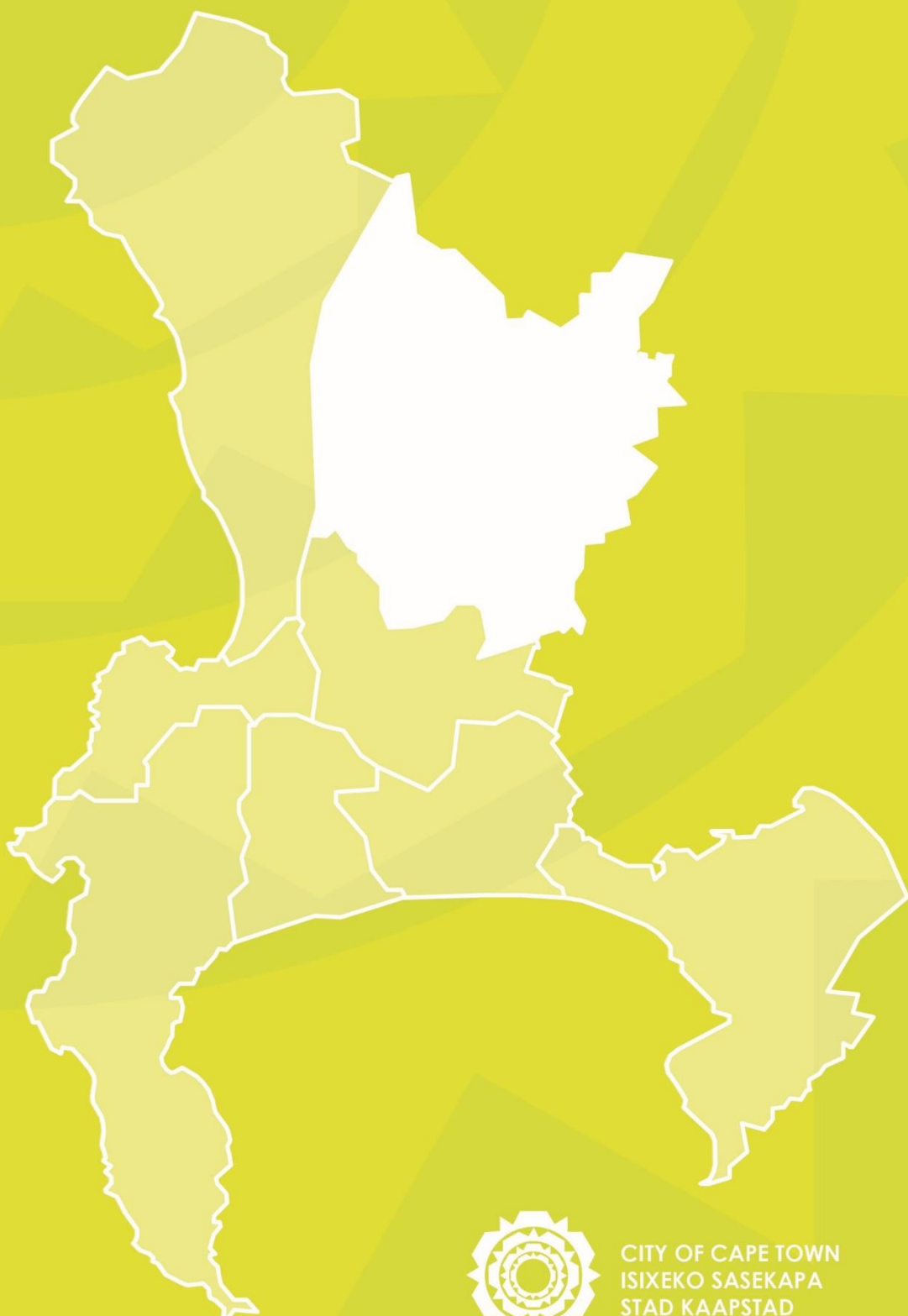


NORTHERN DISTRICT PLAN

Integrated district spatial development framework
and environmental management framework

APPROVED - Vol. 1: Baseline & Analysis Report



JANUARY
2023



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

NORTHERN DISTRICT SDF

BASELINE AND ANALYSIS REPORT

FINAL

Approved by Council 26 January 2023



CITY OF CAPE TOWN
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1 INTRODUCTION

This District SDF is a review of the 2012 District Spatial Plan (DSP) and provides up to date spatial planning guidance for one (1) of eight (8) planning Districts in the City. This process follows the City's commitment to review the District Plans periodically on a ten (10) year basis or when a need arises due to, inter alia, changing trends in the natural environment, built environment, population trends/composition and/or in the legislative environment.

1.1 Structure of the District SDF Suite of Documents

At this stage the SDF suite of documents and the respective main subordinate categories are illustrated in the diagram below.

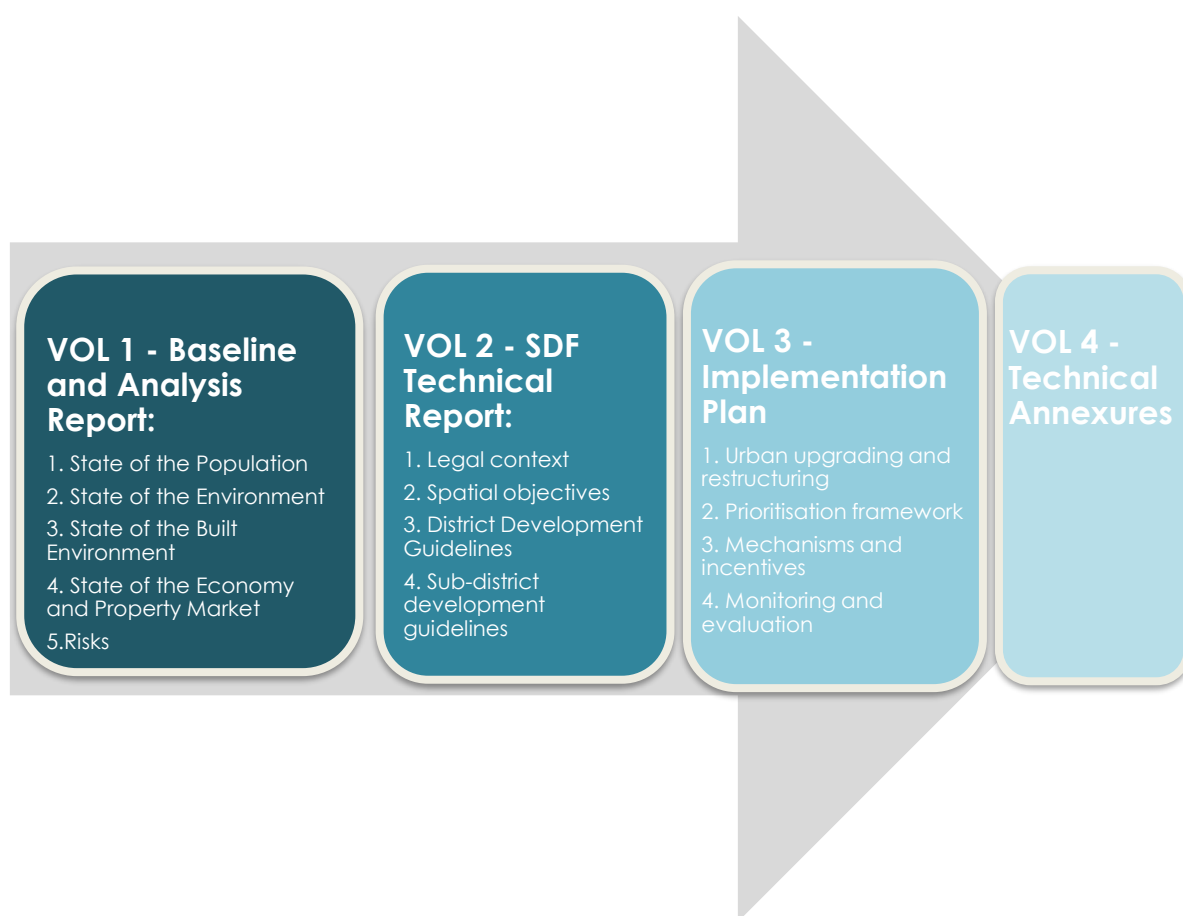


Figure 1: Structure of the DSDF

1.2 Baseline and Analysis Report

The purpose of the Baseline and Analysis Report (BaAR) is to identify the development parameters that will inform the spatial development framework intended to manage the future growth of the Districts in a manner that is sustainable, resilient, equitable and contextually appropriate.

The formulation of the baseline and analysis report uses a spatial layering approach to extract the **constraints** and **opportunities** for the respective structuring elements under investigation in each district. This is required to identify appropriate spatial interventions to **mitigate** against constraints and **enhance** opportunities in order to build integrated and resilient communities. The intent is to enable environments that support the natural, social, physical, and economic integration of people into the existing urban fabric and establish quality living environments for all – refer to Figure 2 below.

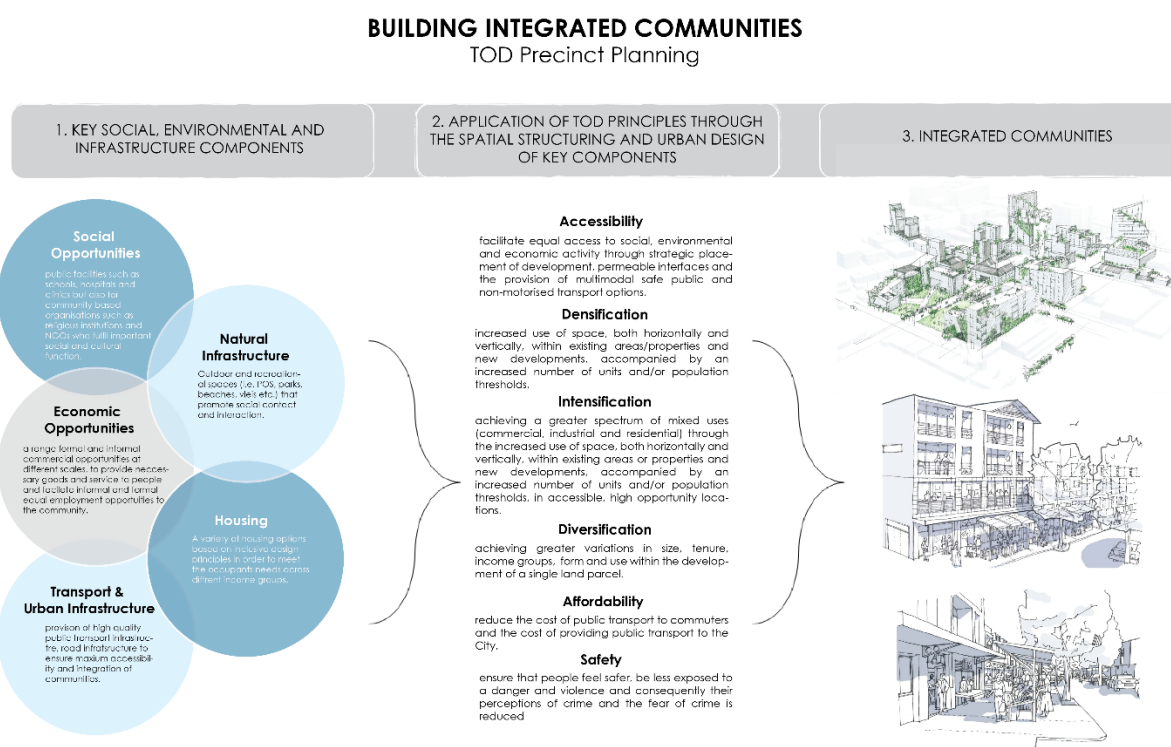


Figure 2: Building integrated communities

The narratives for the respective layers in the baseline and analysis report have been structured using the following approach, by answering the three main questions below:

1. **What is there and what are the trends?** This entails a brief description of the status quo, showing the trends since 2012, i.e. projects built, pressures, constraints and the opportunities;
2. **What does this mean and what are the implications?** This entails an indication of the implications of the above constraints or opportunities for spatial planning (District

SDF), i.e. where are is available, physical space and where is more needed. Where are land use guidelines or policies, or interventions, e.g. physical projects, needed;

3. **How is this linked to other elements/layers?** This is the synthesis, that has not been completed, but explores the interrelationship between the constraints and the opportunities as they relate to the various layers analysed as they all work together to form the basis for plan making, using an analysis informs plan making approach.

1.3 The Structure of the Baseline and Analysis Report

As explained above, under Paragraph 1.8, the Baseline and Analysis Report is divided into the following main sections that aim to respond to at least the following questions for the respective sections:

1.3.1 State of the Population:

- a. What is the current socio-economic profile of the population?
- b. What is current and forecasted growth of the population per district? This is required to identify the projected impact of future growth on the natural and urban environment, and how best to plan for said growth.

1.3.2 State of the Environment:

- a. This will serve as the baseline for the EMF for the District;
- b. Are there areas of ecological and environmental significance which must be conserved/protected from urban development, and where are they located?
- c. Are there areas of cultural significance which must be conserved and protected from inappropriate development which negatively impacts the heritage qualities and value of the area, and where are they located (i.e. the HPOZ and proposed HPOZ)?
- d. What are the bio-physical features of the district that may inform/ influence the form of future development (i.e. rivers, wetland, topography etc.)?
- e. Which areas require appropriate development guidelines in relation to interfaces with the natural environment in order to mitigate negative impact?
- f. Which areas are appropriate for environmental and heritage exemptions or designations (in terms of NEMA and NHRA)?

1.3.3 State of the Built Environment:

- a. What and where are the current development trends and pressures in the district?
- b. What is the current state of supply and demand for transport and urban infrastructure, social and recreational facilities and housing to enable more integrated and resilient communities?
- c. What areas currently have capacity for intensification of land use and which areas require upgrades to the current transport, social, recreational, urban infrastructure to enable further intensification of land use?

- d. What is the current state of transport accessibility and mobility in each district of the city (internally and externally)? This will help identify areas appropriate for intensification (densification and diversification).
- e. What is the extent of underutilised and/or vacant land in the district?

1.3.4 State of the Economy and Property market:

- a. What is the state of employment/unemployment?
- b. What are the best-performing industries, that offer competitive advantages?
- c. What are the best-performing property markets in the district and which areas offer the most property market potential?

1.3.5 Risk and resilience:

- a. What are the risks to the future sustainability of the City and its citizens?
- b. What and where are the setback or proximity parameters that may impact on future development?
- c. How can spatial development promote social inclusion, physical connectivity and equitable travel to optimise carbon emission reductions?
- d. What is the level of vulnerability and resilience of current areas in the district?

1.4 Key informants and limitations of the Baseline and Analysis Report

Whilst every attempt has been and will be made to ensure the information in the BaAR document is accurate it cannot be guaranteed that it is up to date at all times. This is because the information is subject to the availability of information, the time period for when it is available and valid and the credibility of the source. Given the aforementioned and the fact that the District SDF and its implementation period is only for ten years the approach has not been to ensure that every statistic is 100% accurate and undeniably the most recent. However, the authors have opted to rather use the general trends relating to the statistics and not the absolute numbers and will draw the main issues and opportunities for the formulation of proposals and guidelines.

A: STATE OF THE POPULATION

2 DEMOGRAPHICS

2.1 Overview

The population in the Northern District almost doubled between 2001 and 2011, with an annual population growth rate around 4.10%. Remarkably, despite this rapid increase the unemployment rate remained relatively constant.

The household growth rate in the district was slightly faster than the population growth rate, which indicates a slight trend in the district of decreasing household sizes. While we can expect demand from households splitting into smaller units, not only from increasing populations, this is not a strong force in comparison to the rest of the City.

Overall, more than 80% of the population in the Northern District live in formal housing, while less than 15% live in informal housing, including stand alone and back yard shacks. Areas of informality are clustered mainly in Klipheuwel, Fisantekraal, Bloekompos and Wallacedene. These areas, also among those which have relatively lower average household incomes in the district, make them more vulnerable to stresses and shocks.

At 0.57, the Northern District has a slightly lower Gini-coefficient than the Cape Town average of 0.62 and the national average of 0.63. However, South Africa has one of the highest levels of income inequality as indicated by its Gini-Coefficient, in the world. Thus despite being below the local average this is still a key issue in the district.

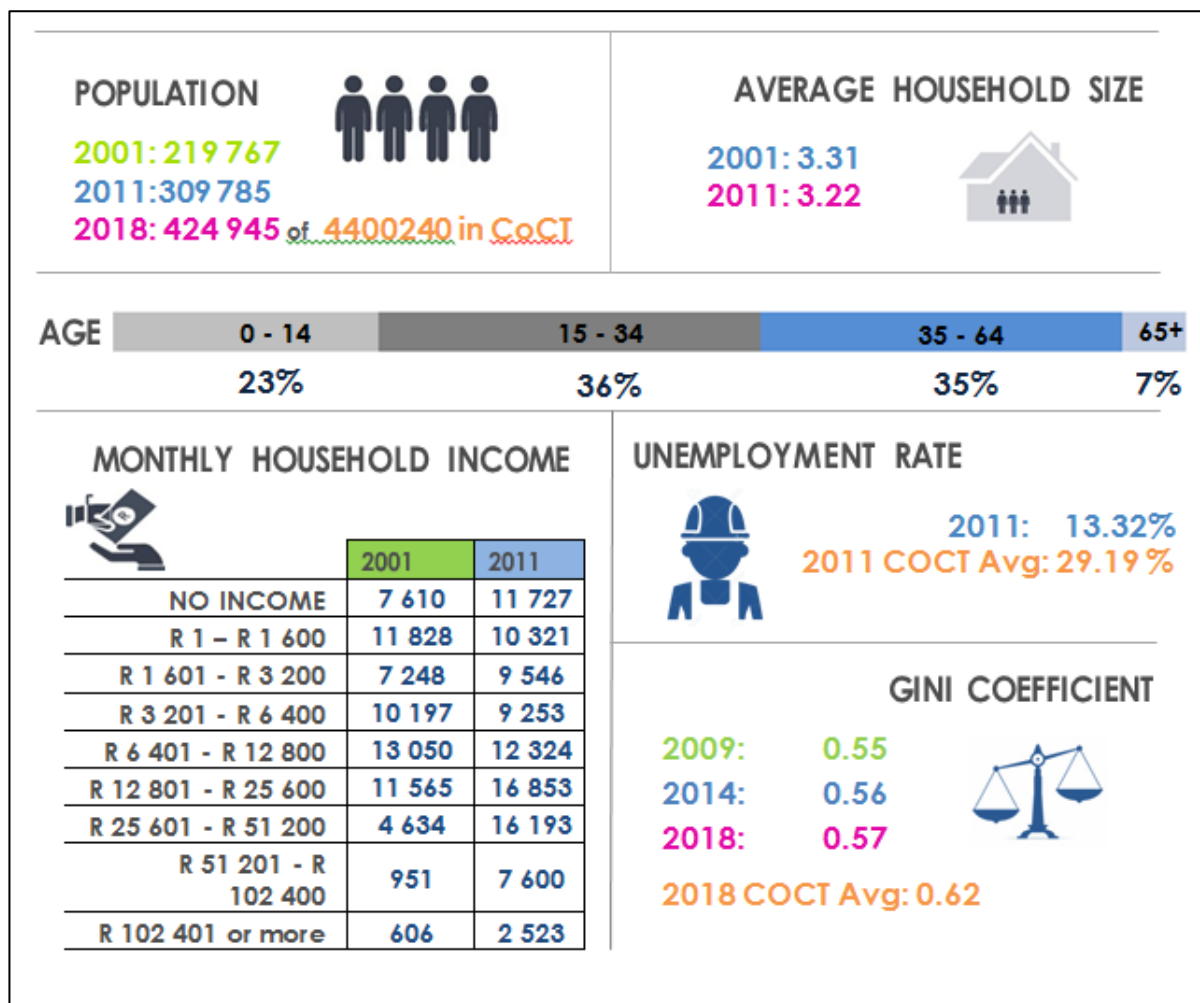


Figure 3: Population statistics of the Northern District

2.2 Population

2.2.1 Growth

The population of the Northern District was estimated to be 424 945 at the end of 2018. The district is the fifth least populous district in the City although its percentage share of the total population has increased since 2011.

The districts population has seen a high average annual growth rate of 4.10 % between 2001 and 2011. This trend may be attributed to the development of areas such as Wallacedene and Bloekombos (See Table 1 below). The district experienced a higher average growth rate compared to the citywide average of 2.93 % between 2001 and 2011 and between 2011 and 2016 the metro average of 2.52 %. This trend is illustrated in Figure 4 below and could indicate the extend of not only lower income infill developments, but also other market driven developments in the area.

Table 1: Population Figures for the Northern District

District	2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2018	2018
Northern	219 767	4.10%	309 785	5.31%	424945
METRO	2 893 399	2.93%	3 740 026	2.52%	4400240

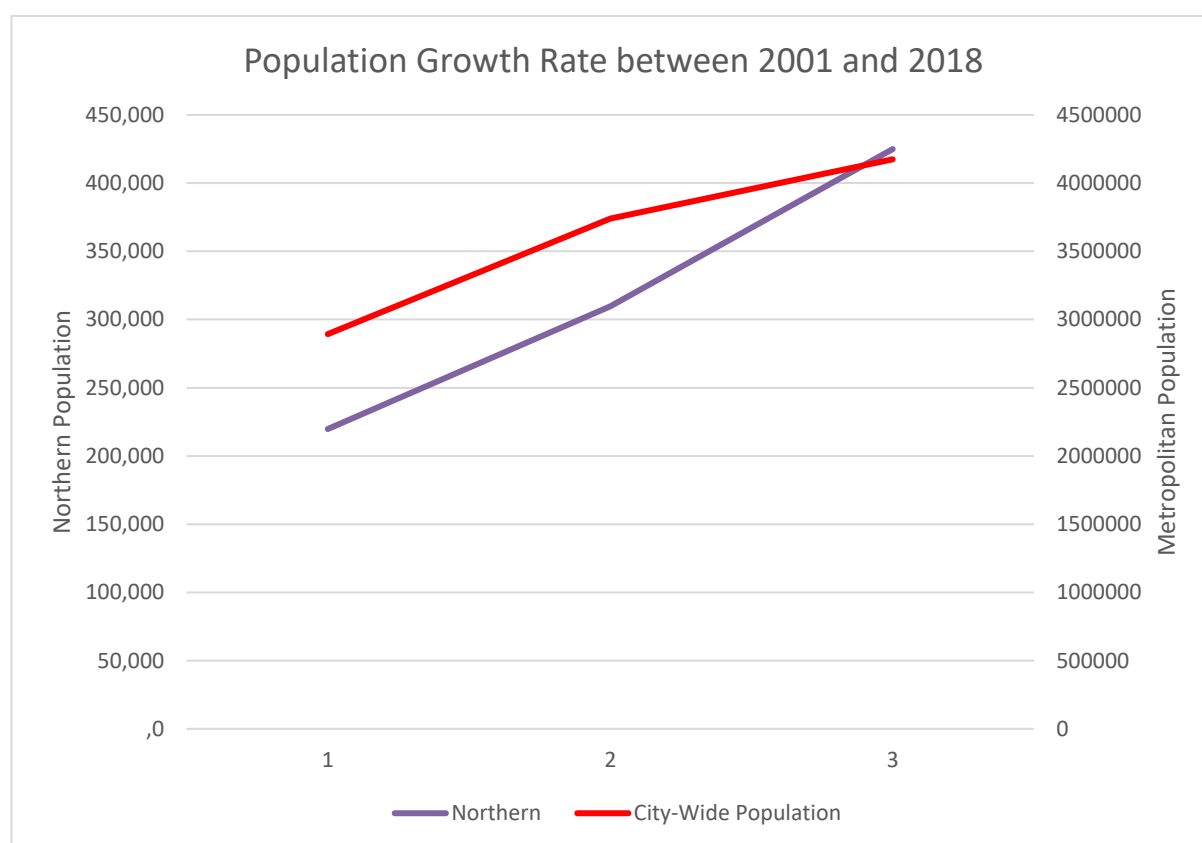


Figure 4: Graph showing change in Population Growth Rates

2.2.2 Spatial Distribution

Within the Northern Districts urban footprint, the population is more clustered in the south-eastern portion (south of the N1 freeway) of the district and in the south of Voortrekker Road in suburbs such as Bloekombos, Wallacedene and Scottsdene where larger infill development has occurred and further development is in the pipeline, i.e. Maroela north and south projects. In newer residential developments such as Kleinbron and Sonstraal Heights. A higher density is also evident in Morningstar in Durbanville.

Slightly lower concentrations of people are to be found in areas such as Eikendal, Belmont Park, Northpine, located mostly south of Old Paarl Road. Areas such as Brackenfell South

& Sonkring represent similar densities (mostly group housing) and is located more to the west. Another high density area with a higher concentration of people is found in Fisantekraal, however, Fisantekraal is located the furthest away from employment opportunities.

The older suburbs in Bellville, such as the Welgemoed area, and older suburbs of Durbanville, represent the lower population clustering. See Figure 7: Population Distribution 2018 (projection from 2011 census) below. The lower density area, and lower concentrations of people are found in areas such as Vredeloof, Brackenfell and areas such as Vierlanden, Sonstraal, Valmary Park, Vygeboom, all located to the north of the N1, with the lowest concentrations to be found closer to the agricultural hinterland, that include areas such as Welgemoed, Van Riebeeckshof, Protea Valley, Graanendal and Clara- Anna Fontein.

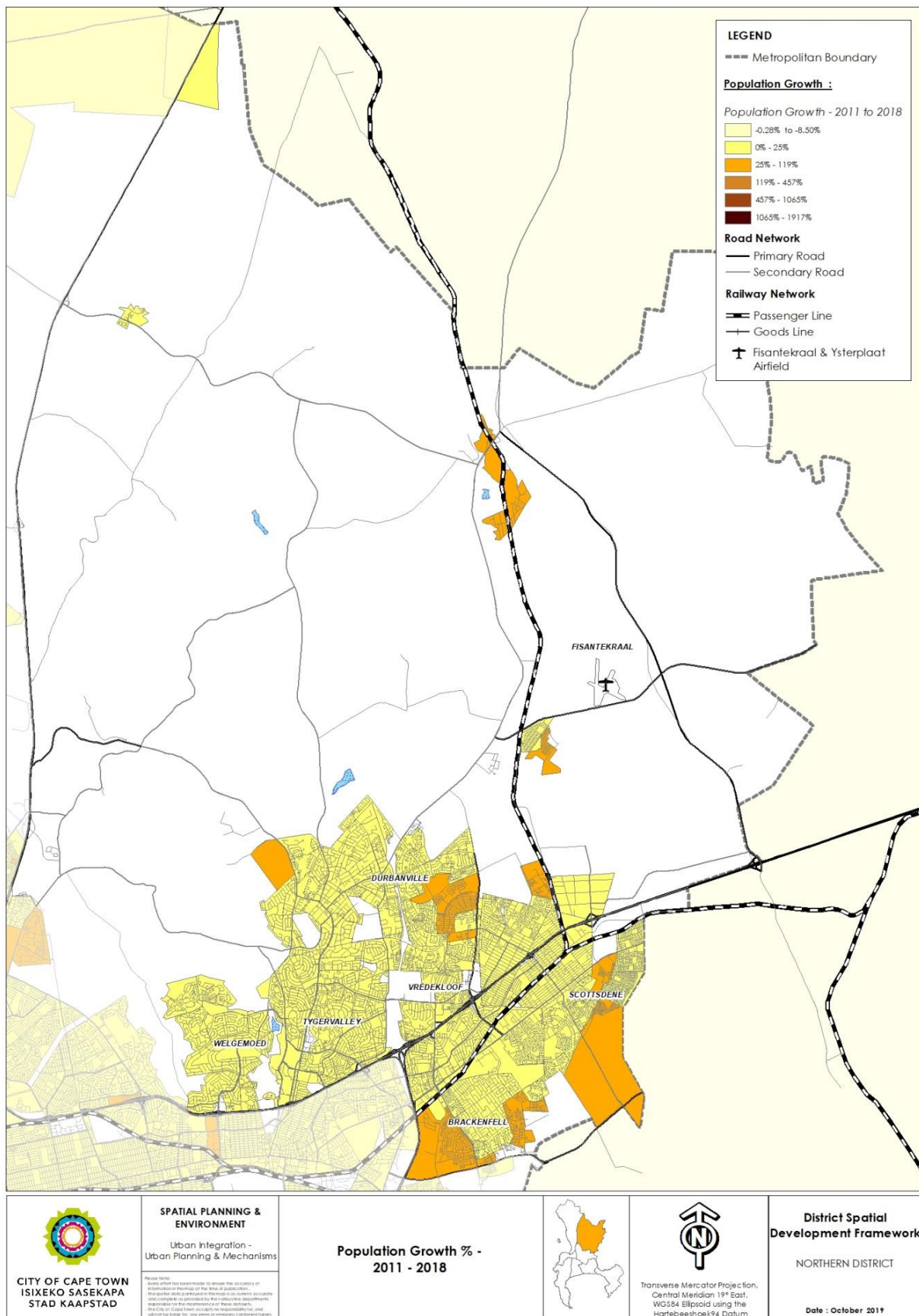


Figure 5: Map showing Population Growth by sub-place in the Northern District between 2011 and 2018

Population growth within the urban footprint (ignore the rural hinterland) of the district has, to a large extent been uniform.

However, areas showing a higher increase in population (per subplace) are, inter alia Fisantekraal, Buh-rein, portions of Graanendal, Pinehurst, Wallacedene & Scottsdene and portions of Protea Heights in Brackenfell.

The area within the urban footprint (ignore the rural hinterland on map showing population density) with the highest gross population density per ha (per subplace) is Bloekompos, followed by Wallacedene. The older established areas such as Welgemoed, Vygeboom and Kenridge have the lowest densities. (See Map in Figure 6: Gross Population Density).

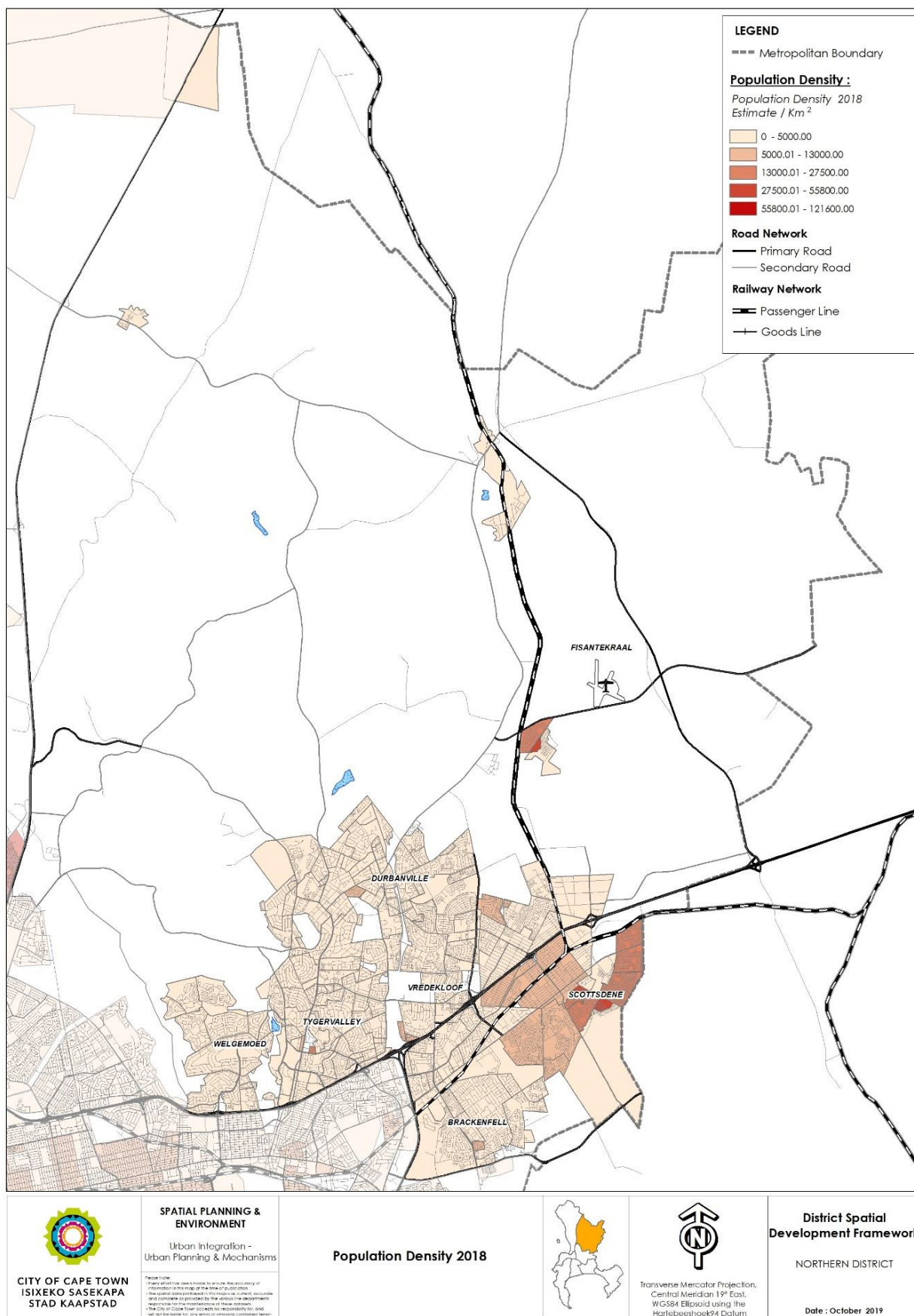


Figure 6: Gross Population Density by sub-place in The Northern District

*Gross population density is calculated per Census subplace area. It is calculated as the number of people per square kilometre within a subplace.

Note on Population and Household Estimates:

The estimated dwelling units and population by census sub-place to 2018 should serve as a reasonable estimate only. Assumptions regarding fertility, mortality, migration and the prevalence patterns and future spread of HIV and AIDS were not made. Population and household data from multiple sources is used, including Census 2011, Aerial Photography Counts 2011 and Solid Waste Door and Roof Counts 2017. While ever effort has been made to ensure duplication does not occur, these sources have different categories and use a variety of methods to obtain these counts. These figures are illustrative of broad trends only. Second and third Dwellings (Formal) are included in the formal estimates. Informal Backyard dwellings are only partially accounted for.

2.2.3 Population Structure

An overview of the population structure of the Northern District is provided in the Table below:

Table 2: Age Distribution of Population in Table (Census 2011)

	0 - 14		15 - 34		35 - 64		65 +		Depen- dency Ratio
	Num- ber	%	Number	%	Number	%	Number	%	
Northern	70 608	22.79	111 237	35.91%	107 742	34.78	20 205	6.52	41.47
City of Cape Town Metro Average	928 302	24.82	1414 230	37.81	1189 971	31.82	207 474	5.55	42.90

2.2.3.1 Age Distribution

The population pyramid for the district is shown in Figure 7 below, to highlight the structure of the population.

As seen in the Figure 7, a high percentage of the population in the Northern District falls within the age categories between 20 and 39 years, defining Northern to have a youthful population.

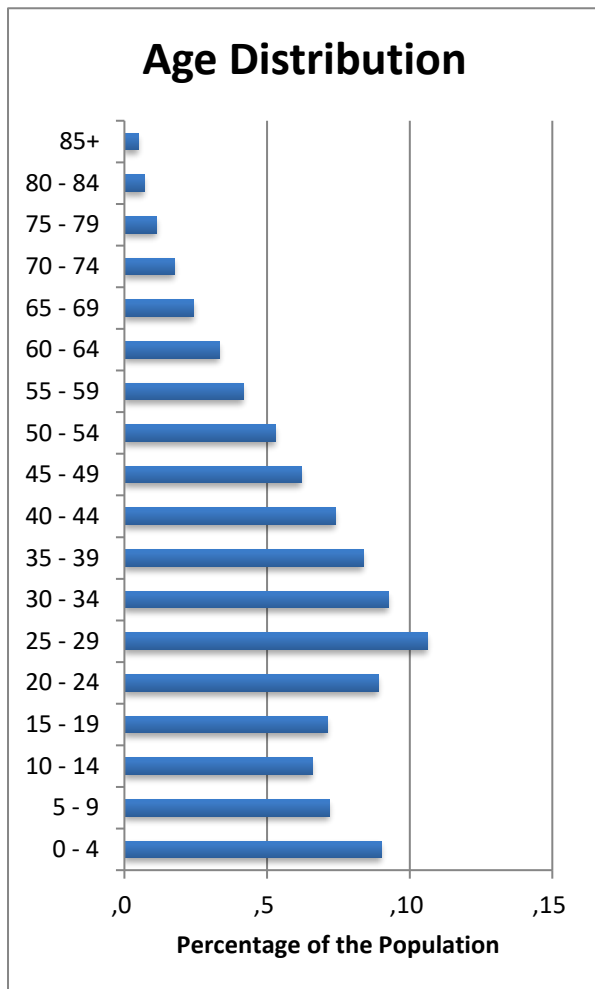


Figure 7: Population Pyramid for the Northern District (Census 2011)

When comparing the District to the Metro Average in Table above, Northern District has a very similar age distribution to the City of Cape Town as a whole.

The dependency ratio (a measure of the number of people in the potential labour force in relation to those in the “dependent groups,” that consists of the youth and aged) for the Northern District is at 41.47%.

In comparison to the Metro average, this value is lower as shown in the Table above. Furthermore, Northern District has the third lowest Dependency Ratio in comparison to all other Districts of Cape Town.

Between 2001 and 2011, the Northern District saw an increase in the percentage of the population in the labour force age category (15 – 64), while the percentage of youth and aged in the district both decreased.

2.2.3.2 Education (aged 20+)

The Northern District has very similar levels of education to the Metro City averages as displayed in Figure 8 and Table 3 below, although the percentage who has some form of higher education, is at 28% much higher than the City of Cape Town average of 16%. Approximately 28% of adults in the district have completed some form of higher education and only 1.7 % of the population has had no form of schooling, which is also lower than the City of Cape Town average.

Table 3: Education figures in the Northern District (CoCT and Census 2011)

	No Schooling		Matric		Higher Education	
	2001	2011	2001	2011	2001	2011
Northern District		1.67 %		32.89 %		28.24%
City of Cape Town Average	4.2 %	1.8 %	25.4 %	30.2 %	12.6 %	16.2 %

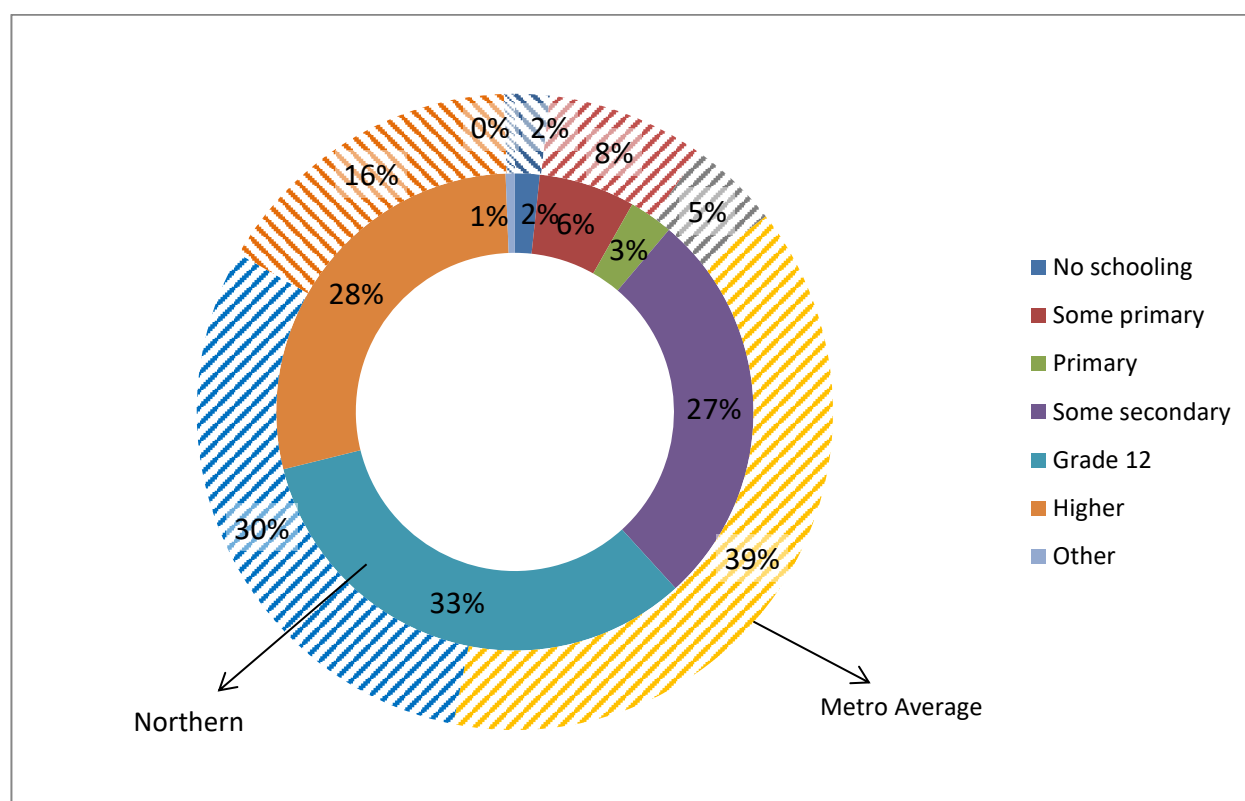


Figure 8: Population Chart for the Northern District (Census 2011)

2.3 Households

The following section provides an overview of the households in the Northern District. The definition of a household is a group of persons who live together and provide themselves jointly with food or other essentials for living, or a single person who lives alone (Census 2011).

The number of Households in the Northern District was estimated to be 112 590 at the end of 2016. The district contains the fourth lowest number of households in the city. The average household size for the district was 3.22 in 2016.

2.3.1 District Trends

The number of households increased by 4.53 % between 2001 and 2011 and a further 6.26 % between 2011 and 2018, as shown in Table 4 below. Between 2001 and 2011, the average annual growth rate of household value has been lower than the population growth rate for the Northern district. However, between 2011 and 2018, the average annual growth rate of household value has been higher than the population growth rate of the Northern district.

Matching the city-wide trends, the effects of the increases in population in the Northern District are further intensified by the increase in the number of households and decrease in the average household size.

Table 4: Household Growth in Northern District

		2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2018	2018
Households	Northern	66 301	4.53%	96 321	6.26%	138499
	Cape Town Total	776 781	3.76%	1 068 573	3.29%	1315015
Average Household Size	Northern	3.31		3.22		
	Cape Town Average	3.72	- 0.60%	3.50	-0.62%	3.39

2.3.2 Spatial Distribution

Within the Northern District, there is an even spread of household growth (per subplace) between 2011- 2018. See Figure below. Therefore, it is anticipated that the distribution of households closely mimics the distribution of population, which is expected.

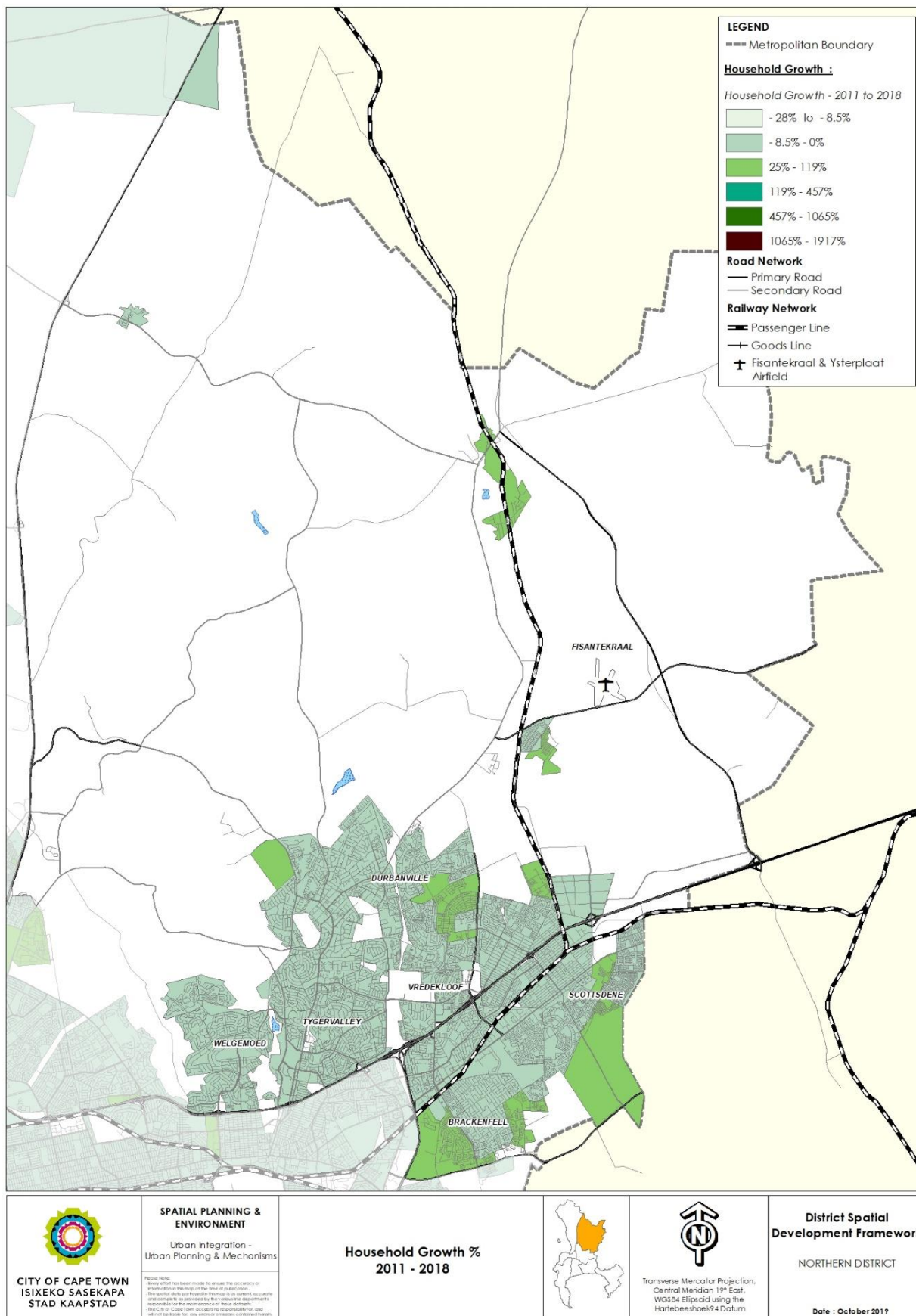


Figure 9: Household growth rate 2011 – 2018

2.4 Employment

In 2011, 70.68 % or 309 785 people of the Northern District's population were of working age (15 to 64 years). Of the working age population, 156 864 people that forms approximately two thirds of the working age population, are part of the labour force, with the remaining third classified as 'Not Economically Active'.

It should also be noted that there is a relatively large percentage of the population that are 'Not Economically Active', and a very small percentage of the group is identified as 'discouraged work-seekers' (4 560 people in the District).

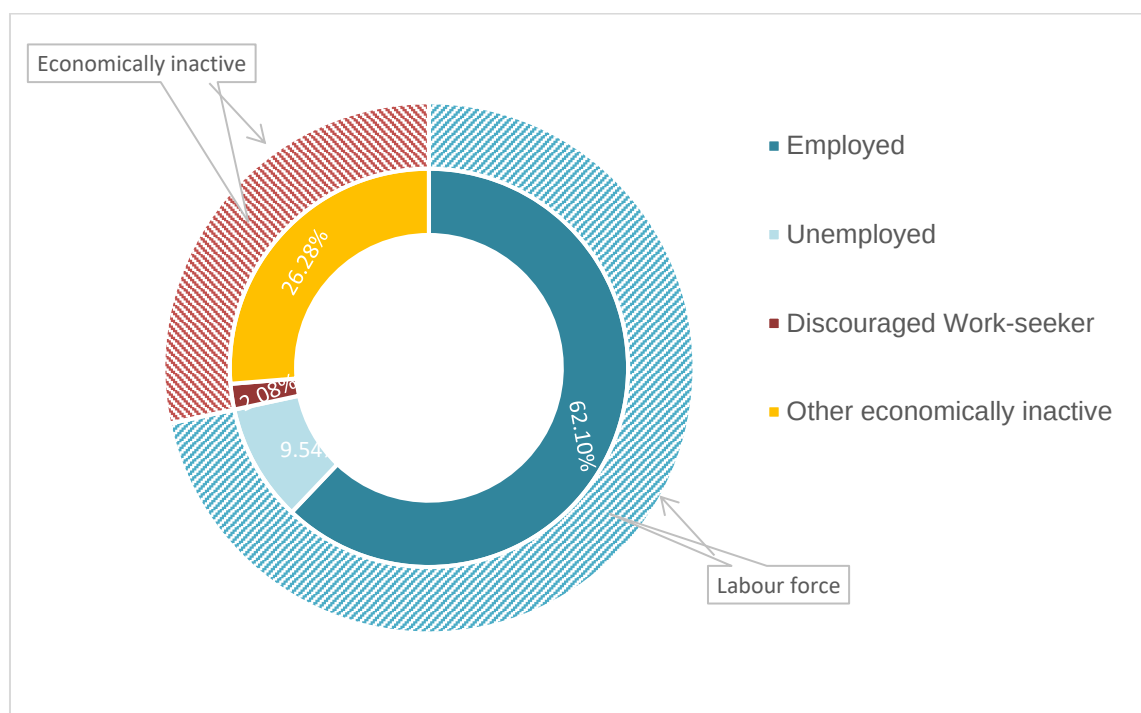


Figure 10: Chart showing Overview of Employment in the Northern District 2011

2.4.1 Employment and Unemployment

Northern District has a large employed labour force of 156 864 people that make up 50.6 % of the population. They formed 49.4% of the district's population. See Chart and Table below.

This indicates that approximately 3 out of every 6 people that wished to be employed were successful. This is further illustrated in the unemployment rate of 13.32%, which is comparatively low in comparison to the metro and national average.

The northern district has a high labour force participation rate of 71.64%, despite the large proportion of the labour force being 'Not Economically Active'.

2.4.1.1 Labour Absorption Rate

The labour absorption rate of 62.10%, indicates that more than half of Northern District's working age population were employed in 2011. This is a significantly positive attribute for the district.

2.4.2 Trends

The following trend with employment rates in the Northern District in 2011 is noted below.

Table 5: Northern District Labour Force Indicators 2011

Northern Planning District : Labour Force Indicators	2011
Population aged 15 to 64 years	218 964
Labour Force	156 864
Employed	135 969
Unemployed	20 895
Not Economically Active	62 100
Discouraged Work-seekers	4 560
Other not economically active	57 540
Rates %	
Unemployment rate	13.32%
Labour absorption rate	62.10%
Labour Force participation rate	71.64%

2.4.3 Spatial Distribution of Employment

The unemployment rate is shown for the various sub-places in the Northern District in 2011.

See Figure 11 below.

- The areas with the highest unemployment rates, of 38% and more are part of Wallacedene and the informal settlement in Fisantekraal;
- Other areas with a relatively high unemployment rate are Klipheuwel, Bloekompos, Wallacedene & part of Scottsdene;
- The remainder of the district has a relatively low unemployment rate.

