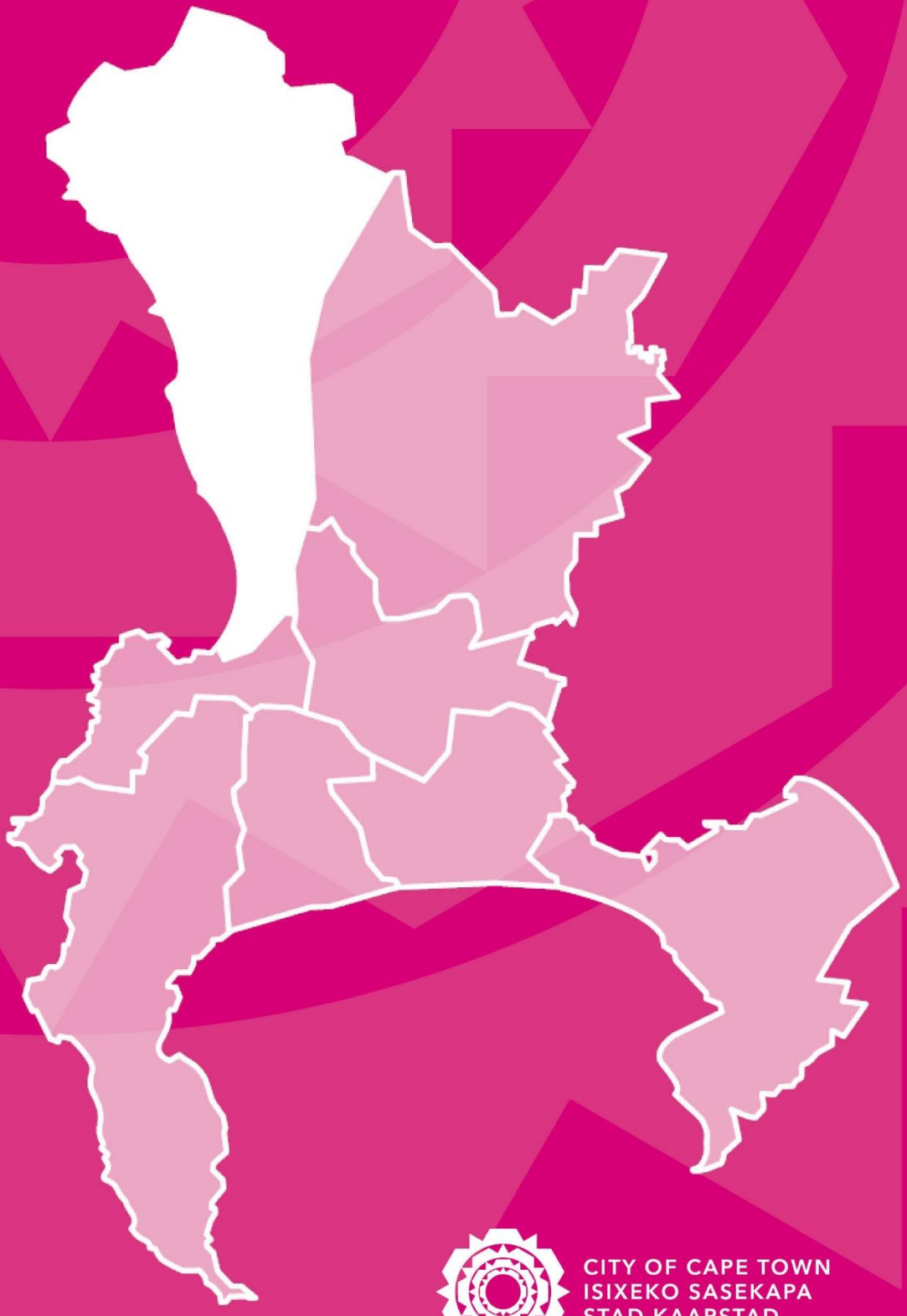
Blaauwberg

Integrated district spatial development framework and environmental management framework

Vol. 1: Baseline and Analysis Report



MAY
2022

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
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CONTENTS

1 INTRODUCTION

1.1 District Overview

Blaauwberg District is a large and diverse district.

Its Western boundary is the Atlantic Ocean, which gives adjacent neighbourhoods and the small town of Melkbos a distinct beach-town character. The northern border is with the Swartland Municipality while the N7 highway forms the district's eastern boundary with the Northern district. To the South the Districts boundary follows the N1 and then the Black River, which goes through Paarden Eiland Industrial hub. In contrast with the large Industrial Parks such of Paarden Eiland, Killarney and Montague Garden, the district has a high number of nature reserves, and many rare and critically endangered fynbos biomes.

Most of the district north of Cape Town city is undeveloped. The small town of Atlantis, and the Moravian-mission villages of Mamre and Pella-Katzenberg are located in this mainly undeveloped portion of the district. The Atlantis Greentech Special Economic Zone (SEZ) is the only SEZ in Cape Town. There are two small-holding areas in the more rural northern area. Although much of the land is zoned agricultural, some of it is not arable and/or is not used for rural/agricultural activities.

The location of Africa's only nuclear power station, Koeberg, on the coast north of the existing built footprint casts a precautionary no-development zone of 5km radius around it, within the restricted-development zone of 16km.

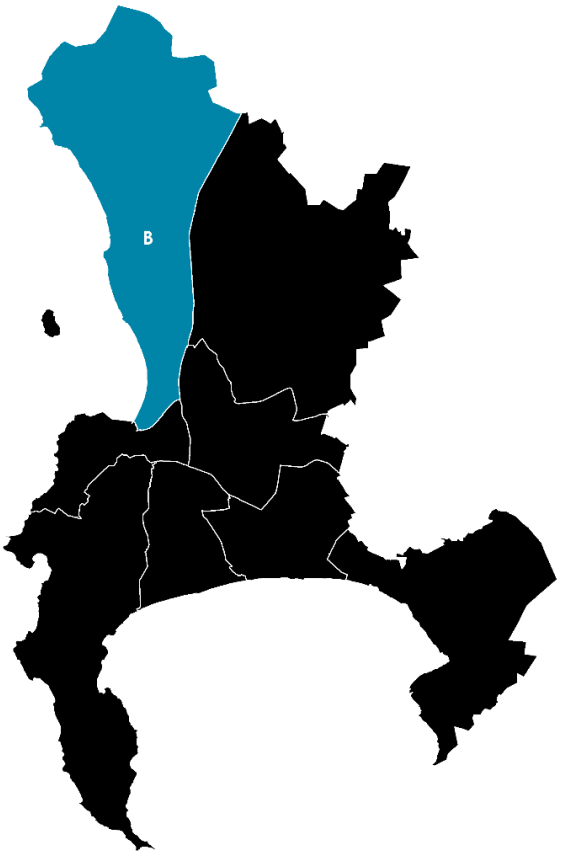


Figure 1.1: Blaauwberg District in Municipal Area

A. STATE OF THE POPULATION

2 DEMOGRAPHICS

2.1 Overview

The population in Blaauwberg almost doubled between 2001 and 2011, with an annual population growth rate around 7%. 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. This was not as marked in Blaauwberg as in other areas of Cape Town. Thus, while we can expect housing demand from households splitting into smaller units, and not only from increasing populations, this is not as strong a force in comparison to the rest of the City. Overall, ±75% of the population in Blaauwberg live in formal housing, while ±25% live in informal housing, including stand-alone and backyard shacks. Areas of informality are clustered mainly in Du Noon, Racing Park, Joe Slovo and Phoenix. These areas are among those which have relatively lower average household incomes in the district, making them more vulnerable to stresses and shocks.

At 0.59, Blaauwberg has a slightly lower Gini-coefficient than the Cape Town average of 0.62, and the national average of 0.63. However, based on its Gini-Coefficient, South Africa has one of the highest levels of income inequality in the world. Thus, despite being below the local average, it is still a key issue in the district.

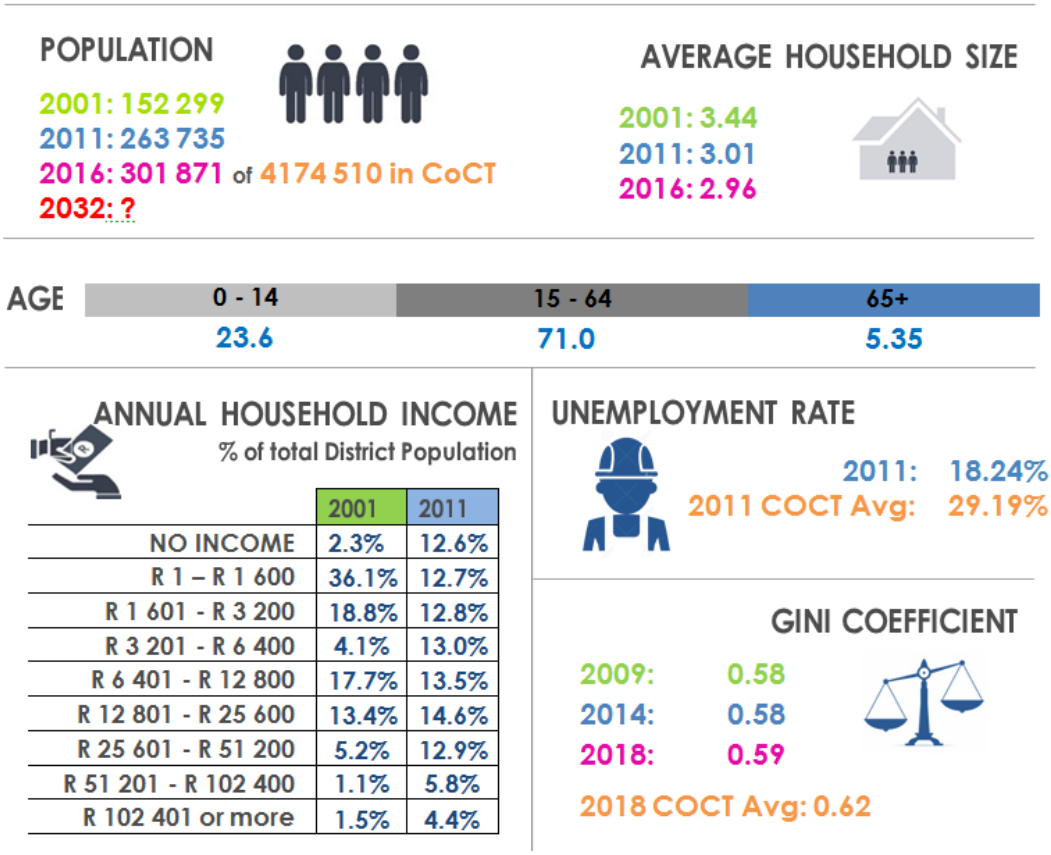


Figure 2.1: Infographic Overview of Blaauwberg Demographics

2.2 Population

2.2.1 Growth

The population of the Blaauwberg District was estimated to be 321 692 in 2018. While Blaauwberg comprises only 7.3% of the City's total population (2018 estimate), it experienced the highest growth rate of all the districts between 2001 and 2011, but slowed down substantially between 2011 and 2018. The population growth was accommodated primarily in greenfield developments on the northern periphery, including Sunningdale and Parklands; in informal settlements in Witsand, Du Noon and Racing Park; and in Joe Slovo Park. Other areas with notable population growth include Melkbos, Rugby and Century City.

	2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2016	2018
Blaauwberg	152 299	7.32%	263 735	3.14%	321 692
Cape Town	2 893 249	2.93%	3 740 026	2.52%	4 400 240

Table 2.1: Blaauwberg's Population Trends

The district's population roughly doubled in 17 years from around 150 000 to 320 000 people – growing 5 percentage points faster than the City average between 2001 and 2011.

2.2.2 Spatial Distribution

Most of the population is clustered in the southern portion of the district – which makes up the northern edge of Cape Town's urban footprint. This includes the areas from Brooklyn, Century City and Tijgerhof through Milnerton and Dunoon up to Parklands and Sunningdale. The rest of the District is predominantly rural, with very low population density, except for the industrial town of Atlantis located approximately 30km north of Cape Town, the small villages of Mamre and Pella-Katzenberg, and the beach town Melkbos. There are a number of uninhabited areas – within the 5km Urgent Protective Zone surrounding the Koeberg Nuclear Power Station.

While the district's population has roughly doubled between 2011 and 2018, population growth has not been uniform, as can be seen in Figure 2.2.

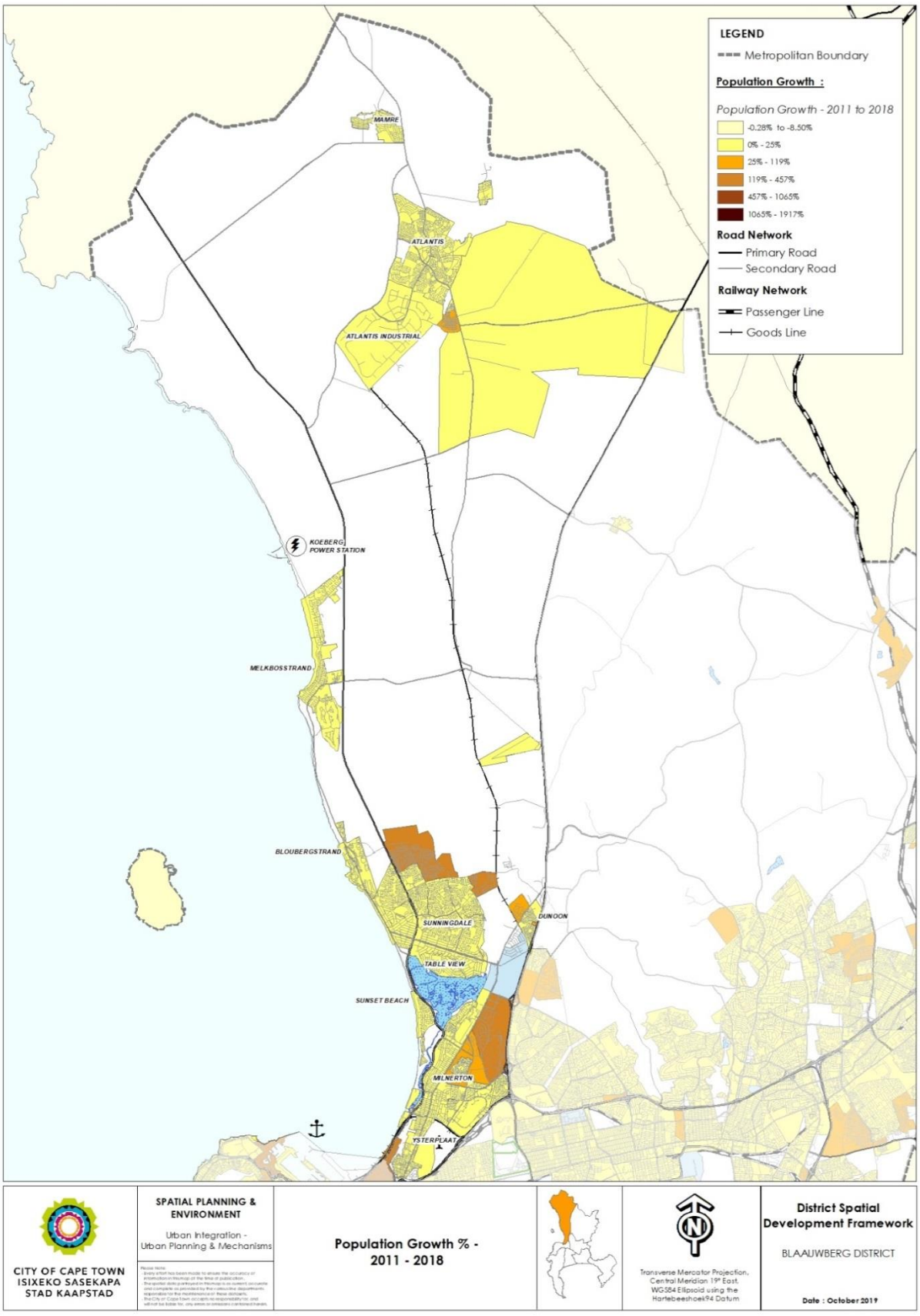


Figure 2.2: Map showing population growth by in Blaauwberg between 2011 and 2018 (Census, 2011 and COCT estimates, 2018)

The areas that have experienced the greatest population growth between 2011 and 2018 are Witsand in Atlantis; Dunoon; Joe Slovo Park; and the northern periphery of the urban footprint in the district – Parklands/Sandown/Table View area. It is interesting to note that in the previous District Plan this was a targeted area for development – to link Cape Town and Atlantis by creating a development corridor. However, the 2018 MSDF aims to consolidate and densify the existing urban footprint.

The established suburbs of Milnerton, Table View and Blaauwberg experienced low growth, despite having low population densities. Low density areas which experienced a slightly higher growth rate include Summer Greens, Brooklyn and Atlantis. This indicates that the majority of the population increase was housed either in new informal settlements, or in new formal residential developments, such as Sandown and Rivergate, rather than in conversions or through intensification in the form of second dwellings in existing areas.

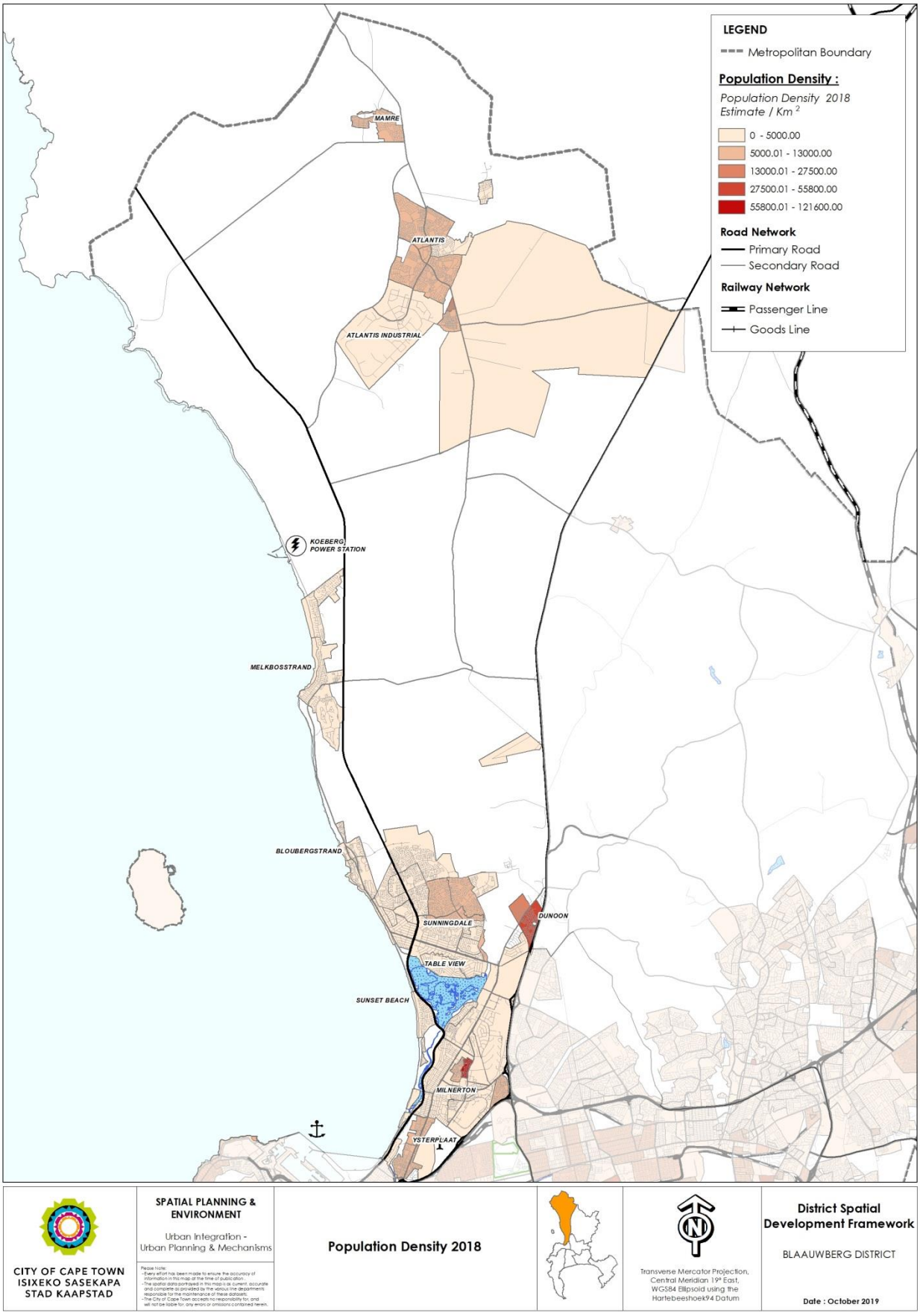


Figure 2.3: Map showing gross population density in Blaauwberg (Census, 2011)

The areas with the highest gross population density[1] are Du Noon and Joe Slovo. Both of which have large informal settlements. The rest of the District has a relatively low population density.

