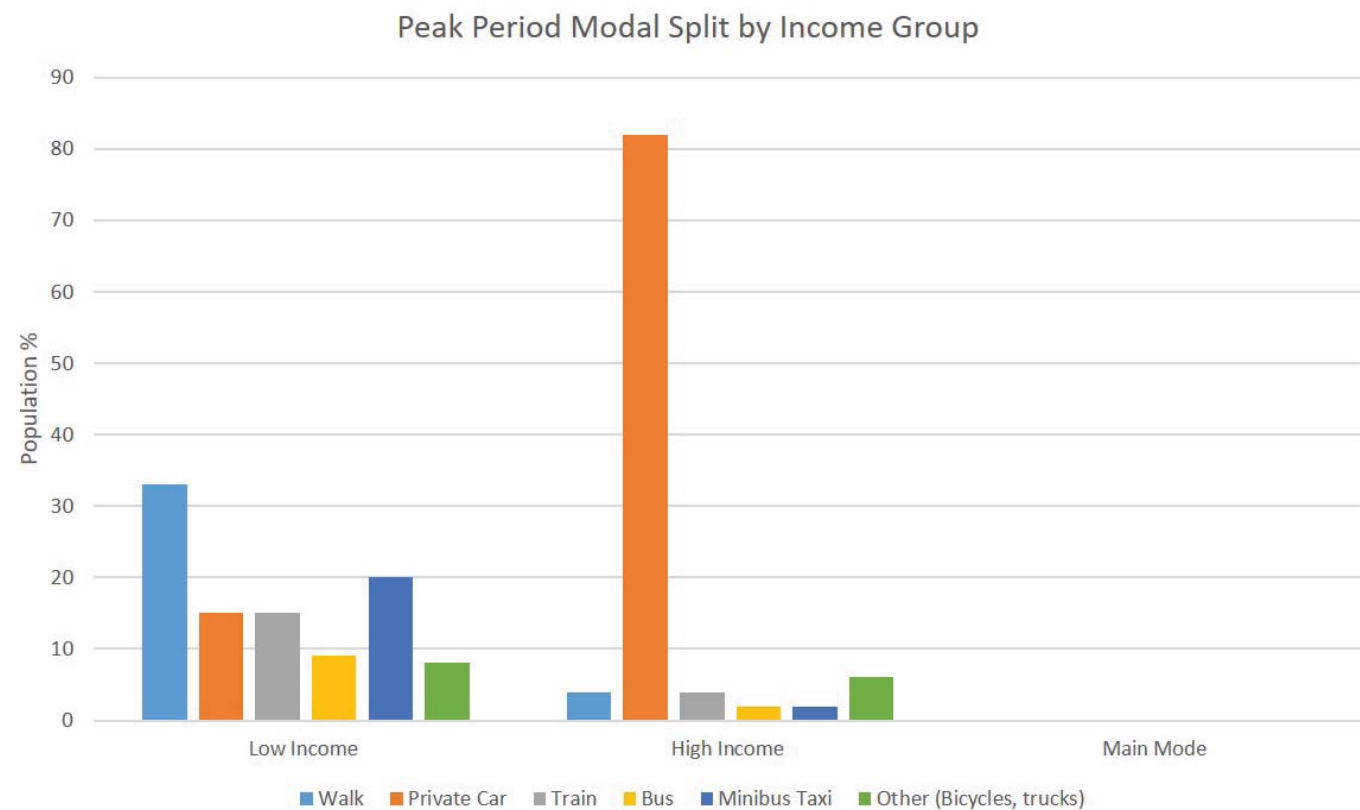


Figure 3.8 Graph showing Peak Period Modal Split by Income Group (Source: Adapted from TCT, 2014)

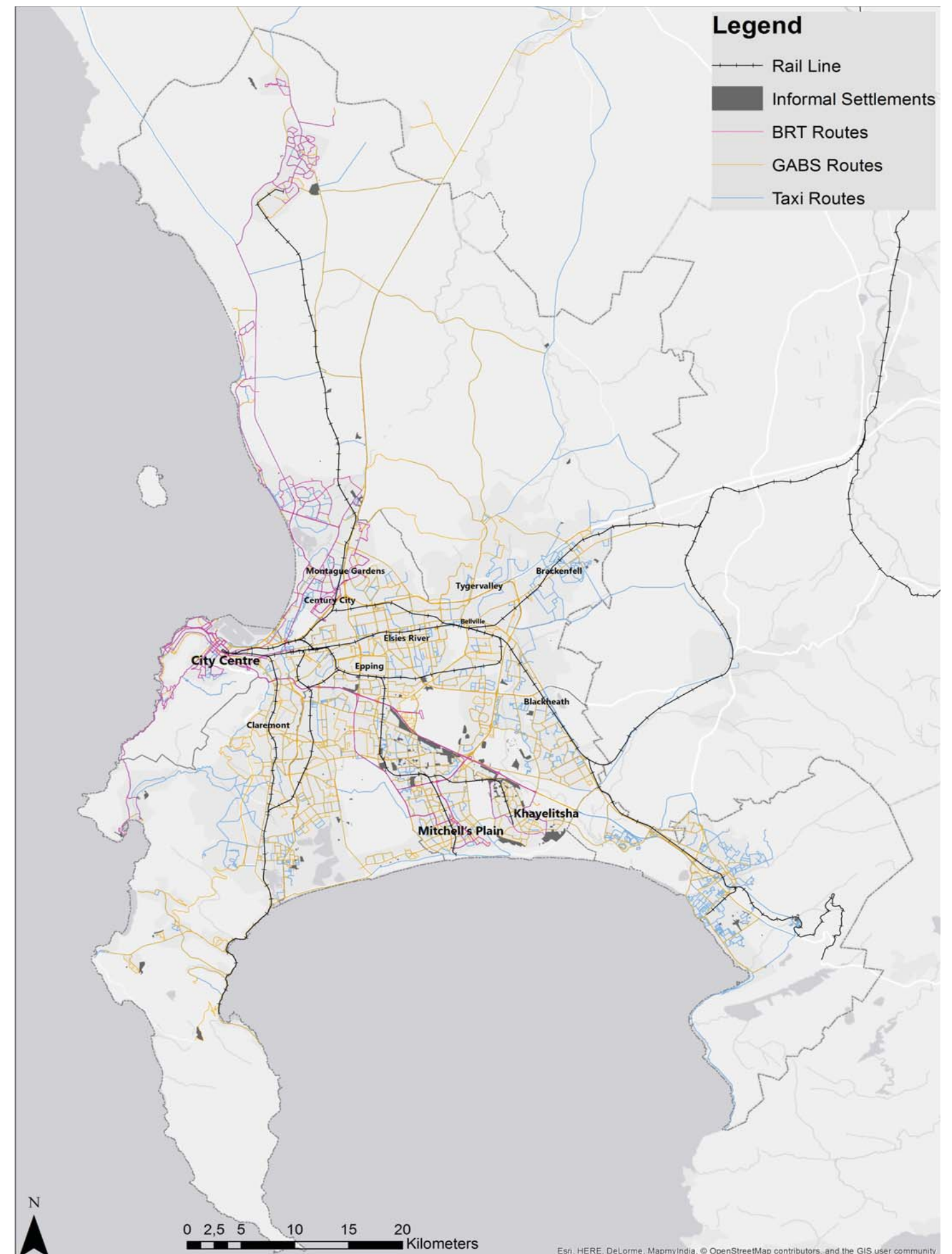


Figure 3.7 Public Transport Routes (Source: CoCT GIS; CoCT, 2016a)

2 Transport of Cape Town has now changed to Transport of Urban Development Authority (TDA).

High levels of traffic and public transport congestion, seen in Figure 3.9, is highlighted as an issue within the city. This links directly to the positioning of major employment and opportunity areas in the city centre and low-income households located in the Metro South East periphery (Sinclair-Smith & Turok, 2012). Figure 3.9 shows congestion bottlenecks in the city centre has a 75% delay during morning peaks and makes it unsustainable for public transport to run efficiently. In Figure 3.8 above, according to TCT (2014), 44% of low-income transport users take public transport modes of either train, bus or minibus taxis. This is, in relation to only 8% of higher income groups who use public transport. 33% of low-income individuals walk as a mode of travel and could suggest the lack of public transport efficiency or expense for these individuals. The new eastern route will travel along Ottery Road towards Wynberg and Plumstead train station, as well as the Lansdowne/Wetton Corridor, which will travel towards Claremont Station. The spatial implications of sprawled low-income suburbs on the periphery and the radial structure of the public transport system is the high cost of travelling as well as the financial sustainability of public transport for the city, as low-income individuals are affected directly by increase in transport costs (TCT, 2016).

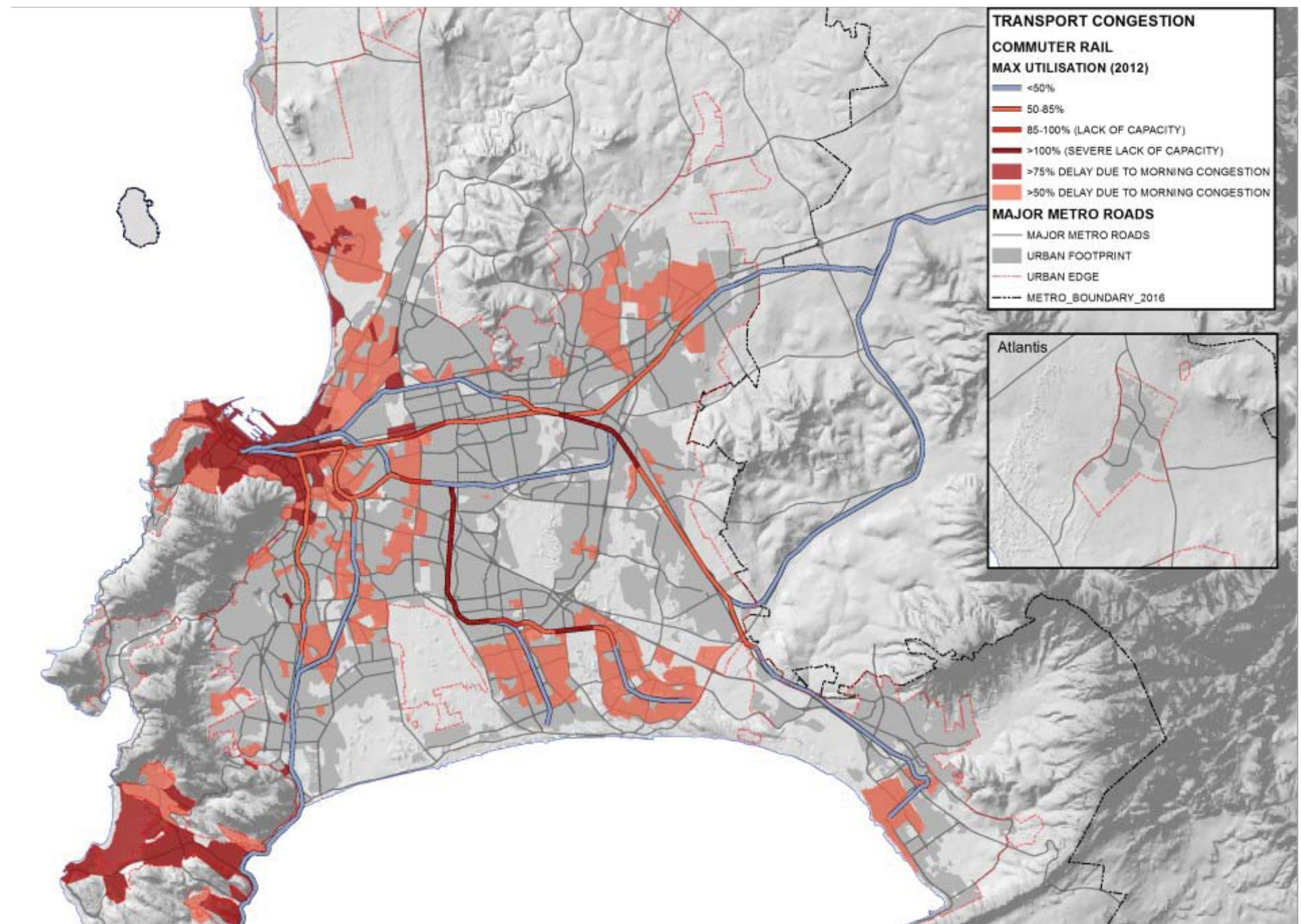


Figure 3.9 Transport Congestion (Source: Rabe, 2016)

3.1.5 Implications of metropolitan analysis for the development of Youngsfield

The above analysis of the spatial problems of Cape Town indicate that Youngsfield can contribute to opening up land in good locations which is well connected to public transport routes and much closer to areas of economic and institutional opportunities. Youngsfield is located in close proximity to major public transport routes and different transport modes (depicted in purple in Figure 3.10). The existing Golden Arrow routes travel along the Ottery Road corridor and as well Lansdowne/Wetton Corridor. This places it in close proximity to the Cape Flats and Southern Suburbs's rail lines. With the introduction of the MyCiti, this could become a more streamlined public transport route and has potential for intermodal transport with minibus taxi, rail and busses. Access to the M5 and M3, which are well located in relation to the major employment and retail areas of Claremont, the city centre and Century City, is also in close proximity to Youngsfield. With the spatial disconnection that Cape Town struggles with, Youngsfield, which is well located for low-income households, features as a site to reconnect the spatial fragmentation of these issues.

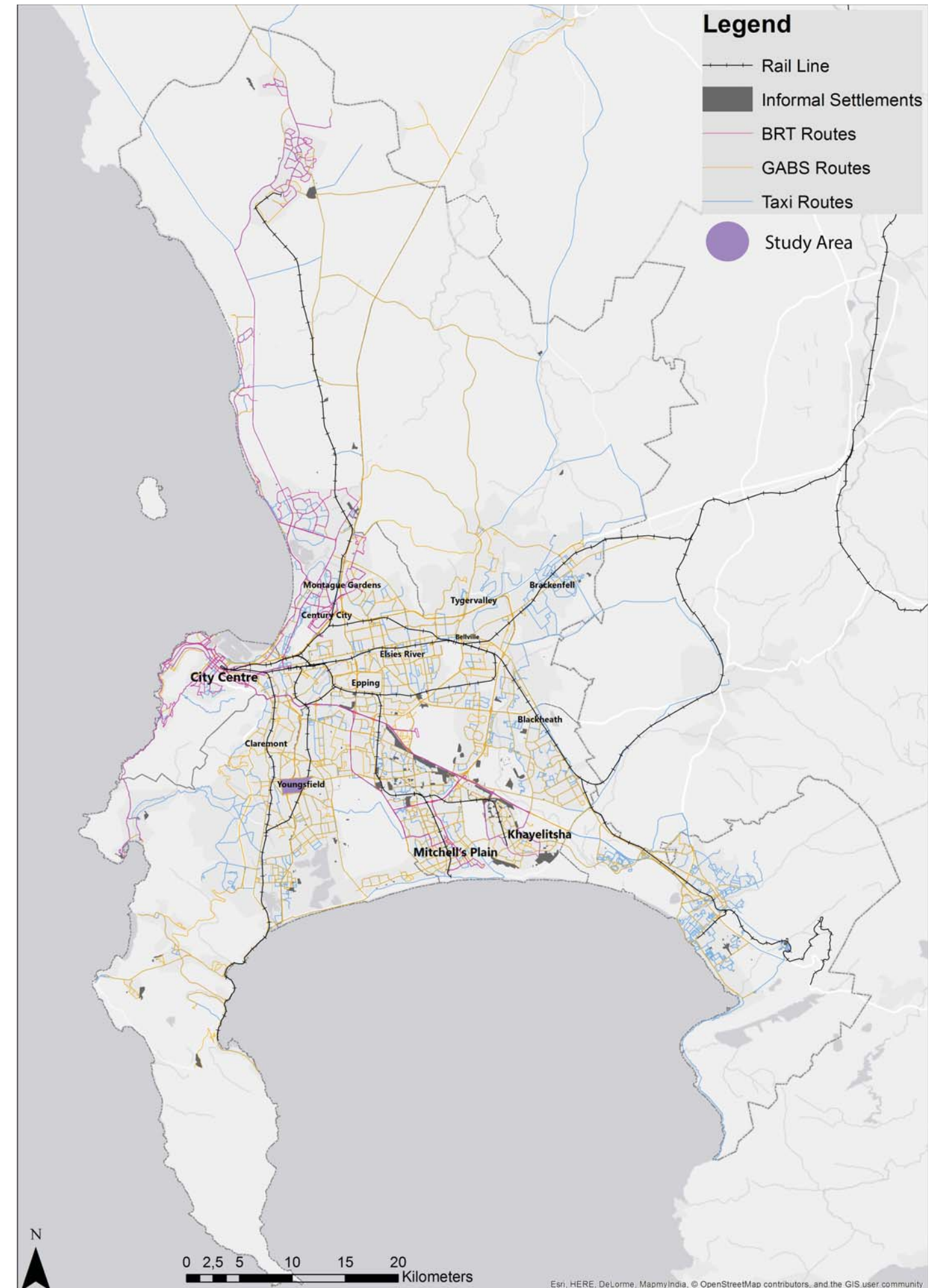


Figure 3.10 Study Area: Youngsfield (Source: CoCT GIS, 2016; CoCT, 2016a)

3.2 Sub-Metropolitan Analysis

The sub-metropolitan analysis will focus on Youngsfield and the surrounding structuring elements of the site. The analysis will be divided into two sections: Environmental attributes and patterns of land use and major movement routes.

The sub-metropolitan area that will be analysed is between two planning districts that are divided by the M5, the Southern Suburbs District, to the west, and Cape Flats District, to the east. Youngsfield is located between the north-south mobility corridors of Rosmead Avenue (M28), the M5 and Rail Line on the east of the site. The M5 cuts the site in half. The corridors surrounding the site are Ottery Road (M68), to the south, Rosmead Avenue (M28) to the west and the Lansdowne/Wetton (M9) corridor to the north. Rosmead Avenue is an active commercial corridor with mixed use space. Lansdowne/Wetton corridor has some commercial and industrial activities and the City has made large investments in it as a future active commercial corridor.

3.2.1 Environmental Attributes of the sub-metropolitan area

The environmental aspects of Youngsfield will be analysed by exploring the geology, soil types and characteristics, slope gradients, vegetation types and characteristics and biodiversity status, as well as the river corridors and wetlands in the sub-metropolitan area.

The geology of the area is dominated by quaternary sandstone that has a gradual flat nature along the Cape Flats area. Wynberg area has some steeper Cape Granite formation, with a slope between 1:6 and 1:4. Below the surface is the Cape Flats aquifer which results in a shallow water table (average 3.75m below surface) which increases and reaches the

surface during winter rains (Harris, Oom & Diamond, 1999).

The dominant soil in the area is podzolic soil, which has coarse-sandy texture. Coarse-textured soils are quite stable during both dry and wet conditions which makes it ideal for development (Anderson & Halsey, 1990). The soil depth is $\geq 450\text{mm}$ and $<750\text{mm}$ which too is suitable for development (CoCT GIS, 2005).

The dominant vegetation type is indigenous Cape Flats Sand Fynbos, see Figure 3.11. Most of the sub-metro area is a built up urban environment, with remnants of Cape Flats vegetation located in the Kenilworth racecourse and Youngsfield undeveloped area. The vegetation type is also found on vacant land along Ottery Road. Kenilworth Racecourse Conservation Area (KRCA) is the only area where remnants of the indigenous vegetation have not been physically disturbed by human activities on the Cape Flats. The other exposed areas were transformed by human activity and has been replaced by invasive alien vegetation (Bird & Day, 2016; Holmes & Pugnalin, 2016).

Figure 3.11 shows that the sub-metro area has six rivers that flow adjacent to the site which has many wetland depressions. Because of the nature of the flat plains, isolated depressional wetlands are common in the open vegetation areas. The wetlands are predominately groundwater fed, but also receive a significant proportion of their water from direct winter precipitation (Bird & Day, 2016). The flat area is not prone to flooding, but transformed wetlands can result in flooding (Holmes & Pugnalin, 2016). The wetlands also act as habitat areas and support different bird species and amphibians of the local ecosystem and neighbouring wetlands of KRCA (Deklerk, 2017).

There are seasonal winds that pass through the sub-metropolitan area. During the summer months the prevailing wind is the south-easter which can be

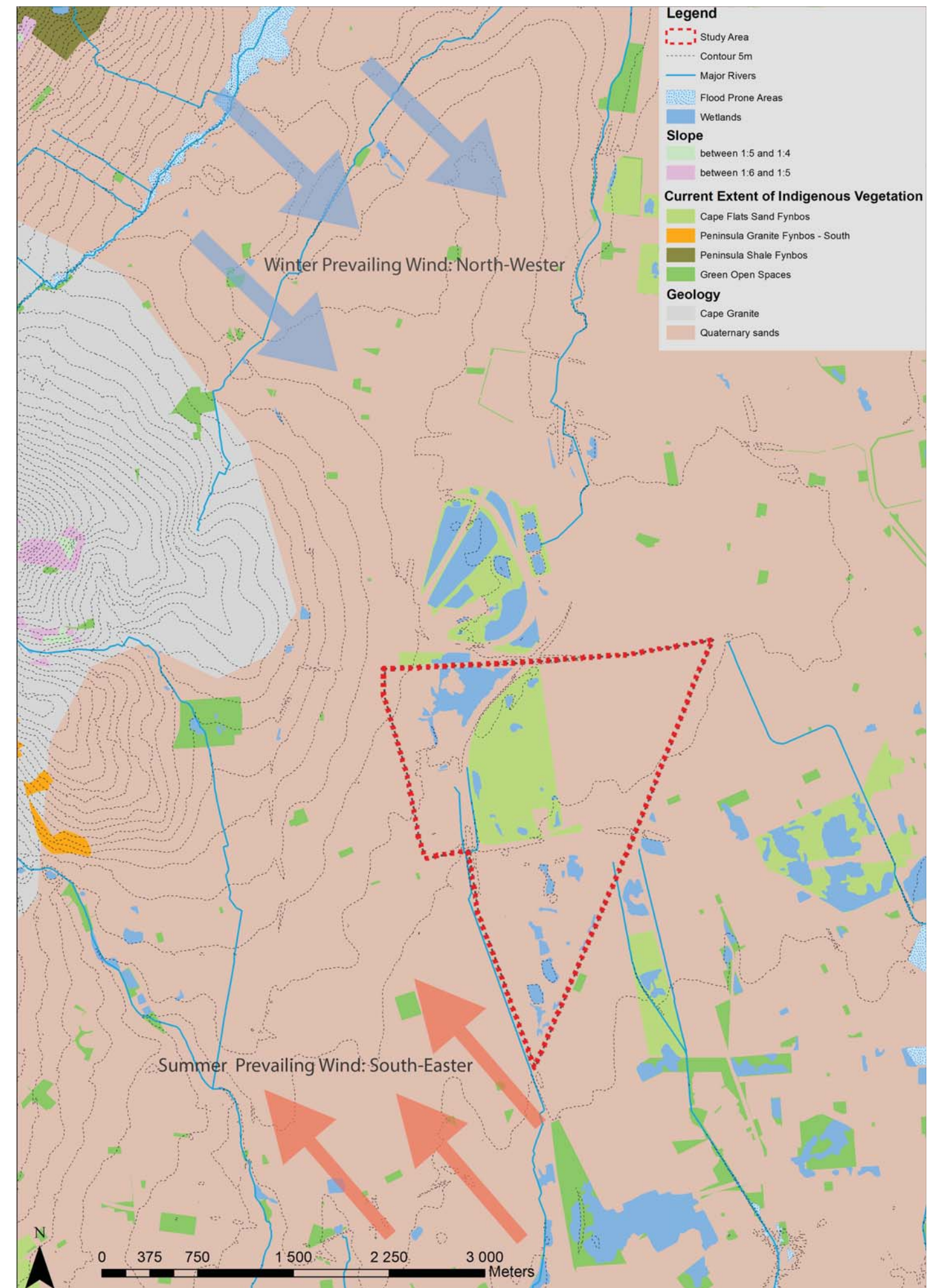


Figure 3.11 Current Environmental Attributes (CoCT GIS, 2005, 2016; SANBI GIS, 2017)

strong. False Bay and Table Bay are exposed to this wind and the site would be exposed to the wind during the dry summer months. In winter, the prevailing wind is from the north-west or west. The mountain may act as a barrier from the north-west wind, and this wind also brings the rain during the winter months (Maritimesa.org, 2016). The average rainfall of Cape Town is 600mm/pa and varies depending on the microclimate (Harris, Oom & Diamond, 1999).

The sun orientation is also a factor, as the slope is flat there is no interference with north-facing sun orientation, as well as no steep hills or mountains that define the sub-metropolitan area. This will ensure optimum solar radiation for potential solar energy and development.

Figure 3.12 shows that the status of most of the wetlands in the sub-metropolitan area is that they are unprotected, but are classified as 'other ecological support areas' and are therefore not under high threat (Holmes & Pugnalin, 2016). Most of the wetlands in the area are modified due to development and only a small area in Youngsfield is natural/semi natural in the entire sub-metropolitan area.

The overall implications for the site in the sub-metropolitan area are minimal, with the main constraint being the seasonal wetlands that could affect potential development. Wind is seasonal and may be a factor because the sub-metropolitan area is relatively flat and not close to the mountain, and solar orientation is not a factor, as the topography of the sub-metropolitan area does not block north-facing solar radiation.

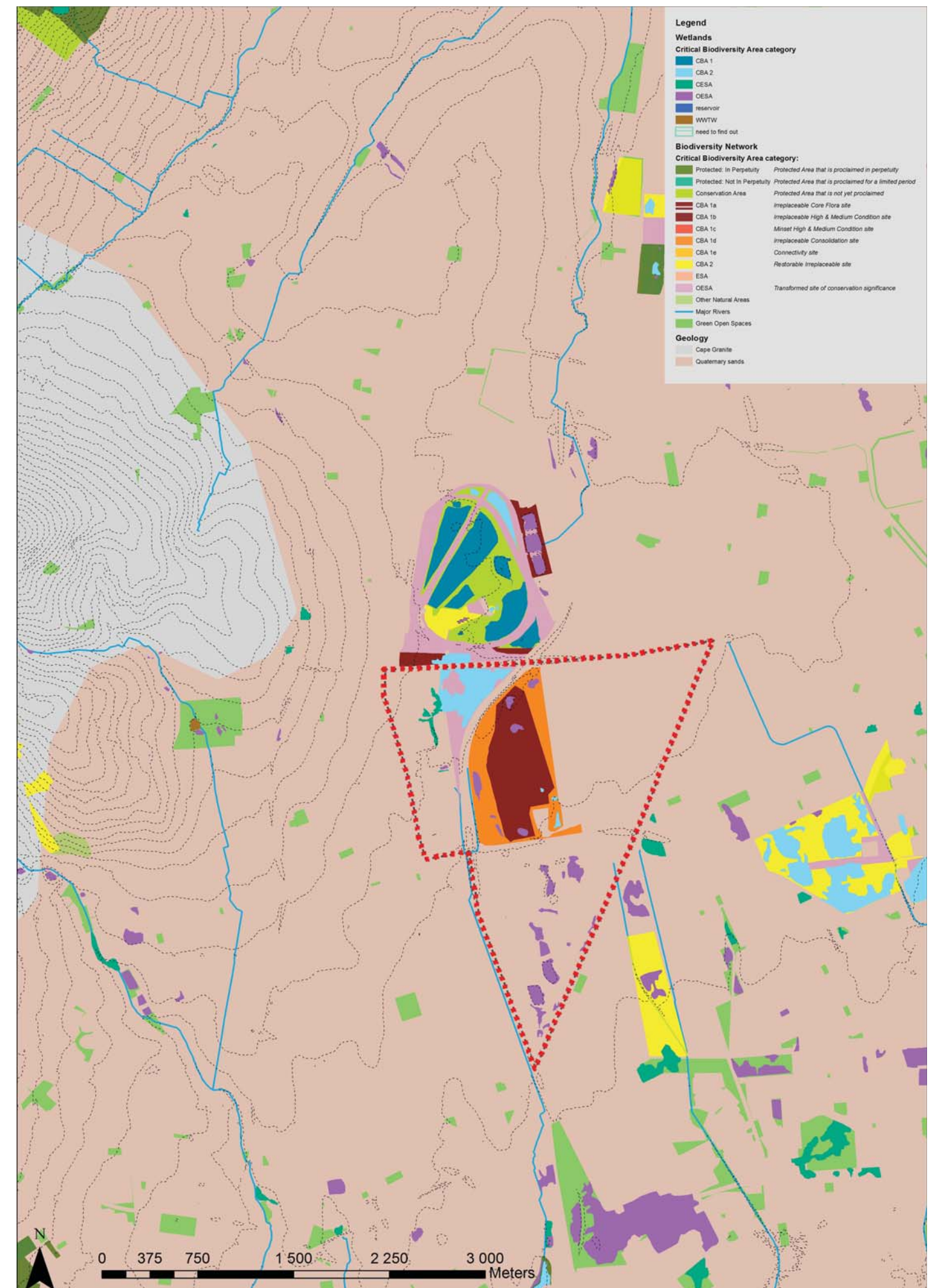


Figure 3.12 Biodiversity Network Status (CoCT GIS, 2005, 2016; SANBI GIS, 2017)

3.2.2 Urban Context of Sub-Metropolitan area

This section will examine the major movement routes in the sub-metropolitan area and the patterns of land use, which include the role of residential, major retail and industrial areas, public facilities and sanitation.

Major Movement Routes

The structuring elements of the sub-metropolitan area are the major movement routes and public transport routes. Figure 3.13 shows that the most important routes run in a North-South direction and are freeways (the M5) and commercial and public transport (bus and taxi) routes – Rosmead Ave (M28) and Main Road (M4). Further important routes connect the sub-metro area from east to west: Ottery Rd (M68) and Wetton Rd (M9). These are also public transport routes and carry mixed use activity corridors. The rail line from Simonstown to the city centre runs to the east of the site and two stations are located along the site. Hence, the site is very well situated in relation to metropolitan public transport routes and vehicular routes.

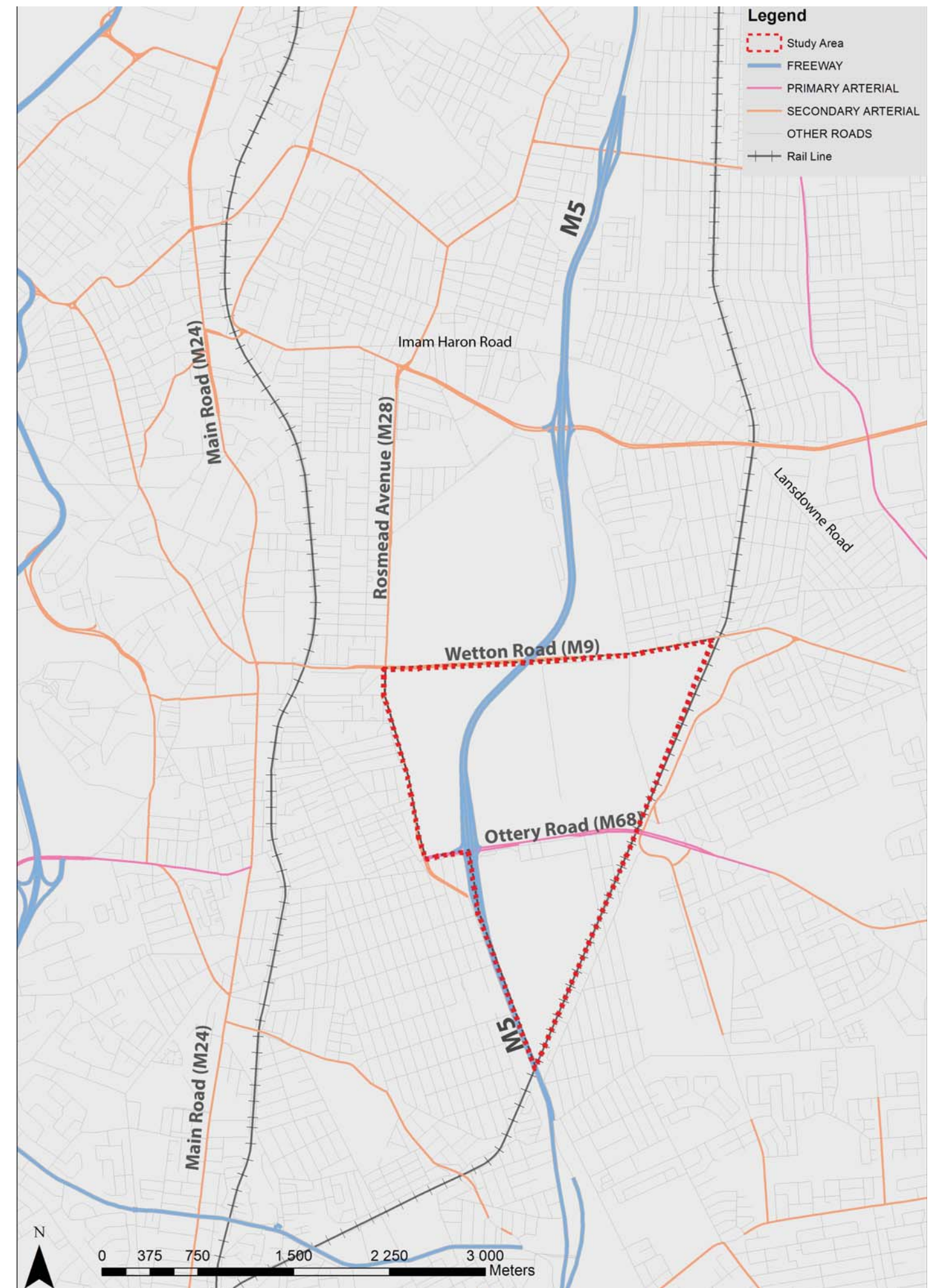


Figure 3.13 Movement Routes (CoCT GIS, 2009, 2016)

Residential areas

This section outlines the surrounding residential area income distribution.

Figure 3.14 shows the annual household income distribution of the study area and surrounds.

According to the Socio economic profile for the City of Cape Town (WCG, 2016b), the household incomes are grouped into low income, middle income and high income. Therefore the income groups in Figure 3.14 are grouped as low-income (R0 - R76 400), middle-income (R76 401 - R307 601) and high-income above R1 228 800). The incomes that overlap with Figure 3.14 grouping are labelled as upper or lower incomes of the bracket.