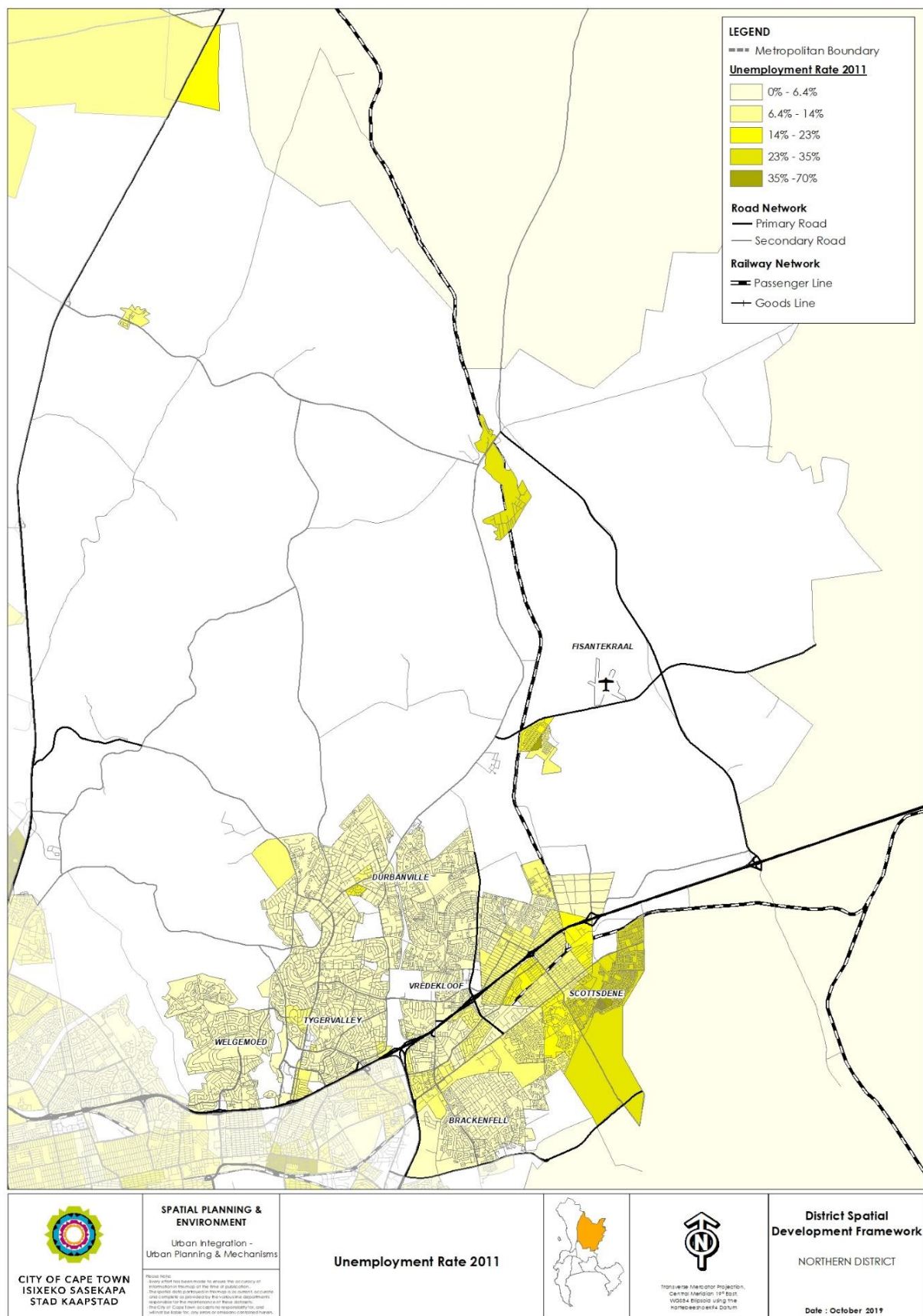


Figure 11: Unemployment Rate in Northern District (Census, 2011)

2.5 Income (Households)

In 2001 and 2011 the Northern district had a spread of income ranges, with above 6 000 households in every income bracket from R1 – R 1 600 per month to R12 801 – R25 600 per month. However, approximately 7 000 households in 2001 receive no monthly income, and in 2011 this value increases to over 11 000 household earning no income, which is a large number of households in the district.

On the other side of the spectrum, in 2001, there was a very small number of households that earned more than R 51 000 per month, but in 2011 this number significantly increased to about 7 500 and more households earning more than R 51 000 per month.

The largest number of households earn between R6 401 – R12 800 in 2001 and R12 801 – 25 600 in 2011. These trends are visually represented in the Graph below, to show how economically dynamic and active the Northern district is.

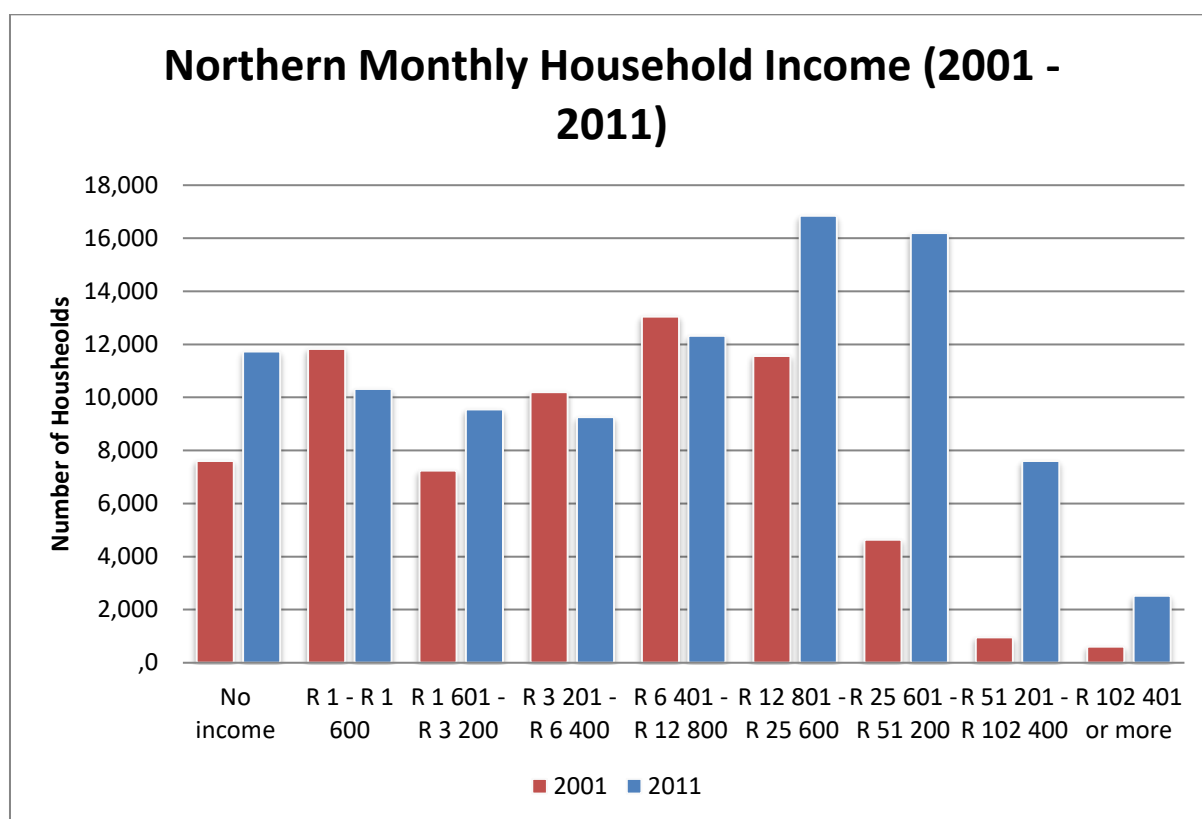


Figure 12: Graph showing Monthly Household Income in Northern District (2011)

2.5.1 Trends

From the graph above, it is clear that the number of households with no income, has increased drastically between the period 2001- 2011. This trend may be ascribed to an

increase in employment rates across the City of Cape Town due to the downswing in the economy, as well as the increase in population in the very low income areas.

Furthermore, the number of households earning above the bracket of R12 000 per month has also increased drastically over the 10- year period. This trend may be linked to the market demand for properties in the middle income bracket as well as the very high income bracket.

2.5.2 Spatial Distribution of household incomes

The Median Household incomes per sub-place are shown for the district in the map below.

- The areas reflecting the lowest income are Klipheuwel, Wallacedene & Bloekombos, i.e. approximately R400- R1600 per month;
- The area north of the N1 freeway reflects a much higher income of approximately R13 000 – R 50 000 per month;
- The areas with the highest income reflect in portions of areas in Welgemoed (Bellville) and Aurora (Durbanville);

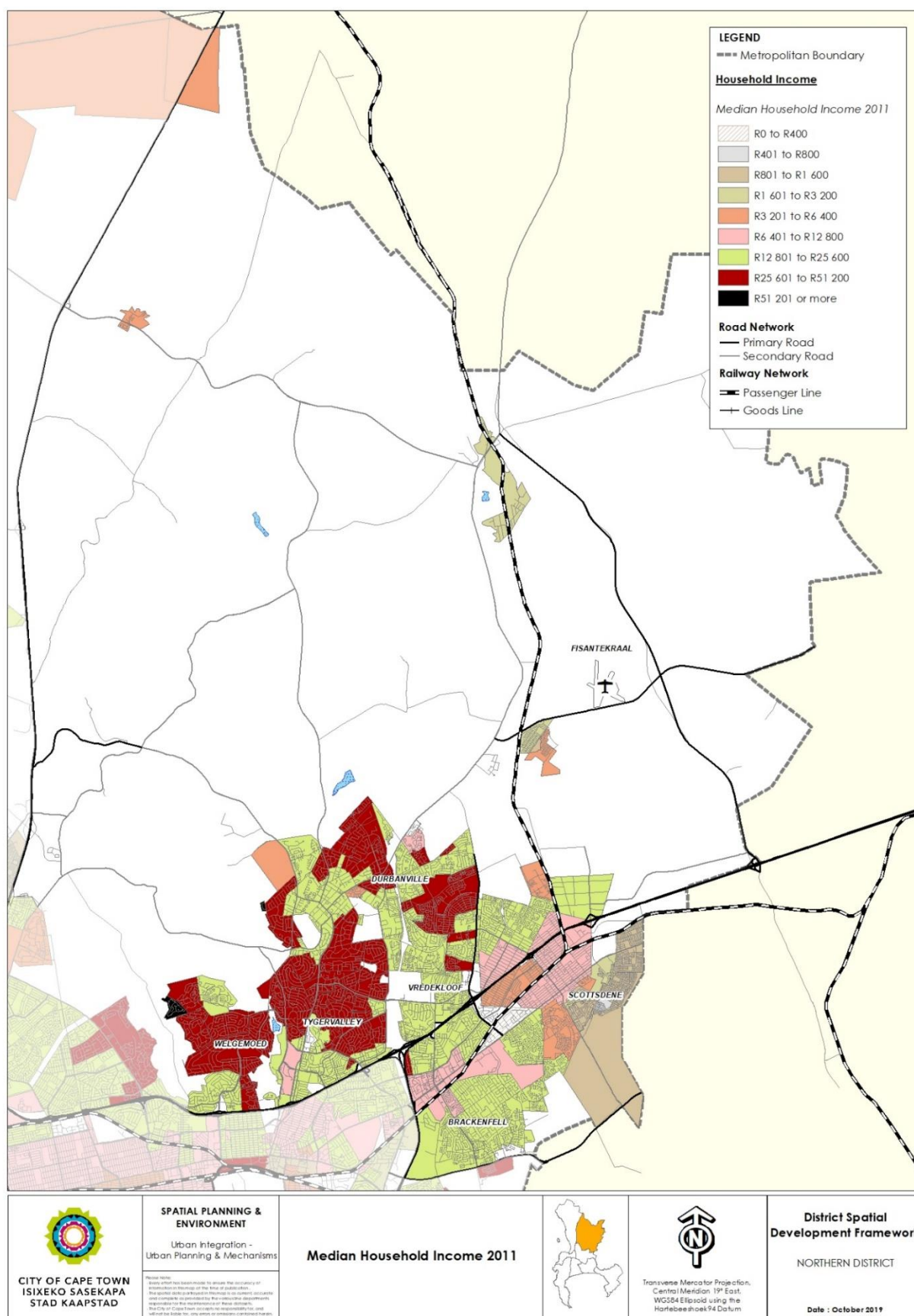


Figure 13: Median Household Income by sub-place for the Northern District (Census, 2011)

2.5.3 Income Inequality

The Gini coefficient is an income inequality measure. The coefficient ranges from 0, which represents “absolute equality”, to 1, which represents “absolute inequality” (Statistics South Africa, 2014). Out of all the districts, the South Peninsula had the lowest measure at 0,56 and Helderberg had the highest at 0,62. However, it is concerning to observe an increase in income inequality throughout the districts, mirroring the Metro’s trend. This shows that income inequality is still a major challenge within the City of Cape Town. See Tables and Graph below.

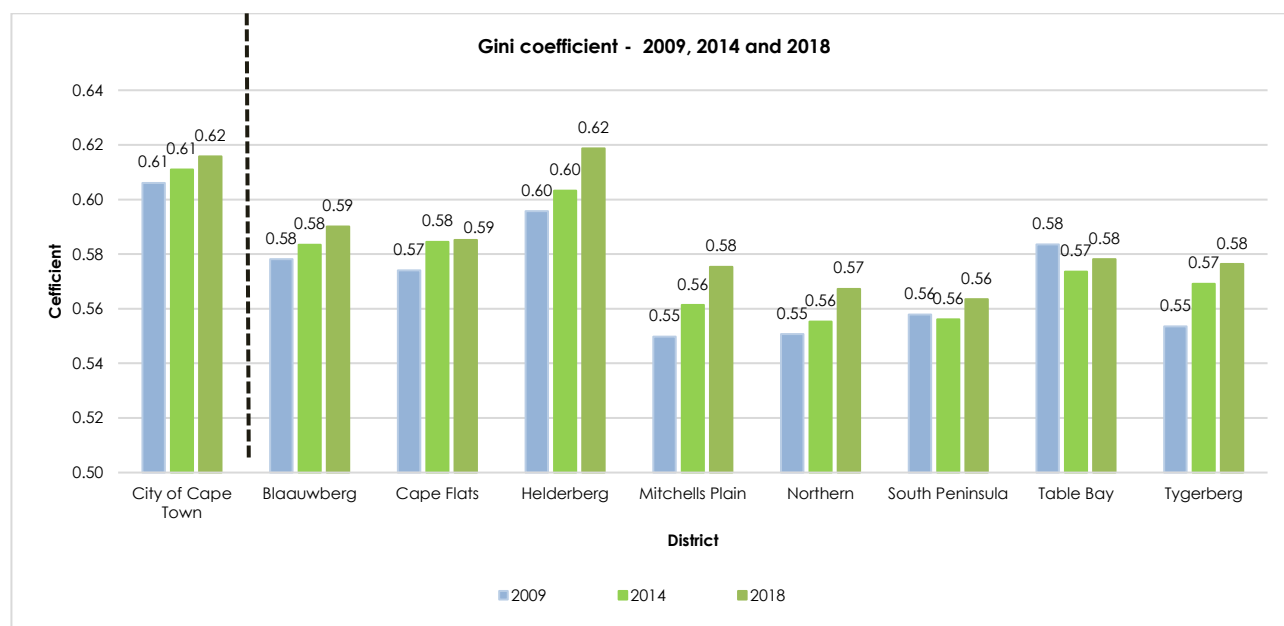


Figure 14: Gini coefficient - 2009, 2014 and 2018

The Northern district has a Gini coefficient that is lower than the Cape Town average and it is one of the least unequal districts out of the eight in Cape Town. This is a positive attribute when compared to other districts in Cape Town.

Table 6: Income Inequality in the Northern District

Districts	Gini Coefficient		
	2009	2014	2018
Northern	0.55	0.56	0.57
City of Cape Town	0.61	0.61	0.62

In total, there are 1 302 946 households in Cape Town and a majority of them are situated in Mitchells Plain (30,9%) followed by Tygerberg (17,6%). Mitchells Plain is predominantly a residential area; thus it is no surprise it has the highest number of households. A majority of

the population in this district has an annual household income between R18 000 and R42 000 (22,5%), whilst other districts recorded the highest percentage of households in upper income percentiles (R132 000 and above). Tygerberg has the largest share of households (28,2%) with an annual income between R132 000 and R360 000, while Blaauwberg, Northern, Table Bay and South Peninsula districts all had their highest share of households in the R360 000 to R1 200 000 category.

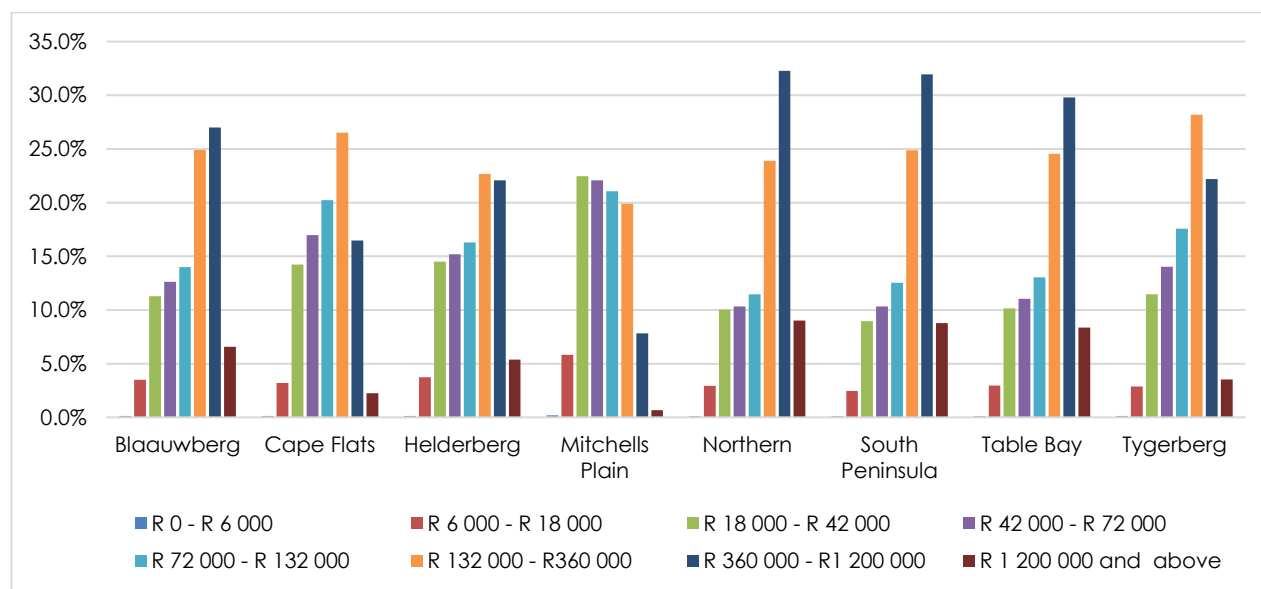


Figure 15: Number of households by income category

2.5.4 Socio-Economic Indicators

The HDI is a composite indicator reflecting education levels, health, and income. The HDI ranges from 0 (no human development) to 1 (high level of human development) (United Nations, 2018). See Table 22 above. In 2018, the South Peninsula (0, 81), Table bay (0, 81) and the Northern district (0, 80) had "very high human development". Mitchells Plain was the only district with a medium human development, indexing at 0, 66. This demonstrates the unequal access to education, health, employment as well as other resources within the Metro, largely due to income gaps and location which limits access to opportunities.

Table 7: The Human Development Index (Source: HIS Markit, 2019)

Planning Districts	Human Development Index (HDI)		
	2009	2014	2018
Blaauwberg	0,75	0,78	0,79
Cape Flats	0,66	0,70	0,71
Helderberg	0,72	0,75	0,76
Mitchells Plain	0,61	0,65	0,66

Northern	0,76	0,79	0,80
South Peninsula	0,78	0,80	0,81
Table Bay	0,77	0,80	0,81
Tygerberg	0,70	0,73	0,74
CITY OF CAPE TOWN	0.70	0.73	0.74

The Northern District has the second highest HDI's in comparison to the eight districts, well above the lowest in 2018, which was Mitchell's Plain/Khayelitsha with 0.66. Northern's HDI has been steadily increasing from 2009 to 2018, at a similar pace to the City average. This is a positive indication for the District.

B: STATE OF THE ENVIRONMENT

3 NATURAL AND HERITAGE ENVIRONMENT

The following section outlines the key environmental and heritage trends and spatial implications that have been identified for the Northern District based on the Strategic Environmental Assessment, the City of Cape Town's State of the Environment Reports, the attributes for the district and other relevant policy documentation.

3.1 Status Quo, Trends and Patterns

3.1.1 Geology

The greater Cape Town region has varied geological features incorporating igneous, metamorphic and sedimentary rocks that were formed from Late Precambrian to recent times. The current geological characteristics were determined by tectonic forces as far back as the split of the southern continents once forming Gondwanaland, as well as by erosion and weathering over time (Reid *et al.*, 2001).

The dominant deposits underlying Northern District belong to the Precambrian Malmesbury Group, which extends across the coastal plain from Saldanha to False Bay. Intrusions of Cape Granite Suite deposits, belonging to the Darling Pluton, and deposits of the Klipheuwel group are also present. These deposits are overlain by more recent deposits belonging to the Table Mountain Group, the geologically recent Sandveld Group (consisting of permeable Quaternary material) as well as other contemporary sediments (Meyer, 2001).

The sediments of the *Malmesbury Group* consist of a variety of shales, greywackes, quartzites and grits, with occasional bands of conglomerate, limestone, dolomite, chert, basic lavas and tuffs. They are mostly dark and medium grained (eWisa, 2008). The Malmesbury Group has a number of sub-groups, the Tygerberg, Moorreesburg and Franschhoek formations. The northern, western and central region of Northern District consists of the Tygerberg formation, while small pockets of Moorreesburg and Franschhoek formations can be found in the eastern and north-eastern areas of the district.

The Tygerberg formation comprises greywacke, phyllite and quartzitic sandstone interbedded with lava and tuff rocks. The Franschhoek and Moorreesburg formations are mainly grey conglomerate, grit and sandstone with minor shale and greywacke with phyllite with beds of quartz schist, limestone and grit respectively (Geological Survey, 1990).

The north of the district is underlain by an exposure of *Klipheuwel Group* deposits that run south-east to north-west just to the south of the town Klipheuwel. The major Klipheuwel Group formation found is the Magrug formation, which comprises conglomerate, grit and sandstone and is often reddish brown. More localized occurrences of the Populierbos formation, which is mainly reddish shale, mudstone and sandy shale, are found in the north of the district (Reid *et al.*, 2001).

Rocks of the *Cape Granite Suite* are characteristically light grey and coarse-grained porphyritic. A small outcrop occurs between the Malmesbury and Klipheuwel Groups. The granite is mainly coarse-grained porphyritic with biotite and tourmaline bearing variants as well as granodiorite. The contact between the Klipheuwel Group and Cape Granite is visible in a large disused quarry, where the feldspar of the granite has been almost completely altered to kaolinite (eWisa, 2008). In the far south-east of the Northern District, a small exposure of the Stellenbosch pluton, also belonging to the Cape Granite Suite, is present. Sporadic outcrops of the Kuils River/Helderberg pluton are present across the south-west and southern part of the district. This granite is also coarse-grained with biotitic and tourmaline-bearing variants (CoCT, 1999).

A large area, mostly located in the south-east of the district, is covered by the relatively recent Quaternary Springfontyn formation, belonging to the *Sandveld Group*. The rocks of the district range from acid/intermediate/alkaline intrusive rocks in the far south and north to undifferentiated rocks and various mixed lithologies that dominate the majority of the region (DWAF, 2000).

Two significant faults, the Klipheuwel and Kalbaskraal faults, occur within the northern region of the district. They run in a north-west to south-east direction (Geological Survey, 1990).

3.1.2 Topography

There are some notable higher lying areas within the district. Koeberg Hill with an elevation of about 370 m lies in the western part. To the south-west lie the Tygerberg and Durbanville Hills, reaching heights of between 300 m and 500 m. To the north-west of Durbanville lies Kanonkop with an elevation of 450 m. The northern flank of the Bottelary Hills reaches 350 m. The Joostenberg Vlakte, an area of low plains, lies between the Rondeboschiesberg in the centre of the district and Joostenberg on the district's eastern boundary.

3.1.3 Soils

Soil is the uppermost layer of the ground. It is the product of mechanical and chemical weathering, determined by climate, the underlying material and the geological characteristics of an area. Soils have an important biological function in supporting plants and animals as well as an economic function in supporting agriculture. There are a range of soil types found in the Northern District.

The majority of the district is covered by shale and granite clays and loams with isolated sporadic pockets of shallow, rocky soils present (usually on hills and mountains). The Diep River, Klapmuts River and sections of the Mosselbank River exhibit locally derived alluvial soils. The remainder of the district, mainly to the east and along the western boundary, is covered by acid sands (CoCT, 1999).

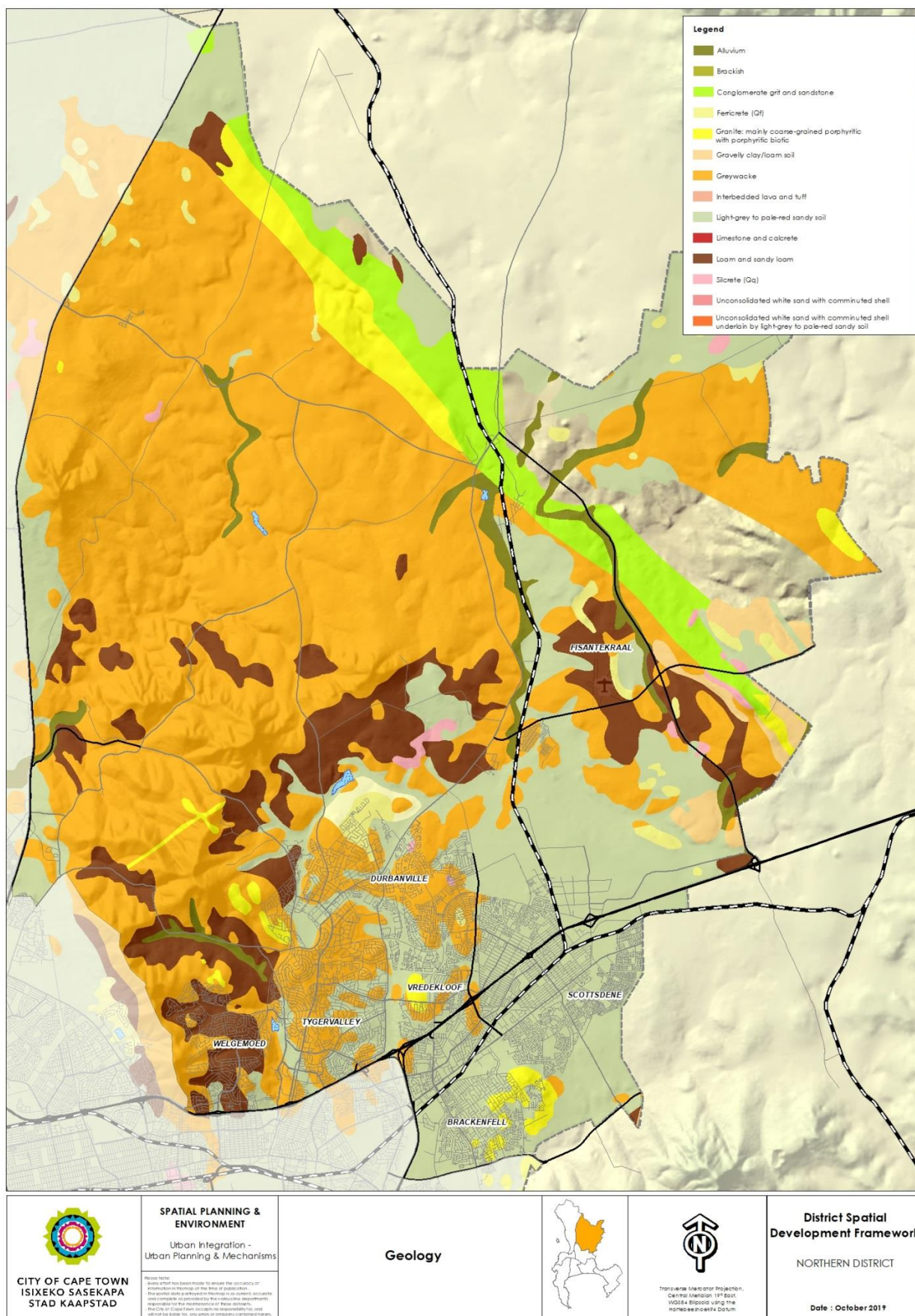
Soils derived from the weathering of Malmesbury Group shales, a result of deposition and compression of silt and clay, are rich in clay and have a superior nutrient status, fertility and water holding capacity as well as displaying a wide variety of depths, profiles and mineralogical make-up. These soils are not particularly vulnerable to erosion and provide a good basis for agriculture. They are, however, prone to crusting, which prevents water infiltration but can be alleviated by vegetation (Cape Nature, 2004).

The granite, which is present in the south-east and north-west of the district, weathers to form various coarse sands and, given the appropriate geomorphic conditions, kaolin (CoCT, 1999).

Much of the southern, eastern and northern regions of The Northern District are characterized by light-grey to pale-red sandy soil with pockets of loam and sandy loam present across the southern half of the district, with some localized occurrences of ferricrete in the central and eastern areas. The south-eastern portion in the vicinity of Kraaifontein and Brackenfell consists of well-drained grey to light-grey regic sands (DWAF, 2002).

The majority of the soils across the northern and central region belong to the prismaeutanic and/or pedocutanic class. The Diep River catchment consists mainly of shallow residual soils of the Mispah, Glenrosa, Swartland and Sterkspruit soil forms and medium to coarse sand. Red-yellow freely drained soils, shales and rocky soils also occur in the higher lying areas (DWAF, 2002).

Soils in the greater Cape Town area are quickly being lost to development through urban expansion and sprawl and through mining for building purposes at an undocumented rate (CoCT, 2001).



3.1.4 Biodiversity

3.1.4.1 Vegetation

The Northern District is a unique district, containing a large portion of agriculturally productive land as well as areas that have seen rapid residential and commercial growth. Balancing the urban development pressures and the need to protect productive agricultural land, important biodiversity remnants and cultural landscapes presents a number of challenges. Further to this is the Mineral Extraction Zone around the Tygerberg hill, which should also be acknowledged. The rocky topography's soil content supports the critical endangered Swartland Shale renosterveld. Since the financial and institutional resources to address these challenges are limited, it is important to identify the key environmental management priorities for the district.

The natural vegetation of the Northern District has been heavily impacted on by the long history of agricultural activity in the area and urban development. However, some fragments of important vegetation remain scattered throughout the district. Invasive alien vegetation is particularly problematic in this district, especially along river courses and threatens biodiversity in the area.

The Table hereunder (Table 8) details the vegetation types within the Northern District as well as the protection status.

(City of Cape Town Biodiversity Report, 2018)

Table 8: Subset for the Northern District of the 20 National Vegetation Types in Cape Town and their National Ecosystem Status

National Vegetation Type	Historic km ²	Current km ²	% Remain	PA km ² Λ	Status [#]	CCT protection level*
Atlantis Sand Fynbos	251	147	58.7	36	CR	Poorly protected
Cape Flats Sand Fynbos	540	59	11.0	10	CR	Poorly protected
Cape Winelands Shale Fynbos	53	29	55.7	19	VU	Well protected
Swartland Alluvium Fynbos	24	3	11.2	0	CR	Not protected
Swartland Granite Renosterveld	70	18	25.7	2	CR	Poorly protected
Swartland Shale Renosterveld	457	34	7.5	7	CR	Poorly protected

Swartland Renosterveld	Silcrete	11	1	13.6	<1	CR	Hardly protected
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PA = Protected Area

^ Excludes non-proclaimed conservation areas and transformed areas in Protected Areas

CR = Critically Endangered, EN = Endangered, VU = Vulnerable and LT = Least Threatened

* According to SANBI criteria, but for areas within the city only

Vegetation types endemic to Cape Town in **bold**

Note: Azonal Vegetation Types excluded: Cape Lowlands Freshwater Wetlands

3.1.4.2 Fauna

All development applications must be informed by the National environmental web-based screening tools for EIA's (<https://screening.environment.gov.za/screeningtool>). This initiative consists of a number of spatial biodiversity priority and feature layers that details ecosystem and species level data to assist in identifying sensitive areas and needed specialist assessments. It is also important to note that while the information detailed here was current at the time of writing, taxonomic and status changes occur from time to time. As such, it is critical that the latest available information must always be sourced and utilized during decision-making processes.

Little is documented about the fine scale distribution of fauna species within the City of Cape Town (CCT). Even for better-known groups, such as mammals, species lists are generally available only for isolated sites such as for the proclaimed nature reserves. This being the case, very little quantitative data is available for each district. This is particularly evident with the invertebrate fauna and limited work has been done on these groups. There are undoubtedly numerous endemic and threatened invertebrate species within the City and certainly a number that have not yet been described. It is hoped that a protected area network that adequately conserves all the vegetation types and habitats in Cape Town, would conserve a representative suite of invertebrates. It is important to note that the invertebrate fauna is a critical component in all ecosystems. Many plant species are completely reliant on insects as pollinators and seed dispersers. The only groups of insects that are relatively well known are the butterflies and Odonata (dragonflies & damselflies) and these are discussed briefly in the relevant section below.

3.1.4.3 Fish Fauna

Due to the lack of large perennial river systems, only two indigenous freshwater fish species are recognized as occurring within the boundaries of the CCT. A significant portion of the Diep River catchment area and the upper portion of the Kuils River occur in District C. Both these systems do contain indigenous fish. There are also numerous other wetlands thought the district which may well contain fish.

The Cape Galaxia (*Galaxias zebratus*) has been shown to be a species complex consisting of numerous taxa across the Western Cape. Ongoing genetic work will eventually allocate all the populations within the CCT to species level. The *Galaxias* lineage in the Diep River in District C is also found in the Klaarsjagers, Schusters and Glencairn Rivers (Impson & Henning 2019). Cape *Galaxias* also occur in the Kuils River system but it is not clear to which lineage these belong. As the taxonomic status of these lineages has not been resolved and their conservation status has not been assessed, it is best to consider the presence of any *Galaxias* as being of conservation significance within the CCT.

The Cape Kurper (*Sandelia capensis*) is found throughout much of the Cape Floral Region. The latest taxonomic evidence has shown that what was previously thought to be one species represents a species complex of several taxa. The distribution and conservation status of each of these taxa needs to be defined. Within the CCT Cape Kurper have largely been eradicated from the lowlands. However, they still occur in the Kuils and Diep River systems in District C.

As there is a lack of clarity regarding the identity and conservation status of the freshwater fish species in the City, the presence of any indigenous freshwater fish is considered to be of conservation significance and would need to be carefully assessed.

Several rivers and water bodies within District C have invasive fish species which cause moderate to severe ecological impacts, including Banded Tilapia (*Tilapia sparamanni*), Mozambique Tilapia (*Oreochromis mossambicus*), Carp (*Cyprinus carpio*), Sharptooth Catfish (*Clarias gariepinus*) and Mosquitofish (*Gambusia affinis*).

Of the 15 rivers that have been identified as key rivers for fish conservation in the Berg Water Management Area (Impson & Henning 2019), upper portions of the Diep River Catchment has been identified as an Important Fish Area. A large part of this Important Fish Area falls within District C. The fish fauna section is based on information provided by Dean Impson, a CapeNature Fauna Resource Ecologist.

3.1.4.4 Mammalian Fauna

Of the 74 species of indigenous terrestrial mammals found or presumed to occur within the CCT, nine are included in the 2016 Red Data Book of South African Mammals (Child, 2016). Three of these are known to occur within District C. This is:

- Cape Clawless Otter (*Aonyx capensis*) – Near Threatened.
This species occurs at the larger wetlands and rivers in the District.
- Striped Weasel (*Poecilogale albinucha*) – Data deficient.
This species appears to have increased in the Western Cape in recent years. They are secretive and their presence is usually only indicated by occasional road kill specimens and camera trap photos. In District C, this species occurs in the Tygerberg Nature Reserve and in the open agricultural areas.
- White-tailed Mouse (*Mystromys albicaudatus*) – Vulnerable.

This species has not been confirmed to occur in District C but could potentially occur on the Tygerberg. There is a single record from the neighboring District D (a skull found in an owl pellet in the Parow Caravan Park). It is expected that this was caught locally but subsequent surveys of the nearby Tygerberg Nature Reserve have failed to confirm this species presence. The species is found in the Blaauwberg Nature Reserve in the neighboring District B where it is found in Cape Flats Dune Strandveld and Cape Flats Sand Fynbos.

Several species of bats are known to occur in the CCT but very little is known about their distribution. Any significant bat roosting sites identified within or near proposed developments would require a specialist report, which would assess the significance of any potential impacts. All proposed wind turbine installations would need to consider potential impacts on bat fauna.

District C still contains extensive open agricultural areas with scattered smaller natural vegetation remnants. This landscape lends itself to the persistence of some of the larger terrestrial mammals still occurring within the District. These species, such as Honey Badger (*Mellivora capensis*) Cape Fox (*Vulpes chama*) and Caracal (*Caracal caracal*), all have a red list status of Least Concern. While these species are not threatened nationally, on a local City or district scale, they may be vulnerable to local extinction. This is because the local populations may be low, isolated and therefore potentially locally threatened. These species play an important role in the ecosystem and their continued existence in the District is important. Their future survival in the District is dependent on there being larger natural open spaces and agricultural areas to ensure that viable populations exist and persist. Ecological linkages that provide the opportunity for faunal movement between remnants is also critical for larger fauna. The Tygerberg Nature Reserve (which is shared with the neighbouring District D) is home to an array of mammals and it is important that this site not become surrounded by urban sprawl in to the future. It is also important that other key natural sites such as Joosternbergskloof have ecological linkages to open spaces outside of the City boundaries.

3.1.4.5 Avifauna

Almost 400 species of bird have been recorded from the City of Cape Town. Of these, 51 species are listed as being threatened in the 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland (Taylor et al., 2015). Numerous threatened species that occur in the coastal and oceanic waters off Cape Town are pelagic seabirds which breed on islands in the Southern Ocean. These birds are therefore not associated with the mainland and need not be addressed in the EMFs. Also excluded are vagrant species which don't regularly occur in the City of Cape Town.

There are extensive agricultural and natural areas in District C. There are also numerous artificial and natural wetland areas. As such, the following bird species of conservation concern occur or could be expected to occur in the District:

Many of the bird species of conservation concern are associated with wetlands. These include:

- The Near Threatened Old World Painted Snipe (*Rostratula benghalensis*) is secretive and therefore seldom recorded. They could occur in any wetland with shallow, vegetated fringes.
- The Near Threatened Greater Flamingo (*Phoenicopterus ruber*) is occasionally seen in some of the bigger farm dams in the district. They do not breed in the area.
- The Great White Pelican (*Pelecanus onocrotalus*) is classified as Vulnerable and regularly visits larger dam and scavenges at various farms in the District. They breed on Dassen Island off the West Coast.
- The Maccoa Duck (*Oxyura maccoa*) is Near-threatened and could occasionally occur at the larger waterbodies in the District.
- The migratory Curlew Sandpiper (*Calidris ferruginea*) is Near-threatened and subject to a global decline. In the District, they would be occasional summer visitors to the larger wetlands and dams with exposed shoreline.

Raptor species of conservation concern include the following:

- The Vulnerable Lanner Falcon (*Falco biarmicus*) is occasionally recorded in the open areas in District C. They are not known to breed in the City of Cape Town.
- The Black Harrier (*Circus maurus*) is classified as Endangered and may occasionally visit the Tygerberg Hills or other extensive natural open spaces in the District. They are not expected to breed in the District.
- The Vulnerable Secretarybird (*Sagittarius serpentarius*) is occasionally encountered in the agricultural areas and natural open space in the northern parts of the district.
- The Endangered Martial Eagle (*Polemaetus bellicosus*) is occasionally encountered within the district. No breeding sites are known in the City but there is a nest site just to the north of the City in the Darling Hills.

1.

Open agricultural habitats:

- The Near-threatened Blue Crane (*Anthropoides paradiseus*) is frequently encountered in the open agricultural areas of the district.

3.1.4.6 Amphibian Fauna

Of the 28 species of amphibian which occur within the CCT, 12 are considered to be species of conservation concern by the IUCN (<https://www.iucnredlist.org>). Three species are classified as Critically Endangered, two Endangered, five Near Threatened and two Data Deficient. Four species are endemic to the City of Cape Town boundaries.

Within District C, two amphibian species of conservation concern is known to occur:

- The Near Threatened Cape Caco (*Cacosternum capense*) occurs in the seasonal wetland systems between Joostenbergskloof and Klipheuwel. They occur in seasonal wetlands, even relatively small wetlands in ploughed fields. They could be expected to occur in suitable habitat anywhere in the district.
- The Near Threatened Cape Rain Frog (*Breviceps gibbosus*) occurs on the heavier soils throughout the District. They are common on the Tygerberg Hills. This species is not associated with wetlands and is often found in suburban parks and gardens. Preventing movement barriers, such as solid boundary walls, and retaining unpaved garden space within residential areas are important in allowing these charismatic frogs to persist in suburban areas.

Amphibians are sensitive to environmental factors such as water pollution and/or altered hydrological regimes. The input of storm water and other effluent into wetlands can have a significant negative influence on amphibians and other biodiversity.

3.1.4.7 Reptile Fauna

Out of the 62 species of reptile found or suspected to occur within the CCT, six are considered to be of conservation concern (<https://www.iucnredlist.org>). Three of these are marine turtle species. Of the remaining three, only one is known to occur within the Northern District (C):

- The Near Threatened Cape Dwarf Chameleon (*Bradypodion pumilum*) is found in natural areas as well as garden environments. The indiscriminate movement of these animals around suburbs by humans is problematic from a disease and genetic perspective. In addition, they are frequently taken into captivity as pets which is extremely detrimental to the animals and illegal.

3.1.4.8 Invertebrate Fauna

Little is known about the insect and other invertebrate fauna in District C. Ongoing research into invertebrates in Cape Town frequently elicits new species reflecting the high level of endemism within this area. Butterflies and Odonata (dragonflies and damselflies) are relatively well known and some information is provided for below.

Butterflies

The Tygerberg Hills of Districts C and D are very important for butterfly species. Unfortunately, two of the taxa that historically occurred in area have become globally extinct or are presumed to be extinct. There is always a chance that they may be relocated, either on the Tygerberg or on similar habitat in the district.

- The Tygerberg Monkey Giant Cupid (*Lepidopchrysops methymna dicksoni*) is classified as Extinct. It historically occurred on the Tygerberg Hills in District C and D. This butterfly has not been seen for over 50 years despite extensive searches (Ball, 2020 A).

- The Tygerberg Hillside Brown (*Stygionympha dicksoni*) is classified as Critically Endangered, Presumed Extinct. It historically occurred on the Tygerberg Hills and the on low hills south of Darling (Ball, 2020 B).

Dragonflies and damselflies (Odonata)

No Odonata of conservation concern are known to occur in District C.

3.1.4.9 Conservation Areas

There are several proclaimed conservation areas in the Northern District, which are briefly described below.

Nature Reserves:

- The Bracken Nature Reserve – consists of sand fynbos and a granite outcrop area to the south-east of Brackenfell residential area, covering an area of ~30 ha. The reserve has great botanical significance with over 165 plant species, many of which are endangered or Red Data Book listed. The reserve is managed by the CoCT. The adjacent Perdekop site supports Swartland Granite Renosterveld and is also a core flora site.
- The Durbanville Nature Reserve – situated next to the Durbanville Racecourse in a transition zone between Renosterveld and Sand Fynbos. It covers approximately 6ha with 185 plant species and is also managed by the CoCT.
- The Tygerberg Nature Reserve – extends over 300 ha and is situated across the southern and eastern slopes of the Tygerberg Hills and borders the south-western flank of the district above Welgemoed. It includes more than 460 plant species and supports one of the last remnants of the critically endangered Swartland Shale Renosterveld vegetation.
- The Uitkamp Wetlands Reserve – this comprises a small wetland in a Renosterveld region in the north of Durbanville, with no formal status. It is 31ha in extent, with roughly 160 plant species, many of which are Red Data species.
- Botterblom Street Nature Reserve, Vierlanden
- Perdekop Nature Reserve, Brackenfell (Erven 11072/73)
- Van Schoorsdrift Conservation Area (Cape Farm 153)
- Botterblom Nature Reserve

Private Nature Reserve Area:

- Welbeloond Conservation Area (Erven 10 and 27, Atlantic Hills)
- Crammix Site (Erf 1503, Brackenfell)

Private Stewardship Conservation Areas:

- Capaia Farm (Ptn 2 of CFM 74)
- Paarl Farm 1294 and Ptn 1 of Paarl Farm 474
- Joostenbergkloof, Van Schoorsdrift, Mellish

Other:

Majik Forest

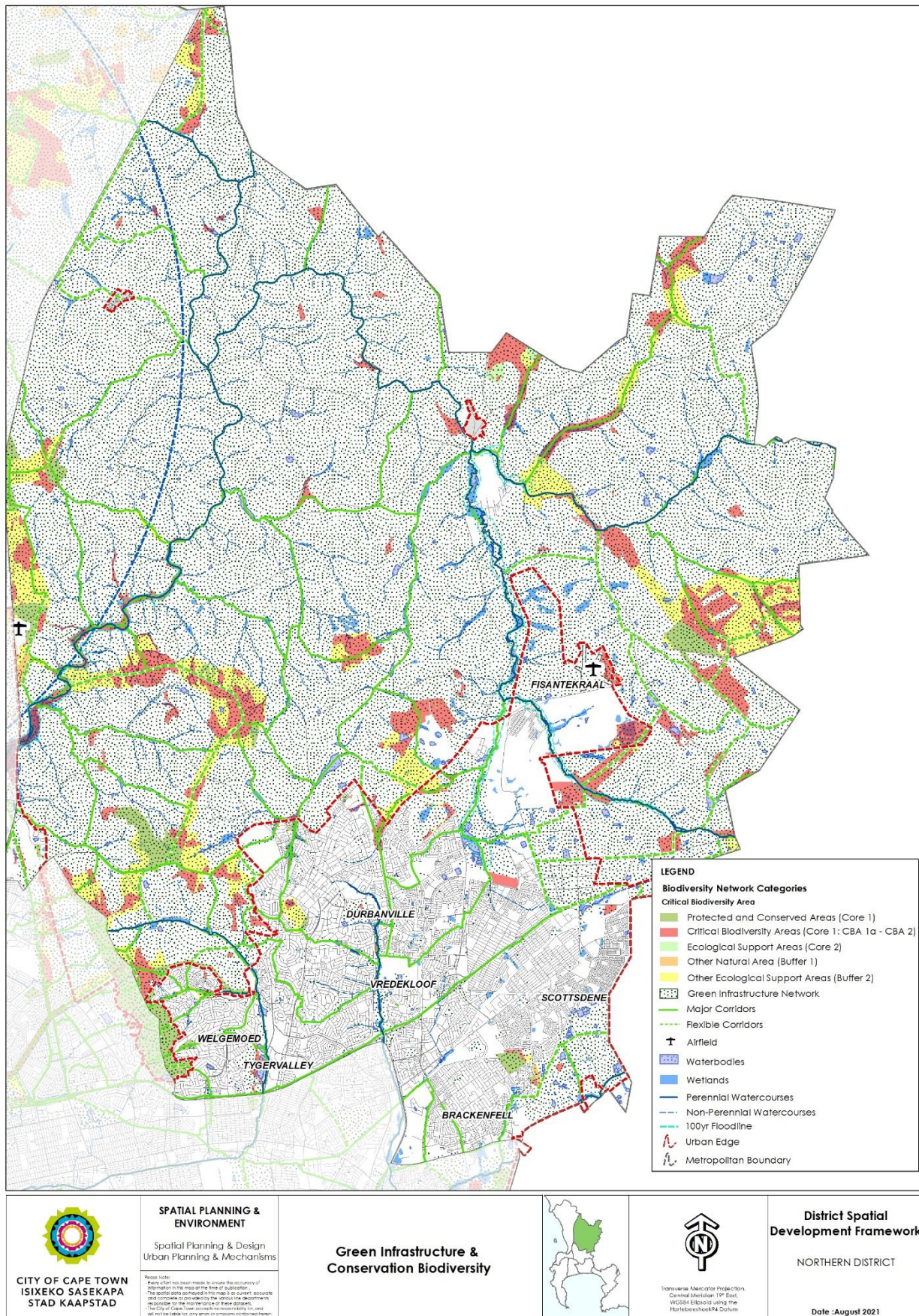


Figure 17: Bio-physical Environment of the Northern District

3.1.5 Hydrology

The pollution and degradation of rivers, wetlands and groundwater systems within the Northern District, and the Western Cape in general, are critical issues. Many of the rivers in the Northern District have been degraded through pollution from agricultural stormwater run-off, treated effluent from WWTW and new industrial areas, water storage and abstraction (there are many farm dams in the district and water is abstracted primarily for agricultural purposes) as well as infestation by alien invasive fish and vegetation. Alien invasive vegetation is particularly bad along the Diep and Mosselbank Rivers. There are also highly productive aquifers in the district and although these are currently only used for water abstraction for agricultural purposes (particularly the Klipheuwel aquifer) they are important resources and measures should be taken to ensure water quality is protected.

3.1.5.1 Rivers

Although The Northern District has large areas of shale and sand, which result in lower volumes of surface runoff, the Northern District contains a number of rivers and some other water bodies such as wetlands and dams (see Map 2.3).

The Northern District contains the upper and middle reaches of the Diep River, one of its major tributaries, the Mosselbank River, and the smaller Klapmuts River which in turn is a tributary of the Mosselbank. The headwaters of the Kuils and Elsiekraal Rivers fall within the southern extent of the district.

The Diep River is the most significant river within the Northern District. It is 65 km long and has an extensive catchment of 1 495 km² (DEAT, 2001) that extends beyond the borders to the north into the Swartland and Sandveld regions in the western lowlands of the Western Cape Province (DWAF, 2003). The river drains the area between the Kasteel Mountain (north of Malmesbury) and the northern slopes of the Durbanville Hills as well as the area west of Paarl.

In the Northern District, the Diep River flows through areas comprised of Malmesbury Group shale, Cape Granite, Klipheuwel Group conglomerates and sandy sediments. The largest part of the river within this district traverses the lower foothill zone, where the river has a lower gradient with an alluvial bed of sand and gravel and where floodplains are often present. The lower reaches of the Diep River cross to the lowland river zone, which typically has a low gradient alluvial channel that meanders within a floodplain (DWAF, 2003). Flow and habitat alteration in the river system has led to the disappearance of indigenous riparian vegetation within the district (DWAF, 2002).

Land use within the catchment of the Diep River consists of 74% agriculture, including temporary commercial dryland and commercial irrigated agriculture as well as commercial forestry. The Diep River region currently accounts for about one-sixth of South Africa's grain production. Some 17% of land within the Diep River catchment still consists of natural areas. The remainder is made up of urban areas, vineyards, orchards, livestock farming and degraded shrubland and wetlands (DEAT, 2001).

Four wastewater treatment works (WWTW), located at Milnerton (Blaauwberg district), Kraaifontein, Fisantekraal and Malmesbury(outside district), discharge into the Diep River along its course. (DWAF, 2003).

The Mosselbank River is the main tributary of the Diep River. It rises in the Skurweberg Mountains and drains the south-eastern portion of the region. Within The Northern District, the Mosselbank River traverses the upper foothill zone upstream in the south-east, where the river is moderately steep with a mixed bedrock-cobble bed. The largest portion of the Mosselbank River within the district flows within the lower foothill zone, where the river has a lower gradient with an alluvial bed of sand and gravel and where floodplains are often present (DWAF, 2005). The Mosselbank River flows into the Diep River within the Northern District.

The Klapmuts River is a tributary to the Mosselbank River. It rises to the east of the Northern District in the Agter-Paarl region and flows westward, draining the north-eastern area of the district.

The upper reaches of the Elsieksraal River are located in the southern portion of the district. This river drains the south-east portion of the Tygerberg Hills and flows through the outskirts of Durbanville, Welgemoed and Bellville. New development is occurring along this river, particularly the Tygervally Waterfront in Durbanville. Land-use in the upper catchment consists of largely natural areas due to the Tygerberg Nature Reserve and less dense residential development (DWAF, 2005).

The upper reaches of the Elsieksraal River are considered to be in mostly fair health with regards to habitat integrity, water quality, riparian vegetation and the fish index. However, with regards to aquatic habitats and invertebrates linked to localized conditions, it is considered to be in poor health (DWAF, 2005).

The Kuils River starts within the Northern District. It arises in the Joostenbergvlakte, between the Tygerberg and the Bottelary Hills east of Kanonkop, and drains a portion of the Tygerberg Hills. The Bottelary River is a significant tributary of the Kuils River in its upper reaches. Minor tributaries are located in the far south of the district and drain the slopes of the Bottelary Hills in the vicinity of Brackenfell. The Kuils River flows southwards out of the Northern District across the eastern Cape Flats for roughly 30 km, after which it converges with the Eerste River in District E before draining into False Bay (eWisa, 2008). The upper Kuils River is in fair to poor health. Water quality, riparian vegetation and fish assemblages are in poor condition, whereas habitat integrity and aquatic invertebrates are in fair condition (DWAF, 2005).

The rivers within the Northern District face a number of challenges. Water storage and abstraction has modified flow for most rivers and reduces the flushing abilities of the rivers (DWAF, 2002), leading to an increase in water temperatures and a decrease in dissolved oxygen levels. Moreover, reduced flow in the Diep River caused by dams has resulted in an increase in aquatic vegetation that can sometimes block channels (DWAF, 2003).