Note on Population and Household Estimates:

These figures are all estimates as some 2011 small areas crossed the Planning District and Ward boundaries. This data is as at October 2011 and the 2018 mid-year population estimate for Cape Town municipal area (SSA, 2019).

Population and Household data originates from multiple sources including Census 2011; aerial photography counts; estimated growth in formal dwelling units and population from October 2011 to end December 2017; the solid waste 2017 count and Corporate GIS's 2018 roof count. Assumptions made for each of these estimates could impact the figures. While every effort has been made to ensure duplications do not occur, these sources have different categories and use different methods to obtain these counts. These figures are illustrative of broad trends only. Formal second and third dwellings are included in the formal estimates. Informal backyard dwelling growth is not accounted for at a Subplace Level.

To avoid distortion of density-related data, subplaces with fewer than 20 households in the 2011 Census data are excluded. These include Atlantis Industrial, Koeberg, Killarney Industrial, Milnerton Industrial, Montague Gardens and Rietvlei Nature Reserve. The Census Subplaces have also been reduced to cover only areas with development and urban footprint.

[1] Gross population density is calculated per Census subplace area. It is the number of people per square kilometre within a subplace.

2.2.3 Population Structure

This section provides an overview of the population structure of the Blaauwberg District using Census 2011 figures.

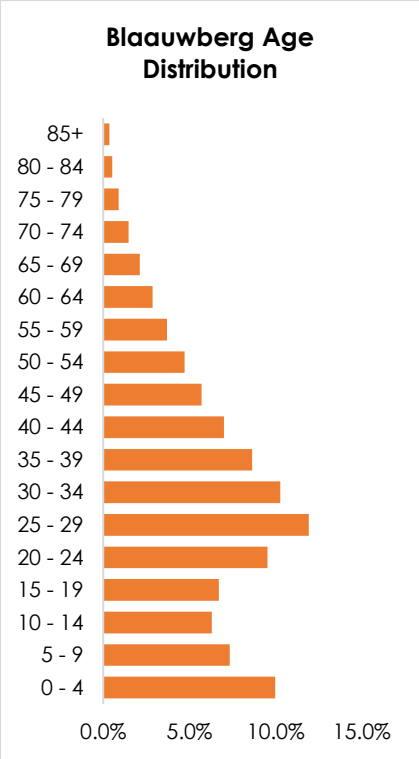


Figure 2.4: Age distribution of Blaauwberg's population in 2011 (Census, 2011)

2.2.3.1 Age Distribution

The population pyramid for the Blaauwberg district indicates a high percentage of the 2011 population in the Blaauwberg District falls within the age categories between 20 and 35 years. There was also a large 0–4-year-old population (10% of the District).

Between 2001 and 2011, despite the high population growth rate, the percentage of the population who was in the working age category stayed relatively constant – changing only 2%.

The dependency ratio is a measure of the number of people in the "dependant age groups" in relation to the number of people in the working age group, expressed per 100 persons. This gives a rough estimate of the level of dependency in a society. In Blaauwberg, the dependency ratio of 40 indicates that for every two people between 15 and 64, there is approximately one person either below 14 years or over 65 years of age, which may be dependent on them. Dependency may relate to income, but also social, physical and/or logistical needs. As the employment section will show, the rate of dependency in terms of income only is much higher due to the low proportion of the working age population employed (the labour absorption rate of just below 60% for Blaauwberg).

Table 2.2: Age distribution of population in Blaauwberg (Census 2001 and Census 2011)

	0 - 14		15 - 64		65 +		Dependency Ratio	Index of Ageing
	Number	%	Number	%	Number	%		
2001	400 63	26.31	105 148	69.04	7 090	4.66	44.84	17.7
2011	62 226	23.60	187 395	71.06	14 103	5.35	40.73	22.66

The Index of ageing (expressed per 100 of the population) increased between 2001 and 2011 by about 5 points. This means that there are more people over the age of 65 in relation to those below 15 years. As the driver of population growth between 2001 and 2011 is assumed to be in migration, this reflects that older people moved into the District, as can be seen in Figure 2.5.

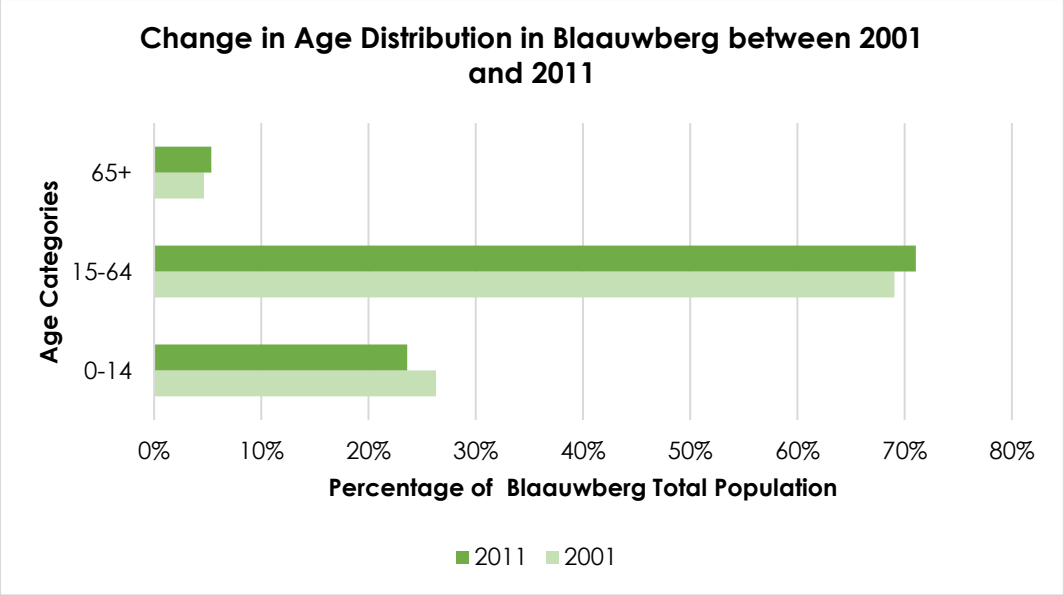


Figure 2.5: Change in age distribution in Blaauwberg 2001 – 2011 (Census 2001 and Census 2011)

2.2.3.2 Education (aged 20+)

The Blaauwberg District generally has high levels of education compared to city averages. In particular, the level of higher education in the district is notable. Approximately 23% of adults in the district have completed some form of higher education compared to just over 16% of adults in the City of Cape Town. In terms of education levels, Blaauwberg is in a middle mark position, with overall lower levels than the Southern, Northern and Table Bay Districts, but higher than the other four districts.

	No Schooling		Matric		Higher Education	
	2001	2011	2001	2011	2001	2011
Blaauwberg	-	1.3%	-	33%	-	23.3%
Cape Town Average	4.2 %	1.8 %	25.4 %	30.2 %	12.6 %	16.2 %

Table 2.3: Percentage of population by highest education level achieved (Census 2001 and Census 2011)

2.3 Households

The number of households in the Blaauwberg District was estimated to be approximately 110 000 in 2018. This is among the least populous districts by number of household. For comparison, the Khayelitsha/Mitchells Plain district had approximately 380 000 households. The average household size for the district was 2.93 people per household in 2018. 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).

2.3.1 District Trends

The number of households increased twofold between 2001 and 2011 and a further 20% between 2011 and 2018. The average annual rate of household growth slowed substantially between 2011 and 2018, from around 10% to closer to 4%. Between 2001 and 2011, the annual average growth rate of households exceeded the population growth rate by about 2 percentage points. Based on the 2018 estimates, this trend continued, although at a much lower rate. This suggests a substantial deceleration in the *rate* of household growth.

Concurrently, the average household size decreased in both periods. The rate of decrease in household size was most significant between 2001 and 2011, at almost double the City average; however, it slowed in the following five years.

Matching the citywide trend, the increase in population in the Blaauwberg District was coupled with an increase in the number of households and decrease in the average household size. This means that we can expect an increased demand for housing and increased pressure on hard infrastructure e.g. Number of connections into main systems.

Table 2.4: Household Growth in Blaauwberg District (Census 2001, Census 2011 and COCT 2018 estimates)

		2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2018	2018
Households	Blaauwberg	44 309	9.75%	87 515	3.63%	109 752
	Cape Town Total	776 781	3.76%	1 068 573	3.29%	1 315 015
Average Household Size	Blaauwberg	3.44	-1.25%	3.01	-0.38%	2.93
	Cape Town Average	3.72	- 0.59%	3.50	-0.61%	3.35

2.3.2 Spatial Distribution

Within the Blaauwberg District, the distribution of households closely mimics the distribution of population. The increase in households tends to outpace the increase in population. The following key aspects are noteworthy.

- The subplace with the most households is Du Noon which grew from 10 722 households in 2011 to approximately 11 786 households in 2018.
- Joe Slovo, Parklands and Tableview are the next most populous subplaces according to household counts in 2011 and in 2018.
- The area north of Table View, including Parklands, Rivergate and Sandown grew from approximately 1 200 households in 2011 to 5 200 households in 2016. This represents households moving into newly constructed low to medium density dwellings.

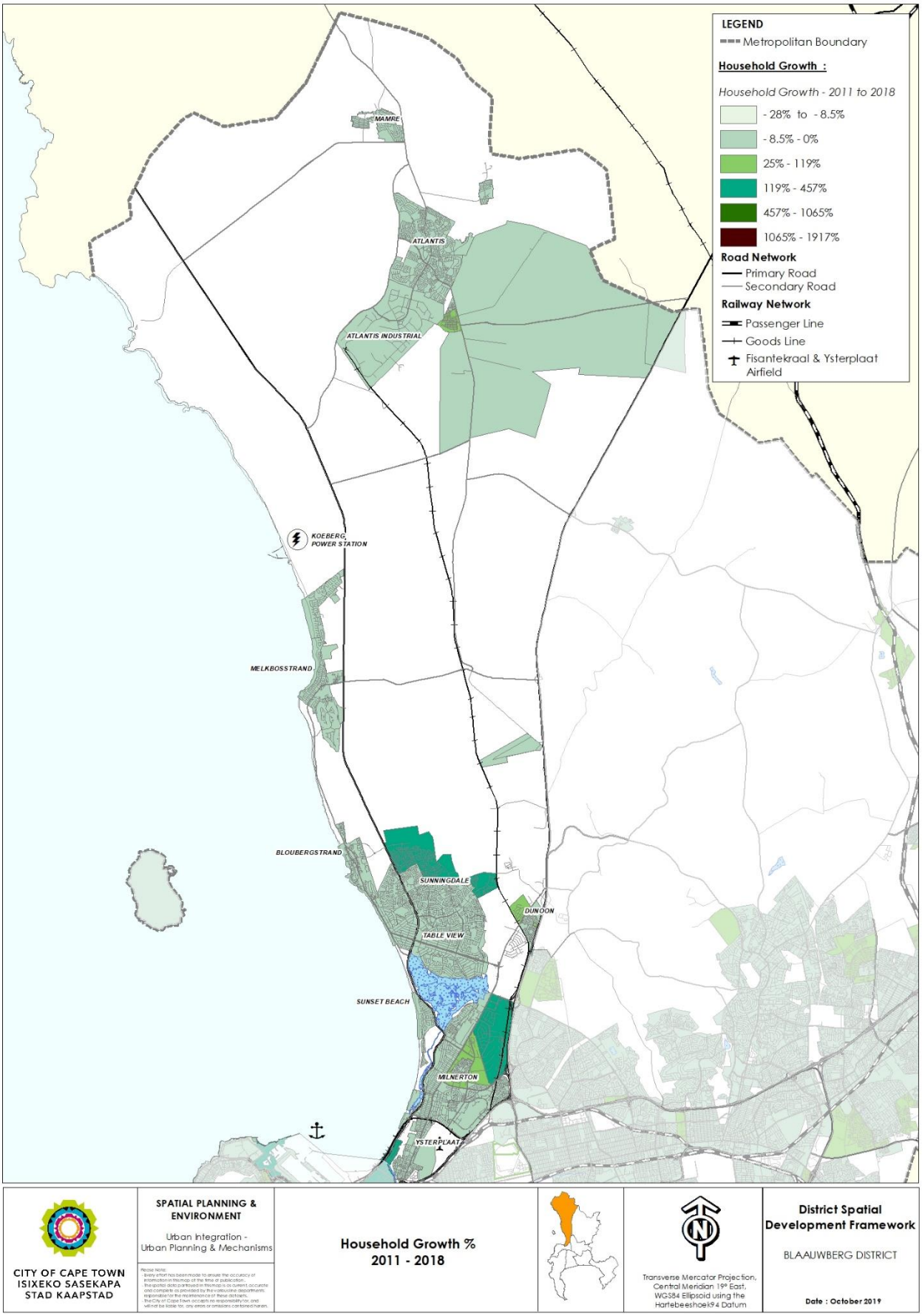


Figure 2.6: Map showing household growth rate 2011 – 2018 (Census 2011 and COCT 2018 estimates)

2.4 Employment

In 2011, 187 392 people of the Districts 263 735 population were of working age.

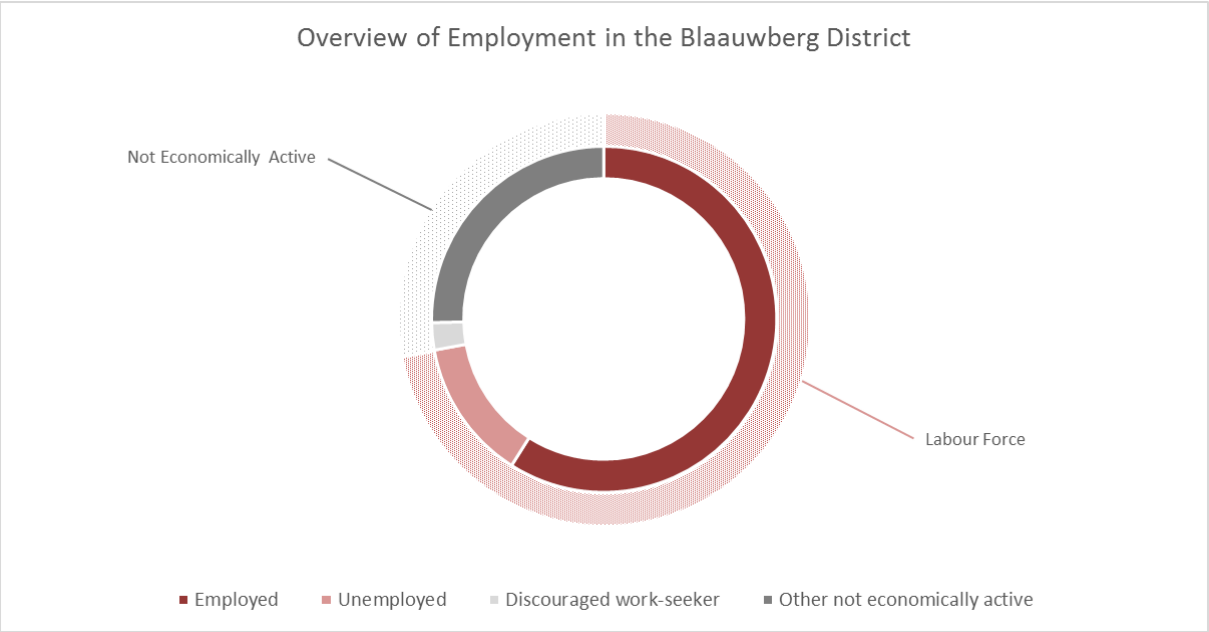


Figure 2.7: Overview of Employment in the Blaauwberg District 2011 (Census 2011)

Approximately three quarters of those made up the 135 135 person strong labour force, with the remaining quarter classified as 'Not Economically Active'. Only a very small percentage of the 'Not Economically Active' population identified as 'discouraged work-seekers' (47 88 people in the District). The vast majority of the 'Not economically active population have other reasons for not working which could include being full time students/scholars, homemakers or pensioners. Given the high Index of Ageing, we might expect the not economically active proportion to increase.

Blaauwberg Planning District Labour Force Indicators	2001	2011
Population aged 15 to 64 years	105 148	187 392
Labour Force	74 632	135 135
Employed	58 130	110 484
Unemployed	16 502	24 651
Not Economically Active	31025	52 257
Discouraged Work-seekers	2 648	4 788
Other not economically active	28 377	47 469
Rates %		
Unemployment rate	22.1%	18.24%
Labour absorption rate	55.28%	58.96%
Labour Force participation rate	70.98 %	72.11%

Table 2.5: Labour force indicators for Blaauwberg 2001 – 2011 (Census 2001 and Census 2011)

Employment and Unemployment

The majority of the labour force, approximately 110 000 people, were employed. Unemployed people comprised the remaining 24 651 people. This indicates that for approximately 1 out of every 6 people who wished to be employed were in fact unemployed. This is captured in the unemployment rate of 18.24%, which is relatively low in comparison to the metro average.

The large proportion of 'Not Economically Active' people results in a relatively low labour force participation rate, of 72.11%, despite the vast majority of the labour force being employed.

Labour Absorption Rate

The labour absorption rate of 58.96% indicates that just over half of Blaauwberg District's working age population was employed. Given the relatively high employment rate for the District, the labour absorption rate is lower than may have been expected. Again, this is due to a large proportion of "Other Not Economically Active" people.

2.4.1 Trends

Despite a rapid increase in population, the unemployment rate decreased from 22.1% in 2001 to 18.24% in 2011. Given the persistently high unemployment rate in the city and country it is unusual that the job market was able to absorb such a large and rapid increase in population. This could indicate that there was a shortage of labour in the district which attracted people to locate in Blaauwberg, leading to the jump in population. The number of discouraged work seekers approximately doubled between 2001 and 2011, in line with the overall growth rate; however, it still makes up an extremely small portion of the working age population.

2.4.2 Spatial Distribution of Unemployment

Unemployment Rate is shown for the various subplaces in the Blaauwberg District in 2011.