The areas along Main Road in Claremont, Kenilworth and Wynberg have more concentrations of the upper middle income bracket and high income households (shown in purple and blue in Figure 3.15). Some low-income and lower middle income households are also dispersed between in the areas of Wynberg and Plumstead (shown in green and orange). Wetton, Lansdowne and Ottery are quite similar to Wynberg a mix of upper low and middle income households (shown in green and blue), but has more dense clusters of lower income households around south east of the site than the western side of the southern suburbs (shown in red and orange).

The suburbs that directly surround the western side of the site are more middle to high income households. This could have implications for the approval from middle and high income groups for lower income households to reside in the area. However, there is a wide range of mixed-income groups surrounding the site. The mix of household incomes allows for better integration of different households living alongside each other.

Annual Household Income (2016)	Income Category
No Income	Low Income
R1 - R6 327	
R6 328 - R12 653	
R12 654 - R25 306	
R25 307 - R50 613	
R50 614 - R101 225	Middle Income
R101 226 - R202 450	
R202 451 - R404 901	
R404 902 - R809 802	High Income
R809 803 - R1 619 604	
R1 619 605 - R3 239 208	
R3 239 209 or more	

Figure 3.14 Annual Household Income classifications for Cape Town (Source: Adapted from WCG, 2016b)

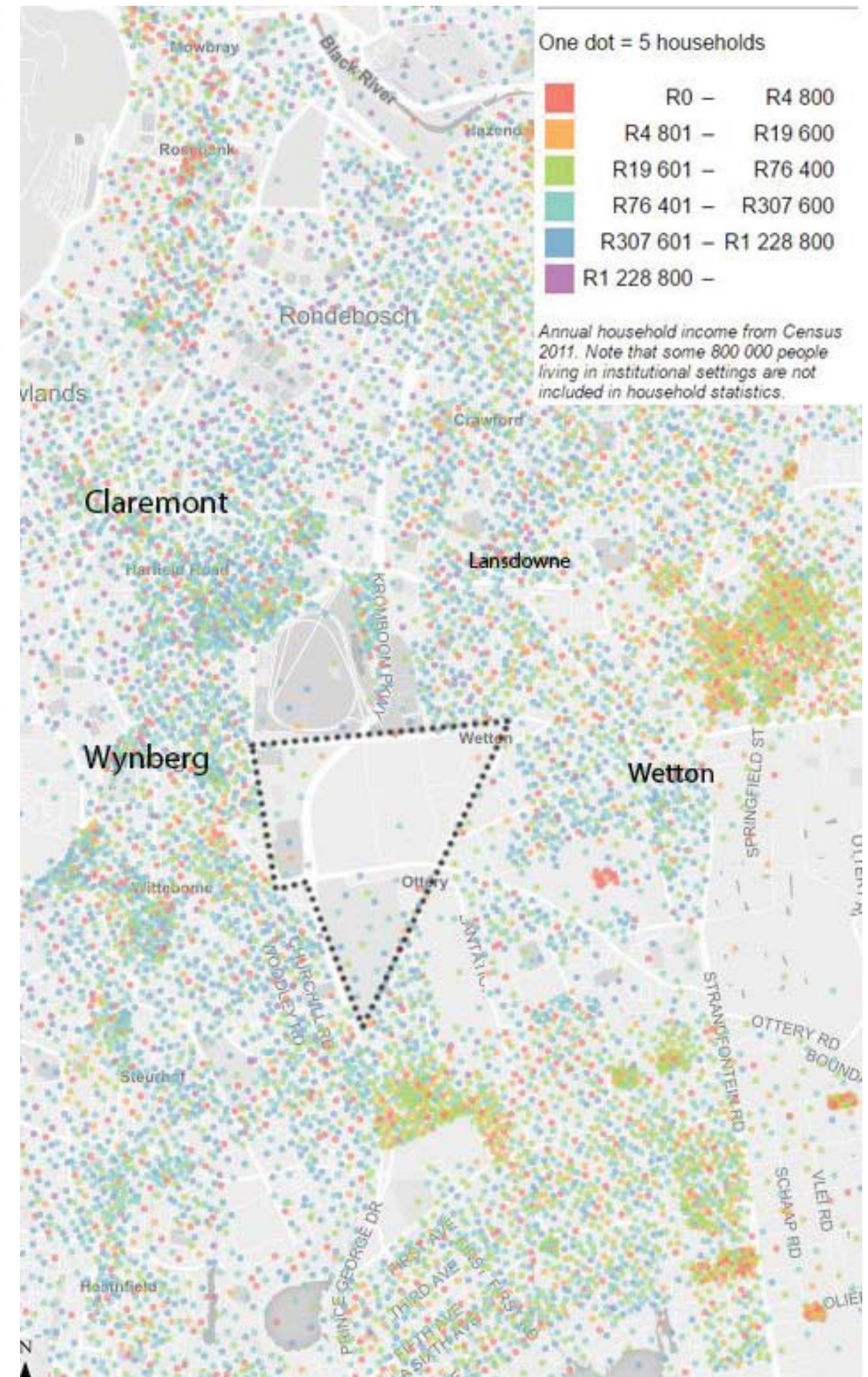


Figure 3.15 Income distribution of Sub-Metropolitan Area (Source: Census 2011; <https://dotmap.adrianfrith.com/>, 2016)

Residential Land Values

The residential land values of the surrounding areas of the site show a mixture of high and medium land values based on rand per square meter, see Figure 3.16. The higher land values concentrate around Main Road (M4), specifically between Wynberg and Claremont. The type of housing found in those areas is a mixture of medium to high density apartment blocks, found along Main Road, which disperses out into lower density units further away from Main Road (CoCT, 2012). Majority of the other suburbs are low density housing with large erf sizes, specifically Plumstead and Lansdowne. There is a distinct contrast between the land values of the Cape Flats areas such as Ottery and Wetton values being R751 – R1000 per m² (shown in green in Figure 3.16) to the Southern Suburbs on the west of Main Road (M4) (shown in light and dark blue). These values show that an introduction of affordable housing in the area should not have an impact on land values, as the surrounding areas have a good mixture of land values and can accommodate low-cost housing. This should avoid Not In My Backyard (NIMBY) objections from higher income suburbs. However consideration must be taken in quality of housing to match with surrounding typologies and property values.

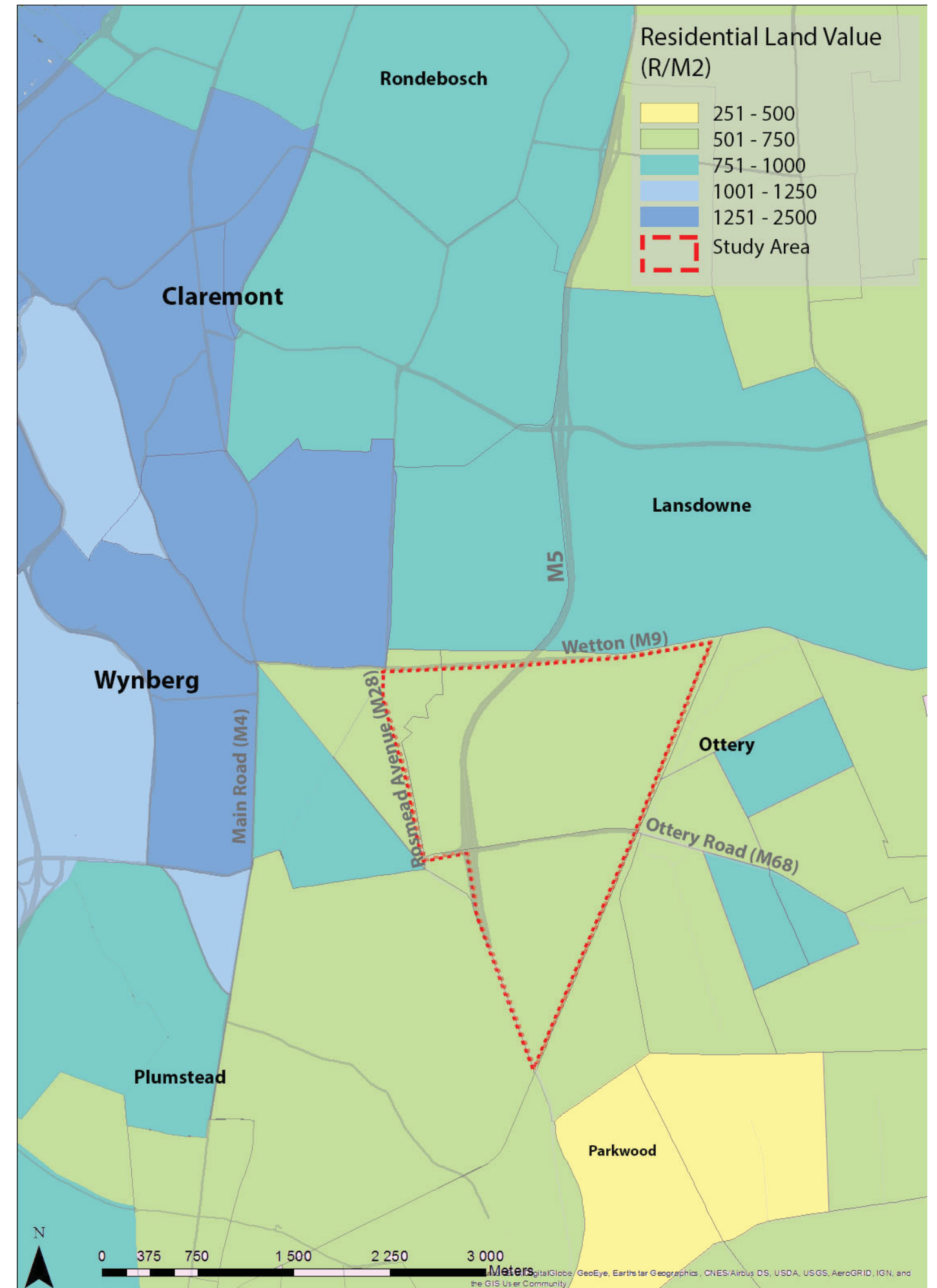


Figure 3.16 Land Values (Source: Adapted from CoCT, 2016a)

Commercial and Retail Areas

Figure 3.17 shows the commercial land use in the sub-metropolitan area in orange, and has linear and nodal elements.

The pattern of commercial space in the area is dominated by linear developments along Main Road (M4), with smaller service retailers located facing the street. Shopping centres such as Cavendish square in Claremont have followed this pattern by fronting directly on the main activity routes. Wynberg and Claremont Main Rd are more established with this dynamic than Kenilworth Main Rd, which has more spaces that are residential, and developments that are setback. These stores are mixed with some established franchises, but cater well for local financial and service outlets. Along the major employment routes on Claremont Main Rd, more office spaces are located, such as call centres, banks and other financial services.

Rosmead Avenue (M28) also has a functioning activity route with established retailers such as Spar and Pick n Pay locating along the route. The route also has a mixture of locally owned smaller retail spaces set slightly back from the street between established retailers who are set further back. Commercial outlets such as local takeaways, local service retailers, vehicle repairs and local restaurants are located along this route.

The major retail nodes of the site are located along Rosmead Avenue (M28) and Imam Haron Rd, north-west of the sub-metropolitan area, and Main Rd (M4) on the west (see Figure 3.17). Kenilworth is a well-functioning commercial area and has Kenilworth Centre shopping mall and Access Park retail stores and factory shops located opposite each other along a busy public transport east-west route.

The major implications of these linear and nodal commercial areas are the employment opportunities they present for low income households. The well-functioning retail areas supply many jobs for people living in the metro south-east and surrounds.

Industrial Areas

Figure 3.17 shows the industrial areas in purple. The major industrial nodes are dominant in the Ottery, Wetton and Lansdowne area. Ottery Gardens Industrial area is located alongside Wetton train station and Wetton Road, with many industrial businesses located there. Ottery Gardens hosts a total of 249 businesses. The area is not predominantly industrial, as wholesale, retail trade and repair of vehicles dominate the industries. Manufacturing has the second highest number of businesses after wholesale. (CoCT, 2017b). Lansdowne industrial area is also located on the east of the site bordered by Lansdowne Road. The industrial land use pattern is more nodal with manufacturing and wholesale retailers clustering in one area.

The implication of the location of the industrial areas is the possible availability of job opportunities, as these areas cater for the manufacturing and wholesale sectors.

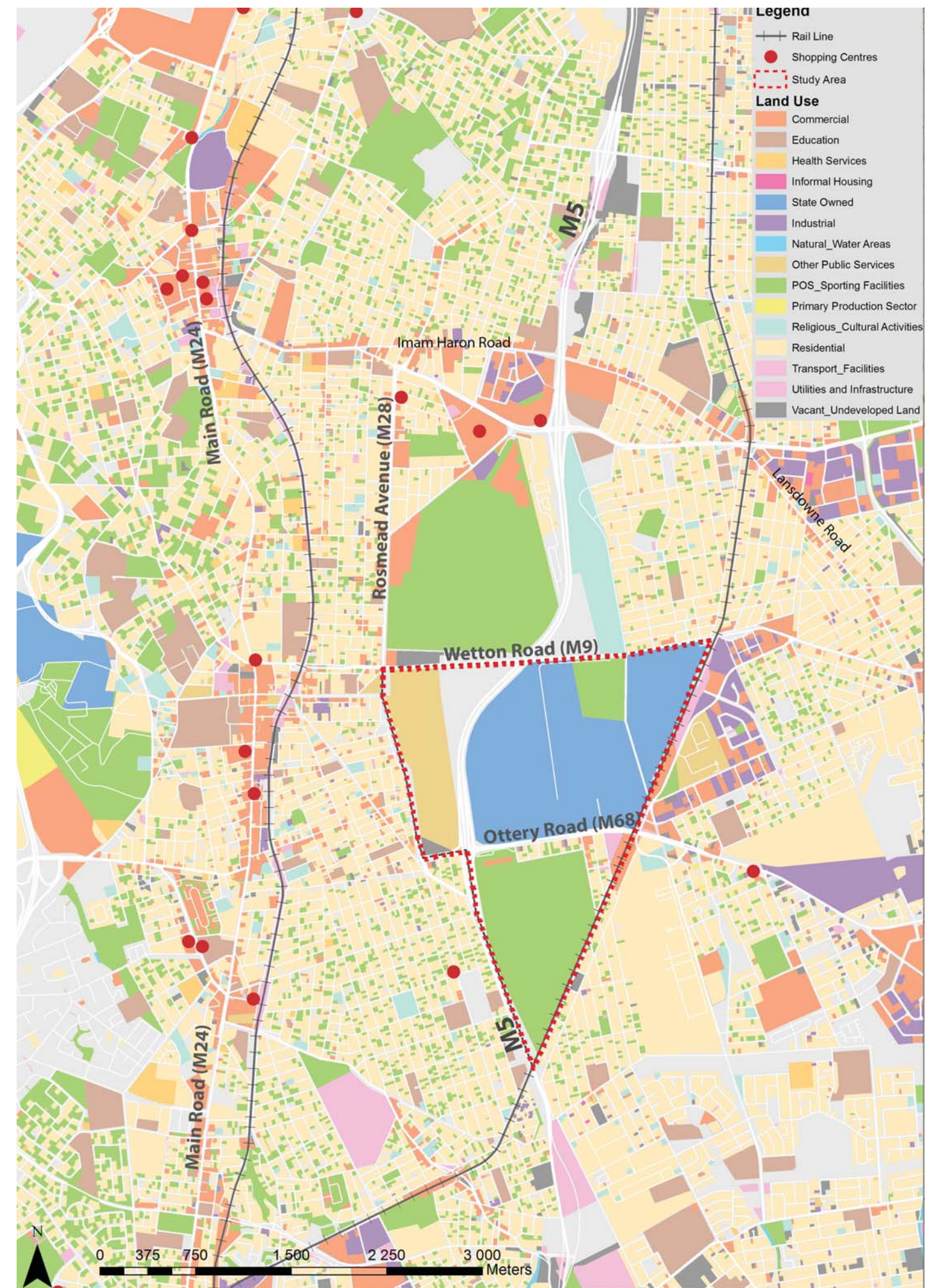


Figure 3.17 Land Use of Sub-Metropolitan Area (Source: CoCT GIS, 2009 & 2013)

Public Facilities

The sub-metropolitan area is well provided with public facilities, shown in Figure 3.18. Educational facilities such as primary and secondary schools are mainly located along the Main Road and southern suburbs rail line from Constantia to Rondebosch. There are also schools dispersed on the Cape Flats within residential areas.

Hospitals and clinics are located along the Main Road and cluster around transport interchanges, as do libraries and community centres. Public parks are also well located, however the safety and use of all public parks is not clear. Sports fields are well provided throughout the sub-metropolitan area and many are also available to the public, such as Rosmead Sports Ground and Chukker Road Sports Ground next to Kenilworth Racecourse.

The public facilities are well provided throughout the sub-metropolitan area. This confirms the good location of Youngsfield where opportunity areas are easily accessible, as well as close to the location of public transport routes. This opens up further choices for a new population which will come onto the site, given the time lag that often occurs between settlement and the establishment of facilities.

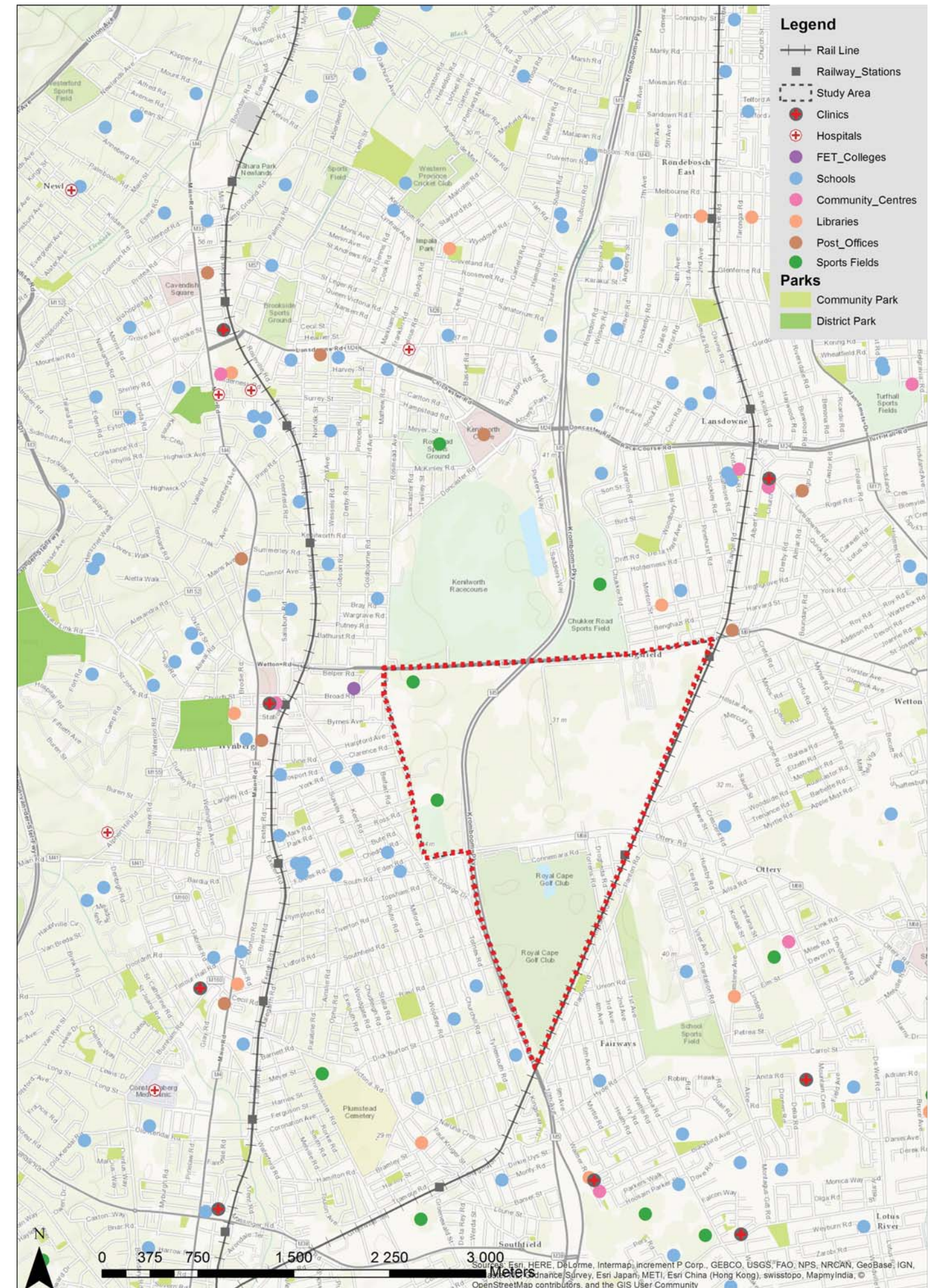


Figure 3.18 Public Facilities of Sub-Metropolitan Area (Source: CoCT GIS, 2005, 2009, 2016)

3.2.3 Bulk Services and Infrastructure

Wastewater Sanitation Network

Figure 3.19 shows the sewerage main network in the sub-metropolitan area. The standard diameter for a sewerage main should be 300mm or more. The diameter varies between 150mm and 1200mm throughout the sub-metropolitan area. Wastewater is piped to treatment facilities via a network of sewer mains and pump stations (CoCT, 2017c). Athlone wastewater treatment works (WWTW) is the closest wastewater treatment plant to the site. Athlone, as well as the other WWTW are currently experiencing sanitation capacity constraints and this may be an issue for the increased demands on the capacity of the sewerage network and bulk infrastructure (Rabe, 2016).

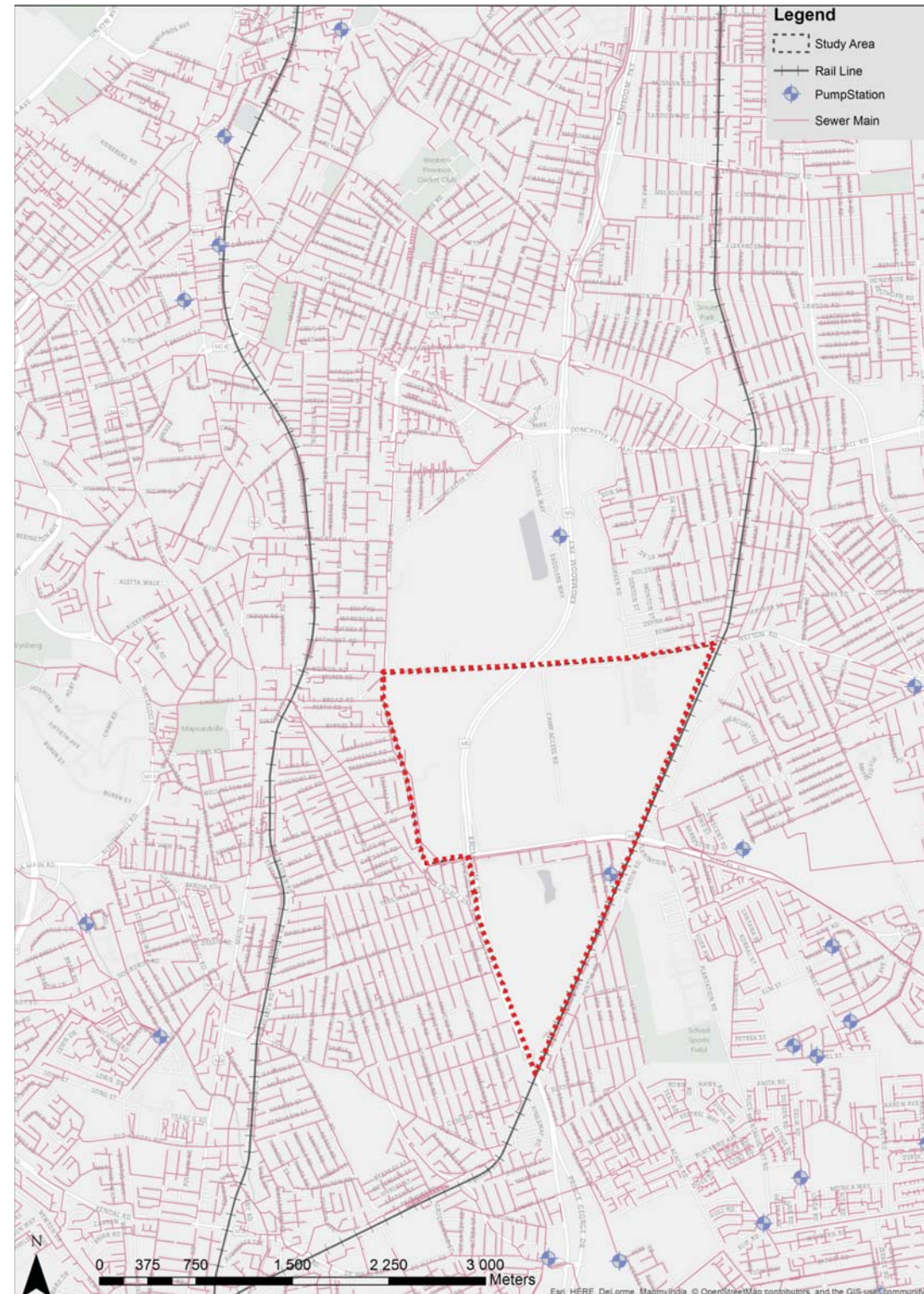


Figure 3.19 Wastewater sanitation (Source: CoCT GIS, 2013)

Bulk Water Network

Figure 3.20 shows the water network is again well connected throughout the sub-metropolitan area and the capacity of the water network is adequate in the area. However, there may be overall supply constraints as water is mostly supplied by dams outside of the metropolitan area which serve the entire city. There are three bulk reservoirs; Wynberg, Newlands Upper and Lower and one smaller distribution reservoir at Albion Springs located within the sub-metropolitan area which distributes potable water to all areas. The highest capacity for these reservoirs is: Newlands Upper, 132.6 mega litres (ML). Newlands Lower, 46 ML and Wynberg, 8.4 ML. This is what can be stored in each reservoir and is not the output of each reservoir (CoCT, 2017c).

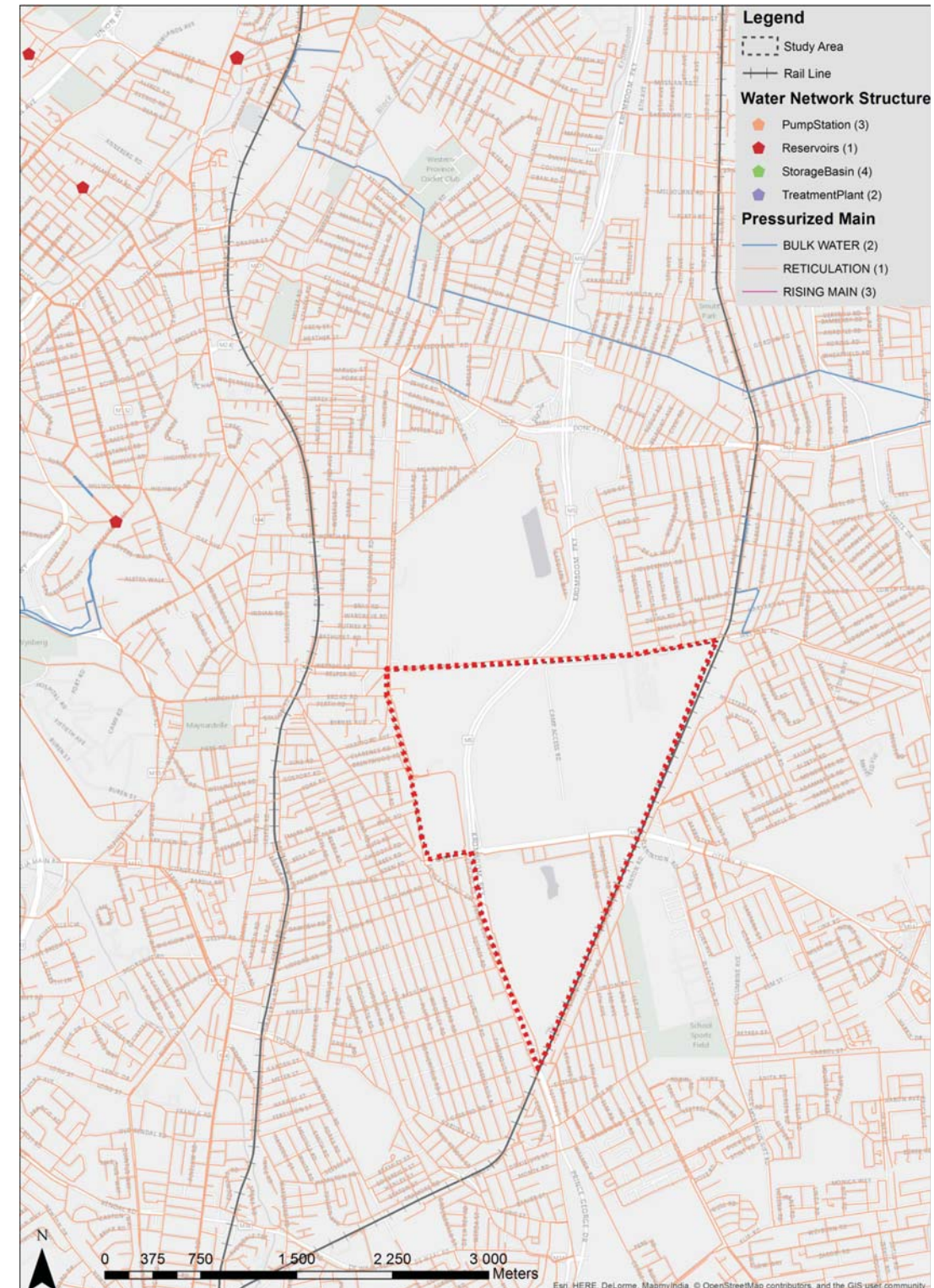


Figure 3.20 Bulk Water Reticulation Network (Source: CoCT GIS, 2013)

3.2.4 New Development Areas

Figure 3.21 shows the proposed development in the sub-metropolitan area. The major proposal is in the Kenilworth Racecourse area. The development will be on the southwestern corner of the racecourse, and will include: up to 498 dwelling units, a hotel of up to 150 rooms, a restaurant of up to 612 m² and a business space of up to 14 000m². There will also be two additional roads within the development (DeKlerk, 2017: 6). The proposed development will border Rosmead Avenue (M28) and Wetton Rd (M9) which could have implications for the activity of Wetton Rd and the interaction of the proposed development on Youngsfield.

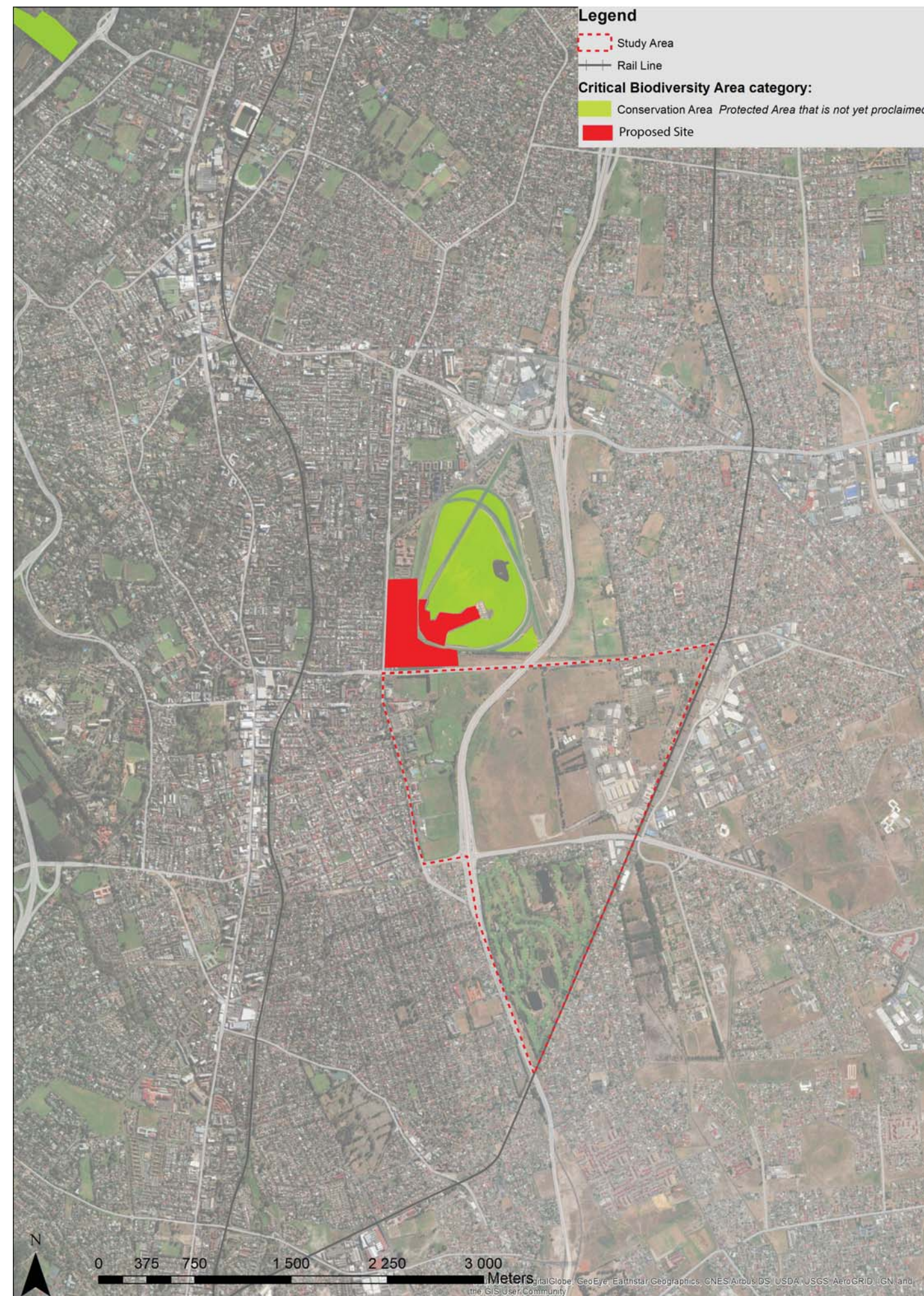


Figure 3.21 Proposed Developments (Source: DeKlerk, 2017; SANBI, 2017)

3.2.5 Implications of sub-metropolitan analysis for Youngsfield

Overall, the sub-metropolitan area is well provided with facilities, has a range of land uses that can provide employment and retail opportunities. These can be accessed from the site due to its proximity to public transport, employment opportunities, retail and commercial areas, public facilities and well distributed bulk sanitation services. Residential land values and income distribution of the sub-metropolitan area also shows a range, which should accommodate affordable housing and avoid NIMBY objections from high-income suburbs. This reaffirms the good location of Youngsfield within the sub-metropolitan area.