Natural vegetation is often disturbed by farming practices along the river bank that promote invasive alien vegetation infestation. Invasive alien trees (e.g. river gums) use

large amounts of water throughout the catchment and confine the river bed, resulting in incised channels, especially in the region of Kalbaskraal in the north-west of the district (DWAF, 2003). A large portion of the district, although fairly undeveloped towards the northern extent, is severely invaded by invasive alien vegetation, especially Port Jackson Willow, along river courses (DWAF, 2005).

Disturbances, such as sand mining and altered river channels and beds cause erosion and increased sedimentation. River channelling has led to a loss of natural pools and refuge areas for fish. Quarries in the south-west of the district in proximity to the Diep River, provide exposures where rocks are being quarried for building material; this leads to a problem of siltation within the river (DWAF, 2003).

Release of treated wastewater from urban areas and agricultural runoff cause nutrient enrichment and reduce water quality, especially in the Diep River (DWAF, 2005). The Scottsdene WWTW, located in the south-east of the district, discharges treated effluent into the Bottelary River, a tributary of the Kuils River (DWAF, 2005).

Alien fish (e.g. carp, banded tilapia and mosquito fish) then thrive in the stagnant eutrophic pools of the Diep River, preying on and competing with indigenous fish (DWAF, 2003). The impact of informal settlements such as Fisantekraal on the Mosselbank River needs to be acknowledged.

3.1.5.2 Wetlands

Many small wetlands are located throughout the district. These are mostly limited to river courses, especially along the middle reaches of the Diep River and the upper reaches of the Mosselbank and Elsieskraal Rivers in the vicinity of Vissershoeek and Durbanville respectively. The Uitkamp Wetland Nature Reserve (approximately 31ha in extent) is the primary wetland area in the district.

3.1.5.3 Dams

Notable dams in the south of the district include Edwards Dam, situated in the Vygeboom area, and Sonstraal Dam, located on a small western tributary of the Kuils River on the edge of Durbanville (eWisa, 2008). The district, in particular the Mosselbank and Diep catchments, has a large number of small to moderate sized farm dams used primarily for agricultural purposes and located on smaller tributaries (eWisa, 2008).

3.1.5.4 Groundwater

The district has a varied hydrogeological environment and includes various groundwater sources or aquifers. Aquifers are typically classified into three types, all of which occur in the Northern District. These are fractured aquifers, such as the Malmesbury Group aquifers, intergranular aquifers in the Sandveld Group and fractured and intergranular aquifers within the Cape Granite Suite (Meyer, 2001).

A moderately productive intergranular and fractured aquifer is present in localised areas in the south-east and north-west of the district where acid/intermediate/alkaline intrusive rocks can be found. It has a median yield of 0.1-0.5ℓ/s. Boreholes in this region do not develop high yields. Groundwater quality in this region varies depending on the diverse weathering forms and varied rock compositions that can be found. Groundwater in granites generally displays a sodium-chloride sulphate nature (Meyer, 2001).

The district is dominated by the moderately to highly productive fractured aquifers of the Malmesbury and Klipheuwel Groups, with median yields ranging from 0.1 to 5.0 litres per second (ℓ/s) (DWAF, 2000). Groundwater exploitation in the Malmesbury Group is often problematic (Meyer, 2001). The aquifers in The Northern District occur mostly in undifferentiated rocks and various mixed lithologies. Groundwater quality thus varies considerably depending on the underlying geological and recharge conditions. Groundwater in the Malmesbury Group is generally of a sodium-chloride-alkaline nature. The groundwater yields over most of the district are moderate at 0.5-2.0 ℓ/s. The central area however has a highly productive aquifer with yields of 2.0-5.0 ℓ/s (DWAF, 2000).

Groundwater yields within the Klipheuwel Group are generally slightly better; however, this particular environment only occurs in a limited area in the north-east of the district and as a highly productive strip running north-west – south-east with yields of 2.0-5.0 ℓ/s. In contrast, the area to the north-east has yields that range from 0.1 to 0.5 ℓ/s. Groundwater is also generally of a sodium-chloride nature. This aquifer occurs in the north-eastern region of the district, in the vicinity of the town of Klipheuwel (Meyer, 2001).

The Table Mountain Group aquifer is a unique regional aquifer that forms part of the Table Mountain Group formation extending over 900km from Nieuwoudtville to Cape Agulhas and eastwards to Algoa Bay. The aquifer is a potentially significant source of future water supplies to the Western Cape. Numerous users have been identified ranging from municipalities to agriculture, with major direct and indirect impacts on the hydrogeology of the Western Cape (DWAF, 2005).

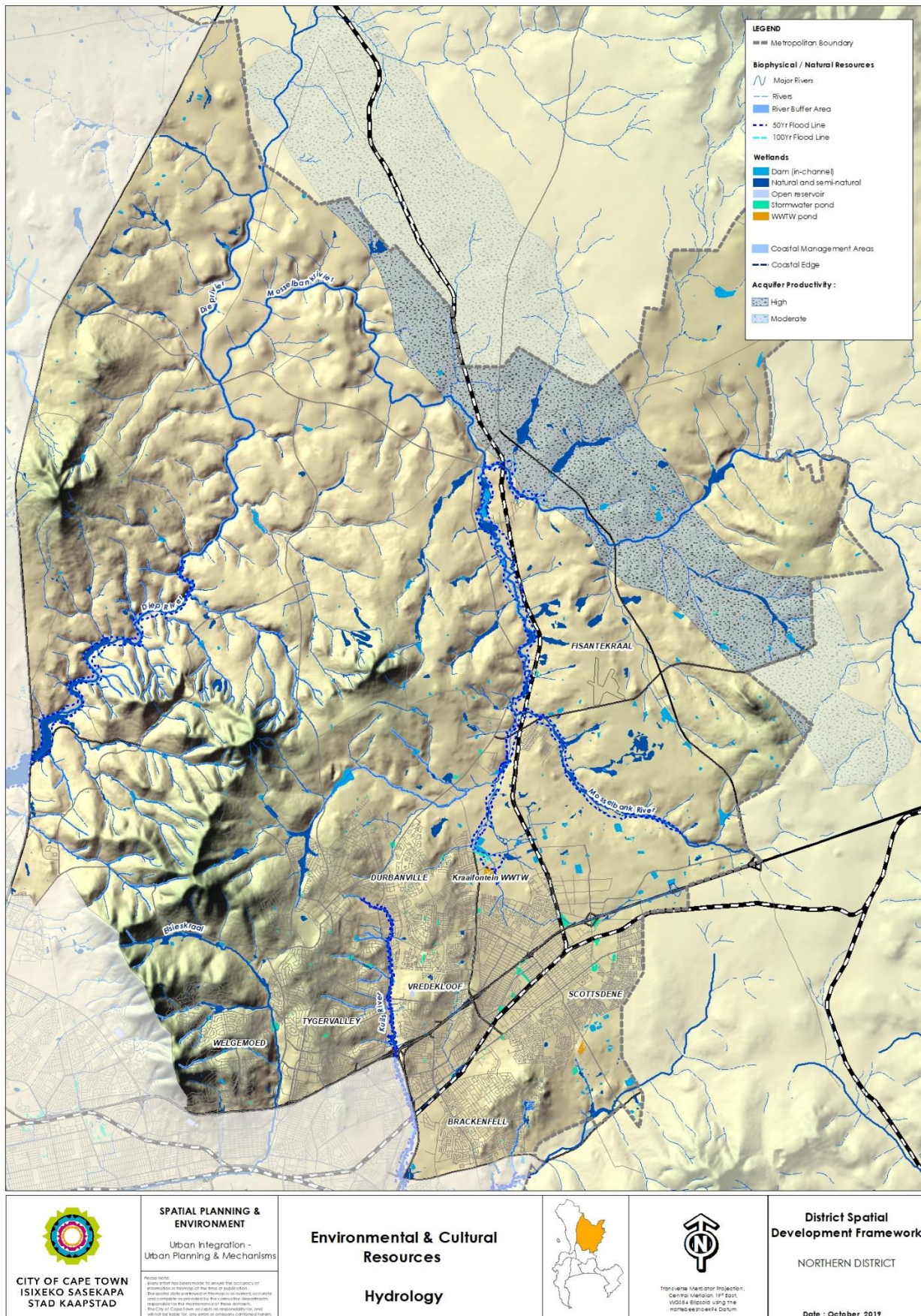


Figure 18: Hydrology of the Northern District

3.1.6 Agriculture and Mineral Resources

Sand and gravel is used for building material and is considered a limited economic resource. There are concerns regarding the limited availability of unexploited sand and gravel resources and this creates conflict between demands to exploit remaining resources and maintaining the integrity of the receiving environment in which these resources occur. The main issues with regards to mineral extraction in the Northern District are the management of the mineral extraction zone, which falls within an area of high and medium agricultural potential, and contains some important biodiversity fragments and the core flora site, Kanonkop, as well as illegal sand mining.

Agricultural land contributes significantly to the province and country's Gross Domestic Product. The Northern District includes a relatively large portion of high and medium potential agricultural land, particularly in the eastern section of the district. These areas are under threat from development pressure.

3.1.7 Air Quality

The right to clean air is a basic human right. The quality of air is a key factor affecting the health of a city as air pollution represents a major health risk to residents.

Three main types of air pollutants are measured and reported on by the City of Cape Town, as follows:

- Nitrogen dioxide (NO₂)
- Sulphur dioxide (SO₂)
- Particulate matter (PM₁₀)

In general, NO₂ levels have decreased over the past 12 years. They are generally within the guidelines standard. SO₂ levels have maintained low trends over the past 12 years, keeping within the guideline standards with discrepancies occurring every few years. However, PM₁₀ levels are more problematic and have considerably increased at most sites over the years.

3.1.8 Green Infrastructure

Green Infrastructure can be defined as “a strategically planned, designed and managed network of natural open spaces and ‘engineered’ ecological systems which provide ecological, community and infrastructure services.

In addition to further motivating for the protection of existing natural assets such as biodiversity and the coast, green infrastructure recognizes the role and importance of a range of urban green spaces or parts of the urban system, including but not limited to gardens, trees, parks, agricultural areas, rivers and wetlands, and storm water infiltration areas, and the role they play in providing ecosystem services, making the city more liveable, and building climate change resilience.

The City has mapped a green infrastructure network, (GINet) identifying and ranking green infrastructure services, the opportunities they present and benefits they provide.

The GINet is intended to be available on the CityMap Viewer accessible via the Open Data Portal.

3.1.9 Heritage and Heritage Management

The historical narrative of the establishment and development of Cape Town as a settlement and the City it is today, is reflected in its diverse cultural heritage and the wide range of heritage resources. These give us our sense of identity and should be preserved and conserved for future generations.

The Northern District has a long history of human occupation spanning the last 1.5 million years. The district represents a number of important cultural landscapes, which have their origins in the early outposts, associated with the Dutch East India Company station at Table Bay. Many of the current farmsteads and the associated vineyards and agricultural land are of historic and cultural importance. Many of these landscapes also contain occasional silcrete outcrops which were very often quarried by pre-colonial communities. There is also a high archaeological potential associated with 18th and 19th century homesteads. The cultural landscapes of the district are under pressure from urban and industrial development and many of the old farmsteads have been inappropriately altered or destroyed.

The Northern district includes some of the oldest areas of expansion that were contemporary together with historical towns such as Stellenbosch and Paarl. Unlike the latter two areas very little of coherent historical character has been preserved in the urban nodes within this district.

The southern extent of the Northern District has experienced extensive urbanization from the 1980s onwards. Durbanville, the oldest urban node in this district, was developed in 1836. It was declared a municipality in 1901. Bellville was established as a village in 1860 along the main road (known as Maitland Road) at the 12th mile stone. While some of the heritage qualities of Durbanville have survived, these are remnants only and a lack of coherent management in the old town center has resulted in a very low heritage quality of urban form. Bellville itself can claim as heritage the remnant of the old outspan (Hardekraaltjie), the old mile stone and an old streetlamp¹.

¹ These have been formally protected as heritage objects under the previous NMA, and are now protected under S27 of the NHRA.

3.1.9.1 Rural cultural landscapes

The expansion of the settlement at the Cape into the interior is marked by the earliest and densest expansion into the more fertile, well-watered areas, with more marginal areas being occupied later. The Northern District has cultural landscapes which cut across municipal boundaries with Swartland, Drakenstein and Stellenbosch municipalities. The cultural landscapes and the associated historical farmsteads are significant heritage resources in this district. Given the proximity to the Cape Town Central Business District (CBD) and central business districts within the Northern District, these cultural landscapes are at risk and have already been greatly eroded by inappropriate development and urban sprawl with the resulting loss of not only heritage qualities, but also agricultural potential.

- Durbanville Hills Cultural landscape
This cultural landscape represents some of the oldest and densest collection of historic homesteads within the district. These farms were mostly granted in the early 18th century (compared to the Liesbeeck and Constantia farms which were granted in the late 17th century).
- Joostenberg Vlake Cultural landscape
De Mosselbank was the earliest farm granted in the Joostenberg Vlake area (1698). This area is still largely agricultural, with increased occurrence of small holdings to the south of the R312 (Lichtenburgh Road – Scenic route).
- Paardeberg/Agter-Paarl Cultural landscape
- Klipheuwel Radio Station
- Bottelary Hills cultural landscape
- Koeberg/Swartland farms Cultural landscapes
- Philadelphia cultural landscape

3.1.9.2 Urban cultural landscapes

Philadelphia originated in the 1850s as a church town, on a portion of the farm Dassenberg, in the northern quadrant of this District. The town grew very slowly and by 1900 it only had 12 houses. The rural charm of this village and its relative proximity to the urban nodes (Durbanville and Cape Town) has made it an attractive location.

3.1.9.3 Heritage management

“The National Heritage Resources Act (NHRA, Act 25 of 1999) introduces an integrated and interactive system for the management of the national heritage resources; to promote good government at all levels; and to empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations...to provide for the protection and management of conservation-worthy places and areas by local authorities...”

The National Heritage Resources Act, Act 25 of 1999 (NHRA) identifies a three tier system for the management of heritage resources and prescribes the criteria for assessing

heritage resources. SAHRA, in consultation with the Minister and MEC of every province must publish regulations distinguishing between at least three grading categories.

- The South African Heritage Resources Agency (SAHRA) is responsible for the identification and management of Grade I heritage resources and the co-ordination and monitoring of the management of the national estate in the Republic.
- Heritage Western Cape (HWC) is responsible for the identification and management of Grade II heritage resources.
- The local authority (in this case the City of Cape Town) is responsible for the identification and management of Grade III heritage resources and heritage resources which are deemed to fall within their competence in terms of the NHRA.

Heritage resources within the City of Cape Town are managed both under the **NHRA** and the **Municipal Planning By-law (MPBL)**. While the management of Grade III heritage resources are currently undertaken by HWC, the NHRA prescribes that Grade III heritage resources must be carried out by the local authority where it is competent to do so.

In 2013, the City of Cape Town was the first local authority to apply for competence in terms of the NHRA, and to have its competence successfully reviewed. One of the criteria for maintaining competence in terms of the NHRA is having an effective tool for managing heritage at local level. The Heritage Protection Overlay Zoning (HPOZ) is the tool within the Development Management Scheme of the MPBL for the protection of heritage places and spaces, the HPOZ is designed to align with the requirements in the NHRA for managing heritage resources formally protected in terms of the Heritage Register (S30) and Heritage Areas (S31).

The following two sections outline the two parallel streams of heritage management:

a) National Heritage Resources Act, Act 25 of 1999

The NHRA comprises two levels of protection: Formal Protections and General Protections. The general protections include buildings older than 60 years (S34); archaeological and palaeontological sites (S35); and burial grounds older than 100 years and graves of victims of conflict (S36). The City must ensure that all decision-making is informed and compliant with national legislation.

A list of places and spaces formally protected under the NHRA is included in Table 9 below.

Formal Protections

- Section 27: Provincial Heritage Sites: These are heritage sites have been formally protected in terms of Section 27 of the NHRA. While many were declared under the previous National Monuments Act (1969) they are Provincial Heritage Sites under the NHRA and are managed by HWC. These are places that are of exceptional heritage significance and are relevant across the Western Cape region.

- Section 30: Provincial Heritage Register: The Provincial Heritage Register is the formal protection in terms of the NHRA for individual local heritage resources (Grade III). HWC maintains the Heritage Register, which is a list of all the formally protected (Grade II) heritage sites as well as any other Grade III heritage resources. Sites are only placed on the Heritage Register once they have been gazetted in the Gazette (Provincial).
- Section 31: The Heritage Area is the protection mechanism for geographical areas or places of environmental or cultural interest. HWC or The City (provided it has retained heritage competency) may, by notice in the *Provincial Gazette*, designate any area or land to be a Heritage Area on the grounds of its environmental or cultural interest, or the presence of heritage resources.

General Protections

- S34: Buildings/structures older than 60 years

In terms of Section 34 of the NHRA a permit is required from HWC for alterations or demolition of any structure or part of a structure that is older than 60 years.

The City maintains a digital heritage inventory of all buildings older than 60 years.

Not all buildings that are older than 60 years are conservation worthy. The NHRA makes provision for lifting the requirements for S34 approvals within a defined geographical area on condition that the relevant heritage authority (HWC) is satisfied that heritage resources within that defined geographical area have been adequately provided for in terms of the formal protections of the Act. The formal protection for Grade III heritage resources is the Heritage Register (S30) and Heritage Areas (S31).

- S35: Archaeological and palaeontological sites

In terms of Section 35 of the NHRA all archaeological objects are the property of the State and a permit is required (from HWC) to destroy, damage, excavate, alter, deface or otherwise disturb any archaeological site.

In the undeveloped areas within and immediately abutting the Cape Town International Airport fossilised bone dating to the Quaternary² period has been recorded.

Isolated archaeological tools dating to the Earlier Stone Age have been observed in the agricultural areas immediately abutting this District. These tools are evidence of early human ancestors and indicate the antiquity of human occupation (2-3 million years ago) in this district. Historical records confirm that this area too formed part of the seasonal migration of the Khoekhoe herders.

There is very little potential for finding intact archaeological and palaeontological sites in this district, given the extensive transformation of the landscape by

² This is the period in the geological history of the world that covers the last 2 million years.

urbanisation. There is some potential for uncovering archaeological sites pertaining to the 18th and 19th century. Platteklouf farm for example was still intact as an archaeological site until the early 2000s. The conservation of an archaeological reserve which included the conservation of the old stone werf wall, site of the historical home (which burnt to the ground in the early 1900s) and an outbuilding popularly referred to as the slave lodge were recommended in the plans for the redevelopment of the site.

b) Municipal Planning By-Law

The City of Cape makes provision for the consideration of heritage in its general process and criteria for deciding applications under S99 of the MPBL. In addition to this, it provides for the further protection of heritage through its Heritage Protection Overlay zoning in the Development Management Scheme.

3.1.9.4 Scenic Drives Overlay Zoning

The development of a scenic drives network aimed to link the diverse parts of the Cape Town Metro through the promotion of the scenic qualities and tourism potential along the existing road network.

The following criteria are used to identify a scenic route:

- Outstanding scenic qualities in terms of views (cultural or natural landscapes)
- Scenic qualities with a strong sense of place
- Range of scenic qualities
- High natural or cultural landscape qualities
- Links between major scenic, historical (or recreational) points of interest

The Northern District has a number of Scenic Drives and Routes which should be used to inform development proposed along its edges.

Table 9: Scenic Routes in the Northern District

Category	Route
S1	N1 Freeway
S1	Tyger Valley Road
S1	Contermanskloof Road
S1	Vissershok Road
S2	St Johns/Race Course Road
S2	Durban Road (N of N1)

S2	R302 Wellington Road
S2	R302 Klipheuwel Road
S2	R312 Lichtenburgh Road
S2	R304

Guidelines for the management of these routes are contained in the City's Scenic Drives Network Management Plan.

Table 10: Formally protected Heritage Sites in the Northern District (excluding memorials)

Heritage site	Address	Description
Onze Molen Mill	Onze Molen Way, Durbanville	Former corn mill with truncated cone around platform with timber sail structure.
Durbanville Dutch Reformed Church	Weyers Avenue, Durbanville	Mid 19 th century church associated with the origins of Durbanville as a village. Good example of traditional church with burial vaults, landmark building.
Rust & Vrede Complex	25 Oxford Street, Durbanville	Former Magistrates Court, good example of its period.
Kings Court	Corner of Church Street and Louw Street, Durbanville	Late 19 th century residential densification of Durbanville. Very good architectural example. Landmark building contributing to the historical interest of the streetscape.

3.2 Key Development Pressures and Opportunities

3.2.1 Development Pressures and Constraints

3.2.1.1 Biodiversity

- Industrial and urban expansion resulting in urban sprawl, particularly in north-east of the District (Fisantekraal) and close to the Durbanville Hills;
- Invasive alien species are found in many of the open areas throughout the district, and particularly along river courses. These areas maintain a seed bank of invasive plants which pose a threat to important biodiversity sites;
- Invasive alien fish in the Diep River (e.g. carp, banded tilapia and mosquito fish) threaten aquatic biodiversity;
- The fragmented nature of the biodiversity remnants makes these difficult to manage and protect;
- Illegal dumping and land-based pollution.

3.2.1.2 Hydrology

- Increasing demand for water from groundwater and rivers for agricultural and domestic use;
- Population growth and urban/economic development (around the Durbanville CBD, Tygerberg Waterfront and informal settlements and proposed new development along the Mosselbank);
- Encroachment of invasive alien vegetation and fauna (e.g. *Acacia saligna* along the Mosselbank and Diep Rivers);
- Increasing pollution and waste/ effluent generation;
- Illegal dumping along rivers resulting in pollution;
- Poor service provision in informal areas especially in Fisantekraal, Wallacedene, Klipheuwel etc. leads to pollution of stormwater systems and rivers. Lack of understanding of impact by residents.

3.2.1.3 Heritage and cultural resources, Agricultural and Mineral Resources

- Increased urban pressure, densification pressure and industrialisation particularly in the Durbanville Hills cultural landscape, Bottelary Cultural Landscape, Joostenberg Vlakte Cultural Landscape, Klipheuwel Radio Station and Koeberg/Swartland Farms Cultural Landscape.;
- Loss of agricultural viability and landscape owing to subdivision of farms; and
- Pressure to subdivide small holding in portions which will detract from their agricultural character, i.e. Westerdale Smallholdings.
- Illegal demolition and alteration of identified and unidentified heritage resources.
- Insensitive/inappropriate design, bulk and layout of new structures being erected within a sensitive heritage context.
- Destruction/removal of historical tree lanes/avenues.
- Increased pressure for development within a cultural landscape.

3.2.2 Integrated Opportunities

Conservation of core environmental features and assets (including POS, rivers, wetlands, biodiversity etc.) will yield the following integrated benefits for the future growth of the city and its residents:

- a. Positive economic development through tourism, job creation, GDP growth linked to:
 - o Establishment of ecological corridors;
 - o Integration of biodiversity with the Metropolitan Open Space System;
 - o Environmental education;
 - o Rehabilitation and conservation, including proclamation of biosphere reserves; and
 - o Sustainable harvesting of medicinal and flowering plant species.
- b. Strengthens the city resilience to and mitigate risks associated with natural and unnatural disasters:
 - o Wetlands and rivers are able to improve the water quality of contaminated stormwater, within limits;
 - o Rivers and wetlands are able to provide flooding control;
 - o Rivers provide fauna and flora habitat and can serve as corridors, connecting ecosystems;
 - o Rivers in the Northern District provide a limited volume of water which can be used for other purposes, e.g. irrigation for agriculture;
 - o Rivers provide amenity value; and
 - o Rivers and wetlands can convey, dilute and assimilate limited volumes of suitably treated effluent.
- 2.
- c. Positive social development by:
 - o Development of scenic route network;
 - o Retention of sense of place and space;
 - o Tourism and job creation;
 - o Potential for stimulating ecologically sustainable farming practices in conjunction with conservation of historical agricultural setting; and
 - o Adding value to place through conservation and development features of historical value; and
 - o Archaeological, historical, architectural research.

3.3 Spatial Implications for District Plan

The following table documents the key spatial implications for the district plan in order to mitigate any potential negative impact on the natural and cultural environment; and enhance the opportunities associated with conservation of natural and cultural resources.

Table 11: Environmental Spatial Implications

NATURAL/CULTURAL RESOURCE	SPATIAL IMPLICATION
A. Biodiversity 	1. Conserve remnants of sensitive and threatened vegetation types; 2. Where these remnants conflict with areas earmarked for industrial and residential development, ensure environmental impact assessments are executed, identifying appropriate mitigation measures are undertaken, before these activities are approved; 3. Avoid development outside of the urban footprint; 4. Consolidate and re-enforce the open space “green corridors”, connecting biodiversity remnants where possible (e.g. through the Darwin Road Development area, along the tributaries of the Mosselbank River and along the Elsieksraal and Kuils River corridors); 5. Introduce indigenous landscaping into public open space, particularly along river courses; 6. Control and remove alien invasive vegetation (particularly along the river course of the Mosselbank and Diep Rivers); 7. Control illegal dumping, particularly in and adjacent to important biodiversity sites and rivers; and 8. Where feasible, enter into partnerships with agricultural landowners to encourage the conservation of biodiversity remnants on existing farms.
B. Rivers, Wetlands and Ground Water 	1. Establish and maintain appropriate river and wetland buffers and prevent inappropriate land uses in these areas; 2. Improve agricultural practices to reduce sedimentation and water quality problems in the Diep and Mosselbank Rivers; 3. Ensure that newly built dams make environmental flow releases; 4. Clear invasive alien vegetation within the river corridors (Diep, Elsieksraal, Kuils and Mosselbank Rivers) and restore the riparian zone by reintroducing indigenous riparian vegetation; 5. Orientate proposed new development (industrial and residential) along the lower reaches of the Mosselbank River towards the river, and include the river corridor, at every possible opportunity; 6. Maintain and upgrade public open spaces along the upper reaches of the Elsieksraal and Kuils Rivers; 7. Encourage the use of indigenous plants in landscaping along the upper reaches of the Elsieksraal and Kuils Rivers; 8. Ensure effluent from industrial development is not discharged in the stormwater system or directly into rivers; 9. Establish and maintain appropriate river and wetland buffers and prevent inappropriate land uses in these areas; 10. Improve agricultural practices to reduce sedimentation and water quality problems in the Diep and Mosselbank Rivers; 11. Ensure that newly built dams make environmental flow releases; 12. Clear invasive alien vegetation within the river corridors (Diep, Elsieksraal, Kuils and Mosselbank Rivers) and restore the riparian zone by reintroducing indigenous riparian vegetation;

	13. Orientate proposed new development (industrial and residential) along the lower reaches of the Mosselbank River towards the river, and include the river corridor, at every possible opportunity; 14. Maintain and upgrade public open spaces along the upper reaches of the Elsieskraal and Kuils Rivers; 15. Encourage the use of indigenous plants in landscaping along the upper reaches of the Elsieskraal and Kuils Rivers; 16. Ensure effluent from industrial development is not discharged in the stormwater system or directly into rivers.
C. Heritage and Cultural Landscapes 	1. Incorporate the scenic route network in planning for the future; 2. Retention of sense of place and space; 3. Tourism and job creation; 4. Potential for stimulating ecologically sustainable farming practises in conjunction with conservation of historical agricultural setting; and 5. Adding value to place through conservation and development features of historical value; 6. Protect cultural landscapes and rural interfaces. 7. Designate Heritage Protection Overlay Zones where applicable (i.e. Philadelphia) 8. Retain and rehabilitate historic tree lanes and avenues 9. Ensure that heritage resources (cultural landscapes) are coherently managed across municipal boundaries (good co-operative governance) 10. Investigate opportunities for heritage regulation exemptions in urban areas.
D. Mining and Agriculture 	1. Preserve and utilise high potential agricultural land and areas currently being used for agricultural purposes 2. Sand mining activities in the agricultural areas need to be dealt with in a sensitive manner.

C: STATE OF THE BUILT ENVIRONMENT

4 LAND USE AND DEVELOPMENT TRENDS

The Northern District is a diverse area bordered by a large agricultural hinterland that comprises of a number of wine farms, two smallholding areas (Westerdale and Mikipunt), and the rural villages of Philadelphia and Klipheuwel.

The urban footprint comprises of a large residential component, representing different typologies ranging from low density areas, especially to the north of the N1 freeway, and higher densities more to the south of the freeway. The district also accommodates a number of industrial areas, of which Atlantic Hills is still largely vacant. The development of the Fisantekraal industrial area is also occurring at a slow pace, whilst infill in the Kraaifontein industrial area has almost been concluded.

The Tyger Valley commercial node is the largest in the district, and still offers opportunity for extension, not only to the retail centre, but also in terms of the availability of land at the University of Stellenbosch Business School and at the Bellville Velodrome.

What follows hereunder is an indication of the status quo as well as emerging trends in the broader district. The following subsections provide an overview of the key development trends per land use in the district.

4.1 Residential

See building plan approval data in Figure 20 below.

Larger concentrations of development occurred over the last 5 years in newer residential developments (private market) such as Clara- Anna Fontein (Durbanville), Pinehurst, part of Protea Heights (Brackenfell), Graanendal, Buh- Rein Estate, and in the lower income areas of Fisantekraal and Scottsdene (subsidised housing).

With regard to industrial development, the focus was primarily on area such as Atlas Park & Atlantic Hills, as well as Morgan Industria, located along the R300 (Brackenfell area).

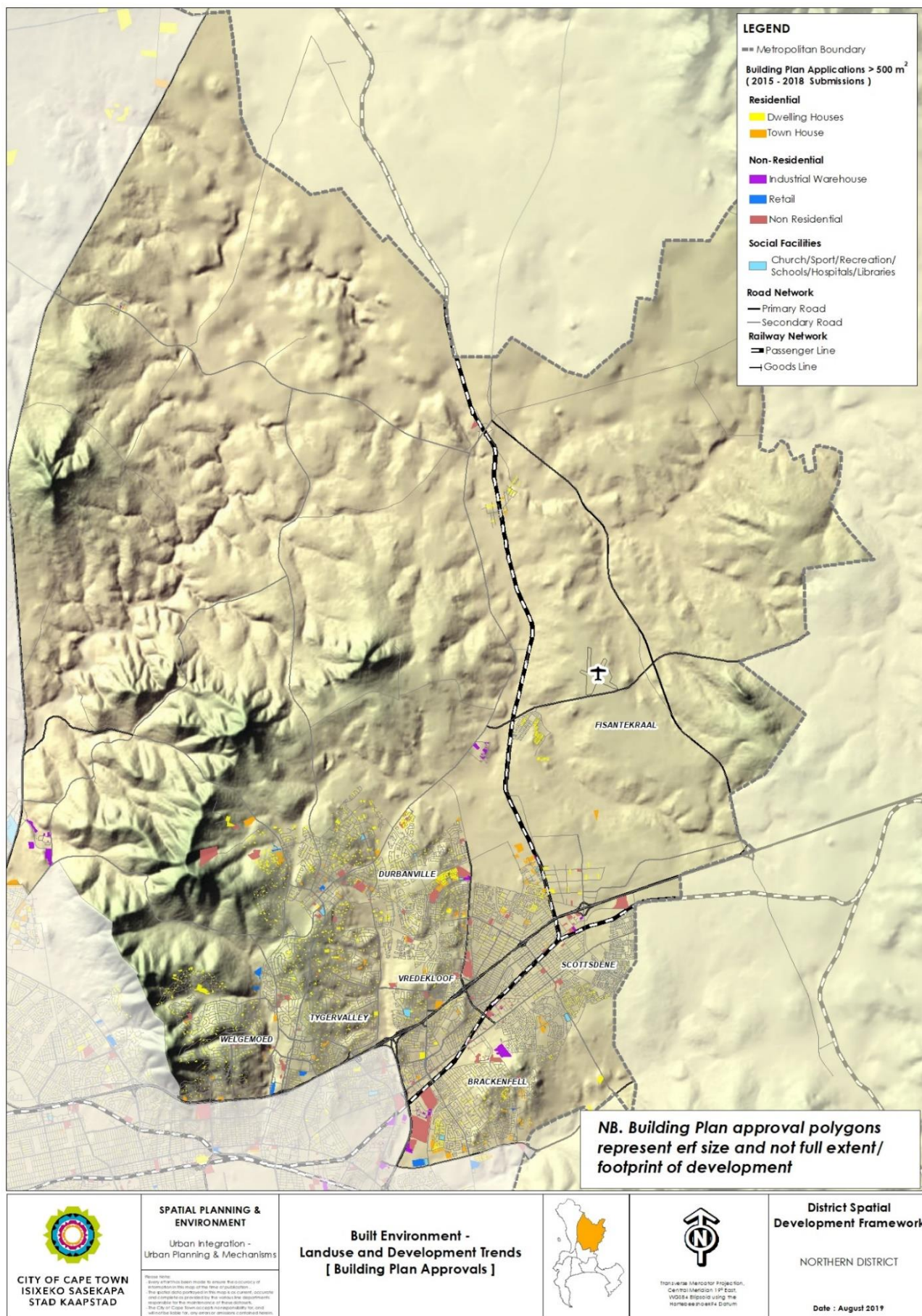


Figure 20: Building Plan Approvals in the Northern District

Public housing projects over the last 5 years include inter alia a subsidized housing project at Morningstar, Durbanville, as well as infill development, at larger scale, in Wallacedene/ Bloekombos (Maroela North & South, awaiting implementation). The so-called Darwin Road development is also in the process of consideration.

Infill development, of different typologies and urban form, also was concluded in Scottsdene. Another subsidized housing project is underway in the Northpine area (Everite site), that will also cater for different income groups. In Fisantekraal, the Greenlands public housing project, located adjacent to Fisantekraal township, is also progressing, and will eventually also provide for different typologies of different densities, where a private market component is included in the later phases of development.

Applications for higher density housing infill developments (open market) (including approvals and applications) have also occurred, especially along Langeberg Road, the Durbanville CBD, Buh-rein estate (along Darwin Road), along De Bron Road (Andrag grounds) as well as south of the Kraaifontein WWTW. These developments are focused on a more affordable market, but yet remain mostly unaffordable to the lower-income bracket. What is important to note, is that the Buh-rein estate was approved at a gross density of 45 units/ ha, but since development has started, numerous applications were made for amendments, and the eventual gross density has been lowered considerably, which may be ascribed to market demand. Therefore, the assumption is made that market demand for higher density development mostly occurs in the commercial nodes such as the Durbanville CBD, the Okavango Road node and Tyger Valley, as well as greenfields where larger portions of land is still available within the urban footprint. It should be noted that in certain instances, land use approvals for developments have been obtained, but implementation is still in process/awaited.

Higher income (low density) developments are occurring on the periphery of Durbanville, such as Clara -Anna Fontein and extensions to Graanendal (Durbanville).

Lower income, more inclusionary developments include Greenville at Fisantekraal. These developments will provide a variety of typologies, catering over time for a wider range of income groups.

The assumption is that the majority of private initiatives are focused on a specific income bracket in the residential property market. It is also clear that large land parcels identified in the 2012 District Plan for infill development, have now either been developed, or is in the process of development (meaning that land use approvals have been obtained, or applications are being considered).

Another trend in the private market segment is the demand for retirement villages, especially in the Durbanville environment.

Another interesting observation is where environmental approval has been obtained for higher density residential development on a large track of land, i.e. the so-called Crammix site, but land use approval could to date not be acquired due to inter alia issues around accessibility.

In conclusion it can be said that more affordable residential developments are still happening in the remote areas, distanced from employment opportunities and commercial centers.

4.1.1 Second dwellings

The Northern District has seen an increase in second dwelling applications. This might be due to primary rights in terms of MPBL being taken up, a decrease in affordability for young families and or first time home owners, or may serve as extra income to primary households.

In addition, the Northern District has experienced a definite increase in subdivisions of single residential properties, as well as smaller group housing developments, especially in areas where larger plots are still available, such as Welgemoed, Vygeboom and Vierlanden. This trend may be attributed to higher costs in terms of municipal rates and taxes, as well as the potential income that will be derived from such subdivision. The approval of council's Densification Policy may also have contributed to this trend.

4.2 Industrial

The industrial nodes in the district are the Kraaifontein Industria area immediately south of the N1 freeway, Brackenfell Industria/ Everite, Okavango Park (along Okavango and Old Paarl Roads), Cilmor (east of R300) and Atlantic Hills Industrial area located adjacent to Atlas Gardens Business Park, along the Contermanskloof Road, not directly serving the district. The Fisantekraal Industrial Park is located adjacent to the Fisantekraal settlement, and comprises of, to a large extent, storage & distribution facilities.

New industrial development is occurring at the Atlantic Hills development, adjacent to Atlas Gardens Business Park. Infill development is mainly focused along the R300 at Brackenfell (Morgan Industria) and Fisantekraal, as well as to the east of Maroela Road, along Sandringham Street (Kraaifontein industria). It needs to be noted that the 'older' Kraaifontein industrial area has, over the last 5 years almost completely redeveloped. This should serve as an indicator of market demand in the area. Furthermore, it should be noted that, according to City of Cape Town Industrial Surveys (2016), the land uses in the different industrial areas are dominated by the 'wholesale and retail trade & repair of vehicles', e.g. Kraaifontein Industrial Area: 49% wholesale & retail trade, followed by 24% manufacturing and 16% transportation & storage (2016 figure). These figures may have changed slightly with the addition of more distribution orientated uses in the area.

4.3 Retail and Office

Retail centres in the district include Cape Gate, Durbanville CBD, Tyger Valley and Willowbridge, as well as retail strip developments along inter alia Okavango Road. Smaller neighbourhood centres have over time developed in areas such as Graanendal, Pinehurst, Sonstraal Heights, Uitzicht, etc.

The private hospital, and related medical uses, such as oncology centre along Okavango Road forms part of this employment centre.

New commercial development is occurring in the Durbanville CBD, as well as within the secondary CBD, in the form of smaller office developments, as well as some medium density residential units (flats). This trend may have a detrimental effect on the energy within the core of the CBD, as it may be argued that such 'decentralised' developments will eventually erode the area of residential capacity, as well as the mixed use capacity/ nature of the core area. New commercial development, mainly retail, has also occurred along Okavango Road in the Gape Gate commercial node. Smaller commercial pockets of development are also occurring along the extended Jip de Jager Road.

The Tyger Valley Retail Centre has received land use approvals for extending the centre. However, implementation is still awaited. Commercial development has also occurred at the Willowbridge precinct, i.e Willowbridge Place, now accommodating a 4-storey commercial building.

The "Galleria" development at the Bellville Velodrome is still awaited, and the University of Stellenbosch Business School property is now also expected to be developed as a mixed use nodal area. However, transport capacity issues are still under investigation, in order to, in future accommodated a development of higher bulk figures.

One cannot expect that the economically active population in the district is only employed in these centers and the above discussed industrial nodes, as other industrial areas such as those in Tygerberg district, Epping 1, Montagu Gardens, Paarden Island and commercial centers such as Bellville and Cape Town CBD area drawing employees from across the metropolitan area. Furthermore, residents in the district may also be employed in areas such as Paarl and Stellenbosch, but are residing in areas such as Brackenfell, due to, inter alia, reasons of affordability. It is further acknowledged that industrial nodes in the cape metropole should not be regarded as pure industrial areas, as large areas are being taken up by commercial uses, which in many cases include some form of retail.

4.4 Mixed Use

There has been a slow uptake in what could be considered genuine mixed use developments. Two factors are considered to play a role:

- The models for financing, residential versus commercial developments differ;
- Existing legislation does not force a mix of uses but rather allows developers to pick financially viable uses from a list of primary rights within a particular zone.

Unless incentives are provided or legislation is changed, the vision of creating developments that provides a rich variety of uses is considered out of reach.

As discussed above, some medium density residential units (flats) are accompanying the development of small office spaces in the secondary CBD of Durbanville, which represents some form of mixed use development. The University of Stellenbosch Business School property is now also expected to be developed as a mixed use nodal area. However, transport capacity issues are still under investigation, in order to, accommodate a

development of higher bulk figures. Enquiries for mixed use development to the north of Joostenbergvlakte have also been received, which is regarded as positive as employment in the district is much needed.

4.5 Smallholdings

The district accommodates three smallholding areas:

- Westerdale smallholdings along Vissershok Road, that are protected from subdivision by the approved Westerdale smallholding policy. In many cases the smallholdings are merely utilised for 'estate' living.
- Botfontein smallholdings (of much smaller scale) along Botfontein Road, where, in certain instances some form of agricultural activity still applies. It needs to be noted that, in terms of the approved MSDF (2023), the section to the west of Botfontein Road may be considered for 'employment creating' land uses.
- Mikipunt smallholdings located to the east of the Klipheuwel Road to the north of Fisantekraal.
- The Joostenbergvlakte 'smallholding area' is, per definition not regarded as smallholdings, due to the large extent of properties being much smaller than 2 ha (the generally accepted extent), and being utilised in many instances for 'estate living'. Pressure on the area for different forms of urban development has been increasing.

4.6 Agricultural land

The agricultural hinterland takes up most of the space in the Northern district and comprises mainly of farmland and the area earmarked for the extraction of 'Minerals/Construction Materials' in the Tygerberg area, the smallholding areas of Westerdale and Mikipunt, and the area known as Klipheuwel accommodating an informal settlement. Pressure for 'low' impact urban development on especially the wine farms along Tyger Valley Road has been ongoing, which has been resisted to date. The city is in favour of the development of tourist related land uses on the farms.

4.7 Development Pressures

Areas currently experiencing the greatest extent of development pressures linked to limited infrastructure, land and/or services capacity are listed below:

- Joostenbergvlakte and area north thereof;
- Higher density infill residential development in low density single residential suburbs being regarded as densification;
- Secondary CBD of Durbanville for office development.

4.8 Existing Development Potential (Vacant Land & Underutilised Rights)

Note that vacant land, where land use approvals are in place or submitted, or development proposals are being considered, are still included in this discussion. The discussion hereunder does not include open spaces, unbuilt road reserves, cemeteries, nature reserves, etc. These are all vacant properties/ portions of properties, but cannot be regarded as still being available land for development. However, in the case of undeveloped open spaces, such open spaces may, in future, be considered for development, but will beforehand be subject to evaluation in terms of open space provision in the specific area, community needs etc.

The largest vacant land parcels in the Northern District are located directly to the east of Malmesbury railway line (south of Fisantekraal), and indicated as 'Consolidation Areas' in the MSDP (2023). This poses the biggest opportunity for higher density, especially more affordable, housing typologies as well as mixed use development for employment creation. However, a lack of bulk services, accessibility, bulk water and sewerage may be the biggest challenge in the short term. The vacant land to the west and east of the Malmesbury rail line (north of the Buh-rein Estate, i.e. Remainder Paarl Farm 728/8 and Paarl Farm 725/50 & 64) is still vacant, but a development application for different typologies of subsidized human settlement development, is in the process of being considered. The vacant properties to the west of Darwin Road, opposite the Buh-rein Estate is still vacant and regarded as available for development.

Some smallholding properties and larger underutilized properties are also still 'available' for development along Langeberg Road in Kraaifontein. Along De Bron Road, north and west of Vredeloof, Remainder of Cape Farm 311, portions 2 and 11 (known as Andrag properties), and Remainder Cape Farm 317, are also still vacant. Development proposals have been submitted for consideration, but have recently been withdrawn. Vacant properties to the north of Hexrivier Road/ Mostert Street in Bonnie Brae (Kraaifontein) are also still vacant, although development applications have been approved/ is under consideration for these properties. Under- utilised properties in Goliath Estate are also still regarded as having potential for redevelopment/ densification. The City of Cape Town is also the owner of a 4ha property along Okavango Road (remainder Cape Farm 311/47, that also has potential for development.

Although a proposed development of approximately 5000 residential units (mostly higher densities) received an environmental authorization for the Crammix- site in Brackenfell (west of Kruin Street) (SF 214/4 & 6, SF 1503, SF 1504/21), land use approval for the development has not been obtained to date, mostly due to access issues remaining unresolved, the land remains vacant. Also along Kruin Street is another smallholding, i.e. SF 214/12 of 5.4 ha that is still vacant. Development proposals for the site is however in the process of consideration. To the east of Kruis Road in Brackenfell are also a number of vacant smallholdings, such as Remainder SF 228 (22ha), Remainder erf 23122 (7ha), as well as others, totaling approximately 40ha (SF 222, portions 12, 33, 47, 48, 49, 50, 51, 84, 102).

Additional vacant land is found in and around the Stellenbosch Business School site & Tyger Valley environment, i.e. Transnet property to the north east of Willowbridge and land

adjacent to the Bellville Velodrome/ - Stadium, known as the Galleria development, for which a land availability agreement is in place.

Other opportunities are focused on infill development, especially in the low density residential areas, where larger plots are still available, such as erven 4623- 4625 (city owned), located east of St John's Road in Durbanville, adjacent to the race course. This should be regarded as opportunities for incremental densification, but the cumulative impact on the residential fabric should also be considered.

The Durbanville Secondary CBD, as depicted in the 2012 District plan, offers opportunity for redevelopment in the form of higher density residential typologies.

Vacant land around stations in the district, such as erven 13686/7 & 11297 at the Brackenfell station, and vacant city owned properties to the south of Kraaifontein station offer opportunity for infill and higher density developments.

In Brackenfell, the smallholdings located to the west of Botfontein Road can be considered for development, but, in terms of the MSDF (2023) (Table 8), only if such development(s) will be 'employment- generating' land uses.

With regard to Fisantekraal and surrounds, in terms of the MSDF (Table 8), it is stated that certain sites in the vicinity are no longer of 'agricultural significance', and consideration would therefore be given to employment-generating land uses. In this regard ample land in the Fisantekraal industrial node is still vacant, although some properties have obtained land use approval. Further to the north, the property known as Apollo Bricks, have also recently obtained land use approval for industrial development. That leaves the question whether the larger area, comprising of smaller unproductive and unviable agricultural units should be earmarked (or not) for a larger future employment node to address unemployment in the Fisantekraal area.

The land located north of Fisantekraal, i.e. the so-called Bella Riva development, obtained land use approval as well as recently the approval for subdivision of agricultural land. It is expected that the existing land use approval will be amended via a new land use application to provide for a higher density development.

4.9 Key Challenges and Opportunities within the Northern District

4.9.1 Opportunities³

- The largest vacant land parcels in the Northern District are located directly to the east of Malmesbury railway line (south of Fisantekraal), and indicated as 'Consolidation Areas' in the MSDf (2023). This poses the biggest opportunity for higher density, especially more affordable, housing typologies. However, a lack of bulk services, inter alia accessibility, may be the biggest challenge in the short term. The vacant land to the west and east of the Malmesbury rail line (north of the Buh-rein Estate, i.e. Remainder Paarl Farm 728/8 and Paarl Farm 725/50 & 64) is still vacant, but a development application for different typologies of subsidized human settlement development, is in the process of being considered. The vacant properties to the west of Darwin Road, opposite the Buh-rein Estate is still vacant and regarded as available for development.
- Some smallholding areas and larger underutilized properties are also still 'available' for development along Langeberg Road in Kraaifontein. Along De Bron Road, north and west of Vredeloof, Remainder of Cape Farm 311, portions 2 and 11 (known as Andrag properties), and Remainder Cape Farm 317, are also still vacant. Development proposals have been submitted for consideration. Vacant properties to the north of Hexrivier Road/ Mostert Street in Bonnie Brae (Kraaifontein) are also still vacant, although development applications have been approved/ is under consideration for these properties. Under- utilised properties in Goliath Estate are also still regarded as having potential for redevelopment/ densification. The City of Cape Town is also the owner of a 4ha property along Okavango Road (remainder Cape Farm 311/47, that also has potential for development.
- Although a proposed development of approximately 5 000 residential units (mostly higher densities) received an environmental authorization for the Crammix- site in Brackenfell (west of Kruijn Street) (SF 214/4 & 6, SF 1503, SF 1504/21), land use approval for the development has not been obtained to date, mostly due to access issues remaining unresolved, the land remains vacant. Also along Kruijn Street is another smallholding, i.e. SF 214/12 of 5.4 ha that is still vacant. Development proposals for the site is however in the process of consideration. To the east of Kruijn Road in Brackenfell are also a number of vacant smallholdings, such as Remainder SF 228 (22ha), Remainder erf 23122 (7ha), as well as others, totaling approximately 40ha (SF 222, portions 12, 33,47,48,49,50,51,84,102).
- Additional vacant land is found in and around the Stellenbosch Business School site & Tyger Valley environment, i.e. Transnet property to the north east of Willowbridge and land adjacent to the Bellville Velodrome/ - Stadium, known as the Galleria development, for which a land availability agreement is in place.
- Other opportunities are focused on infill development, especially in the low density residential areas, where larger plots are still available, such as erven 4623- 4625 (city

³ Note that vacant land, where land use approvals are in place or submitted, or development proposals are being considered, are still included in this discussion. The mapping (Map 5) does not include/ show open spaces, unbuilt road reserves, cemeteries, nature reserves, etc. These are all vacant properties/ portions of properties, but cannot be regarded as available land for development. However, in the case of undeveloped open spaces, such open spaces may, in future, be considered for development, but will beforehand be subject to evaluation in terms of open space provision in the specific area.

owned), located east of St John's Road in Durbanville, adjacent to the race course. This should be regarded as opportunities for incremental densification, but the cumulative impact on the residential fabric should also be considered.

- The Durbanville Secondary CBD, as depicted in the 2012 District plan, offers opportunity for redevelopment in the form of higher density residential typologies.
- Vacant land around stations in the district, such as erven 13686/7 & 11297 at the Brackenfell station, and vacant city owned properties to the south of Kraaifontein station offer opportunity for infill and higher density developments.
- In Brackenfell, the smallholdings located to the west of Botfontein Road can be considered for development, but, in terms of the MSDF (2023) (Table 8), only if such development(s) will be 'employment- generating' land uses.
- With regard to Fisantekraal and surrounds, in terms of the MSDF (Table 8), it is stated that certain sites in the vicinity are no longer of 'agricultural significance', and consideration would therefore be given to employment-generating land uses. Natural resources should attract more tourism and investment.
- Greenfield (vacant land) infill development is still available to the south of Graanendal, Durbanville, as well as the area between Fisantekraal and the Joostenbergvlakte smallholdings. It needs to be noted that no bulk services are available in the latter instance, and therefore the developer(s) will be held responsible for the provision of bulk services. In order to assist feasibility, higher density forms of development should be considered.
- Vacant smallholdings are also still available along Langeberg Road (Kraaifontein), in close proximity to the Okavango Road precinct. Some vacant properties remain undeveloped in the vicinity of De Bron Road, although a development application for the larger property to the north of De Bron Road has been submitted for consideration, but lately been withdrawn.
- In the Tyger Valley node, the largest greenfield sites are the US Business School property, as well as the vacant property of which Transnet is the owner. It needs to be noted that required transport infrastructure may have an impact on the potential bulk of development that may be considered on these land parcels.
- Furthermore, incremental densification (small-scale densification that has a relatively low impact on the character of the area) (Densification Policy, 2012) should also be considered in low density environments, where larger underutilised properties are available for redevelopment. The form of such developments will need to be sensitive to the surrounding urban fabric.

4.9.2 Challenges

- The availability of large greenfield sites to provide opportunities for affordable human settlement development, in closer proximity to existing or future public transport facilities, does not exist anymore.
- A lack of bulk infrastructure in the area to the north of Joostenbergvlakte will have a definite impact on development potential/ timeframes for development.
- Traffic congestion throughout the district is increasing.
- The growing levels of unemployment in the district brings to the fore the need for employment centres in closer location to the lower income communities.
- The protection of high potential agricultural land needs to receive priority.

5 TRANSPORT AND ACCESSIBILITY

5.1 Introduction

This chapter provides a status quo analysis of the mobility and accessibility networks within the Northern District.

There is a strong focus on transport as an informant of the CTMSDF, using the TOD Strategic Framework (2016), in line with international planning trend which recognizes the need for spatial planning tools to support public transport and non-motorised transport options, as well as reducing the need to travel. The CTMSDF now needs to be translated “down” in scale to a district level. This section therefore focuses on the application of TOD to a district/corridor level.

The diagram below is useful in this regard, showing TOD at various scales.