- The areas with the highest unemployment rates, of 45% and more are Racing Course and Frankdale
- Du Noon, Wesfleur and Witsand in Atlantis have a relatively high unemployment rate at 40 – 45%
- Mamre, Pella, Atlantis, Kleine Zout Rivier and Joe Slovo have unemployment rates between 32% - 40%
- Brooklyn, Tjgerhof and Sanddrift have a slightly higher unemployment rate around 20 – 30 % while overall there is an extremely low unemployment rate in the urban southern part of the District, generally below 6.5%,

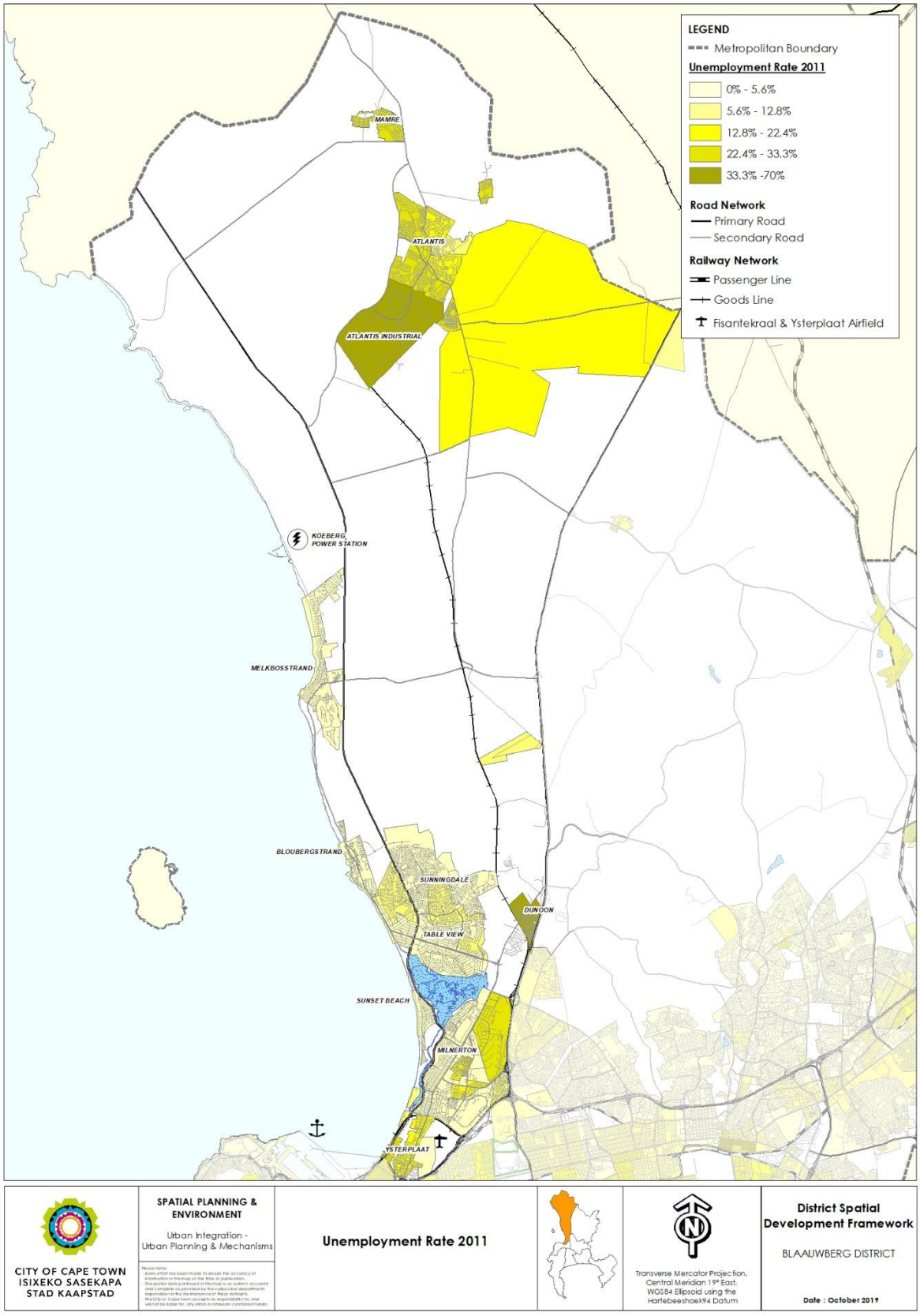


Figure 2.8: Map showing rates of unemployment in Blaauwberg in 2011 (Census, 2011)

2.5 Income (Households)

In 2011 Blaauwberg had a consistent spread of income ranges, with approximately 1 000 households in every income bracket from R1 – R 1 600 per month to R25 601 – R51 200 per month. Approximately 11 000 households received no monthly income, and – on the other side of the spectrum – 7 000 households earned more than R 51 000 per month.

Figure 2.10 below shows that while overall employment trends remained relatively constant, the spread of that employment – in terms of income – changed substantially between 2001 and 2011. In particular, there was a marked increase in the number of households with no income. In the lowest income band there was a decrease from approximately 15 000 to 11 000 households. There was an increase in the number of households earning no income and in in every category above the lowest income bands. An opportunity is that there has been a huge increase in the number of households earning high monthly incomes, particularly in the R25 000 and more categories.

2.5.1 Spatial Distribution of household incomes

The median household incomes per subplace are shown for the district in the map below. Median income is used, as it is less sensitive to outliers than the mean/average income.

- Wesfleur 2 in Atlantis and Race Park has the lowest median household incomes in the district at R0-R400 per month. This means that half of the population in those subplaces earned that or less.
- Frankdale has a median income of R401 – R800 per month.
- Witsand, Du Noon and Kleine Zoute have median incomes of R R801 - R1 600
- The Southern urban area has a relatively high median household income although Joe Slovo is an anomaly in the area with R1601 – 3200

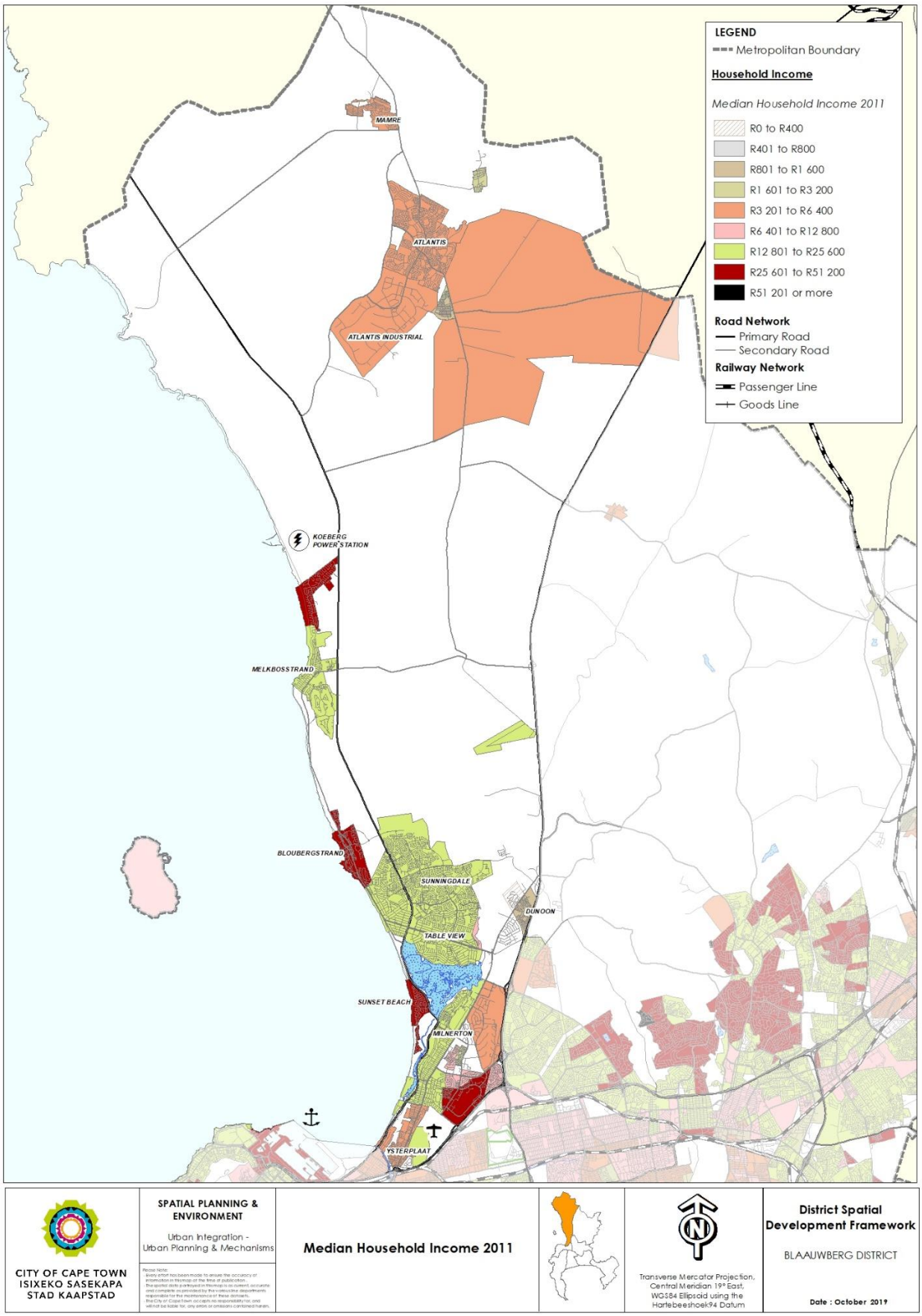


Figure 2.9: Map showing median household income for the Blaauwberg District (Census, 2011)

2.5.2 Income Inequality

The Gini coefficient is a measure of income variance among a population which is often used to indicate income inequality. The coefficient ranges from 0, which represents "absolute equality", to 1, which represents "absolute inequality" (Statistics South Africa, 2014).

Although Blaauwberg's Gini coefficient is lower than the Cape Town average, it is the second most unequal district in terms of income dispersion out of the eight in Cape Town. It is concerning to observe even a slight increase in income inequality between 2014 and 2018, mirroring the Metro's trend given the high range Cape Town is already in.

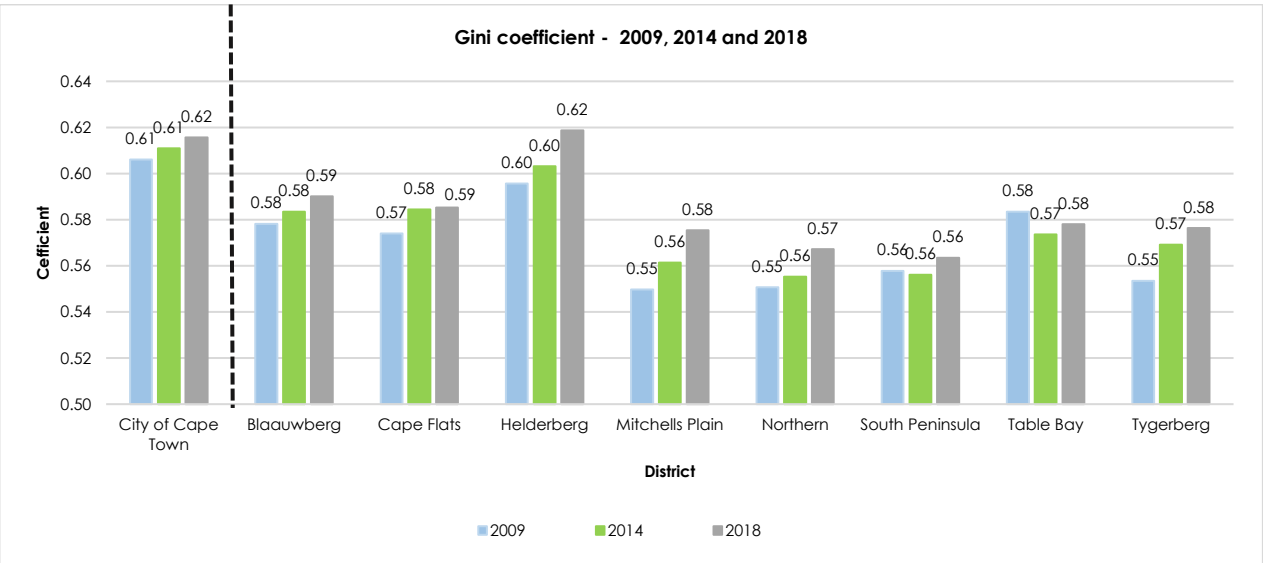


Figure 2.10: Gini coefficient - 2009, 2014 and 2018 (IHS Markit, 2018)

2.5.3 Socio-Economic Indicators

The Human Development Index (HDI) is a composite indicator reflecting education levels, health, and income. The HDI ranges from 0, "no human development", to 1 which indicates "high level of human development" (United Nations, 2018).

District	Human Development Index (HDI)		
	2009	2014	2018
Blaauwberg	0.75	0.78	0.79
City of Cape Town	0.70	0.73	0.74

Table 2.6: The human development index in Blaauwberg (Source: HIS Markit, 2019)

Blaauwberg has one of the highest HDI's out of the eight districts, well above the lowest in 2018, which was Mitchell's Plain/Khayelitsha with 0.66. Blaauwberg's HDI has been steadily increasing from 2009 to 2018, at a faster pace than the City average.

B. STATE OF THE ENVIRONMENT

3 NATURAL ENVIRONMENT

The following section outlines the key environmental and heritage trends and spatial implications that have been identified for the 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, Topography and Soils

3.1.1.1 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 well as by erosion and weathering over time (Reid et al., 2001).

The dominant deposits underlying the Blaauwberg district belong to the Precambrian Malmesbury Group, which extends across the coastal plain from Saldanha to False Bay. There are intrusions of Cape Granite Suite deposits, belonging to the Darling Pluton, in the north of the district. These deposits are overlain by more recent deposits belonging to the Table Mountain Group, the geologically recent Sandveld Group (consisting of permeable Quaternary material) and contemporary sediments deposited along the West Coast.

The Malmesbury Group rocks are poorly exposed. They consist of low rolling hills and have been subject to only low-grade regional metamorphism. 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. The rocks are dark, medium grained, sub-greywackes with interbedded blue and occasionally purplish shales and unfossiliferous. Graded bedding is not uncommon in the greywackes and there is evidence of multiple folding and late shearing at Bloubergstrand (Reid et al., 2001). Outcrops of the Tygerberg formation, one of three formations making up the Malmesbury Group, is evident particularly as the undulating hills along the eastern boundary of the district.

Rocks of the Cape Granite Suite, some 540 million years old (Reid et al., 2001), are characteristically light grey and coarse-grained porphyritic. Phenocrysts (crystals that are distinctly larger than the grains of the surrounding rock) are plentiful and form a noticeable feature of this granite.

The Sandveld Group consists of the Springfontyn, Velddrif, Langebaan and Witzand formations. It is some 2 million years old (Reid et al., 2001) and thus the geologically most recent formation, dating from Tertiary to Quaternary. The Springfontyn formation with semi-consolidated sandy sediments is the most common one found in the Blaauwberg district, with the Velddrif formation being the most rarely found. The Springfontyn formation consists of two members. The lower member is composed of fossiliferous fine, medium and

coarse sand with scattered fine gravels and characterised by abundant internal casts of gastropods (snails), fish and shells in laminae. The upper member consists of mainly well-sorted sand of fine to coarse, grain size with no gastropods present.

3.1.1.2 Topography

The southern, coastal and northern regions of the Blaauwberg district have undifferentiated coastal and inland rock deposits. The central eastern portion of the district is covered by undifferentiated rocks and mixed rock deposits, while at the north-eastern boundary of the district acid intrusive rocks are found. The north-west aligned Mamre fault in the northern part of the district is the only evident major fault in the Blaauwberg district. A shear zone, tentatively called the proposed Milnerton fault, may occur between Bloubergstrand and Cape Town (Reid et al., 2001).

The district is characterised by plains and hills. The plains of the Cape Flats extend from the Cape Peninsula in the south to Atlantis in the north across the Sandveld region of the West Coast. The coastal belt maintains a relatively low-lying relief, with only Blaauwberg Hill in the south rising to just over 200 m. The coastal belt is gently undulating, interspersed with small hills (or 'koppies') with a diversity of slopes, hollows and drainage lines. The central region also has some smaller hills rising between 100 m and 200 m above sea level, with a series of hills north-east of Atlantis and Mamre rising to an elevation of up to 300 m. These hills are the only area where noteworthy steep slopes are found within the district. However, they are largely undeveloped except for limited agriculture.

3.1.1.3 Soils

Soil 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 Blaauwberg district (see Figure 2-2).

The majority of the district is covered by well-drained grey to light grey regic sands with some localized occurrences of ferricrete (Geological Survey, 1990), a mineral conglomerate consisting of surficial sand and gravel cemented into a hard mass by iron oxide that is derived from the oxidation of percolating solutions of iron salts.

The immediate coastal strip and area to the south-west of Atlantis is characterized by unconsolidated white sand with pebbles and shells that are locally distributed along the beach and which is typical of the Witzand formation. Pockets of limestone and calcrete, which is partially cross-bedded, calcified parabolic dune sand, occur close to the coast and are indicative of the Langebaan formation (Geological Survey, 1990).

Clayey plinthic catena upland duplex margalitic soils occur to the east, far north east along and along the Diep River (CoCT, n.d.). A large portion of the central and eastern area of the district has prismacutanic and/or pedocutanic soils with dominant diagnostic horizons, offset by Glenrosa soils (CoCT, 2008a).

The low-lying areas of the West Coast are characterised by deeper, sandy, calcareous soils that are less acidic and have a marginally higher nutrient content than the soils

associated with the Table Mountain Group sandstone close to or on mountain slopes. The calcareous marine-derived soils contain a varying amount of decomposing shell matter and are rich in calcium-carbonate. As these soils are occurring in low-lying areas close to the ocean, they frequently become waterlogged due to high local water tables (CoCT, 1999).

Soils derived from the weathering of Malmesbury Group shales, which were formed by the deposition and compression of silt and clay, are located towards the eastern and north-eastern edge of the district. These soils are rich in clay and have a high nutrient content, 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 form the backbone of agriculture in the region. They are, however, prone to crusting, which prevents water infiltration and increases runoff and nutrient loss, especially when vegetation cover is removed. High soil fertility has also meant that natural vegetation, such as Renosterveld, is gradually being lost due to clearing of those areas for agriculture (CapeNature, n.d.).

Other surfaces found in the district include bare rock and very thin sandy layers as well as wetlands, marshy areas and alluvial soils along drainage lines. Granite, present in the far north of the district, weathers to form various types of coarse sands and, under the appropriate geomorphic conditions, kaolin.

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.