3.3 Site Analysis

This section will define and explain the boundaries of the site and analyse environmental attributes and patterns of movement and land use. Finally, the opportunities and constraints of the site will be determined as informants of the plan.

3.3.1 Site Boundaries

As indicated in Figure 3.22 below, the site boundaries include the Youngsfield Military Base and the Royal Cape Golf Club, south of the military base. The sports fields bordering Rosmead Avenue have also been included to intensify the role of the activity route and ensure better integration into the surrounding fabric. The Cape Town Municipal SDF Draft Review (2017a) has identified the sports fields as developable land and is City-owned land. The M5 will also be included in the boundaries. The golf course is ideal for development as most of the land is currently used for recreation by a small and select section of the population and the MSDF (2017a) has also identified the area as developable land. Rosmead Avenue (M28) and the M5 border the western side of the site, Wetton Road (M9) is north of the site and the railway line borders the eastern side. Ottery Road (M68) divides the site in half in an east-west direction, whereas the M5 splits the site in a north-south direction. The area not included in the study is the vacant land above Wetton Rd (M9) which borders Kenilworth Racecourse, as that area falls into a proposed development.

3.3.2 Environmental Analysis

Vegetation

Figure 3.22 shows vegetation in the northwestern area of the site (shown in orange and maroon as CBA 1B and CBA 1D) which has been identified as irreplaceable by SANBI (Pugnalin & Holmes, 2016) and the MSDF (2017a) as the area has indigenous Cape Flats Sand Fynbos. However, recent studies from Bird & Day (2016), in the area, have found that the vegetation has had extensive transformation from the dumping of materials during the construction of the military base. Patches of transformed vegetation have been replaced by invasive kikuyu grass *Pennisetum clandestinum* and Port Jackson willow *Acacia saligna*, covering almost 100% of the Youngsfield open area. This area does not have legal protection status, but is identified as a high priority area for conservation. It has also been identified as constrained land for development by the CoCT, as it falls into core 1 as critical biodiversity (CoCT, 2017a). However, it is difficult to restore transformed indigenous vegetation, and the area will not meet the national biodiversity targets based on the current extent of vegetation. The CoCT GIS (2017) has acknowledged that remnants of the sand fynbos have been invaded by alien vegetation and state “higher impact activities may be permitted on highly degraded areas” (CoCT GIS, 2017). This will allow for the western side of the military base to be used for appropriate development that will be sensitive to the wetland areas, which should be incorporated into environmental, and recreation design. Careful and sensitive development should occur on the vegetation areas classified as CBA 1B and CBA 1D. Indigenous vegetation found around the wetlands should be rehabilitated and conserved for recreational features and should be included in public space. Figure 3.22 shows that the eastern side of the site is partially developed and is not constrained by indigenous vegetation or poor soils.

Hydrology

There are over 20 wetlands on site, which do not have protection or conservation status (Pugnalin & Holmes, 2016). The wetlands are categorised as sand fynbos isolated wetlands, but most have been transformed due to development activities. There are only three isolated depressional wetlands that are natural/semi-natural, see Figure 3.22. The other wetlands have been transformed into either stormwater depressions or irrigation ponds in the golf course area.

One major wetland on the golf course should remain on site and be used as a recreational feature and public space. The other wetlands can be infilled for development. The natural/semi-natural wetlands should be restored and maintained for recreational features. These are located on Youngsfield, bordering Ottery Road. The larger wetlands should also be restored and conserved and incorporated into the recreational features of the site.

The state of the exposed land, on the north-west of the site, bordering the M5 and Wetton Rd, is poor. This is because of illegal dumping, its close proximity to Wetton Rd, and alien invasion and trampling. A large seasonal wetland is also located there and the existing sports fields act as a buffer during winter rainfall. The degraded wetland (Light blue in Figure 3.22) should be rehabilitated and partially conserved. The leftover area should be infilled for development and the restored sections should be used for recreational features and public space bordering the M5. This may have issues for drainage, however, infill must be dealt with by specialists in the field. This will ensure that ecological functions of wetlands will provide storage and flood protection during high rainfall events for the site as well as the surrounding areas. Wetlands are also valuable for aquifers and assist with groundwater recharge, this is essential for the Cape Flats aquifer below the site (Michaud, 2001).

Wind & Solar

The seasonal winds could be a factor for the site as it is exposed with no immediate buffers. Public open spaces on the site will have to be designed to be protected from these winds. The summer prevailing wind is the south-easter which is a strong wind and during winter the prevailing wind is the north-wester which brings the rain. There are low buffers on site that could prevent winds, such as the row of trees between the military base and exposed vegetation area. However, the trees are invasive alien Port Jackson's and will be removed.

In terms of solar radiation, tall buildings do not block sun orientation of the site or high slopes in a north-facing direction. This will ensure optimum use of solar radiation on site for renewable energy. The sun orientation also complements good views of Table Mountain to the north and west of the site.

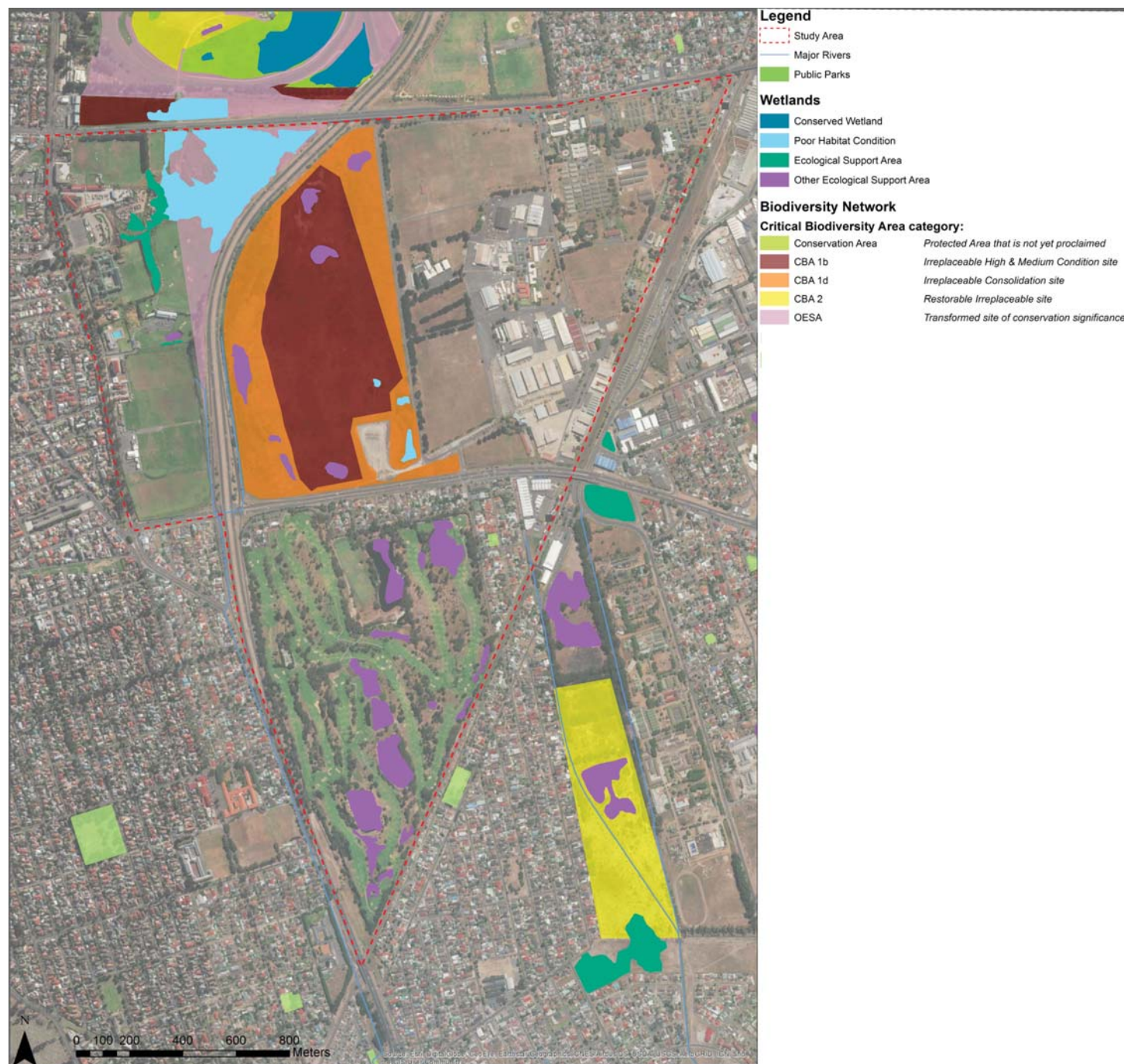


Figure 3.22 Biodiversity Status of Wetlands and Vegetation (Source: Author, 2017; CoCT GIS, 2016; SANBI GIS, 2017)

3.3.3 Movement Routes

Figure 3.23 shows the major movement routes are the M5 and the railway, which act as a barrier and divider on the site. The M5 is a high order movement route and prevents pedestrian or other forms of movement across the site. Certain of the movement routes surrounding the site are also not entirely permeable as they are high order. These include Ottery Road (M68), which has little traffic calming measures. It is a wide road and has few pedestrian friendly pavements, making the route appear high order. This is similar to Wetton Rd (M9) where it borders Youngsfield. However, Ottery Rd and Wetton Rd are more permeable and have active public transport routes.

Ottery Rd and Wetton Rd have certain edges of permeability. Ottery Rd is permeable after the elevated bridge, mainly due to the commercial activity along the route and access routes to surrounding neighbourhoods. Wetton Rd is similar with the commercial activity fronting onto the street. These routes have the potential to link to the surrounding fabric due to both routes fronting onto accessible and multifunctional routes. This opens up opportunities to link to lower order routes in adjacent neighbourhoods and can create better accessibility to the site.

The railway line also restricts access to the east of the site and the bridge is the only way pedestrians can cross over the railway. Minibus taxis and Golden Arrow Bus (GABS) stops are also located on Ottery Bridge.

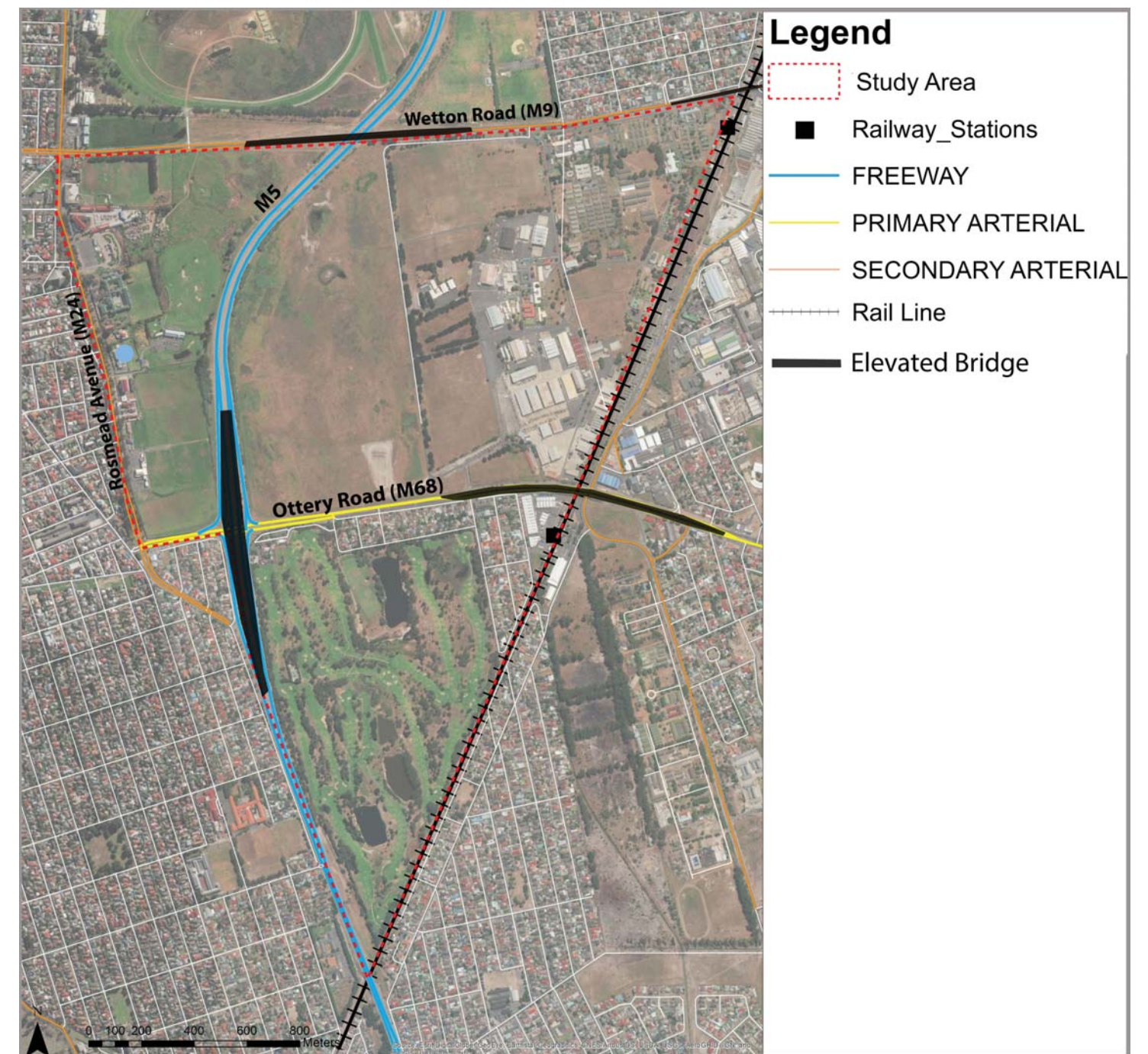


Figure 3.23 Movement Routes (Source: Author, 2017; CoCT GIS 2016)

3.3.4 Land Use on Site

Figure 3.24 shows the existing development on site is the industrial area on the east of the site, office buildings in Youngsfield, and smaller low-density housing for military training. There are also many public facilities and sports fields along Rosmead Avenue (M24). The major public facility buildings as well as the public and recreational facilities such as Wynberg swimming pool are essential for households to access close by. Other important public institutions located along Rosmead are the Department of Social Development and fire station. The sports fields are a prominent community area and cover a large area of the site. The sports field bordering Wetton Rd (M9) could be incorporated into the sports fields bordering Ottery Rd (M68), as there are many unused fields. The sports fields that should be developed on are located along potential corridors and limit the fronting on commercial or mixed use space along that route. The informal settlement located behind the Wynberg municipal dump will be accommodated in the new development in transitional housing units. The sports fields not shaded in orange are potential development areas because of their good location along active corridors, which will encourage better use of the bordering of activity corridors.

The industrial area (shaded in purple) and the existing buildings on Youngsfield will remain on site and will be incorporated into the potential development (see Figure 3.24). The existing development areas will remain on site and the other visual infrastructure and sports fields left open will be transformed for the proposed development. However, the smaller low-density buildings are currently used for training space; this can be used for development and will not remain on site, as it limits the potential fabric of the site, as well as potential higher densities.

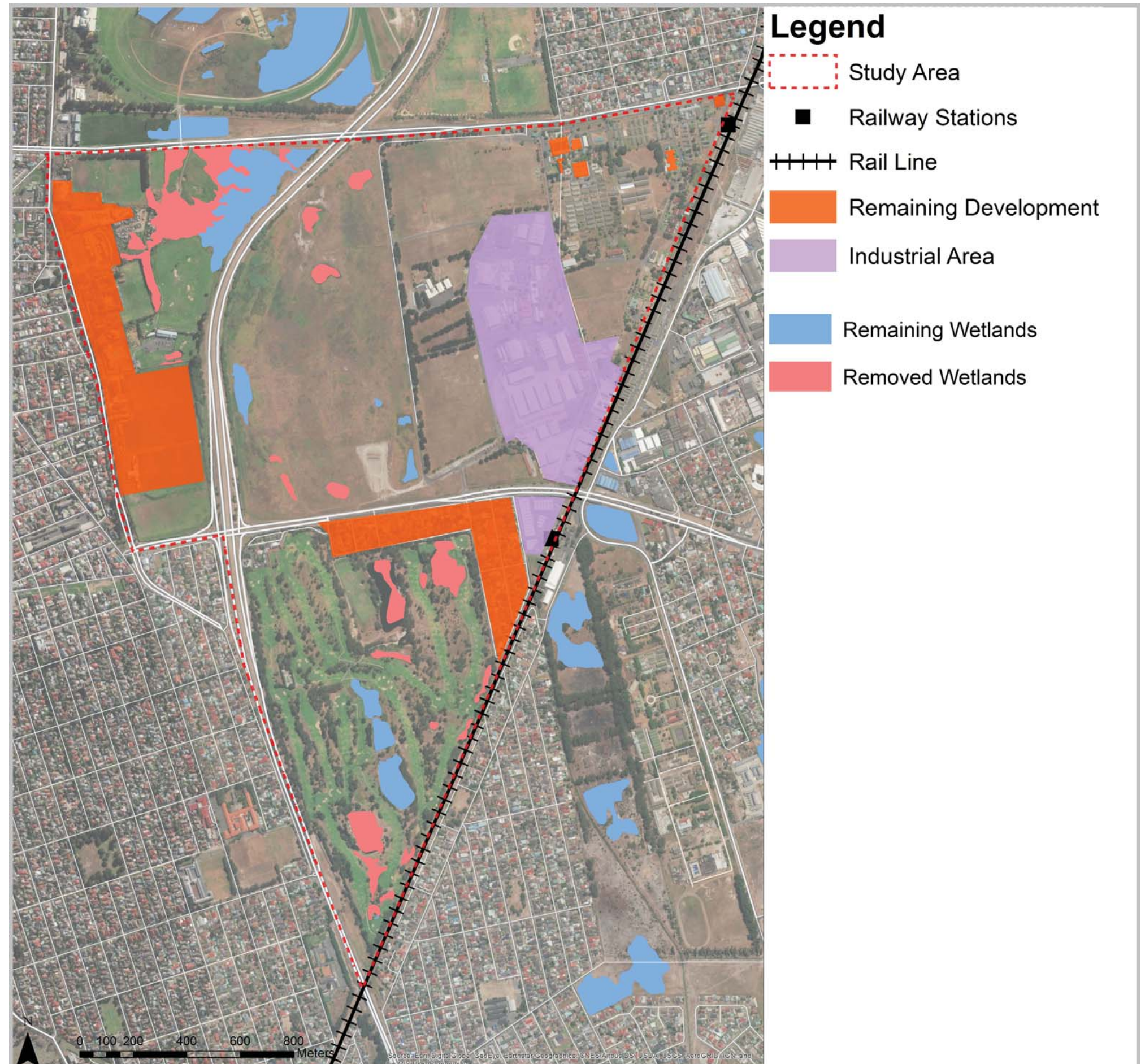


Figure 3.24 Land Use on Site (Source: Author, 2017; CoCT GIS 2016)

3.3.5 Opportunities and Constraints

Opportunities

The good location of the study area ensures opportunity and connectivity, which will allow it to knit into the surrounding fabric, see Figure 3.25. The existing street network in the surrounding areas is a potential integrator and creates potential access points into the site. The two railway stations also act as opportunities for good access to commuter rail. Bordering roads are all public transport routes and ensure accessibility. The close proximity to the commercial and retail corridors along Rosmead Avenue (M28) and Wetton Rd (M9) ensure good accessibility to employment and services. Industrial areas are also close by and could be an opportunity for potential employment. The golf course is also an opportunity, as it increases the integration into the surrounding fabric, and has potential for pedestrian linkages over the railway.

Another opportunity for the site is the good provision of bulk infrastructure (sanitation and water). As the site has not housed people, it does not have any sewer mains on site; however they do feed the boundaries of the site well. The bulk water network is also not provided on site but surrounds the boundary. These need to be provided during the development to cater for potential households.

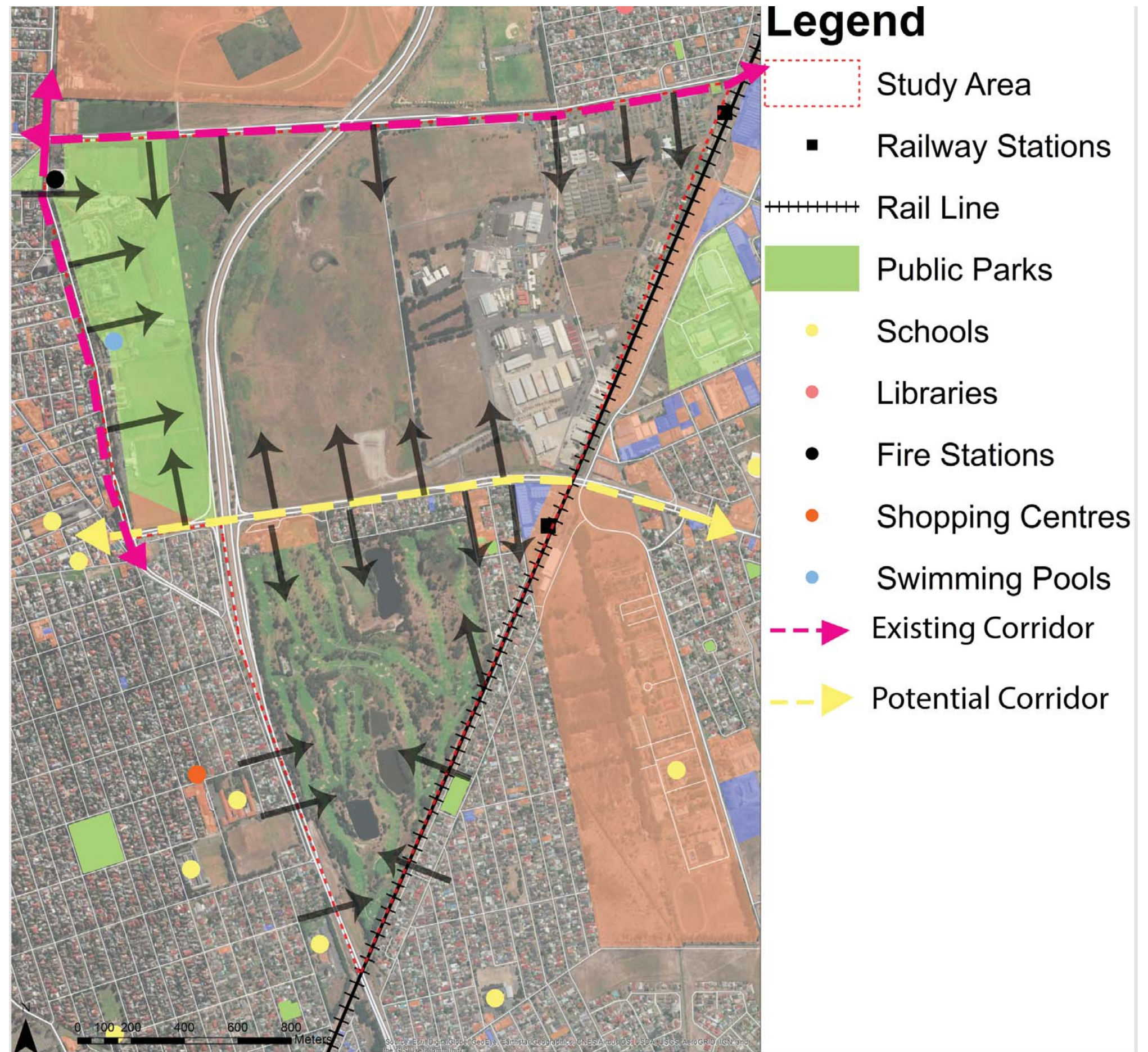


Figure 3.25 Opportunities of the Site (Source: Author, 2017; CoCT GIS, 2013 & 2016)

Constraints and Fixes

Figure 3.26 shows the environmental and infrastructural constraints on the site. The major constraints on the site are environmental, specifically the wetland areas. The wetlands are a potential constraint to the site as transformation of wetlands has implications for the ecosystem services as they buffer potential overland flow from heavy rainfall. The critical biodiversity statuses (CBA) of the high-ranking artificial wetlands are 'other' ecological support areas (OESA) and the natural/semi-natural wetlands is CBA 1 which is high priority to restore and conserve (Pugnalin & Holmes, 2016: 16). This could have implications for development on the site. However, wetlands will be incorporated into the site through environmental and recreational design, and degraded wetlands will be filled for potential development.

Other constraints are infrastructural, with the M5 and railway line acting as a barrier for the site and limiting accessibility from adjacent areas. Elevated bridges on the site are also a potential constraint for accessibility. Wetton (M9) Bridge in the north-east of the site, and Ottery (M68) bridge on the south-east of the site act as constraints to integration with the surrounding fabric. The role of these two movement routes is crucial in integrating Youngsfield with neighbouring areas. Another constraint is the existing development (sports fields and public facilities) in the west of the site, bordering Rosmead Avenue (M28), as well as the industrial development in the east of the site will remain and be incorporated in future development.

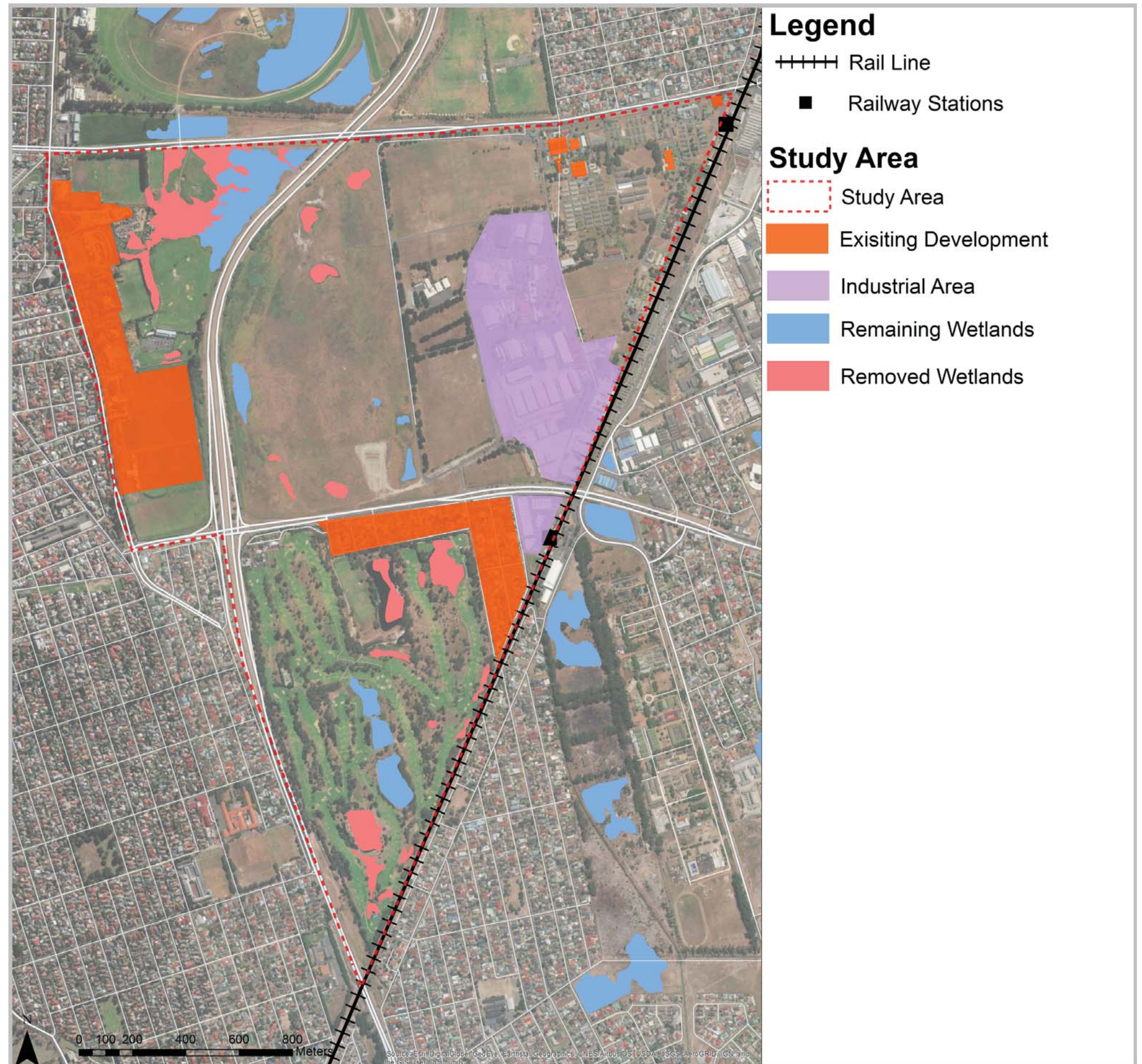


Figure 3.26 Constraints on Site (Source: Author, 2017; CoCT, 2016)

3.4 Synthesis

In this section, an overall synthesis will draw together analyses at the metropolitan, sub-metropolitan and site scales.

Metropolitan analysis showed the very problematic nature of low-income areas distant from major employment, retail and amenity areas. The prominent issues for low-income households are incurring costs on travel and access to opportunity areas. The analysis showed that Youngsfield has good potential location for low-income households to access opportunity areas. The site is also well located along key north-south movement and public transport corridors that connect Milnerton to Muizenberg (CoCT, 2017a). The conclusion from my metro analysis is that the site could play a major role in addressing accessibility constraints for low-income households by being located in close proximity to opportunity areas of the city.

The sub-metropolitan analysis focused on the functioning of surrounding areas with their potential land uses, and environmental attributes. It was discovered that the area is surrounded by well-functioning mixed-use spaces along Rosmead Avenue (M28) and Main Rd (M4) and potential activity routes, Wetton Rd (M9) and Ottery Rd (M68). The area is also well provided with bulk service infrastructure and public facilities. The environmental attributes were analysed to better understand the potential environmental implications of the area. The wetlands and indigenous vegetation were the major implications at a sub-metropolitan level. Wetlands are crucial because of their importance in storing floodwaters in urban areas and ecosystem services. The conclusion from my sub-metro analysis is that the site had good location potential in relation to the sub-metropolitan commercial and industrial nodes. This will offer many opportunities for low-income households in relation to the potential location of the site.

The site analysis scaled down to focus directly on the site in regard to the opportunities and constraints of the site. The major opportunities lie in good access to employment areas and public transport routes, very good views and potential for north-facing development, and accessing solar energy. The major constraint for the site is the prevalence of wetlands because of its role in ecosystem services, which is an implication for development. The other constraints are infrastructural and are due to the nature of high order roads and elevated bridges that limit access to the site and surrounding areas.

Overall, the site is well located in relation to opportunity areas in the metropolitan and sub-metropolitan areas. It is also well provided for through adjacent public facilities, work opportunities, transport and bulk services. Environmental factors need to be carefully considered so that they are integrated into site development. The site is highly suitable for mixed use development with a strong emphasis on affordable housing.

Finally, Figure 3.27 shows the fixes on site. Some wetlands and existing infrastructure have remained and will be incorporated into the potential development and fabric of the site. These are fixes and will remain on site. The total amount of developable land has been calculated with the fixes, leaving 312 Hectares of available developable land. This will allow for sustainable development and housing for low-income households.

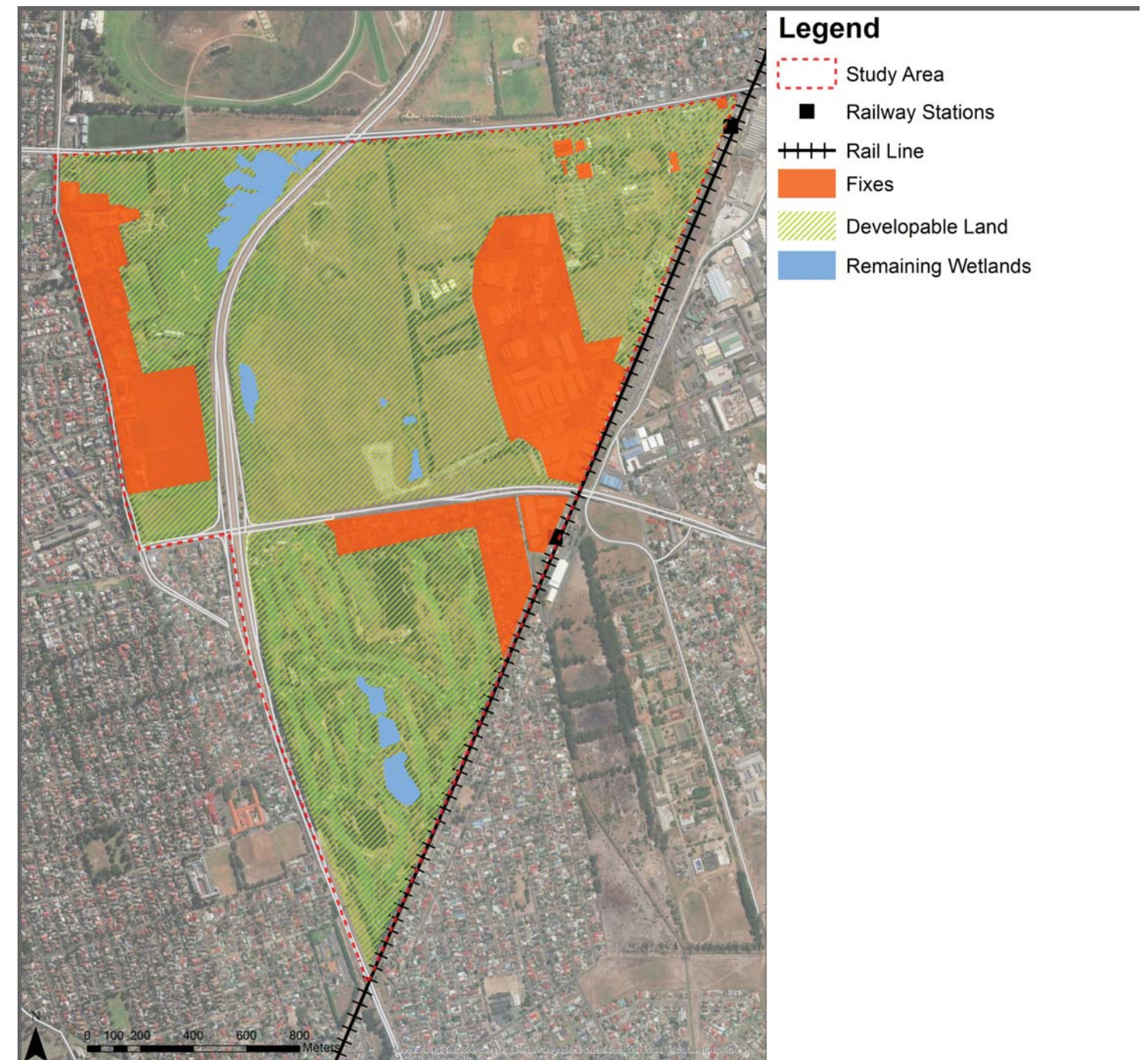


Figure 3.27 Synthesis Map (Source: Author, 2017; CoCT 2016, SANBI GIS, 2017)

Chapter Four: Spatial Principles & Affordable Housing Policy

4.1 Introduction

This section has two parts: The first section outlines the spatial design principles that should guide the layout of a development. These principles are crucial in creating quality urban environments, and enabling developments to become vibrant, enriching and efficient urban environments (Behrens & Watson, 1996). These principles are depicted in concept form, and encompass prominent spatial implications for: movement routes and public spaces, public facility hubs, densities and urban built typologies. Planning principles discussed below, take on a normative approach, and address spatial implications of: place making, scale, access, opportunity, efficiency and choice. The principles discussed have spatial implications.