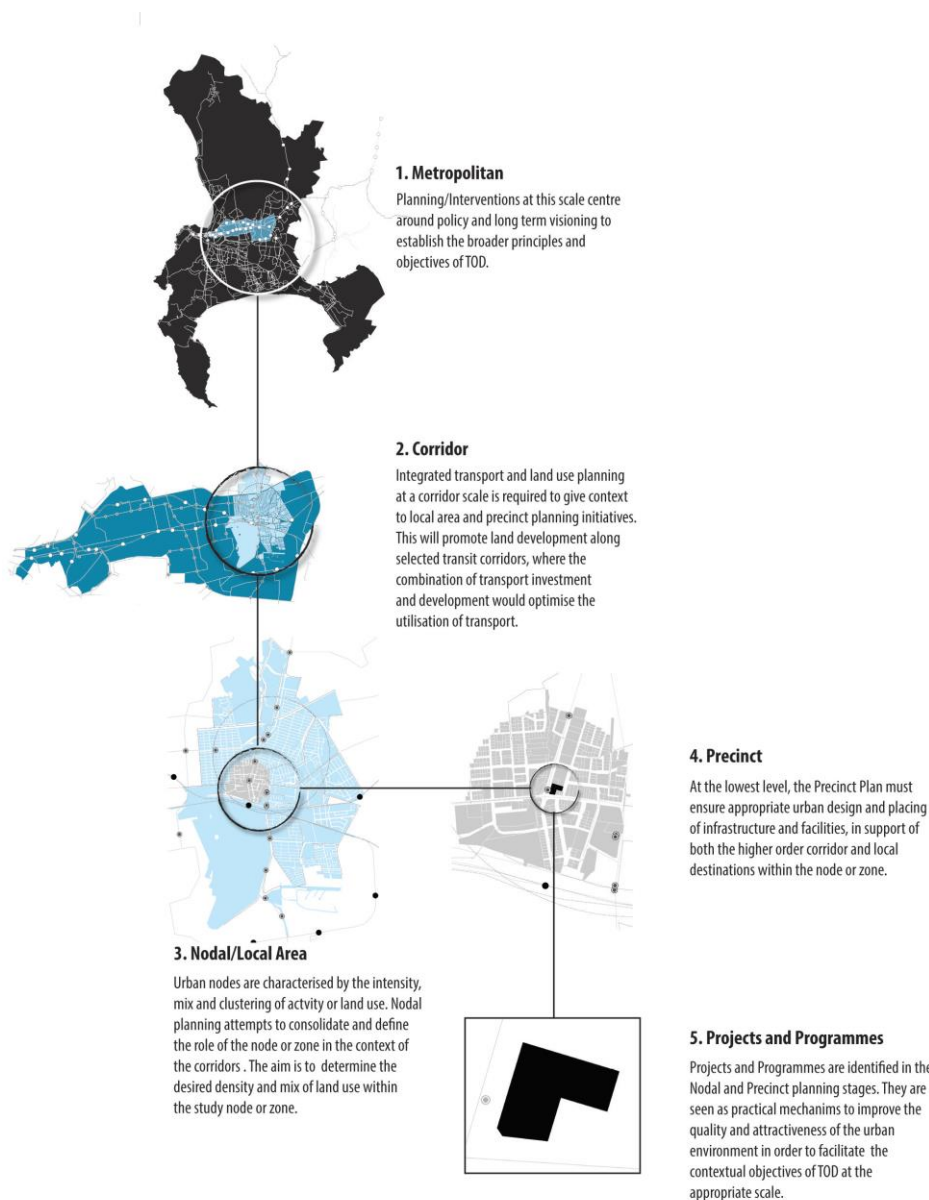


Figure 21: Transit Oriented Development Concept at Various Scales (Source: TOD SF, 2016: 24)

At a metro scale, there is a need to balance and shorten trips through:

- i. maximising the residential opportunities in and around the CT CBD;
- ii. maximising the work (and education) opportunities in the Metro South East;
- iii. enabling greater internal trip generation (ie balance trip producers and attractors) in Atlantis, greater Somerset West area, and the Far South.

At a corridor scale, TOD requires the generation of bi-directional flow (to replace the current "tidal" commuter patterns), reduced travel distances to public transport, and higher seat renewal (multiple origins and destinations along the route). The district plan will identify which corridors in the district should be reinforced with land use proposals.

5.2 Strategic Parameters & Informants

The City of Cape Town has developed a host of strategies which aim to provide various strategic intents and objectives to guide the delivery of an efficient transport system and outline the primary framework within which the system develops. Further strategies address other transport needs such as non-motorised transport, universal accessibility, parking, operations, etc.

5.2.1 District Specific Transport Strategies

There are no location-specific transport strategies for this district.

5.3 Status of Public Transport

5.3.1 Existing Infrastructure and Services

5.3.1.1 High Order Public Transport

This district displays the least amount of public transport activity of all the districts.

Rail

There is a railway line running through the southern part of the district parallel to the N1. Several passenger services utilize it: Cape Town to Wellington; Kraaifontein to Malmesbury; the Boland Business Express; and Cape Town to Worcester.

Transnet also uses these lines for freight movement.

Bus Rapid Transit (BRT)

There is currently no BRT service which services the district.

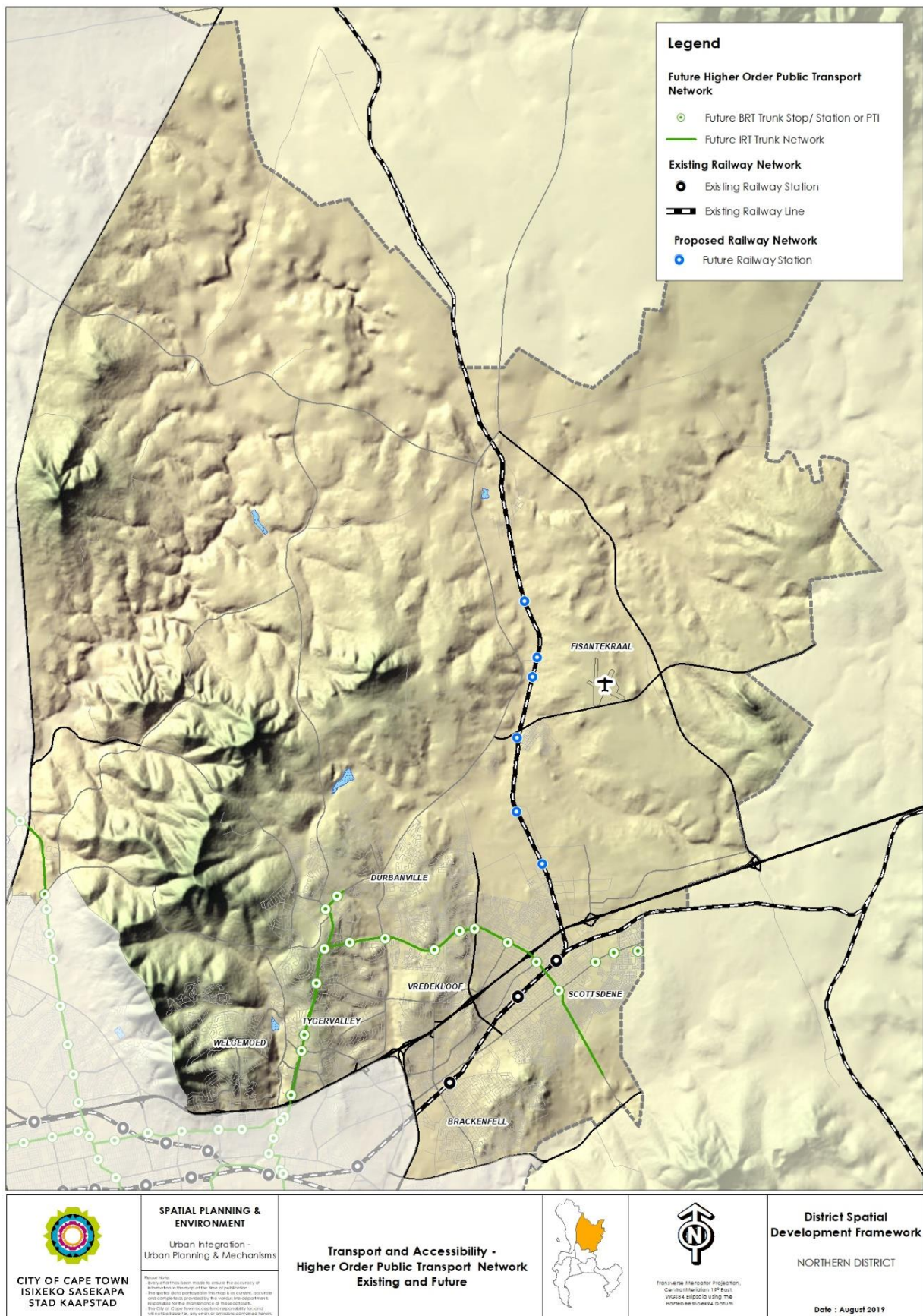


Figure 22: Existing and Future High Order Public Transport Services

5.3.1.2 Low Order Public Transport

Taxis and GABS (including PTIs)

The district is served by minibus taxi operators and bus services, which operate along the main routes in the area, most notably Durban Rd and Old Paarl Rd. Public transport interchanges include Durbanville and Wallacedene, while the Tygervally Centre forms a significant but informal PTI.

City-owned PTI's include the following:

Table 12: City-owned PTI's

No	Name	Formal/ Informal	Any plan for upgrading
1	Bloekombos Minibus-taxi Rank	Formal	
2	Brackenfell Station Transport Interchange	Informal	
3	Durbanville Public Transport Interchange	Formal	Scoping/Prefeasibility Study
4	Eikenfontein Station Transport Interchange	Formal	
5	Fisantekraal	Informal	
6	Kraaifontein Station Transport Interchange	Formal	
7	Wallacedene Minibus-taxi Terminus	Informal	New asset completed (2015)

Non-Motorised Transport (NMT)

The district is currently not well served by formal NMT facilities, because of the long distances involved, and the insular nature of many of the neighbourhoods. It is best served along Old Paarl Rd, in Scottsdene and Wallacedene.

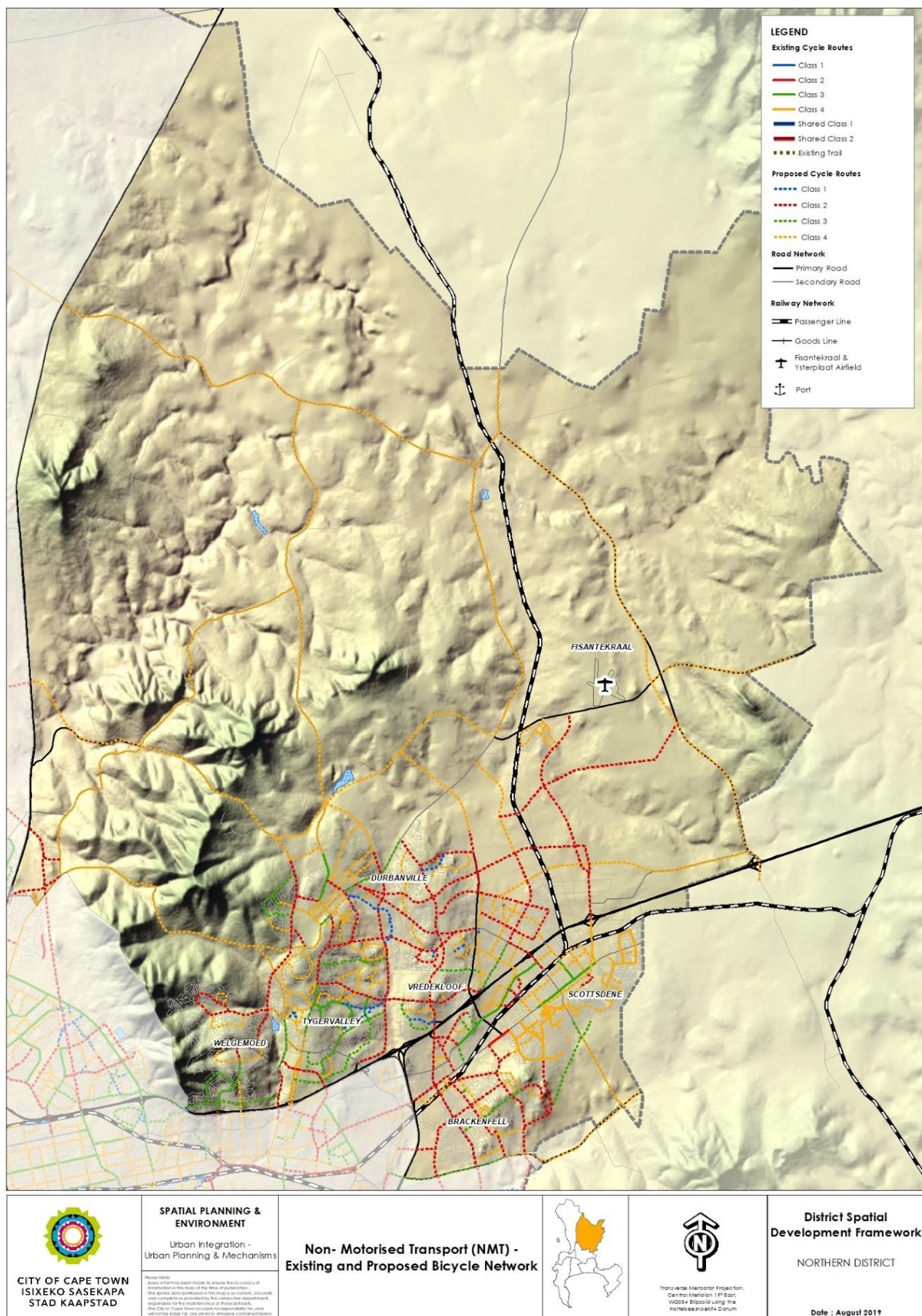


Figure 23: Existing and Planned Cycle Routes in the Northern District

5.3.2 Planned Transport Infrastructure and Services

5.3.2.1 BRT feeders and trunks

Feeder services are planned to support the new Blue Downs rail line to the south of the district. While indicative only at this stage, feeders could link Kraaifontein to the north-south rail service. A trunk service is also planned to link Wallacedene/Scottsdene to Durbanville, Bellville CBD and on to Paarden Eiland as part of Phase 3.

5.3.2.2 Rail

There are no known planned upgrades to the Malmesbury, Wellington or Worcester lines.

5.3.2.3 PTIs

Durbanville PTI is planned to be upgraded.

5.3.3 Level of Public Transport Accessibility

As part of the TODC model a scoring of the various Transport Accessible Precincts (TAPs) around stations and stops in the city was conducted. The overall score provides a measure of the level of accessibility of the City's current public transport network using the following indicators:

- C1. Status of station: Existing or Proposed
- C2. Status of network: Existing or Proposed
- C3. Connectivity: Accumulative Travel time to the City's top 10 employment destinations
- C4. Capacity: Capacity of stations to accommodate passenger volumes
- C5. Modal Integration: Level of integration between modes of public transport (Rail/BRT/PTI/Feeder)
- C6. Intensity: Number of people within 500m of a station/core feeder stop

Note that this scoring methodology does not take into account the *functionality* of the public transport services. The measure is purely a *locational* score. Based off these scorings, the following patterns are highlighted for the district:

- The TAPS scores are generally low in the district, but higher along the railway system.
- The planned MyCiTi routes will extend the TAPS corridors significantly.
- Some areas are not served by public transport (or minimally served), resulting in no overall accessibility score, largely as a result of topographical factors, rural land uses, and limited habitation.

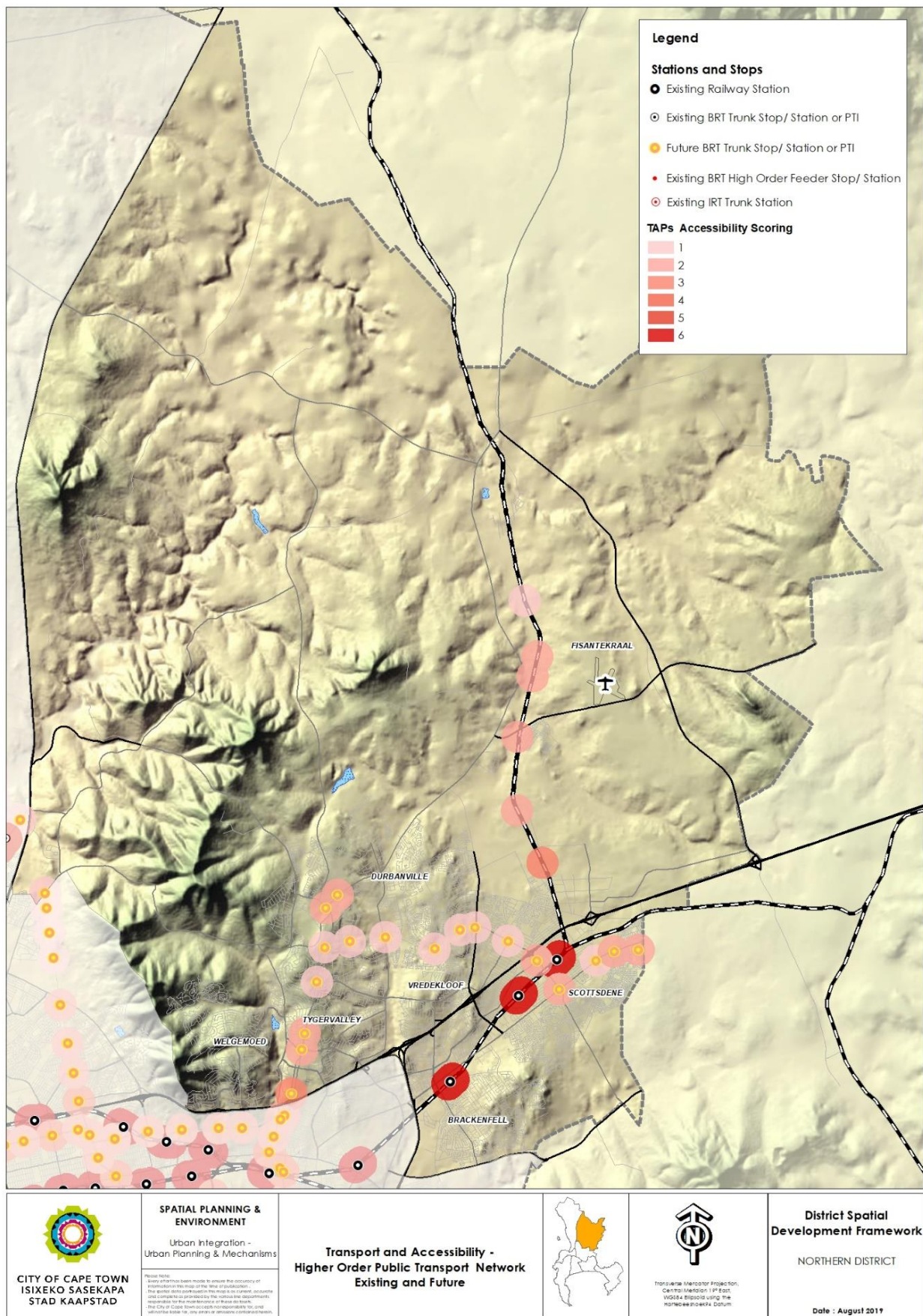


Figure 24: TAPs Accessibility Scoring

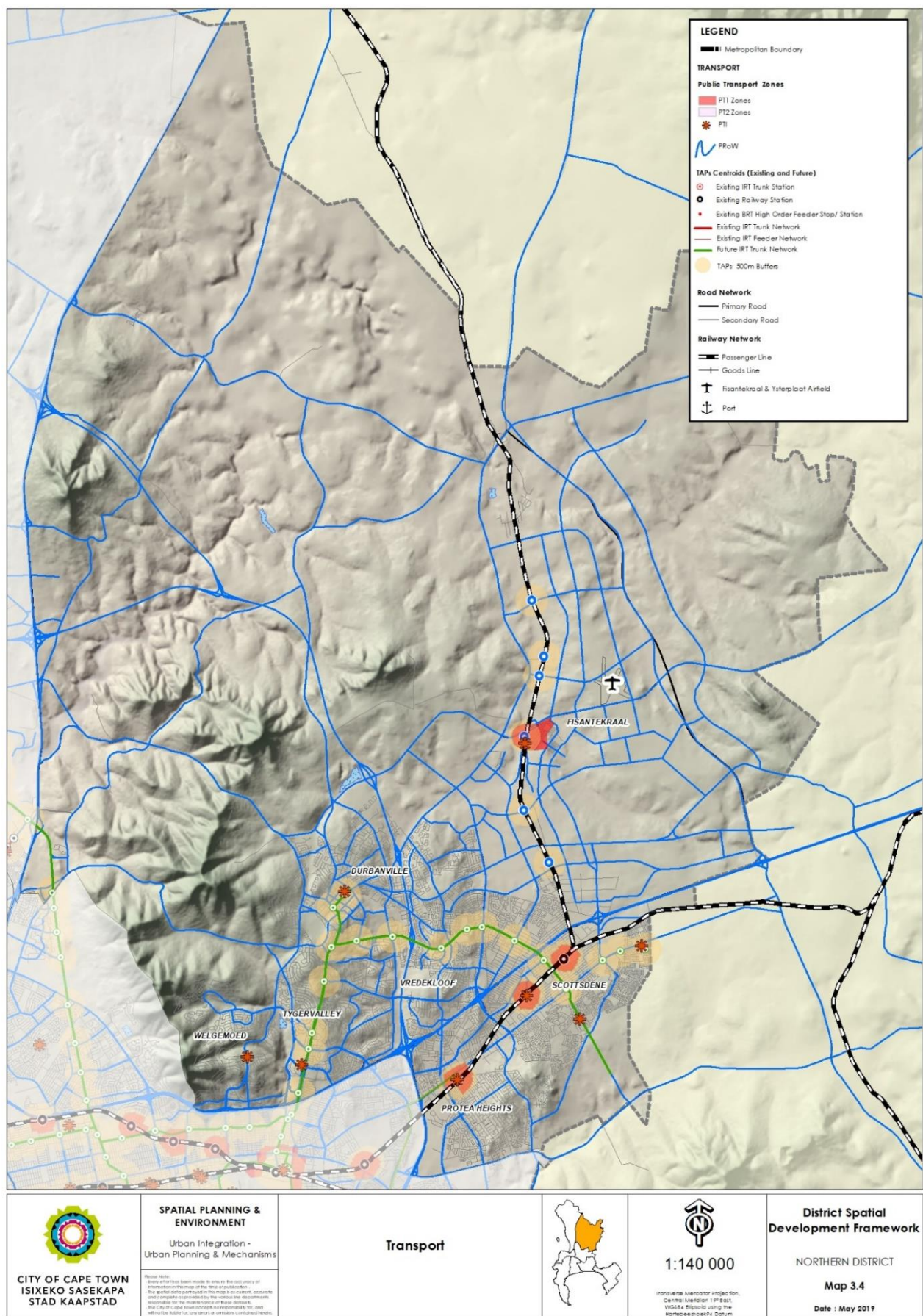


Figure 25: Transport routes in the Northern District

5.4 State of Road Infrastructure

5.4.1 Overview of the district road network

The district can be regarded as being well-served with arterial routes, i.e. the N1 Freeway transverses the district in an east-west direction, and major routes such as Durban Road and Okavango Road cross the N1 in a north-south direction. However, capacities at interchanges such as Brighton Road and Durban Road have reached capacity, and either require upgrade or alternative solutions.

There is significant demand for east-west and north-south movement through the district. An existing constraint is the lack of linkages in a north-south direction, specifically the R300 extension, and the completion of Okavango Road and Brackenfell Boulevard to the north. This gives rise to congestion on east-west routes, such as Wellington Road through the Durbanville CBD.

Areas along the N1 experience some of the worst congestion in the city, according to a congestion study carried out in 2015.

5.4.1.1 *Current road projects*

Over the past 20 years, roads infrastructure improvements have not kept up with development. The Western Cape Government's recent upgrades to the N1 between Mike Pienaar Blvd and Old Oak Avenue have helped to restore Levels of Service over this section of the N1.

The alignment of Lucullus St (M167) between the N1 and Klipheuwel is currently being undertaken.

5.4.1.2 *Historic Road Schemes to be reviewed*

Because this District falls outside the original Cape Town municipal area, there are no historic road schemes which need to be reviewed or amended.

5.4.1.3 *Parking*

There are no reported parking issues particular to this district as a whole.

5.4.1.4 *Planned Road Infrastructure*

It is evident on the map below that the extension of R300 north of the N1 is needed, as arterials such as Okavango Rd and Brackenfell Blvd have become increasingly congested.

Several new road connections which have an impact on the district have been made provision for in terms of the metropolitan transport plan, including:

- Completion of Okavango Road to the south of Old Paarl Road.

- The extension of the R300 Freeway to the north to provide the linkage to the N7.
- Numerous additional roads to accommodate possible urban expansion into the rural hinterland to the north-east.

5.5 The State of Freight

The freight sector is critical to the efficient movement of goods in support of the economy and the provision of services. On the other hand, it can be a hindrance to traffic flow, and trucks place a disproportionate maintenance burden on road infrastructure (and the impact of accidents are great).

Freight movement in the city as a whole can be seen on the map below: clearly the largest volumes are on the national roads, and related to the Port. Cape Town's deep water port processes ± 15 million tons of freight per annum, with around 95% of freight movement on the land-side being road-based. The port together with over 30 industrial areas located in various parts of the City, contribute to a high number of trucks on the municipal road network.

The City's Freight Management Strategy addresses the planning and management of freight operations within the city's functional region. It recognises the need to shift the modal split back towards rail where possible.

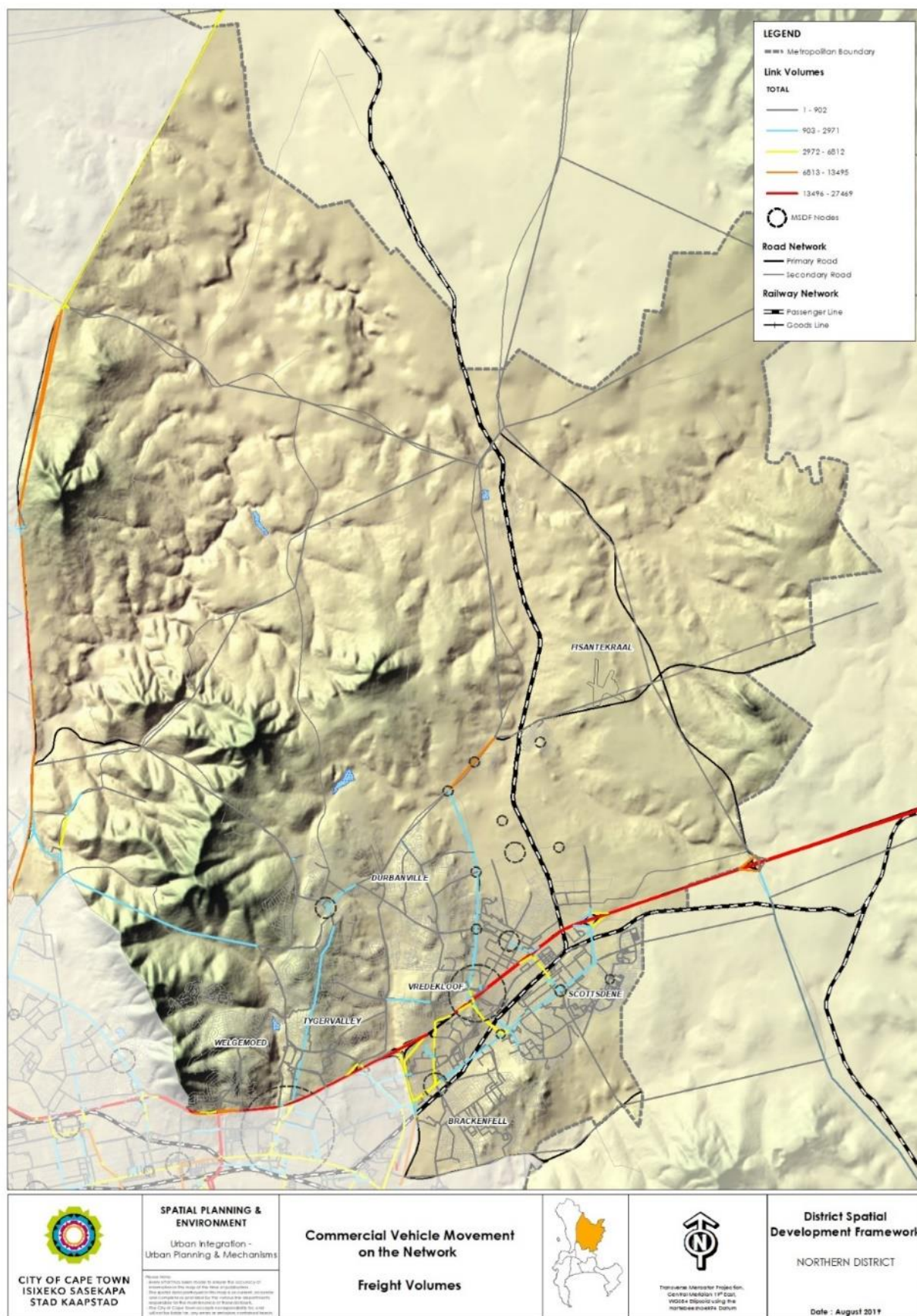


Figure 26: Road-based Freight Volumes

The map shows that the district experiences significant freight movement through it, along the N1. As this district is the "gateway" district of the city on the main road and rail route from Gauteng, it has the potential to house a break-of-bulk, or intermodal facility (a location near Kraaifontein has been identified).

5.6 Travel Patterns

5.6.1 Current (EMME Demand – Base year 2015)

There is a low to very low level of trip generation and attraction, except for the employment in the Brackenfell industrial area, and higher density residential development of Scottsdene and Wallacedene.

The majority of the district is rural, generating a very low, dispersed transport demand, resulting in poor public transport services, not only to the farming areas, but also to settlements like Fisantekraal, Mikpunt and Klipheuwel.

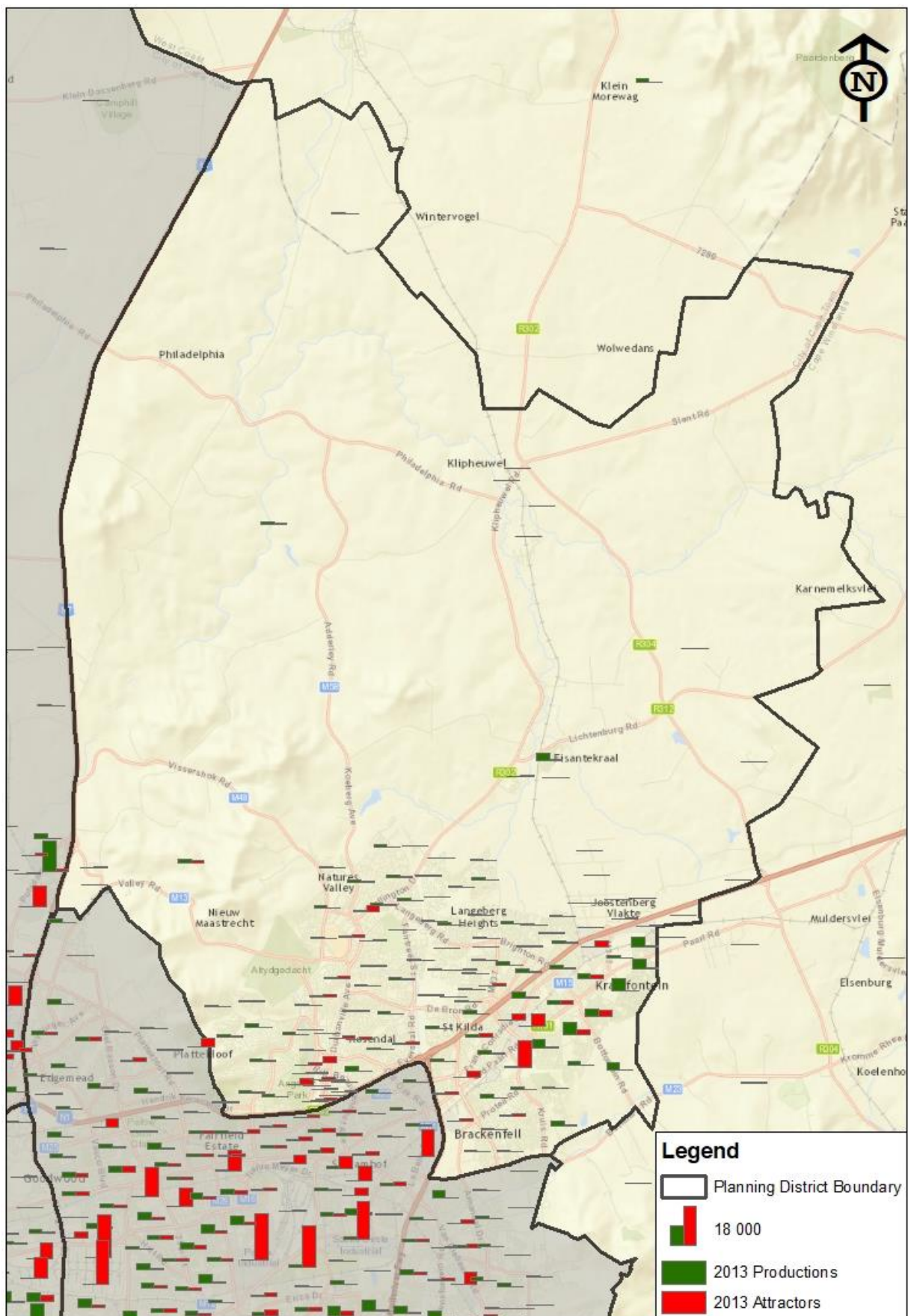


Figure 27: Base Year Trip Generators and Attractors (2013)

5.6.2 2013 Origin Destination Movements for the District

The metropolitan origin-destination maps show the following patterns:

- Many residents move out of the area, mainly to Bellville (a relatively short distance) and the CT CBD.
- The majority travel by private transport
- This district is not a large trip generator for public transport
- The district attracts minimal trips.

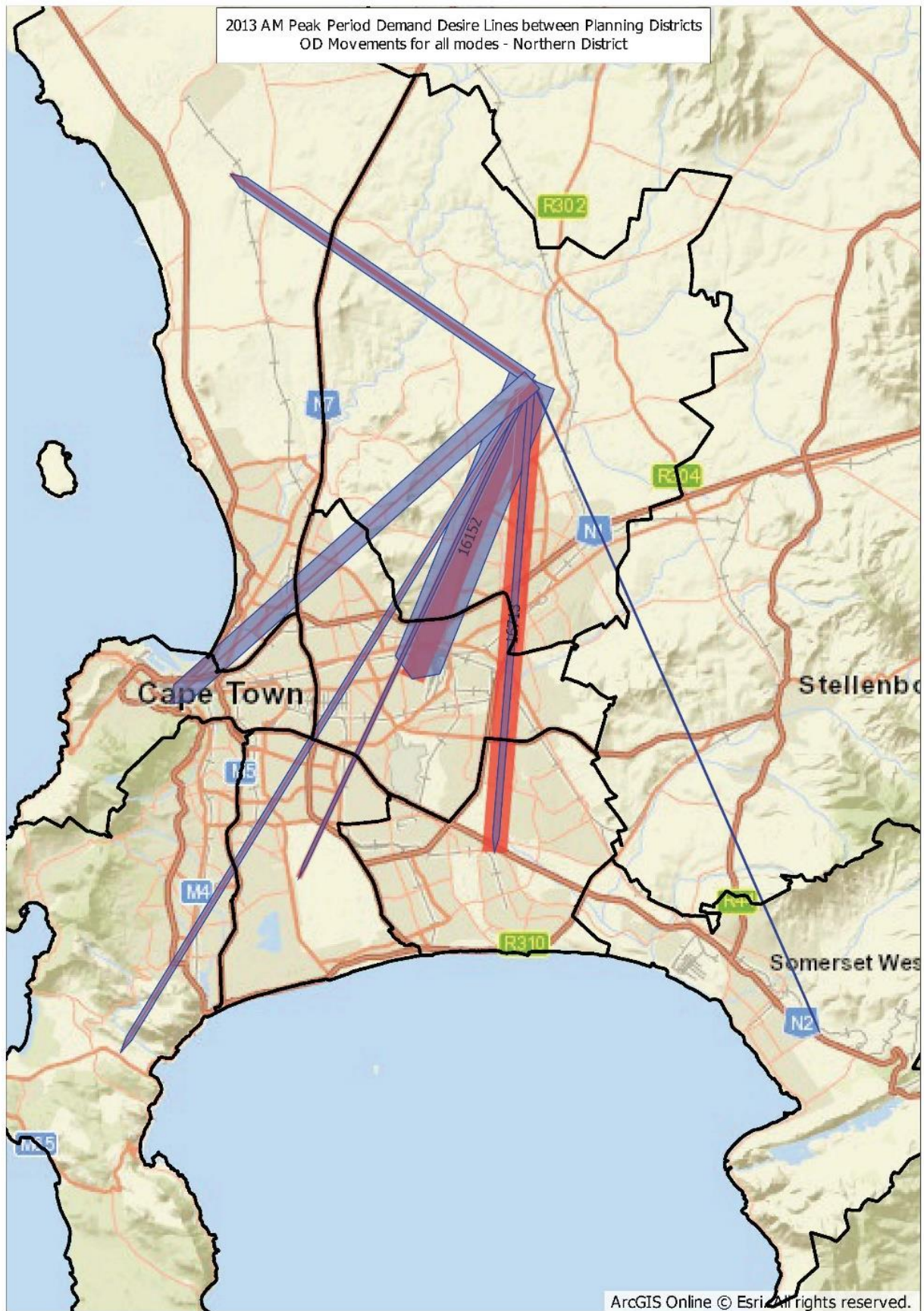


Figure 28: Origin-Destination of All Commuter Trips (2013)

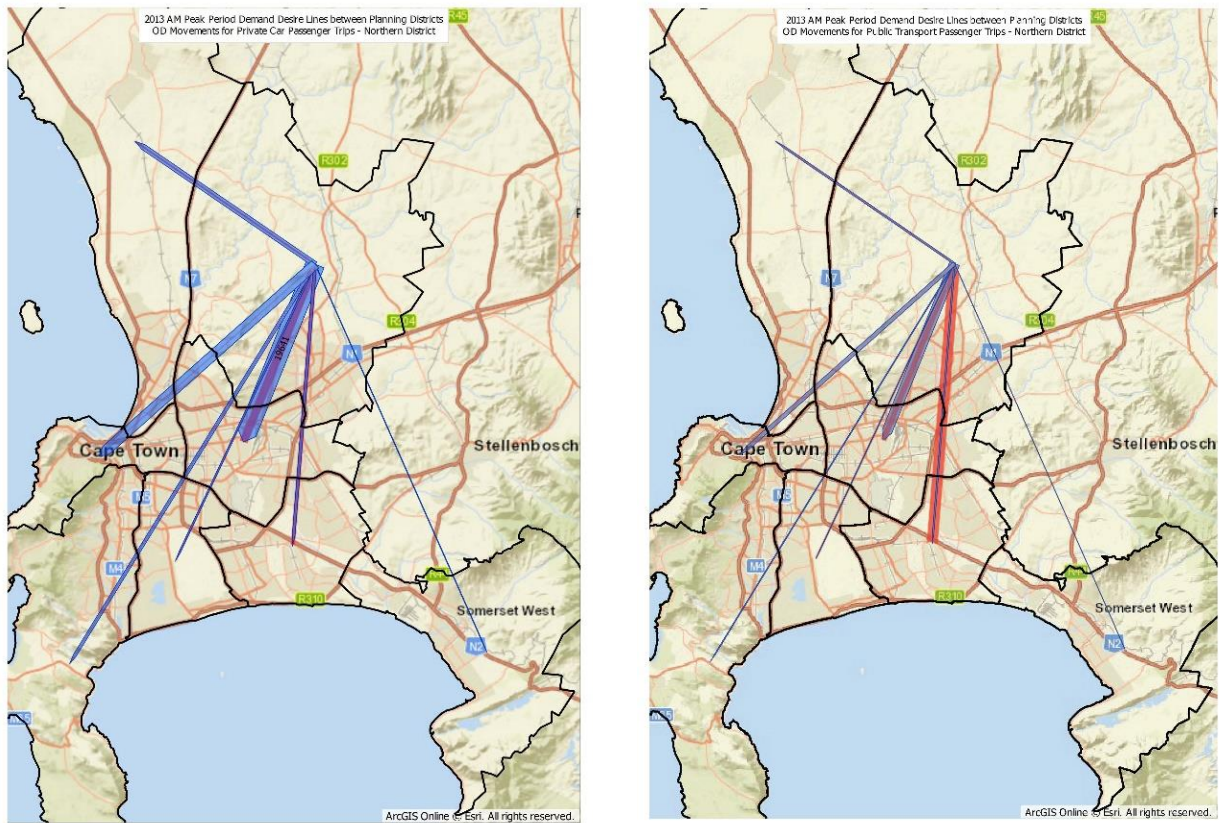


Figure 29: Metropolitan Origin-Destination Patterns for Private and Public Transport

Table 13: Origin and Destination trips for the Northern District

Origin	Destination	NMT	Car	Taxi	Bus	BRT	Train	Public Transport	Total
Northern	Table Bay	0	3212	878	523	2	3391	4794	8006
Northern	Blaauwberg	2	2505	441	254	6	258	959	3467
Northern	Tygerberg	270	7730	1624	1255	1	1725	4606	12606
Northern	Helderberg	79	766	446	305	1	245	996	1841
Northern	Khayelitsha / Mitchells Plain	0	294	80	100	0	442	622	916
Northern	Cape Flats	0	406	90	99	1	459	649	1054
Northern	Southern	0	341	132	163	2	734	1031	1372
		351	15254	3691	2699	13	7254	13658	
Northern	Northern	2632	5256	1835	1108	5	575	3523	11410
Table Bay	Northern	0	866	136	57	0	311	503	1368
Blaauwberg	Northern	61	390	304	311	3	32	650	1101
Tygerberg	Northern	276	4812	1741	779	0	481	3001	8089
Helderberg	Northern	126	1369	1099	563	0	161	1823	3317
Khayelitsha / Mitchells Plain	Northern	0	1279	1560	1982	0	2030	5572	6851
Cape Flats	Northern	0	835	454	346	1	527	1328	2164
Southern	Northern	0	929	80	73	0	745	898	1827
		463	10480	5374	4110	4	4287	13775	

5.6.2.1 Cost of Travel

This nature of tidal movement across the city results in an inefficient use of public transport and of the road-space: people traveling into the CBD in the morning, and out in the afternoon.

5.6.2.2 User costs

The newly-developed Urban Development Index (UDI) measured the cost of travel for different income groups, different travel modes, and to their top 5 destinations⁴ in terms of travel time, travel distance, and direct costs.

Modal choice is influenced by a range of factors: not simply direct costs, but indirect costs such as safety (of the service itself), security (on the service, as well as accessing it), level of flexibility (of the service), reliability (of the service), and the impact of congestion on the service. The high rate of NMT as the primary mode of transport as evidenced in poorer areas has less to do with short travel distances, and more to do with affordability.

The urban part of this district (ie the south) has a relatively high modal split in favour of private transport, averaging round 60%. The rural part of the district could not be measured due to its dispersed population.

Travel distances by public transport to the top 5 destinations increase towards the periphery of the urban area, with the Tygervalley area experiencing the shortest travel distance by both public and private transport.

The Fisantekraal area experiences the shortest average travel time to its top 5 destinations by private transport (8 min); however the Kraaifontein area experiences the longest by minibus taxi and bus (40min and 94mins respectively).

Public transport direct costs as a percentage of income for the low income group varies greatly across the district: from 8% in the Kraaifontein area to 23% in the Wallacedene area. The Durbanville, Tygervalley and Brackenfell areas experience relatively low direct transport costs for private transport across all income groups, while all income groups in the Joostenberg vlakte area experience the highest direct costs.

5.6.2.3 Operational costs

There is a high cost to operate public transport in a sprawling urban environment. If the travel demand patterns of the city remains at current variables this will translate into a deterioration of the recurrent annual operating deficit for the whole MyCiTi system by approximately R1 billion (IPTN Business Plan, 2017).

⁴ The top 5 commuting destinations were identified for each area based on employment and education pattern.

5.6.2.4 Environmental and Economic costs

- Serious constraints on economic growth and development - congestion currently costs Cape Town R2.8 billion per year.
- Increasing negative environmental impacts
- CO₂ emissions and energy consumption.

5.6.2.5 Future Ideal Distribution of Trip Generators and Attractors (2032)

In modelling the future land use patterns which would generate the demand for trips to be served by the IPTN, an “ideal” scenario, namely “Comprehensive Transit Oriented Development”, or CTOD, was run for 2032. The CTOD response is to try to balance trip attractors and trip producers in all areas, to theoretically eliminate/ minimise the need to travel by having jobs and residences in the same area. The map below shows this ideal future state to work towards, with growth in the right locations to minimise travel time.

From a transport optimisation perspective, the large quantity of anticipated residential units (trip producers) in some locations which are far from existing trip attractors needs to be countered / matched by new non-residential land uses (trip attractors) in order to achieve this goal.

From a spatial planning perspective, this means mixing land use (diversifying land use). This DSP must use it as a guide and determine how this is achievable.

Ideally, there will be some areas of intense trip attraction (employment) on the periphery of the developed area of the city, which will keep some trips internal to the district, and will contribute towards bi-directional flow, as there will be few trip producers in the same locations.

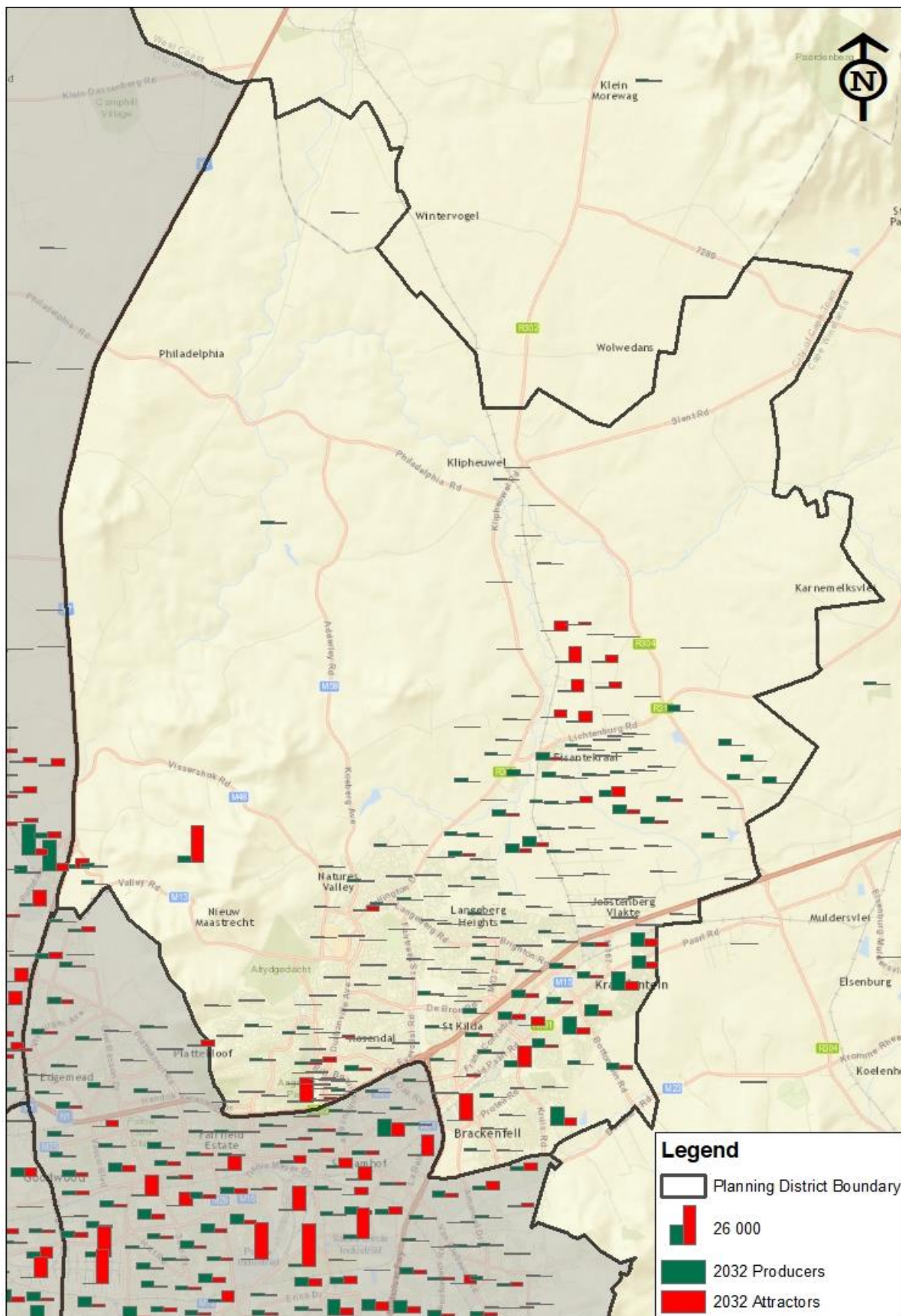


Figure 30: Ideal Mix of Future Trip Producers and Attractors (CTOD: 2032)

The south-east of the district should host a good mix of trip producers and attractors. The majority of the district will still be rural, generating a very low, dispersed transport demand, resulting in lack of connectivity not only to the farming areas, but also to settlements like Fisantekraal, Mikpunt and Klipheuwel.

5.7 Key Transport Challenges and Opportunities

5.7.1 Constraints

Low population densities in the rural, peri-urban suburban, and outlying settlements such as Fisantekraal, Mikpunt and Klipheuwel, combined with long commuting distances, mean that a quality public transport service is not yet viable in much of the district.

Low seat renewal (travelers getting on and off along the route) and little bi-directional flow (travelers moving in both directions within the peak) make quality public transport unviable at this stage.

5.7.2 Opportunities

The IPTN will be exploring an incremental approach to the BRT roll-out, with the possible inclusion of the current bus and minibus taxi services. It will therefore explore the opportunities for prioritizing these services in the roadscape, for example “queue-jumping” at intersections.

New generation technologies such as e-hailing, enable greater mobility, though at this stage, it comes at a price. App- or web-based lift-clubbing sites should serve this area well, for those living in close proximity, and travelling to the Tygervalley business district or the CT CBD.

The Catalytic Land Development Programme (CLDP), which includes the regeneration of Bellville CBD as a top priority, may provide impetus for quality PT between Durbanville and Bellville.

5.7.3 Spatial Implications

As demonstrated in the CTOD 2032 map, the need for educational and job opportunities in the rapidly-developing peri-urban areas is high, from a transport as well as a spatial integration perspective. This is the challenge for the DSP, as the current market trend is for more mono-functional, low density, high income, golf / secure residential estates.

At a district scale, while there is pressure for “greenfields” developments in the agricultural areas in the north of the district, this is contrary to the growth management principles in the CTMSDF. This district plan will need to provide clear guidelines on growth management in support of the CTMSDF.

Another consideration in future-proofing the district is to align it with the Resilience Strategy process: some of its related pathfinding questions have relevance to the District:

- How can we can we improve the design and co-location of public facilities to achieve multiple resilience dividends?
- How can we incentivise city residents to become more involved in resilient place making?
- How can partnerships in society be leveraged to contribute to reducing the stress of traffic congestion?

6 INFRASTRUCTURE

Information in the section on infrastructure that follows, has primarily been sourced from the 2015 Medium Term Infrastructure Investment Framework (MTIIF). Additional information has been sourced from officials in the relevant departments.