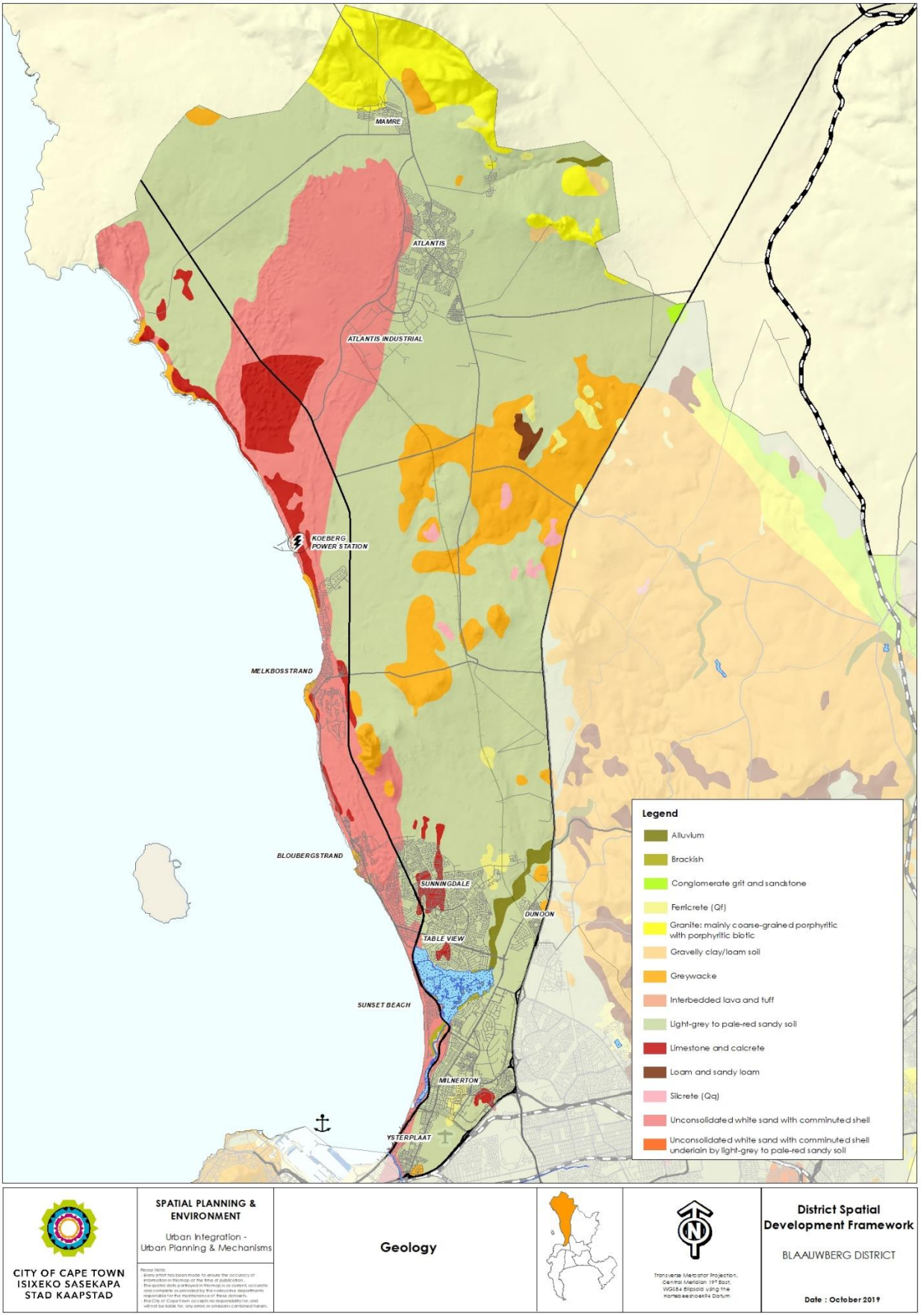


Figure 3.1: Map showing geology of Blaauwberg district

3.1.2 Biodiversity

3.1.2.1 Vegetation

The West Coast region includes some of the most important unpreserved lowland habitat within the Cape Floristic Region, which has been identified as a conservation priority and area of enormous international significance. The Blaauwberg district contains some of the last remaining tracts of two of South Africa's rarest vegetation types, namely Sand Fynbos (two sub-types; both 'Critically Endangered') and Renosterveld (three sub-types; all 'Critically Endangered'). Both of these vegetation types are exceptionally high in species diversity but they are also threatened, containing some of the highest incidences of 'Threatened' plant taxa in the world, closely associated with many endemic faunal species (refer to 3.1.1.3 Soils). The biodiversity in this district is undergoing continual decline with the most significant threats being presented by sand-mining, agricultural activities, overly frequent veld fires, rapid and insensitive development; infestation by invasive alien species, and overexploitation of water and marine resources. Biodiversity decline is evident in the recent loss of the biodiversity connectivity corridor through the Frakendale Industrial Area, which is likely to have ensured the extinction of at least three species. Similarly insensitive developments must be avoided in future. A brief description of the vegetation in the Blaauwberg district is provided below:

Cape Flats Sand Fynbos is endemic to the City and occurs mainly on deep, leached, acid sands (Mucina et al., 2006). It is characterised by typical Fynbos families such as Protea, Erica, Restio (Cape reeds), Buchu and Geophytes (bulbs). The vegetation comprises moderately tall shrubland, interspersed with Restios (BCA, n.d.). Cape Flats Sand Fynbos is exceptionally high in species diversity and has a high number of Vulnerable, Endangered and Critically Endangered plant species (some 94 Red List Threatened species occur on the remnants within Cape Town). Cape Flats Sand Fynbos is listed as Critically Endangered and most of this vegetation has been transformed (89%). The most extensive area of this vegetation type remaining is found in the area between Morning Star, Blaauwberg Hill and Parklands.

Atlantis Sand Fynbos is found in the north of the district between Atlantis and Kalbaskraal and extends north of the City on moderately undulating to flat sand plains. It is characterized by dense moderately tall, ericoid shrubland, dotted with emergent taller shrubs and a short restioid layer. Dominant families include Restio, Protea with patches of Erica and Asters (daisies) in seepage areas. It is Critically Endangered and it contains 100 Red List Threatened species. About 41.3% of the vegetation has been transformed by agriculture and urban development.

Cape Lowland Freshwater Wetland vegetation occurs on temporarily or permanently flooded restiolands, sedgelands and rush-beds. Important species include *Senecio halimnifolius, Paspalum vaginatum, Pennisetum macrourum, Triglochin bulbosa, Bolboschoenus maritimus* and Juncus krausii. Very little of this vegetation remains inside the CoCT parameters, however some is conserved at Rietvlei in the Table Bay Nature Reserve. The vegetation type is classified as Critically Endangered.

Swartland Shale Renosterveld is characterised by a rich winter bulb flora and is a low to moderately tall shrubland, with low, open shrubland dominated by renosterbos where it has become degraded. It is found mostly on clay soils on moderately undulating plains and valleys. It is Critically Endangered and 92.5% of the area in which this vegetation occurs has already been transformed, primarily for agricultural purposes. Remaining patches are often found in isolated patches and are threatened by invasive alien vegetation.

Swartland Granite Renosterveld occurs in a small area in the north of the district near Dassenberg and Mamre. Swartland Granite Renosterveld supports a mosaic of grassland/herblands rich in bulbs and medium dense, microphyllous shrublands dominated by renosterbos. Groups of small trees and tall shrubs are associated with the heuweltjies and rock outcrops found in this vegetation. This vegetation is considered critically endangered, with almost 74.3% having already been transformed.

Swartland Silcrete Renosterveld, the largest remaining fragment of this vegetation is found between Moorreesburg and Mamre on moderately undulating lowlands (often elevated). This vegetation is an open, low, small-leaved shrubland dominated by renosterbos with many succulents. This vegetation is classified as Critically Endangered and 86.4% has already been transformed, making conservation targets unattainable.

Cape Flats Dune Strandveld is endemic to Cape Town and is found along the coast and in dunes further inland towards the north of the district. This vegetation is dominated by broad-leaved shrubs and small trees such as taaibos (Rhus spp.) and ghwarrie (Euclea spp.), with a fair degree of succulence. Grasses, annual herbs and succulents are abundant. Cape Flats Dune Strandveld has a higher proportion of fruit-producing plants than fynbos vegetation and accommodates more birds and animals who are responsible for pollination and seed dispersal. Cape Flats Dune Strandveld plays an important role in terms of corridors for animals, ensuring connectivity between the coast and inland. It is listed as Endangered and 53.6% of this vegetation type has already been transformed.

The rich biodiversity in the district is under threat for a variety of reasons, including conversion of natural habitats to permanent agriculture, inappropriate fire management, rapid development, over exploitation of water resources, and infestation by invasive alien species.

Table 3.1: Conservation status of national vegetation types occurring in the Blaauwberg district in the City of Cape Town (City of Cape Town State of Environment Report, 2018; CCT 2009 Biodiversity Network report for historical figures)

National Vegetation Type	Historic km^2	Current km^2	% Remaining	PA km^2^	Status#	CCT protection level*
Atlantis Sand Fynbos	251	147	58.7	36	CR	Poorly protected
Boland Granite Fynbos	96	59	61.5	19	VU	Moderately protected
Cape Flats Dune Strandveld	407	189	46.4	70	EN	Moderately 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
Elgin Shale Fynbos	8	3	39.4	3	CR	Well protected
Hangklip Sand Fynbos	33	18	55.5	12	EN	Well protected
Kogelberg Sandstone Fynbos	95	92	96.6	79	CR	Well protected
Lourensford Alluvium Fynbos	39	3	7.0	39	CR	Hardly protected
Peninsula Granite Fynbos	92	40	42.9	24	CR	Well protected
Peninsula Sandstone Fynbos	219	210	95.9	156	EN	Well protected
Peninsula Shale Renosterveld	24	3	11.6	2	CR	Poorly protected
Southern Afrotemperate Forest	3	3	99.4	3	LT	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 Silcrete Renosterveld	11	1	13.6	<1	CR	Hardly protected
Western Coastal Shaleband	3	3	99.7	3	LT	Well protected

VEGETATION TYPE MAP TO BE INCLUDED

3.1.2.2 Fauna

Very little is known about the fine scale distribution of fauna within the CoCT, but there are undoubtedly numerous endemic and threatened species within the City and certainly a number which have not even been described.

2.1.2.2.1 Fish Fauna

Five indigenous freshwater fish species are currently recognized as occurring within the boundaries of the CoCT. However, the one species, Cape Galaxias *(Galaxias zebratus)*, has been shown to potentially comprise of at least 13 species across the Western Cape. Ongoing genetic work will hopefully allocate all the populations within the CoCT to a particular species (there may well be more than one) and they will be assigned a conservation status. The Galaxias from the Diep River system will in all likelihood be described as a new species, the Diep River Galaxias. As this information is currently not known it is best to consider the presence of Galaxias as being of conservation significance within the CoCT. Galaxias are found in flowing or standing water across the City and they are known from the Diep River system and the Silwerstroomstrand Stream, but can be expected to occur in any suitable habitat in the Blaauwberg district.

Cape Kurper *(Sandelia capensis)* is found throughout much of the Cape Floral Kingdom. The latest taxonomic evidence has shown that what was previously always thought to be one species represents a species complex of at least 5 taxa. The distributions and conservation status of each of these species needs to be confirmed and presently it is unclear which taxa would fall within the Blaauwberg district. These fish have largely been eradicated from the Cape Flats and most remaining populations are in the upper reaches of streams and in dams in the mountain catchment areas. It is however possible that Sandelia do occur in some of the better condition wetlands / rivers within the Blaauwberg district and the presence of these would be considered of conservation significance.

The fish assemblage of the estuary is quite diverse, including 28 species, although 5 of these are aliens introduced over the last century. Pollution problems have, however, led to a drastic decline in the number of important line-fish species in the system such as the juveniles of the White Steenbras (*Lithognathus lithognathus*) and White Stumpnose (*Rhabdosargus globiceps*). As a result, the estuarine fish assemblage in the estuary is now completely dominated by the opportunistic harder *Liza richardsonii* which is able to survive in both estuarine and marine environments. On the other hand, there has also been a sudden influx of the vulnerable freshwater mullet (*Myxus capensis*) into the system.

2.1.2.2.2 Mammalian Fauna

Of the 83 species of indigenous mammals found or presumed to occur within the CoCT parameters there are 12 species (excluding marine mammals) which are included within the Red Data Book of South African Mammals. The Vulnerable Gants Golden Mole (*Eremitalpa granti*) is suspected to occur in coastal sands of the West Coast within the District. There are also six species of bats which could possibly occur within the District which are considered Near Threatened. Very little is known about the distribution of bats within CoCT, and any bat roosting sites identified within or near any proposed

development requires a specialist report to assess the significance of any potential impacts.

The Vulnerable White-tailed Mouse *(Mystromys albicaudatus)* has been confirmed to occur in relatively high densities on the Blaauwberg Hill. This is of immense conservation importance as it is the only known population within the city and they occur at higher densities than ever recorded before. Their presence in similar habitat within the Blaauwberg district is likely.

Honey Badgers (*Mellivora capensis*), which are currently categorized as 'Least Concern' but remain on the IUCN Red Data watch list are still present in the Blaauwberg district. These animals have massive home ranges and no single CoCT reserve could conserve a population of this species. Substantial ecological corridors and/or agricultural areas are critical in ensuring that this species persists within the City.

With regard to the remaining larger terrestrial mammals which still occur within the District, all are currently assigned the status of Least Concern. This indicates that the species are currently not threatened nationally, but on a local city or district scale the species may be very close to becoming locally extinct. Their future survival in the district is dependent on there being larger natural open space to ensure that viable populations exist. The ecological corridors linking important natural areas are essential for the continued survival of many mammal species. Important ecological corridors within the Blaauwberg district are the corridor linking the Blaauwberg Conservation Area (BCA) to the Koeberg Nature Reserve, the Parklands Fynbos Corridor and the corridor linking the Mamre Commonage to the coast. The agricultural areas to the north of the BCA are critical for fauna. While the natural vegetation corridor on the western side of the R27 is botanically important it will not facilitate the movement of locally rare mammals within the City. To this end the agricultural areas to the north of the BCA are critical in insuring that the BCA still remains viable for species with extensive home ranges or low densities within the CCT. These include the Aardvark *(Orycteropus afer)*, Black-backed Jackal *(Canis mesomelas)* and Bat-eared Fox *(Otocyon megalotis)*.

2.1.2.2.3 Avifauna

Of the 404 bird species recorded within the City of Cape Town, 28 species are listed as being threatened. Numerous threatened species found in the costal and oceanic waters off Cape Town are pelagic seabirds which breed in the Southern Ocean. These birds are therefore not associated with the mainland and need not be addressed in the EMF. However, the Endangered Bank Cormorant (*Phalacrocorax neglectus*) and Cape Cormorant (*P. capensis*), and Near Threatened Crowned Cormorants (*P. coronatus*) roost or feed along the coastline of the Blaauwberg District. These species breed on Robben Island which also falls within the District.

It is suspected that the Endangered Black Harrier (*Circus maurus*) may be breeding on the coastal flats within the BCA. There are several pairs breeding in the Koeberg Nature Reserve and they are presumed to breed in the Silverstroom and Atlantis areas. These birds nest on the ground and are therefore sensitive to disturbance.

The Vulnerable Secretary bird *(Sagittarius serpentarius)* and Blue Crane *(Anthropoides paradiseus)* are frequently encountered in the agricultural areas and natural open space in the northern parts of the district. The Vulnerable Martial Eagle *(Polemaetus bellicosus)* is occasionally encountered within the district but no breeding localities are known.

Important Bird Areas (IBA's) and other roost and breeding sites:

The importance of Rietvlei as an austral summer foraging area for palaearctic wading birds is highly significant and is the most important site in the CoCT for wading birds. The seasonal nature of the pans is fundamental to the continued suitability of Rietvlei to these wading birds. Rietvlei has been ranked as the sixth most important coastal wetland in South Africa for water birds. This has resulted in Rietvlei (Site Number: SA111) having been identified as an Important Bird Area (IBA) in a 1998 assessment of the most important bird areas in South Africa. The Near Threatened Lesser Flamingos (*Phoenicopterus minor*) are non-breeding visitors to the reserve.

Robben Island (Site number: SA110) has also been identified as being an IBA due to its important nature as a sea bird breeding site. This includes significant colonies of Endangered African Penguin (*Spheniscus demersus*), Endangered Bank Cormorant (*Phalacrocorax neglectus*), Swift Tern (*Sterna bergii*), African Black Oystercatchers (*Haematopus moquini*) and Hartlaub's Gull (*Larua hartlaubii*). A large heronry is often active on the northeastern part of the island.

There is an active water bird breeding site (a heronry) in the Blouvlei (Intaka Island) wetlands at Century City.

2.1.2.2.4 Amphibian Fauna

Of the 27 species of amphibian which occur within the CoCT parameters, 10 are allocated threatened status. Two species, the Critically Endangered Table Mountain Ghost Frog (Heleophryne rosei) and the Near Threatened Cape Peninsula Moss Frog (Arthroleptella lightfooti) are endemic to the Cape Peninsula and these constitute the only endemic vertebrates to the CoCT.

Within the Blaauwberg district, only two threatened amphibians are known or are suspected to occur. The Near Threatened Cape Caco (*Cacosternum capense*) has been recorded in shallow seasonal wetlands in ploughed clay soils in the agricultural lands north of the M19. This species could be expected to occur in suitable habitat anywhere north of the M19. The Near Threatened Cape Rain Frog (*Breviceps gibbosus*) is also likely to occur in the eastern clay soil areas of the Blaauwberg District. This frog is not associated with wetlands.

Amphibians are vulnerable to disturbance as they are sensitive to environmental factors such as water pollution and/or altered water regimes. The input of storm water into wetlands can have a significant negative influence on biodiversity. The effects of storm water entering wetlands of conservation significance requires a specialist report assessing the significance of any potential impacts.

2.1.2.2.5 Reptile Fauna

Of the 61 species of reptile found or suspected to occur within Cape Town, eight are considered to have red data status. The conservation assessment of South African reptiles is currently underway so the status of some of the species found in the CoCT may change. However, three threatened terrestrial reptiles are known to occur in the Blaauwberg district. These are the Vulnerable Blaauwberg Burrowing Skink (*Scelotes montispectus*), the Vulnerable Cape Sand Snake (*Psammophis leightoni*) and the Near Threatened Gronovi's Dwarf Burrowing Skink (*Scelotes gronovii*). Within the perimeters of CCT the Gronovi's Dwarf Burrowing Skink is only found on Robben Island.

2.1.2.2.6 Invertebrate Fauna

Very little is known about the insect fauna in the Blaauwberg district. The information supplied here is from the keen lepidopterist Dr. Jonathan Ball. What is very evident in Dr Ball's, Critical Evaluation and Update of the Red List of South African Butterflies (2006), is that there is an important area for invertebrates in the Atlantis / Pella and Mamre region of the Blaauwberg district. Although Pella is outside the boundaries of the CoCT, most, if not all the important invertebrate taxa can be expected to occur in similar habitat (Atlantis Sand Fynbos) within the City. These include several butterfly species discussed below as well as an undescribed species of Owl Fly (*Bubomyiella sp*.) and the extremely rare Spoonwing Lacewing (*Halterina purcelli*) which was prior to 2004 only known from two specimens.

Wallengren's Silver-spotted Copper (*Trimenia wallengrenii wallengrenii*) is a Critically Endangered butterfly which used to occur in Swartland Granite Renosterveld on the hills north of Mamre. While it may still occur within the City, no adult Wallengren's Silver-spotted Copper has been recorded near Mamre for nearly 20 years. Although the Dark Opal (*Chrysoritis nigricans nigricans*) is considered as being of Least Concern, the species is close to becoming locally extinct within Cape Town. The local population near the Pella Mission Station near Atlantis is nearly extinct, and on the peninsula, the population near the top of Ou Kaapseweg appears extinct and the population on the 12 Apostles appears to be very small.

The Endangered Dickson's Strandveld Copper (*Chrysoritis dicksoni*) is known to have historically occurred in two widely separated localities, namely between Melkbosstrand and Mamre and on the south coast near Witsand. However, *Chrysoritis dicksoni* appears to have become extinct in all known localities between Melkbosstrand and Mamre. Near Atlantis, the taxon was found in the vegetation type named Atlantis Sand Fynbos (Mucina et al. 2005).

3.1.3 Proclaimed Nature Reserves

There are several proclaimed conservation areas in the Blaauwberg district, which are briefly described below.

- **The Table Bay Nature Reserve** (TBNR) is located on the floodplain of the Diep River in the area upstream of the point where it drains into Milnerton Lagoon. It is a

declared Nature Reserve covering an area of 560 ha and comprises predominantly Cape Lowland Freshwater Wetland with Cape Flats Dune Strandveld vegetation along the coast. An additional area of 320ha is in the process of being declared as a nature reserve in terms of the National Environmental Management: Protected Areas Act. This addition will increase the nature reserve's extent to 880ha within the next 5 years. The TBNR consist of the following sections:

- **Rietvlei Section**: The Rietvlei section is located on the floodplain of the Diep River in the area upstream of the point where it drains into the Milnerton Lagoon. It is a declared Nature Reserve and comprises predominantly Cape Lowland Freshwater Wetland with Cape Flats Dune Strandveld vegetation along the coast.

- **Zoarvlei Section:** This is the southern portion of the Table Bay Nature Reserve and includes the wetlands south of Boundary road and in-between the suburbs of Rugby and Paarden Eiland.

- **Milnerton Race Course Section**: This section is located on what was formally the Milnerton Racecourse, east of the residential development known as 'Royal Ascot'. The area consists of two separate remnants that historically would have connected to the Rietvlei wetland complex. The Milnerton Conservation Area (MCA) covers an area of 17.6 ha and has over 232 recorded plant species and 12 Red List 'Threatened' species.