The second part of this section, outlines affordable housing policies and theory on the topic. Finally, affordable housing precedents from the Global South will be examined to inform models that could be used in the implementation of the plan.

4.2 Movement Routes & Public Spaces

4.2.1 Focus on public space and movement routes as the main structuring element of urban settlements

The location of public spaces should be closely linked with the movement system, especially public transport routes. The largest spaces should be placed around the movement routes, the places where these intersect, and the facilities and activities requiring the most public exposure (see Figure 4.1). This also provides a good location for informal traders and potential public markets. Public markets should be recognised as public infrastructure and be located where high foot traffic occurs. This is most successful in geometric road layouts, which concentrate, rather than disperse, pedestrian and vehicular movement (Behrens & Watson, 1996: 82) Placement of public markets, should be along major movement generators and should be linked to modal interchanges, large employment centres, and commercial complexes.

Public spaces play a number of crucial roles in urban settlements. One prominent role is to enable informal activities and events where people engage socially. Another positive outcome of public spaces is how they act as an extension of individual dwelling units, particularly for low-income communities where private space is limited (Behrens & Watson, 1996).

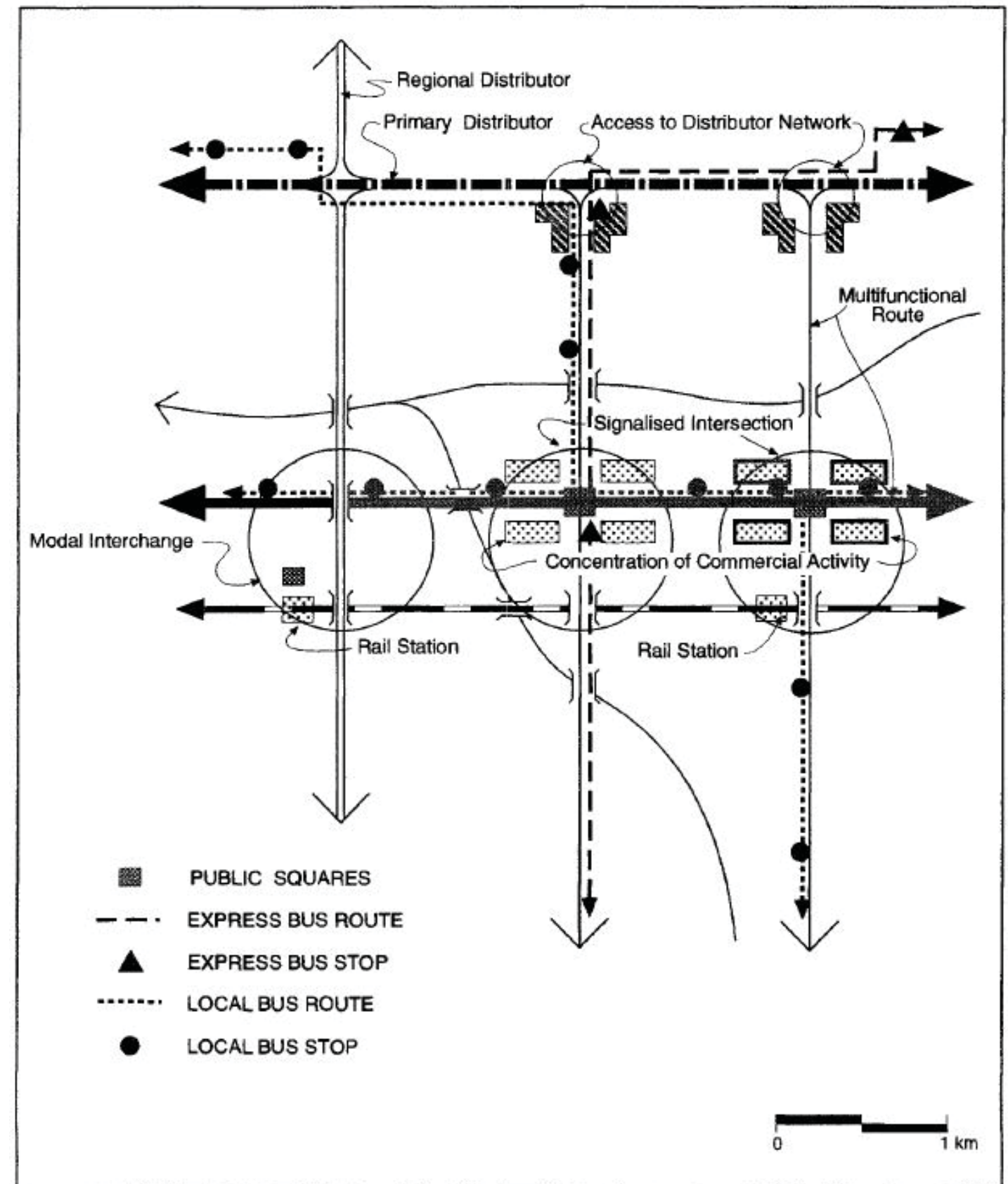


Figure 4.1 Hard Spaces and Movement Routes (Source: Behrens & Watson, 1996)

4.2.2 Legibility

Location of major social institutions and spaces for symbolic as well as functional purposes assists with the legibility and understanding of a settlement (see Figure 4.2). Public buildings should be given visual dominance to increase legibility of a settlement. These buildings act as reference points for users and reinforce their symbolic importance for inhabitants. This should take the form of locating public buildings in relation to formal public spaces and active streets to enable informal trader activities to spill into the public realm (Behrens & Watson, 1996). Lynch (1960) divides these reference points into five elements: paths, edges, districts, nodes and landmarks. These inform the user on how to read the landscape or urban area easily and are used as clues to identify and structure a route which ends up becoming more familiar (Bentley, 1985; Lynch, 1960),



Figure 4.2 Paths (Source: Lynch, 1960)

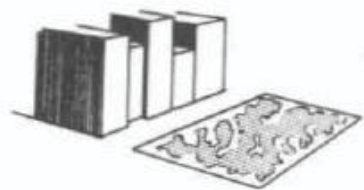


Figure 4.3 Edges (Source: Lynch, 1960)



Figure 4.4 Districts (Source: Lynch, 1960)



Figure 4.5 Nodes (Source: Lynch, 1960)

- Paths are channels (streets, walkways, transit lines) along which the user may occasionally or potentially move. This is considered a predominant element by users as people observe the city while moving through it (Figure 4.2).

- Edges are boundaries between two precincts which may be barriers that are permeable, and are important organising features, as they define generalised areas and make it easier to move through. See Figure 4.3 (Lynch, 1960: 47).

- Districts are identified by visible entrances and exits in an area and are recognizable as having common features. Mostly identified from the interior, districts are also used as exterior references if visible from the outside. However these features are sometimes seen individually and may differ for each person (see Figure 4.4).

- Nodes are strategic points in a city where users enter and are intensive foci for travellers. They may be junctions, places of a break in transportation, or concentrations, which, importantly, is the condensation of some use or physical character, such as a street-corner hangout or an enclosed square. Some concentration nodes are the focus of a district and may be called cores. The concept of nodes is related to the concept of paths, and acts as the convergence of paths as events that occur at the junction (see Figure 4.5).

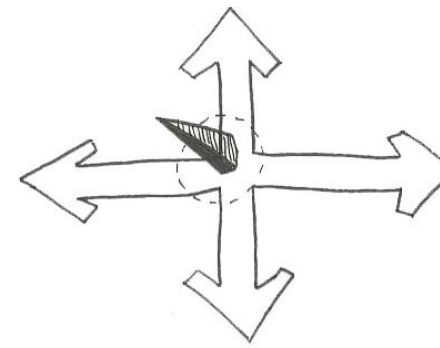


Figure 4.6 Landmarks (Source: Adapted from Lynch, 1960; Author, 2017)

All of these elements should be incorporated into a settlement to make end user experiences more legible and easy to navigate.

- Landmarks are other reference points, but they act externally rather than entering into an area. They usually come in the form of physical objects such as buildings, signs, stores/shops or mountains. Usually their use involves the singling out of one element from other features, seen in Figure 4.6). They are seen from multiple angles and are used as radial references. Other landmarks are mainly local and are visible in close proximity, and from certain approaches, such as signs, store fronts, trees and other urban details which act as reference points. These features are relied upon as a journey becomes more familiar (Bentley, 1985; Lynch, 1960).

4.2.3 Define hard open spaces

Hard open spaces should be defined by trees and public buildings in order to provide, a sense of enclosure, greater safety through public surveillance, and a clear definition between public, semi-private and private space (see Figure 4.7). Public facilities should be located adjacent to public spaces, and should enclose hard public spaces in order to create a comfortable human scale (Behrens & Watson, 1996: 72).

A hierarchy of hard public spaces should be synchronised with the movement system. The largest and most important hard spaces should generally be located at points of maximum accessibility (ie. intersections between more intensive movement routes and public transport mode interchanges) where there is commercial activity (Behrens & Watson, 1996: 80).

Hard open spaces need to be multifunctional to ensure that these spaces have diverse use at different times of the day, as well as seasonally. They should have social functions, economic functions, movement and political or symbolic functions. Hard open spaces are also arranged in different shapes and sizes. Generic forms of these spaces should be used, such as streets, squares or plazas, markets, parking areas and public transport stops and stations. Streets can be mixed-mode, which would contain a mix of motorised and non-motorised users. Hard open space elements should include wide sidewalks, bicycle lanes and space for provision of engineering services (Council for Scientific and Industrial Research (CSIR), 2005;



Figure 4.7 Buildings and trees define hard open spaces (Source: Adapted from CSIR, 2005; Author, 2017)

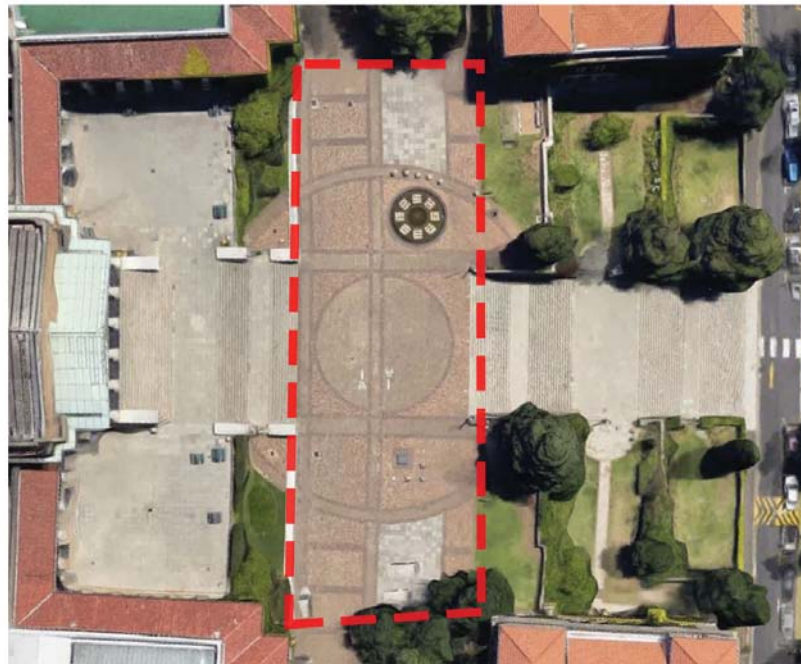
Global Designing Cities Initiative (GDCI), 2016). Streets should prioritise pedestrian and non-motorised transport (NMT) use. These could be in the form of temporarily or permanently closed streets used for trading, markets and recreational purposes. Another form of hard, open spaces are squares or plazas. These spaces are mainly used as courtyards, inner-city parks, markets and spaces for recreation. Markets are more flexible spaces as informal trading and informal markets can be located on streets, parking areas or sidewalks. Based on precedents of large plazas, the recommended size of a plaza with a good sense of enclosure, is a maximum size of 5000 m² and level below the large plaza should be 2500 m², see Figure 4.8.

Green Market Square



4900 m²
 Enclosed by six to eleven storey buildings
 Mainly used for informal trading

Jammie Plaza



2800 m²
 Enclosed by six storey building
 Social and entertainment space used by students

Figure 4.8 Public Square Precedents (Source: Adapted from Google maps, 2017)

4.2.4 Design open and flexible movement systems

Movement systems should be designed to facilitate, primarily, the needs of pedestrian and public transport movement. An open, multi-functional road network, in the form of a distorted rectilinear grid, enables complex systems of movements to emerge, creates numerous intersection points which offer trading opportunities, and is able to respond to changes in sub-metropolitan movement patterns, land-use distribution and modal split resulting from developments in surrounding areas (Behrens & Watson, 1996: 78).

Routes within road networks should accommodate multiple functions and users and should support a diverse range of social, environmental, developmental as well as movement functions (CSIR, 2005). Settlements need more streets and squares with a more diverse structure of main streets, side streets and primary and secondary squares to allow choice and flexibility of movement (Gehl, 2011). Multi-modal streets are encouraged to have wide sidewalks of 3 m or the equivalent width to hold different modes at peak periods. Wider sidewalks ensure easy movement for pedestrians, cyclists and informal traders, seen in Figure 4.9 (CSIR, 2005: 47; GDCI, 2016: 15).

Short city blocks give more alternate routes and more choice to users. They also ease pedestrian circulation. Block lengths should be around 100 m and widths should not exceed 60m along higher order routes. Along residential lower-order routes, block widths should have a minimum of 30 to 40 m intervals to ensure easy pedestrian circulation (Behrens & Watson, 1996; Bentley, 1985; CSIR, 2005; Montgomery, 1998). Block sizes are related to different densities and will be discussed further in section 4.4 on densities.

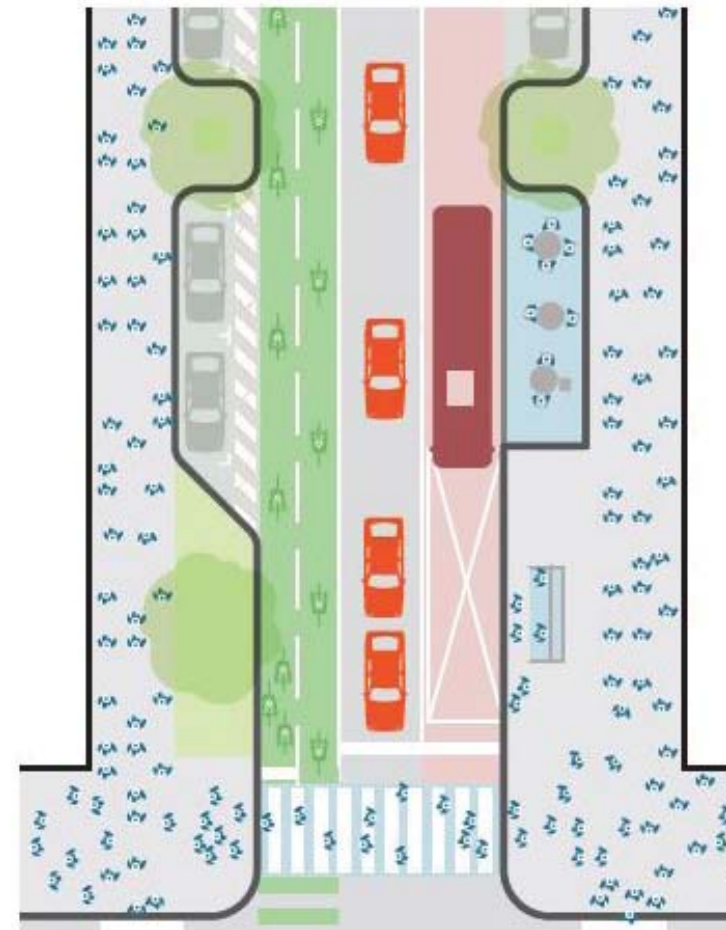


Figure 4.9 Multimodal Street (Source: GDCI, 2016)

4.2.5 Integrate the road layout with the surrounding movement system

To improve accessibility throughout the site, the layout should be stitched into the broader urban fabric by the roads that are provided. This will improve levels of interconnection and extend important routes through the area. Local road networks should allow for existing public transport operations to be complemented (Behrens & Watson, 1996).

Figure 4.10 shows that permeability is essential for accessibility within a settlement and public space. This can be achieved by providing many alternative routes from one point to the other. It can also be achieved by locating high order mixed-mode active links which run parallel to high-capacity vehicle-only links. This enables the choice to travel between the active corridor and vehicle-only route (CSIR, 2005: 3).

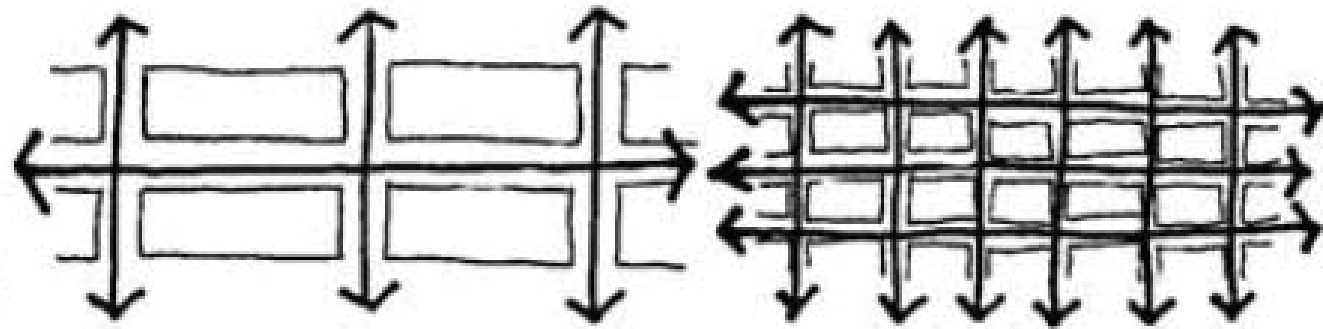


Figure 4.10 Relationship between higher and lower order mixed-mode links (Source: CSIR, 2005)

4.2.6 Prioritise pedestrian and non-motorised transport movement

Pedestrian routes should be located to provide the shortest practical routes between activities - links throughout the area should be direct and convenient, connecting and integrating the layout with surrounding areas (see Figure 4.11).

A movement network should prioritise the needs of non-motorised modes most sensitive to distance. It should also prioritise the needs of public transport services which households without access to private vehicles depend upon (CSIR, 2005: 3). This is especially crucial for low-income areas where residents are reliant on public transport and walk to these different modes. Continuous sidewalks that are free of obstructions and are situated along small blocks, increase permeability and decrease walking distances for pedestrians. This ensures the safety of pedestrians, cyclists and vulnerable users such as: children, seniors and people with disabilities. Therefore, sidewalks need to be wide enough for comfortable walking along intense active routes with high pedestrian volumes during peak periods (GDCI, 2016).

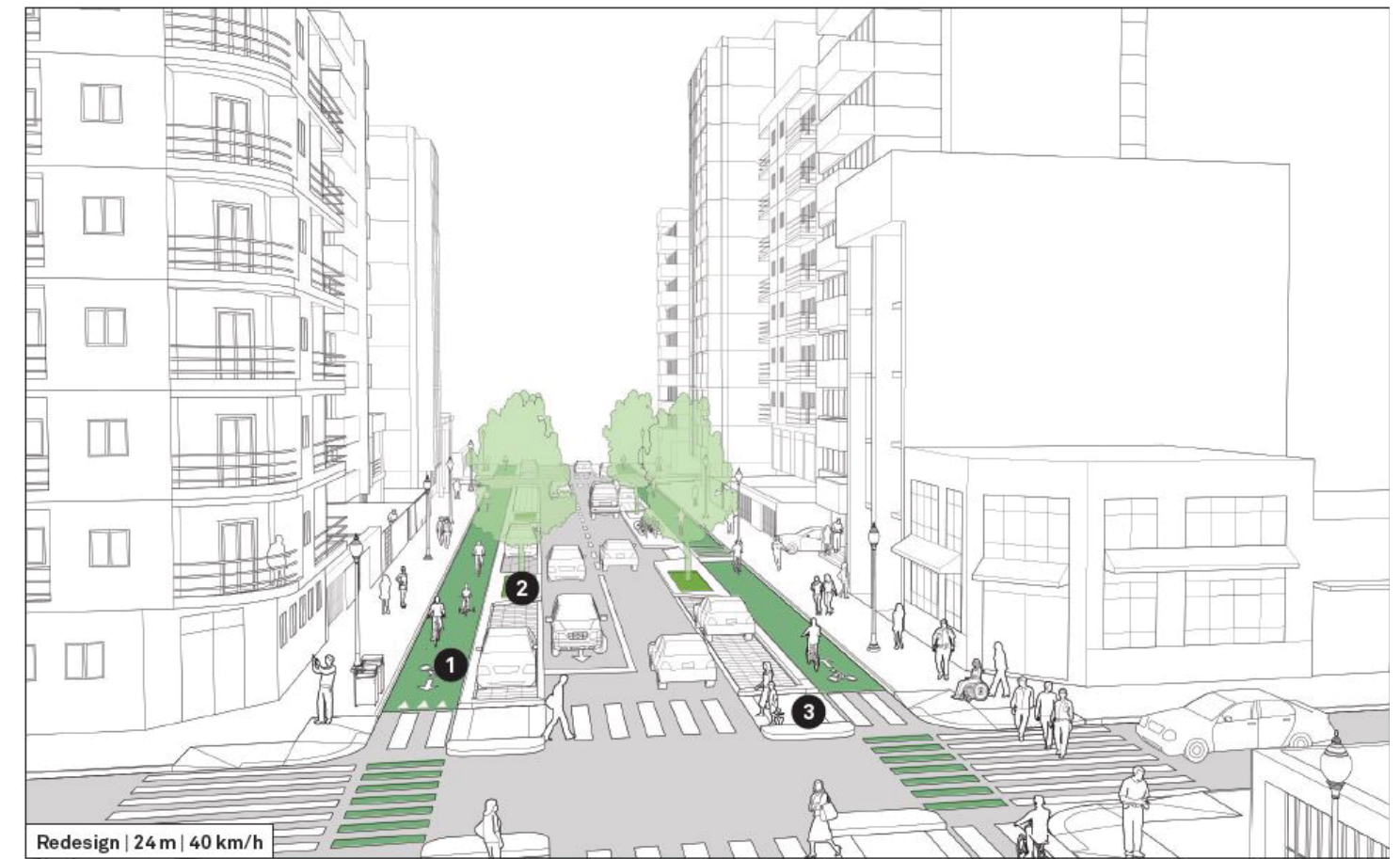


Figure 4.11 Pedestrian and NMT prioritised lanes (Source: GDCI, 2016: 267)

4.2.7 Facilitate efficient and effective public transport services

An effective public transport system should encompass all modes of transit such as bus, minibus taxis and rail. This would especially benefit low-income households as it would provide more variety for different users. It would also improve inter-district accessibility, integrate different neighbourhoods, as well as reduce the need for private vehicle use (Behrens & Watson, 1996). Routes that are to be most accessible should have dedicated rights-of-way for public transport to ensure efficiency and priority for public transport users (CSIR, 2005). Various road hierarchies are required to enable effective public transport movement. Each play a role in the provision of different modes. Figure 4.12 shows how minor arterials are essential for public transport as these routes feed traffic from major arterials into, and from the main urban districts and provide the link between them. Collector roads are the link between main road arterials and neighbourhoods. These roads constitute the appropriate levels of hierarchy for provision of public transport services and feeder services and should allocate proper road widths at 7,3 m wide to accommodate stops for busses and minibus taxis (CSIR, 2005: 12-13).

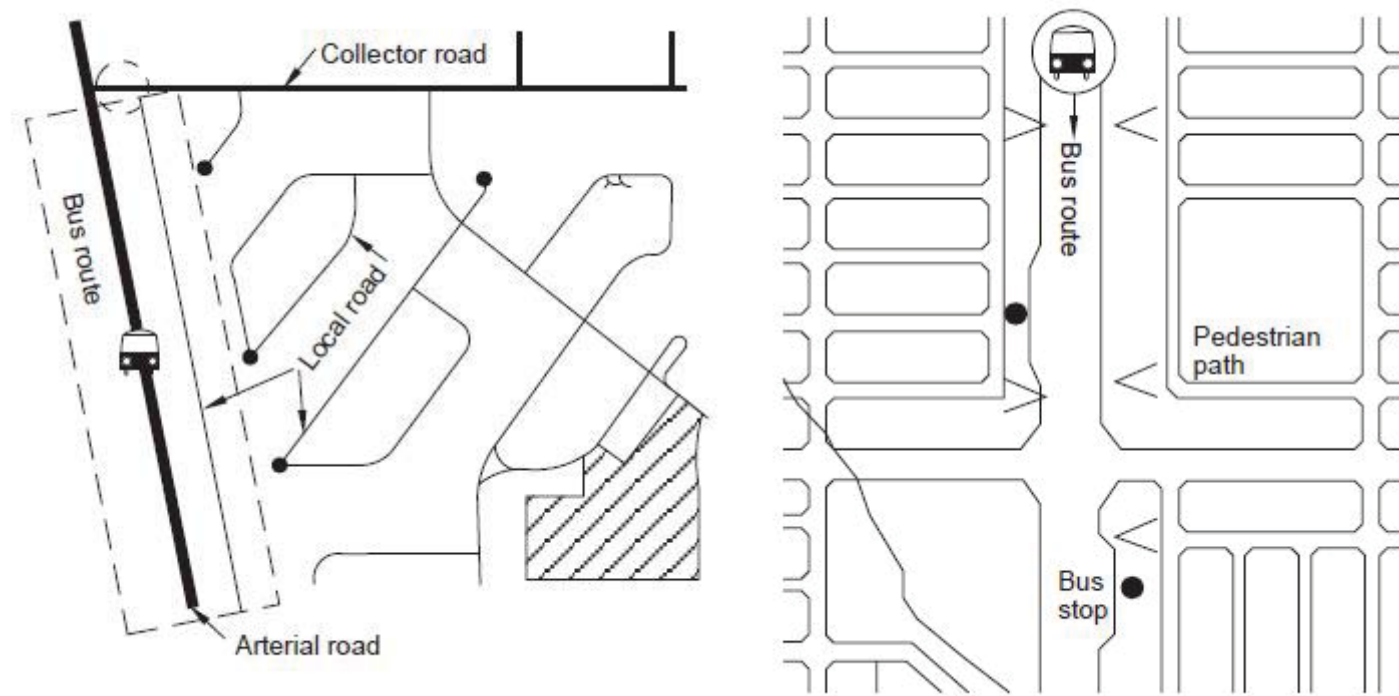


Figure 4.12 Public Transport Hierarchies (Source: CSIR, 2005: Ch5.2, 20)

4.2.8 Provide contrasting spaces of intense activity and relief (public/private thresholds)

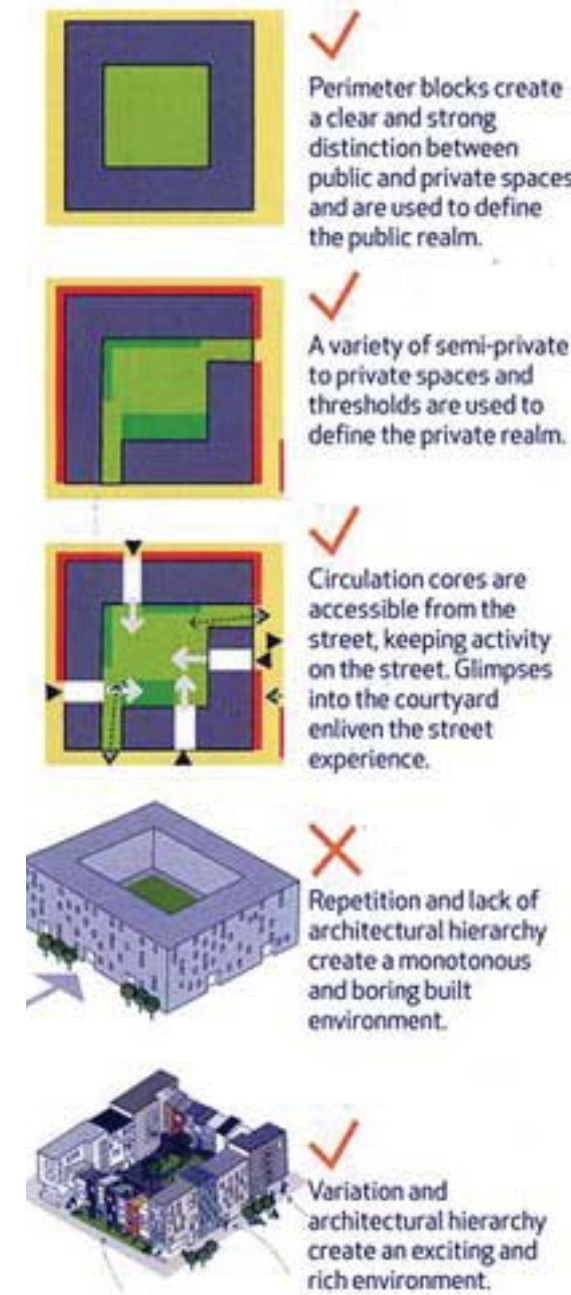


Figure 4.13 Perimeter blocks role in public/private space (Source: MAKE Architects and Gehl et al, 2011)

Quality urban environments are characterised by the choice between busy areas and quiet areas. Public spaces can play a role in providing releasing and relaxing vibrancy in developed areas, as well as generating intensity and interaction in private areas such as courtyards or backs of buildings that are not immediately public. Public spaces should be positioned strategically to achieve this outcome, seen in Figure 4.13. Permeability and the public/private interface is essential for enabling activity around edges of buildings. There should be a clear distinction between public and private spaces by ensuring that buildings have two faces: fronts which front onto public space, entrances and most public facilities, and a back for private activities (Bentley, 1985).

Degrees of privacy are also important elements to distinguish, as some private or public spaces may be poorly designed and create unsafe spaces where crime could occur. In more residential spaces, private outdoor space such as a garden or balcony is at one end of the spectrum, and at times public areas within residential spaces appear publicly accessible but have more of a semipublic character, seen in Figure 4.14. Communal spaces in neighbourhoods are more public for known residents, while the public square in a city centre is the most public (Gehl, 2011: 58-59). Perimeter blocks are ideal for creating active frontages of buildings along streets, and private areas at the backs of the buildings. Perimeter blocks should shape the urban form to encourage permeable blocks buildings to front onto the street and ensure effective use of space. Edges of buildings that enclose public spaces need to be reinforced by public institution building fronts that spill into onto the public realm. These designs ensure the best surveillance onto public spaces and give “a greater feeling of security and a stronger sense of belonging to the areas outside the private residence”, see Figure 4.14 (Gehl, 2011: 59; Newman, 1972). Perimeter blocks are flexible as the activities around the block can change depending on the use and building typology (Behrens & Watson, 1996; Bentley, 1985). Appropriate transition zones should

be established between public to private spaces. This is essential for low-income areas where alleys or hidden streets act as havens for potential offenders and increase residents' and visitors' fear of crime" (CSIR, 2005: ch 5.8.1, Pg 2; Gehl, 2011).

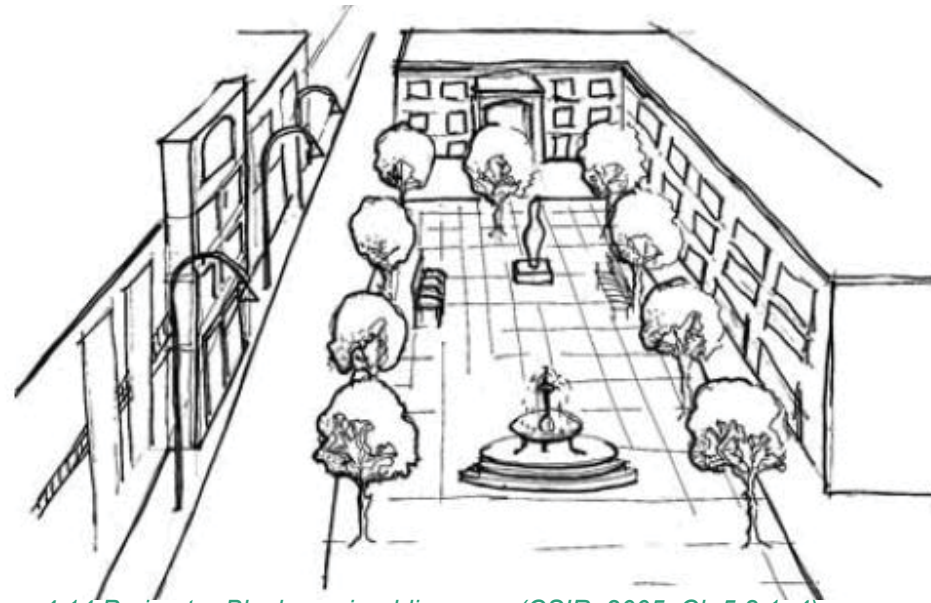


Figure 4.14 Perimeter Block semi-public space (CSIR, 2005: Ch 5.8.1, 4)

Suggested perimeter block sizes are dependent on residential or industrial use. Residential perimeter blocks should have smaller dimensions as dwelling units should be more compact in order to accommodate more dwellings on an erf. Public spaces should be slightly larger to accommodate larger buildings for higher order facilities such as hospitals. Figure 4.15 shows the suggested dimensions and uses of the perimeter block spaces.