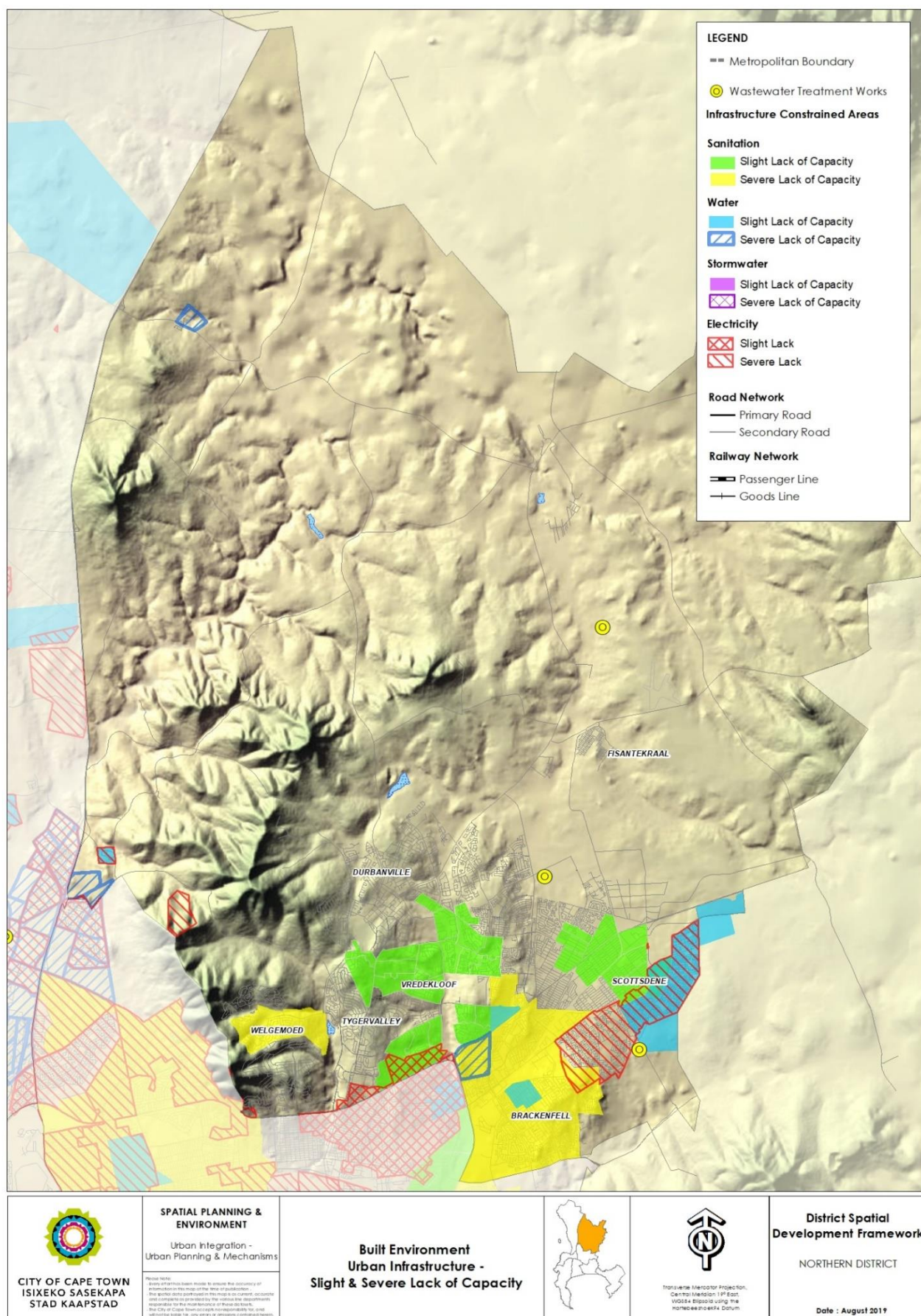


Figure 31: Areas with Lack of Infrastructure Capacity in the Northern District

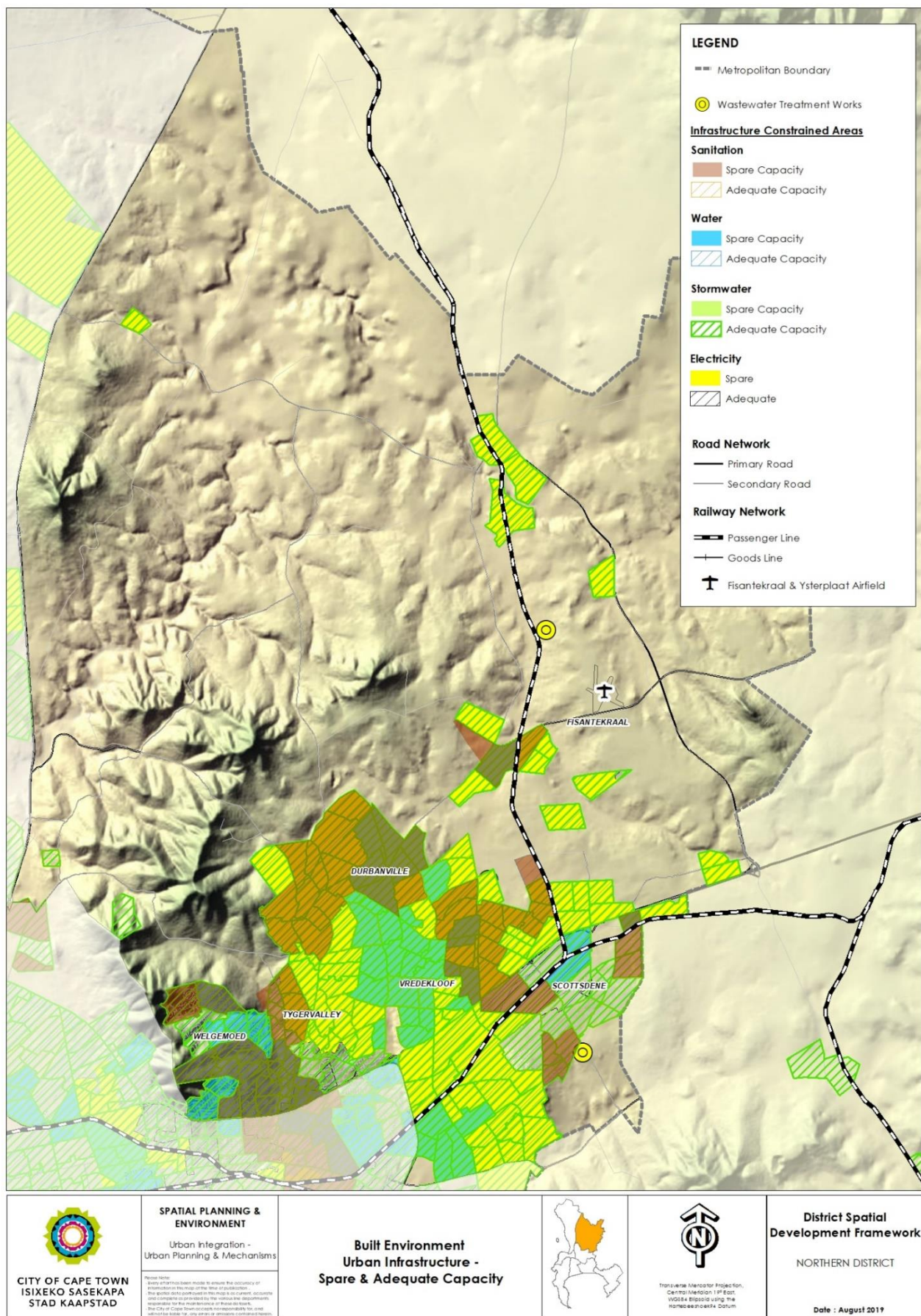


Figure 32: Areas with Spare Infrastructure Capacity in the Northern District

6.1 Electricity

The Northern district falls within the Eastern service area for the Directorate: Energy, that covers the larger Bellville and Parow and Kuilsriver areas, as well as the wider area of Kraaifontein that include Brackenfell and Durbanville.

Over the last 5 years approximately R20m of capital expenditure occurred in the service area, that included upgrades the substations and other infrastructure.

In order to accommodate future developments in the service are, an application has been lodged with ESCOM already to increase the intake (from Stikland substation) at Oakdale substation from 66kV to 132kV for internal distribution to the Boston and Doordekraal substations. The increase in intake revolves not only around capacities, but is also tariff-orientated.

Adequate capacity is available to accommodate future developments at the wider Tyger Valley area, that include the Galleria development as well as future expected developments at the University of Stellenbosch Business School property (a phased approach is followed). Adequate capacity is also available to accommodate future developments in the wider Kraaifontein area, Durbanville and Brackenfell. It should be noted that the area located to the east of the Malmesbury rail line is an ESCOM area (excluding Fisantekraal and the Greenville development). Incremental densification can be accommodated, but where larger scale densification is to be considered, upgrades to infrastructure may be required.

With regard to provisions in the Municipal Planning By-Law (2015), with regard to the provision for second and third dwelling units on a single residential property, notice need be made of the impact of large areas taking up the rights, the impact may require the upgrade of infrastructure in order to increase capacities.

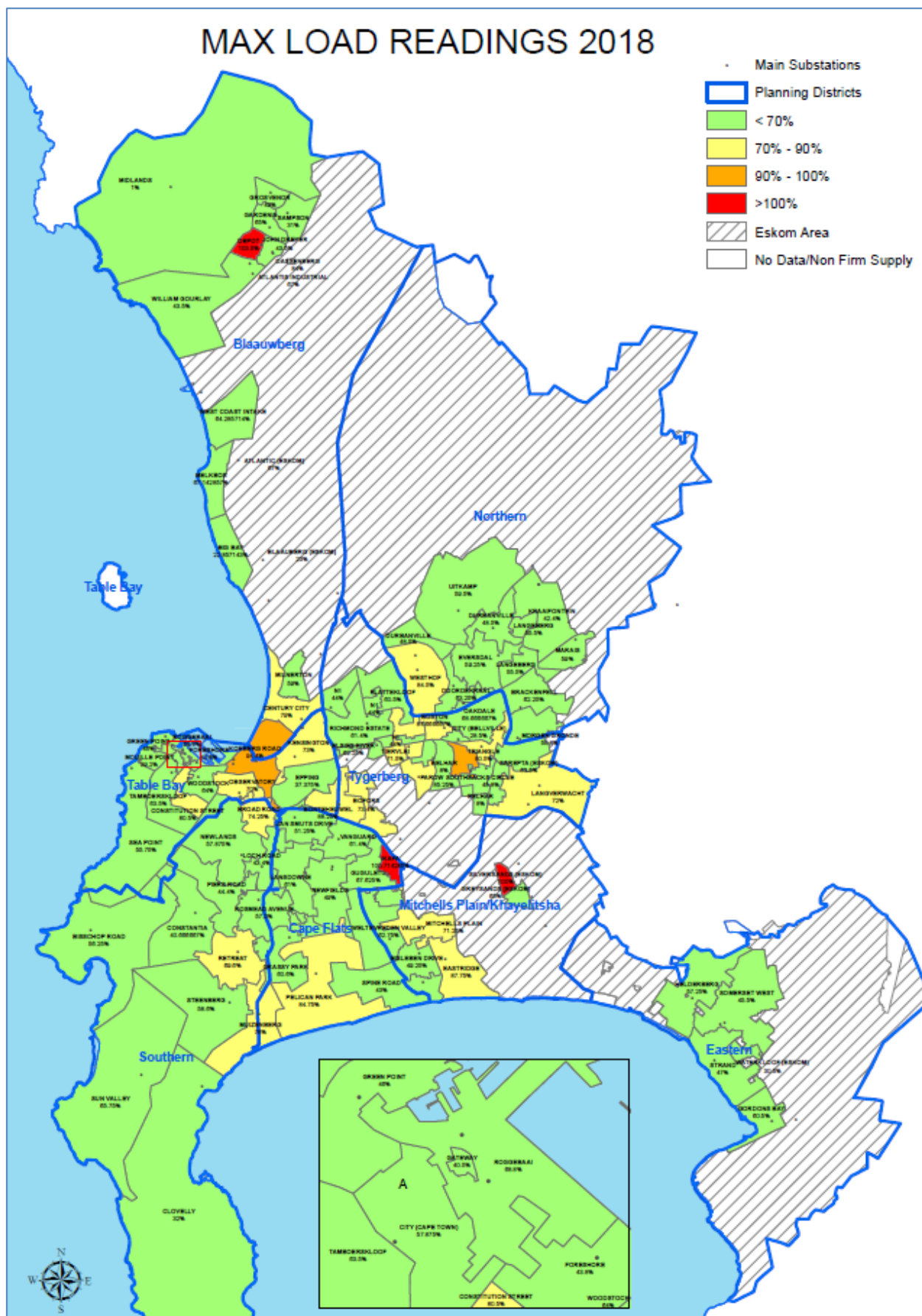
Bulk electrical infrastructure includes:

- Existing main transmission substations (MTSs)
- New MTSs
- Existing 132/11 kV distribution substations
- New 132/11 kV distribution substations
- Existing 132 and 66 kV underground (UG) cables and overhead lines (OHLs)
- New 132 kV UG cables

The information used for the assessment of bulk electrical infrastructure capacity is from 2018 peak loads at distribution substations. The information was processed and each substation supply area classifies according to its level of existing capacity. There are 114 substation supply areas in the metropolitan. 82 of these are within the City of Cape Town's distribution area, while 38 are within Eskom's area of distribution. The table below gives the definitions used to classify the capacity of a substation area. The assessment was done using Transport Analysis Zones (TAZ's) indicated in blue in Figures 34 and 35, which have different geographical delineations when compared to the substation supply areas.

Table 14: Definition of electrical system capacities

Capacity status	Definition
Severe lack of capacity (red)	Over 100% of firm substation capacity
Slight lack of capacity (Orange)	90% to 100% of firm substation capacity
Adequate capacity (Yellow)	70% to 90% of firm substation capacity
Spare capacity (Green)	Less than 70% of firm substation capacity



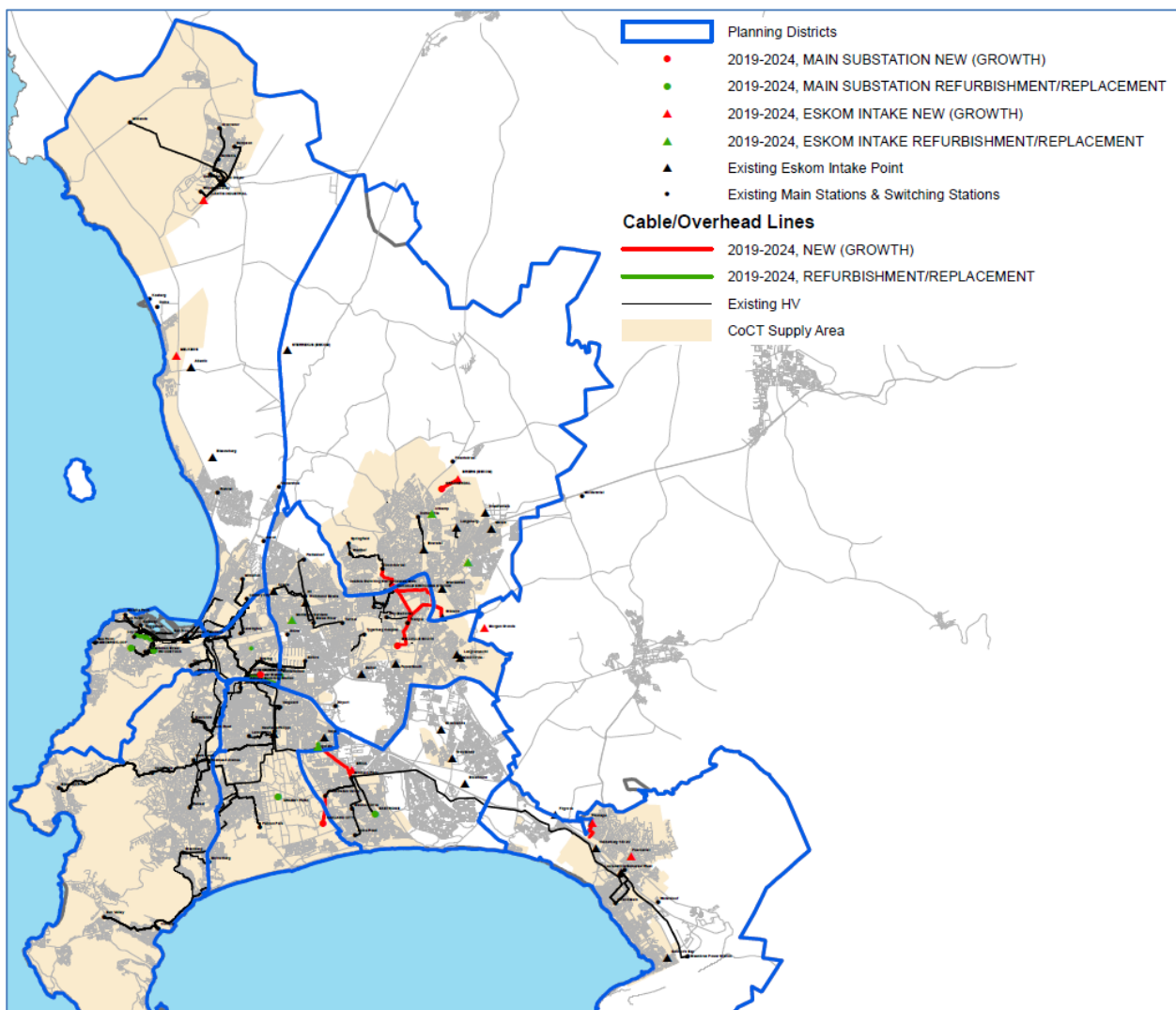


Figure 34: Proposed electricity infrastructure projects

In Northern district, **no areas have a severe lack of capacity** and the District **has adequate or spare capacity**.

Projects are planned in the Kraaifontein area to deal with anticipated load from continued housing developments in the area.

6.2 Water

Adequate bulk water capacity is available to serve new developments between Greenville at Fisantekraal, and Kraaifontein. Adequate capacity is available from the Spes Bona reservoir. However, in the longer term, a new bulk water augmentation scheme will be required at Spes Bona to serve new developments in the wider region. Budget provision as from the 2019/20 financial year to 2023 is being made.

Bulk water capacity at the village of Philadelphia will remain limited, as there are no large extension planned for the area, in the short and longer term.

For the purposes of this project bulk water infrastructure include the following:

- Bulk supply system from the water sources to the water treatment works (WTW)
- WTWs
- Supply pipelines from the WTW to reservoirs
- Reservoirs
- Pump stations and rising mains
- Distribution pipes ≥ 250 mm diameter (nominal)

The information used for this baseline assessment relies on 2011 and 2015 data which was processed for MTIIF. The impact of the recent drought in terms of water infrastructure provision and capacities has not been calculated.

Table 15: Definition of water system capacity

Capacity status	Definition
Severe lack of capacity	0 - 15 m residual pressure in the reticulation networks < 36 hours x AADD reservoir storage
Slight lack of capacity	15 - 24 m residual pressure in the reticulation networks 36 - 48 hours x AADD reservoir storage
Adequate capacity	25 - 60 m residual pressure in the reticulation networks 48 – 72 hours x AADD reservoir storage
Spare capacity	> 60 m residual pressure in the reticulation networks > 72 hours x AADD reservoir storage

In the Northern District, the following areas have a **severe lack of capacity**:

- The town of Philadelphia
- Suburbs of Edenpark and Bracken Heights

The following areas have a **slight lack of capacity**:

- Atlas Gardens Industrial Park
- Scottsdene, Wallacedene, Bloekombos
- Marlborough Park, Welgeleë
- Part of Brackenfell (north of Protea Heights)

The following areas have **adequate** or **spare capacity**:

- The majority of the district has spare or adequate capacity, except for the few areas previously mentioned.

6.3 Sanitation (Waste Water and Solid Waste)

6.3.1 Waste Water

Problems regarding capacity in the district is in the process of being addressed, i.e. the pipeline from Van Riebeeckshof/ Doordekraal to divert sewerage from the Bellville WWTW to the Fisantekraal WWTW (that is actually under- capacity) is in the process of implementation and should be completed by 2021. This will again create capacity at Bellville- and Zandvliet WWTWs. Upgrade to the Scottsdene WWTW is also planned.

Waste Water infrastructure includes the following components:

- All wastewater treatment works (WWTWs)
- Pump stations (≥50 l/s duty flow)
- Rising mains (≥250 mm diameter (nominal))
- Gravity pipelines (≥250 mm diameter (nominal))

The information used for this baseline assessment relies on 2011 and 2015 data which was processed for MTIIF.

Table 16: Definition of waste water system capacity

Capacity status	Definition
Severe lack of capacity	WWTW: Capacity exceeded (major drainage areas) Gravity mains: < 15 % relative spare capacity
Slight lack of capacity	WWTW: Capacity exceeded (minor drainage areas) PS: Required pump flow 105% - 115% of current capacity Gravity mains: 15% - 30% relative spare capacity
Adequate capacity	WWTW: 95% - 100% of treatment capacity required Gravity mains: 30% to 50% relative spare capacity PS: Required pump flow 95% - 105% of current capacity
Spare capacity	WWTW: < 95% of treatment capacity required PS: Required pump flow < 95% of current capacity

In the Northern District, the following areas have a **severe lack of capacity**:

- Large areas of Brackenfell and parts of Vredeloof
- Welgedacht, Protea Valley area (constraints in the process of being addressed)

The following areas have a **slight lack of capacity**:

- Kraaifontien
- Stellenryk to Stellenridge
- Vredeloof
- Durbanville Hills, Sonstraal, Sonstraal Heights

The following areas have **adequate** or **spare capacity**:

- Eversdal
- Scottsdene, Wallacedene, Bloekombos and Durbanville/Durbanville Hills

6.3.2 Bulk solid waste

Bulk solid waste infrastructure considered for the purpose of this project consists of the infrastructure required to provide current waste management services to existing and future developments and new infrastructure associated with evolving legislative requirements. This includes:

- Landfills and associated mechanical plant
- Refuse transfer stations

- Drop-off facilities (garage waste, greens, builder's rubble, recyclables, household hazardous waste)
- Buy-back centers
- Fleet (Workshop, Collection vehicles, Cleansing vehicles)
- Material recovery facilities
- Alternative treatment technologies

The information is based on data from 2019.

Table 17: Existing bulk solid waste management infrastructure capacity status

Infrastructure type	Capacity status	Comment
Landfills and mechanical plant	The total banked airspace is >10 years in the city, but less than the international benchmark of 15 years. Excludes regional landfill site of which the authority is under consideration.	Landfill sites are not area bound. The city only has 3 operational landfills. Due to Limited capacity at landfills, based on license conditions. All landfills have a limited life, per their specific license, and hence will close as the said conditions are met. Infrastructure, plant and equipment at all landfill sites are sustainable managed and compliant with License Authority regulated audits. The Regional landfill will receive most household/business waste via RTSs.
RTSs	The total transfer capacity available currently meets the demand capacity. Additional RTSs are being planned and included in the SWM IWM Plan. RTSs are primarily designed for the waste compactor fleet servicing household/businesses.	RTSs are strategically located throughout the city and hence do not necessarily coincide with the city area model. TRSs service large catchments, structured in terms of resource economic models. Due to the sensitivity of obtaining land/authority of these type of activities closer to high demand areas, they are in most instances built at landfill sites or on main roads to improve accessibility. More RTSs are however required as existing centralized landfills are closing. At an RTS the waste collected by refuse compactors are downloaded, re-compacted, containerized and then hauled to landfill sites. These new required additional RTSs will where practically possible be developed on landfill sites (operational or closed) or be strategically located on city owned land.

Drop-off facilities	Currently the city has adequate capacity in terms of drop-off floor area. The actual number of drop-offs are significantly less than what is required to improve accessibility.	The need for drop-offs closer to communities is a major challenge. The current spread is a drop-off within 7km of each household. Due to many economic and social factors communities find it difficult to effectively utilize these facilities. To improve accessibility and to decrease illegal dumping the planned spread of drop-offs should not be one within 3km of each household, with even a higher density in poorer communities. It is extremely difficult to find suitable land that is compliant with city policies and by-laws, additional to the resistance from adjacent or close-by property owners. Pressure is on SWM to close existing facilities as development is allowed closer to the same.
Buy-back centers/ recycling facilities	Nil	There is a huge desire to develop buy-back centers or recycling facilities, to be operated by SMME's, CBO's, NGO's or the city in poorer communities throughout the city. Whilst the land requirement is <1000m², it is difficult to secure city land within communities that are compliant with city policies and bylaws. Support for these type of facilities is increasingly provided by Councilors and lately also from City Urban Renewal and Sub Councils.
Fleet - Collection vehicles	Adequate number of collection compactors	Replace and supplement Collection fleet in accordance with city growth and service requirements (different communities, local conditions, different vehicle types). Ensure collection fleet has an average replacement age of < 7 years
Fleet - Workshop	Adequate capacity	City operates own dedicated workshop for servicing at Hillstar. Emergency repairs & maintenance, tyre services and overhauls are outsourced.
Cleansing vehicles	Lack in capacity of the correct vehicles, heavy plant and equipment	Replace and supplement Cleansing fleet in accordance with city growth and service requirements (different communities, local conditions, different vehicle types). Ensure cleansing fleet has an average replacement age of less than the 5

		years, 7 years and 12 years respectively. The number of vehicles need to increase significantly, also the type of vehicles in use., such as mechanical cleaning equipment, loaders and tippers.
MRFs	Lack of capacity in the city	Growth in recycling is hampered due to the unavailability of MRFs. The city has developed a MRF in Kraaifontein and 2 more are planned for development, at Coastal Park and at ARTS. The city will supplement these larger MRFs with mini-MRFs to increase capacity, to improve accessibility by all and to create SMME opportunities. Current larger drop-offs are earmarked for this added function.
Alternative treatment technologies	No capacity	In terms of legislative requirements, the city is obliged to meet stringent diversion targets for several waste types. Organic and food waste diversion is a major challenge that falls in this category for alternative treatment technologies. Best technologies, required infrastructure and business requirements are being investigated in an effort to identify the basic requirements. Where practically possible existing land at landfills or RTSs will be used to host the new integrated waste infrastructure.

6.4 Stormwater

Limited capital expenditure (approximately R2m) occurred over the last 5 years in the Tygerberg and Northern district catchment areas. In many instances capital projects are linked to projects of other services, such as Parks Department, where projects are implemented within river corridors.

In terms of stormwater attenuation and treatment, the policy guideline that is followed is that any new development and or redevelopments on properties larger than 4000m² should attenuate and treat stormwater on-site. In the district, stormwater capacity is to a large extend dependant on the following rivers:

- *Elsieskraal River*: The implications of the Elsieksraal floodline on new developments at numerous stations along the Bellville Railway line (Tygerberg district) are particularly troublesome given the emphasis on encouraging TOD at rail station precincts. The lack of adequate stormwater attenuation upstream within the catchment of the Elsieksraal, with its origins in the rural area of the Northern District, has a particularly harmful impact on several high profile development areas identified as catalytic projects in the Tygerberg district. These include the Two River Urban Park, Mowbray Golf Course and most importantly, the Conradie Hospital Site. This has given rise to the appointment of engineering consultants (study commenced) to investigate solutions to address the above constraints to developments down-stream (i.e. either by the addition of gabions (coffer dams) upstream, and or the extension of existing dams), and thereby reducing the floodplain area of the river corridor downstream. A potential option to address the issue may, inter alia be to increase the capacity of the quarry dam on the property of the University of Stellenbosch business school site in the Northern District. A high level Master plan has been completed for the Northern district, and therefore the floodplain (1:50 & 1:100 year) exists for the rural catchment area as well where setbacks for developments can be determined.
- *Kuils River*: A high level Stormwater Master Plan (2013) exist for the Kuils River. However, a Master plan is also required for the Bottelary river for the southern portion of Brackenfell and Botfontein catchment area.
- *Bottelary River*: A Stormwater Master Plan (including a river corridor plan) will be required to accommodate future development in the catchment area.
- *Mosselbank River*: Floodlines for the river exist up to Klipheuwe (completed in 2001), but an update will be required for each development application. For the area north of the Joostenbergvlakte smallholdings, a Master Plan will be required to determine stormwater management requirements for new developments.

The stormwater system of the CCT consists of a wide range of infrastructure components. The CCT's *Management of Urban Stormwater Impacts Policy* (CCT, 2009) defines the stormwater system as "both the constructed and natural facilities, including pipes, culverts and watercourses, whether over or under public or privately owned land, used or required for the management, collection, conveyance, temporary storage, control, monitoring, treatment, use and disposal of stormwater".

The stormwater infrastructure applicable to this study therefore includes the following:

- Piped networks (excluding provision for minor drainage system associated with road provision)
- Culverts
- Open channels, lined and unlined, including watercourses
- Detention and retention facilities
- Energy dissipation structures
- Water quality management facilities
- Outfalls to watercourses or the sea
- Storm surge and flood protection infrastructure

In the Northern District, no specific suburb areas are identified as having a **severe lack of capacity** in MTIIF.

6.5 Key Opportunities and Constraints

In terms of the assessment above, areas that have spare capacity signify opportunities, while those with a severe lack of capacity are the most constrained areas.

7 HUMAN SETTLEMENTS

The concept of integrated human settlements goes beyond providing housing, but rather speaks to creating environments that support the social, physical, and economic integration of housing developments into the existing urban fabric and establishing quality living environments that are sustainable. This means that housing is merely one of the basic infrastructure components required to build integrated and resilient communities. Housing must be integrated within areas through housing mix, typologies, design and income, and be close to transport routes supporting transit-oriented development, where available.

BUILDING INTEGRATED COMMUNITIES TOD Precinct Planning

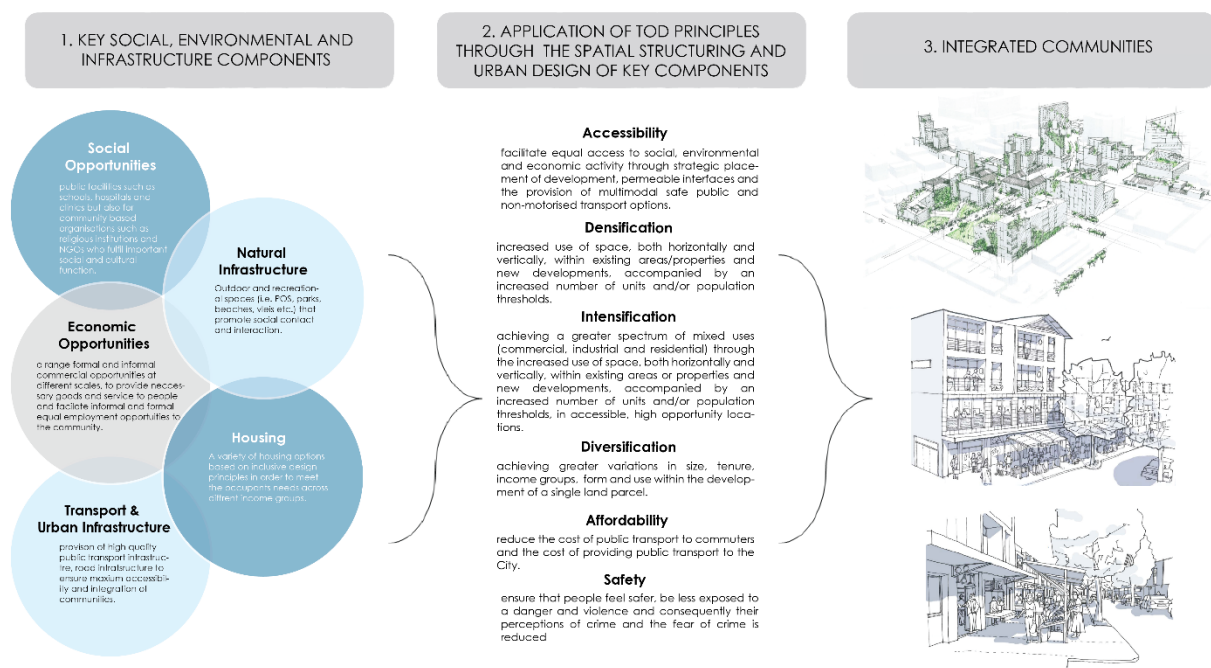


Figure 35: Building Integrated Communities

7.1 Housing Overview

7.1.1 Type of Structure

The majority of dwellings in this district consist of formal dwellings with a percentage of 87.43 %, compared to 12.57 % of informal dwellings. The formal dwelling typologies are predominantly freestanding houses, along with a smaller percentage of apartments and a fairly low number of semi-detached and town houses.

The table and chart below give a detailed breakdown of dwelling typologies. The spatial distribution of the various formal typologies is indicated in the accompanying map. Higher concentrations of cluster housing (group housing) appear in newer developments in parts of areas such as Protea Heights, Kenridge and Sonstraal Heights. Note that the information obtained is outdated (2011), and developments since 2011 focussed much more on the development of group housing clusters and blocks of flats. It is also anticipated that the number of second dwelling units increased over the last years.

The percentage of informal dwellings is low in comparison to other Districts of Cape Town. However, the predominant areas of Northern with the vast majority of informal dwellings are Fisantekraal, Bloekombos and Wallacedene. See Figure below, depicting informal settlements.

Table 18: Dwelling Typologies in Northern District (Census 2011)

Dwelling Typology	Number	%
House (brick/concrete block structure)	68 662	71.3%
Traditional dwelling/hut/structure made of traditional materials	371	0.4%
Flat or apartment	7 581	7.9%
Cluster house in complex	2 698	2.8%
Townhouse (semi-detached house in a complex)	3 645	3.8%
Semi-detached house	1 253	1.3%
House/flat/room in backyard	797	0.8%
Informal dwelling (shack; in backyard)	4 971	5.2%
Informal dwelling (not in backyard)	5 310	5.5%
Room/flatlet/servants quarters/granny flat	582	0.6%
Caravan/tent	41	0.0%
Other	407	0.4%
Total	96 318	100.0%

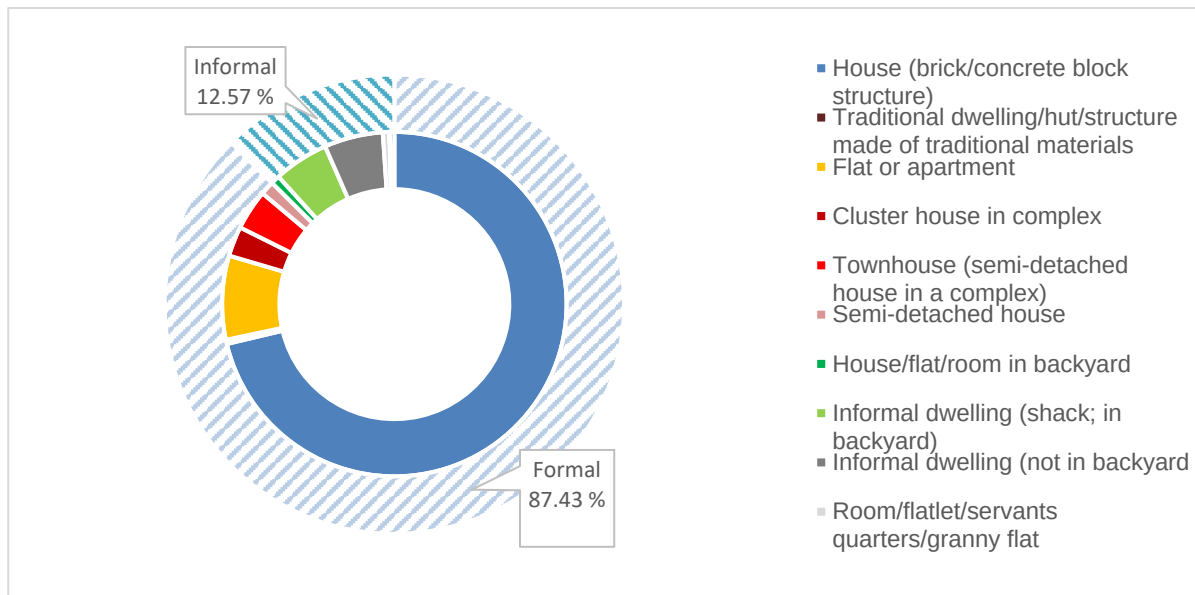


Figure 36: Chart showing Formal versus Informal Dwelling Typologies

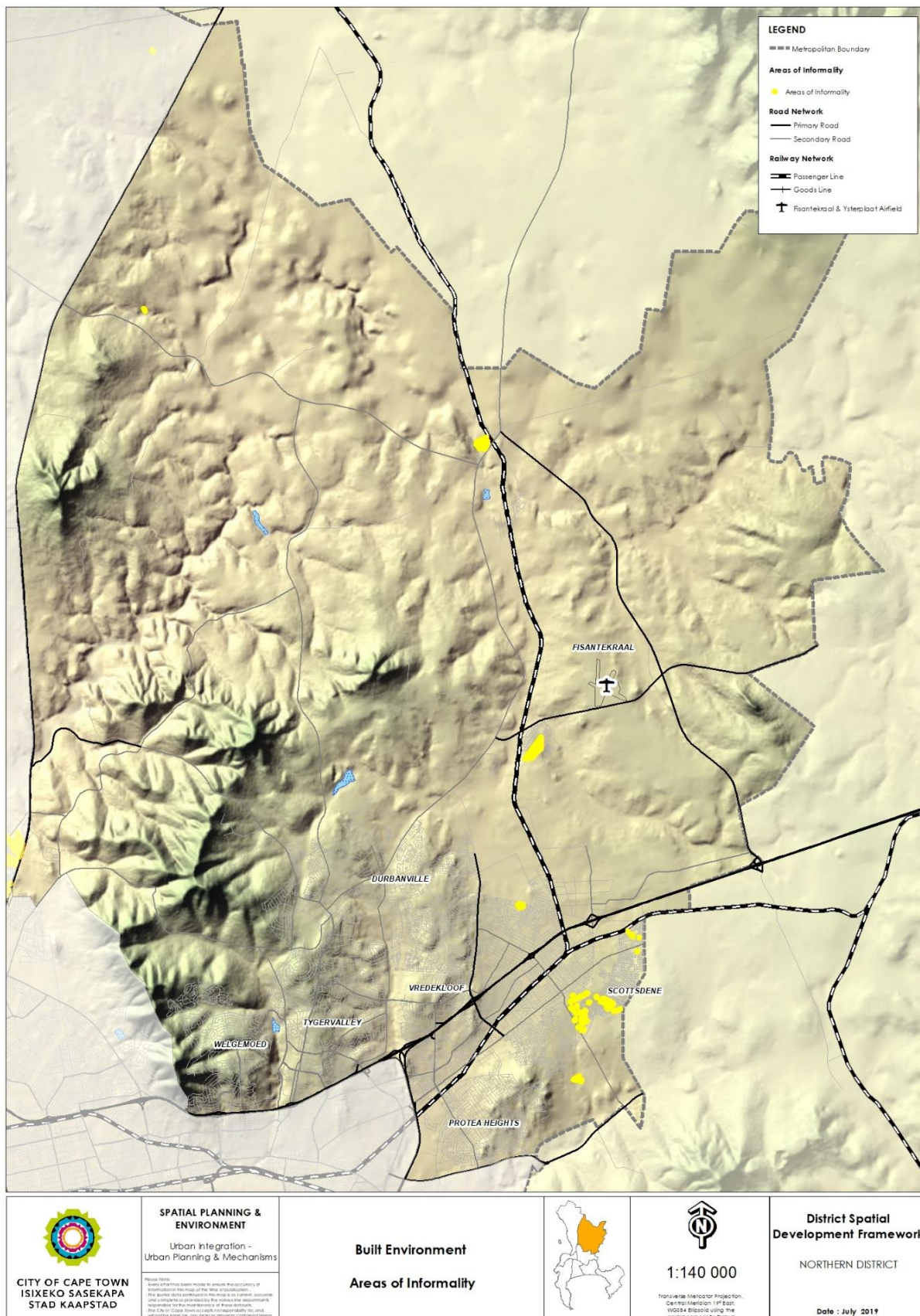


Figure 37: Map showing areas of informality in the district

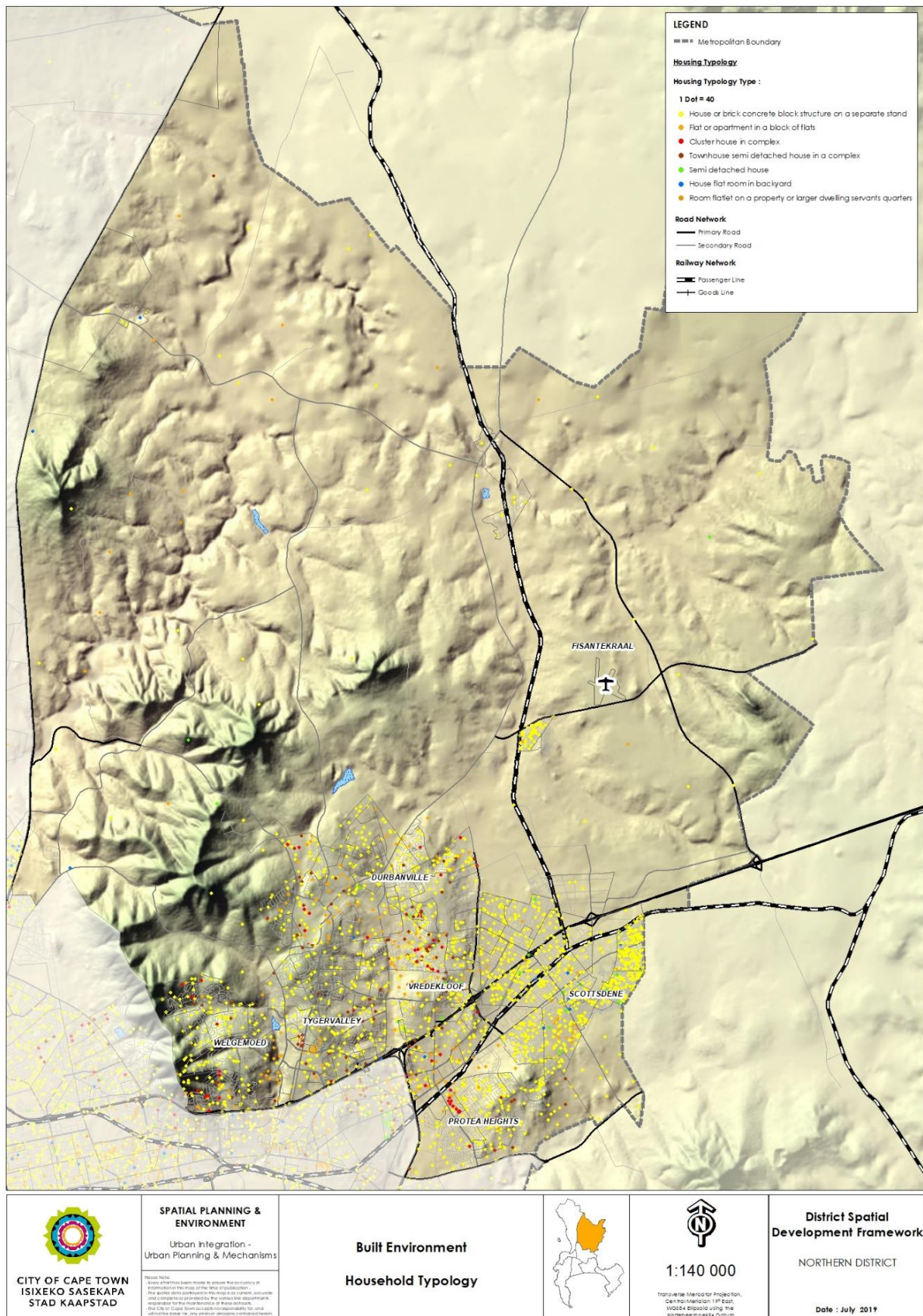


Figure 38: Map showing formal Housing Typologies in the Northern District

Freestanding structures (single residential) are dominating the urban footprint, whilst informal structures (areas of informality) appear to be concentrated in areas such as Klipheuwel, Fisantekraal, Bloekombos and Wallacedene. See Figure 38 above.

7.1.2 Tenure Status

Table 19 below indicates that almost 30% of the household population in Northern are renting their homes and only a quarter of the households own their homes with all debts paid off.

Table 19: Tenure Status in Northern District (Census 2011)

Tenure Status	Number	%
Owned and fully paid off	25802	26.79%
Owned but not yet paid off	30081	31.23%
Rented	28433	29.52%
Occupied rent-free	9264	9.62%
Other	2737	2.84%
Total	96317	100.00%

The tenure status of households in the Northern District (per subplace) is shown in the Figure below:

- The majority of properties in the district is owned, although a large number of properties are bonded.
- It appears as if a large number of properties, throughout the district, is rented.
- The areas of Bloekombos and Wallacedene appear to be the areas where no rent is paid. This may be ascribed to the extent of informality in the area.

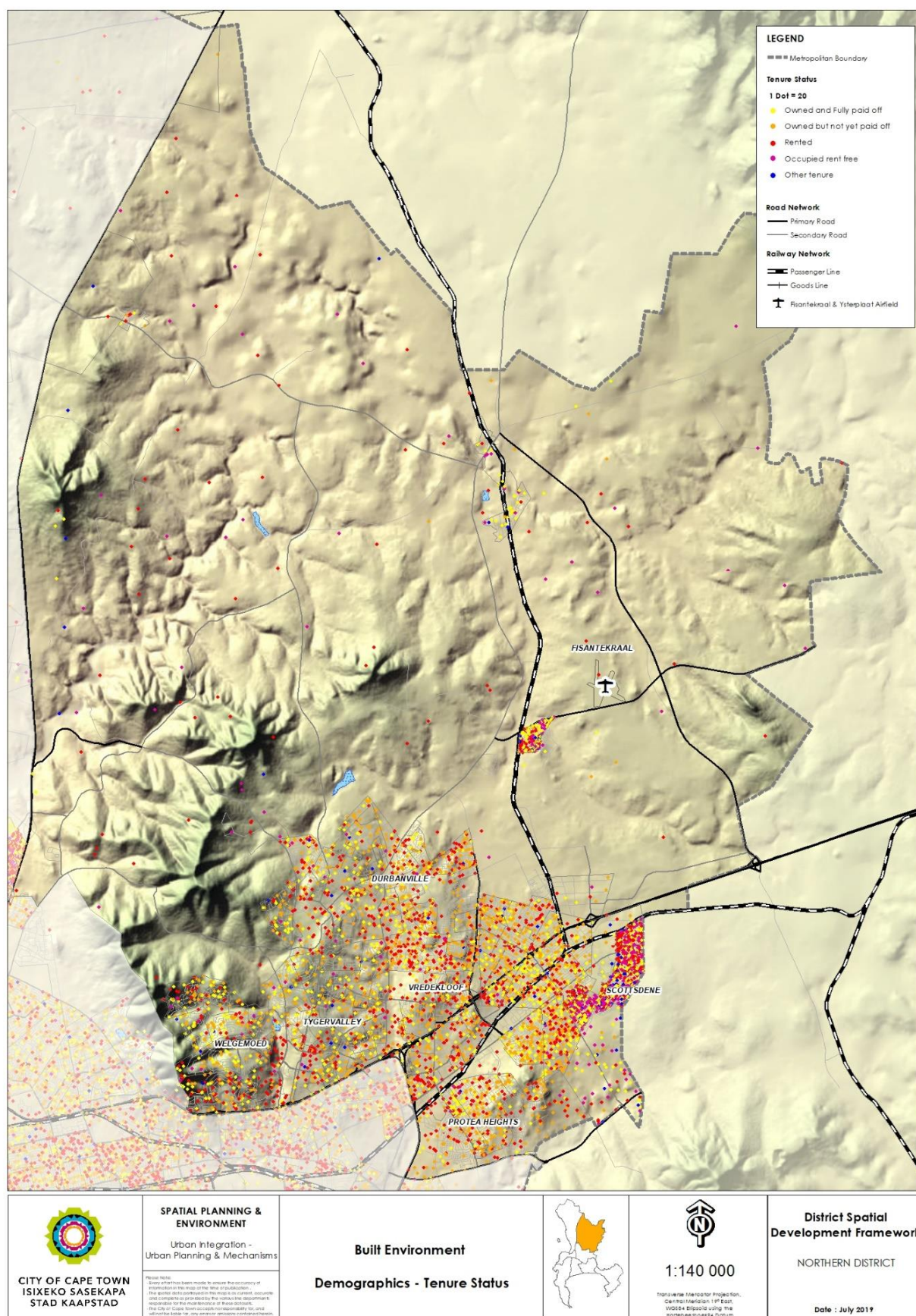


Figure 39: Map showing distribution of Tenure Status in Northern District (Census, 2011)

7.2 Housing Demand

Housing demand in the Northern District is assessed using a proxy⁵ of the number of informal structures in the District, as well as the number of people that have registered their need for housing on the City's Housing Needs Register. NOTE: People who have registered their need for housing might also be living in informal settlements in the area.

Hereunder is a graph showing the numbers of informal dwellings in the metropolitan area 2017/18 roof count by City of Cape Town). The Northern District has the lowest number of informal dwellings, compared to the other districts, i.e. 4979 dwellings, predominantly located in Klipheuwel, Fisantekraal, Bloekombos and Wallacedene.

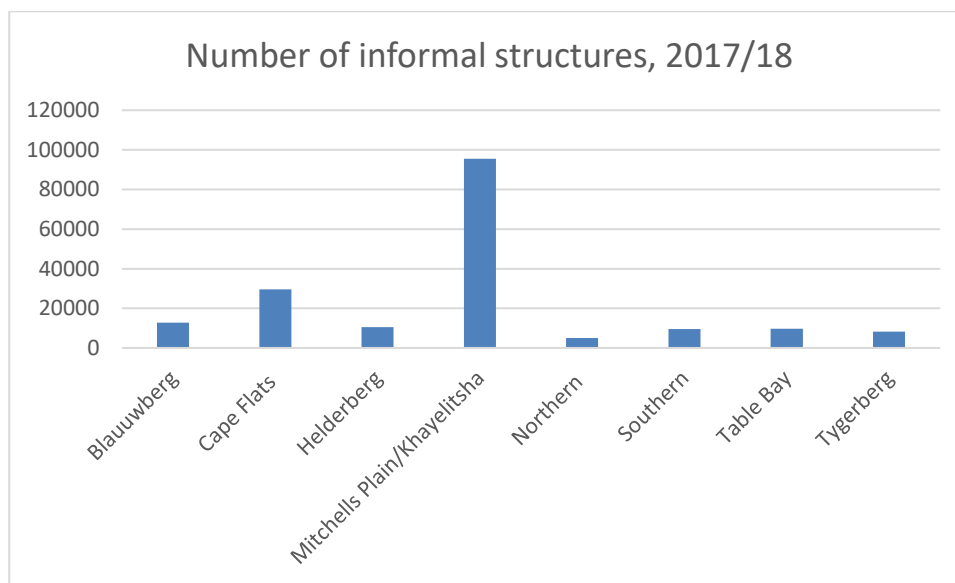


Figure 40: Number of Informal Structures

By the end of 2018, 10 067 people had registered their need for housing on the City's Housing Needs Registry. This accounted for 3.5% of all people who have registered their need across the City. NOTE: Anyone is able to register their need for housing on the Housing Needs Register, however many of the people registered might not qualify for housing, or their circumstances may have changed over time, thus the data needs to be treated with caution. A background check of beneficiaries registered on the database is only done at project inception.

The high population growth and increase in the number of households in Cape Town suggest that housing demand will continue to grow in the area. Particularly an increase in the number of households with no monthly income, leading to individuals more likely to be living informally, and would rely on the state to provide formal housing.

⁵ A comprehensive picture of housing demand showing all income levels in relation to housing stock at various prices, is not included in this section.

7.3 Housing Supply

7.3.1 Constructed/Delivered

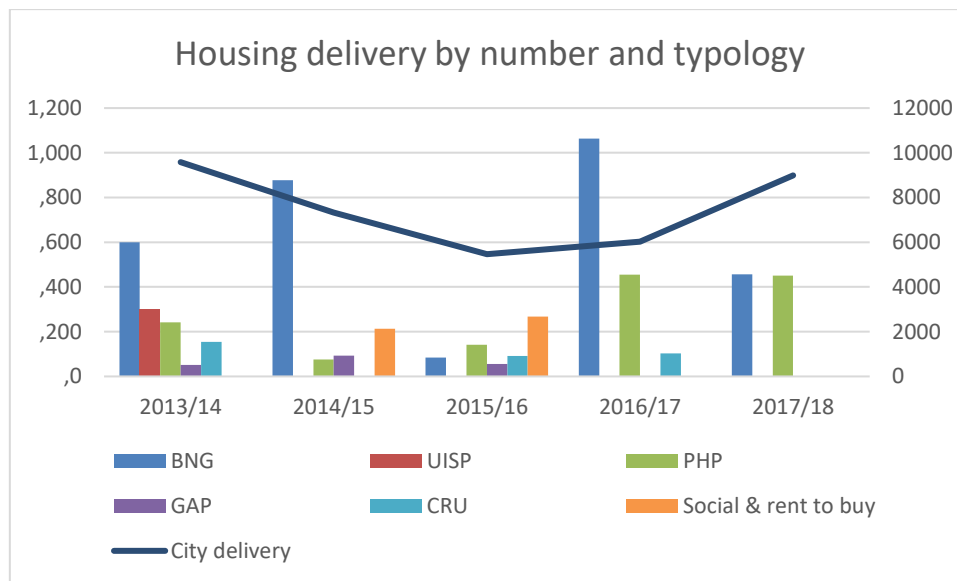


Figure 41: City's Human Settlements delivery data, 2013/14 – 2017/18

Over 2013/14 to 2017/18, 5297 housing opportunities were created in the Northern District, mostly in the areas of Fisantekraal and Scottsdene, predominantly BNG housing. A BNG project has also been concluded in Morningstar, Durbanville where 166 units were completed.