- **Parklands Fynbos Corridor:** This corridor is a series or remnants, measuring a total of 17.8ha in extent, that link the Diep River Section of the TBNR to the north. Although bisected by numerous roads, in the medium term, this corridor, will be expanded to include a series of ecological corridors linking the Diep River to Blaauwberg Nature Reserve. The area mainly comprises of 'Critically Endangered' Cape Flats Sand Fynbos and some 'Endangered' Cape Flats Dune Fynbos with numerous populations of threatened species. There are also significant habitat features within the corridor, including an ephemeral pan. The ephemeral pan area consists of ±25ha of interlinked saline pans, located over a calcrete (calcified dune) substrate and surrounded by shallow dunes. The pan is a large and locally rare example of a Cape Inland Salt Pan, unique in that it is not associated with a watercourse. The pans are highly sensitive and contain conservation worthy species that must not be disturbed. The Sandown Fynbos Corridor measures 36,67ha and it protects the fynbos remnants which contains populations of threatened species. The ephemeral pan and Sandown Fynbos Corridor have been delineated and are currently undergoing restoration before being incorporated into the TBNR and declared a Nature Reserve.
- **Diep River Section**

- **The Blaauwberg Nature Reserve** is located approximately 25 km from Cape Town's city centre, and it contains approximately 1445 ha of rich biodiversity. It represents

one of the most intact and diverse lowland vegetation habitats in Cape Town, marking the beginning of the West Coast flora. The nature reserve comprises three highly threatened lowland vegetation types: Cape Flats Dune Strandveld, Swartland Shale Renosterveld and Cape Flats Sand Fynbos and resultant ecotones. The combination of these vegetation types are seldom found in a single conserved area. Over 560 plant species have been identified, of which more than 40 are considered to be threatened. Over 40 mammal, 28 reptile, 5 amphibian and 30 butterfly species have been identified at the reserve. The recently discovered Blaauwberg dwarf burrowing skink (Scelotes montispectus) is only known from six individuals, three of which are found within the Blaauwberg Nature Reserve. Some other species found here include the honey badger (Mellivora capensis), Cape grysbok (Raphicerus melanotis) and caracal (Felis caracal). Over 140 bird species, including the threatened African black oystercatcher (Haematopus moquini), have been recorded. In 2018, the BBNR was awarded the first WESSA Green Coast Award in South Africa.

The Blaauwberg Hill, which forms part of the nature reserve, offers one of the few viewpoints in the world from which two World Heritage Sites can be viewed, namely Table Mountain and Robben Island. The Blaauwberg Nature Reserve also presents a rich cultural and historical heritage of various periods in history. Shell middens dating back to approximately 15 000 years have been found in the area, indicating early human occupation. In addition, the reserve conserves the site of the Battle of Blaauwberg in 1806, where the British took second occupation of the Cape and retained ownership until South Africa's independence. Blaauwberg Hill features several buildings constructed during World War II, one of which includes the first radar station built in South Africa.

- **The Witzands Aquifer Nature Reserve** is located 45 km from Cape Town's central business district and 7 km west of the town of Atlantis along the R27 West Coast Road in the Western Cape Province. The reserve was declared a nature reserve in terms of the National Environmental Management: Biodiversity Act on 12 January 2018. The nature reserve covering over 3000 hectares consists of two vegetation types including the endangered Cape Flats Dune Strandveld and the critically endangered Atlantis Sand Fynbos. Generally, both of these vegetation types are poorly conserved. The reserve also plays an important role in contributing to the protection of the Atlantis Aquifer as well as the extremely rich natural and cultural heritage of the area. Pond 7, Witzands Aquifer Nature Reserve's largest man-made water body, is a recharge pond managed by the City of Cape Town Atlantis Water Scheme. The scheme works closely with Biodiversity Management staff in the area to protect and enhance the unique biodiversity found here. The non-vegetated mobile dune fields are an outstanding feature of the reserve attracting a variety of visitors due to their potential for hosting a selection of recreational activities.

- **Melkbos (Remainder Erf 1694) "Conservation Area":** This 76.76 ha area forms part of the City's Biodiversity Network and conserves a unique diversity of natural and

cultural heritage resources. It is an important corridor conserving Endangered Cape Flats Dune Strandveld (CFDS) and important wetland habitats.

- **The Cape West Coast Biosphere Reserve (CWCBR)** the local arm of the UNESCO: Man and Biosphere programme, stretches from the Diep River in the south to the Berg River in the north covering an area of 378 000 ha (3 780 km2) of coastal lowland plains. Three mutually reinforcing functions are defined; conservation, sustainable development and logistic support for scientific research and education. Witzands Aquifer NR makes up part of the southern "core zone" of the CWCBR falling into the northern part of the district.

- **Koeberg Private Nature Reserve (KPNR)** is managed by Eskom and has a footprint of approximately 2 650ha. The reserve plays a vital role in conserving one of the remaining portions of Cape Flats Dune Strandveld present on the West Coast.

Private Stewardship Conservation Areas:

- **The Dassenberg Coastal Catchment Partnership (DCCP)** comprises of the DCCP West (Witzands Aquifer Nature Reserve [WANR], four additional erven to the north of the Dune field and the Brakkefontein Section) and the DCCP East (Klein Dassenberg, the Kanonkop, Fraaiuitsig, Dankbaar, Sonop, Dassenberg Sections and Stewardship sites). The management of the DCCP further includes building and maintaining relations with various stakeholder groups, communities, private landowners, City Departments (including Sub Council structures) and other agencies. The DCCP is also responsible for the operational management of three official residential properties and the Mamre Visitors Information Centre (MVIC).

- **Camphill Village Conservation Area (Rem Cape Farm 1184 & Ptn. 5 of Cape Farm 20)** is a privately managed conservation area of 45 ha, located along the Klein Dassenberg Drive. The conservation area forms an integral part of the Sand Fynbos corridor linking the Schoongezicht and the Dassenberg Coastal Catchment Partnership (DCCP) biodiversity clusters. Numerous threatened species have been recorded in the area including two Critically Endangered floral species nl. *Babiana blanda* and *Amphithalea ericifolia* subsp. *erecta* for which this site is an important refuge.

- **Nirvana Conservation Area (Ptn 20 of Cape Farm 20)** is a privately managed conservation area within the DCCP biodiversity cluster near Atlantis that conserves 15.5 ha of Critically Endangered Atlantis Sand Fynbos. The conservation area contains nearly 30 threatened plant species including three Critically Endangered species *Diastella proteoides*; *Aspalathus retroflexa* subsp. *bicolor* and *Amphithalea ericifolia* subps. *erecta*. The conservation area is a seamless extension of the Dankbaar Section of the Witzands Aquifer Nature Reserve and is completely clear of invasive alien species and in maintenance phase.

- **San Michell Conservation Area (Ptn 19 of Cape Farm 29)** is a privately managed conservation area within the DCCP biodiversity cluster near Atlantis that conserves 10 ha of Critically Endangered Atlantis Sand Fynbos. The conservation area is an extension of the Nirvana Conservation Area and the Dankbaar Section of the Witzands Aquifer Nature Reserve containing one Critically Endangered species *Aspalathus retroflexa* subsp. *bicolor*. The conservation area has been cleared of all invasive alien species, but requires several more follow-up treatments.

- **Woodlands Conservation Area (Ptn 29 of Cape Farm 29)** spans 16 ha of Swartland Shale Renosterveld and Atlantis Sand Fynbos, both Critically Endangered vegetation types. It also contains a significant, natural wetland in the Donkergat river system. The wetland creates a unique environment which is currently completely un-conserved within the City's Protected Areas Network. The City is in the process of acquiring the Conservation Area so that it can be proclaimed as a Nature Reserve, to be managed by the City. To date, more than 30 threatened species have been recorded in the area including Critically the Endangered *Babiana blanda* and *Marasmodes fasciculata*. The new Nature Reserve will be the first formally protected area within the Schoongezicht biodiversity cluster.

- **Three Fountains Nature Reserve (Ptn 63 of Cape Farm 29)** spans 20 ha of Critically Endangered Swartland Shale Renosterveld and Atlantis Sand Fynbos with degraded wetlands within the Donkergat river system. The private Nature Reserve is in process of proclamation and will be managed in partnership with the City and CapeNature. A restoration plan is being drafted to try and restore the unique biodiversity representative of the area. The property contains one of the last remaining populations of *Marasmodes fasciculata,* now Critically Endangered and the Klipheuwel Caco which is listed as Data Deficient, but is only known from three localities.

- **Quantum Foods Fynbos Conservation Area (Ptn 37 of Cape Farm 22)** is a private conservation area spanning 37 ha of Critically Endangered Atlantis Sand Fynbos within the Schoongezicht biodiversity cluster. The conservation area conserves 28 threatened species including two Critically Endangered species *Diastella proteoides* and *Aspalathus retroflexa* subsp. *bicolor.* Since 2012, the conservation area has been completely cleared of all invasive alien species and is currently in maintenance phase.

- **Joubert Family Conservation Area (Ptn 42 of Cape Farm 22)** is a private conservation area spanning 3 ha of Critically Endangered Atlantis Sand Fynbos within the corridor linking the Schoongezicht and DCCP biodiversity clusters. The small conservation area is being cleared of invasive alien species and conserves only one threatened species *Phylica thunbergiana* (Endangered), but is an important fauna habitat for species moving between the larger biodiversity clusters.

- **Manning Family Conservation Area (Ptn 107 of Cape Farm 29)** is a new, private conservation area spanning 3 ha of Swartland Shale Renosterveld within the

Schoongezicht biodiversity cluster, but also within the Donkergat river system wetlands. Two Critically Endangered species of *Babiana* occur on this small site; *Babiana blanda* and *Babiana leipoldtii*. The conservation area is currently being cleared of invasive species and has been fenced off from the remainder of the farm.

- **Hunters Valley Conservation Area** is a private, 6 ha conservation area linked to the conditions of approval for the subdivision and development of the equestrian estate on the farm. The small conservation area lies within Critically Endangered Swartland Silcrete Renosterveld vegetation with one Critically Endangered member of the Protea family *Leucadendron thymifolium* and one species of succulent considered endemic to the property, *Ruschia serrulata*, currently listed as Data Deficient.

- **The Sunninglade Private Nature Reserve** (Portion of Erf 38385) consists of 7ha of Cape Flats Dune Strandveld vegetation. It is located south of the Blaauwberg Nature Reserve, however the east-west arterial route (R300) has been designed to be constructed in future, immediately south of the Blaauwberg Nature Reserve. This will cause a fragmentary effect on the Cape Flats Dune Strandveld on this site. The site contains dune ridges and open low dunes and provides habitat for indigenous fauna and flora.

- **Mamre Nature Garden** is a Core Flora Site spanning 1 700 ha of Atlantis Sand Fynbos and Swartland Granite Renosterveld, owned by the Mamre Communal Property Association. It is also a valuable community heritage asset and formal negotiations have been ongoing to protect the Core Flora Site as a Private Nature Reserve in partnership with CapeNature and the City.

- **Klein Dassenberg Hill/ Kanonkop** consists of an area of 940ha purchased by the City for biodiversity land banking. It now forms part of the Witzands Aquifer Nature Reserve

3.1.4 Hydrology

The Blaauwberg district has a diverse hydrological environment. Due to the district's large areas of shale and sand, it has lower volumes of surface runoff and hence fewer water bodies such as wetlands, reservoirs and dams than other regions within the CCT municipality.

3.1.4.1 Rivers and Estuaries

Two significant rivers and catchment areas are located within the Blaauwberg district, the Diep River in the south and the Sout River in the central part. Two smaller rivers or streams, the Buffels River and Silwerstroom, are located in the north of the district. The Silverstroom River, in the north of the District, is a sensitive and unique river system with unusually high water quality. A tributary of the Modder River can be found in the north-east of the district in the vicinity of Mamre. The state of rivers and estuaries are summarised in Table 3.2 below.

Table 3.2: Health status of rivers in the Blaauwberg district (DWAF, 2005)

River	River health*	Most notable problems
Diep River	Fair to Poor	• Release of treated effluent from urban areas and run-off from and agricultural areas • Sedimentation and erosion due to sand mining and channelling • Water abstraction • Infestation with alien vegetation • Infestation with alien fish
Sout River	Fair to poor	
Buffels River	Good	
Silwerstroom	Good	• Infestation with alien vegetation • Infestation with alien fish in lower reach • Some water abstraction
Modder River	Fair	• Infestation with alien vegetation • Infestation with alien fish in lower reach • Some water abstraction

*****Note: The order of rankings is Natural, Good, Fair, Poor, Unacceptable (DWAF, 2005)

Table 3.3: Status of estuaries in the Blaauwberg district (Harrison et al., 2000)

Estuary	Overall water quality*	Overall aesthetic state
Diep River Estuary	Poor	Poor
Sout River Estuary	Poor	Moderate
Silwerstroom Estuary	Fair	Good

*****Note: The order of rankings is Good, Fair/Moderate, Poor (Harrison et al., 2000)

The pollution and degradation of rivers, wetlands and groundwater systems within the Blaauwberg district and the Western Cape in general, are critical issues. Many of the rivers in The Blaauwberg district, particularly the Diep River, have lost much of their natural riparian habitat and their environmental functioning has been seriously compromised. Rivers have been degraded by pollution from agricultural and urban stormwater run-off, treated effluent from WWTW and new industrial areas as well as infestation by alien invasive fish and vegetation. The degradation of rivers also affects coastal deposition and sedimentation processes.

3.1.4.2 Wetlands

There are five distinctive wetland plant communities in the district. These are perennial wetland, reed-marsh, sedge-marsh, open pans and sedge pans1. The sedge-pan habitat represents one of the rarest ecological systems in South Africa and is of high conservation value. The open pan, perennial wetland and sedge-marsh communities also have a high ecological value. Key wetlands in the district include:

- **Rietvlei**, a wetland covering approximately 6.6 km^2, is located between the suburbs of Milnerton and Table View on the floodplain of the Diep River. The wetland as a

whole is considered to be of regional, national and international importance and was declared a Protected Natural Environment in 1989

- **Milnerton Lagoon**, 1.2 km long, 150 m wide and lies at approximately 1.5 m below mean sea level. Since the construction of the channel and Woodbridge Island, the mouth has remained open and the estuary has become freshwater-dominated in summer as a result of the discharge from the sewage works.
- **Zoarvlei**, a narrow strip of wetland, measuring approximately 1.4 km² and located between the industrial area of Paarden Eiland and the residential suburbs of Rugby and Brooklyn. Zoarvlei exists today as a seasonal freshwater coastal lake rather than an estuary, fed by groundwater and stormwater runoff, with a small outlet to the sea via a culvert leading into the Milnerton Lagoon (Paardein Eiland Local Area SDF, 2015)

The water quality of Rietvlei and Milnerton Lagoon in particular have been seriously compromised not only by the sewage effluent and inputs from the catchment, but also as a result of stormwater discharges from adjacent industrial areas and informal settlements. Zoarvlei considered to be in moderate health with lower than expected pollution, given its location near an industrial area (CoCT, 1999) however, its biodiversity has decreased significantly over the past few decades.

Other wetlands are seasonally present across the district, for example in lower-lying areas of the vegetated coastal dune systems. They are important ecological features and contribute to the overall diversity of the area.

3.1.4.3 Groundwater

The Blaauwberg district is also important for Cape Town's water security as the district has a diverse hydrogeological environment and has various aquifers storing groundwater. Aquifers are typically classified into three types (fractured, interangular and fractured and fracture) all of which occur in the Blaauwberg district.

- Sandveld intergranular aquifers are located in the southern and north-eastern parts of the Blaauwberg district. The Sandveld aquifer is essentially a coastal aquifer, extending along the West Coast from False Bay to Saldanha. The southern aquifer extending beyond Blouberg Sands is moderately productive with a median yield of 0.1 to 0.5 litres per second (ℓ/s). The north-western aquifer, located between Mamre and Atlantis and stretching to the West Coast, is highly productive with a median yield of 0.5 to more than 5 ℓ/s (DWAF, 2000).
- In the far north of the Blaauwberg district, an intergranular and fractured aquifer is present (see Figure 2-3), which is moderately productive with a median yield of 0.1-0.5 ℓ/s (DWAF, 2000). Groundwater in granites generally contains sodium-chloride sulphate (Meyer, 2001).
- The central and north-western regions of the Blaauwberg district are dominated by fractured aquifers of the Malmesury and Klipheuwel Groups (see Figure 2-3), with mostly moderate median yields of 0.5-2.0 ℓ/s (DWAF, 2000).

The Atlantis Water Scheme comprises two wellfields, one at Witzand and one at Silwerstroom. The Witzand aquifer is artificially recharged with treated wastewater from the

Wesfleur WWTW at Atlantis, while water from the Silwerstroom is blended with aquifer water, treated and distributed to Atlantis and Mamre (DWAF, 2005). This area is protected under Witzands Aquifer protection zone. However, the quality of the water in Atlantis sole-source aquifer could be compromised by development pressures adjacent to the Witzands dunes and at Silverstroom (the aquifer's recharge areas), as well as pressure on the Wesfleur WWTW. Treated effluent from this facility is currently used to recharge the aquifer, so water quality monitoring and maintenance of the Wesfleur facility is critical.

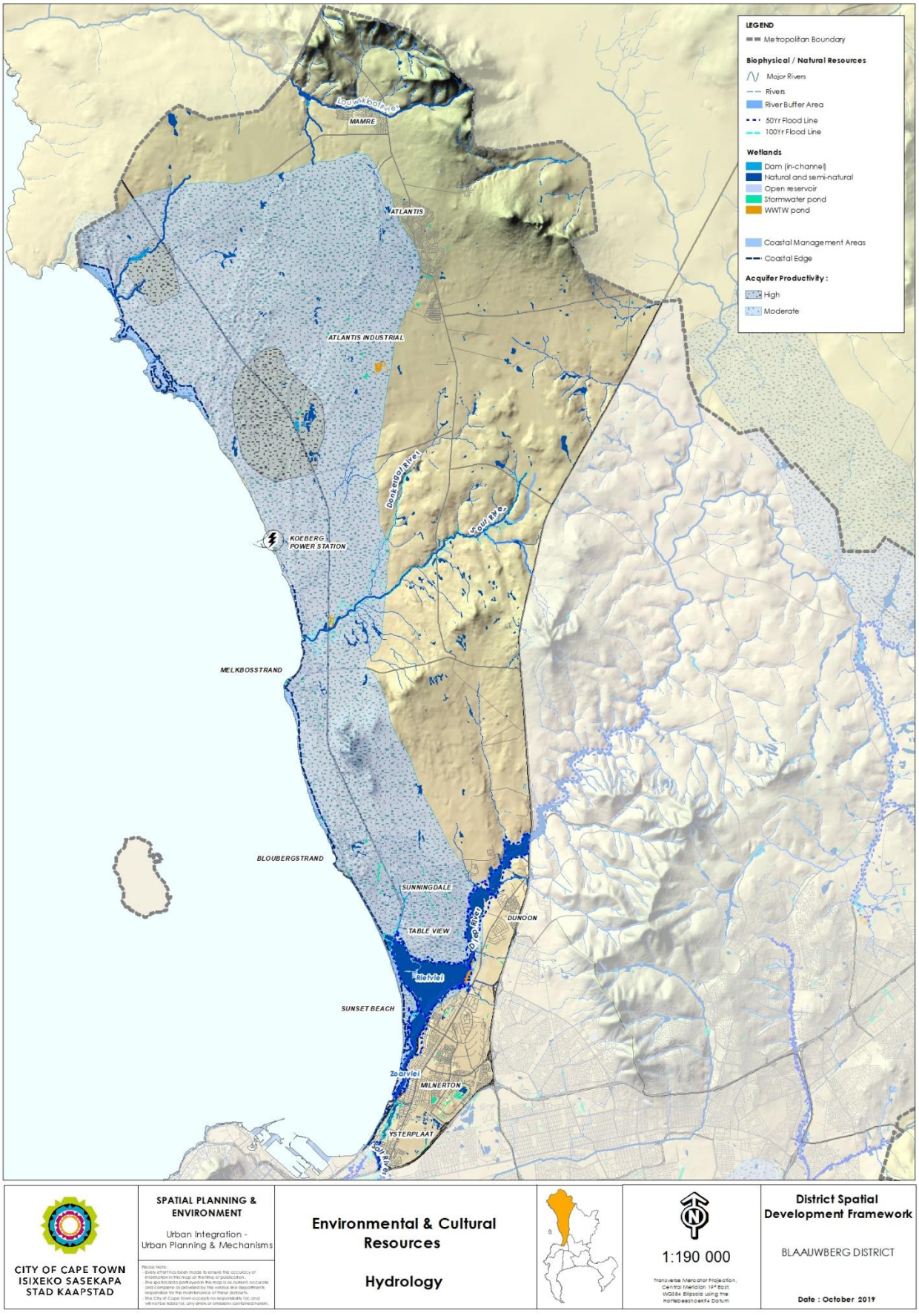


Figure 3.2: Map of hydrology of Blaauwberg district

3.1.5 Coastal Areas and Dunes

3.1.5.1 Coast

The coastline of the Blaauwberg district is relatively straight and runs in a north-westerly direction. It is dominated by sandy beaches that are interspersed with occasional rocky shores, most notably to the north of Blouberg, south of Big Bay, south of Melkbosstrand, Ouskip, south of Matroosbaai and at Springfontein Point. The southern portion comprises most of Table Bay. The diversity of the coastline habitats, ranging from rocky coast and sandy beaches and dunes to rocky and sandy sub-tidal areas and the pelagic zone, supports a diversity of marine life. Species richness on the coast tends to be highest on rocky shores.