Figure 4.15 Perimeter Block dimension (Source: <https://www.wexfordcoco.ie/sites/default/files/content/Planning/Draft-GoreyLAP17-23/UrbanDesignGuidelinesandNeighbourhoodFramework.pdf>)

4.3 Public Facility hubs (Schools, libraries, clinics etc)

4.3.1 Cluster and expose public facilities to enable resource sharing

The main aim when planning a public facility network should be to make facilities as accessible to the greatest number of end-user households as possible. The majority of public facilities should be located in positions with the most exposure, along main public transport routes (see Figure 4.16). Higher order public facilities, such as hospitals should be clustered around highly accessible public transport stops, adjacent to major road intersections. Lower order facilities, such as libraries, should be located at lower order road intersections along public transport routes (Behrens & Watson, 1996: 78). These will essentially create opportunities for collective activity of pedestrians, public facilities and potential informal trading.

Functionally related facilities should be clustered in order to increase sharing resources between facilities. Recognition of functional interrelationships and the accommodation of their spatial preconditions in the layout plan, facilitates resource sharing and the multifunctional use of facility buildings (Behrens & Watson: 83). Public facilities that complement one another should be clustered to share resources effectively, in addition to being located along important public transport routes. For instance, school sports fields could be made available for public use at certain times. Community libraries could be located close to schools for shared use. Facilities should still be accessible to the broader public and not be clustered too closely, thereby inhibiting access. Another advantage of clustering is to promote full use of buildings at all times (CSIR, 2005).

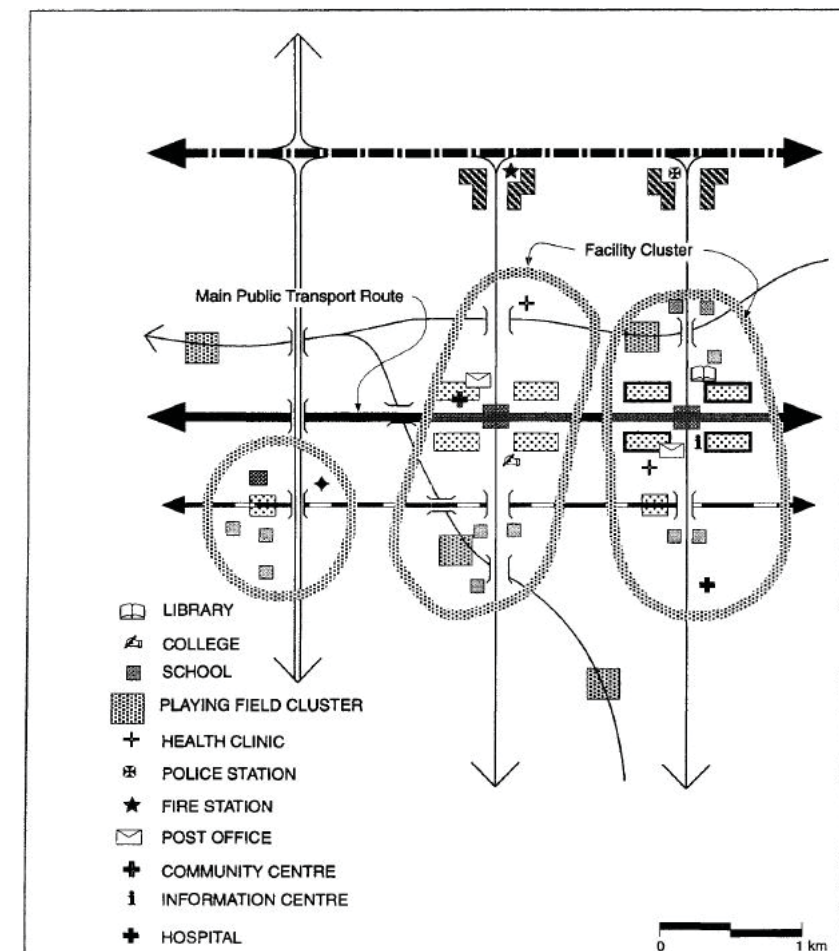


Figure 4.16 Clustering of public facilities (Source: Behrens & Watson, 1996)

4.4 Densities and Building Typologies

4.4.1 Facilitate a range of housing processes

The recommended average gross density of 70-75 dwelling unit per hectare gross (du/ha) is needed to support the functioning of a viable public transport system (TCT, 2014: 103). Higher gross densities of 50-180 du/ha should be encouraged at strategic points such as public transport stops and alongside higher amenity areas such as parks and along important public transport routes. This would facilitate service use. These high densities guarantee more efficient use of facilities and public transport, see Figure 4.17 (CoCT, 2009; CSIR, 2005).

Layout and infrastructure design should facilitate numerous housing forms and housing processes. The size of erven and level of service provision per erf should vary within a layout to reflect the range of housing needs of the end-user community. Longer block lengths allow for cumulative depth of erven to increase dwelling unit densities (Behrens & Watson, 1996: 87 & 147). Figure 4.18 shows that a range of different lot sizes and housing types throughout the settlement assist with providing choices for people with different housing needs and contribute to the diversity of the settlement. A wider range of typologies and unit sizes also stabilises neighbourhoods through variety (CSIR, 2005; Williams, 2009). Over time the flexible layout of housing types and form will accommodate mixed and changing land uses, and will adapt easily. Housing types will come in the form of low-rise multi-unit housing, three to four-storey walk-up accommodation and would be able to accommodate up to 50 du/ha (gross). High-rise accommodation is more expensive if lifts are needed (Behrens & Watson, 1996: 152; CoCT, 2009: 11).

Different units and building forms can also act as noise buffers to external noise sources such as major roads, railways or industries (CSIR, 2005).

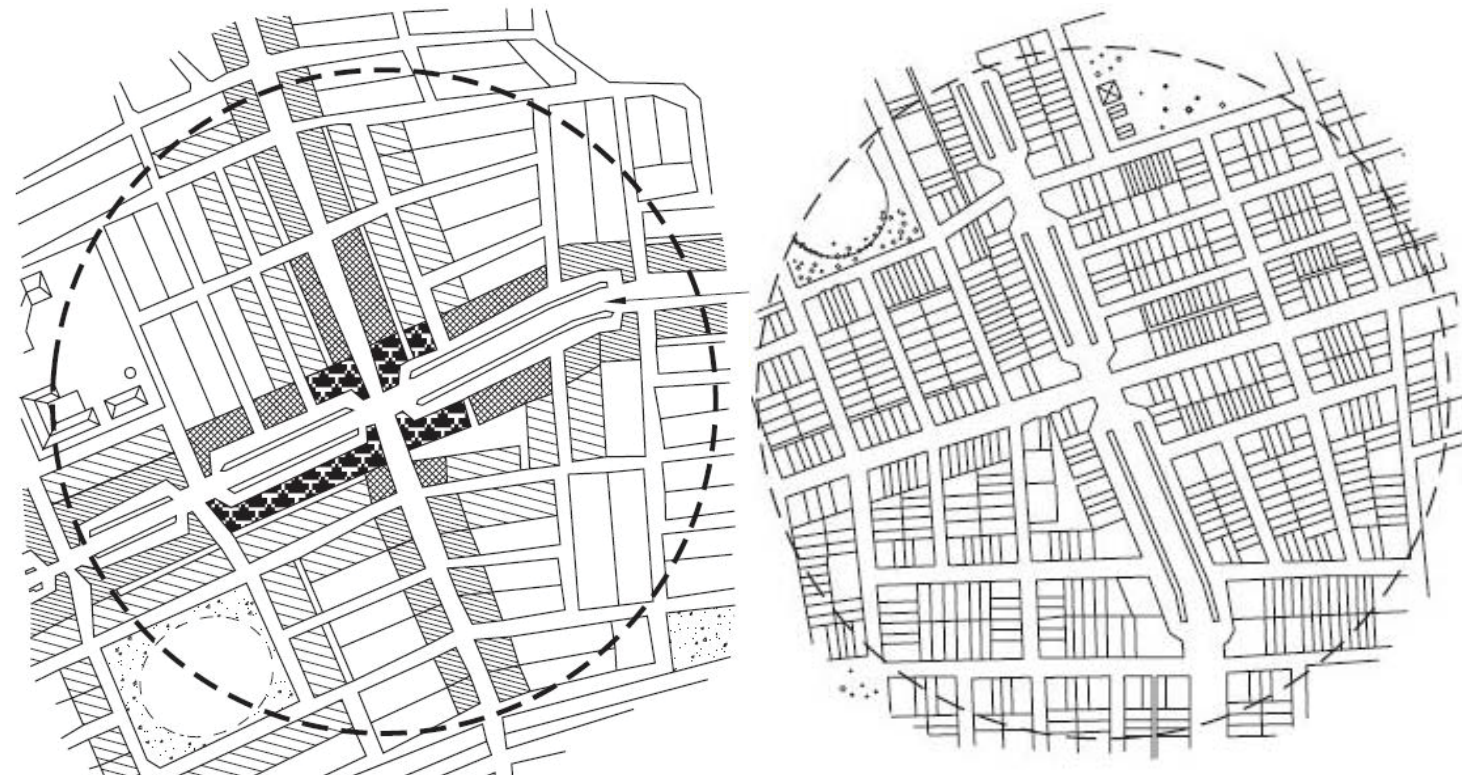


Figure 4.17 Open movement network with high density mixed land use in support of public transport (Source: CSIR, 2005)

Figure 4.18 Diversity created by different lot sizes and shapes (Source: CSIR, 2005)

Higher density built form, with a maximum of 180 du/ha gross, should situate along active corridors to sustain public transport and public facility use, shown in Figure 16. There should be a range of housing typologies within a settlement to encourage high-intensity mixed urban districts along intensive activity areas and public spaces (Montgomery, 1998). The range of densities needed along activity corridors is 50-180 du/ha gross. This applies particularly to public transport stops or stations, route intersections, mixed use areas and commercial nodes. There should be a range of typologies such as rowhousing or townhouses (Figure 4.19) and apartment buildings (Figure 4.20) varying from 4 to 15 storeys (CoCT, 2009: 11).



Figure 4.19 Townhouses in Brooklyn, New York (Source: <http://moncon.com/projects/atlantic-center-phase-1-and-2/>)



Figure 4.20 Apartment block with retail ground floor: Harlem, New York (Source: <http://moncon.com/projects/metro-125/>)

Different housing typologies should be implemented based on the range of density. Medium to high density typologies should be along high order routes and the typology options should be apartment blocks of three to four storeys or townhouses (Montgomery, 1998). Higher density housing should be located along the active corridors and close to soft and hard open spaces, as higher densities have restricted links to the outside and need to be close to open spaces (Bentley, 1985).

Medium density housing is defined as approximately 40-100 du/ha (gross). Typologies such as townhouses or rowhouses should be placed along hard open spaces such as public squares, whereas higher density typologies created by apartment blocks ranging between four to six storeys should be placed along higher order corridors for better access to public transport and public facilities. It must be ensured that variety within housing typologies occurs, as this will provide options and choice for different types of households within a settlement (Tonkin, 2008; Bentley, 1985).



4.4.2 Utilising single building typologies for multiple uses

Vitality of mixed use spaces happens through the presence of people on streets, spaces and buildings across different times of the day. Mixing different land uses works when primary uses such as offices, residences, retail and places of education, recreation and entertainment attract groups of people to a space. When combined with secondary diversity, enterprises and services grow in response to primary use activity. This makes mixed use space successful in attracting consumers outside primary use hours. However, mixed use developments do not always result in active spaces, in cases where secondary diversity has not grown organically it has resulted in spaces being underused after hours (Montgomery, 1998: 14).

Therefore, the form of how mixed use space resides in reality, mainly in city blocks must be rethought. The best way to integrate mixed use and enable secondary diversity is through horizontally and vertically zoning uses in building blocks (see Figure 4.21). Although, mixed use spaces should be context specific, as uses along intense activity corridors would be different to residential areas. Vertical zoning could be applied to ensure activity is enhanced on ground floors (Montgomery, 1998). This could enhance the uses of former wasted spaces into activity cycles and promote full use of buildings at all times (CSIR, 2005).

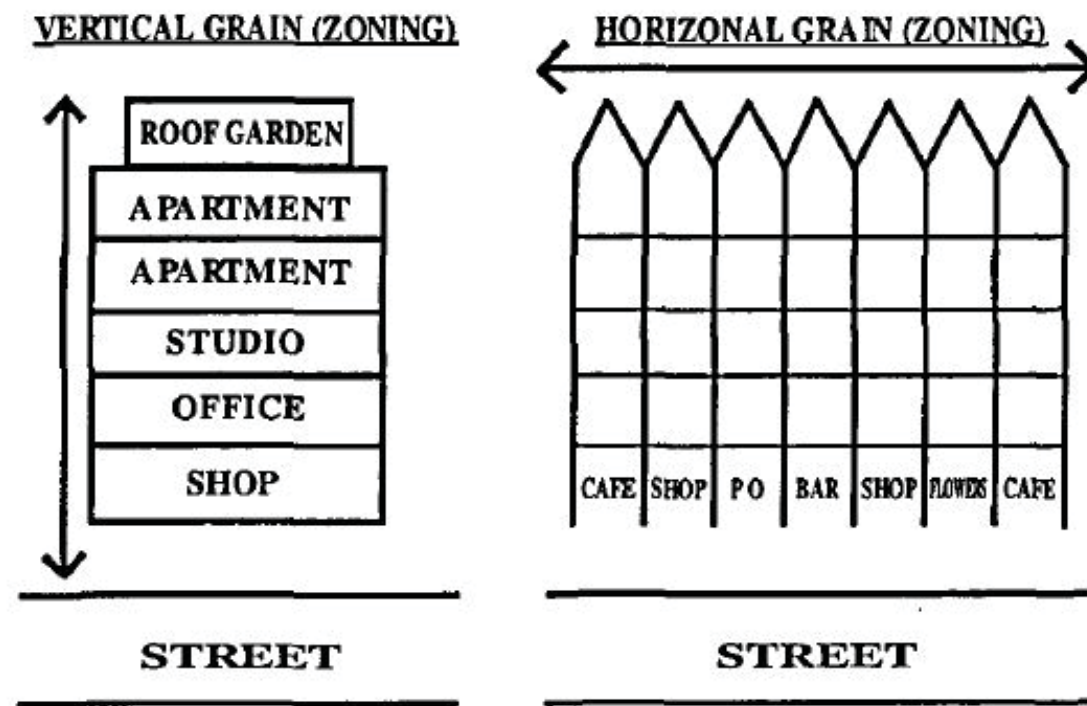


Figure 4.21 Vertical and Horizontal Grain (Zoning) (Source: Montgomery, 1998: 110)

4.5 Environmental Design Principles

4.5.1 Link soft open spaces

Figure 4.22 shows how soft public open spaces and playing fields should link to form interconnected networks of recreation space, flowing through the built environment. Linked open spaces create opportunities for uninterrupted walkways and enable ecological processes to continue sustainably. Linear arrangements of soft open space should locate along water courses and floodplains. Larger soft open spaces and natural remnants of indigenous vegetation need to be linked by soft open spaces. Linkages facilitate the ecological functioning of indigenous species and enable systems to be protected more effectively than when areas are unconnected. Defined pedestrian paths should be provided to enable easy movement, and playing fields should be clustered to facilitate sharing by neighbouring schools and sports clubs. This will ensure multi-functional use of these spaces as playtime and recreational areas for longer hours (Behrens & Watson, 1996: 74; CSIR, 2005).

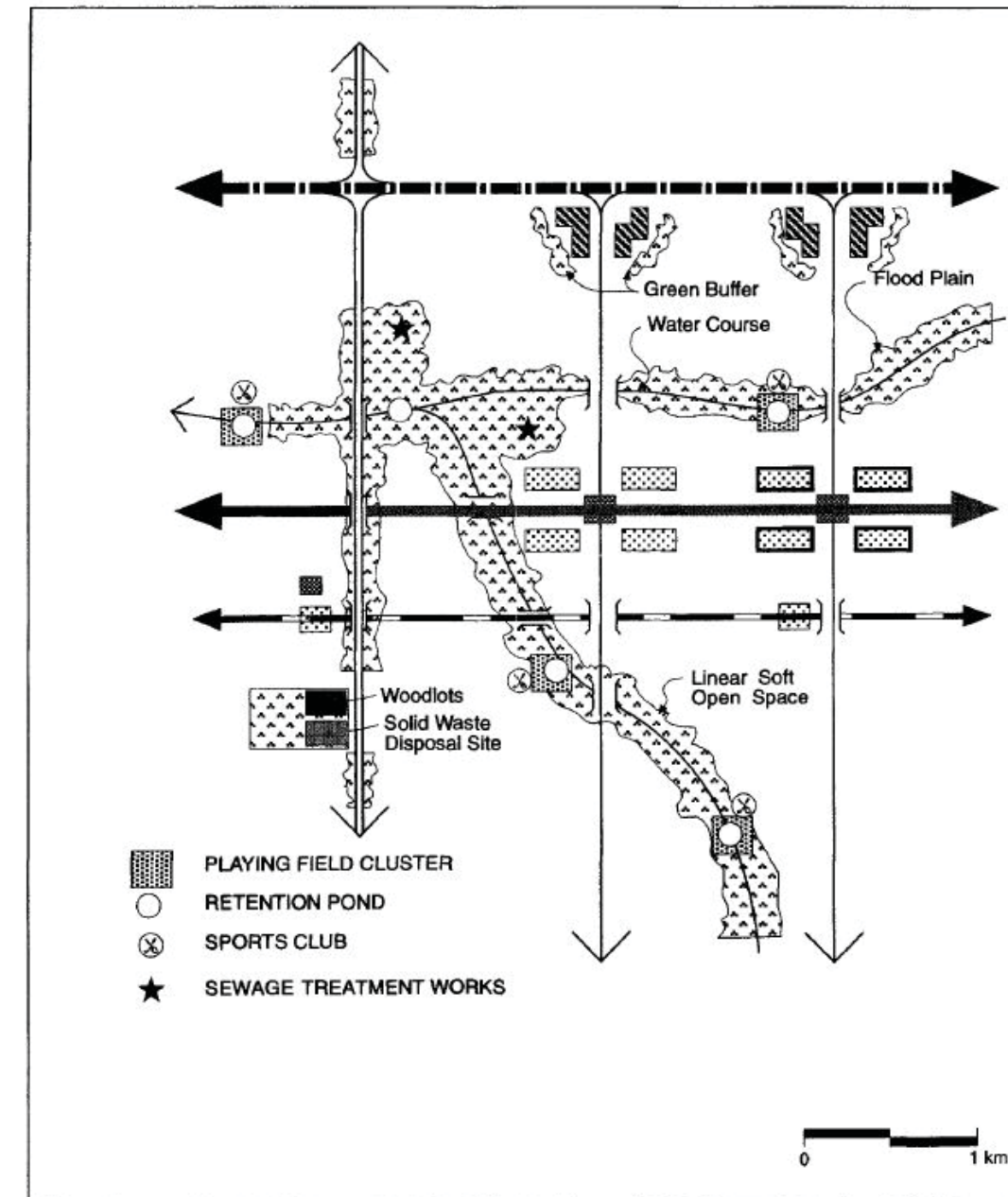


Figure 4.22 Linking of open spaces (Source: Behrens & Watson, 1996)

In areas of high crime and violence, large open stretches of soft open spaces offer dangerous unseen spaces. To prevent potential threats, housing and other land uses need to front onto the space to maximise surveillance. The width of the open space will enable users to see across the space (Behrens & Watson, 1996). Examples from Violence Prevention Through Urban Upgrading (VPUU) (2014) have redesigned unsafe open spaces to have more 'natural surveillance' from buildings facing onto a large open area (Newman, 1972). An intervention that VPUU (2014) has used as natural surveillance is an Active Box that is a multi-storey building overlooking the space to appear as if the space is continuously being monitored, seen in Figure 4.23.



Figure 4.23 'Active Box' overlooking Harare Square (Source: VPUU, 2013)

4.5.2 Integrate open spaces and green infrastructure with utility services

Interconnected soft open space systems should be integrated with major stormwater management systems (ie. open stormwater channels, retention and retarding ponds). Green open spaces and playing fields should act as overflow facilities in the event of severe storms and position along low-lying land prone to periodic flooding. Stormwater outfall and storage facilities should be incorporated into landscape features within the amenity network (Behrens & Watson, 1996).

Green infrastructure strategies should also be linked to utility services, as they reduce strain on stormwater systems through infiltration or evaporation, which improves the quality of the connected street environment (GDCI, 2016: 153). Strategies such as passive irrigation directs stormwater to the surface of landscaped areas and provide irrigation to vegetation, reducing stormwater runoff onto the street surface (GDCI, 2016: 157).

4.5.3 Align trunk services to important routes

Trunk services should be aligned to more intensive movement routes which link public facilities and non-residential land uses, and electricity sub-stations should be located close to public facility clusters (Behrens & Watson, 1996).

4.5.4 Concepts and Principles Conclusion

Overall, the implementation of these principles should encourage and facilitate quality urban environments that are accessible, that provide numerous opportunities and choice to individuals, that are sensitive and safe for pedestrians and vulnerable groups as well as providing relaxing spaces that incorporate soft open spaces and open environments in an urban space.

Affordable Housing Policy & Precedent

4.6 Introduction

This section outlines the affordable housing policies available in South Africa, in addition to the housing policy and legislation that indirectly link to affordable housing ownership and rental accommodation. The successes and failures of these policies are discussed in relation to the housing crisis and National Housing Policy goals and objectives. Following that, I will outline some South African perspectives on affordable housing and find some successful implementation of housing policy and precedents that have worked in other South African cities to provide for a better understanding of the affordable housing landscape.

Affordable housing is a term used loosely throughout the Global South and Global North. In South Africa it varies depending on whether the term is being used by government or private sector. The government refers to affordable housing as subsidised rental, or subsidised housing for ownership, and should not exceed R350 000³ (NDoHS, 2007). Whereas the private sector refers to affordable housing as the value of land and housing that is more affordable in relation to more expensive properties in a particular area or neighbourhood (Tissington, 2011).

4.7 National Housing Legislation

There are numerous Acts that inform national housing policies. The main Acts that I will be outlining are: The Housing Act (1997), National Norms and Standards (2007) and The Social Housing Act (2008).

Housing Act (1997)

The Housing Act is the primary piece of housing legislation in South Africa. The Act outlines the sustainable development process using general principles for housing and development in all spheres of government; “it defines the functions of national, provincial and local governments in respect to housing development” (Tissington, 2011: 14); and outlines the foundation for national housing programmes. In section 2(1) the Act states that all spheres of government must give priority to the needs of the poor in respect to housing development, and must consult meaningfully with individuals and communities affected by housing development. They must ensure that housing development, is economically, fiscally, socially and financially affordable and sustainable; is based on integrated development planning and is administered in a transparent, accountable and equitable manner. It should also uphold the practice of good governance. Additionally, Section 2(1)(e) states that all spheres of government must promote: the process of racial, social, economic and physical integration in urban and rural areas; measures to prohibit unfair discrimination on the grounds of gender and other forms of unfair discrimination by all actors in the housing development process; higher density in respect of housing developments to ensure the economical utilisation of land and services; the meeting of special housing needs, including, but not limited to, the needs of the disabled; the provision of community and recreation facilities in residential areas; the housing needs of marginalised women and other groups disadvantaged by unfair discrimination and; the expression of cultural identity and diversity in housing development (Housing Act, No 107 of 1997, 1997:s2; Tissington, 2011).

The Housing Act stipulates a pro-poor policy and legislation and encourages the provision of secure, environmentally friendly and integrated settlement environments. The major challenges are covered further on in the housing policies and implementation strategies that will be discussed later.

National Norms and Standards (2007)

The National Norms and Standards were introduced in 1999 in terms of section 3(2)(a) of the Housing Act. These provided guidelines and technical specifications including environmentally efficient design proposals. These national norms and standards are contained in the 2009 National Housing Code. These specifications state, that all stand alone houses constructed through application of the National Housing Programmes must at least comply with the norms and standards (Tissington, 2011: 20; NDoHS, 2010):

- Minimum gross floor area of 40m²
- Two bedrooms
- Separate bathroom with a toilet, a shower and hand basin
- Combined living area and kitchen with wash basin
- Ready board electrical installation, if electricity is available in the project area.

The Social Housing Act (2008)

In 2008 the Social Housing Act 16 of 2008 (Social Housing Act) was passed, providing the enabling legislation for the Social Housing Policy. The revised policy has recently been included in the Social Housing Programme (SHP) in the new National Housing Code of 2009.

The Act aims to establish and promote a sustainable social housing environment; to define the functions of national, provincial and local governments in respect of social housing; to provide for the establishment of the Social Housing Regulatory Authority (SHRA) in order to regulate all social housing institutions obtaining or having obtained public funds; to allow for the undertaking of approved projects by other delivery agents with the benefit of public money; to give statutory recognition to social housing institutions; and to provide for matters connected therewith (Social Housing Act, No. 16 of 2008, 2008). The SHRA will also deal with the accreditation of social housing institutions (SHIs) in terms of this legislation and regulations following it (Tissington, 2011: 20).

The Social Housing Act is a major instrument in restructuring South African cities as the main aim of the legislation is to introduce the proper authorities in regulating well-functioning social housing projects. These will be discussed later on in the chapter.

³ This amount was decided as of the drafting of the Inclusionary Housing Framework in 2007

4.8 National Housing Policy

There are two relevant housing policy documents in South Africa; The 1994 White Paper: A New Housing Policy and Strategy for South Africa (White Paper on Housing) and 2004 Breaking New Ground: A Comprehensive Plan for the Development of Sustainable Human Settlements was the first major policy amendment document of the White Paper 1994 (Tissington, 2011).

Inclusionary Housing Policy (2007)

The Inclusionary Housing Policy (IHP) was discussed between government and the private sector which comprised of property developers and banks. This was in order to, to accelerate housing delivery for people on the housing backlog waiting list. The main objective of the policy is to:

“provide accommodation opportunities for low income and lower middle income households in areas from which they might otherwise be excluded because of the dynamics of the land market” and “to mobilize private sector delivery capacity to provide affordable housing” (NDoHS, 2007: 11)

The aim of the policy is to incentivise and leverage the private sector to provide affordable housing opportunities for low-income and lower-middle income households in well-located areas close to a range of opportunities. The Minister of Housing at the time stipulated that “every commercial development, including housing developments that are not directed at those earning R1 500 or less, should spend a minimum of 20 percent on the construction of homes within human settlements for those who qualify for government subsidies” (Tissington, 2011: 71). This was later amended to R3 500 to R7 000⁴, due to costs. It also aims to increase the supply of affordable rental and ownership housing (Tissington, 2011: 71).

The two strategies that IHP proposes are, a Voluntary Pro-Active Deal-Driven (VPADD) component and a Town Planning Compliant (TPC) approach. In the voluntary approach, VPADD, municipalities approach the private sector to partner in developing social housing. They first identify inclusionary housing projects on local government-owned land and incentivise the private sector. The second TPC approach, is mainly an incentive-linked approach to entice the private sector to comply with the programme. Rezoning or subdivision approvals for the private sector are contingent on meeting specified inclusionary requirements in return for some development rights. Additional incentives would comprise of: “public investment in bulk and connector infrastructure, density bonuses and the allowance of multi-storey units and some commercial rights” (Tissington, 2011: 71). However, these incentives can only be allocated if 30 percent of units developed in the project are affordable. The intention of these two components is for a “win-win situation in which the private sector, with state support could ensure the provision of low-income rental and ownership options in well-located areas” (NDoHS, 2007; Tissington, 2011: 72).

However, the implementation of inclusionary housing projects has been quite slow and has been criticised to be functioning only within urban areas, rather than rural areas. Gauteng and the Western Cape have implemented some inclusionary projects, with eThekweni leading the way in stipulating developers to include affordable housing in their projects. However these projects have been considered as having made a big enough impact in addressing the housing crisis.

⁴ In accordance with Cape Town municipal TDA Inner City Housing Prospectus (2017), the new income bracket has changed to R3 501 – R18 000 monthly income.

Other challenges of implementation have been, the difficulties of including different income bands and cross-subsidisation within housing developments, and the issues around mixed-tenure projects. Another challenge is the lack of capacity and expertise in modelling viable projects and implementing them successfully without incurring extra costs and damaging the relationship with private developers in the long term. These issues have made it challenging to implement. Therefore, not too much is expected in addressing the housing backlog, and inclusionary housing will only make a small contribution in alleviating the crisis of affordability as the income bracket target for rental and ownership housing is R3 500 to R7 000 (NDoHS, 2007; Tissington, 2011: 72).

4.9 Housing Institutions

There are several legislated housing institutions, which undertake specific functions in the housing arena such as; National Housing Finance Corporation (NHFC), the Housing Development Agency (HDA) and Social Housing Regulatory Authority (SHRA).

The NHFC was established by the government to mobilise finance for housing, from external sources outside the state and partnerships from numerous areas (Tissington, 2011: 23). HDA is a national public entity and is “tasked with the acquisition, management and release of state and privately-owned land for human settlement development” (Tissington, 2011: 23). Also its role is to assist with project delivery support to municipalities and provinces and improve capacity and deliverables of integrated sustainable human settlements (Tissington, 2011). The HDA plays a crucial role in allocating under-utilized public land for potential housing developments. SHRA replaced the SHF and functions as the national regulatory authority to increase the amount of rental accommodation available to low-income groups. It functions to secure more funding for social housing projects and develop more of these in urban areas. SHRA also oversees the accreditation of the Social Housing Institute in terms of legislation and regulation (Tissington, 2011: 24).

4.10 National Housing Programmes

The National Housing Code, in accordance with the Housing Act, set out the underlying principles, norms and standards which apply to the National Housing Programmes. The Code is binding on provincial and municipal spheres of government and guides municipal governments’ housing strategies (CoCT, 2016b; Tissington, 2011: 21; NDoHS, 2010). National Housing Programmes and subsidy mechanisms are included in the Code. Three core programmes have been identified for future housing delivery: Integrated Residential Development Programmes (IRDP), Upgrading of Informal Settlements Programme (UISP) and Social/Rental Housing Programme. I will only be discussing IRDP and Social Housing Programme (SHP) as these are relevant to my topic.

Integrated Residential Development Programme (IRDP)

IRDP was introduced to facilitate a new vision of housing that locates in well-located areas, instead of the peripheries, and provides improved access to urban amenities; including major employment areas and social facilities. The IRDP provides for phased-area wide planning and the development of integrated housing projects in situations where; “i) a project is undertaken in an area where unoccupied vacant land is developed or ii) a project is undertaken in an existing township where an undeveloped parcel of land is utilised for development purposes. The programme provides for both subsidised, as well as finance-linked, housing, which caters for households earning between R3 500 and R 15 000 a month. It also provides for social and rental housing, commercial, institutional and other land uses to be developed (Tissington, 2011: 81; NDoHS, 2010).

Social Housing Programme (SHP)

The SHP was implemented through the approval of the Social Housing Policy. The aim of the programme is to supply affordable rental accommodation for low-income persons in well-located areas at higher densities enabling urban regeneration and social mobility for rental users. The target household monthly income is R3 501 – R15 000 and qualifies for subsidised rental for social housing (TDA Inner City Housing Prospectus, 2017: 12). These developments need to be located within a restructuring zone set out by local authorities and supported by provincial government, and managed through accredited housing institutions, in this case the Social Housing Institute (SHI) (Tissington, 2011: 98). The challenges previously experienced by the SHI has been the difficulty of securing proper funding for social housing stock. At first, the Institutional Subsidy together with loan funding from the NHFC (discussed earlier) along with donor funding and the local authority grant was used to cover institutional set-up and operational costs. This resulted in the majority of the funding being reliant on donor funding. This was an unsustainable environment in which to develop social housing effectively (Tissington, 2011: 99).

National Housing Development Programmes

Table 4.1 Defining Housing Sector (Source: Status Quo Knysna Gov, 2013; TDA Inner City Housing Prospectus, 2017)

	Housing Development Programmes	Brief Description	Monthly Household Income	Market Segment
State/ Public Sector	Community Residential Units (CRU)	This programme will target low income households who are not able to be accommodated in the formal private rental and social housing market. The programme seeks to bridge the divide between social housing and lower markets which pose a significant problem.	R800 - R1 500	Low
	Social Housing	Rental or co-operative housing for low to middle income persons. These units are provided and managed by social housing institutions.	R3 501 – R15 000	Low to middle (affordable)
	Breaking New Ground (BNG)	Housing unit provided free of charge to individuals who qualify for a full subsidy.	R0 - R3 500	Low
	Finance Linked Individual Subsidy (FLISP)	This programme provides individual subsidies linked to the household income of the applicant to enable the applicant to acquire a residential property or to construct a house. This subsidy is subject to the approval of a mortgage loan.	R3 501 - R15 000	Low to middle (affordable)
Private Sector	Open Market	Housing that is procured through private sector market instruments and is not directly supported or subsidised by public funds.	R15 000 +	Middle to high

4.11 City of Cape Town Municipal Housing Initiatives

According to the Integrated Human Settlements Framework (IHSF) (CoCT, 2016b), affordable housing qualifiers fall into the gap housing market. This means that individuals earning between R3 501 and R15 000 per month, are not served by the government under subsidised housing and also do not qualify for bond loans from banks. The City has implemented a strategy to deal with this challenge, using loan-funded gap housing mechanisms as well as consumer self-help programmes. The Institutional Housing Programme is one strategy that targets low-income households of a maximum monthly income of R3 500. The programme utilises the state subsidy and a top-up loan. “For example, a house valued at R200 000 would be built through a R110 947 government subsidy and R89 052 loan” (CoCT, 2016b: 49). The City also has social housing initiatives and works alongside partners that manage the developments on the City’s behalf. Currently, the City has completed social housing projects in Steenberg, Brooklyn, Bothasig, Scottsdene and Belhar. In light of inner city housing high land values, the City has included Inclusionary housing as new category.