While government is a key provider of housing households earning lower incomes – particularly those who earn below R3500 – the private sector plays a crucial role in the provision of housing at all income levels. **The private sector delivery of housing has not been factored into this analysis.**

7.3.2 Housing supply vs Demand

The City's housing programmes have not been able to keep up with housing need expressed by registrations on the Housing Needs Register. In the period 2012/13 to 2017/18, some 5778 housing opportunities were developed in the District. However, over the same period some 9583 additional individuals in the Northern District expressed their need for housing by registering on the City's Housing Needs Register, over and above the 12533 that were already registered in the District. This means that while housing delivery increased by an average of 7% per annum, the number of people registered on the City's Housing Needs Register increased by an average of 12% per annum. The City is thus failing to make headway in reducing the registered housing need – with housing need continuously outstripping housing supply.

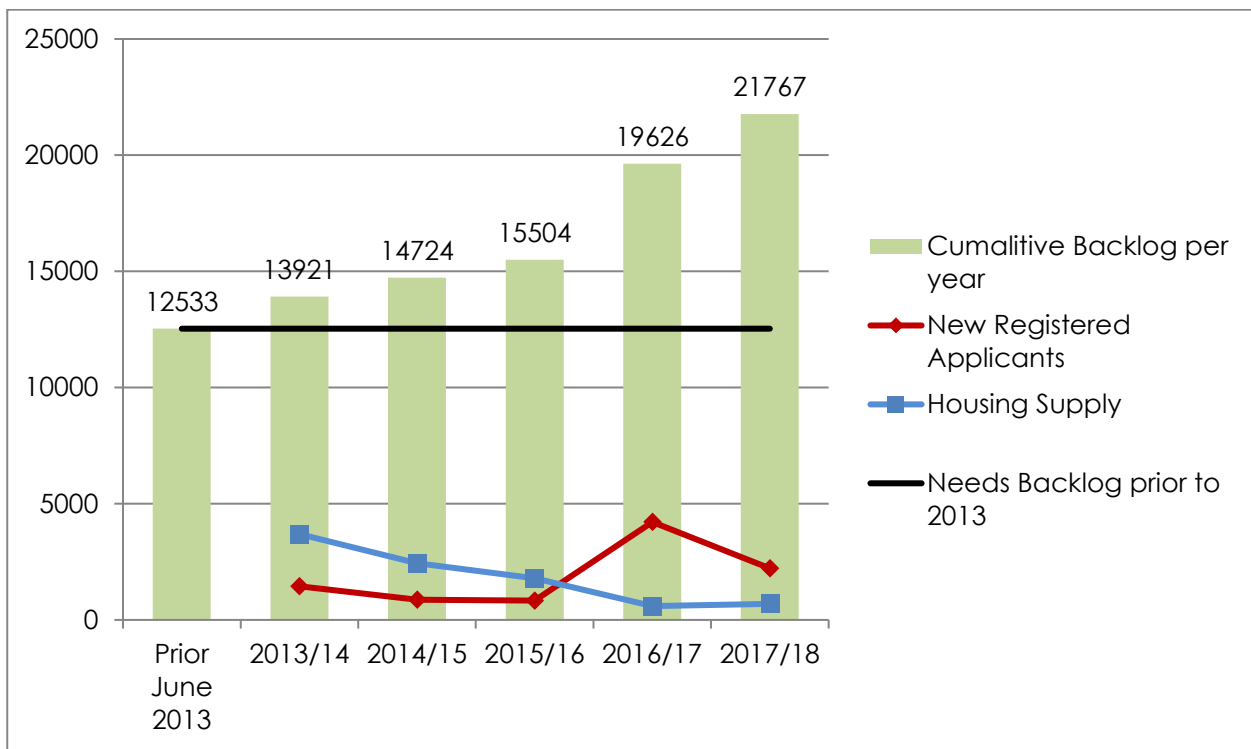


Figure 42: Comparison of Housing Needs Register to the number of housing units delivered by the City

Limitation within Housing Demand and Supply data:

Needs Summary:

- Records marked as “Assisted” – this is not a true reflection on supply per financial year as records are not regularly updated. For this reason there is a difference between the figures (per financial year) for “Assisted” records and “Total Supply”.
- Furthermore, “Assisted” records primarily refer to the supply of BNG, PHP and CRU housing opportunities as not all housing products supplied are currently captured on the Housing Needs Register.
- Records marked as “Waiting” – this only refers to persons who came forward to express their housing need and not necessarily person who will qualify for a state subsidized housing opportunity. The qualification verification process will only occur once a person is selected for a housing opportunity.

Supply Summary:

- UISP – persons who are beneficiaries within an Upgrading of Informal Settlements Project are not necessarily registered on the City's Housing Needs Register as this is not a mandatory provision as per the prescripts of the National Human Settlements Policy. The idea is to upgrade the identified Informal Settlements regardless of a person's eligibility criteria. A person's eligibility criteria is however taken into account during the transfer of ownership of a services site and/or top-structure.
- GAP – people who are beneficiaries within the GAP market are not necessarily registered on the City's Housing Needs Register. Eligible persons apply directly to the developer to purchase the property and will apply directly to the Western Cape Department of Human Settlement for the Financed Linked Individual Subsidy Programme (FLISP) subsidy.
- Land Restitution/ Institutional - persons who are beneficiaries within this housing programme are not necessarily registered on the City's Housing Needs Register.
- Social and rent to buy - persons who are beneficiaries within this housing programme are not necessarily registered on the City's Housing Needs Register as this housing programme cater for households with an income up to R15 000 per month. Prospective tenants apply directly to the respective Social Housing Institutions for rental vacancies.

From the information above, it is clear that the demand for housing outweighs the extent of delivery. Keeping in mind the number of projects in the planning phase, the picture may look different in future as delivery in the district increases again.

As was stated already, the extent of greenfield sites available for larger scale infill development in the district, has to a large extent been depleted as all of the sites are already in the planning stage. The question therefore arises where land should be made available to address future/ longer term needs.

7.3.3 Pipelined, Planned and in Construction

While the data above outlines the housing delivery, the map below outlines human settlements projects that are in construction, planned (meaning budget has been allocated to them), or pipelined (future developments that will be planned next).

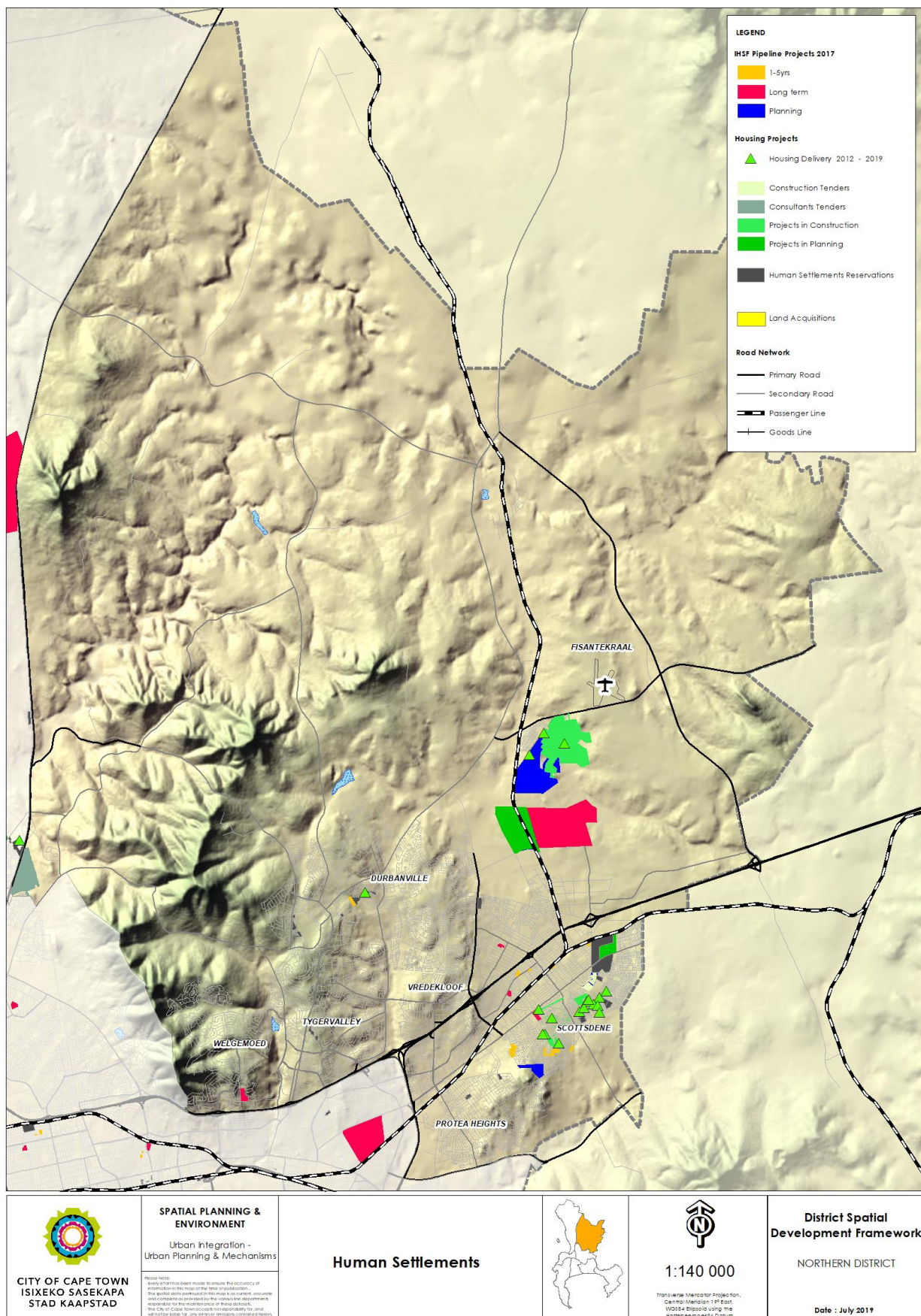


Figure 43: Housing Pipeline for Northern

7.4 Key Opportunities and Constraints

7.4.1 **Generic constraints**

In terms of number of houses built, housing demand continuously outstrips housing supply, with more and more people registering their housing needs on the City's Housing Needs Register. National funding for human settlements has reduced across the country, as a result of fiscal constraints – with significant questions being raised about the long term financial sustainability of the government subsidised housing programme.

The City of Cape Town, like key economic nodes across the country, has experienced urbanisation and the accompanying increase in population numbers. This can particularly be seen with regards to the increase of informal settlements across the City. Urbanisation is a worldwide trend – particularly in developing country contexts. Thus housing interventions need to prepare for increased population sizes, who often reside informally.

A key constraint with human settlements implementation across the City, has been a lack of integrated planning of budget cycles, which impacts on the prioritisation of projects by City Directorates. This has undermined the attempt to create integrated communities in some areas of the City.

It is thus strategically important to question whether the City can 'build' its way out of this housing crisis through using the existing government grant programmes, which has always privileged the provision of a subsidised free-standing house to qualifying beneficiaries earning R3500 and less. A strategic shift is required, and more emphasis should be placed on considering the importance of the upgrading of informal settlement programme – particularly in situ upgrading. However, in situ upgrading of informal settlements remains challenging: firstly, the land might not be suitable for development (e.g. area that is prone to flooding, environmentally sensitive areas etc.), and secondly, some areas of the City might be too dense so that de-densification becomes necessary in order to enable formalisation of areas.

When considering the spatial goals of densification and diversification of land uses, it is important to recognise that most of the government subsidised housing programmes implemented by the City are nationally funded programmes, which come with strict conditions and legal parameters. These human settlements programme parameters constrain the development of affordable housing that meets the spatial goals of the City – particularly the densification and diversification of typologies. Social housing remains one of the only housing programmes that enables densification on well-located, scarce land. Innovation around mixed-income and mixed-use is thus of critical importance.

Human settlements is not just about the development of housing, but also about the development of integrated, liveable communities. A key constraint to human settlements implementation across the City has been a lack of integrated planning of budget cycles, which impacts on the prioritisation of projects by various City Directorates. This has undermined the attempt to create integrated communities in some areas of the City – e.g. social facilities might not always be integrated into housing developments.

Capacity constraints regarding the social facilitation of human settlements developments can impact negatively on the outcomes of projects, and remains an ongoing challenge – particularly as it relates to the upgrading of informal settlements.

The development of integrated human settlements requires the use of well-located land for government subsidised housing. Well-located land is expensive, in short supply, and often more appropriate for infill development than the large-scale BNG developments that are often on cheaper land.

Land invasion has increased, and represents a significant challenge to the City. Land invasion sterilises land which was otherwise earmarked for human settlements, or other social or economic activity. It represents a challenge to the City's human settlements project pipeline through redirecting resources. It also results in community conflict between those who have invaded land, and those who are waiting for long periods of time on the Housing Needs Register.

Most of the government subsidised housing programmes implemented by the City are nationally funded programmes, which come with strict conditions and legal parameters. These human settlements programme parameters constrain the development of affordable housing that meets the spatial goals of the City – particularly the densification and diversification of typologies.

In situ upgrading of informal settlements is a challenge, as firstly the land might not be suitable for development (e.g. area that is prone to flooding, environmentally sensitive areas etc.), and secondly, some areas of the City might be too dense so that de-densification becomes necessary in order to enable formalisation of areas.

7.4.2 Local constraints

When the greenfield projects of Maroela North & South (presently in planning process) and Klein Begin have been implemented, no larger tracks of land will be available in the vicinity of Wallacedene and Bloekombos for further human settlement development, unless land is identified outside of the 'urban edge'. However, development of settlements further away from public transport, employment opportunities and amenities cannot be regarded as desirable.

7.4.3 Local Opportunities

Smaller vacant land parcels should be identified in closer proximity to rail stations for infill development.

8 PUBLIC FACILITIES

8.1 State of Supply and Demand

The following analysis and proposals on Community Facilities are informed by the updated Community Facility Guidelines and Standards for Facility Provision reviewed in 2020. Each facility has a set of planning standards for providing facilities which have been articulated by line departments, work-shopped and agreed to with key stakeholders. The facilities guidelines and standards were incorporated into a modelling exercise that sought to understand sufficiency or insufficiency in the distribution of community facilities and build a hierarchy of civic clusters (a network of nodes with community facilities) across the City.

The results from the modelling exercise should be used as a data driven support tool to inform strategic planning, budgeting, decision making and implementation as such they do not replace the facilities identified and prioritized by line departments and the Community Services and Health Infrastructure Plan.

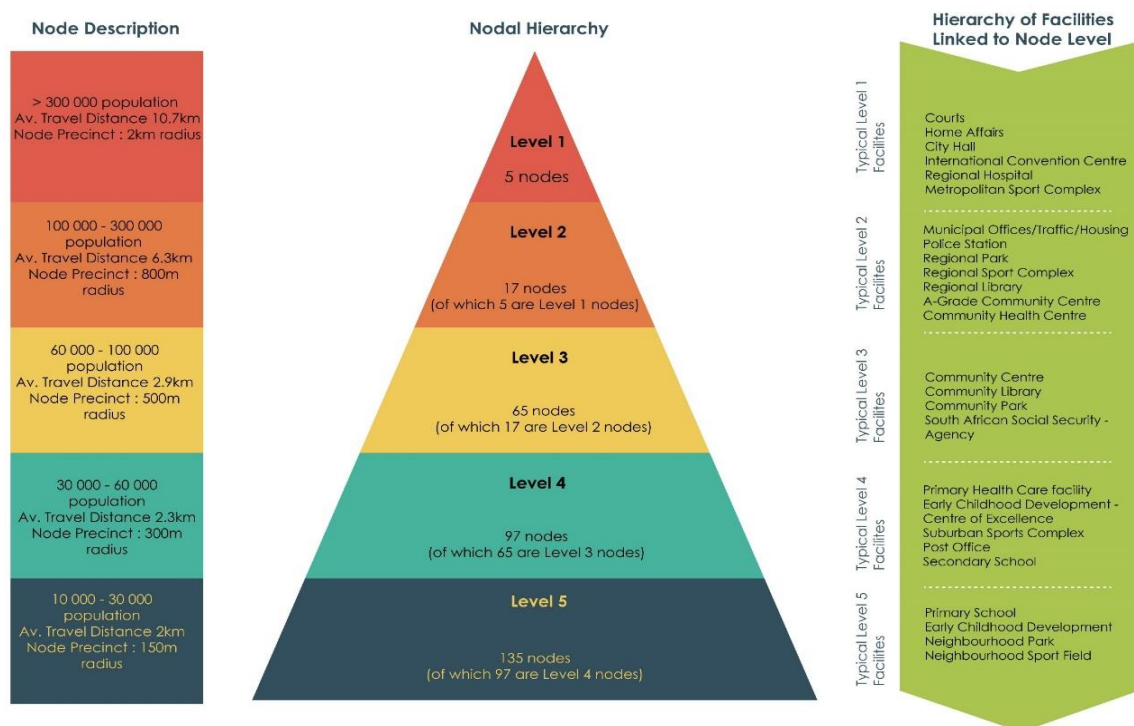


Figure 44: Conceptual Hierarchy of Community Facility Nodes/Civic Clusters

8.2 Existing Facilities

The map below illustrates the distribution of existing facilities and highlights sufficiency/insufficiency as at the year 2020 in the form of a heat map, neighborhoods that fall within areas shaded red, orange are the most underserved areas in the district. The Northern District is generally well serviced by community facilities. Sub-district 1: Tygervally Node and Durban Road corridor, benefit from a range of private facilities in addition to public ones. Furthermore, the northern portion of the district benefits from the adjacent

natural areas, to the north, portions of which can be used for recreation purposes, in the case of nature reserves. While the areas north of the N1 are well served, Sub-District 3 has been rated as the most underserved, within the Northern District. This area is characterized by significantly lower socio-economic index and is receiving extensive human settlements development and high presence of informal settlements. The node of highest need is Wallacedene, which also the 4th highest ranked in the Metro, in terms of insufficiency. In addition, Scottsdene has been identified as an area of insufficient provision and increasing need for community facilities.

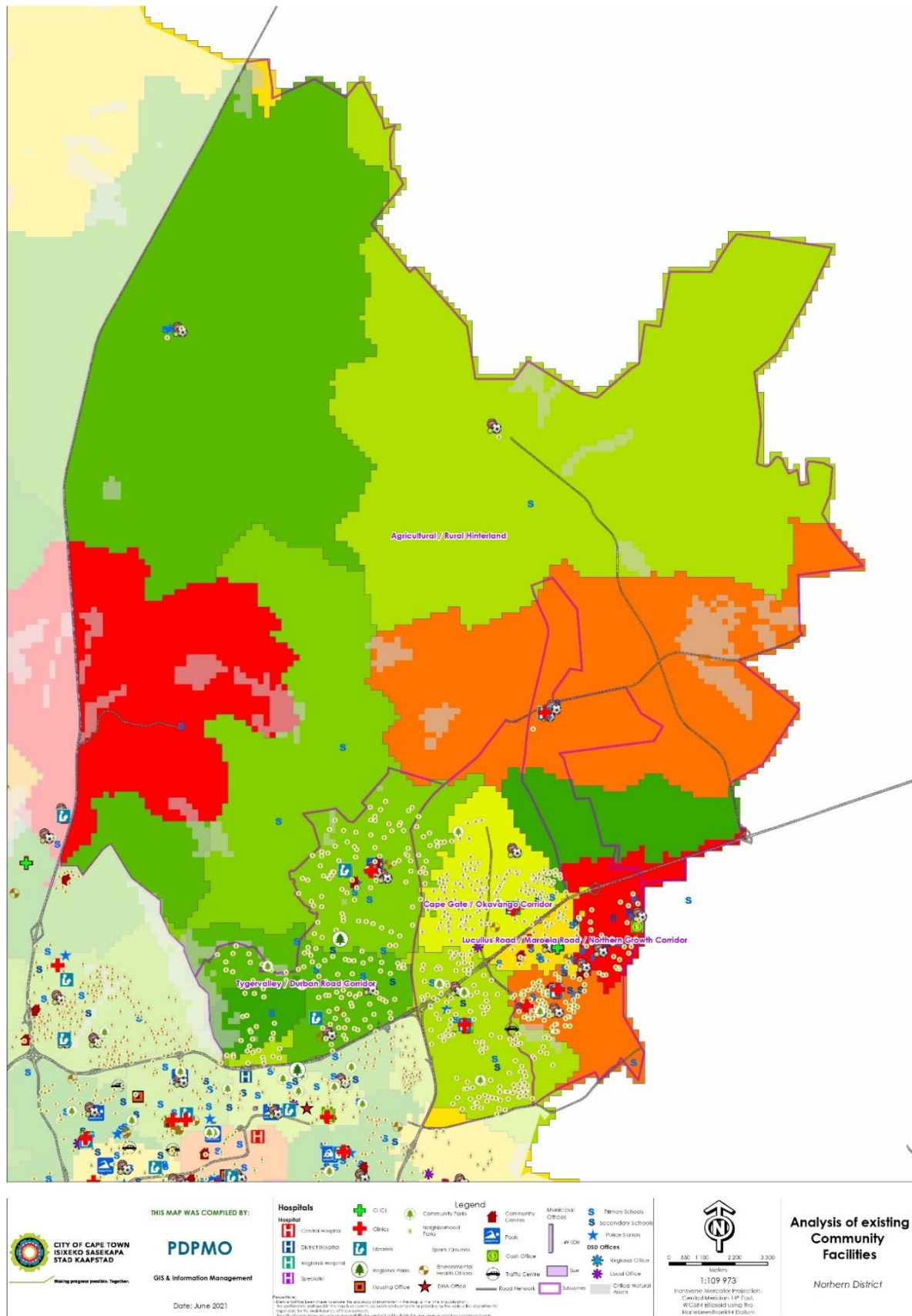


Figure 45: Existing community facilities in the Northern District

Table 20 shows the results generated from a modelling exercise that was undertaken to identify nodes/ service catchment areas of need and the type of facilities required in the district in order to meet the needs of the population in 2020 and 2040 taking into account sector specific assumptions, guidelines and standards for facility provision.

Table 20 lists the top areas of need in the Northern district and indicates the facilities that are required based on the modelling exercise. It should be noted that the node identified as an area of need represents not only the name of the area/suburb but a larger catchment which includes other suburbs.

Table 20: Top Areas of highest public facilities need Northern District, 2020 & 2040

	2020			2040		
Facility Type	Node/Area	Population Demand	Facilities Required *	Node/Area	Population Demand	Insufficient Supply*
Community Centres	- Wallacedene - Kraaifontein	181 015	-2.3	- Wallacedene - Kraaifontein - Fisantekraal	240 736	-3.6
Education	Primary Schools - Wallacedene - Kraaifontein - Brackenfell	203 655	-12.1	Primary School - Wallacedene - Kraaifontein - Scottsdene - Brackenfell - Fisantekraal	301 653	-25.5
	Secondary School - Kraaifontein - Brackenfell	108 147	-4	Secondary School - Wallacedene - Kraaifontein - Scottsdene - Brackenfell - Fisantekraal	371 655	-11.3
Libraries	Community - Wallacedene - Kraaifontein	181 015	-2.3	Community - Wallacedene - Kraaifontein	228 104	-2.5
	Regional			Regional Wallacedene	223 152	-2
Primary Health				Clinic - Brackenfell - Kraaifontein - Wallacedene	261 024	-1.4
Parks	Neighbourhood - Wallacedene - Scottsdene	140 148	-33 ha	Neighbourhood - Wallacedene - Fisantekraal	163 091	-46ha
	Community - Wallacedene - Kraaifontein - Scottsdene	187 978	-4.1	Community - Wallacedene - Kraaifontein - Scottsdene - Fisantekraal	382 666	-6.6

	Regional - Wallacedene - Kraaifontein	336 434	-2	Regional - Wallacedene - Kraaifontein	434 966	-2.6
Sports grounds	- Wallacedene - Kraaifontein - Scottsdene - Brackenfell	246 373	-13.1	- Wallacedene - Fisantekraal - Scottsdene	282 110	-186
	* Equivalent to No. of Facilities / No. of unserved population/ha of land required Positive values indicate an over provision; Negative values indicate a shortfall relative to the standards					

Figure 46 unpacks the detail related to insufficiency, specifically reflecting facility insufficiency or need in relation to the nodal hierarchy. It should be noted that this is based on the modelling and interpretation of data (supply of facilities, population, facility standards, distance) specifically for the following facilities: Neighbourhood Parks, Community Parks, Regional Parks, Community Library, Regional Library, Primary Health Care, Sports Grounds, Schools(primary and secondary). The insufficiency has been depicted through bar graphs that highlights the number of facilities needed per nodal catchment area. However, the education facilities have been omitted from access to education facilities and schools are provided at different scales namely the bar graphs as the needs are expressed through the number of learners requiring small, medium and large schools.

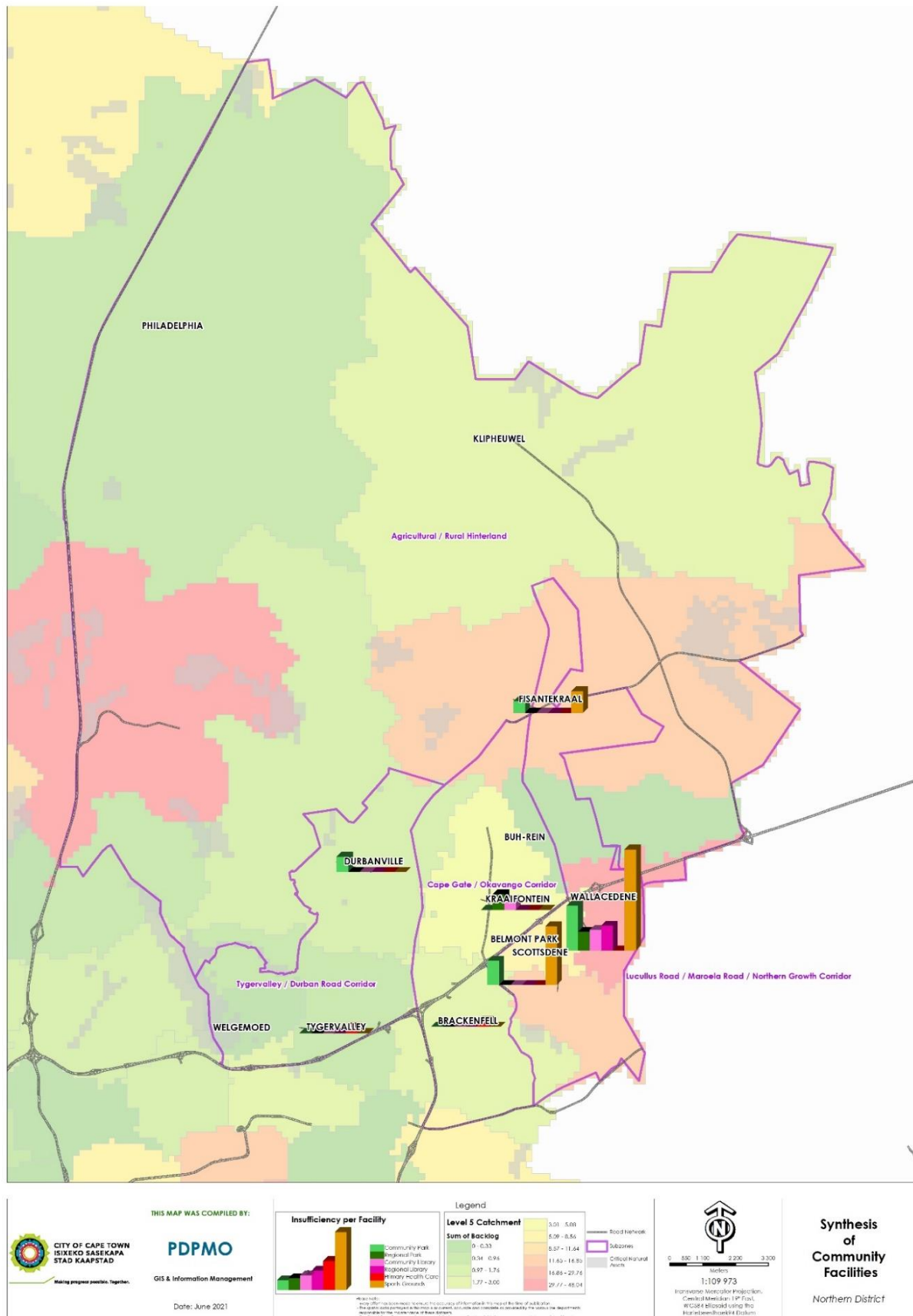


Figure 46: Facility insufficiency in Northern district

8.3 WCED Educational facilities assessment

The Western Cape Education Department has identified 6 hotspot areas across the city based on the current service delivery challenges and provision of education services. The aim is to stabilize these areas from an overall education provision perspective through implementation that is directed in a spatially targeted manner that ensures that the demand/need is met at a provincial level. These areas are: Dunoon, Bloekombos/Wallacedene, Delft/Mfuleni, Imizamo Yethu/Hout Bay, Ocean View/Masiphumelele and Lwandle/Nomzamo.

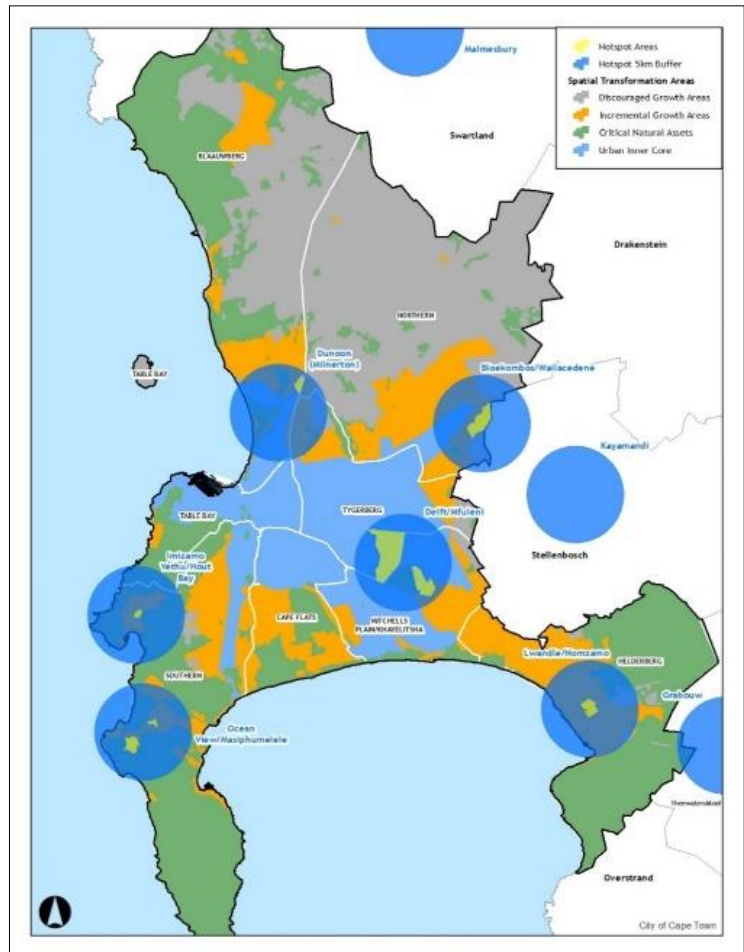


Figure 47: WCED hotspot areas in relation to Spatial Transformation Areas

The Northern District in context of education provisioning can be characterised into 2 parts namely (a) the wider Durbanville and (b) Kraaifontein areas. In this instance, many schools within the Durbanville may have their respective challenges, however, at a neighbourhood level, they are considered 'stable'. Contrary to this the Kraaifontein areas are experiencing enrolment challenges. This is more prominent in the Bloekombos/Wallacedene areas (Hotspot). Challenges include access to suitable vacant land and overall management of enrolment at schools.

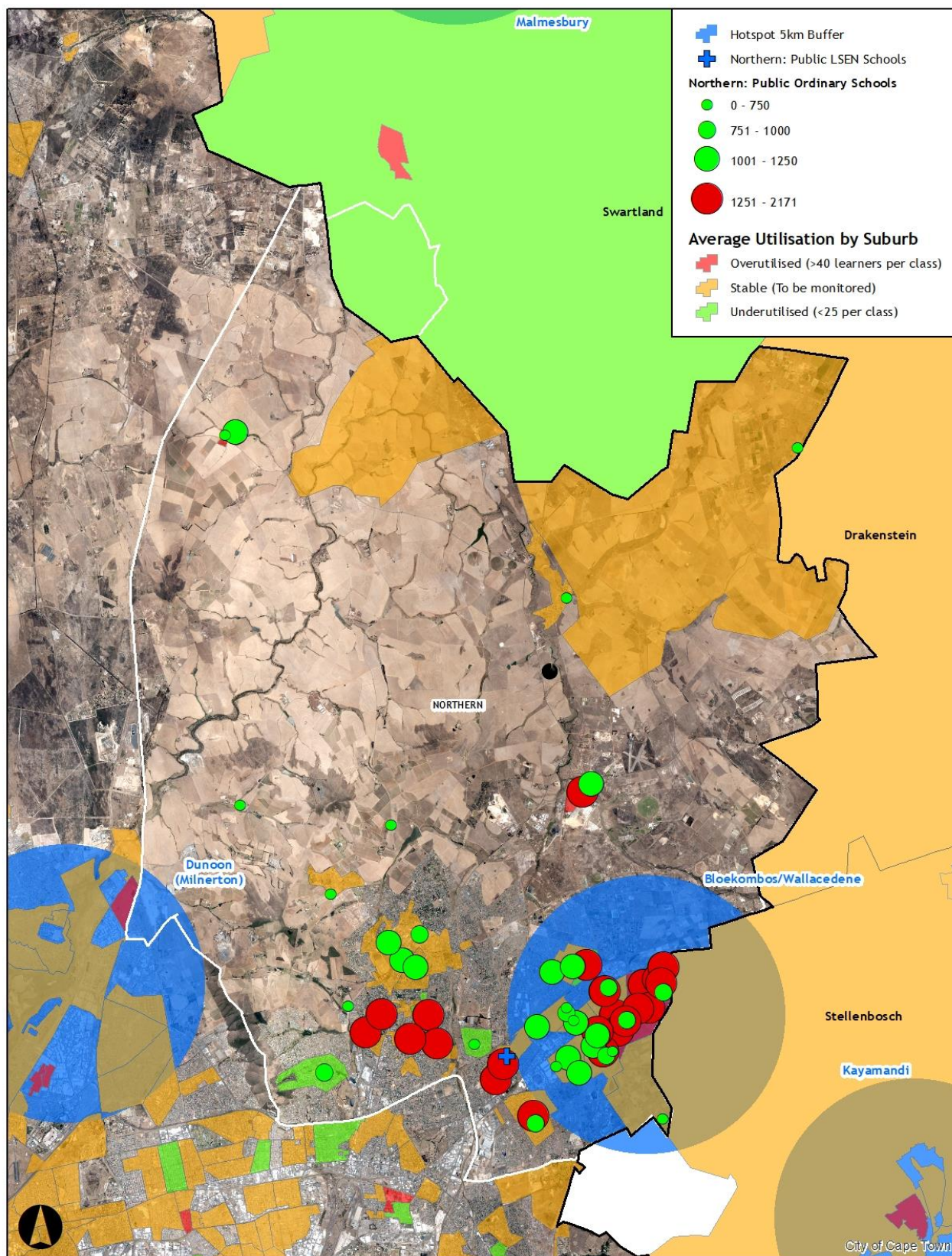


Figure 48: WCED areas of need and sufficiency analysis

8.3.1 Fire Stations

There are three fire stations within the Northern District which includes Brackenfell, Durbanville and Kraaifontein. These fire stations serve the entire district. Kraaifontein Fire station serves the largest percentage of the population when compared to the rest of the fire stations in this district. This is generally due to the high population densities within the Kraaifontein fire station's service area.

8.4 Key Observations

Established residential areas to the north of the N1 freeway are relatively well serviced in terms of a range of community and public facilities both at a local and district scale. Facilities are generally well maintained; however, some facilities are not functioning optimally. In terms of access, facilities within this part of the district are generally accessible and located on or close to major transport routes. However, facilities within lower income areas such as Fisantekraal, Bloekombos and Wallacedene are generally oversubscribed and poorly maintained, with open spaces and sports fields within these areas under pressure from settlement encroachment.

It is clear that the neediest communities are those of Bloekombos and Wallacedene (Reference: Draft Community Services & Health Infrastructure Plan 2018-2033, Directorate Community Services & Health).

Caution should be taken not to dispose of land parcels in the lower income areas such as Bloekombos & Wallacende, as the area is in need of public facilities.

D: STATE OF THE ECONOMY AND PROPERTY MARKET

9 THE ECONOMY

9.1 Macro-Economy

In 2018, Cape Town's real GDP growth averaged 2.1%, outperforming South Africa's average Real GDP growth of 1,67%, however both still reflecting an overall downward trend. See Figure hereunder.

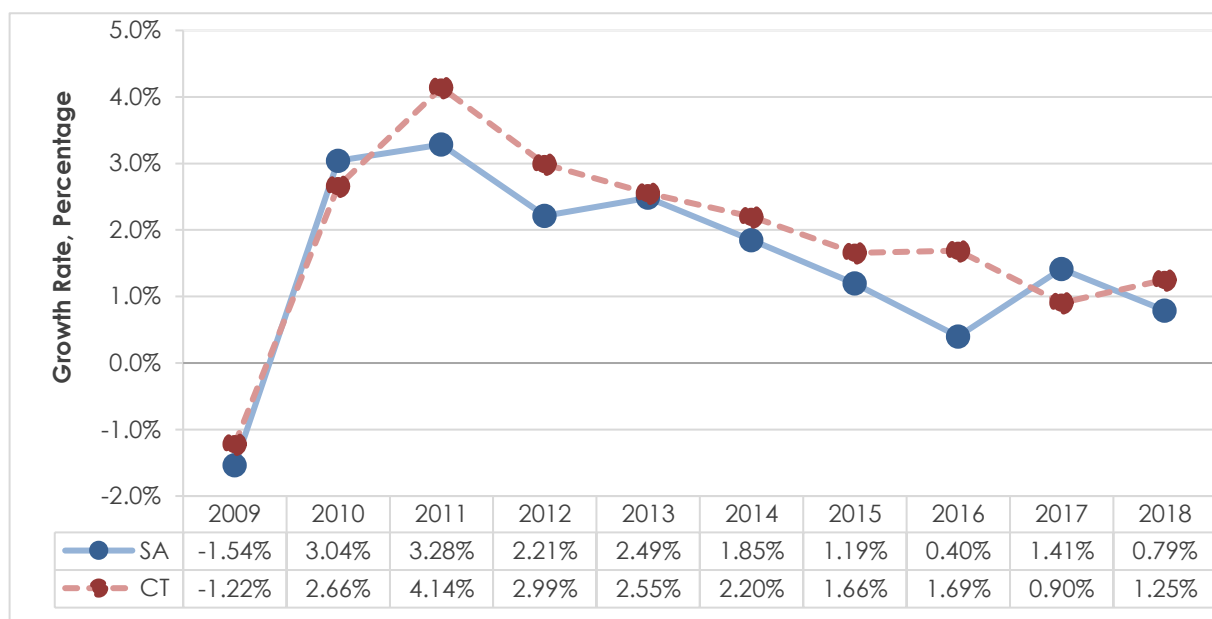


Figure 49: Average annual Gross Domestic Product (GDP) growth, South Africa vs. Cape Town for 2009 to 2018 (Source: IHS Markit, 2019).

Economic activity in Cape Town largely mirrors trends at the national level though often exceeding the national GDP. Deviations in these trends are observed since 2016; which may be attributable to the recent drought conditions faced in the region. Between the year 2009 and 2018, Cape Town's real GDP growth averaged 2.1%, outperforming South Africa's average Real GDP growth of 1,67%, however both still reflecting an overall downward trend.

Cape Town's appealing lifestyle and skilled labour makes it an attractive financial and business service hub for global and national organisations. As a result, the finance and business services sector has been the largest contributor to the growth of Cape Town's economy in the past ten years. This is likely to result in increasing demand for office space.

Although Cape Town's office vacancy rate has remained the lowest among the five largest municipalities⁶ (SAPOA, 2018) over the past five years, the negative effects of recent political and economic events have, nevertheless, damaged consumer and investor confidence. This has impacted negatively on an otherwise resilient office vacancy rate and caused a moderate decline in the city's rental growth rate.

⁶ The five largest municipalities being: City of Johannesburg, eThekweni, Nelson Mandela Bay, City of Tshwane and City of Cape Town

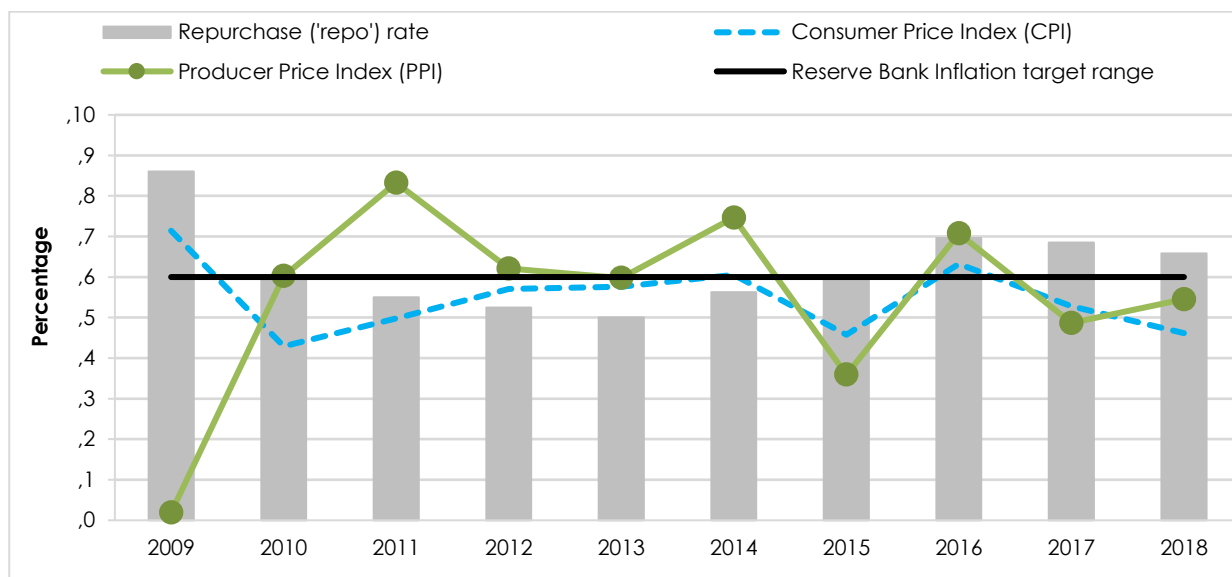


Figure 50: CPI and PPI trends in South Africa, 2009 to 2018 (Source: CPI and PPI extracted from Statistics South Africa, 2018-2019, and repurchase rate extracted from SARB, 2018-2019).

The consumer price index (CPI), inflation rate, and the producer price index (PPI) measure the price fluctuations of goods and services in the economy (See Figure above). Within the ten-year period observed above, the CPI and the PPI varied slightly around the reserve bank upper inflation target rate of 6%.

In the figure above, it can be observed that inflation (6,33%) exceeded the upper limit of the target in 2016. This upward trend could largely be explained by the price increases in housing rentals, recreation and cultural activities. In response to the increase in inflation in 2016, the Reserve Bank increased the repo rate to 7%. While the rate has been adjusted downward since 2016, in response to lower levels of inflation, the repo rate (and, by extension, the prime lending rate) has remained significantly higher than in the 2010 -2015 period. As a result, property buyers have found it costlier to take out mortgage bonds between 2016 and 2018 than in the five-year period preceding that. Together with low levels of consumer confidence, this has resulted in dampened activity in the property market.

Another factor impacting on the level of property market investment was South Africa's credit rating downgrade at the beginning of 2017, which led to big international fund managers selling out of South African bonds. This increased bond yields and continued to discourage consumer spending. During this time, it appears that building developers began losing confidence in South Africa's property market.

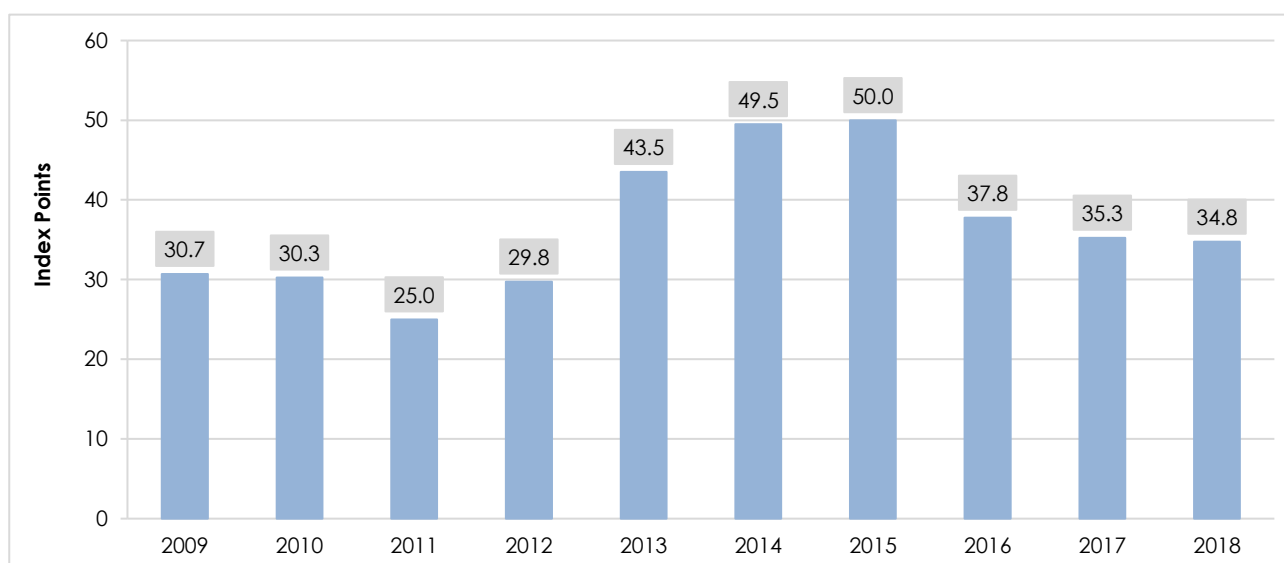


Figure 51: Building Confidence Index (BCI), 2009 to 2018

Figure 51 above shows the First National Bank (FNB)/BER composite building confidence index for the 10-year period from 2009 to 2018. The Building confidence index records the percentage of architects, quantity surveyors, and contractors and manufacturers of building material, who are either satisfied with or wary of the prevailing business conditions (BER, 2018).

The First National Bank (FNB)/BER composite Building Confidence Index (BCI) declined by 15,3 points from 2015, where it peaked at 50,0 index points, to reach 34,8 index points in 2018. This decline in 2018 can be attributed to the weakened confidence of architects and quantity surveyors, as a result of an unstable economic environment characterised by relatively high office and retail vacancy rates, high interest and inflation rates as well as slow GDP growth (FNB, 2018).

Although the building confidence index has dropped significantly since 2015, Cape Town has continued to see stable growth in building supply with the conversion of older office buildings to residential use cushioning the level of vacancies (Baker street properties, 2018). The weak economic growth is, however, eventually likely to aggravate the weak employment growth which could, in turn, see demand for building or office space declining (JLL, 2018).

9.2 Property Market Performance

The Figure below, displays the total floor area of new office building space and new industrial building space added to building stock, against the observed variations in the office and industrial vacancy rates, from 2015 to 2018. There is generally, although not exclusively, a positive relationship between building completions and vacancy rates.

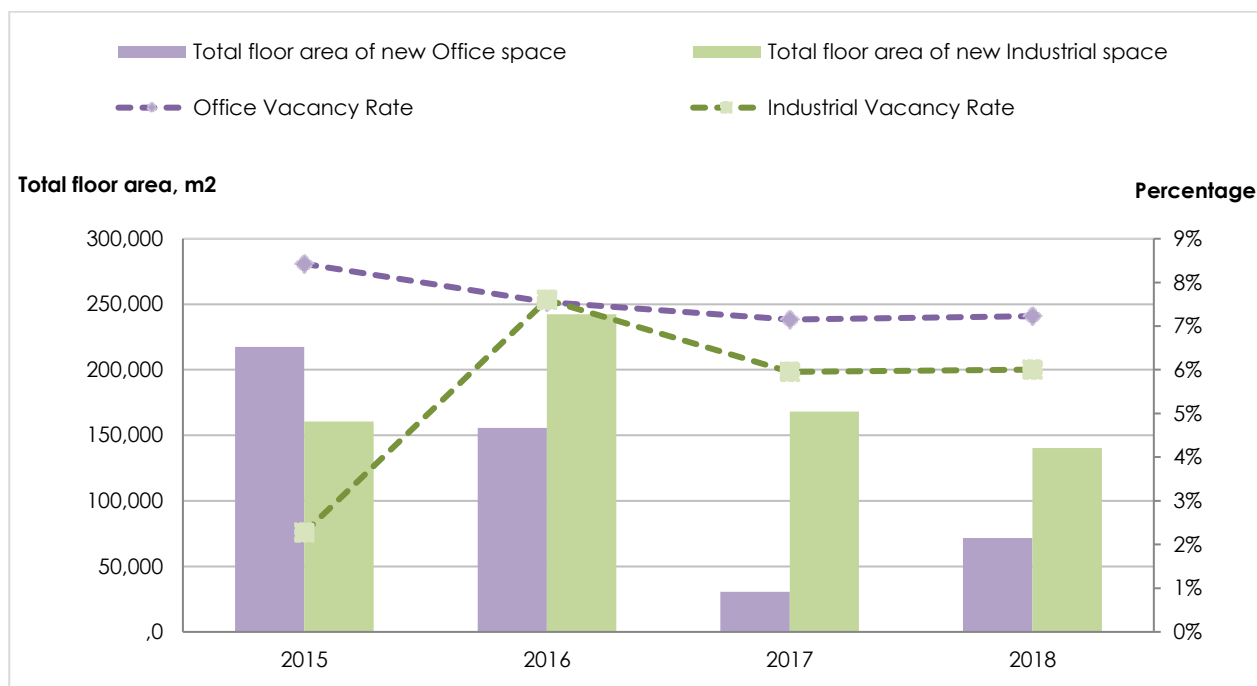


Figure 52: Cape Town's new building completions and vacancy rates for Office and Industrial space, 2009 to 2018

Source: Transport Business Support Department; South African Property Owners Association (SAPOA), 2019.

The total floor area of new Industrial space increased by 51% to reach a high of 242 394 m² in 2016, most likely to address the high demand for industrial space, reflected in the low vacancy rate in the previous year.

Cape Town's office vacancy rate remains the lowest among the five largest municipalities⁷ (SAPOA, 2018), however the slowdown in the office-to-residential conversion, which has assisted in reducing office vacancies in Cape Town may reveal the weak demand for office space (JLL, 2018). The figure above shows that the vacancy rate begins to decline as new office building completions decreased (with 2018 as the exception). A significant drop in building completions (80%) was recorded for 2017; which may be largely attributed to the negative effects of the drought, as the water prices spiked making construction of buildings more expensive.

⁷ The five largest municipalities being; City of Johannesburg, eThekweni, Nelson Mandela Bay, City of Tshwane and City of Cape Town.