Table Bay, at the southern end of the Blaauwberg district's coastline, is a log-spiral or "half-heart" asymmetric bay anchored by the rocky headland of Mouille Point in the south and Blouberg Rocks in the north. The bay consists generally of fine to medium sand along the eastern shore. Since the construction of the Port of Cape Town, the bay has been eroding eastwards in order to regain its former shape that was altered by the construction of the port. This has caused erosion of beaches and dunes along the entire extent of Table Bay, with the most extensive erosion occurring towards the centre of the bay in the vicinity of the Milnerton Golf Course

3.1.5.2 Dunes

The dunes on the West Coast are a combination of active and partially stabilised vegetated dunes, where dunes closer to the coast are more sparsely vegetated. The most obvious feature of coastal dunes is the gradient they present towards the land (away from the wind). The dune shapes found along the Blaauwberg district are typical of wave-dominated sandy shorelines and comprises embryo, linear, parabolic, sand sheet and transverse dunes (Low and Pond, 2004).

Reclamation and development around Duncan Dock / Port of Cape Town and stabilisation of sand by urbanisation are the primary causes of the coastal erosion in Table Bay, and the Milnerton coast has already been severely altered. The southern portion of the Blaauwberg district's coast has undergone erosion, particularly of sensitive dunes at Woodbridge Island and Zonnekus, while erosion worsens between Milnerton Golf Course clubhouse and Sunset Beach. These areas may continue to erode, with the potential of causing considerable physical, structural, ecological and economic problems as well as permanently altering the coastline. Additionally, many of the linear and embryo dunes close to the coast have been impacted on by invasive alien vegetation (predominantly *Acacia*) or urbanization.

In light of future climate change and sea level rise predictions, these floodprone areas will have increased occurrence of storm events due to higher sea levels and increased storm energy. These factors combine to create significant safety issues for development in close proximity to the coast and emphasise the need for the protection of the remaining dune systems.

3.1.6 Agriculture and Mineral Resources

Agricultural land contributes significantly to the province and country's Gross Domestic Product. The Blaauwberg district borders the West Coast provincial district and includes a relatively small portion of high potential agricultural land in the north-eastern section of the district, with some smallholdings directly south of this area and at Morningstar (see Figure 4.2 below). These areas are under threat from development pressure.

3.1.6.1 Minerals

The Blaauwberg district has a range of mineral resources. The economically most important mineral resource is building sand, which occurs sporadically across a large portion of the district in the central, coastal and northern areas. The most significant deposit occurs north of Melkbosstrand in the Koeberg area. 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 Blaauwberg district are the sterilization of economic mineral resources by urban development as well as illegal sand mining.

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 (NO_2)

• Sulphur dioxide (SO_2)

• Particulate matter (PM_{10})

In general, NO_2 levels have decreased over the past 12 years. They are generally within the guidelines standard. SO_2 levels have maintained low trends over the past 12 years, keeping within the guideline standards with discrepancies occurring every few years. However, PM_{10} levels are more problematic and have considerably increased at most sites over the years.

The City's Air Quality Management Plan outlines processes to monitor and manage air pollution. Management actions include greening, community awareness programmes and enforcing regulations preventing and reducing air pollution.

3.1.8 Green Infrastructure

Green Infrastructure can be defined as "a strategically planned, designed and manged 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 recognises 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 and storm water infiltration areas.

The City is in the process of identifying and mapping a green infrastructure network, (GIN) identifying and ranking green infrastructure services, the opportunities they present and benefits they provide.

Metropolitan open space is a key component of green infrastructure, the recreational open spaces are in Map 4.1) a metropoliltan open space network was prepared for the 2018 MSDF and will be reviewed through the GIN as part of this District Planning Process.

GREEN INFRATRUCTURE MAP TO BE INCLUDED WHEN AVAILABLE

4 HERITAGE AND CULTURAL RESOURCES

4.1 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.

4.1.1 Historical development (of the district)

The Blaauwberg district has a diverse cultural heritage spanning many thousands of years. Early and Middle Stone Age artefacts have been recorded at Duinefontein, Koeberg, Witsands Aquifer Nature Reserve and also at Atlantis. Archaeological evidence of Later Stone Age herders and hunter-gathers are typically found in the coastal shell middens. About 2000 years ago, Khoekhoe herders appear with their herds of cattle and sheep at the Cape. The circumnavigation of the Cape of Good Hope resulted in ships stopping off along the coast (Saldanah, Table Bay etc) for fresh water and meat. These trade opportunities lead to the establishment of a refreshment station at the Cape of Good Hope by the Dutch East India Company (VOC).

4.1.2 Rural cultural landscapes

In the late 17th century farms were granted to freeburghers in an attempt to increase the supply of fresh meat needed to replenish passing ships. A number of VOC outposts were established along the so-called 'cattle routes' and served various functions which included monitoring and controlling movement of the Khoekhoe within the settlement, defence and as stock farms in their own right. In the Blaauwberg District, VOC outposts De Kijkuit (Paarden Island) and Jan Biesjies Kraal (Milnerton) no longer exist, having been lost to urbanisation in the early/mid 20th century. Brommelshok and Groenkloof still exist, the former at the site of the farm Welbeloond, and the latter the Mission station of Mamre.

Kleine Oliphantskop (originally also a VOC outpost), De Brackefontein (1703), De Brakkefont (1714), De Rustplaats 1715) and Welvergenoegd (1716) are the historical farms that form the backbone of the Koeberg cultural landscape. The farms are relatively poor ecologically and traditionally stock farming was practiced.

Mamre together with Pella-Katzenberg, forms a cultural landscape within the Blaauwberg District with unique characteristics. Based on the Moravian village model of a generous commonage bisected by the Louws River (Mamre) and Swart River (Pella-Katzenberg) with abutting garden plots. These villages provide a model for sustainability that have withstood the test of time and technology.

Battle of Blaauwberg cultural landscape represents a relic cultural landscape which is associated with the Battle of Blaauwberg (1806) and its aftermath. The landscape in which the battle between the British occupying forces and the defending Cape/Batavian troops, including mercenary soldiers, the "Hottentot Light Infantry" , farmers (Burgher cavalry) and the "Javanese Artillery Corps" took place includes the battle field and the field hospital as well as archaeological remains associated with the battle and the (as yet un-located) graves of the fallen soldiers. The cultural landscape forms part of a declared nature reserve and protected area and has been nominated for declaration as a Provincial Heritage Site.

4.1.3 Urban nodes

The oldest urban node in the Blaauwberg District is Mamre: established in 1808 as a Moravian Mission Station. Mamre was established on the VOC outpost of Groenekloof (also known as *de Kleine post*). At the time of the establishment of the mission station, the land incorporated two additional farms: *Louwskloof* (which was referred to as a Khoekhoe 'reserve'[1]) and *Cruywagenskraal*. The Moravian missions originally focused on converting local Khoekhoe descendants. After the emancipation of slavery in 1830, the Moravian mission station became a refuge for newly freed slaves. The name Mamre dates to 1854[2]. Pella-Katzenberg is an offshoot from the Mamre mission station

Historic urban development is focused on the southern part of the Blaauwberg District and is relatively late compared to the rest of the Metro. Substantial expansion of these urban nodes start in the period just before the Second World War. Little evidence remains of the early VOC outposts that were established along the coast and the coastal road northwards. The early farms established in the southern part of this District, are no longer evident and exist only as place names e.g. Ysterplaat[3].

Milnerton was established in c1900. It was already planned in the 1890s as a speculative development and can probably be described as the first 'transport orientated

[2] Kruger, B. 1966. The pear tree blossoms: a history of the Moravian mission stations in SA 1737-1869.
[3] The farm predated 1810 and was known as *Yzere plaat*. By the late 19th century, it had already been subdivided. Rentzkie's farm, one of these subdivisions, was used as an isolation hospital for small pox since 1882 and in 1900 for Bubonic Plague. The Brooklyn Chest hospital has its origins in this facility.

development': being linked to central Cape Town by rail. Associated with the development of Milnerton was the establishment of the Milnerton Racecourse. The first formal meet was held in May 1908, despite the construction of the Racecourse being incomplete. Initially growth was relatively slow, but accelerated in the years following the end of the Second World War. In 1955 Milnerton was declared a municipality[4].

The defining feature of Brooklyn and Rugby is the Ysterplaat airfield. Ysterplaat functioned as a landing field as early as 1915. It was first used for military purposes in 1938 to train pilots for the SA Air Force. Urban development of Brooklyn and Rugby dates to the 1930s/1940s.

There is a long history of the season use of what is now Blaauwbergstrand and Melkbosstrand for the purposes of exploiting marine resources that extends back in time to before the establishment of the refreshment station in Table Bay in 1652. This pattern of movement of people between the interior farms/communities to the coast still exists today, and is part of the living heritage of many communities. Very little evidence remains of the early built form in these areas. As with Milnerton, the period following the end of the Second World War saw an increased urban development along the coast and Blaauwberg Strand and Melkbosstrand developed as seaside resort villages.

Atlantis was built in the 1970s under the Group Areas Act as a (previously categorised as) 'coloured area' and is an example of Apartheid era town planning. The town is a combination of residential and industrial components. The success of Atlantis as a manufacturing and industrial hub was short-lived and came to an end in the 1980s as soon as the tax incentive programmes ended.

The intangible heritage of Cape Town includes the narrative of the Forced Removals, sites of struggle history and the living cultural practices of residents which include (but are not limited to) traditional access to sites and/or places and heritage practices. One of the challenges in the long term planning of the City is the recognition of intangible/living heritage and the provision of social facilities or spaces/places to accommodate cultural events and practices.

4.2 Heritage management

A list of places and spaces formally protected under the NHRA is included in Annexure 1. NHRA protections are ordered in terms of the following:

4.2.1 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.

[4] Rosenthal, E. History of Milnerton (www.blaauwberg.net/milnertonbook/historyo milnerton.pdf)

There are a number of Provincial Heritage Sites in the Blaauwberg District (See Annnexure 1: table).

- 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 Provincial Gazette.

  Currently there are no heritage resources within the Blaauwberg District that are listed in the Provincial Heritage Register. However, in 2019 HWC took a decision to place Highclere (Erf 280, Rancke Road, Blaauwberg) on the Provincial Heritage Register.

- 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.

  Currently the Blaauwberg conservation area is the only heritage area in the Blaauwberg District. Blaauwberg Conservation Area (declared under National Monuments Act) is designated a heritage area in terms of S31 of the NHRA. The area designated does not align with the boundaries of the Blaauwberg Nature Reserve and extends into the area identified for the Garden Cities development on the boundary of the Reserve.

1.2.1.2. 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.

The area between Blaauwbergstrand and Melkbosstrand in particular has a high potential for uncovering archaeological remains. These archaeological remains may include human burials in association with archaeological artefacts. Undeveloped or areas that have not been landscaped are particularly vulnerable, but developed sites cannot be excluded. Cases are common where shell middens and even burials are uncovered during the course of routine house extensions, additions and even underneath existing foundations. To date, in excess of 79 recorded human burials have been uncovered in the area between Milnerton and Melkbosstrand.

4.2.2 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.

4.2.2.1 Heritage Protection Overlay Zoning (Chapter 20 Part 1)

The Heritage Protection Overlay zoning, is the tool within the MPBL for managing heritage places and spaces. It is consistent with and meets the requirements of S30 and S31 of the NHRA which instructs local authorities at the time of the compilation or review of a town or regional planning scheme or a spatial development plan, or at any other time of its choosing, to compile and inventory of its heritage for submission to the PHRA for placement on the Provincial Heritage Register; and to identify the need for the designation of heritage areas to protect any place of environmental or cultural interest.

The intention is that all Heritage Protection Overlay zone areas are gazetted as Heritage Areas. This would allow for the lifting of the provisions of S34 in these areas, but is conditional to HWC being satisfied that the protection and decision making mechanism under the MPBL(HPOZ) are adequate and robust.

There are no existing HPOZ in the Blaauwberg District. Mamre historical core and associated cultural landscape has been identified as areas for investigation for protection as a place of high cultural interest.

4.2.2.2 Scenic Drives Overlay Zoning (Chapter 20 Part 4)

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 Blaauwberg District has a number of identified scenic routes shown on the Map of Heritage and Cultural Resources (Annexure 2 Map xxx).

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

ANNEXURES:

Table 4.1: Formally protected Heritage Sites (PHS) in the Blaauwberg District (excluding memorials)

Provincial Heritage site	Address	Description
Mamre Historical werf and graveyard	Off Frans Street, Mamre	Originated as an 18th century VOC outpost known as Groenkloof. Was transferred to the Moravian Missionary society in 1808. It is the oldest Moravian Mission in the Cape Town Metro and the second oldest Moravian Mission station in in the Western Cape/South African. The historical farm dwellings were converted by the missionaries to accommodate homes for the missionaries themselves as well as school buildings and a church.
Mamre Watermill	Off Frans Street, Mamre	The watermill dates from c1840
Klein Zoar	Wemyss Street, Brooklyn	One of few remaining 18th century vernacular buildings remaining in Cape Town. Popular history associates Klein Zoar with Wolraad Woltemade, a local heroic figure who died in 1773 while rescuing sailors from the wreck of de Jonge Thomas.
Old Milnerton Town Hall	Jansen Street, Milnerton	Unique town hall, later known as the Casino, built c1904 as a concert and dance hall. The sunken dance floor is noteworthy.
Wooden Bridge	Off Marine Drive, Woodbridge Island	Reportedly built in 1901 by the Fortress Company of the Royal Engineers during the Anglo-Boer War (South African war) in order to provide access across the lagoon to Woodbridge Island. It is the only bridge of its kind in the Western Cape.
Onze Huisje	16 Line Road, Blaauwbergstrand	Period cottage associated with the Stadler family: of the founder families of Blaauwbergstrand
PROPOSED 2019 Blaauwberg Nature Reserve	Off the R27	The relic cultural landscape representing not only the battle field, but also the archaeological landscape, from the shoreline to the plains beyond Blaauwberg Hill, of the indigenous peoples of Cape Town

Table 4.2: Scenic routes in Blaauwberg district

Category	Route
S2	Marine Drive/Paarden Island
S1	Marine Drive/Rietvlei
S2	Beach Road/Otto du Plessis; Milnerton to Big Bay
S1	Otto du Plessis; Big Bay to Melkbosstand Golf Estate
S1	Melkbosstrand Road to N7
S1	N7; Potsdam Road northwards
S1	Philadelphia Road; Mamre road to N7
S2	Mamre Road (R304); From N7 to Atlantis
S1	Dassenberg Road; Atlantis to Mamre

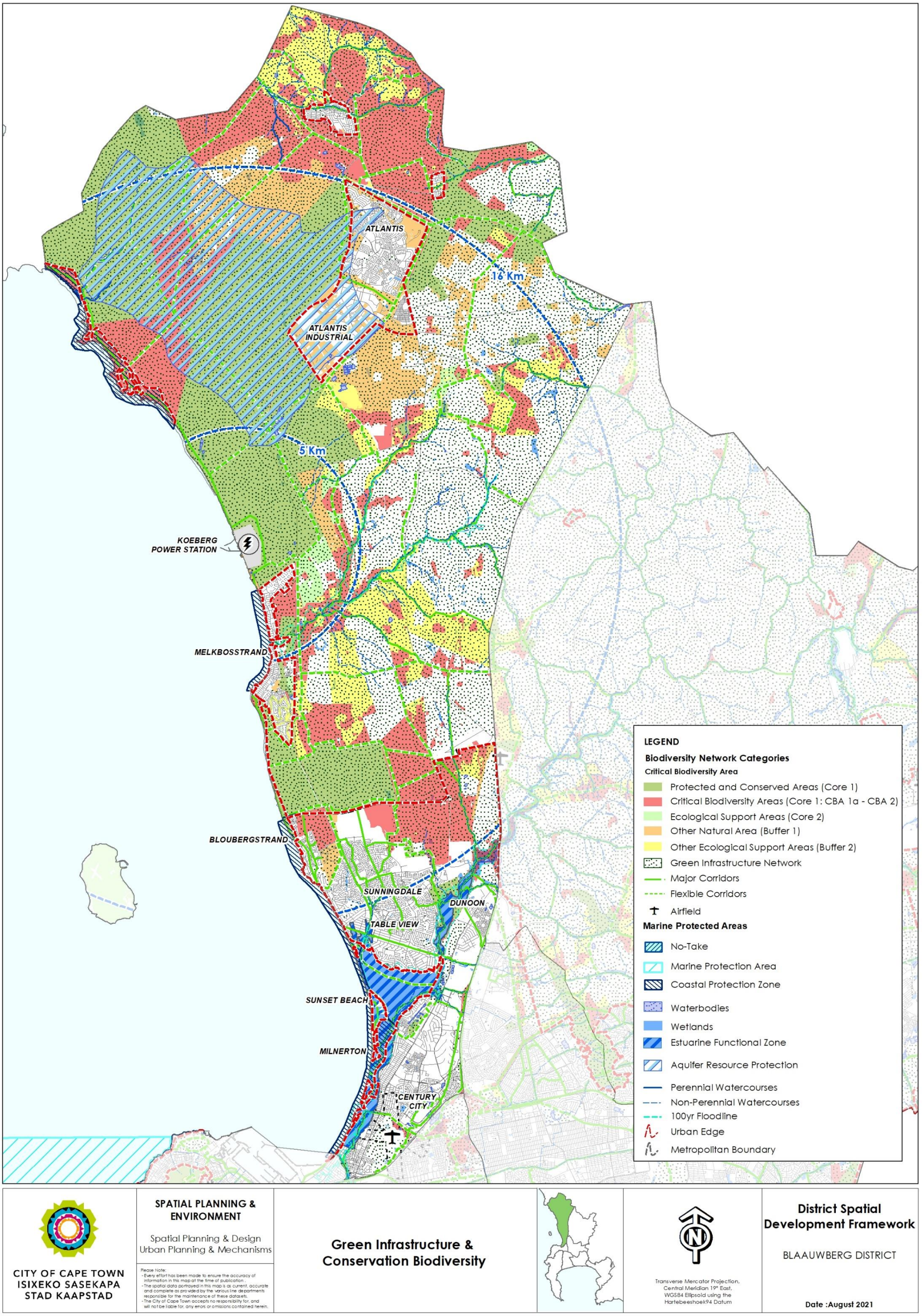


Figure 4.1: Map of bio-physical environment in Blaauwberg district

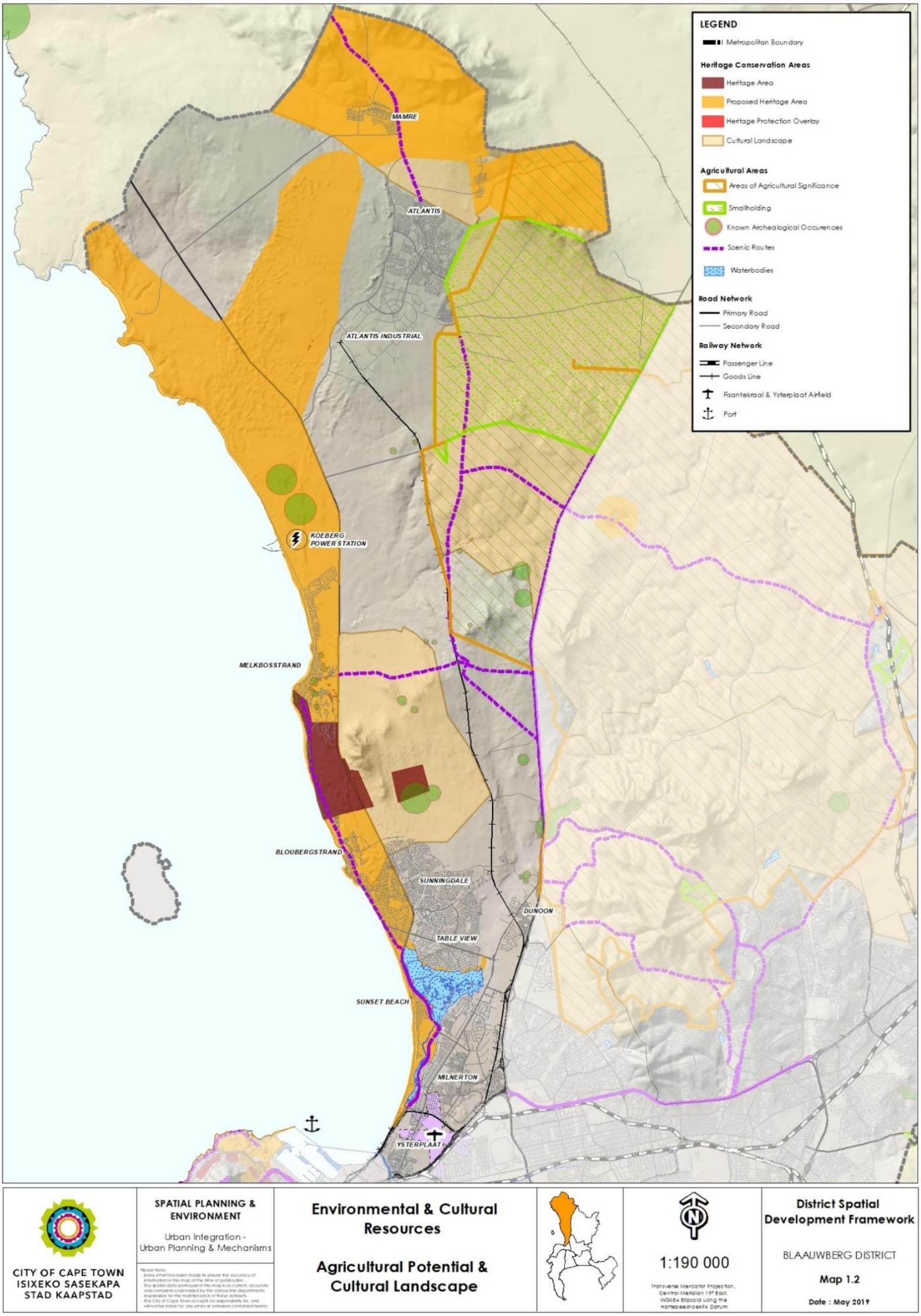


Figure 4.2: Map of agricultural potential and cultural resources in Blaauwberg district