The City has stated that it needs to align to national and provincial priorities in respect to housing delivery and settlement planning. The City’s current housing delivery strategies that support the National Outcome 8 are: “developments must be suitably located, affordable and decent; developments must facilitate the spatial transformation of the city’s suburbs: i.e. moving towards efficiency, inclusion and sustainability; the building of cohesive and caring communities with improved access to economic and social opportunities is imperative; and developments must be financially sustainable to the City in the long term” (CoCT, 2016b: 73). This is still a great challenge for the City. Of importance also are precedent and affordable housing models work on which still needs to be implemented.

4.12 Examples of Affordable Housing Provision

Many cities in the South Africa are challenged by the need for adequate, secure and affordable housing provision. Many low-income households are located on the outskirts of the city and are far away from accessing employment, retail and social amenity opportunities. The examples below show the implementation of successful affordable housing developments in South Africa and some different precedents that were considered too difficult to implement successfully.

4.12.1 Affordable Housing Precedent in South Africa



Figure 4.24 Hlanganani Gardens (Source: (<https://www.jhc.co.za/about/buildings/hlanganani-gardens>))

Hlanganani Gardens, Johannesburg

Figure 4.24 shows Hlanganani Gardens an example of a greenfield site used for social housing rental accommodation. This project’s process went through the Johannesburg Housing Company and was one of the first projects rolled out after the introduction of the Inclusionary Housing Policy (NDoHS, 2007). However, this example only accommodates rentals and not ownership options, but is an example of well-located affordable rentals in inner city Johannesburg.

283 units in two and three storey walk-up buildings. Options of 1 bedroom, 2 bedroom (50-53 m²) and 3 bedroom. Two bedroom apartments rentals around R4 700 per month. (Johannesburg Housing Company, nd)

Belhar Mixed Tenure Development, Cape Town

Figure 4.25, the Belhar mixed-used, high-density residential project is one of the first projects that incorporated mixed-tenure in a social housing development. It incorporates FLISP, Social housing rentals, student accommodation and some commercial spaces. However, this project has not implemented the best placemaking principles and has struggled to utilise the greenfield site to its fullest. It has only provided residential units instead of better mixed land uses for the site. This project is crucial, as it has tested the incorporation of affordable housing ownership units through the FLISP programme alongside rental units. Although this was a major challenge for the City and developers, this may assist with more developments that want to continue this model. (Calgrom3, nd)

The development incorporated:

- Total number of units: 3 616
- Social Housing: 627 units
- Student Accommodation: 1 000 units
- Rental and GAP (FLISP) housing: 1 973 units
- Freestanding and open market bonded: 16 units



Figure 4.25 Belhar Affordable Housing Project (Source: <http://www.calgrom3.com/index.php/belhar>)

Mountain View Villas, Maitland, Cape Town.

This development is an example of subsidised affordable housing units located in Maitland (see Figure 4.26). The development is managed by the Cape Town Community Housing Company (CTCHC) and funded by the National Housing Finance Company (NHFC). The development caters for the gap housing market, specifically first time buyers with a household income starting from R13 000 per month or higher. The development is also well located in relation to amenities, with good access to Cape Town CBD a major employment area, community health centres, local primary and high schools and retail areas.

The layout of the development is quite poor in the sense of the complex not fitting into the existing fabric of the street. In spite of this, it is an example of good use of vacant space for affordable housing.

Apartments are priced from R 389 900 with loan repayments starting at R3 892 per month. Rentals are also available and range from R3 200 to R6 200 per month. (CTCHC, nd)

The complex consists of 300 sectional title apartments

- Bachelor Units/Bed sitter (27 m²)
- One Bedroom Units (37 m²)
- Two Bedroom Units (50 m² and 56 m²)



Figure 4.26 Mountain Views Villa (Source: <http://www.finservegroup.co.za/wp-content/uploads/2015/03/Untitled-2.jpg>)



Figure 4.27 Mountain View Layout (Source: <https://cdn.filestackcontent.com/output=compresstrue,striptrue,quality90resize=fit-crop,width1922cache=expiry31536000IpCrZ1yxRkOyNiiEgdA7>)

Drommedaris, Brooklyn, Cape Town

Drommedaris is a mixed-use social housing development run by Communicare (Pty) Limited, designed around public spaces and courts. The development provides residential and commercial space and includes a total of 239 units comprised of 219 social rental units and 20 gap housing (ownership) units. The social rental units comprised:

- Bachelor Flats 92 units
- One Bedroom 58 units
- Two Bedroom 69 units

The units include: bachelor flats, one and two bedroom social rental units, commercial units, restaurants, perimeter security, private and public courtyards and parking. The urban design and typology design was considered seriously and layout of the development fits into the existing fabric well. The development is also well-located in relation to amenity, retail and employment areas (jsa-architects, 2011)



Figure 4.28 Drommedaris Social Housing Development (Source: <http://www.jsa-architects.co.za/drommedaris.html#>)

4.13 Conclusion

The incorporation of essential spatial concepts and principles that contribute to effective urban environments are essential for the implementation of well-located, accessible and safe affordable housing opportunities. Many low income developments exclude the placemaking principles and proper urban design principles that not only make a settlement vibrant, but also contribute to the economic success and potential investment in a settlement. Therefore, following these spatial principles of public space and public infrastructure should encourage better implementation and vibrancy into a settlement.

In summary, the affordable housing policy, specifically gap housing and social housing, in South Africa has fallen short on implementation and has disadvantaged some groups because of the lack of legislated policy traction. Specifically the Inclusionary Housing Policy (NDoHS, 2007) which has international precedent. The legislation and traction from government needs to be mandated in order to streamline suitable affordable housing projects for the gap housing market. There are major precedents and policy recommendations from the rest of South Africa that should be considered for better affordable housing implementation in Cape Town. These precedents illustrate that mixed-tenure developments are possible and can be implemented with proper investment and public-private partnerships.

Chapter 5: Concept Plan

5.1 Introduction

This section outlines the spatial concept plan for the development of Youngsfield, Rosmead and Royal Cape golf course precincts. Starting with the programme, gross densities are calculated to understand the population threshold of the site and allocate the appropriate amount of public facilities needed for the area. Following that, the concept proposal outlines where the non-buildable areas, recreational and sports fields are located; as well as where the movement route hierarchies, public facilities, public spaces, commercial outlets and housing forms and densities are located. This proposal brings together the analysis of the wider context and the site in Chapter 3. Including the exploration of the spatial principles, which are necessary to produce high-density, mixed-use, sustainable and livable environments, discussed in Chapter 4.

5.2 Programme

After the site analysis in Chapter 3 (section 3.12), the available developable land was calculated to be 312 Hectares. In order to calculate the average gross density of the site, a decision on an appropriate gross density was made. An average between 40 du/ha and 80 du/ha gave 60 gross du/ha⁵. This was multiplied by hectares of developable land to give the total number of households/dwellings. 312 x 60 = 18 720 households or dwelling units. (Landcom, 2011: 8; CoCT, 2012: 5).

5.2.1 Dwelling units and population threshold

The average between a lower and upper required density was calculated to determine the most suitable dwelling unit per hectare (du/ha) for the site. Using the mean density, allows for lower density areas to reach 40 du/ha and higher density areas to reach 80 du/ha, see Table 5.1.

Table 5.1 Average Gross Density (Source: Author, 2017)

Average Gross Density	Total Units
40 du/ha	12 480
80 du/ha	24 960
Mean Gross Density 60 du/ha	18 720

Average household size according to StatsSA (2011) is 3.3 people. I have used this average to determine the population size for the site: **61 776 people**

5.3 Public Facilities

Based on the population threshold of 61 776, I have calculated the necessary public facilities needed for the site, according to Social Facility Provision Toolkit (CSIR, 2017).

⁵ Gross du/ha density refers to the number of dwelling units per hectare of land calculated in a designated area on the basis of land used for residential purposes and other land uses such as education, transport and parks (CoCT, 2012: 2).

However, the sub-metro analysis in Chapter 3 (section 3.6) showed a good provision of public facilities in the surrounding area. The number shown below is 2/3 of the suggested facilities from the toolkit. Although there is a subsequent increase in population numbers, the public facilities will be less than suggested by the Social Facilities toolkit (CSIR, 2017). To avoid using large amounts of land for facilities, the majority of facilities will be clustered into public facility 'hubs'. This is shown in Table 5.2 and 5.3.

Table 5.2 New Public Facilities (Source: Adapted from CSIR, 2017)

Sector	Facility Type	Number of facilities	Within distance (km)	Level of Hierarchy of facilities
Community Halls	B-grade Hall	1	15km	Second order
Education	Primary School	5	5	Third order
	Secondary School	3	5	Third order
Health	Clinic	3	5	Third order
	Community Health Centre (24 Hour)	1	10	First order
Libraries	Basic Public Library	2	5	Second order
	Branch Public Library	1	10	Second order
Social Development	Creche/nursery school	10	5	Fourth order
	Home for the Aged	1	30	Fourth order
	Social Grant Paypoint	8	5	Second order
Local Economic Development	Public Markets	4	5	Second order

Table 5.3 New Recreational Facilities (Source: CSIR, 2017)

Recreational facilities		
Playgrounds/Parks	Third order	8 Ha
Sports fields ⁶	Second order	11 Ha

5.4 Concept Proposal

This section illustrates the concept plan proposal for the site. It indicates the non-buildable areas on the site, such as existing buildings which will remain on site, existing and proposed sports fields and recreational areas, wetlands, and areas of endangered indigenous vegetation. These areas define where the movement routes are incorporated into the site and surrounding fabric, as well as the location of nodes and the activity route, public spaces and commercial outlets.

5.4.1 Non-buildable areas (see Figure 5.1):

The non-buildable areas consist of certain existing buildings, valuable natural land remaining on site, sports fields and recreational areas. These areas define where development will not occur on site, shown in Figure 5.1.

- The remaining wetlands identified in Chapter 3 (site analysis) have a 15 meter buffer to allow for enough protection of indigenous vegetation and existing habitats. The buffer is also essential for flood protection during winter rainfall.
- 9 hectares of 16 hectares of sports fields along Rosmead Avenue (M28) will remain. Two other green spaces along Wetton Rd (M9) will remain for recreational purposes.
- Some existing buildings along Rosmead Avenue (M28) will be demolished and the land will be made available for development closer to the street edge to front onto the activity route. The activity route will then have infill development and front onto the street edge for good interaction with the street.
- The two remaining buildings (Fire station and Novalis Ubuntu Institute) are situated well in relation to the street front. The Novalis Ubuntu Institute is an older building and is an important space for non-profit use. It is also used as second-hand market space by residents in the adjacent areas. Although it is set quite far back from the street front it can be incorporated into infill development.
- The industrial area located north to south from Ottery Road (M68) and Wetton Rd (M9) has larger industrial buildings that will remain.
- The church located along Wetton Rd (M9) will remain and be incorporated into infill development.
- The residential development along Ottery Road will remain, with infill occurring along the route and additional access routes to the interior of the site.
- The industrial area located below Ottery Road (M68) will also remain with additional access routes over the railway and the interior of the site.

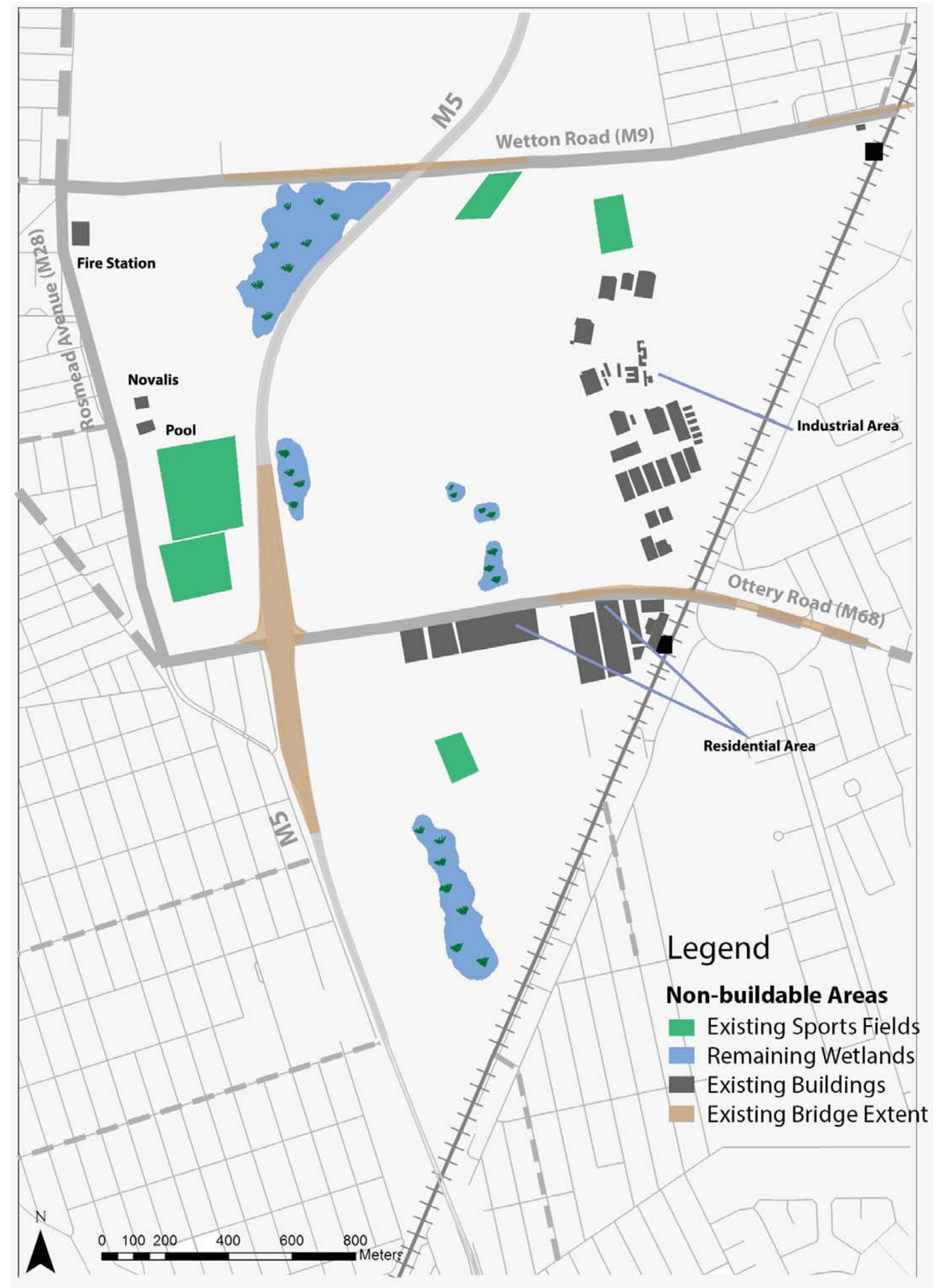


Figure 5.1 Non-buildable Areas (Source: Author, 2017; CoCT, 2016)

⁶ The total number of sports fields are exclusive of the existing sports fields on the site.

5.4.2 Movement Route Hierarchy

The movement route hierarchy is divided into level one and level two routes. Level one routes are the routes on the edge of the site and level two are the internal routes. The level three routes are not shown on the plan and will be discussed as a sample super block of the site. The importance of developing the routes this way is to create a flexible and extroverted site in order to link the site to the sub-metropolitan routes and allow them to carry commercial and other activities. This will create an open, multifunctional road network where points of intersection enable numerous opportunities for multi-directional movement.

Level One Routes (see Figure 5.2)

- The nature of these level one routes is multi-functional. These routes are major public transport routes and activity routes with mixed land use facing onto them. They accommodate pedestrians and other forms of NMT such as cycling, and informal trade spaces.
- These routes are located along existing and proposed intense activity routes (Rosmead Avenue (M28), Wetton Rd (M9) and Ottery Rd (M68) depicted as thick black lines in Figure 5.2).

Level Two Routes

- The dark grey lines show the level two routes within the site. The proposed north-south routes link Wetton Rd and Ottery Rd as well as the former Golf Course area with the M5 (see Figure 5.2). These routes are proposed main public transport routes. East-west corridor connections are less continuous, as the freeway (M5) limits access, as does the railway on the east of the site. These internal routes are also public transport routes with mixed-use developments fronting onto the street.
- Proposed linkages across the M5 have included two bridges for vehicular access and one underpass for pedestrian and vehicles over the M5. Two other links are over the rail. One is a former level crossing with a boom, and the other is an underpass for vehicles.

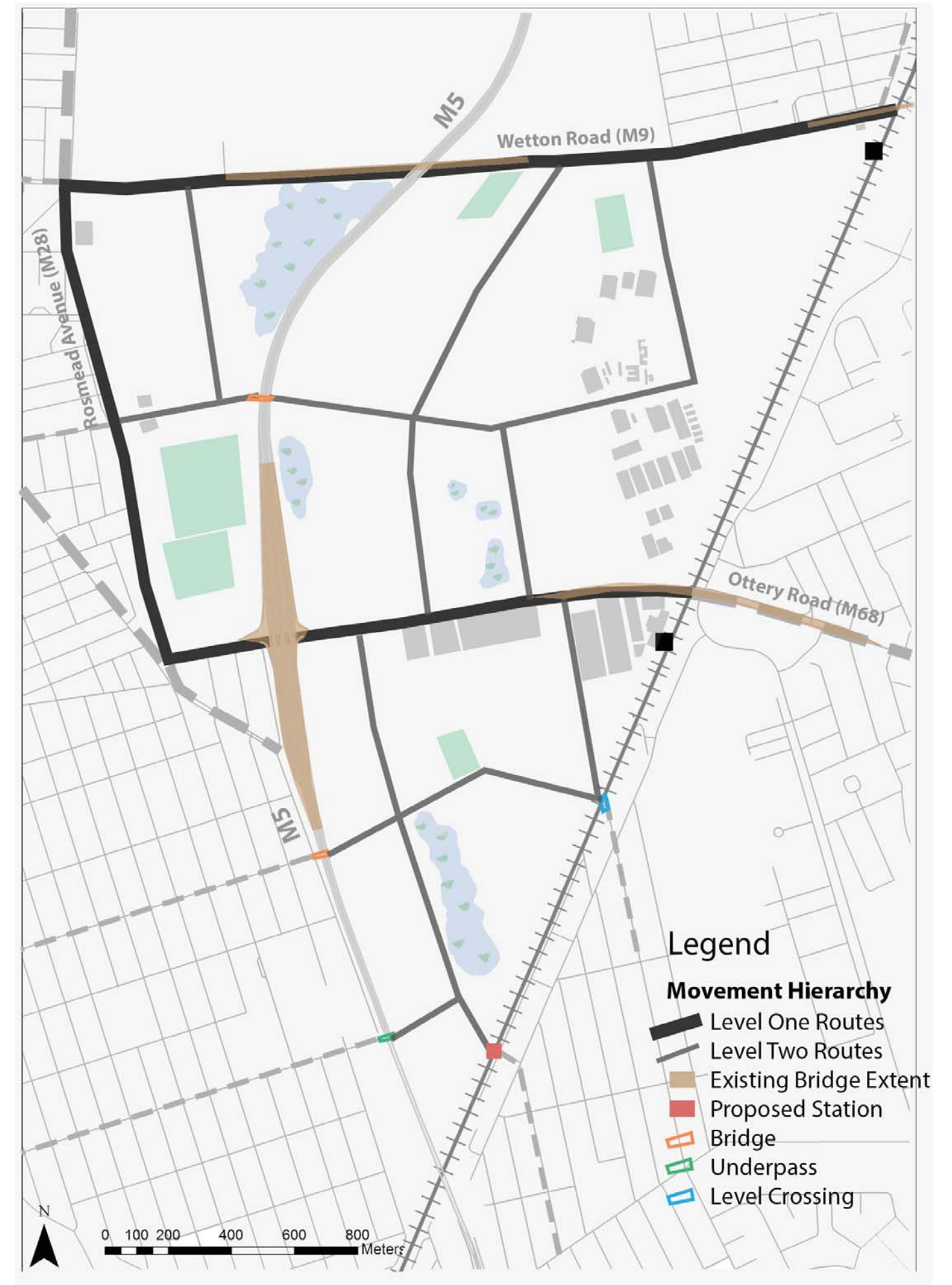


Figure 5.2 Movement Hierarchy (Source: Author, 2017; CoCT, 2016)

Level One street sections

Figure 5.3 shows three to four-storey buildings front onto the street with ground floor commercial space and either office, or commercial second floors, with residential space above. The pedestrian sidewalk also accommodates informal traders of various kinds; however, the trading bays or shelter structures should not exceed 1.5 m depth from the street. Public transport stops are also accessible along the street, specifically the BRT and minibus taxis. The proposed MyCiti bus rapid transit (BRT) lanes that are currently being phased into these three routes are included.

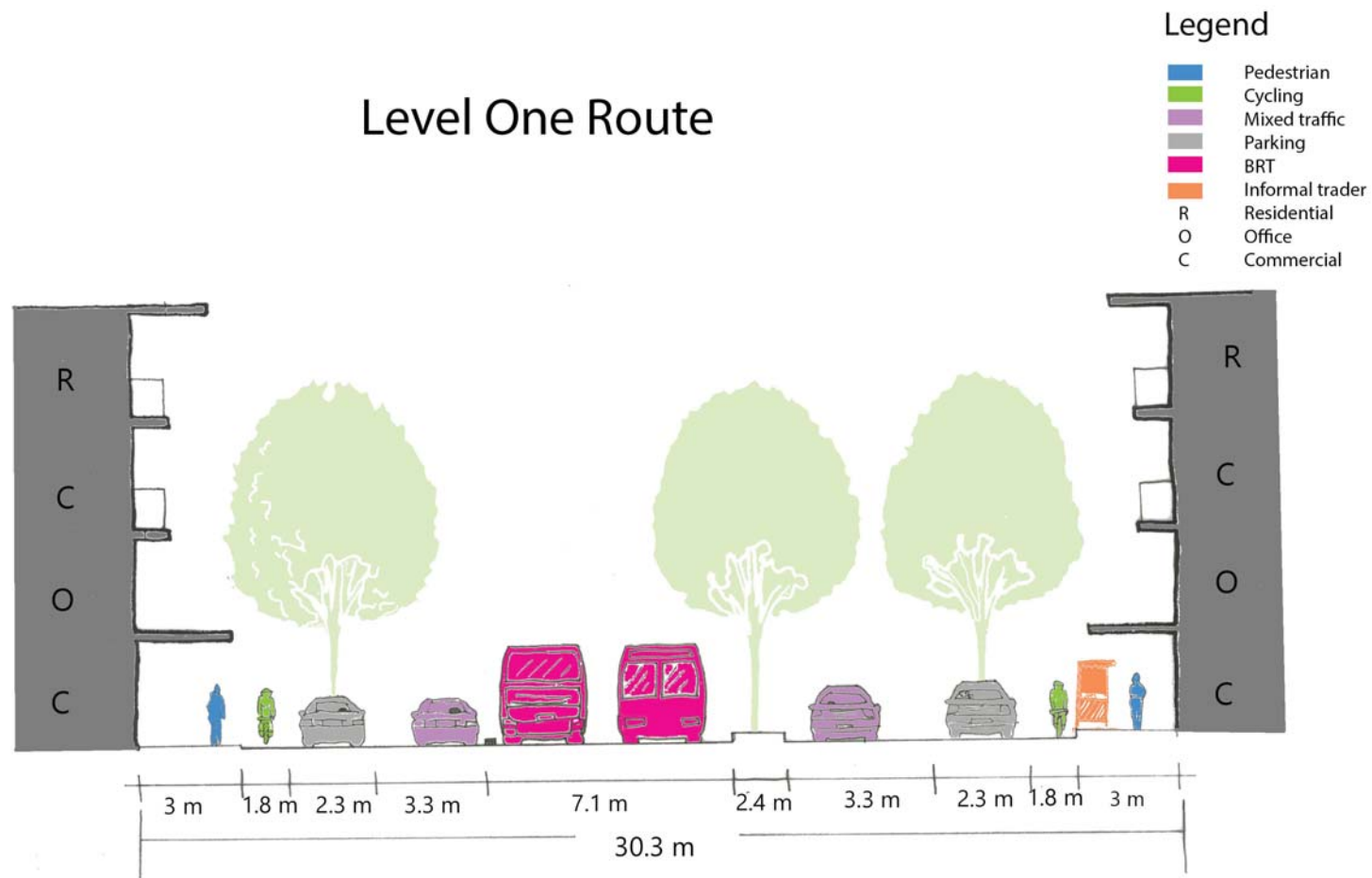


Figure 5.3 Level One Routes (Source: Author, 2017)

Level Two Street Section

Figure 5.4 shows a street section of the interior public transport route. These consist of proposed mixed transit on the route, as well as wide sidewalks to accommodate pedestrians and informal traders. These streets are essential for creating quality urban environments while facilitating mixed-use spaces with pedestrian friendly and vehicular use. Public transport stops along the street are also crucial in enabling high foot traffic and vibrancy along the street edge.

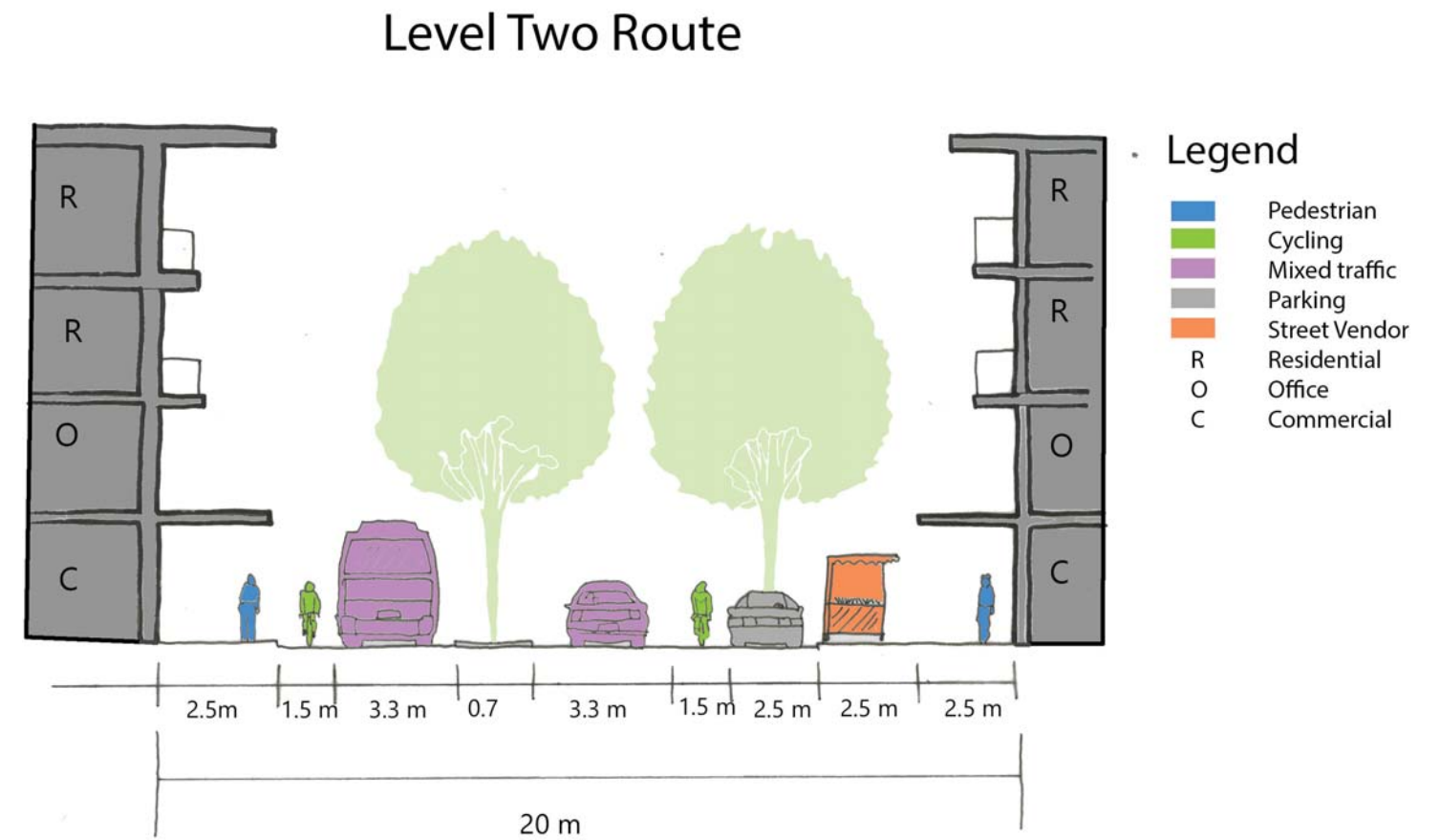


Figure 5.4 Level Two Routes (Source: Author, 2017)

Level Three Street Section and Layout

The level three movement routes are the more local residential routes and are not shown in the movement route map (Figure 5.2) but are instead shown as a sample layout of a super block in the diagram below (Figure 5.5).

The street layout below shows the narrower streets for residential areas. The street layout follows the higher density perimeter blocks adjacent to the level two routes. This supports the multi-functional use of these routes, with the lower density row house built form located behind perimeter blocks. The road sizes allow for vehicle and NMT use, and short blocks allow for easy walking close to public transport routes at level two intersections. The role of the local residential route is to enable NMT friendly streets with wide sidewalks and cycle lanes. These local streets have a quieter feel in relation to the external level one routes. Proposed residential development is more prevalent along these routes. The narrower street acts as a traffic calming measure with many pedestrian crossings located along the street. Street widths of level three streets will vary depending on planned precincts.

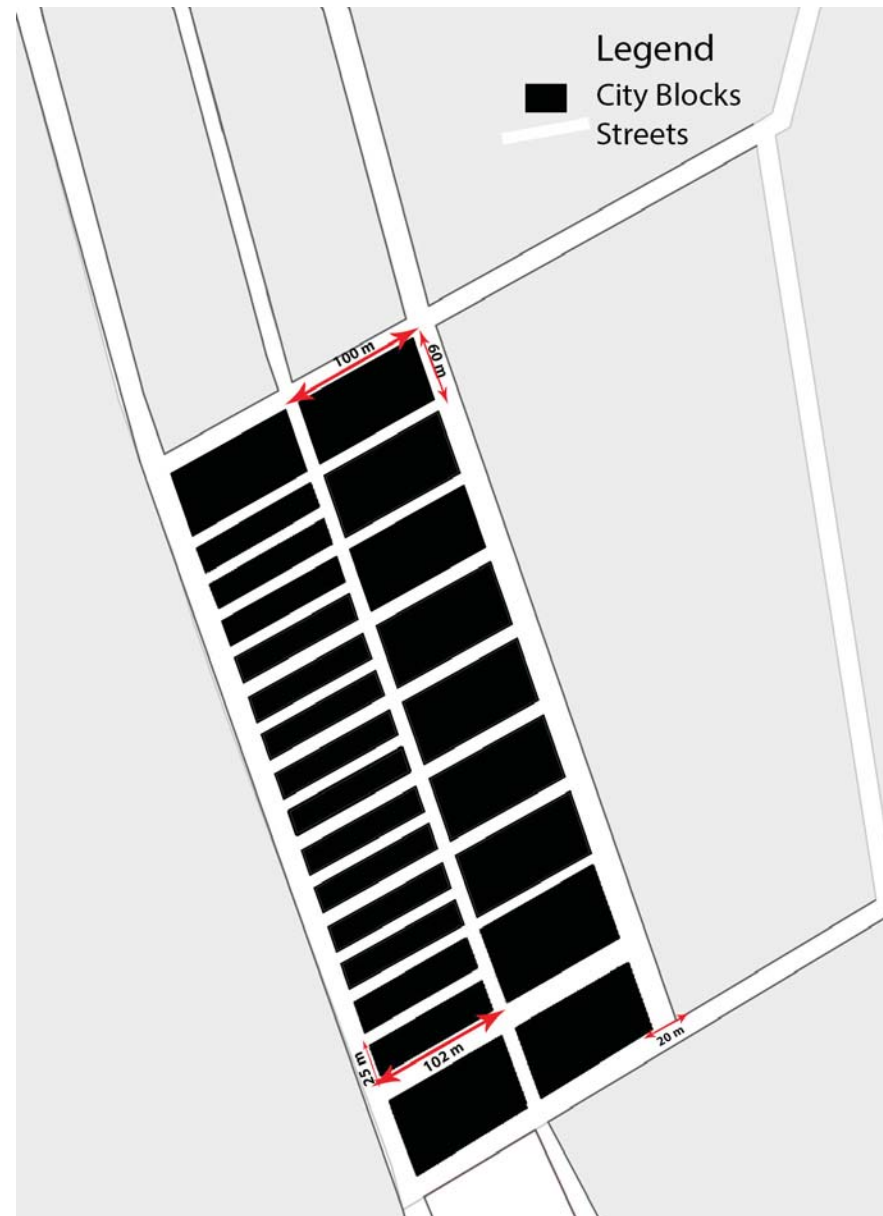


Figure 5.5 Level Three Street and Block (Source: Author, 2017)



5.4.3 Public Space – Hard and Soft

The role of public space is crucial for creating quality urban environments. The main principle used for designing public spaces, discussed in Chapter 4, is linking public spaces and movement routes as the main structuring elements of a settlement.

Hard Open Space

Hard open spaces form a hierarchy with the most important (Level one in Figure 5.6) public spaces at the intersection points of highest accessibility (eg Rosmead Avenue on the map). Level one public spaces are large public squares of around 5000m² maximum (similar to the size of Green Market square) with informal trading activities, markets and spaces for recreation (refer to Chapter 4). Large plazas and squares should be well-defined and enclosed by buildings of four to six storeys and trees. This gives the space more of an outdoor room feel. These spaces should enable multifunctional uses throughout the day to ensure that diversity continues beyond working hours and seasons. First order facilities that attract large numbers of people should enclose these public spaces and this should facilitate economic functions, such as informal trading, markets and use of commercial spaces located close by.