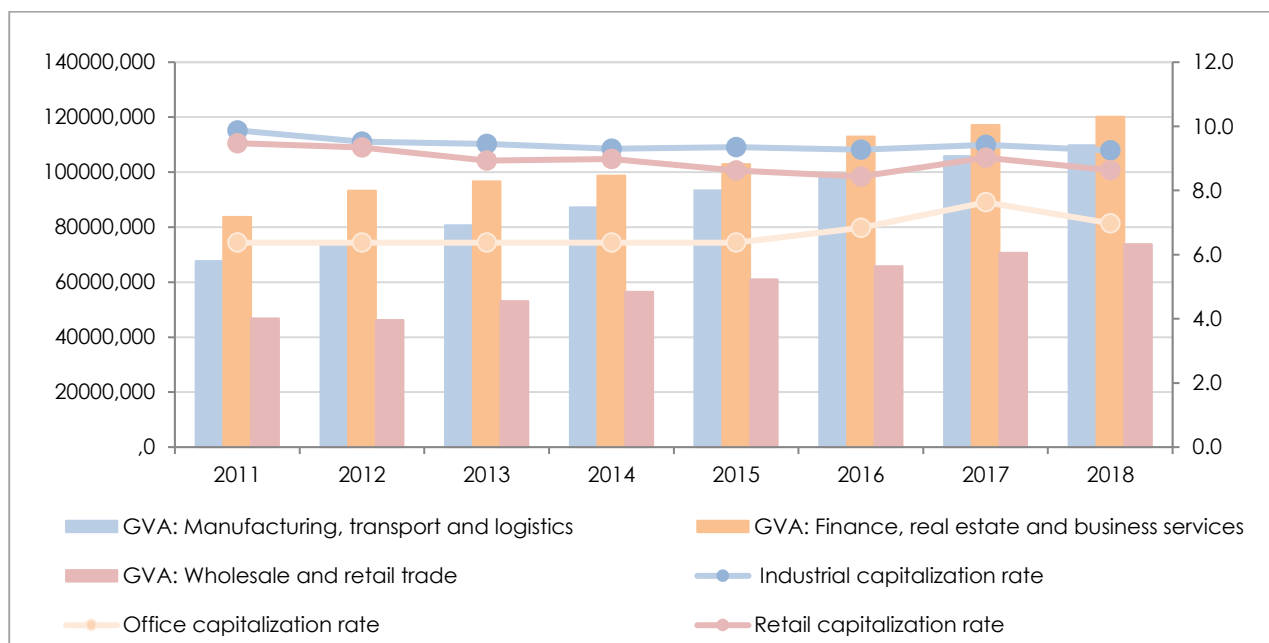


Figure 53: Cape Town's Gross Value Added (GVA) and Capitalisation rate , 2011 to 2018

Source: IHS Markit, 2019; South African Property Owners Association (SAPOA), 2019.

The Figure above shows the industrial, office and retail capitalization rates as well as the Gross Value Added (GVA) for the finance and business services sector; manufacturing, logistics and transport as well as whole sale and retail trade. The Gross Value Added (GVA) for industrial, office and retail space all followed a steady, though decelerating, upward trend from 2011 to 2018.

A cap rate is one type of measurement used in evaluating an investment, indicating **risk** and the **potential rate of return** for a prospective property. A low cap rates imply lower risk, higher value and a high cap rates imply higher risk, lower value. In the figure above the capitalisation rates for office, industrial and retail property in Cape Town follow a similar trend between 2011-2015. From 2016 – 2017 the cap rates for all sub-segments increased despite a momentary upturn in 2017. The increase in 2017 may largely be explained by stagnating property prices, a consequence of Cape Town's water crises and the credit ratings downgrade.

9.3 District Analysis

9.3.1 Economic Characteristics

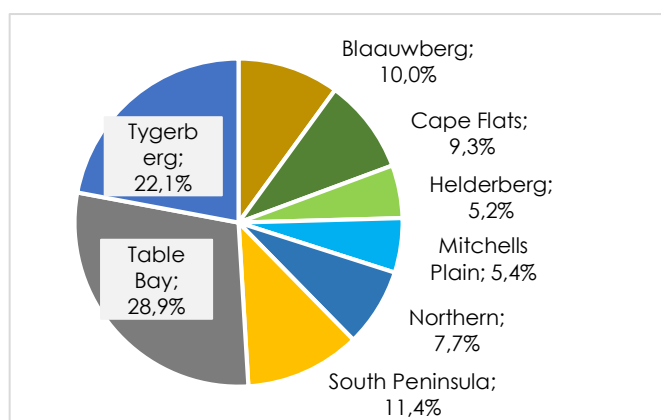


Figure 54: Gross geographic product (GDP) contributions at current prices in 2018 (IHS Markit, 2019).

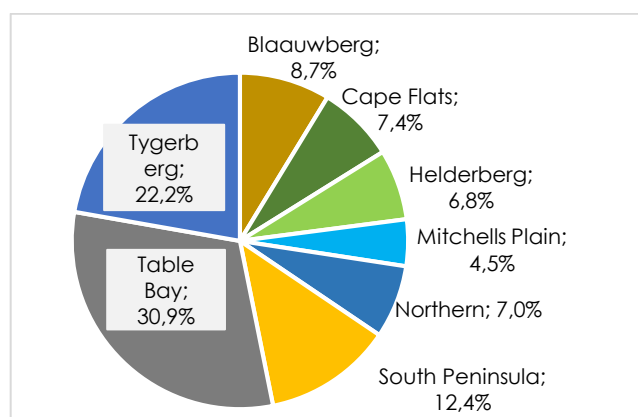


Figure 55: Employment contributions in 2018 (IHS Markit, 2019).

The largest contributor to the gross geographic product (GDP) at current prices for Cape Town in 2018 was the Table Bay district (28,9%), an area characterized by the intense concentration of business and commercial activities. See Figures 55 and 56 above. This area also comprises of the main tourist areas of the city such as the CBD, the City Bowl and the Atlantic Seaboard as well as the significant economic infrastructure of the port, the Cape Town International Convention Centre and the V&A Waterfront. Tygerberg district, with a share of 22,1%, was the second largest district economy in 2018 and is largely dominated by finance, insurance, real estate and business services.

The top three districts in terms of employment are Table Bay (30,9%), Tygerberg (22,2%), followed by South Peninsula (12,4%). See Figure above. However, the Mitchells Plain district had the lowest employment share at 4,5% (71 800 jobs) in 2018. This highlights the lack of employment opportunities as a result of low economic activity occurring within the district, although there is a growing labour force living within this area.

9.3.1.1 Economic Performance

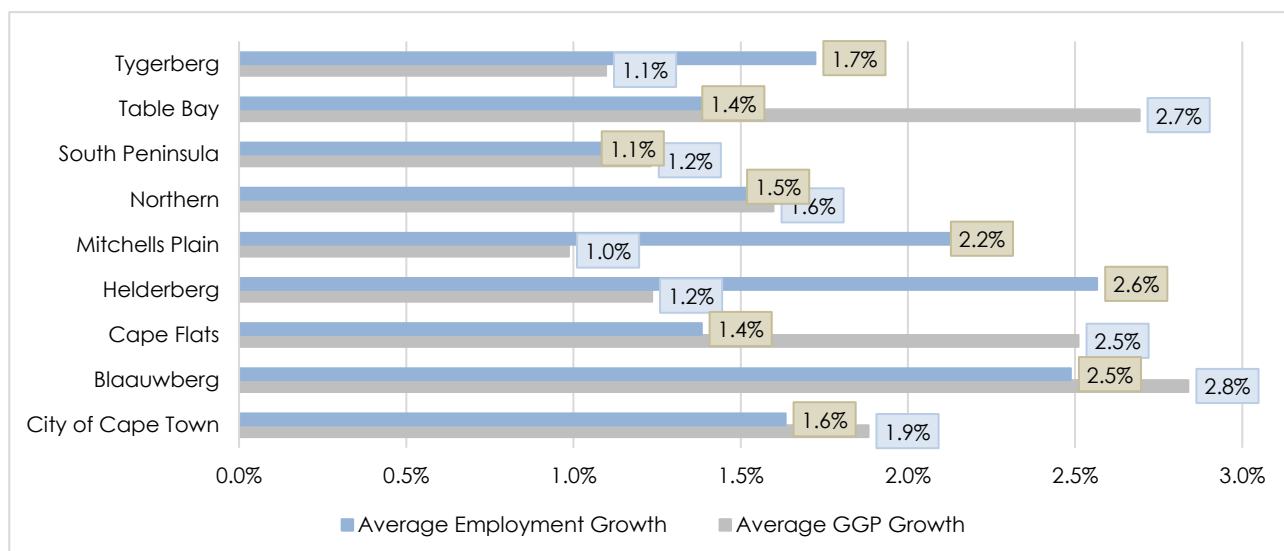


Figure 56: Average employment growth across the districts

The average annual growth rate of the Northern District is shown in the Figure above as 1.6% which is lower than the Metro's average growth rate of 1.9%. The South Peninsula reported GGP growth of 1.2% over the ten-year period, lower than the Metro average. The Helderberg district had the highest employment growth at 2.6%, closely followed by Blaauwberg at 2.5%, both areas surpassing the Metro's average employment growth rate of 1.6% over the ten-year period.

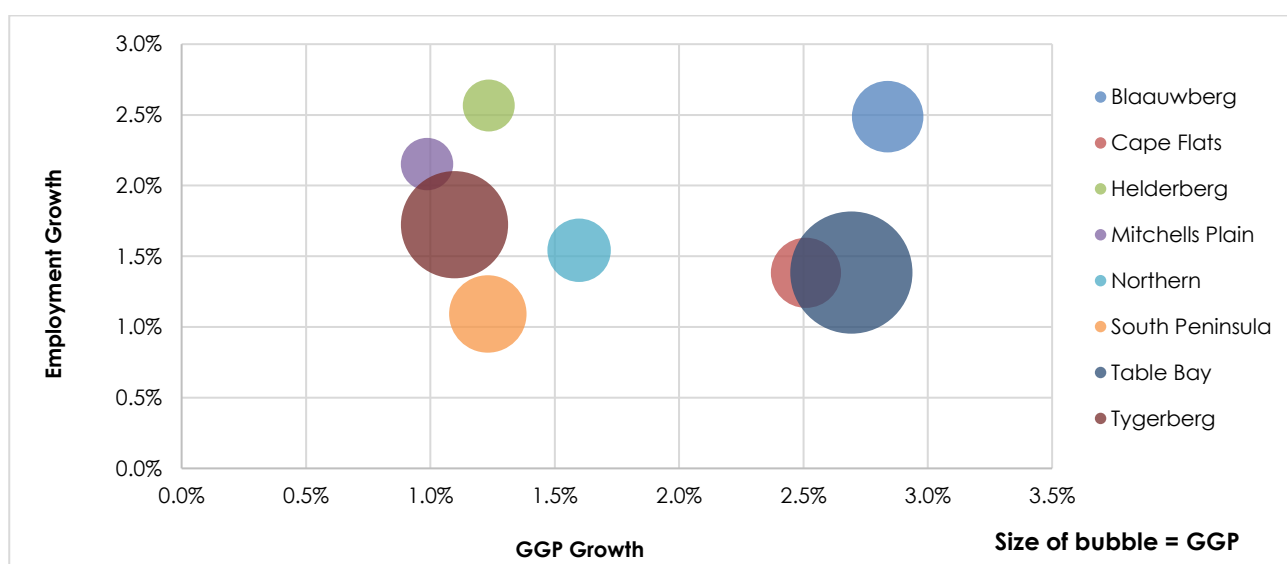


Figure 57: Performance comparison, 2018 (source: IHS Markit, 2019).

The Figure above plots the average economic growth on the horizontal axis and average employment growth on the vertical axis. The size of the bubble is the relative size of the economy as measured by gross geographic product in 2018. The Northern district grew relatively slower than Tygerberg and Blaauwberg districts in terms of both GGP and employment over the ten-year period.

9.3.2 Sectoral trends

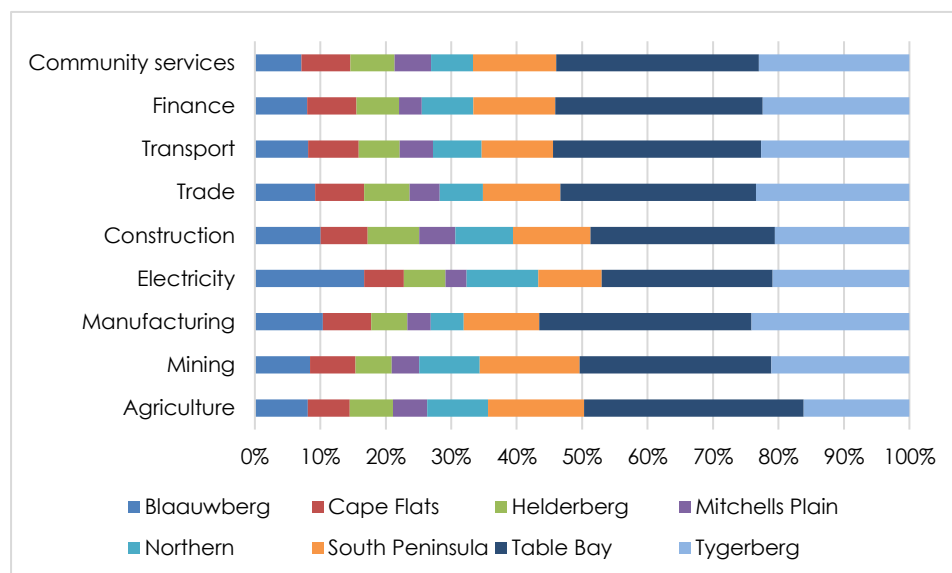


Figure 59: Gross Value Added (GVA) contribution by sector, 2018 (IHS Markit, 2019)

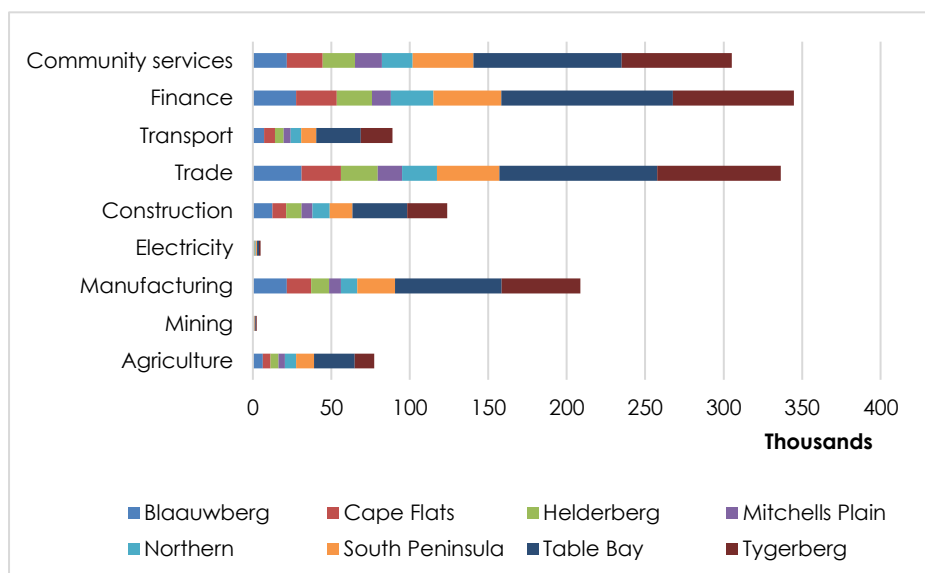


Figure 58: Employment contribution to Cape Town, 2018 (IHS Markit, 2019)

From the figures above, it is clear that Table Bay district is the main contributor to the total gross value added (GVA) of most sectors in Cape Town, followed by Tygerberg district. Table Bay district's contribution is especially pronounced in the transport (34,7%) and trade sectors (30,6%) – this is as a result of the district containing the city's port and also because it functions as the main retail hub in the city.⁸ The Northern district does not feature strongly as contributor in any of the sectors, also with regard to its employment contribution.

Employment trends, for the most part mirror the output trends, although Tygerberg district is seemingly more labour intensive (contributing more to employment than GVA) than Table Bay district. Mitchells Plain showed the lowest contribution to Cape Town's GVA across most sectors, largely attributable to this area's economy being highly reliant on the community services sector (public sector).

⁸ The mining figures are for all districts are almost insignificant.

The Figures above demonstrate the output sizes as well as total employment (number of people employed) across all sectors by each planning district. As observed from the figures, mining's output and employment in the city is negligible. Whilst agriculture recorded a small output size across all planning districts in 2018, it contributed significantly more to employment. As shown by output size and total employment - finance, community services, trade and manufacturing are significant contributors across all planning districts at different scales.

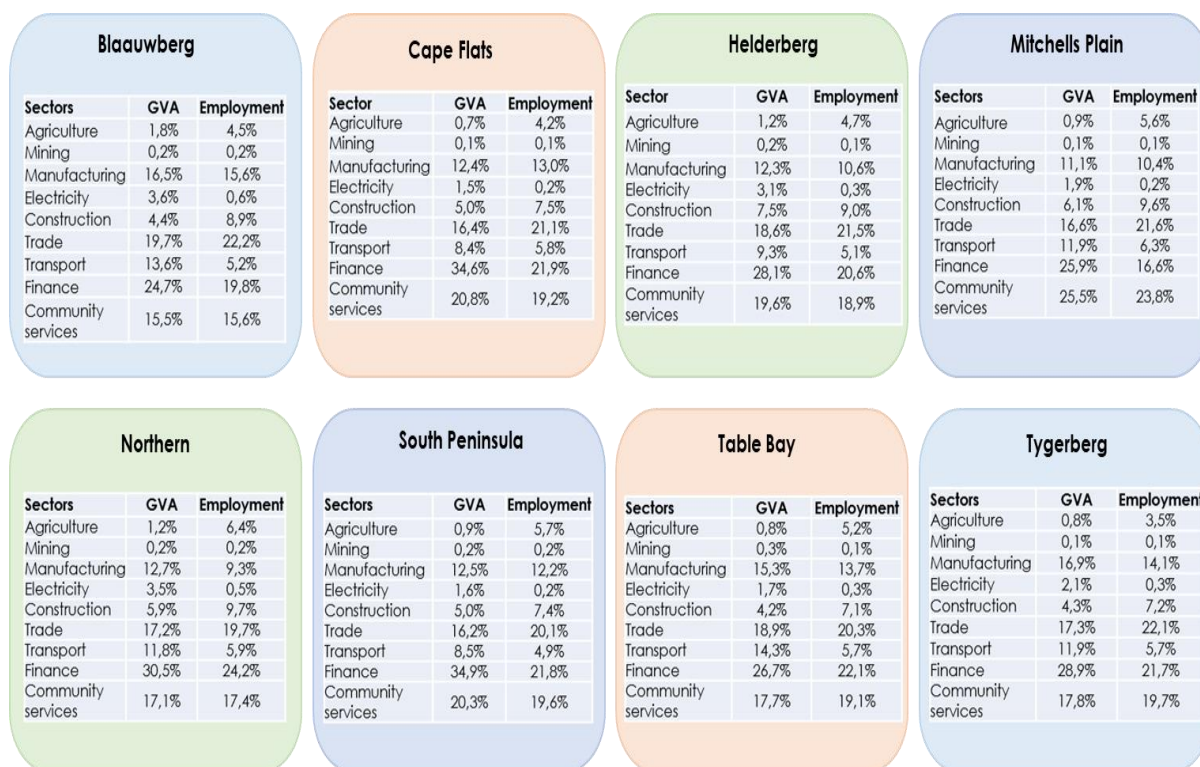


Figure 60: Gross Value Added (GVA) and Employment contributions in 2018 (IHS Markit, 2019)

Figure 60 illustrates the sectoral gross value added (GVA) and employment shares within each of the planning districts. It is apparent from the figures presented that the smaller district economies (Cape Flats, Mitchell's Plain) tend to be less diversified than the larger district economies: with proportionally less contribution from the manufacturing sector and greater reliance on community services⁹. Among the productive sectors, manufacturing is relatively more important to Tygerberg district's economy while Agriculture is relatively more important to Blaauwberg's economy. For the Northern district, trade and finance are the main contributo

⁹ Community services includes education; public administration and defence activities; health and social work and other service activities.

Table 21: Top Five sectors by location quotient in each district (detailed SIC), 2018

Planning District	Rank	Sector	Location Quotient
Blaauwberg	1	Fishing, operation of fish farms	2,08
	2	Electricity, gas, steam and hot water supply	1,71
	3	Transport equipment	1,44
	4	Hotels and restaurants	1,24
	5	Fuel, petroleum, chemical and rubber products	1,22
Cape Flats	1	Education	1,33
	2	Other business activities	1,26
	3	Real estate activities	1,23
	4	Other service activities	1,16
	5	Finance and Insurance	1,12
Helderberg	1	Construction	1,56
	2	Electricity, gas, steam and hot water supply	1,44
	3	Hotels and restaurants	1,22
	4	Fuel, petroleum, chemical and rubber products	1,20
	5	Sale and repairs of motor vehicles, sale of fuel	1,20
Mitchells Plain	1	Education	2,02
	2	Public administration and defence activities	1,31
	3	Construction	1,27
	4	Real estate activities	1,25
	5	Health and social work	1,19
Northern	1	Electricity, gas, steam and hot water supply	1,63
	2	Construction	1,22
	3	Finance and Insurance	1,13
	4	Metal products, machinery and household appliances	1,13
	5	Sale and repairs of motor vehicles, sale of fuel	1,10
South Peninsula	1	Real estate activities	1,61
	2	Public administration and defence activities	1,16
	3	Education	1,12
	4	Other service activities	1,11
	5	Fishing, operation of fish farms	1,11
Table Bay	1	Air transport and transport supporting activities	1,28
	2	Land and Water transport	1,20
	3	Hotels and restaurants	1,18
	4	Wood and wood products	1,18
	5	Wholesale and commission trade	1,15
Tygerberg	1	Metal products, machinery and household appliances	1,27
	2	Finance and Insurance	1,24
	3	Furniture and other items NEC and recycling	1,21
	4	Food, beverages and tobacco products	1,21
	5	Textiles, clothing and leather goods	1,18

Source: IHS Markit, 2019.

While analysis at a broad sectoral level is useful, it is too aggregated a level to adequately understand the nuances of a regional economy. As such, the Table above undertakes a location quotient analysis utilising the more detailed 2-digit Standard Industrial Classification (SIC) codes. By comparing the relative share constituted by an industry in the respective district economies to its share in the city-wide economy, location quotient analysis provides an indication of the relative importance of industries to a district economy as compared to the Cape Town economy as a whole. The table ranks the top five industries by location quotient. It is important to note that having the highest LQ does not necessarily mean an industry is the largest contributor to the district economy nor that it is most strongly

represented in that district. Caution should also be exercised when considering non-tradable sectors within small economies. For instance, the fact that Education has the highest location quotient in Mitchell's Plain and Cape Flats is more a reflection of the weak economy in those areas rather than an indicator of them having a comparative advantage in Education.

9.4 The Informal Economy

The 'informal sector' commonly refers to the unregulated, non-formal portion of the market economy. Statistics South Africa uses an employment based definition for the sector, defining it broadly as comprising of employees working in establishments employing less than 5 employees who do not pay income tax, as well as own account workers whose businesses are not registered for either income tax or value-added tax. The term 'informal economy' is preferred to 'informal sector' as it reflects the broader scope of economic activities that take place informally.

The relatively low entry barriers in the informal economy, and its strong penetration in impoverished areas, means that it has the potential to increase economic inclusivity by of otherwise marginalised members of society.

9.4.1 Size of Informal Economy

Statistics South Africa estimates that 220 000 people were employed in the informal sector in Cape Town in the second quarter of 2019. This constituted 13.3 % of Cape Town's workforce, a significant amount.¹⁰ Importantly, the benefit of the sector is predominantly in low-income communities, and it accounts for an estimated 5 percentage point

reduction in the poverty rate.¹¹ The graph shows that the number of jobs in the informal economy has grown from 2015 to 2019, as has the share of jobs which are informal.

9.4.2 Employment Distribution

There is informal economic activity in almost all sectors, and particularly present in trade, transport services, community services, recycling, construction and manufacturing.

¹⁰ StatsSA, 2019, Quarterly Labour Force Survey

¹¹ GHS 2013

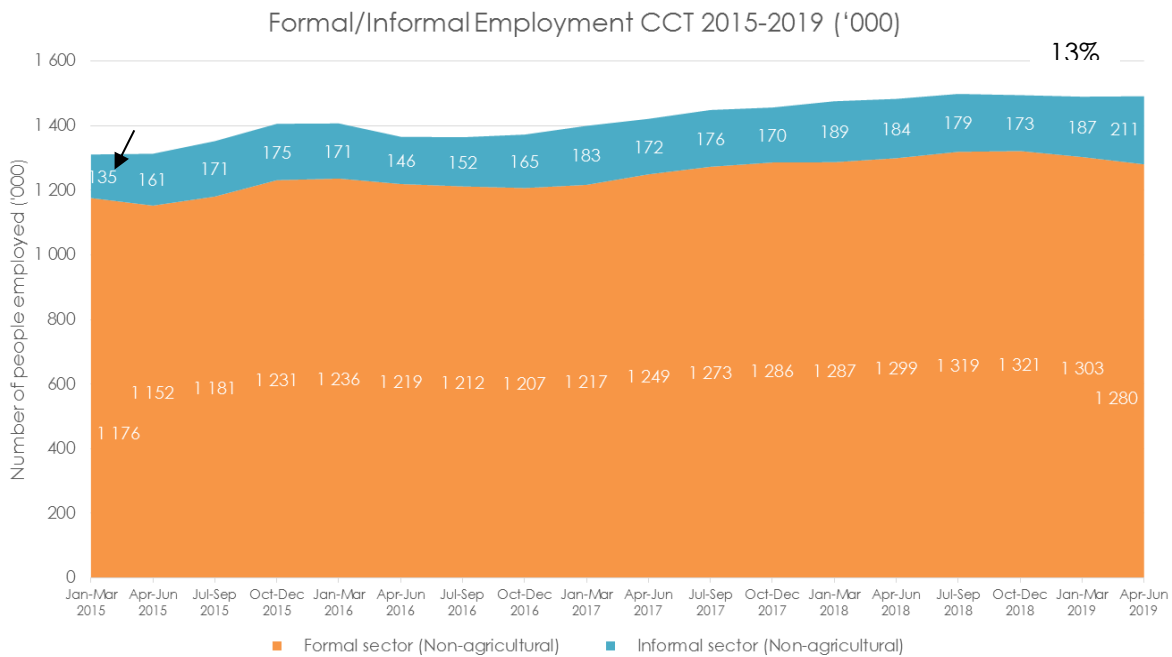


Figure 61: Formal/Informal Employment in Cape Town

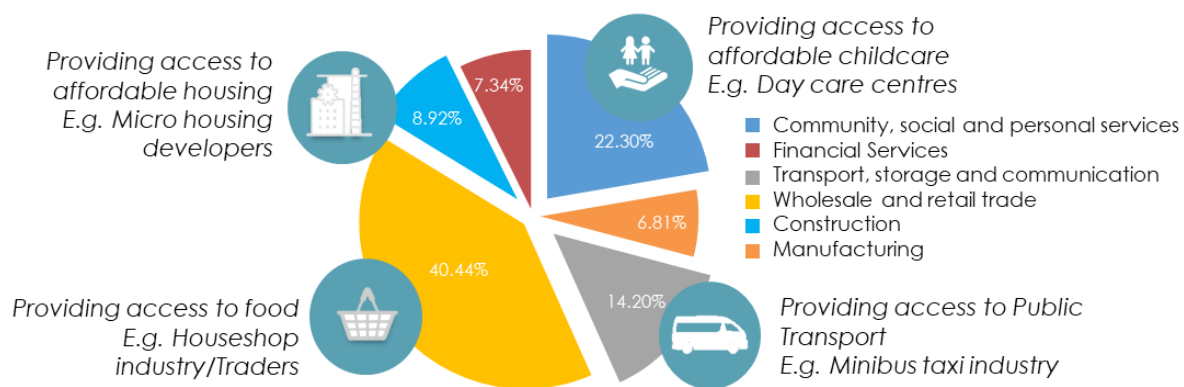


Figure 62: Industry distribution of informal sector employees in Cape Town (Source: Stats SA, QLFS Q2, 2019)

9.4.3 Opportunities and Constraints

As long as the population of Cape Town grows, through births and in-migration, at a higher rate than formal jobs are created, the informal sector will be an important avenue for generating livelihoods and reducing poverty. This is particularly true in a scenario where the bulk of new arrivals to the city or young residents entering the workforce in the city are low or semi-skilled. The informal economy has the potential to provide transitional employment for new arrivals to the city or new entrants to the labour market, and in some cases to provide sustained livelihoods. But there is a risk that many informal economy participants get stuck in low productivity, survivalist activities.

Cape Town's informal economy is comparatively small by emerging country standards, particularly in the context of high levels of unemployment in the formal sector. This presents an opportunity for economic growth.

As with the formal sector, a *lack of skills*, particularly relating to the operating of a business, is a key constraint to the growth of informal sector enterprises. Most informal businesses *battle to access growth markets and the capital* required to diversify and scale up their activities, and as a result are left to compete fiercely for market share at the local level servicing lower-income consumers, leading to low and precarious profit margins¹². There is an opportunity for business support to be improved.

The conditions in which informal economy actors operate are often characterised by *low-quality urban spaces* with limited amenities and services such as bathrooms, shelter and storage facilities. Informal businesses are generally more affected by *crime and insecurity*, and the unregulated nature of the informal economy also increases opportunities for exploitation. The *regulations governing business licencing and other regulatory requirements*, such as land use and building approvals are designed for formal businesses and often are not relevant to the realities of the informal sector. The costs associated with regulatory compliance represent a disincentive to formalisation, which may severely hamper the growth of informal enterprises.

A key challenge for the City in supporting informal sector development is the *scarcity of data* about the size, location and activities of the informal economy. Lack of information about the lived reality of those working informally and their priority needs is also a challenge.

¹² Human Science Research Council (HSRC), 2018, *Township Economies Workshop Notes*

10 PROPERTY MARKET

10.1 Market Performance

Figure 63 below depicts the average capitalisation ("cap") rate, a measurement used in evaluating an investment based on **risk** and the **potential rate of return** for a prospective property. The cap rate is the ratio of stabilised annual net operating income to purchase price. Thus, it measures income after deducting operating expenses and normal vacancy, but before deducting financing charges and income taxes (*Ambrose and Nourse, 1993:221*). A low cap rates implies lower risk and higher value associated with the property; and a high cap rate implies higher risk and lower value associated with the property.

The following endogenous and exogenous factors influence the cap rate:

- **Market Value:** the estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion (Blackledge, 2009).
- **Gross rental income:** the total amount collected in rent and any related rental property income before any expenses are deducted (may include rent for parking and other factors).
- **Net operating income (NOI):** the annual income generated by an income-producing property after deducting all operating expenses.
- **Operating expenses:** the necessary expenses to successfully operate the property, which includes property taxes, rental property insurance, management fees, repairs, maintenance and miscellaneous things like accounting and legal fees.
- **Occupancy rate:** the ratio of rented space to the total amount of available space (typically used in multi-unit properties).
- **Growth** in sales
- **Supply vs. demand:** number of properties available for occupation in the area (where there is lower inventory (supply) and high demand, cap rates tend to be lower).
- **Property type/asset class:** the type of property, such as multi-family apartment building, industrial or commercial property (typically, residential properties have lower cap rates than commercial properties, because commercial properties tend to have higher rents)
- **Rents that are above or below market**
- **Length of the lease term**
- **Financial strength/credit rating of the tenant**

Taking the above into account, the cap rate is considered to be a good indicator to assess property market performance.

The following tables and graphs show the average cap rates, as well as average operating costs, market rental and vacancy rates for Blaauwberg District. This gives an indication of how strong different property market segments have performed. A lower cap rate indicates there was less risk associated with investing in that property segment. An analysis and explanation of the data follows in the next section.

Table 22: Northern District Property Market (Mean) Indicators (City of Cape Town Non-Res Market Research: 2018)

Market Segment	Year	Average Cap Rate (%)	Average Operating costs (R/m ² /month)	Average Gross market rental (R/m ² /month)	Average Vacancy Rate (%)
Industrial	2012	10.3%	R 5.71	R 30.08	3.5%
	2015	9.9%	R 6.93	R 36.22	5.8%
	2018	9.3%	R 10.67	R 70.47	2.9%
Retail	2012	10.4%	R 13.15	R 76.62	3.5%
	2015	9.3%	R 17.36	R 86.04	5.0%
	2018	10.6%	R 30.52	R 201.24	5.3%
Office	2012	9.7%	R 23.44	R 87.17	5.0%
	2015	9.4%	R 24.00	R 100.07	7.0%
	2018	9.6%	R 26.14	R 156.67	11.2%

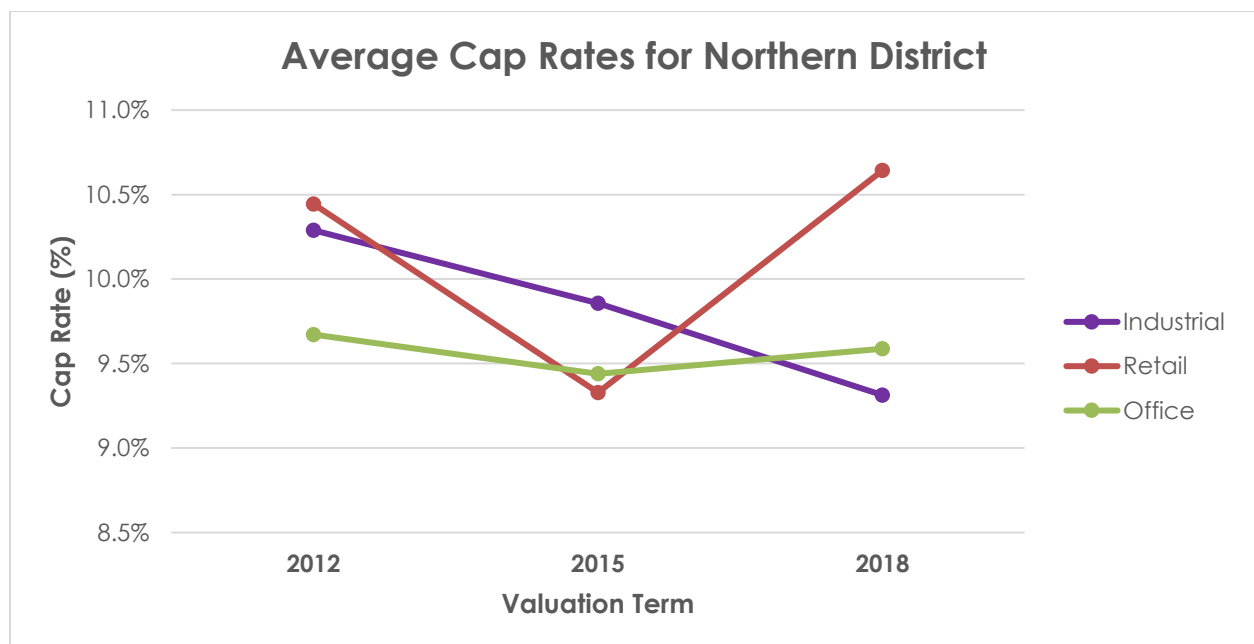


Figure 63: Average capitalisation rates per non-residential market segment (City of Cape Town: Non-Res Market Research: 2018)

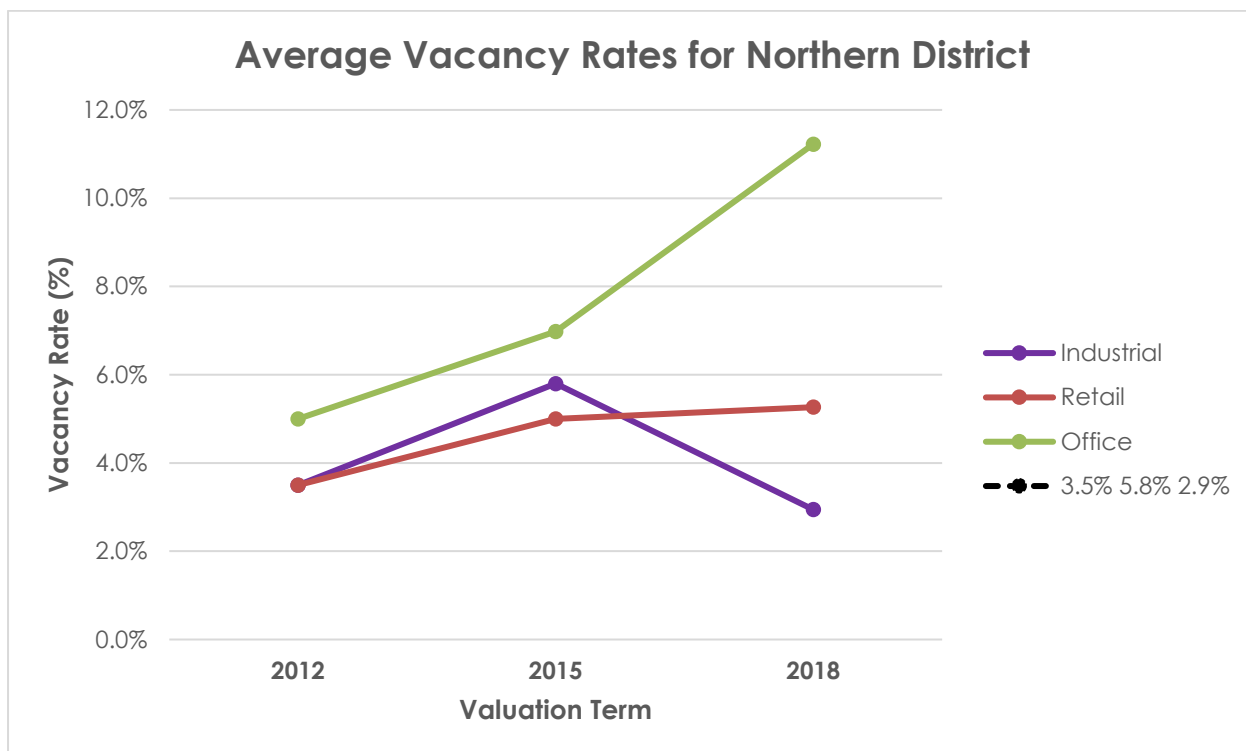


Figure 64: Average vacancy rates per non-residential market segment (City of Cape Town Non-Res Market Research: 2018)

10.1.1 Key Observations and Trends

i. Non-Residential

a. Industrial

The district has a strong industrial property market which strengthened between 2012 and 2018, as indicated by the decreasing cap rate over these years. While the average vacancy rate increased from a low of 3.5% in 2012, to 5.8% in 2015, it then dropped drastically to 2.9% in 2018. This indicates a strong take up of industrial space in the area.

In 2018, the average industrial cap rates were consistently low across the district. Industrial activity is clustered at Fisantekraal Industrial Park and the nearby Corobrik Quarry. It also clusters along the railway line and two roads leading on to the N1 highway, which includes Kraaifontein Industria, Okavango Park, Brackenfell Industrial, Everite Industria and Morgan Industria. Morgan Industria is under-performing in relation to the rest of the industrial property in the district.

b. Street Front Retail

This segment had the highest cap rate, which indicates worst performance, out of the three non-residential segments in 2012 and 2018. However, in 2015 it had the lowest cap rate, which suggests volatility in this segment. The shop front retail property segment is slightly more agile than industrial activity, broadly requiring less specific and intensive capital investments to fit out properties. This may explain an element of volatility in the market as individuals and businesses are able to enter/exit and move within this property segment fairly easily.

The vacancy rate has steadily increased from 2012 to 2015 to 2018. This is surprising given the massive increase in gross rental return between 2015 and 2018, which suggests a high demand for this type of property. The average gross rental return increased by approximately R10 from 2012 to 2015 and then by R115 to a total of R201.24 in 2018. While the operating costs increased in a similar pattern, they did not keep pace. This indicates this segment was highly profitable in 2018, which aligns with the low cap rates indicating strong market performance.

Retail property is more dispersed throughout the built footprint of the district compared to industrial and office property segments. There is also not as strong a trend of agglomeration or clustering, as is present in the other two segments. The best performing area of the retail segment is the Durbanville CBD, this is followed by a few small areas surrounding Tygervalley.

There is a strong presence of street front retail along Okavango Road, from the off ramp of the N1, surrounding Cape Gate and further north until it intersects with Brighton Rd. At the intersection of Brighton and Okavango, the cap rates are slightly lower than along the two individual roads. There are large areas of retail activity in Springbok Heights/St Michaels and from Eikendal along Old Paarl road to Belmont Park. The retail segment in Belmont Park is performing poorly, with high cap rates, in the region of 11 – 12%.

c. Retail

The office segment had the highest average vacancy rates and operating costs over the three valuation terms. However, it also had consistently low capitalisation rates. This is due to the average rental return being significantly higher than that of the other two segments (retail and industry). For example, in 2015, the average gross rental income for a square metre of office space in the district was approximately R100, compared to R36 for Industrial and R86 for Retail. Overall the consistently low (although not always the lowest) capitalisation rates, hovering around 9.5%, indicates that despite higher vacancy rates and operating costs, it was the most stable market segment out of the three non-residential segments.

Office property tends to be clustered and located along main roads in the Northern District, although there are a few clusters in residential areas. Overall, there is quite a high variation in the strength of the office property market segment, ranging from below 7% to 11%. In general the two main areas of office activity are located around Tygervalley, along Durban Road and around the Durbanville CBD. Two smaller clusters, which performed slightly worse are: along Brighton and Darwin road, and around Springbok Park, including along Brackenfell Boulevard.

The best performing areas are Bellville Park (the office park south of Tygervalley Shopping Centre), Vineyard Office Estate (De Bron) Rosenpark and along Durban Road. The worst performing office segments in the district are clustered at Belmont Park, Bracken Heights to a limited extent at Kenridge and along Brighton/Darwin Road.

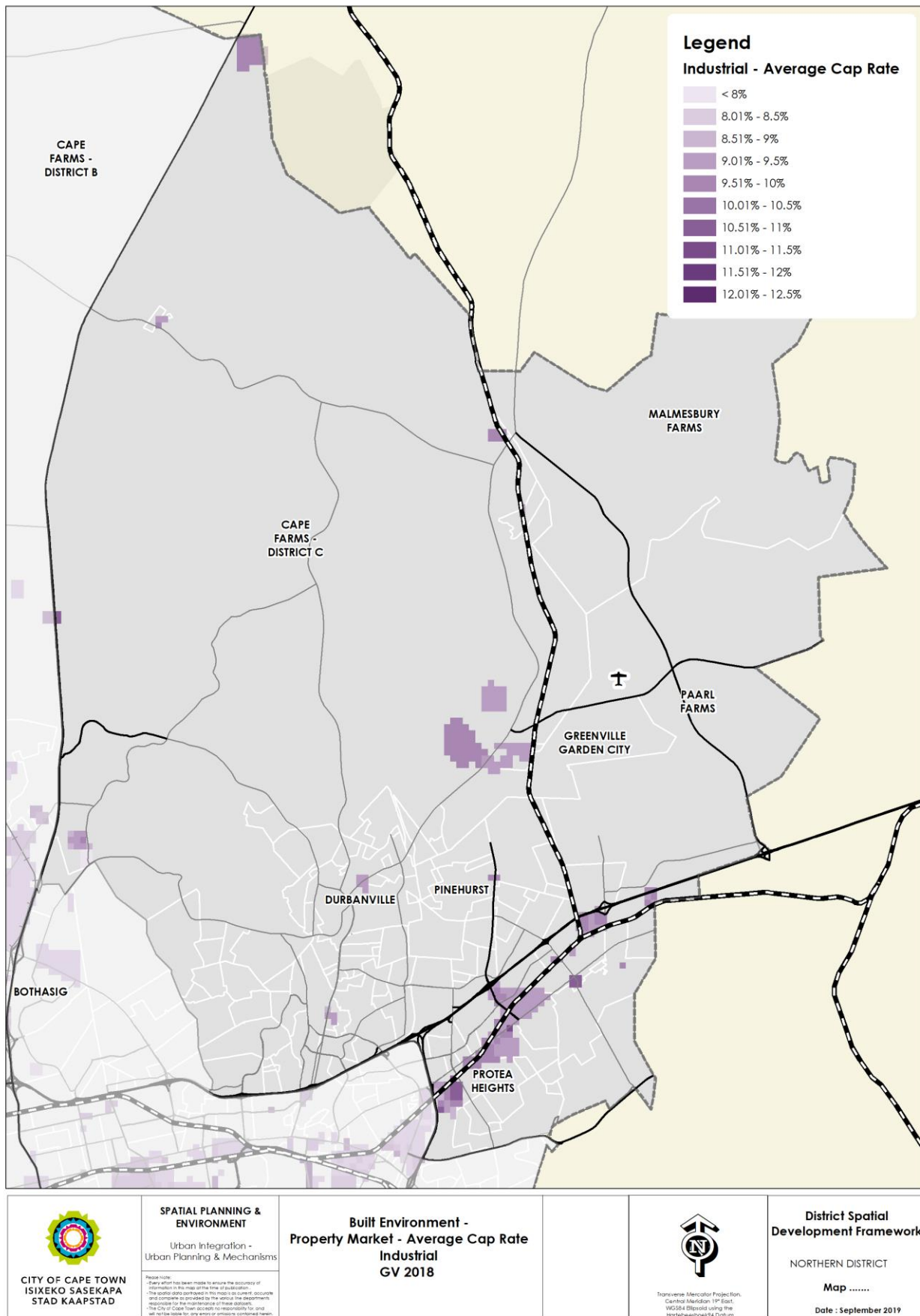


Figure 65: Property Market Average Cap Rate for Industrial Property

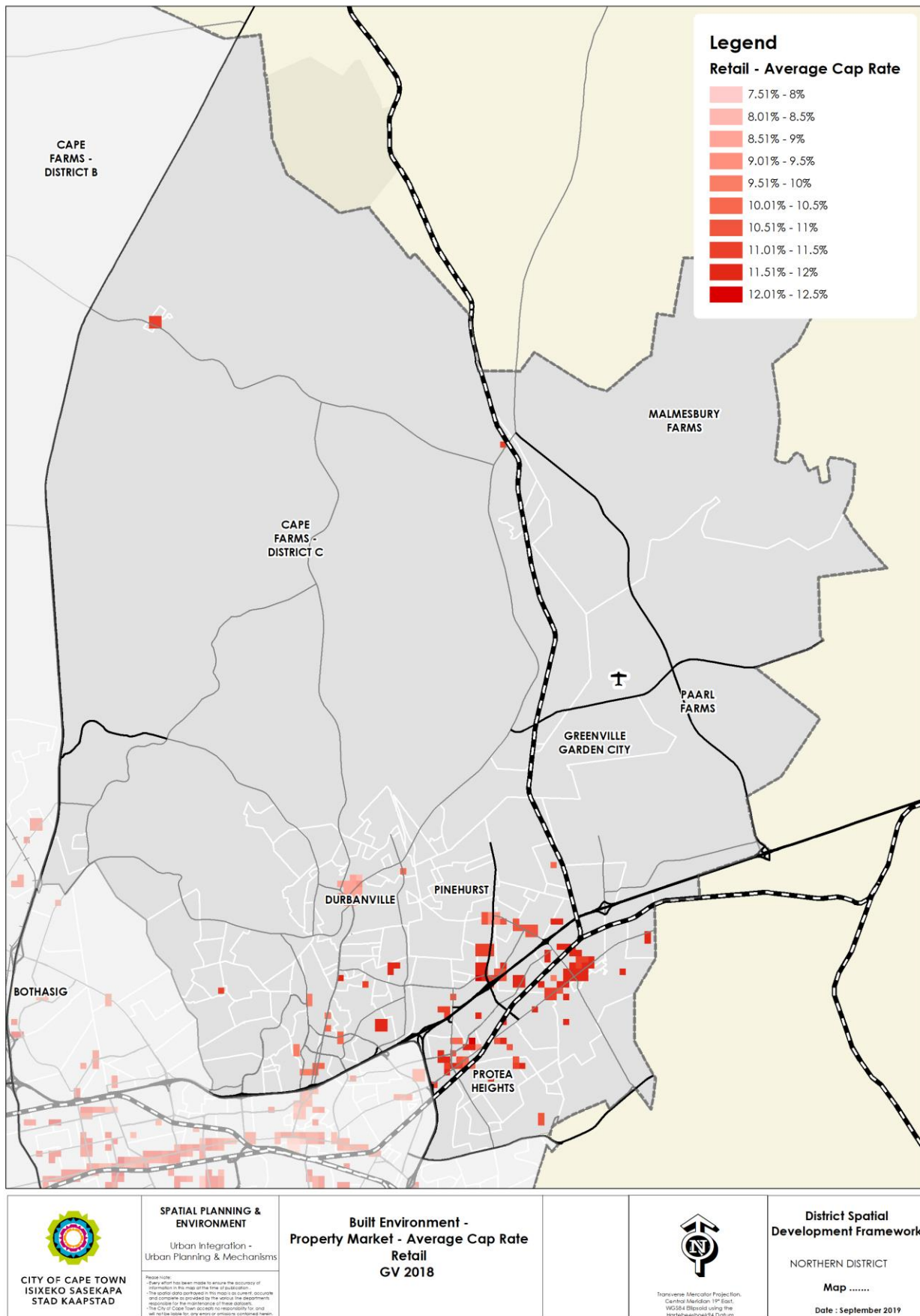


Figure 66: Property Market Average Cap Rate for Retail Property

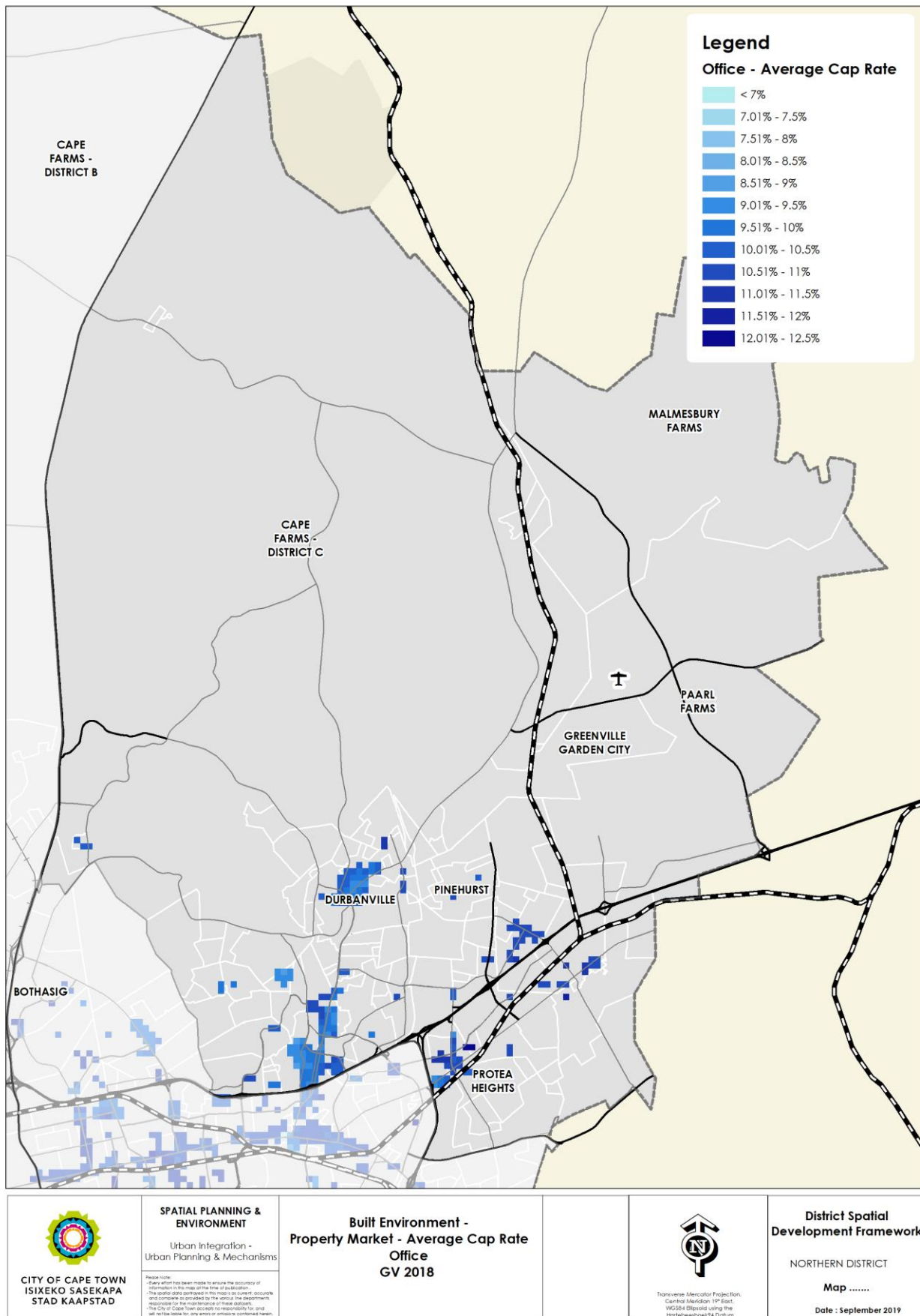


Figure 67: Property Market Average Cap Rate for Office Buildings

ii. Residential

a. Sales

Figure 68 shows suburbs where the most property sales have occurred between 2012 and mid-2019. Durbanville, Pinehurst and Brackenfell South/Burgundy have the highest volume of residential sales. Interestingly, in 2018 Durbanville's properties had average sales values of both R 350 000 – R1 500 000 and a larger portion of properties in R 4 900 000 – R8 200 000 bracket. Pinehurst and Brackenfell South/Burgundy had a similar average sales price.