4.3 Key Development Pressure and Opportunities

4.3.1 Development Pressures and Constraints

4.3.1.1 Biodiversity

- Industrial and urban expansion resulting in urban sprawl, particularly in the central portion of the district resulting in rapid loss of flora and habitat for fauna and ecosystem services;
- Conflict with critical biodiversity areas and areas earmarked for industrial and residential development. Current conflicts include proposed residential areas within the urban edge in Mamre and Atlantis, mixed use development within the Melkbosstrand urban edge (western boundary), potential development at Silverstroom and various sites in the Sunningdale, Sandown, and Rivergate development area
- Climate change and sea level rise are exacerbating erosion and flooding particularly along the coastline near Milnerton;
- Inappropriate and/or illegal land management practices by private owners of many of the critical biodiversity sites, particularly within the urban edge, make management of these sites difficult for the authorities to control.
- Destructive development interfaces along biodiversity corridors. Biodiversity corridors are not big enough to ensure adequate protection of rare and endangered flora, provision for faunal movement, fire management and buffers from human disturbance.
- Invasive alien plant species are spreading aggressively and not being controlled by private landowners
-

4.3.1.2 Hydrology

- Increasing demand for water from the Atlantis Aquifer as well as poor or inappropriate regulation of flows and water abstraction;
- Inappropriate planning and historic modification of rivers, with many industrial areas located along the rivers in this district has resulted in soil erosion, sedimentation, bank modification, infilling and encroachment of the Diep River floodplain;
- Increased demand for municipal water due to Population growth and urban/economic development, the Blaauwberg district is currently the fastest growing district within the City;
- The Diep River water quality has deteriorated as a result of agricultural runoff, stormwater runoff from urban, industrial and commercial areas and treated waste water discharges. Lack of capacity in WWTW (Potsdam and Melkbosstrand) and the resulting poor effluent quality;
- Poor service provision in informal areas, especially those located alongside rivers (e.g. Du Noon and Doornbach), leads to pollution of stormwater systems and rivers.
- Poor interfaces between rivers (in particular the Diep River) and urban development. With inadequate provision for ecological buffers along river corridors

and wetlands to protect these systems from the effects of adjacent development and land use changes
- Invasive alien plants use more water than surrounding indigenous plants, which has a direct impact on stream flows and groundwater reserves. Infilling and encroachment onto rivers and wetlands often done by riparian landowners who are trying to reclaim land

4.3.1.3 Coastal Areas

- Development along the coastline and the resulting modification of the coastal environment, particularly around Duncan Dock, Paarden Island and Milnerton;
- Destruction and fragmentation of dune systems due to urbanisation, for example at Table View, Blaauwberg and Melkbosstrand;
- Interference with coastal dynamics and processes has led to increased erosion, loss of amenity and tourism opportunities and increasing damage and risk to coastal infrastructure and property;
- Global climate change resulting in a change in coastal dynamics, the possibility of more frequent and intense storm events, as well as gradual sea level rise;

4.3.1.4 Cultural, Heritage, Agricultural and Mineral Resources

- Urban sprawl
- Increased urban pressure, densification pressure and industrialisation e.g. Bloubergstrand, Melkbosstrand, Mamre, Rugby leading to loss of (archaeological) heritage resources and Brooklyncharacter;
- Loss of agricultural feasibility owing to numerous factors including sand mining e.g. Koeberg Farms;
- Pressure to subdivide farms into uneconomically viable units;
- Pressure to subdivide small holding in portions which will detract from their agricultural character;
- Sand mining for example at Vaatjie, Morningstar and Koeberg smallholdings.
- Existing urban development, preventing the extraction of mineral resources, particularly near Melkbos;
- Unregulated and/or illegal sand mining, particularly north of Parklands, where smallholdings are located (Morningstar / Koeberg smallholdings);
- Insensitive/inappropriate design, bulk and layout of new structures being erected within a sensitive heritage context
- Destruction/removal of historical tree lanes/avenues.

4.3.2 Integrated Opportunities

Conservation of core environmental features and assets (including POS, beaches, 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:

- recreation, coastal amenity, and future industrial and commercial development;
- maintain and managing proclaimed areas;
- expand and promulgate core conservation areas;
- sustainable harvesting of medicinal and flowering plant species
- potential for stimulating ecologically sustainable farming practices in conjunction with conservation of historical agricultural setting e.g. Camphill;
- specific sites along this coastline are popular for national and international competitions and events (e.g. Bloubergstrand)
- agricultural, industrial, construction, retail and sand mining sectors.
- views of Table Bay and Table Mountain stimulate demand for residential and commercial development.

b. Strengthens the city's resilience to climate change and mitigate risks associated with natural and man-made disasters:
    - Rivers and wetlands provide flood control;
    - Wetlands and rivers are able to improve the water quality of contaminated stormwater, within limits;
    - Aquifers and ground water sources are critical for water security especially in today's context, in particular The Atlantis aquifer can continue to provide a sustainable water resource if properly managed;
    - Rivers in the Blaauwberg district provide a limited volume of water which can be used for other purposes, e.g. irrigation, if of adequate quality;
    - Conservation of critical biodiversity and opens spaces improves the city's ability to adapt to climate changes, by increase our ecological footprint, diversifying natural resources etc.
    - Stimulating ecologically sustainable farming practises in conjunction with conservation of historical agricultural setting e.g. Camphill.
    - Conserve the natural vegetation and be part of the global initiative.
    - Integrated green spaces protect against the heat-island effect and reduce the impact of heat waves and high heat days.

c. Positive social development by:
    - Creating a sense of place and belonging by preserving and enhancing the city's cultural identity
    - Outdoor and recreational spaces (i.e. POS, parks, beaches, vleis etc.) promote social contact and interaction.
    - The Diep River estuary and wetlands are regionally important resources for recreation and bird watching. It also serves as a fish nursery.
    - For better health and well-being of the residents, ensure a quality urban environment by reducing alien vegetation and plant local indigenous vegetation.

4.4 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 4.3: Environmental Spatial Implications

NATURAL/CULTURAL RESOURCE	SPATIAL IMPLICATION
A. Biodiversity 	1. Conserve identified biodiversity linkage corridors of sensitive and threatened vegetation types and control development pressure in the key sensitive areas such as Silverstroom Strand, Atlantis and the northwards expansion of urban area in Sunningdale, Sandown and Rivergate. Reinforce the proposed east-west ecological corridor, linking the linking the Diep River to the Blaauwberg Nature Reserve 2. Where these remnants conflict with areas earmarked for industrial and residential development, ensure specialist botanical and faunal impacts assessments, identify appropriate mitigation measures before these activities are approved. Current conflicts include proposed residential areas within the urban edge in Mamre and Atlantis, mixed use development within the Melkbosstrand urban edge (western boundary), potential development at Silverstroom and various sites in the Sunningdale, Sandown and Rivergate development areas;
B. Rivers, Wetlands and Ground Water 	3. Promote an active interface and permeable perimeter fencing on properties bordering natural resources and provide roads interfacing with biodiversity corridors for fire management 4. Prevent inappropriate land uses in identified flood prone areas; 5. Protect the re-charge and extraction areas for Aquifers 6. Ensure ecological buffers and biodiversity corridors are large enough (and connected) to provide the ecological requirements for the healthy functioning of rivers and wetlands and its associated biodiversity which will also serve to protect development from natural disasters like wild fires and flooding.
C. Coastal Areas & Dunes 	7. Prevent inappropriate development in or close to any sensitive inland and coastal dune systems (Witzand dunes); 8. Prevent development within the coastal edge, except at identified special place nodes, which have been identified for amenity opportunities (see point below); 9. Maximise amenity opportunities, with minimum disturbance to the coastal environment and processes. Identified nodes include: • Milnerton Lagoon Mouth • Marine Circle • Big Bay • Silverstroom • Melkbosstrand 10. If development is considered near to Silverstroom, the mouth and the sensitive headland dunes close to the mouth must be avoided and protected; 11. Avoid major new urban development infrastructure and bulk services investment in coastal areas that are vulnerable to coastal storm events and inundation;
D. Heritage and Cultural Landscapes 	12. Protect and conserve the Koeberg Farms Cultural Landscape; 13. Protect and enhance the Mamre Cultural Landscape and surrounds; 14. Heritage compliance (S35 NHRA) in coastal areas of high archaeological potential; 15. Acknowledge Scenic routes and implement the guidelines stated in the Scenic Drives network; 16. Designate Heritage Protection Overlay Zones where applicable (e.g. in Mamre, Bloubergstrand ,Brooklyn streetscapes, commemoration of Blaauwberg Nature reserve).). 17. Development of Scenic Network; 18. Retention of sense of place and space; 19. Heritage Tourism initiatives and job creation; 20. Potential for stimulating ecologically sustainable farming practises in conjunction with conservation of historical agricultural setting; and 21. Adding value to places through conservation and appropriate development features of historical value; 22. Reinstate historic tree lanes/avenues.

E. Mining and Agriculture 	23. Preserve and utilise high potential agricultural land and areas currently being used for agricultural purposes and 24. Where feasible, protect mineral resources (building sand) particularly near Melkbos for extraction prior to development.

C.STATE OF THE BUILT ENVIRONMENT

5 LAND USE AND DEVELOPMENT TRENDS

The Blaauwberg District is a diverse area bordered to the west by the Atlantic Ocean, to the east by the N7 national road, to the south by a portion of Paarden Eiland industrial area and sharing a boundary to the north with Swartland Municipality. The district is one of the largest in the city and has some of the fastest growing areas with a mix of urban, rural and farming areas. Fast growing areas in the district include Big Bay, Melkbosstrand, West Beach, Century City, Sunningdale and Parklands. Although the area is vast and is mostly affluent there are also pockets of lower-income areas including informal settlements such as Doornbach, Visserhok, Marconi Beam, Du Noon, Saxonworld, Witsand, Atlantis, Mamre and Tafelonzo with poor access to amenities and other services as well as economic opportunities. The District includes some of the most important industrial areas in the city namely Killarney Gardens, Montague Gardens and Paarden Eiland. Century City is a key residential and commercial node in the city.

The majority of development pressure in Blaauwberg continues to occur in the south of the district and is private sector driven in the form of the redevelopment of existing areas and significant greenfield development including the areas of Parklands and Sunningdale. What follows is by no means meant to be an exhaustive list, but more indicative 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 Blaauwberg district.

5.1 Residential

Atlantis, Mamre and Pella is situated in the northern sector of the district. Residential development in Mamre and Pella is limited to extensions to existing dwellings, the provision of second dwellings, and City housing projects. All three areas are largely single residential in character.

Areas experiencing great pressure for residential densification in the form of blocks of flats include parts of **Koeberg Rd**, **Blaauwberg Rd**, **Arum Rd**, **Briza Rd, Athens Rd** and **Coral Rd** (See Figure 5.1).

Figure 5.1: Blaauwberg Road Corridor

Milnerton, Table View, Parklands and parts of Milnerton Proper contain properties which have latent primary rights which have yet to be exercised. Furthermore, there are number of properties along strategic corridors, like Blaauwberg Road, where title deed restrictions apply that limit the densification and/or diversification of land use.

Figure 5.2: Lagoon Beach and Paarden Eiland

The most recent pressure areas for higher density residential rights are focused on the single residential erven along/near **Lagoon Beach** and surrounds, as well as on industrial zoned erven in parts of **Paarden Eiland**.

Other forms of densification include applications for *ad-hoc* subdivisions (mostly into two) of single residential erven in **Milnerton Proper** (a township established in the 1970s). Even newer suburbs such as **Parklands** have been subject to densification applications.

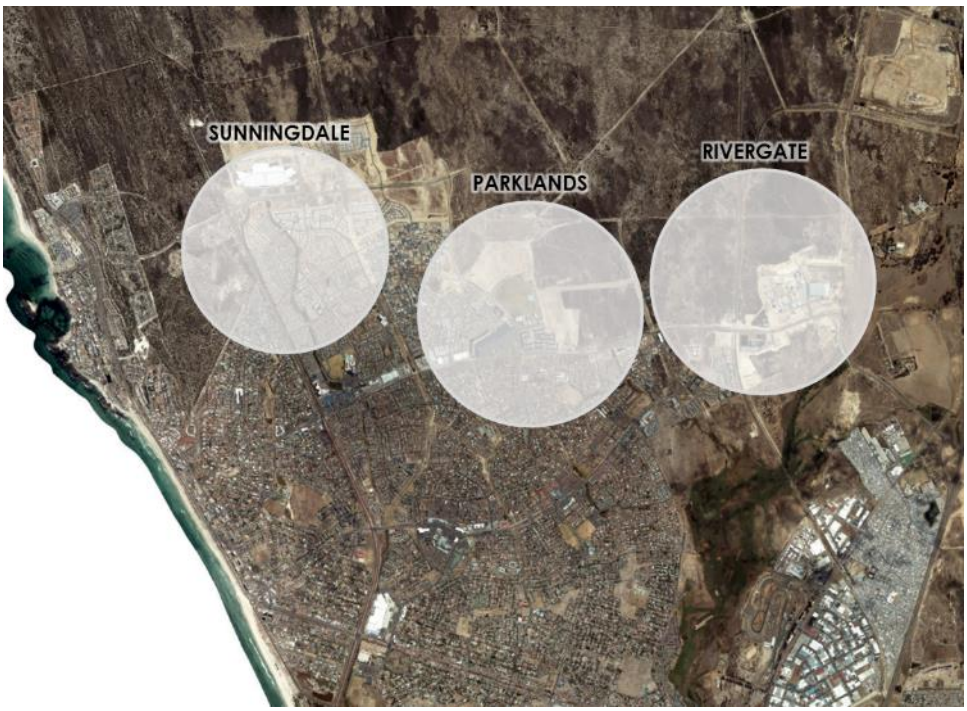


Figure 5.3: New development areas: Sunningdale, Parklands and Rivergate

Brooklyn, **Rugby** and **Ysterplaat** are some of the oldest suburbs in the district. The areas play a critical role in the provision of residential accommodation for a range of income groups close to employment and public transport. The interest in these areas for increased densification / alternative land uses are growing. The future of the areas must be carefully considered to avoid negative effects of gentrification whilst still allowing for densification and land use intensification along Koeberg Road.

Joe Slovo, **Phoenix** and **Dunoon** are extremely dense areas within the urban inner core. There has been a rise in illegal building work; often onto public road reserves or public spaces. Similarly, the construction of unauthorized boarding houses has increased. The aforementioned is considered a direct response to the dire need for housing in close proximity to employment opportunities. All three of these areas are located close to or next to industrial / mixed use areas which are employment generators. It will be critical for the City to address the form and manner of densification to ensure the safety and wellbeing of residents.

Figure 5.4: Densely populated areas: Joe Slovo, Phoenix and Dunoon

Wolverivier is a temporary relocation area established on Cape Farm 101/5. It accommodates approximately 500 residential units and some supportive land uses in the form of an early childhood development centre, place of worship, and place of assembly.

5.1.1 Second dwellings

With the inclusion of second dwellings in the single residential zone as an additional use right, the process for obtaining such rights were thus streamlined. The take-up of such rights are however still subject to title deed restrictions in some of the older areas as well as the impact of the Koeberg Nuclear Power Station. In respect of the latter, the additional use right has to be tested in the Traffic Evacuation Model (TEM) to ensure that sufficient infrastructure exist for evacuation in case of emergency.

5.1.2 Greenfield development

New greenfield development which has taken place since the late 90's includes **Big Bay**, **Parklands and Sunningdale**. These areas largely consist of low and medium density residential development with a limited number of commercial and retail opportunities located in relation to higher order transport routes and intersections with the R27 see Figure 5.6 below, which depicts the concentration of building plan approvals between 2012 and half of 2019 per suburb. Extensive development opportunities still exist in relation to Parklands and Sunningdale. Further phases in the east of Parklands will include industrial

development and a range of housing opportunities including subsidised and rental opportunities located along the Atlantis corridor.

5.1.3 Redevelopment Trends

The majority of redevelopment pressure in the south of the district is concentrated along the **Blouberg beachfront** and in relation to Blaauwberg Road. Development along the Blouberg beachfront is in the form of high density residential/hotel development with a mixed use node developing at Marine Circle. Concerns in relation to these developments relate to height and bulk departures which are placing increasing pressure on services capacity and the movement network.

Redevelopment along **Blaauwberg Road** is largely commercial in nature consisting of small scale offices and retail centres. In addition, there is pressure for redevelopment and densification within the single residential areas located within close proximity of the beachfront. Due to the limited commercial opportunities in this part of the district, illegal business uses are locating in residential areas particularly in relation to Wood Drive and Raats Drive.

5.2 Industrial

The district contains a significant amount of industrial land in Atlantis, Rivergate, Racing Park, Killarney Gardens, Montague Gardens and Paarden Eiland. Parts of Atlantis Industrial has also been declared a Special Economic Zone (SEZ) with incentives for green-tech industrial uses.

The Frankendale industrial development to the west of the Vissershok Landfill site was approved in 2016, but has not been developed yet. The proposed development provided for more than **900 000m²** of industrial floor space.

Koeberg Nuclear Power Station is zoned for Risk Industry purposes. It is however a stand-alone facility which does not allow other industrial uses to co-locate.

5.2.1 Redevelopment Trends:

Paarden Eiland has historically been an industrial area, but due to its strategic location in terms of proximity to the City centre and coastal amenity, the area is beginning to experience redevelopment pressure with a change from industrial to a mix of commercial and residential use.

5.3 Retail and Office

The largest intensity retail and office land uses are located in Century City node. Other key retail and office uses are located along Koeberg Rd, Blaauwberg Rd, Parklands Main Rd, and Sandown Rd.