The second order level of hard open spaces (blue squares on Figure 5.6) are at intersections of level two streets and contain smaller concentrations of people and activities such as informal trading, market space and are enclosed by second order level public facilities (eg: libraries or community halls). These public squares are roughly at a scale of 2 500m² (similar to Jammie Plaza at UCT) and should be enclosed by buildings of up to four storeys, to create a good ratio of open space to building heights. This should be enable appropriate transition zones from private to public areas.

The third level of public squares, not shown on the map, will be local squares and streets within residential areas. Public squares disrupt the movement routes to slow traffic and create a space of connection and vibrancy within residential areas. Smaller hard spaces should enable social activities and act as outdoor space for occupants of high density dwelling units with limited private space.

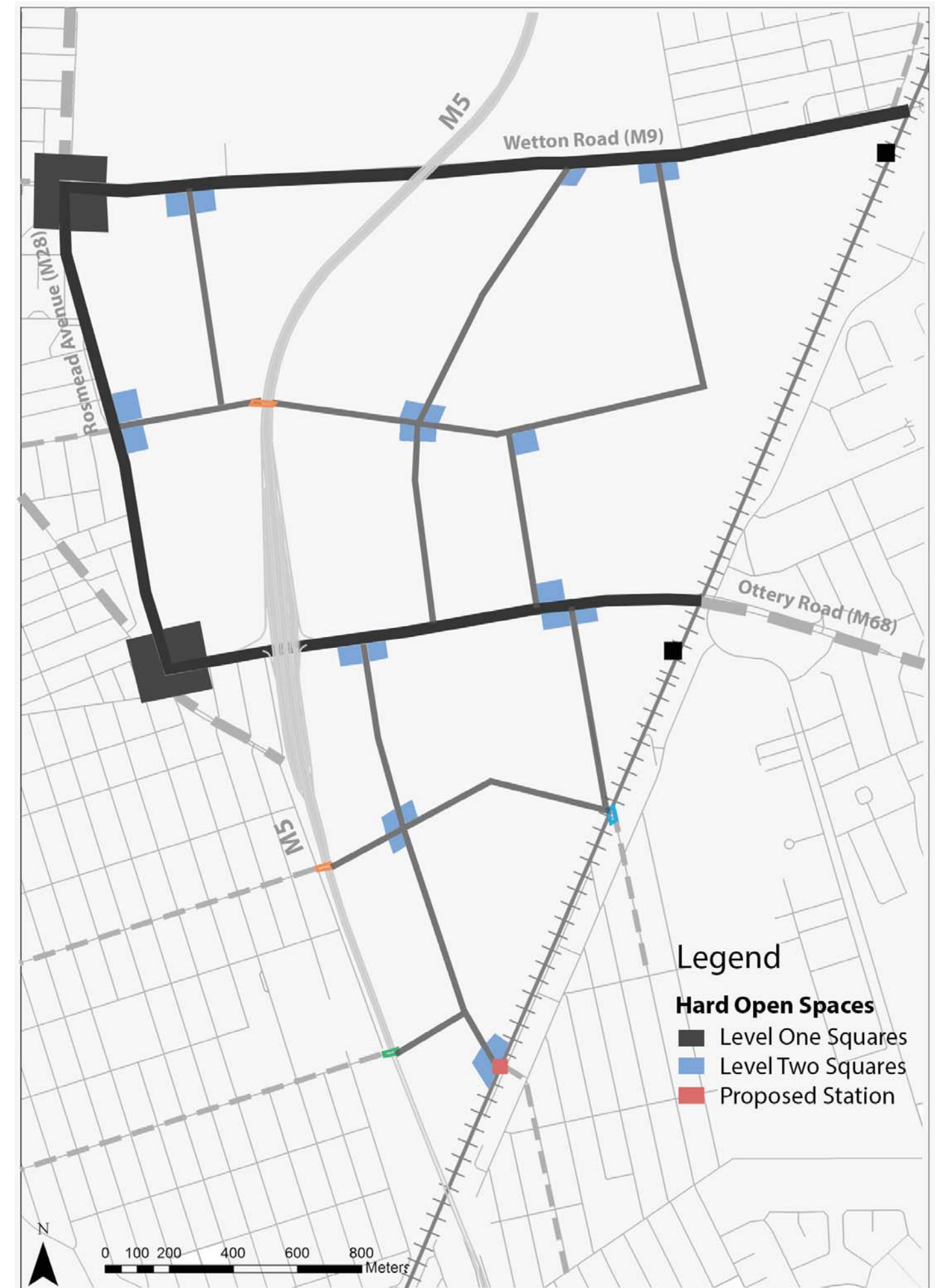


Figure 5.6 Hard Open Spaces (Source: Author, 2017; CoCT, 2016)

Green Open Space

Figure 5.7 shows the proposed soft open spaces which include natural space comprising of the wetlands, city parks and sports fields that are available to the public outside school hours. The important principle that guides green space is that they should be linked. This is essential for ecological benefits such as the role of wetlands in mitigating flood risks and creating biodiversity corridors for habitats and indigenous vegetation. It is also essential for creating softer spaces within a bustling dense urban environment (Behrens & Watson, 1996).

Adjacent to the wetlands, proposed parkways are located with pedestrian routes, which structure the green space. Parkway and sports fields also act as dry detention ponds to minimise adverse flood effects near built up areas (CSIR, 2005: Ch 6, pg 10). City parks are adjacent to the parkways as an extension of the green space for more playful activities for children. These are similar to the size of Green Point Urban Park. These parks consist of play spaces fronted by buildings to ensure surveillance of children.

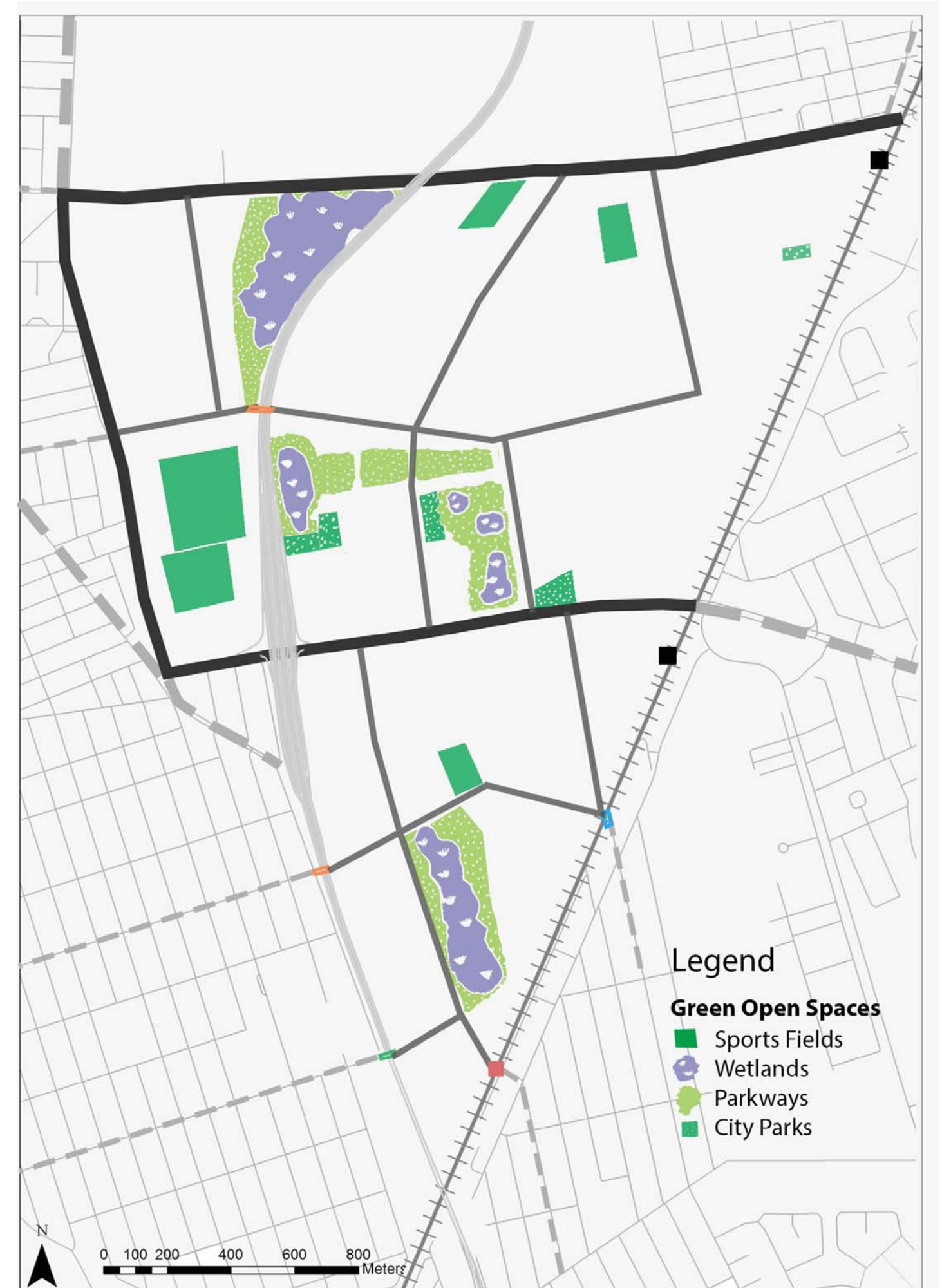


Figure 5.7 Green Open Spaces (Source: Author, 2017; CoCT GIS, 2016)

5.4.3 Public Facilities

This section spatialises the concept principles discussed in Chapter 4 for public facilities. The main concept guiding the location of public facilities is clustering and exposure of facilities to enable resource sharing. The location of these facilities needs to be at major intersections to ensure visibility and accessibility. They should also be clustered in order to increase the sharing of resources between facilities. The other benefit of clustering is the efficiency for users who may have had to travel far distances to access public facilities. These will now be closer together and could be accessed in one trip. The other concept that guides public facilities is their role in enclosing public spaces and ensuring multifunctional use of space (Behrens & Watson, 1996; CSIR, 2005). Public facility access is crucial to settlement layout, as these facilities need to be as accessible as possible to the greatest number of users. Public facilities that complement one another are clustered into hubs in order to share resources effectively (see Figure 5.8).

Public facility hubs have been divided into two categories: Level one facility hubs should be located at the primary public transport interchanges and major intersections (see Table 5.4). Level Two facility hubs should also be located close to public transport routes and at level two route middle order intersections. They need to be visible and accessible to a large number of people. Level three facilities are not shown on the map but should also be accessible along local (level three) routes, and in quiet environments that are easy to access from public transport stops and interchanges (Behrens & Watson, 1996). These level three facilities should be planned once precinct developments occur.

Level one public facility hubs

Level One hubs are located at points of highest movement access (see Figure 5.8). First and second order facilities such as hospitals, community centres and libraries cluster around level one hard open spaces which also contain commercial outlets and a range of third and fourth order facilities. It is essential for these facilities to be located close to retail and markets to allow for effective use of active nodes. The major public facilities that enclose level one public spaces are the community hall, library and police station. These facilities serve large numbers of people and locating them close to public spaces will ensure multifunctional use of space as well as market thresholds reliant on large numbers of people. Commercial spaces are also incorporated within these clusters to ensure full use of the hub. Placement of certain higher order facilities also assist with legibility of a space, as is the case with the fire station and hospital.

Level two public facility hubs

These facilities are located at points of intersection of level two movement access routes and relate to level two public squares. The facilities clustered at this level are a mixture of second, third and fourth order facilities as per Table 5.4. These are clustered to ensure resource sharing for schools and sports clubs that utilise sports facilities. Primary and secondary schools are located close together to utilise shared sports fields. Enclosing public spaces with facilities and multifunctional spaces facilitates the continuous use of public facilities. When second order facilities are linked to level two public spaces and public markets, they attract large numbers of people and maintain the vibrancy of public squares. Informal traders should be supplied with public market facilities such as different ranges of trading bays,

electricity, water points and storage areas. This will enable good access for informal traders along level one and two routes.

Table 5.4 Public Facility Allocation (Source: Behrens & Watson, 1996; CSIR, 2005, 2017)

Nature of Facility	Functional Category of Public Facility	Location	Icon
First Order	Community Hospital	Along regional route	
Second Order	Community Hall	Along intense activity route	
	Library		
	Post office		
	Police station		
	Social Grant Paypoint		
	Public Market		
Third Order	Primary Schools	Located a block or two away from intense activity route	
	Secondary Schools		
	Clinics		
Fourth Order	Crèche	Located within residential area, walking distance of residences home.	

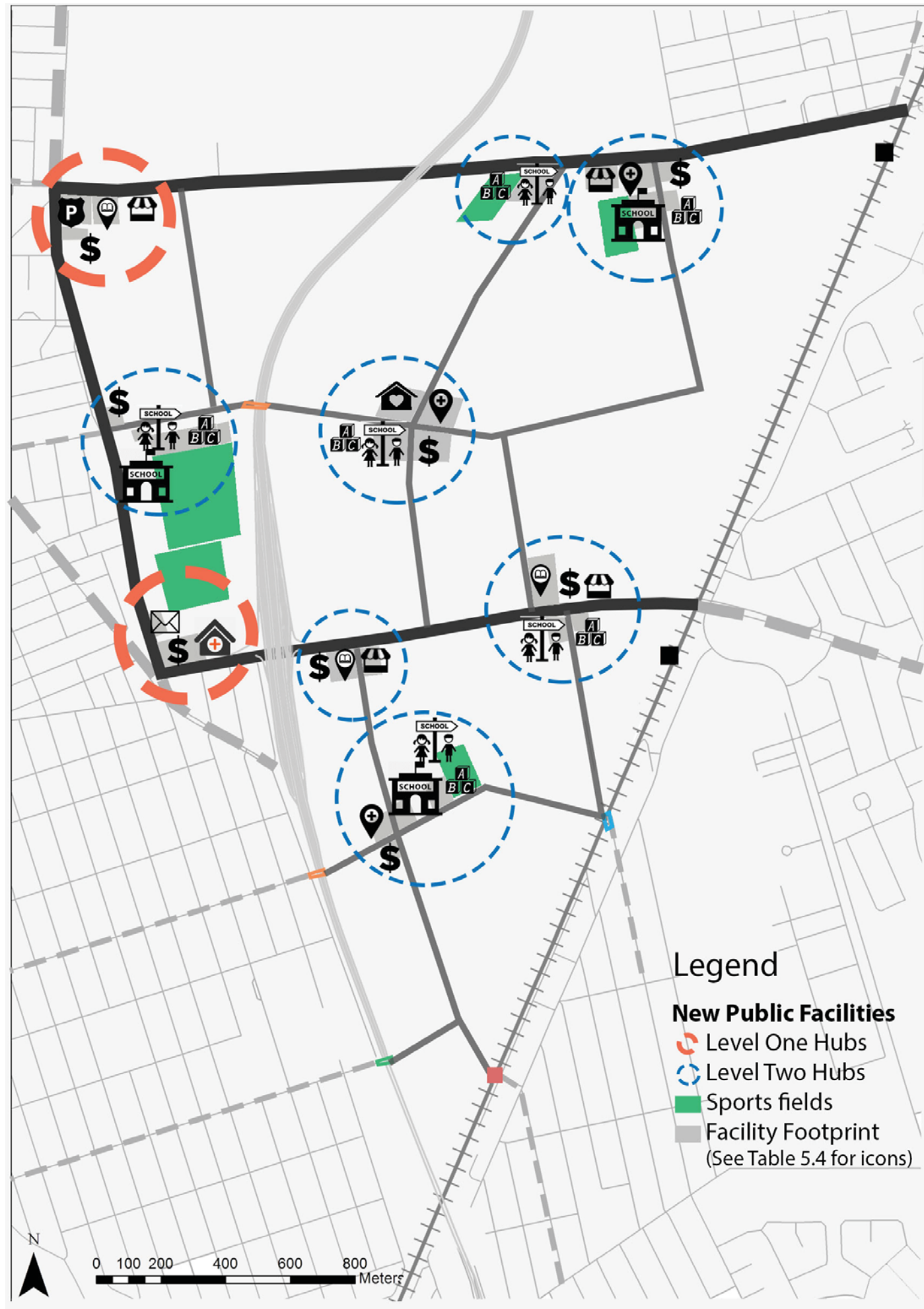


Figure 5.8 New Public Facilities (Source: Author, 2017; CoCT, 2016)

5.4.4 Residential Built Form

This section illustrates the nature of residential built form and the main concepts that guide this site layout. The important aspect of residential built form is to ensure a variety of housing forms. These would need to be facilitated by layout and infrastructure design.

Higher density residential built form is located along the more intense level one routes and main public transport routes (see Figure 5.9). This is incorporated into mixed-use spaces with residential units above ground floor commercial and office space. Perimeter blocks are the main built form along intense activity routes to maximise use of space. They have semi-private courtyards in the centre of the block (dark orange in Figure 5.9). The average du/ha for that space should be around 80 du/ha and the built form should be up to four storey walk-ups. However, buildings located at level one public squares should go up to six storeys.

Along the accessible public transport routes, located a block or two away from intense routes, is the lower density row housing (light orange in Figure 5.9). The average residential du/ha for the residential space would be between 40 to 60 du/ha. The proposed built form should be row housing to accommodate these densities.

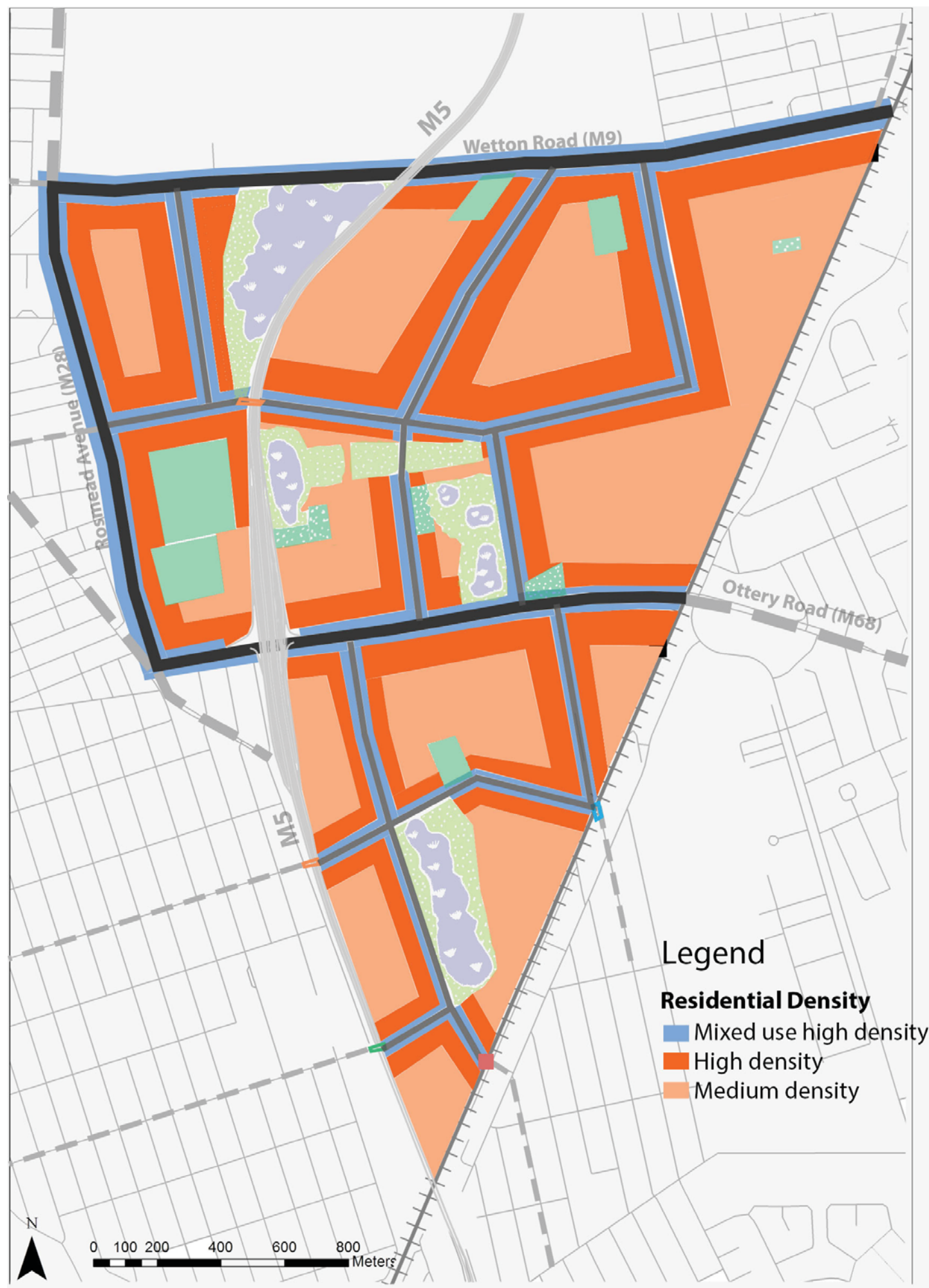


Figure 5.9 Residential Density (Source: Author, 2017; CoCT GIS, 2016)

5.4.5 Residential layouts and densities

This section shows examples of residential layouts located within the site. Two residential forms and densities are shown here: higher density areas take the form of the perimeter block and lower density areas take the form of row housing. Figure 5.10 and 5.11 below show the different built forms.

High Density: Perimeter Block multi-storey built form

The perimeter blocks locate along activity routes and around higher order public spaces and facility hubs. They will allow higher densities (averaging 80du/ha gross) and mixed-use with commercial activity on the ground floor and residential or offices above. The perimeter blocks depicted in dark orange are located along an activity street. The street widths range from 20 – 30m depending on the order of the route. The block dimensions range from 80 – 120m length and 50 – 80m width. The built form making up the perimeter blocks occupy the majority of the site with little setback from the street. They are set around semi-private courtyards or public squares enclosed by the block (see Figure 5.10). The height of all buildings in the perimeter blocks are three to four storeys. Unless buildings are located at level one public squares, heights can go up to six storeys.

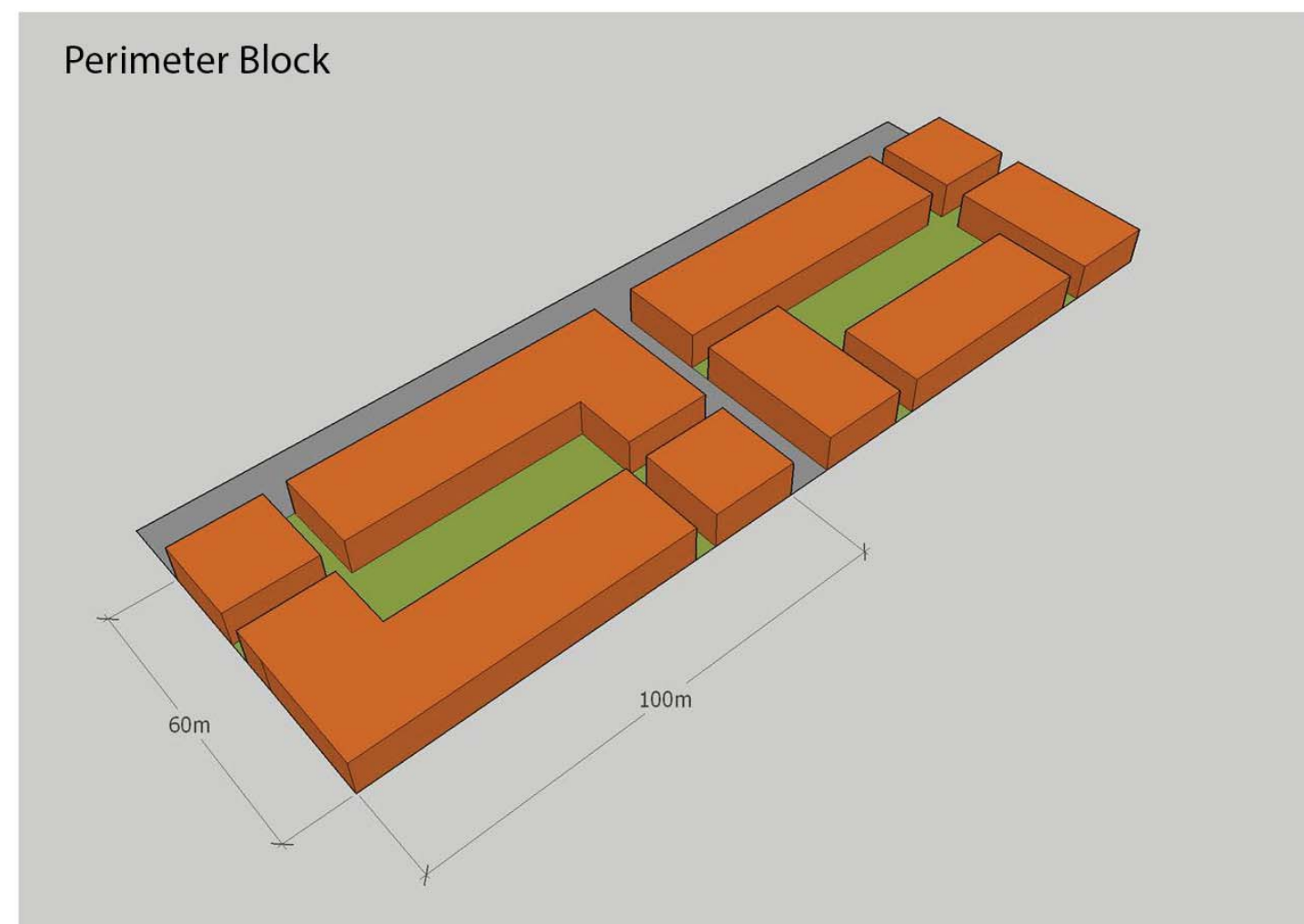


Figure 5.10 Perimeter Block Built Form (Source: Author, 2017)

Medium Density Housing: Row Housing

The city blocks located behind the perimeter blocks on less intense streets will be lower densities (averaging 40 and above du/ha gross) with row housing (see Figure 5.11). These are mainly residential units and have good access to public space. The individual row housing plot is approximately 8 m width (See Figure 5.11) and 12 m length, making each unit size 100 m². This is similar to the Woodstock/Salt River row housing dimensions. The blocks are permeable with private courtyards at the back of individual plots provided for residential spaces as well as smaller streets between blocks to ensure safety for children and traffic calming for private vehicles.

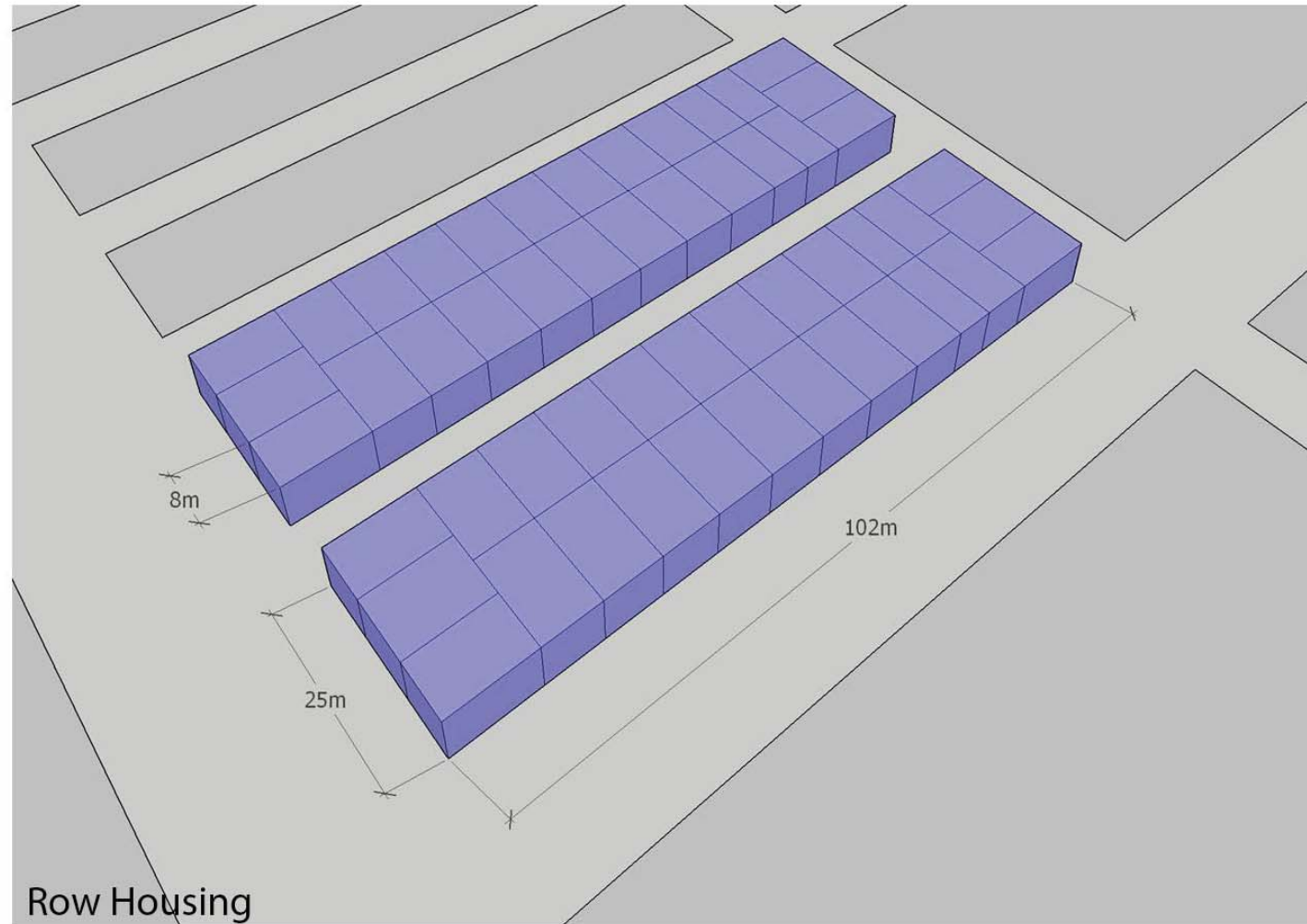


Figure 5.11 Row Housing Built Form (Source: Author, 2017)

5.4.5 Package of Plans: Precincts

The package of plans process should be used for the development of affordable housing on a large scale. This process will be discussed in more detail in the implementation section (Chapter 6). Due to the large size of the site (312 Ha of developable land), the site has been divided into precincts to better streamline the development process. The precinct divisions assist with allocating different phases of the development and the developers needed for each precinct. Subsequent developers will do precinct plans. The precincts will also assist with allocating developers and different institutions needed for social housing and affordable housing (Steenkamp & Winkler, 2014). There are 13 precincts in total. The precincts' divisions in Figure 5.12 are based on the road intersections, as well as the green open spaces that define the space.

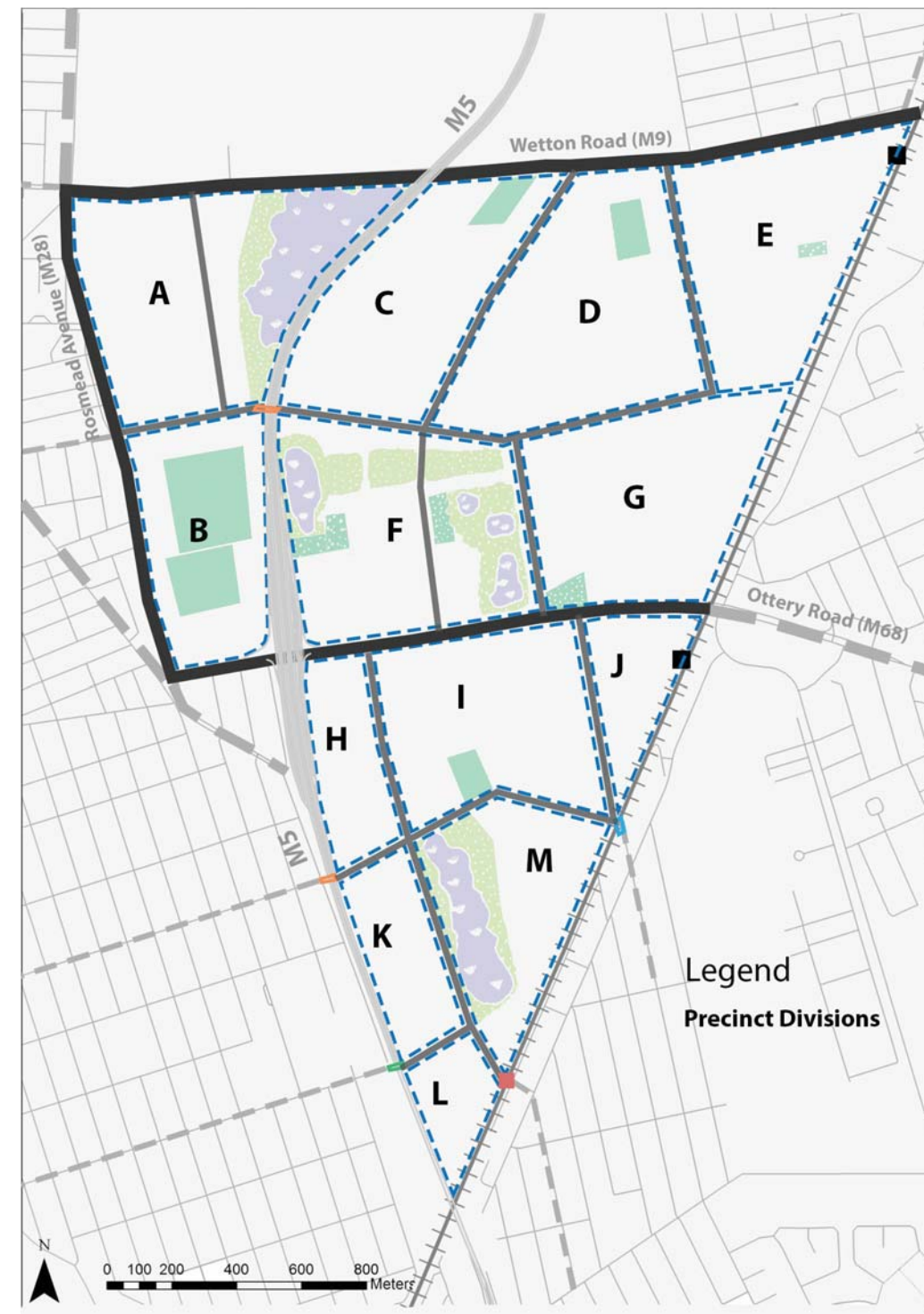


Figure 5.12 Precinct Divisions (Source: Author, 2017; CoCT, 2016)

5.5 Conclusion

This concept proposal plan illustrates the use of key planning concepts and precedent on the site. I have attempted to bridge the gap of a locked in site through main access routes into the surrounding areas but have ensured that the existing aspects of the site remain, and are incorporated meaningfully. The use of planning concepts explained in Chapter 4 has guided this proposal to enhance the place-making aspects of the site and to ensure that low-income households have good access to public facilities and retail opportunities. Appropriate densities and built form have been proposed to allow for a good living environment for end-users who have also been ensured access to effective functioning public transport, public facilities, and formal and informal economic opportunities.