This indicates that there is a high demand for residential properties in two different brackets of affordability in the district. Note that the data depicted in these figures does not include "informal" sales transactions (i.e. transactions that are not registered in the Deeds Office).

The data reveals there are some options in the formal 'affordable housing' residential market segment. The 'Affordable housing' segment refers to households earning a monthly income between R18,000 and R22,000. Table 23 below depicts the total amount these household incomes are likely to obtain from end-user financing.

Table 23: Monthly income bands and the corresponding bond amount

Household Monthly Income	Affordability (assuming a bond on a <u>13% interest rate</u>)
R22 000	R560 000.
R20 000	R510 000.
R18 000	R460 000

The residential sales data reveals that there some, but not many options in the District for households earning R18 000 – R22 000 per month as residential properties tend to have sales price above this affordability threshold.

Figure 69 depicts the average value per square meter of land in Cape Town. It is calculated by dividing the sales price by the erf extent, and aggregating the result to 4ha grid cells. This map indicates the concentration of properties with the highest value in the district. Sonstraal Heights, Pinehurst, Uitzicht and Welgedacht currently contain properties with the highest value per m². These are clustered along the edge of the urban footprint and within it in the case of Pinehurst and Sonstraal Heights. This map illustrates that the traditional bid rent theory¹³ does not apply to the Northern District, and that access and convenience is not the driving force behind the residential market.

¹³ The bid rent theory is a geographical economic theory that refers to how the price and demand for real estate change as the distance from the central business district (CBD) increases. It states that different land users will compete with one another for land close to the city centre. Users are willing to pay more for land close to the CBD and less for land further away from this area.

b. Growth in Value

Figure 70 and Figure 71 below depict the City's growth in value per 4ha grid area over time, by calculating the percentage difference in value between the three City of Cape Town's municipal valuation terms (per property). All values were adjusted/deflated to 2016 Rands using the CPI (consumer price index), to approximate real growth in value.

Residential property values in the Northern district grew by a large variety. Properties on the periphery such as Viking Village, Buh-rein Estate, Greenville Garden City and Burgundy increased by 70% and more on average. Some of these areas show a significant increase in value as a result of new greenfield residential developments, which have transformed vacant land to residential property.

In terms of non-residential or commercial properties, values have significantly increased by more than 100% around industrial areas such as Fisantekraal, Everite and Kraaifontein Industrial. Large property value increases are also notable around Belmont Park and Eikendal which are areas of retail activity, while central Durbanville has a large office node.

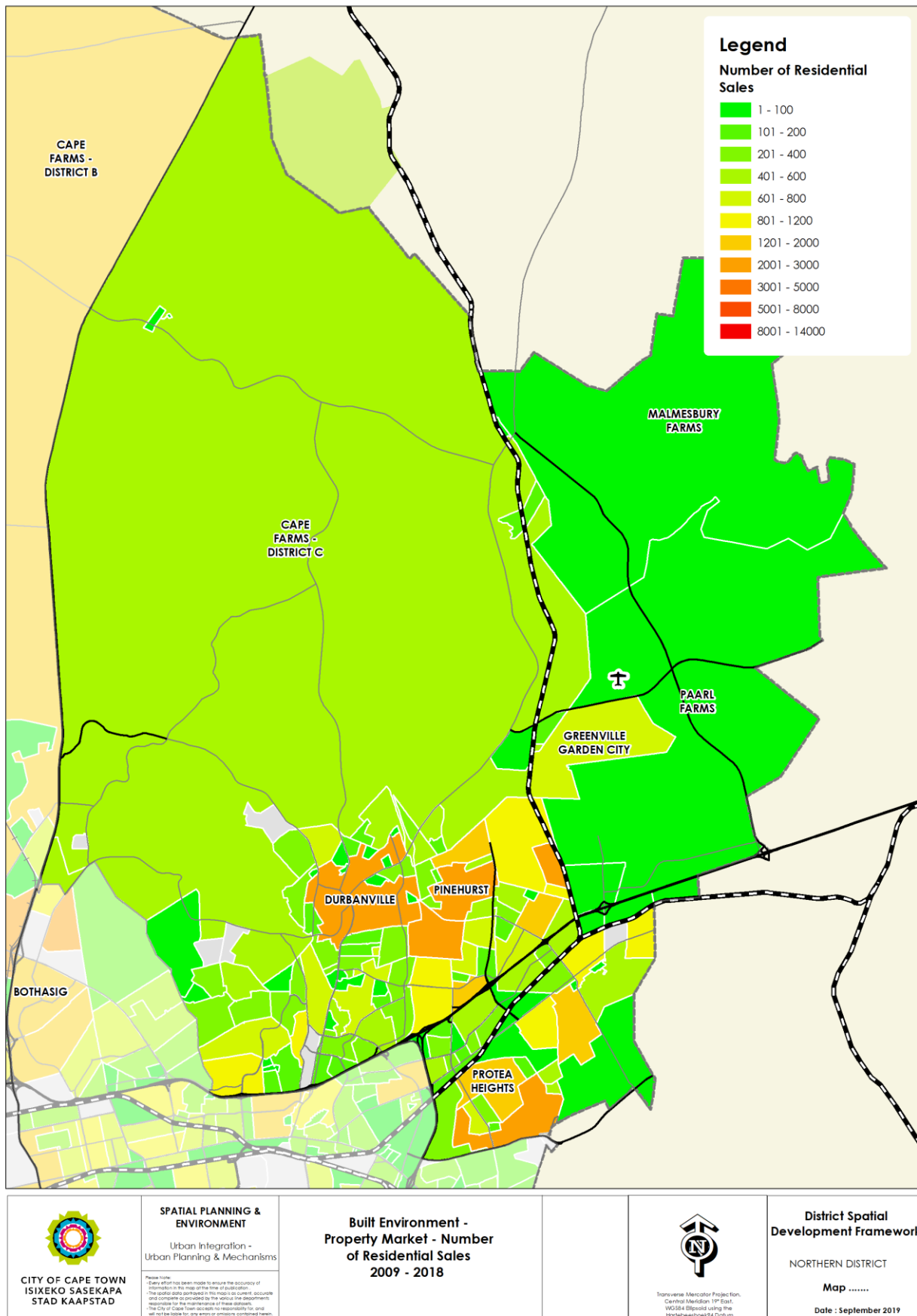


Figure 68: Number of Residential Sales per Suburb (2009-2018)

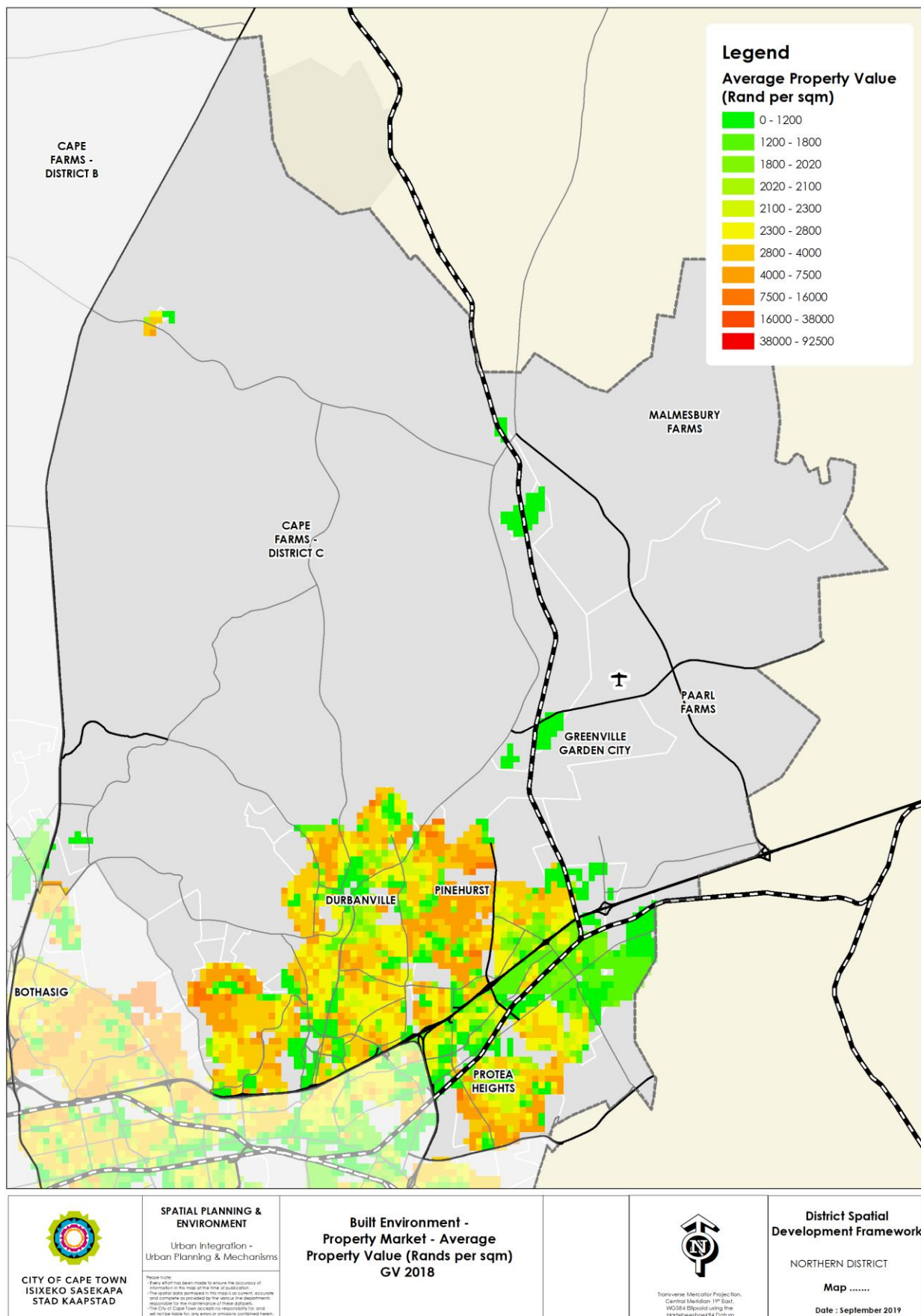


Figure 69: Value (R) per m²

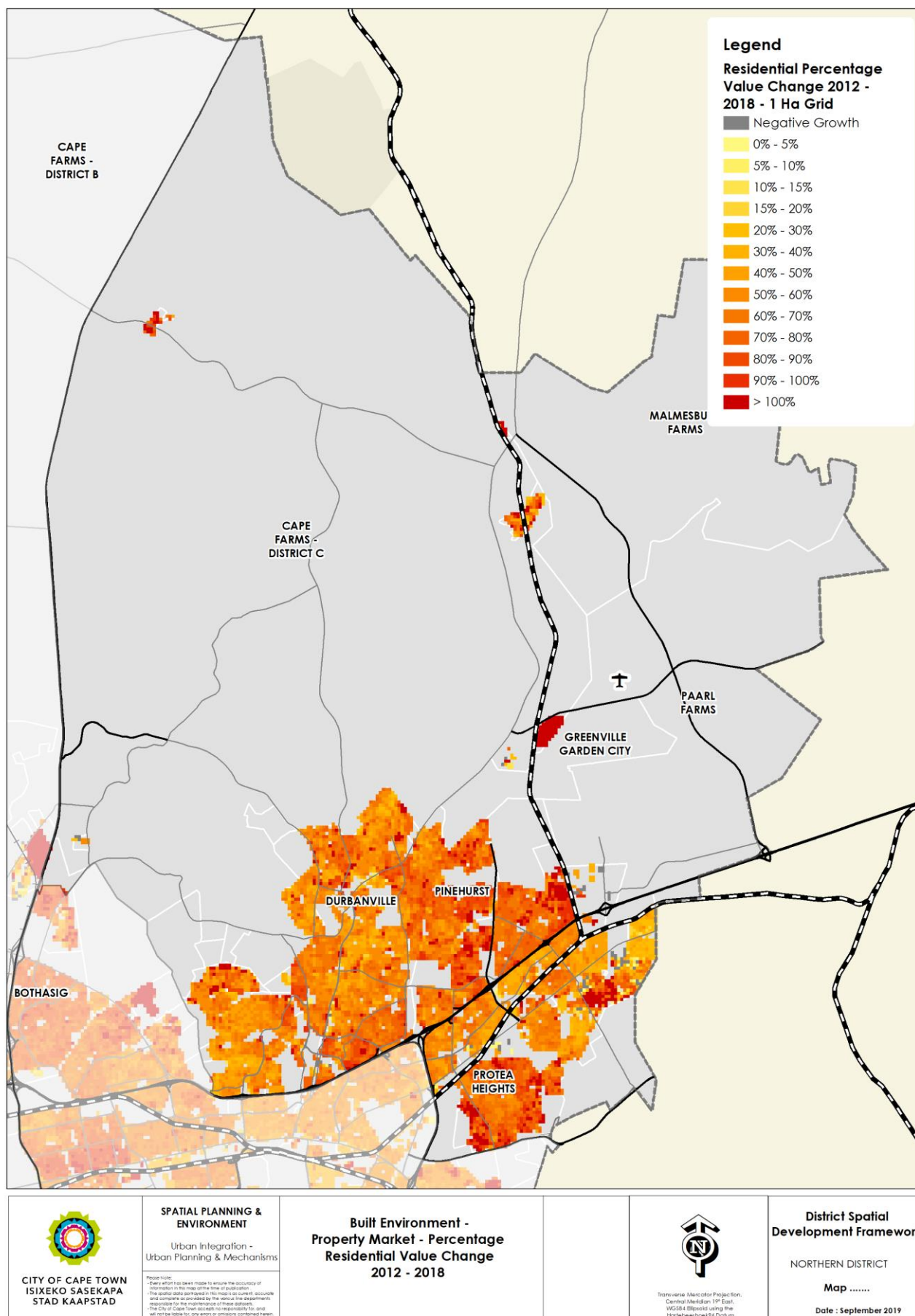


Figure 70: Percentage Value Change for Residential Properties between 2012-2018

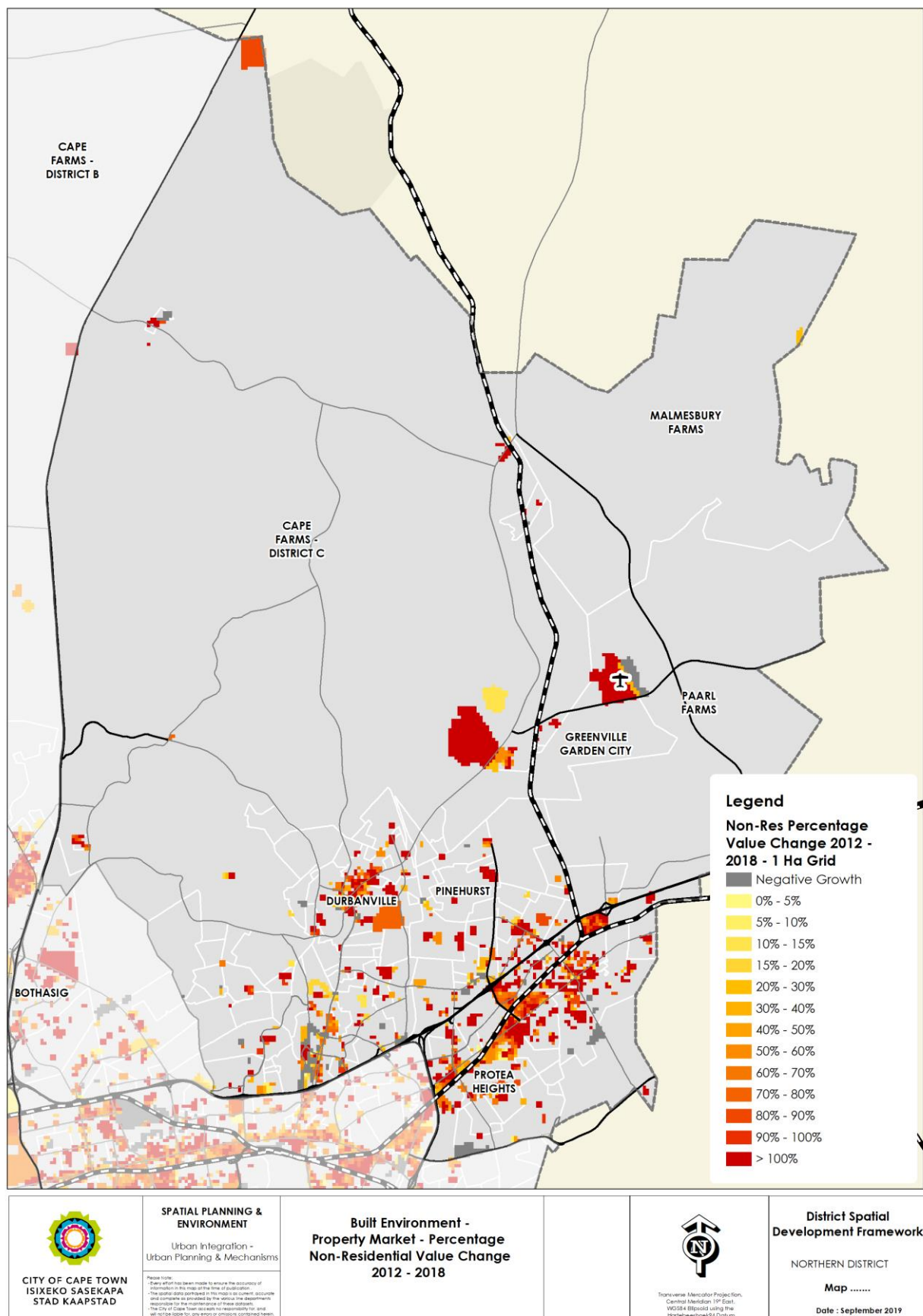


Figure 71: Percentage Value Change for Non-Residential Properties between 2012- 2018

10.2 Key opportunities and constraints

10.2.1 Opportunities

- The industrial market is performing well and has expanded considerably in the past 8 years.
- Expanding residential market in a number of affordability brackets.
- Durbanville and Tygervalley are both large and well-performing office nodes.

10.2.2 Constraints

- The district is vulnerable to shocks in the industrial property market sector due to the large amount of industrial space available.

E: RISKS

11 RISKS

Urban developments are subject to a certain amount of risk, for example construction faults, traffic accidents or exposure to hazardous substances. In the context of the District plan, the focus is on avoiding, mitigating or reducing the risk of disaster, by guiding development away from known hazards or in a way that the risk of being exposed to disasters¹⁴ is lessened.

This chapter outlines the current and future risks to the Northern District and their associated levels of impact **on the intensity and location of future urban development** in the area.

11.1 Guiding policy on risk and risk management

The IDP focus area "Safety Priority" reflects on the management of disasters and risks. The City emphasises integrated planning and governance in disaster risk management, and the need to build the City's resilience to risks (i.e. the ability to recover from disastrous events).

The City's Disaster Risk Management Plan, embedded in the IDP, considers the City's response to disaster impacts, relief, rehabilitation, reconstruction, and preparedness.

The City's Resilience Strategy (2019) notes that chronic stresses such as unemployment, congestion and poverty weaken the City's ability to cope with shocks. All communities of the city have a degree of vulnerability to risk, the Disaster Risk Management Plan identifies 70 hazards and risks that the City must respond to. Approximately 25 of these risks could occur across the City, for example drought and rainfall reduction, service disruptions, traffic accidents, the transportation of hazardous substances, terrorism or construction faults.

Stresses which increase vulnerability are disproportionately experienced by communities experiencing inadequate shelter, poverty and unemployment and especially the urban poor living in informal settlements. The servicing, disaster response and development of vulnerable areas and informal settlements is a priority across the City for building resilience.

Spatial planning must ensure that new developments both avoid and do not exacerbate risk and where historic urban development is exposed to risk and hazard, it is mitigated. Similarly, the direction of spatial planning under a high-resilience framework ensures that the built environment is developed to bring about low-carbon opportunities, and meaningfully mitigate against climate change and buffer against increasing costs of fossil fuels. Doing so in the immediate future reduces the cost of implementing climate adaptation measures in the long-term.

¹⁴ The definition of a **disaster** is: "a progressive or sudden, widespread or localised, natural phenomena or human-caused occurrence which –
(a) causes or threatens to cause –

(i) death, injury or disease;

(ii) damage to property, infrastructure or the environment; or

(iii) disruption of a community; and

(b) is of a magnitude that exceeds the ability of those affected by the disaster to cope with its effects using only their own resources" (Disaster Management Act, 57 of 2002)

Table 24: Policy statements for dealing with Risk Areas

Sub-Strategy 2.3: Appropriately Protect the Citizens of Cape Town from Risk Areas and activities <i>(extracted from 2023 MSDF)</i>	
Policy Statement	What this Means/Requires
Policy 16 Direct urban growth away from risk areas	Risk areas that are either already determined through proclamations/ law or specialist studies, or will be determined as part of the EIA processes or pre-submission consultations processes and include both man-made and natural risks.
Policy 17 Discourage further urban growth in risk areas – includes fire, flooding, heat exposure, poor air quality and noise pollution.	Urban growth should be directed away from areas vulnerable to climate change risks, where possible. Where this is not possible, special attention should be given to the inclusion of risk mitigation and climate adaptation design interventions in both new development, redevelopment, or changes to existing land uses.

The Disaster Risk Management Plan for Cape Town evaluates known hazards in terms of the following¹⁵:

Table 25: Measurement criteria for Risk Hazards

Measurement Criteria for each Hazard Assessed	Criteria's Assessment Rating	Integration of factors to determine the Relative Priority	Hazards Relative Priority Rating
Probability of Occurrence	Very Likely		
	Likely		
	Possible		
	Unlikely		
Maximum impact/ Severity & Consequences	Extreme		Very High Priority
	Moderate		
	Insignificant		
Vulnerability of Community and/or Environment and/or Economy	Very Vulnerable		Medium Priority
	Vulnerable		Lower Priority
	Small Vulnerability		
	Good		

¹⁵ Further description of the methodology and ratings prescribed is contained in the City of Cape Town Disaster Risk Management Plan

Manageability/Coping Capacity by Responders to offset Hazards Impact and Vulnerabilities	Adequate		
	Basic		
	Poor		

11.2 Risks in Northern district

Taking the aforementioned guiding policy into the account the following section identifies the types of risk (see figure 77 below) and the level of exposure to risks at the district scale, **referencing those risks that impact on the permissible intensity and location of future urban development (see tables below)**. The hazard evaluation above is referenced where possible. In addition, the relevant principles that apply when considering the allocation of development rights and possible exceptions are identified:

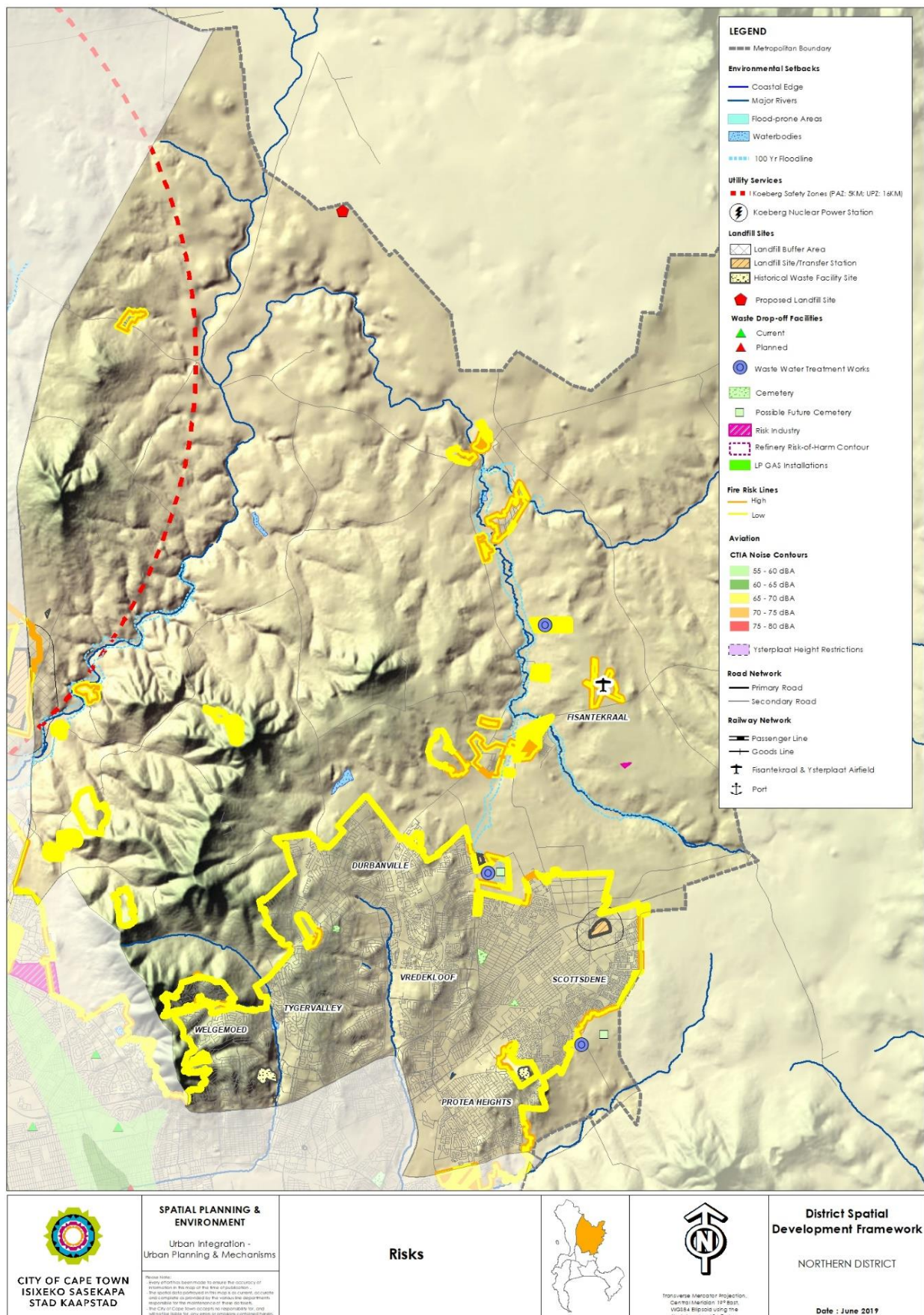


Figure 72: Identified Risks in the Northern District

11.2.1 Natural Risks

11.2.1.1 Wild Fire

Fire lines indicate the interface between the wild lands vegetation and urban areas, high risk indicates where there are larger volumes of combustible vegetation. Fire risk is anticipated to increase over time due to increased temperatures, increased drying, and higher wind speeds caused by climate change.

Table 26: Development Principles w.r.t Wild Fires

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely	Moderate	Vulnerable	Adequate	High	Consideration should be given to reducing the risk and to the operational needs of the City's fire services. In cases where development is permitted, conditions should ensure access for fire fighting vehicles and that building materials and landscaping do not exacerbate risk.

11.2.1.2 Flood Risk

The presence of waterbodies 1:100 year flood lines and indicative sea level rise modelling reveal where the areas with higher probability for flood and coastal inundation occur.

Table 27: Development Principles w.r.t. Flood Risks

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Likely	Moderate	Very Vulnerable	Good	High	Careful management of development to avoid developing in high flood risk areas, to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent watercourses / wetlands.

The relative elevation map reveals areas where water will flow faster with potential to inundate and create risk either annually or perenially.

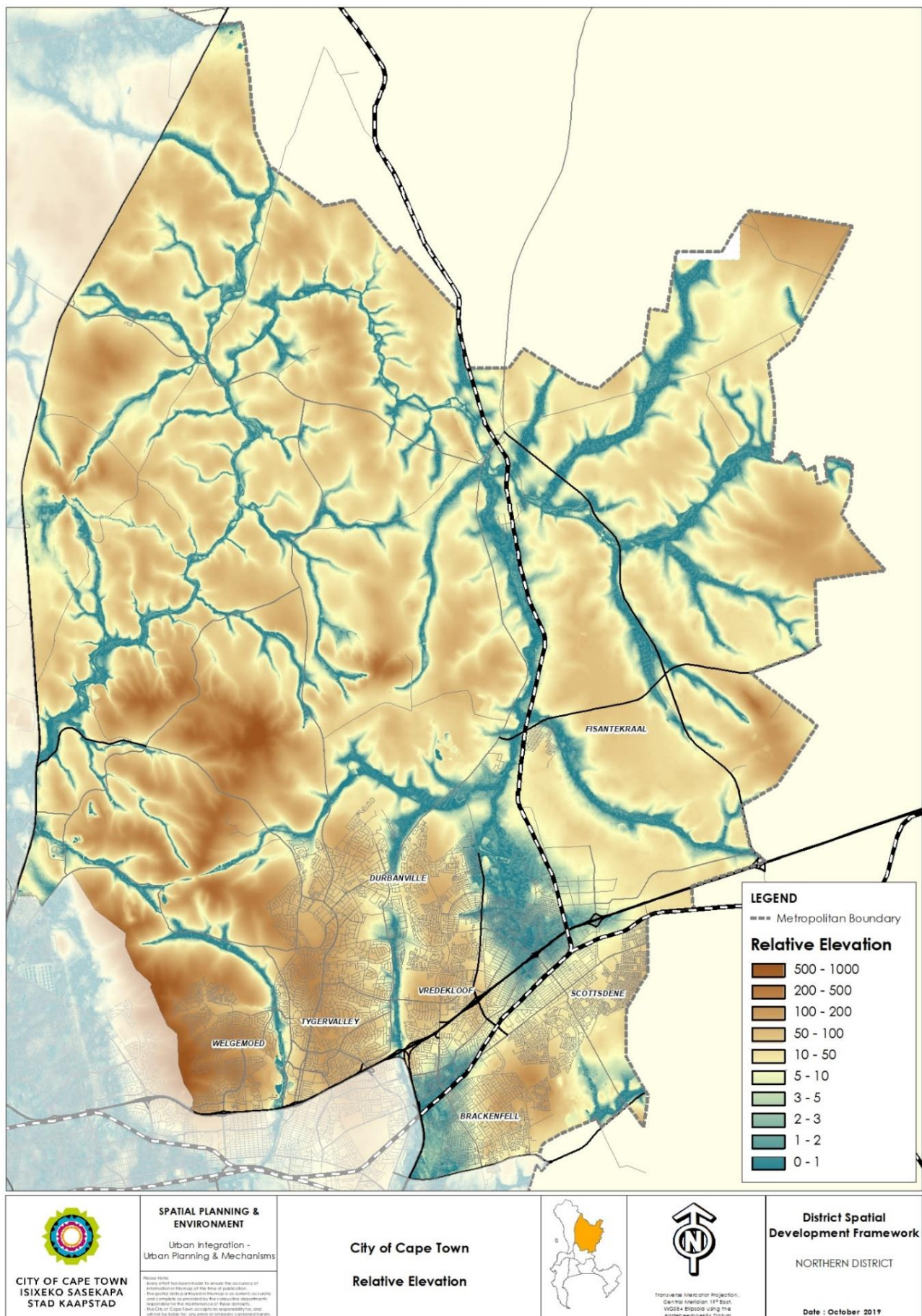


Figure 73: Elevation in the Northern District

11.2.2 Built Environment Risks

11.2.2.1 Risk Industry

Risk industry zones include industries and industrial practices that pose a hazard to human health and well-being. While there are no large risk industry areas in the Northern District, the risk of accidental release of hazardous material is higher in risk industry areas and nearby populations more vulnerable to this threat. The disaster probability rating includes the possible release while transporting risk substances and hazardous goods & is therefore higher than it might be for risk industry generally.

Table 28: Development Principles w.r.t. Risk Industry Zones

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely (1 in 1 month)	Moderate	Vulnerable	Adequate	High	No inappropriate development in risk industry areas in accordance with the Development Management Scheme.

11.2.2.2 Koeberg

The western portion of the Northern District is located within the 16km zone of the Koeberg Nuclear Plant.

The impacts of an event of this nature are most likely to be felt in the 16km zone around the power station, but may be felt in an 80 km radius depending on the amount of release and the wind directions.

To ensure the viability of the Koeberg Nuclear Emergency Plan (KNEP), all urban development within the KNPS Precautionary Action Zone (PAZ) (area within a 5 km radius of the Koeberg nuclear reactors) and Urgent Protective action planning Zone (UPZ) (area within a 5 km – 16km radius of the Koeberg nuclear reactors located at X = -52727.4000, Y = -3727966.6500, must conform to the restrictions referred to in the Development Management Scheme Section 158 (Specific Conditions regarding the Koeberg Restriction Area Overlay Zoning).

Table 29: Development Principles w.r.t. Koeberg Precautionary Area

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Unlikely (1 in 50 years)	Extreme	Very Vulnerable	Adequate	High	See Koeberg Conditions below

Koeberg Conditions:

The Traffic Evacuation Model under the Integrated Koeberg Nuclear Emergency Plan & the RRR (Radiological Release Plan) guides decision making ceilings regarding the extent of development allowed and the land use diversity and density.

To ensure the viability of the Koeberg Nuclear Emergency Plan (KNEP), all urban development within the KNPS Precautionary Action Zone (PAZ) (area within a 5 km radius of the Koeberg nuclear reactors) and Urgent Protective action planning Zone (UPZ) (area within a 5 km – 16km radius of the Koeberg nuclear reactors must conform to the restrictions referred to in the Development Management Scheme Section 158 (Specific Conditions regarding the Koeberg Restriction Area Overlay Zoning).

New development within the UPZ (as defined above) may only be approved subject to demonstration that the proposed development will not compromise the adequacy of disaster management infrastructure required to ensure the effective implementation of the KNEP (version approved by the NNR). Specifically, within the UPZ area, an evacuation time of 16 hours of the projected population, within any 67,5° sector, must be demonstrated by means of a traffic (evacuation) model approved by Council and the NNR. The evacuation time must be measured from the time that the evacuation order is given. These development controls will be superseded by the National 'Regulations on Development in the Formal Emergency Planning Zone of the KNPS', when approved.

Consideration should be given to Council Report C 53/12/13 (4 December 2013) which contains evaluation criteria for applications and projects around Koeberg. This includes inter alia:

- a) Applications within the urban edge but furthest away from the PAZ, are likely to be able to evacuate easier (depending on the available road network and capacities).
- b) To evaluate development applications outside the urban edges require an amendment to the TEM Baseline. The NNR has to approve this and such applications should therefore not be supported.

11.2.2.3 Cemeteries, solid waste disposal sites and waste water treatment works

Exclusion buffers exist around land fill and waste disposal sites to protect surrounding populations from hazards and nuisances. Historic sites also exclude certain types of development for a period of time determined in the waste management regulations. Smaller

sites and drop off facilities present fewer nuisances and hazards but may have an impact on neighbouring property uses.

Table 30: Development Principles w.r.t. Cemeteries, solid waste disposal sites and waste water treatment works

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
n/a	n/a	n/a	n/a	n/a	No inappropriate development in waste sites or buffer areas.

11.2.2.4 Infrastructure Availability

The availability of infrastructure influences the type of development that can occur, higher infrastructure capacity can include higher intensity of land use. In order to build resilience and deliver an efficient urban form in the areas that are less exposed to risk, infrastructure needs to build in redundancies and accommodate the growth in the existing urban footprint.

Table 31: Development Principles w.r.t. Infrastructure Availability

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
n/a	n/a	n/a	n/a	n/a	Development shouldn't occur where bulk infrastructure services are stressed. Infrastructure should build in redundancy in areas where development is prioritised.

11.2.2.5 Fisantekraal Airfield Height Restrictions

When development applications are being considered in the proximity of the airfield, requirements by the aviation authority need to be adhered to, especially height restrictions that may be applicable.

11.2.2.6 Structural Fire Informal Settlements

Informal settlements and backyard dwellings are often built at extremely high densities and are unable to meet building standards for fire risk reduction. All informal settlements. The reasons for informal settlement fires and methods for reducing risk are complex and site specific requiring an integrated response. From a spatial planning perspective, community planning initiatives such as reblocking and maintenance access routes for emergency services are interventions that may reduce risk.

Table 32: Development Principles w.r.t. Fire Risk in Informal Settlements

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely	Extreme	Very Vulnerable	Adequate	Very High	Access for fire services needs to be maintained Working with informal settlement communities to manage risks and adapt buildings.

11.2.2.7 Structural Fire Formal Settlements

Fire in formal settlements is a risk across the district, particularly when exposed to high temperatures and high winds. The prevalence of older buildings in the District and more vegetated suburbs also contributes to this risk. In general however a higher degree of building standard compliance and clearer access routes for emergency mean that there is less vulnerability than informal settlements experience.

Table 33: Development Principles w.r.t. Fire Risk in Formal Settlements

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely	Extreme	Vulnerable	Adequate	Very High	Maintaining access for fire services and maintenance of water access points. Compliance with buildings standards and urban design to reduce fire risk. Encouraging maintenance of trees and vegetation in private properties.

11.2.2.8 Heat and heat islands

All areas of the city are at risk from increased heat due to climate change, including increased heat waves (defined as 3 or more days in a row of temperatures higher than 32°C) and high heat days (defined as a temperature of higher than 35°C). Dense urban areas with low levels of green vegetation are most at risk of heat impacts and can be several degrees hotter than those areas not subject to the heat island effect.

Fire risk is anticipated to increase over time due to increased temperatures, increased drying, and higher wind speeds caused by climate change.

Table 34: Development Principles w.r.t. Heat Islands

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Likely	Moderate	Vulnerable	Adequate	Lower	Careful management of development to ensure the equitable distribution of green space, reduce the loss of existing green vegetation, and ensure that areas targeted for densification include sufficient green space and public spaces and facilities that are designed for cooling.

11.2.2.9 Unmanaged Land Occupation/Unregulated Development

Vacant and unmanaged land is seen as an opportunity for many households with inadequate housing and structures are illegally. Occupation of city owned and private land threatens the availability of land reserved for other uses such as future human settlements or social service provision they may also place households at risk of flood, fire or other risks depending on the location. Unregulated and dense development in informal settlements can result in building forms and conditions that are vulnerable to risks of heat or fire and are not able to access infrastructure and services.

Table 35: Development Principles w.r.t. Unmanaged Land Occupation

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
n/a	n/a	n/a	n/a	n/a	Refer to human settlements policy and means to address affordable housing demand across the City. Aim for effective land use management and enforcement across the City.

11.2.3 Climate Change Hazard, Vulnerabilities and Risks - Overview

A climate change hazard, vulnerability, and risk study has been conducted for the City which identified six key climate hazards which the city must adapt to. These hazards are:

- Decrease in rainfall
- Change in seasonality of rainfall
- Increased mean, maximum, and minimum temperatures
- Increased number of heat waves and very hot days
- Increased wind strength
- Sea-level rise increased and coastal erosion

It is important to note that many of the climate impacts that Cape Town currently experiences and will experience into the future are due to high levels of vulnerability and low levels of resilience, rather than due to particularly extreme climate hazards or events.

11.2.3.1 Vulnerability and Impact

Vulnerability is due to several factors, including physical and geographical vulnerability (i.e. proximity to high risk areas such as the coast or flood-prone areas), social vulnerability (i.e. low levels of resilience and adaptive capacity), the legacy of poor planning decisions (i.e. infrastructure or services located in high risk areas), and the adaptive capacity of local (and other spheres of) government (i.e. the ability of government to take action to address risks).

These climate hazards are anticipated to have a range of negative impacts on the city, including but not limited to the following impacts:

- Drought and water scarcity due to decreased rainfall
- Increased wildfire and urban fire risk due to increased heat and wind
- Heat stress and other related health impacts including Typhoid, Typhus and Cholera
- Loss of biodiversity due to climatic changes that these systems are not adapted to
- Coastal erosion and coastal storm damage due to sea level rise and a change in coastal system dynamics
- Flooding, due to high vulnerability and poor drainage, even within a context of lower overall rainfall
- Damage to City infrastructure due to flooding, sea level rise, heat, wind, or drought.
- Food insecurity due to damage to agriculture, especially in key food growing regions outside of Cape Town which are projected to experience more severe climatic changes
- City-scale economic losses due to major events such as droughts
- Loss of livelihoods associated with natural resources such as flower selling or urban agriculture
- Increased rural urban migration due to impacts on rural livelihoods, leading to increased informality and backlogs in basic service provision
- Increased resource costs due to scarcity e.g. water and food
- Potential for civil unrest or protest action

A climate hazard, vulnerability, and risk study has been completed which has mapped climate hazards, vulnerability/resilience, and overall climate risk (hazard + vulnerability = risk). Hazard and risk mapping has been done for the baseline period (1960 – 1991), the mid-future (2021-2050) and the far future (2070-2099), while vulnerability/resilience mapping was based on current data. The climate projections are based on a low climate-mitigation scenario and are in line with the current global trend in which carbon emissions are increasing over time. For the purposes of the district planning process, the mid-future assessment is presented below.

Figure 74 shows a consolidated map of all climate hazards (harms) for the mid-future period, including rainfall changes, temperature changes, heat islands, flood risk, coastal inundation risk, and wind speed change. In mountainous areas, and other naturally vegetated areas

risk pertains largely to increased fire risk. Heat island effects are seen in dense urban areas while flood risks are seen in low lying areas around water bodies.

Figure 75 shows a composite score for resilience in the present day based on a weighted analysis of the social, economic, and environmental factors listed in the table below:

Table 36: Social, economic and environmental factors

Indicator	Description	Weighting
Crime Rate	Total number of crimes by police precinct area	5
Electricity for Lighting	Percentage of households with access to electricity for lighting	4
Flushing Toilets	Percentage of households with flush toilets (main sewerage connection and septic tanks)	4
Median Household Income	Median household income	5
Range of household income within 3km	Measure of income disparity in different neighbourhoods: maximum minus minimum household income within a 3km radius	4
Higher Education	Percentage of people over the age of 20 with higher education	4
Employment opportunities within 1km	Measure of employment opportunities, ranked zoning areas by potential formal employment areas assessed in a 1km radius	5
Employment variety within 1 km	Measure of job diversity opportunities: distance from multiple zoning areas related to employment opportunities assessed within a 1km radius	5
Refuse collection	Percentage of households without municipal refuse collection services	3
Tap Water	Percentage of households without access to tap water	5
Toilet Facilities	Percentage of households without access to toilet facilities	5
Population Density	Number of people living in the area relative to the size of the area	4
Tap Water Inside Houses	Percentage of Households with tap water inside their house	4
Travel Time to Hospitals	Estimated time to travel to the nearest hospital	3
Travel Time to Police Stations	Estimated time to travel to the nearest police station	3
Travel Time to nearest Spring	Estimated time to travel to the nearest spring	1
Travel Time to CBD	Estimated time to travel to the CBD	5
Employment Rate	Percentage of people unemployed in the formal sector	4
Weekly Solid Waste Collection	Percentage of households with weekly solid waste collection services	4
Jobs: Population Density	Measure of job opportunities relative to population densities	5

It should be noted that resilience can be seen as the corollary to vulnerability, and therefore areas of high resilience will have relatively low vulnerability, and vice versa.

Figure 77 shows an assessment of risk relative to resilience; in this figure areas with high exposure to harms and low resilience will have the highest risk rating while those with low exposure to harms and high resilience will have the lowest risk rating.

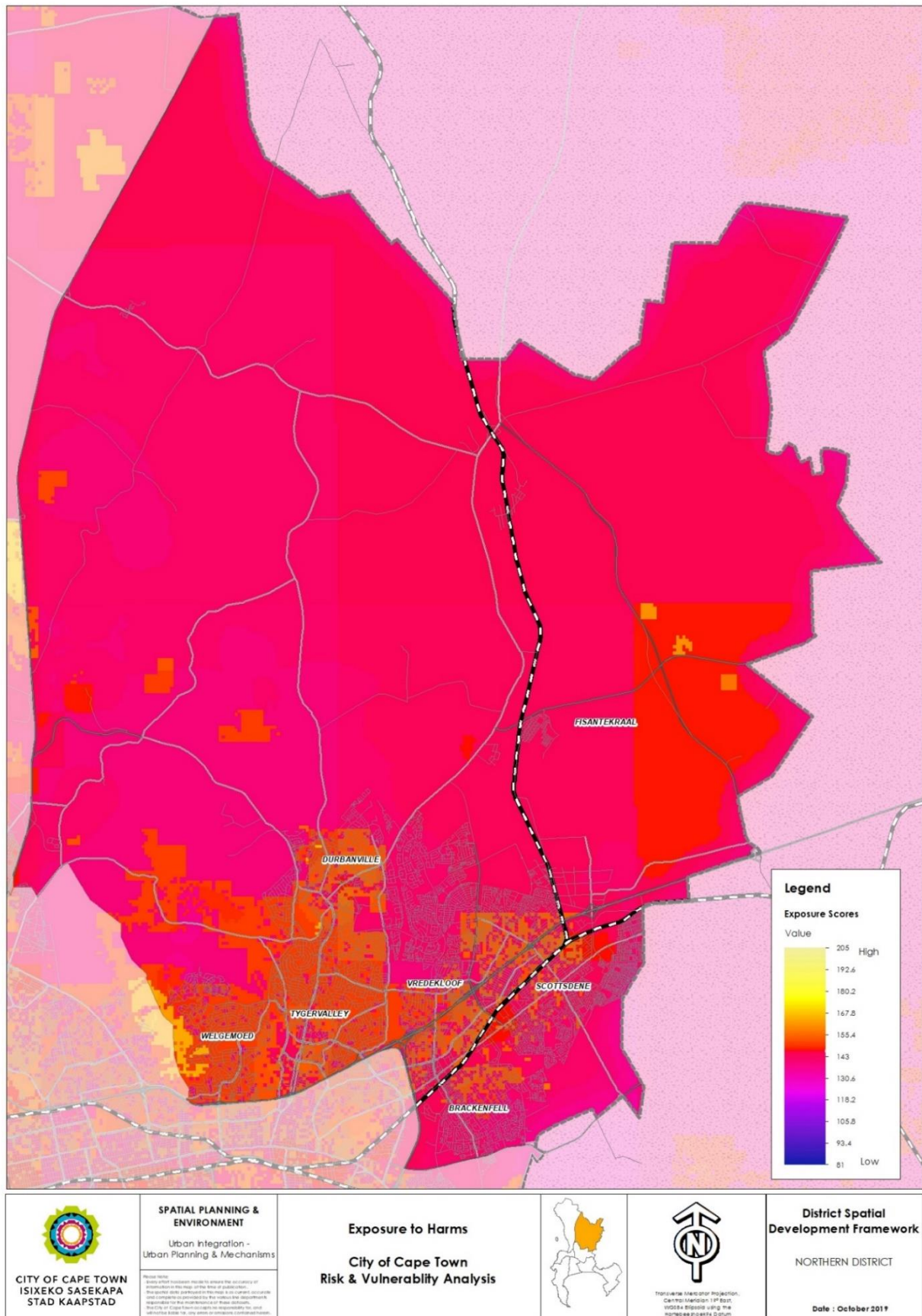


Figure 74: Risk and Vulnerability Analysis of the Northern District w.r.t. Exposure to Harms

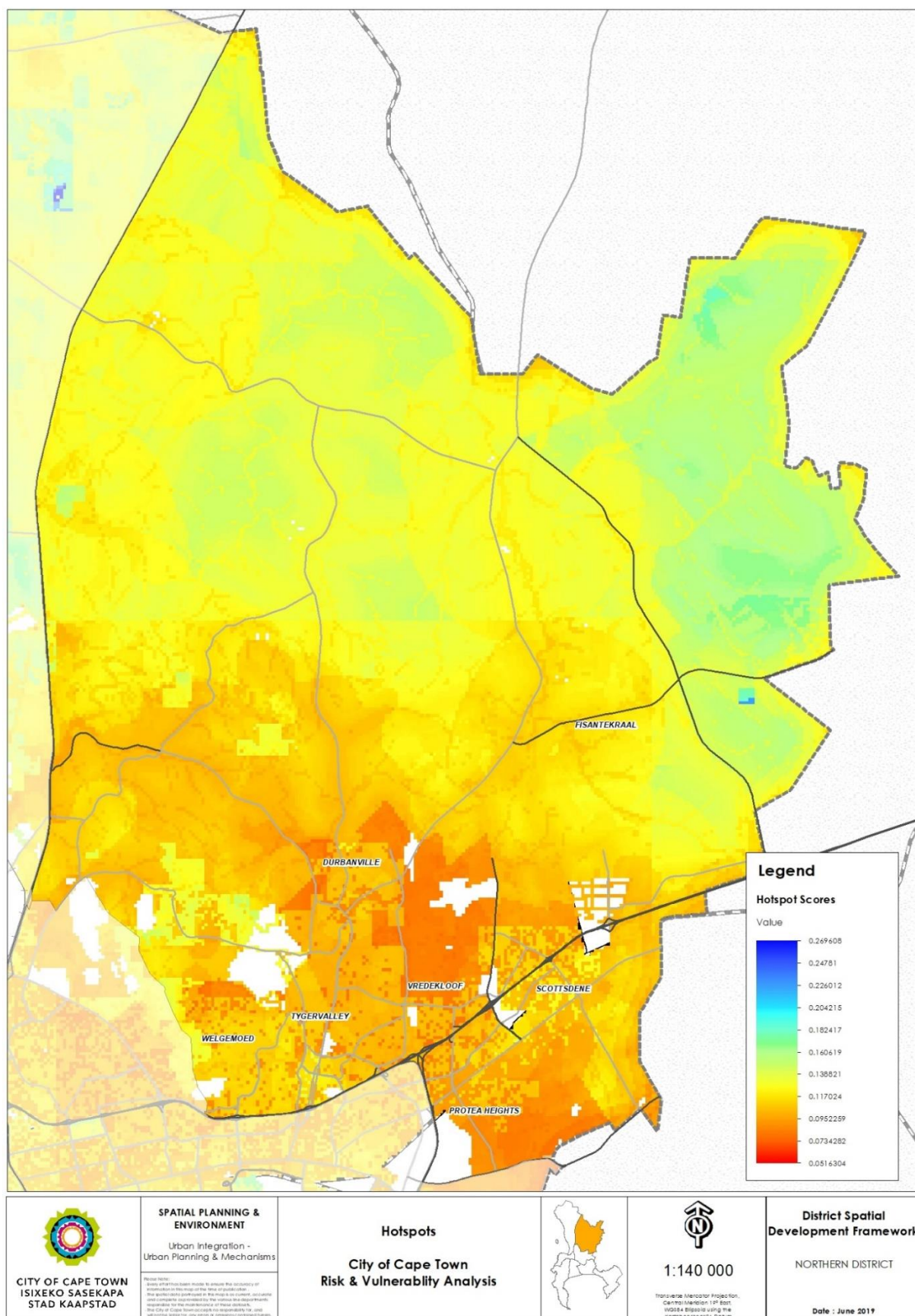


Figure 76: Risk and Vulnerability hotspots of the Northern District

11.2.3.2 Implications

Vulnerable areas and risk hotspots indicate areas that will need to be prioritised for resilience building, public sector intervention and support. Rural areas in the District face particular vulnerability to projected rain fall reductions.

11.3 Key opportunities and constraints

The following table (Table 38) identifies opportune **(encouraged)** and constrained **(discouraged)** area for development in the Northern District, informed by the aforementioned risk assessment.

Table 37: Encouraged and discouraged areas for development in the Northern District

Risk	Impact Radius	Discouraged Types of Development	Encouraged Types of Development
Koeberg	16km	All development above the maximum threshold	Cemeteries Managed Biodiversity and Green Infrastructure
Waste disposal sites	800m	Residential Development within buffer	Non-Residential development; Circular economy related industry and commerce
Cemetery			Open space uses
Fisantekraal airfield	Height restriction zone	All developments over regulated height	Development within restrictions zoning scheme
Flood Risk and Coastal Inundation Zones	Informed by 1:100 year flood lines and coastal urban edge line ¹⁶	Intensification of urban development	Green infrastructure, non- motorised transport Open space recreation Feasible development to support identified public recreational nodes.
Wild Fire	Fire lines	Development outside the range of existing service response times.	Fire Breaks Development that incorporates fire protection measures.
Structural Fire	High	Entire City but higher in informal settlements	Building materials and built forms that prevent the spread of fire.
Heat wave	Lower	Entire City	Planning built areas with green spaces, shade cover or tree cover.

¹⁶ These are indicative and do not include all areas and properties at risk.