Chapter 6: Implementation Framework

6.1 Introduction

This section outlines the implementation of the spatial development framework and affordable housing programme for the site. The package of plans approach has been used to facilitate the release of land to developers and interaction between the City and land developers. The first section illustrates the pre-conditions and processes that need to be addressed before the proposed development can proceed. The package of plans approach for the site and the necessary processes for development are then outlined. Following that, the precinct phasing is outlined and priority projects are listed. Zoning rights are then explained in relation to the general guidelines and the housing implementation framework is further explained.

6.2 Implementation Pre-Conditions

Certain processes and pre-conditions need to occur before implementation can begin. These processes should be convened by the City by allocating different stakeholders to subsequent items. The processes are listed below:

6.2.1 Land Consolidation/Acquisition

- The Housing Development Agency (HDA) must manage land acquisition. HDA is a national public entity and is tasked with the acquisition, management and release of state and privately-owned land for human settlement development. The land ownership of Youngsfield needs to be transferred from National government to the City of Cape Town through the HDA. The rezoning of land then needs to be approved by the City. The potential relocation of the Department of Defense (School of Logistics) activities to Wynberg Military base should be discussed with interested and affected parties.
- The Royal Golf Course has leased the land from the City therefore it does not need to be acquired. Wynberg St Johns sports field, Wynberg municipal dump and the rest of the land along Rosmead Avenue precinct is also City-owned and does not need to be acquired by the HDA.
- Consolidation of land must be approved by the City in terms of the By-Law. Rezoning of land is subject to section 35(2) of Land Use Planning Act (LUPA) and Chapter 7 of Municipal Planning By-Law. The City can rezone the land subject to determined conditions and declare it a Special Planning Area so that the package of plans can be initiated.

6.2.2 Regulatory Approval

- The regulatory approval follows the package of plans process, discussed in detail later on in section 6.3.
- Impact assessments must be prepared and approved by relevant environmental, heritage and social practitioners and the City.

6.2.3 Institutional Arrangements

- Stakeholder engagement with interested and affected parties must occur. The first stakeholders to be engaged should be interested and affected parties related to the site. These should include the School of Logistics managing board, interested parties from Wynberg St Johns, the Department of Social Development, and the management board of from Royal Cape Golf Club residential area as well as communities from surrounding neighbourhoods through their representative bodies.
- Engagement with new community members needs to occur pre and post-housing implementation. Such as efforts to support socio-economic development for low-income households and efforts to create social cohesion for new households coming from different places. The City needs to work closely with new and existing civic organisations from affected communities for relevant input.
- An inter-departmental task team within the City of Cape Town must be instated comprising of departments to be involved in site preparation as well as land developers such as social housing institutions.

6.2.4 Bulk services and infrastructure provision

- The preparation of land for infrastructure provision should first begin with the clearing of invasive vegetation. Working for Water and Working for Wetlands should be drawn in by the City to service the full site.
- Bulk services such as bulk water, electricity and wastewater sanitation for the overall site need to be provided by the City. However, reticulation systems and sewage networks need to be provided by subsequent developers subject to precinct plan approvals.

6.2.5 Strategy for land release (precinct division)

- After the allocation of precinct divisions, different actors (including social housing institutes) should take on projects based on the scale of specific precincts. Smaller companies should be included to allow for a diverse range of stakeholders involved in the development process and to include local businesses from surrounding areas to run smaller scale developments

6.3 Package of Plans Process

Due to the scale of this development, the package of plans approach will be used. Under the Chapter 14: General Provisions of the municipal planning by-laws, section 136, the general purpose of a package of plans is:

“To provide for a mechanism to plan and manage the development of a large strategic urban development area. It is a phased process of negotiation, planning and approvals, whereby increasing levels of planning detail are approved together with conditions of such approvals. Areas where package of plans approach is used are referred to as Special Planning Areas (SPA).” (CoCT Municipal Planning By-Law of 2015, 2015: Chap14, s136).

The package of plans (PoP) consists of components listed in a hierarchy from higher-order to lower-order plans (see Figure 6.1). Lower order plans need to be in compliance with higher-order plans. (CoCT Municipal Planning By-Law of 2015, 2015: Chap14, s136). As in Chapter 3, the site analysis (same level as the contextual framework) has identified the role of the site and is aligned with the Municipal SDF (CoCT, 2017a). Chapter 5, the higher order proposal plan (in the same role as development framework), has identified overall policy, broad goals, and principles for development. It has also spatialised the distribution of different land uses, major transport and pedestrian linkages and additional infrastructure including required gross du/ha density for the development. See Table 6.1:

Package of Plans Process

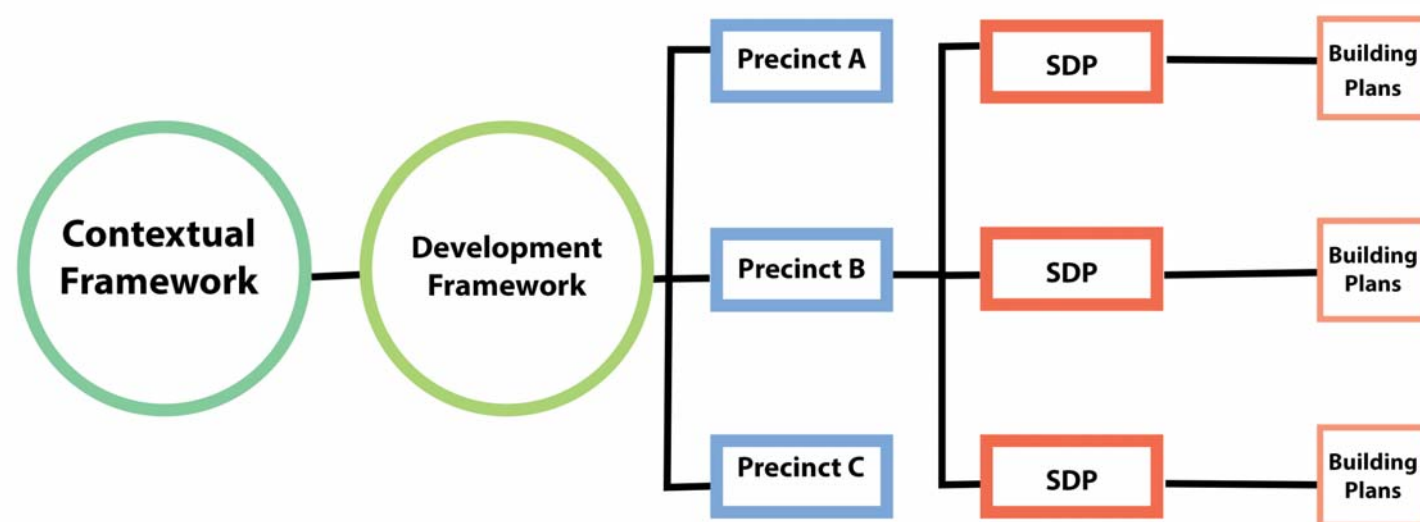


Figure 6.1 Package of Plans diagram (Source: Adapted from Steenkamp & Winkler, 2014)

Table 6.1 Package of Plans Explanation (Source: Adapted from CoCT Municipal Planning By-Law of 2015, 2015, Chap14, s136; Steenkamp & Winkler, 2014)

Plan Hierarchy	Relevant Policy Documents	Components	Role of Plan	Outcome
Contextual Framework	Municipal SDF	1. Policy Framework 2. Land use context for site	Provides link between relevant spatial planning and PoP mechanism. Ensures development of site is informed by overarching municipal SDF.	Provides the broader development context for the site. Includes relationship to surrounding urban and natural environment.
Development Framework	Municipal SDF and Policies	1. Development framework diagram 2. Spatial principles	Details land use and physical structure for development of site.	Total zoning rights (floor space and permitted uses) awarded by municipality
Precinct Plans	Development Framework	1. General distribution of zoning rights 2. Land use	Provides basis for municipality's approval of SDP's and allocation of zoning rights to specific rights.	Provides basic framework of services and movement to which development proposals must respond.
Site Development Plan	Relevant Approved Precinct Plan	Detailed plan	Provides link from precinct plan objectives and vision	Allocates positioning of buildings and structures, property access, building designs and landscaping.
Building Plans	Relevant Site development plans and subdivision plans	Detailed specifications as required by National Building Act	Provides foundation for construction of development	Authorises building work to begin

6.3.1 Precinct Implementation Framework

The implementation processes as per the Package of Plans process, and following the development framework done in Chapter 5, are listed below:

i) Precinct Plans

Subsequent developer's allocated precincts from A to M, will draw up precinct plans and respond to the development framework objectives and vision (concept plan) from Chapter 5. Developers must provide a basic framework of services and movement for site development plans (SDPs) to respond to with a detailed development proposal. The plan must contain the general distribution of zoning rights and detailed proposed land use intentions using principles for urban form, land use, pedestrian links, traffic movement, floor space and environmental management (CoCT Municipal Planning By-Law of 2015, Chap14, s136).

iii) Site Development Plans

Following the allocation of zoning rights for precincts, developers are expected to provide detailed plans for the subsequent precincts including development provisions for one or more land units within the development. These provisions may include: details relating to land use, floor space, buildings lines and others. A site development plan may be required before or after subdivision plans and should provide for the information as required in item 123(2). (CoCT Municipal By-Law of 2015, 2015: Chap14, s136, ss4(e))

iv) Buildings Plans

Building plans contain detailed specifications as required by the National Building Act and are drafted by subsequent developers, and once approved by the City, authorise building work to be performed. (CoCT, Municipal By-Law of 2015, 2015: Chap14, s136, ss4(f)). Relevant developers will submit subdivision plans to establish new cadastral boundaries for approval and to facilitate the transfer of land units. In addition to approving subdivision plans, the provisions of sub-item (6) applies, as "the City shall determine the total floor space or density permitted within the development" as a condition for approval (CoCT Municipal By-Law of 2015, 2015: Chap14, s136, ss6).

6.3.2 Precinct Phasing

The phasing below in Table 6.2 shows the priority infrastructure projects that need to be initiated first for each precinct shown in Figure 6.2: The precincts have been labelled in accordance with the phasing of execution, from A to M. Therefore, Precinct A is the first precinct to begin construction, as it is located along main access routes (level one and two routes), refer to Chapter 5.

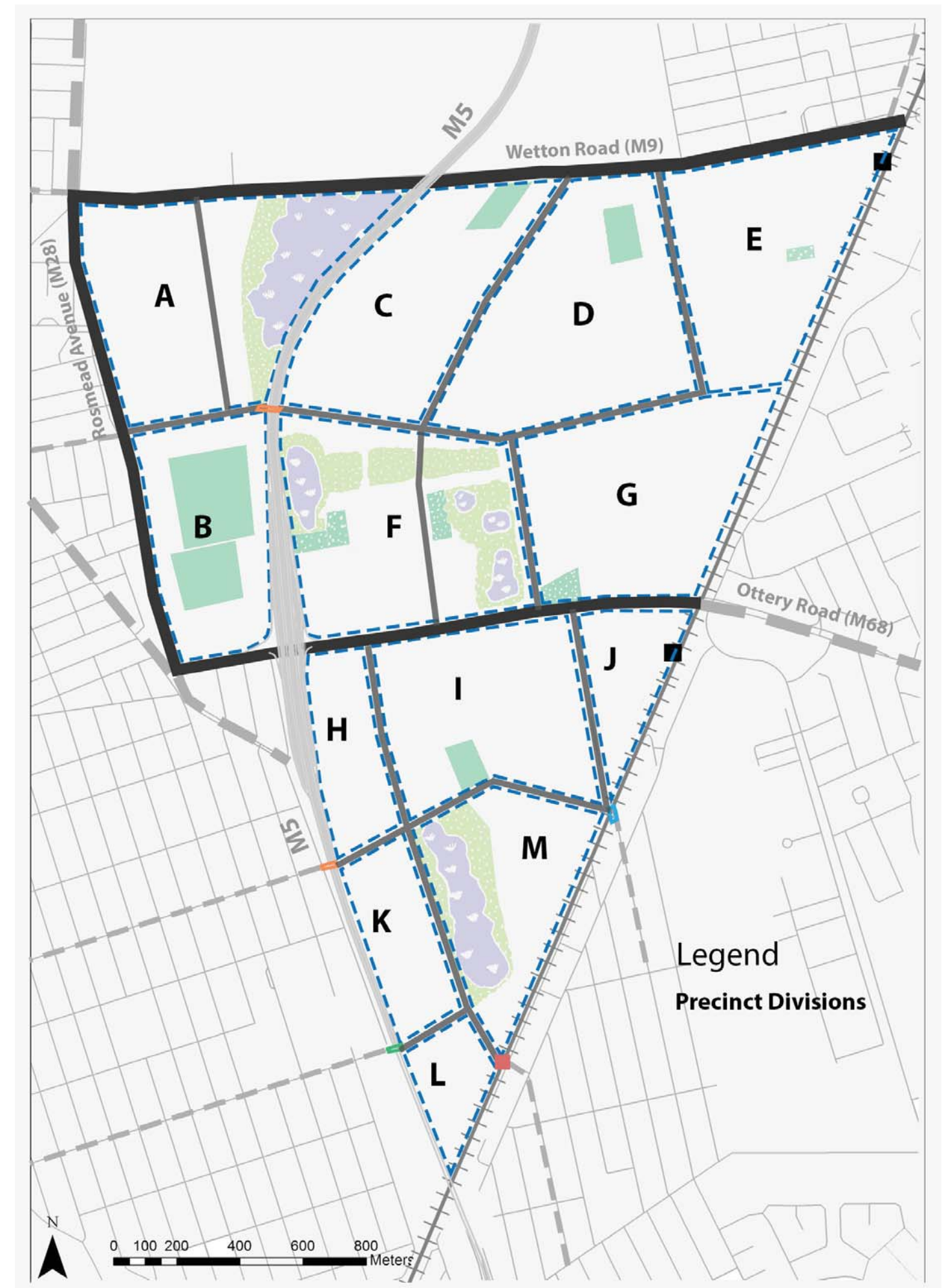


Figure 6.2 Precinct Divisions (Source: Author, 2017; CoCT GIS, 2016)

Table 6.2 Precinct Phasing (Source: Author, 2017)

Precinct	Priority Infrastructure	Timeframe	Government Spheres	Key Stakeholders	Funding
A	Construction of Level one and two routes	1 Year	National		
			Provincial	Department of Transport and Public Works (DTPW)	Western Cape Government
			Local	CoCT	
			Private/NGO	SMEC Professional Engineering and Development Consultants	
	Construction of vehicular bridge over M5	1 Year	National		
			Provincial	Department of Transport and Public Works (DTPW)	Western Cape Government (WCG)
			Local	CoCT	CoCT
			Private/NGO	SMEC Professional Engineering and Development Consultants	
	Rehabilitation of wetland areas	6 Months (management allocation for precinct)	National	Department of Agriculture, Forestry and Fisheries (DAFF)	DAFF
			Provincial	Department of Environmental Affairs and Development Planning (DEADP)	DEADP
			Local	CoCT	
			Private/NGO	Working for Water, Working for Wetlands, SANBI	SANBI
B	Construction of level one and two routes	1 Year	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	

	Construction of secondary and primary schools	2 Years	National		School Infrastructure Backlog Grant
			Provincial	Western Cape Education Department (WCED), DTPW	WCG
			Local	Relevant school associations community members	
			Private/NGO		
	Construction of Community Hospital	2 Years	National		
			Provincial	Department of Health (DoH), DTPW	DoH and DTPW
			Local		
			Private/NGO		
C	Construction of Level one and two routes	1 Year	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	
	Construction of primary School	1 Year	National		
			Provincial	WCED, DTPW	DTPW, WCED
			Local	Relevant school and civic associations	
			Private/NGO		
Construction of community hall	6 Months	National			
		Provincial			
		Local	Recreation and parks department, CoCT, new and existing civic associations	CoCT, Recreation and parks department	
		Private/NGO			

D	Construction of Level one and two routes	1 Year	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	
	Construction of Clinic along Wetton Road	1 Year	National		
			Provincial	DoH, DPTW	DoH, DPTW
			Local		
			Private/NGO		
	Construction of secondary school	1 Year	National		School Infrastructure Backlog Grant
			Provincial	WCED, DTPW	DTPW, WCED
			Local	Relevant school and civic associations	
			Private/NGO		
	Construction of Clinic on Level two route	1 Year	National		
			Provincial	DoH, DPTW	DoH, DPTW
			Local		
			Private/NGO		
E	Construction of level one and two routes	2 Years	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Upgrade of rail station	6 Months	National	Passenger Rail Agency of South Africa (PRASA)	PRASA
			Provincial		
			Local	Transport and Urban Development Authority (TDA)	TDA
			Private/NGO		

F	Construction of level one and two routes	2 Years	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Construction of primary school	1 Year	National		
			Provincial	WCED, DTPW	WCED, DTPW
			Local		
			Private/NGO		
	Rehabilitation of wetland areas	6 Months (management allocation for precinct)	National		Dep of Agri, Forestry & Fisheries (DAFF)
			Provincial		Dep of Env Affairs & Dev Planning (DEADP)
			Local		
			Private/NGO	Working for Water, Working for Wetlands, SANBI	
G	Construction of level one and two routes	2 Years	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Construction of branch library	1 Year	National		
			Provincial	DTPW	WCG
			Local		
			Private/NGO	Violence Prevention Through Urban Upgrading (VPUU)	International grants

H	Construction of level one and two routes	6 Months	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Construction of public library	6 Months	National		
			Provincial	DTPW	WCG
			Local		
			Private/NGO	VPUU	International grants
	Construction of Clinic	1 Year	National		
			Provincial	DoH, DTPW	WCG
			Local		
			Private/NGO		
I	Construction of level one and two routes	1 Year	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Construction of primary school along Ottery Road (M68)	1 Year	National		School Infrastructure Backlog Grant
			Provincial	WCED, DTPW	WCG
			Local		
			Private/NGO		
	Construction of primary and secondary school	2 Years	National		School Infrastructure Backlog Grant
			Provincial	WCED, DTPW	WCG
			Local		
			Private/NGO		

J	Construction of level one and two routes	2 Years	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	
	Upgrading of rail station	6 Months	National	Passenger Rail Agency of South Africa (PRASA)	Transport Grant
			Provincial		
			Local	Transport and Urban Development Authority (TDA)	CoCT
			Private/NGO		
K	Construction of level two routes	6 Months	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO		
	Construction of vehicular bridge over M5	1 Year	National		
			Provincial	DTPW	Western Cape Government
			Local	CoCT	
			Private/NGO	SMEC	
Construction of underpass	2 years	National			
		Provincial	DTPW	Western Cape Government	
		Local	TDA	CoCT	
		Private/NGO	SMEC		

L	Construction of level two routes	6 Months	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	
	Construction of new station	2 years	National	PRASA	Transport grant
			Provincial		
			Local	Metrorail	CoCT
			Private/NGO		
M	Construction of level two routes	6 Months	National		
			Provincial	DTPW	WCG
			Local	CoCT	CoCT
			Private/NGO	SMEC	
	Rehabilitation of wetland area	6 Months (continuous management on precinct level)	National		DAFF
			Provincial		DEADP
			Local	Interested civic associations	
			Private/NGO	Working for Water, Working for Wetlands, SANBI	

6.3.3 Package of Plans Objective

The main objective of package of plans is to establish the proper allocation of land for affordable housing to private developers as well as social housing institutes. It is used as a mechanism to engage partnerships with the City and developers to better streamline the management of development on a large scale.

6.4 Zoning Rights

Zoning rights, which allow for mixed use, are allocated to public space, commercial space and residential areas located along main access routes (level one and two routes). Individual sites are only allocated zoning rights at site development plan (SDP) level. The general zoning rights are given at the development framework level. This will specify the zoning rights of building footprints along level one and two routes, as well as public spaces (discussed in Chapter 5). The zoning rights below refer to Table A: Summary of the zonings and development rules (City of Cape Town, Municipal Planning By-Law of 2015, 2015: Chap14, item 20):

1. Level One and Two Routes
 - a. Land abutting level one and two routes have been zoned to Mixed-use subzonings (MU1 - MU3). Primary uses that apply to this land include: business premises, flats and place of entertainment. Existing residential areas fronting onto level one and two routes are also rezoned to assist with incremental change. This also enables new perimeter blocks to have ground floor commercial space.
2. Public Squares
 - a. Land around public hard open spaces has been zoned for Local Business Zoning 2: Local Business (LB2), which allows for primary uses of service trade. Other provisions (zoning parameters) allow for: canopy projection on street corners, parking and access, and informal trading.
3. Level Three Routes
 - a. Residential areas fronting onto level three routes have been zoned General Residential Subzoning GR2. The primary uses that apply to the land include dwelling house, flats, group housing and open space.

6.5 Housing Implementation Framework

This section outlines the implementation of affordable housing for the site. The vision for the site, discussed in Chapter 1, seeks to provide mixed-income, mixed-tenure affordable housing options. This will allow low-income households, who qualify for social housing rental subsidies and those who qualify for the Financially Linked Individual Subsidy Programme (FLISP), to live together in the same development. This should also take the approach of tenure-blind development, in which housing from different tenures will be indistinguishable from one another with regard to their external architectural design. It should also ensure that units from different tenures should be integrated rather than configured in clumps (Roberts, 2007: 187). Many low-income developments are visible due to poor quality architectural design and this should be avoided in this development. The tenure-blind approach, together with social housing design principles of robust, higher quality, external architecture of housing stock, allows for homogeneity of typologies. This will ensure that different typologies have the same high quality finishes and designs so that the status of rentals as lesser than owned or, higher and lower income typologies, will not be distinguishable, to create a more equal settlement. If the design and quality of the overall development is to a high standard, property prices are not necessarily affected (Williams, 2009).

The Inclusionary Housing Policy Framework and Social Housing Policy govern the implementation of affordable housing, in this case Social Rental Housing and affordable market and rental units. These policies stipulate the processes required to implement affordable housing through partnerships with the private sector. Strategic incentives will be used to encourage private sector involvement in the development of affordable housing. Using this legislation, a thorough housing implementation framework will demonstrate the procedures of affordable housing. The Transport and Urban Development Authority should authorise the provision of affordable housing projects. The New Market Development Department in the City implements and monitors human settlements projects, as well as develops, facilitates and maintains partnerships between the City and private sector developers for integrated housing delivery. These two authorities should manage and facilitate the overall implementation process.

6.5.1 Potential Model

Each precinct should include a mix of social housing rental units, inclusionary housing subsidised units and middle/high income open market units (shown below) that can be used as a cross-subsidisation mechanism in certain precincts. Open market housing must cater for 30% of units reserved for affordable housing. Each precinct must secure some commercial uses to cover return costs and potential cross-subsidisation. The proposed development should ensure that the full range of income brackets are accommodated in the development and not only target the higher income groups of each housing category bracket. Individual government subsidies will facilitate the development of certain housing categories. In addition, associated government grants involved in the costing of development of precincts are also listed below. Precinct A should include transitional housing on site and accommodate 50 units with shared communal facilities. This must be managed by an SHI and takes the role as short term alternative accommodation for relocated households from the local informal settlement on Precinct A (refer to Chapter 3). First time buyers will be prioritised for ownership and open market categories. This includes Land Restitution Programme claimants who qualify for the subsidy. Social housing beneficiaries

will be coordinated through the housing database by subsequent SHIs. Spatial principles need to be applied in the development of affordable housing to create a settlement of opportunity and vibrancy (refer to Chapter 4 and 5).

6.5.2 Affordable Housing Intervention Categories

Table 6.3 and 6.4 below set out the affordable housing categories and provides explanations of relevant policy and the stakeholders involved:

Table 6.3 Affordable Housing Intervention Categories (Source: Author, 2017)

Intervention Category	Definition	National Housing Subsidy	Description
Open market	Gap Housing	FLISP	The subsidy acts as a top-up loan for qualifiers. The subsidy amount varies between R20 000 and R87 000. Residential property may not exceed R300 000.
Cross subsidy Open Market	High income open market units cross-subsidise a percentage of affordable housing units	Cross subsidy	Open market development must secure 30% units for affordable housing.
Social	Social Housing	Social Housing	Subsidised rental units
Mixed-housing development	Inclusionary Housing	Units cost covered by developers	Incentive-linked approach for open market rental and ownership units.

Table 6.4 Housing Subsidy Explanation (Source: Author, 2017)

Housing	National Housing Programmes	National Subsidy Mechanisms	Relevant Policy/Legislation	Partnerships	Household monthly income	Funding	Unit Cost
Social Housing	Social Housing Programme	Social Housing	Social Housing Policy	SHRA, Communicare, Cape Town Community Housing Company (CTCHC)	R3 501 - R15 000	Restructuring Capital Grant (70 % of capital costs) Rentals (30% of capital and management costs)	R265 000 per unit
Gap Housing	Integrated Residential Development Programme	FLISP	Inclusionary Housing Policy	NHFC, Provincial Human Settlements, Developers	R3 501 - R15 000	Urban Settlements Development Grant	Up to R300 000
Inclusionary Housing	Inclusionary	Development funded by NHFC, not individual subsidy	Inclusionary Housing Policy	NHFC	R3 501 - R18 000	Private developers and NHFC	Range between R106 000 up to R550 000 ⁷
Cross-subsidised affordable units	Private sector involvement	Costs covered by developers	Mandatory Inclusionary Housing Policy	Public-private partnership	R3 501 - R18 000	Developers with incentives	Should not exceed R550 000 for affordable unit

⁷ Home loan calculated using FNB Affordability calculator (<https://www.fnb.co.za/calculators/homeloan/Affordability.html>).

6.6 Implementation Model Guidelines

6.6.1 Social Housing

Social housing must be four-storey walk up apartments within a perimeter block built form. Private developers can work alongside subsequent SHIs, who will manage the housing stock. The overall development will be authorised by the SHRA in order to access public funds, and the restructuring capital grant for construction costs. Households who qualify for the social housing subsidy are listed on the housing database. Developers should move through the SHIs to coordinate the database and allocation of households. All developments need to secure ground floor commercial tenants to cover return costs for the future.

6.6.2 Gap Housing

Gap housing must be three to four storey walk-ups within the perimeter block built form. Options of rental and ownership should be available. Costing of full development is covered by national government through NHFC, and developers must work alongside this institution. The individual subsidy is covered by FLISP and must be coordinated through the New Market Department who act as implementation agents on behalf of Western Cape Human Settlements Department. Top structures are funded by the Urban Settlements Development Grant (USDG). Housing allocation must be done through the City of Cape Town housing database and developers should coordinate through the New Market Department.

6.6.3 Inclusionary Housing Initiative

This inclusionary housing category focuses on private developer involvement in order to cover development costs. This is in exchange for enhanced rezoning or subdivision approvals for developers. These units must cater for ownership and rental. Developers can enter into a partnership with an accredited SHI. These units need to have a good spread of the income bracket and not only cater for the higher income.

The inclusionary housing policy has a mandatory approach that will be used for the implementation of the inclusionary housing category for the site. The Town Planning Compliant (TPC) approach is mainly incentive-linked so that it can entice private sector involvement in affordable housing provision. The following incentives will be offered for proposed development approvals in order to streamline affordable housing objectives (NDoHS, 2007; Tissington, 2011; TDA, 2017):

- Developers can opt to receive increased floor area based on the amount of affordable housing they provide, up to a limit.
- Public investment in bulk and connector infrastructure
- Density bonuses and the allowance of multi-storey units and use rights
- Fast tracking of approval processes

6.6.4 Cross-subsidy Open Market Units

Open market units can cater for middle to high income households and must comply with securing 30% of the units for affordable housing (Gap Housing Group). Private developers will be awarded specific incentives for complying with these specifications. This category is governed by the Inclusionary Housing Policy (IHP) and follows the mandatory TPC approach. The same incentives listed in section 6.6.3 will be provided.

6.6.5 Location of Affordable Housing Categories

The location of housing developments is essential for good access to public transport stops and amenity areas, shown in Table 6.5:

Table 6.5 Location of affordable housing categories (Source: Author, 2017)

Housing Category	Location	Total Units	Net Residential Density and Built Form
Social Housing	Fronting on level one and two routes. Ground floor commercial tenants	10 920 units	- 70 du/ha - Four storey walk-ups - Perimeter Blocks
Gap Housing	Behind social housing buildings and along level one and two routes	5 616 units	- 60 du/ha - Three to four storey walk-ups - Perimeter Blocks
Inclusionary Housing	Behind gap housing along level three routes	1 240 units	- 40 du/ha - Two storey - Row Housing
Affordable Open-market	Along level three routes	1240 units	- 40 du/ha - Two storey - Row Housing

6.7 Conclusion

The implementation framework has illustrated the different processes and objectives that need to be achieved through properly coordinated partnerships. The package of plans approach set out the requirements, for developers and other stakeholders, for development to occur. The housing implementation framework illustrated the different categories and guidelines for developers to abide by in order to provide affordable housing opportunities. The importance of complying with this framework is that it ensures that provision is executed efficiently and effectively and that proper design principles are applied to create a quality urban environment.

Chapter 7: Conclusion

This dissertation provides an approach to address the provision of affordable housing in well-located areas for low-income households. It therefore addresses the spatial disconnection challenging low-income groups when accessing economic opportunities from their residential areas, which are located on the outskirts of the city. The site comprises the underutilised state-owned land of Youngsfield and the City-leased land of the Royal Cape Golf Course. Both are located in the southern Peninsula area of the Cape Town Metropolitan Area. Using the package of plans approach as the method of affordable housing implementation should allow for better facilitation and guidelines for developers.

The spatial analysis set out the major issues faced by low-income households and grounded the good location of Youngsfield in relation to its proximity to work and public facilities. The site analysis (contextual framework) identified the developable land and reiterated its alignment with the objectives of the draft Municipal Spatial Development Framework. The concept plan, that played the role of a development framework in the package of plans approach, aligned with the spatial principles outlined in Chapter 4. These principles promoted high-density, mixed-use and tenure-blind urban environments. It was followed in the next chapter by addressing affordable housing provision with careful attention to creating a quality urban environment that facilitates economic opportunities. It also locates people close to public facilities and public transport routes, which is essential for low-income households who spend a disproportionate amount of their income on transport costs (refer to Chapter 3). This quality urban environment also enables better access to work and public facilities. These interventions also contribute to a citywide goal of spatial integration of settlements. It will enhance economic efficiency due to better access to employment areas, reduce the costs low-income households incur through commuting, and enable social development within settlements (Turok, 2001: 2354).

The crucial aim of this dissertation was to promote a high-density mixed-use model of affordable housing implementation. The functioning settlement that would be created should enable social development, informal and formal economic development and quality urban spaces which would improve the quality of life of low-income households. This is an element missing from existing housing implementation, where provision focuses more on quantity instead of quality and does not consider the development of sustainable human settlements (Tomlinson, 2006).

The affordable housing interventions are crucial in addressing the provision of subsidised and open market affordable housing. The use of relevant housing policies demonstrates that appropriate implementation of inclusionary housing mechanisms can facilitate less challenging provision. This is of course dependent on proper management and monitoring from the City and participating housing institutions. Proper partnerships with relevant stakeholders can ensure quicker provision of housing, especially if guidelines are firm and developers abide accordingly.

The important role of acquiring land in well-located areas has many benefits for low-income households. This is a crucial aspect in affordable housing provision, as low-income households will benefit due to increased access to opportunity areas. The city will also see greater social and economic integration

and socio-spatial justice will be promoted. The use of well-located land challenges the status quo of current land distribution patterns of affordable housing implementation in a different format of high-density mixed-use settlement.

Further research or action is needed due to the use of the package of plans process and also the scale of research. More research needs to go into securing funding for affordable housing implementation from national government. The possibility and feasibility of international private sector partnerships should also be researched. The role of the concept plan was to identify the relevant precincts and not to have a detailed precinct plan. This task is left for further planning phases and implementers. The spatial principles and guidelines, which local precinct developers should follow, are set out in preceding chapters.

A significant limitation of the housing system is the lack of control over which households are selected for these affordable housing developments. This needs to be investigated further. The legacy of apartheid planning has left many people of colour, who still make up the majority within the low-income bracket, without access to urban land market. The housing waiting list will continue to be the only avenue to accessing subsidised housing; therefore, the implementation of inclusionary housing with open market models could be a way of opening up opportunities for low-income households to access the urban land market. This system definitely needs further research for better outcomes and implementation.

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APPLICATION FORM

Please Note:

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

APPLICANT'S DETAILS		
Name of principal researcher, student or external applicant	Megan Parker	
Department	City & Regional Planning	
Preferred email address of applicant	PRKMEG003@myuct.ac.za	
If a Student	Your Degree e.g., MSc, PhD, etc.,	MCRP
	Name of Supervisor (if supervised)	Vanessa Watson
If this is a research contract, indicate the source of funding/sponsorship	Click here to enter text.	
Project Title	Role of Youngfield in addressing the housing crisis in the greater Cape Town metropolitan	

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

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

SIGNED BY	Full name	Signature	Date
Principal Researcher/ Student/External applicant	Megan Parker	Signed	23/06/2017

APPLICATION APPROVED BY	Full name	Signature	Date
Supervisor (where applicable)	Vanessa Watson	Signed	23 Jun 2017
HOD (or delegated nominee) Final authority for all applicants who have answered NO to all questions in Section 1, and for all Undergraduate research (Including Honours)	JAIN LOW Click here to enter text.	Signed	23/06/2017 Click here to enter text.
Chair : Faculty EIR	Click here to		Click

Committee For applicants other than undergraduate students who have answered YES to any of the above questions.	ENTER TEXT. G. SITHOLE	A. Signed	here to enter a date. 14/08/2017
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