Small scale commercial activities are found in smaller towns, Mamre and Pella, North of the district. Uses such as night clubs, retail shops and ATMs are found in Mamre as well as general dealers, hardware store, food outlets, house (spaza) shops, bottle stores and cafes. In Pella the predominant commercial land uses found are general stores.

The size of erven along Sandown Rd and Parklands Main Road have given rise to proliferation of "big box" retailers -

This has not created a desirable urban form and has resulted in:

- large, impermeable street blocks with large structures for big retailers; not designed to human scale or to enable easy pedestrian movement from adjoining residential suburbs;
- limited functional adaptability. It in order to change the function of the building it would require the demolition of existing large structures.

Unless other mechanisms are put in place, future applications for greenfield developments should be shaped in such a manner to avoid the creation of large city blocks.

5.4 Mixed Use

There has been a slow uptake in what could be considered as mixed use developments. This can be seen in f Figure 5.6Figure 5.7. 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 to address the inhibiting factors above, the vision of creating developments that provides a rich variety of uses may not be feasible.

There are excellent examples of mixed use development in the Big Bay area for example Eden on the Bay and Seaside Village.

Century City is a major mixed use node which is located along the N1, and consists of high density residential development, intense office development and the major shopping centre of Canal Walk. Ratanga Junction at Century City was recently demolished creating new opportunities for urban infill and mixed use developments.

5.5 Smallholdings

The district accommodates two smallholding areas:

- Morningstar (west of the N7 and north of the Vissershok Landfill site); and
- Klein Dassenberg Smallholdings (to the west of the N7 and east of Atlantis).

Both areas include a range of land uses, many of which are illegal. There have been very little requests for further subdivisions in the Morningstar area.

Klein Dassenberg is subject to the Klein Dassenberg Smallholding Area Development Framework (2002) which guides development in the area. Subdivision sizes are limited to 7ha. There are sporadic applications for subdivisions. There has also been an increase in enquiries to accommodate zonings other than agricultural or rural. The area is constrained in respect of services capacity (with particular reference to water).

Both smallholding areas fall within the Koeberg Nuclear protection zones which prevent intensive land use.

5.6 Agricultural land

Agricultural land in the district is sparsely used for farming. This may be attributed to the soil quality. Where farming is actively practiced, it involves grain, cattle and/or sheep and dairy farming among others.

Examples of other types of land uses that have located on agricultural land in the district (without formal approval) includes skydiving, 4 x 4 driving course, restaurants, etc.

Areas in the north identified as Smallholding, in particular, the Klein Dassenberg Area has

5.7 Other

The district's only coastal resort, under City ownership, is located at Silwerstroomstrand. There is interest for a private development to the south of the existing resort.

5.8 Supportive land uses

Given its proximity to the ocean, there is a significant number of tourist-related accommodation establishments, especially in Melkboschstrand, Big Bay, Blaauwberg, Table View, Milnerton, Sunset Beach and Lagoon Beach.

Other supportive land uses include early childhood development centres (of varying scales), and the expansion of existing community facilities (inclusion of after cares, special needs facilities) where previous conditions or zoning schemes limited such uses to a single land use.

5.9 Development Constraints

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

- Blaauwberg Road/Arum Road/Briza/Athens/Coral Roads
- Dunoon
- Joe Slovo
- Parklands
- Phoenix
- Rivergate
- Sunningdale

5.10 Undeveloped and partially-developed Land

Table 5.1 depicts undeveloped and partially-developed land in Blaauwberg, grouped into four categories using the following criteria:

Table 5.1: Undeveloped and partially utilised land

Code	Category	Description

1	**Underutilised, undeveloped land:**	Unimproved land **without any** of the following attributes: • reservations, • public projects (human settlements; social facilities etc.) • building plan approvals • rezoning land use approvals.
2	**Potential future development:**	Undeveloped land **with any** of the following attributes: • reservations, • pending building plan approvals, • any public projects in pipeline stage,
3	**Utilised Vacant Land:** (vacant land under development or a registered intent to be developed)	Undeveloped land **with any** of the following attributes: • any public projects in planning or construction stage, • existing building plan approvals, • rezoning land use approvals
4	**Undeveloped Land Reserved and/or Zoned for Community or Recreational use:**	This will include undeveloped land currently zoned OS1, OS2, OS3, CO1, CO2 not included in the above categories.
5	**Undeveloped Land Zoned for Transport Use:**	This will include undeveloped land currently zoned TR1, TR2 and Utility not included in the above categories.

It must also be noted that land located in the Critical Natural Assets and Discouraged Growth STAs as designated by the City's approved MSDF have been excluded in Figure 16.

Most vacant land in the district is located to the north (not accounting for land located in the PNAs and DGAs). These properties form part of the Parklands and Sunningdale expansion and to a large extent, currently have land use approvals attached to them or currently have applications in process.

Properties shaded in blue and grey are land zoned for community or recreational use, and should ideally be reserved as such in order to accommodate existing communities and anticipated growth/intensification in residential development. However, there are some larger properties which can potentially accommodate additional mixed use development (non-residential and residential land uses), other than only community or recreation.

1

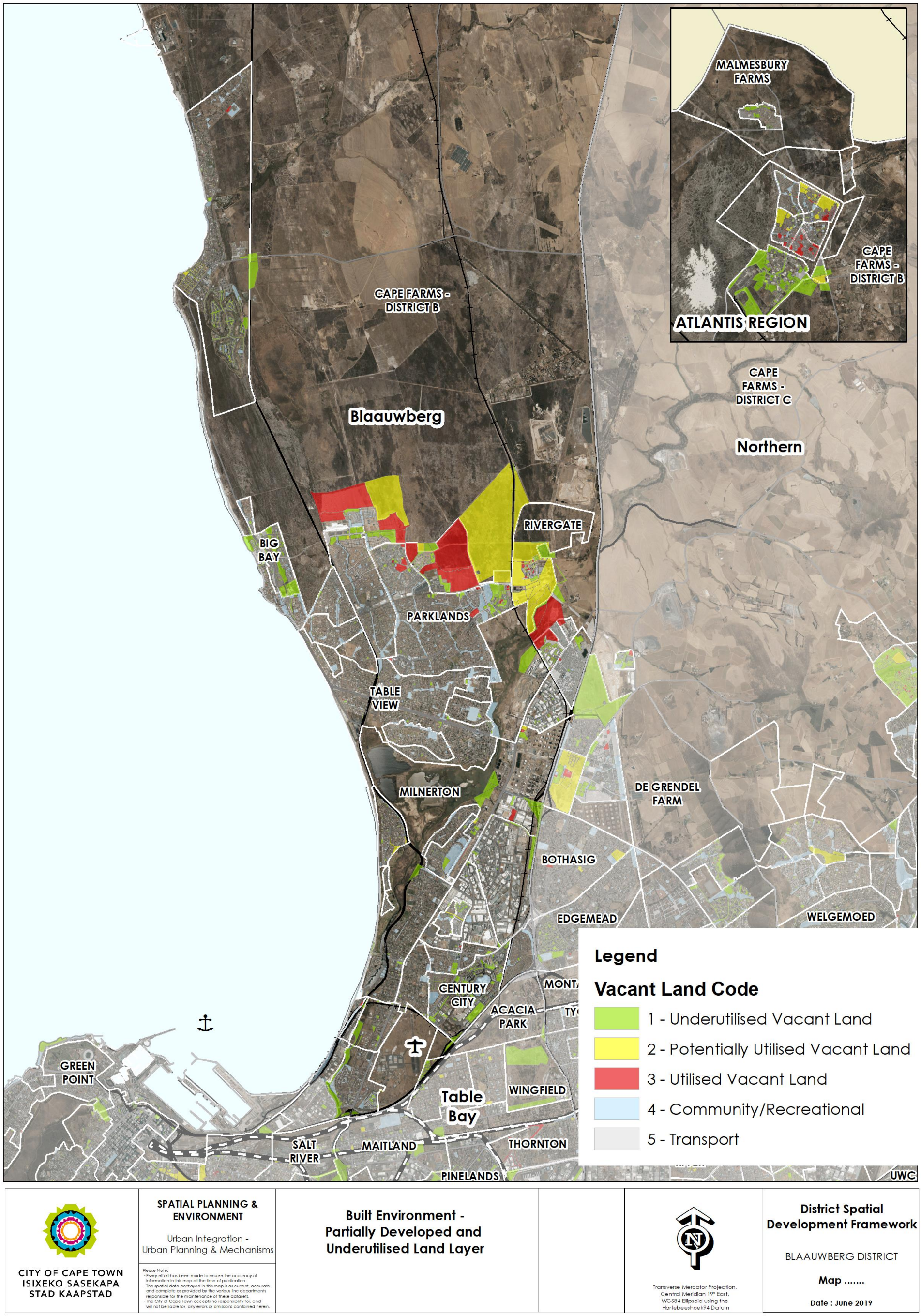


Figure 5.5: Vacant and Underutilised Land

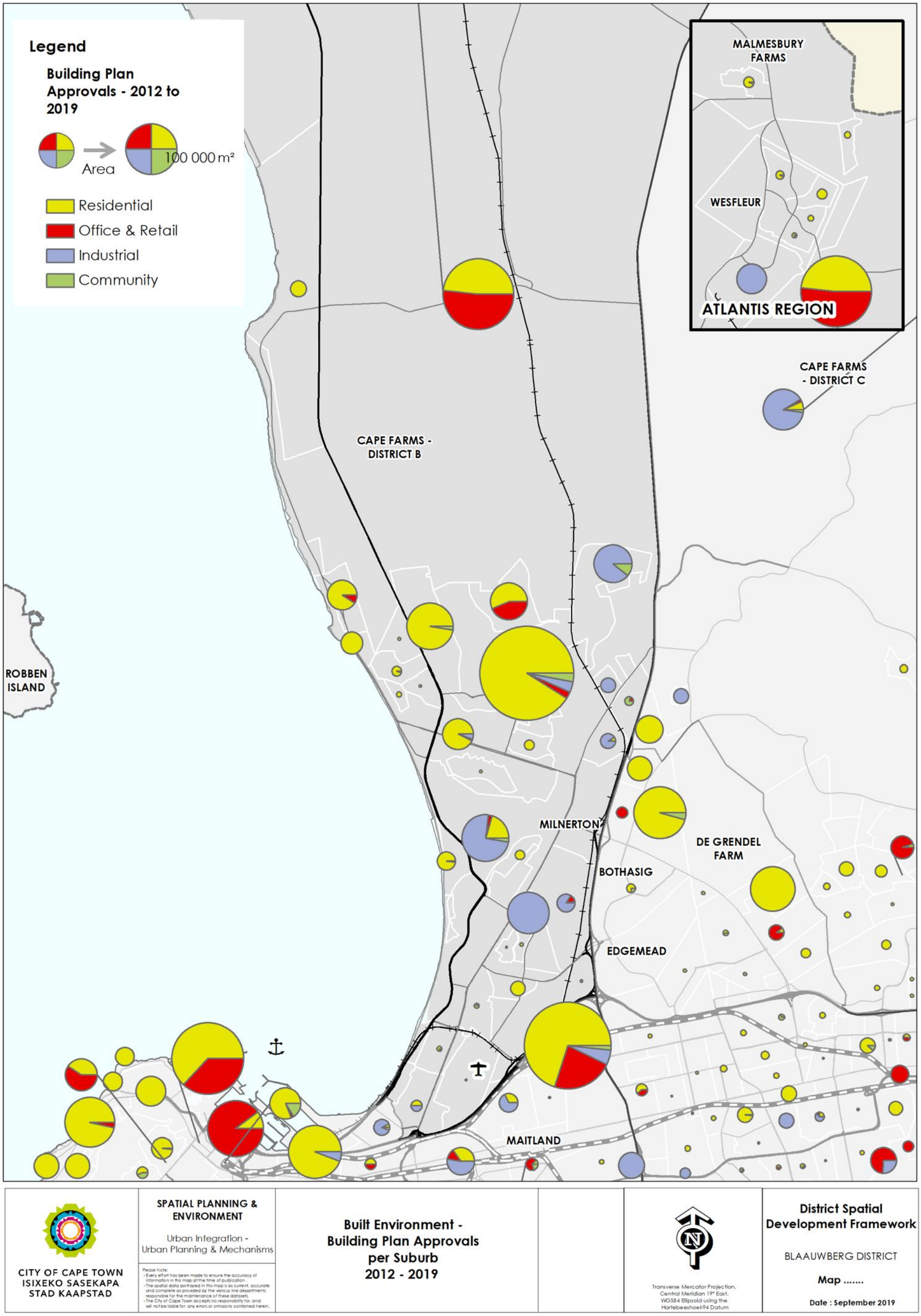


Figure 5.6: Building plan approvals per suburb (2012-2019)

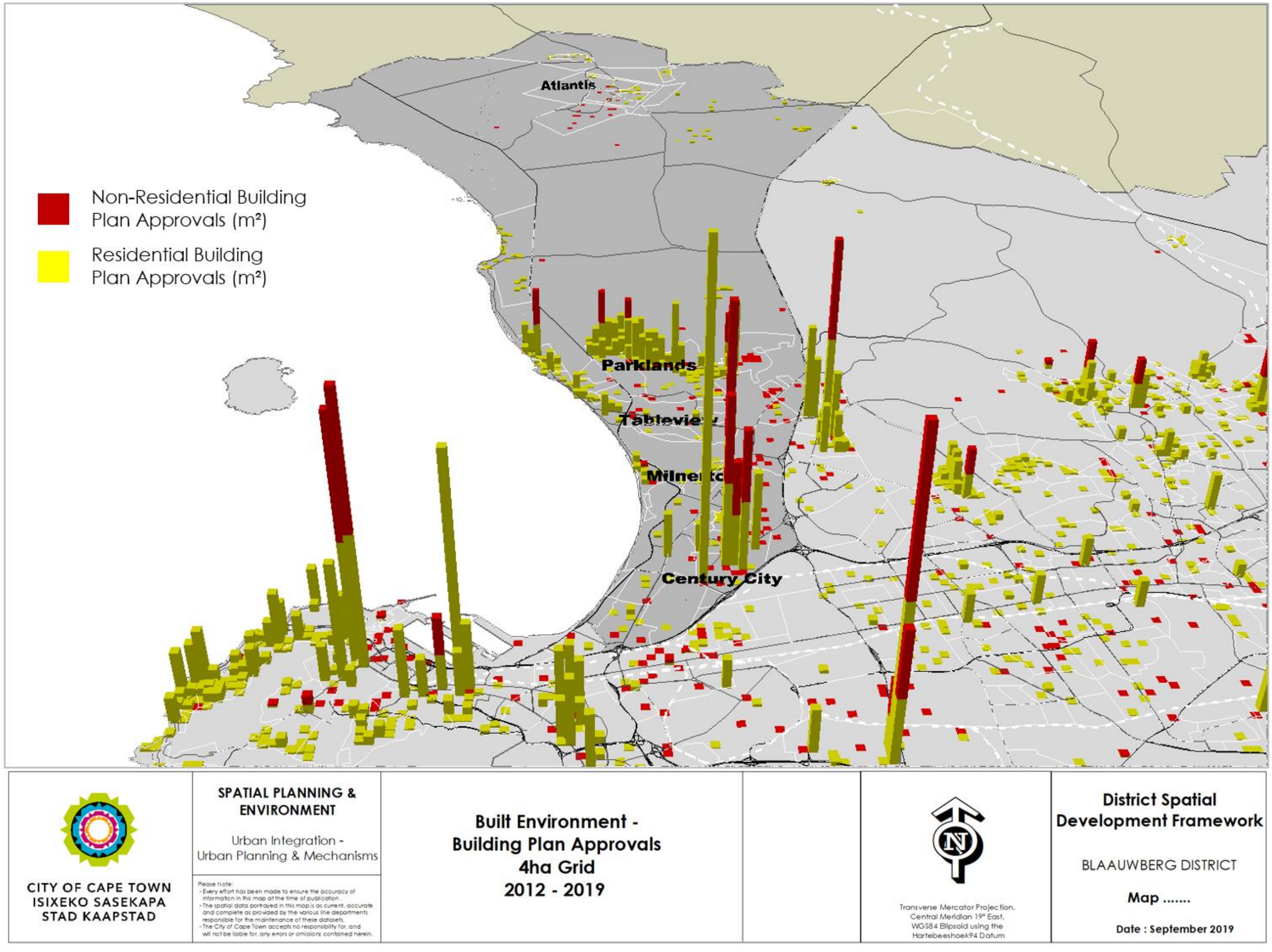


Figure 5.7: 3D Map depicting Residential and Non-Residential development (2012-2019)

5.11 Key Challenges and Opportunities

5.11.1 Challenges

- Loss of community continuity where densification is applied without the necessary consideration of for the receiving built environment
- Gentrification
- Koeberg Nuclear Power Station and the 0-16km protective zones and evacuation routes capacity with specific reference to Berkshire Boulevard extension to link with the N7, limits further densification of land use particularly trip attracting (commercial) land uses.
- Infrastructure capacity
    - Potsdam WWTW
    - Private vehicle use leading to gridlocked neighbourhoods
    - Aging infrastructure in suburbs like Brooklyn, Ysterplaat, Rugby, parts of Tijgerhof and Milnerton Proper, which were developed prior to 1953.
- Overdue update of the Blaauwberg Road Management Strategy.
- Densities in Joe Slovo, Phoenix and Dunoon and the impact on community health and safety.
- Potential loss of industrial land close to Cape Town harbour and rail access due to infiltration of other less compatible uses (e.g. retail, residential).
- Transversal co-operation to provide key supportive land uses (e.g. magistrates courts, hospitals, clinics, libraries, functional safe open space, public schools) for the district remains a challenge due to planning and financing for such not being coordinated between the different spheres of government.
- Resource capacity lacking to drive the redevelopment of the beach front along Marine Drive/Otto du Plessis.
- Public resistance to development, regardless of approved city policy
- Restrictive title deed conditions inhibiting appropriate development within the urban inner core such as the restrictions found *inter alia* in Table View, Milnerton, Tijgerhof areas.
- Bureaucratic processes and costs, especially with reference to properties with title deed restrictions, deter investment in the area.
- Legislation currently does not enforce the provision of a range of land uses within the relevant mixed use zones.
- Financial models of developers are not accommodating mixed use type developments; furthermore there are no incentives or legislative mechanisms to support this type of development.
- Fragmented developments due to single-erf ownership.
- Summer Greens is considered a rapidly decaying suburb with little public or private investment.
- The protection of Brooklyn/Rugby/Ysterplaat against gentrification is critical.

5.11.2 Opportunities

- Encourage appropriate high density development in areas where heritage and cultural environment will not be negatively affected by the application for exemptions in terms of S34 and S38 of the NHRA
- The declaration of Heritage Areas with HWC approved rules for protection of heritage, provides for the lifting of S34 in such areas.
- Marine Circle and the beachfront provides opportunity for redevelopment
- Single residential erven along key public transport corridors provide opportunity for higher density residential/mixed use development, especially when consolidated
- Underdeveloped land should be encouraged to develop and existing developments to take up remaining latent rights
- Sensitive redevelopment of parts of Tijgerhof, Brooklyn, Rugby, Ysterplaat given its close proximity to the central business district (CBD) of Cape Town, as well as being served by public transport.
- Atlantis Industrial and the Special Economic Zone (SEZ) present significant employment-generating opportunity.
- N7 interchange upgrade, the duelling of Sandown Road and Blaauwberg Road extension over the N7; all of which will assist in alleviating existing traffic congestion within the area.
- Creation of a "container city" on suitably-zoned industrial land and movement of containers out of Cape Town Central Business District.
- Appropriate intensification and densification along Bosmansdam Rd, Koeberg Rd and Blaauwberg Rd.
- Creating incentives for consolidation of erven to promote cohesive developments instead of fragmented developments along activity corridors.

6 TRANSPORT AND ACCESSIBILTY

6.1 Introduction

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

There is a strong focus on transport as an informant of the CTMSDF which recognizes the need for spatial planning tools to support public and non-motorised transport options, as well as reducing the need to travel altogether. This section focuses on the application of TOD to a district scale / corridor level.

Figure 6.1 is a useful reference in this regard, showing the different planning scales:

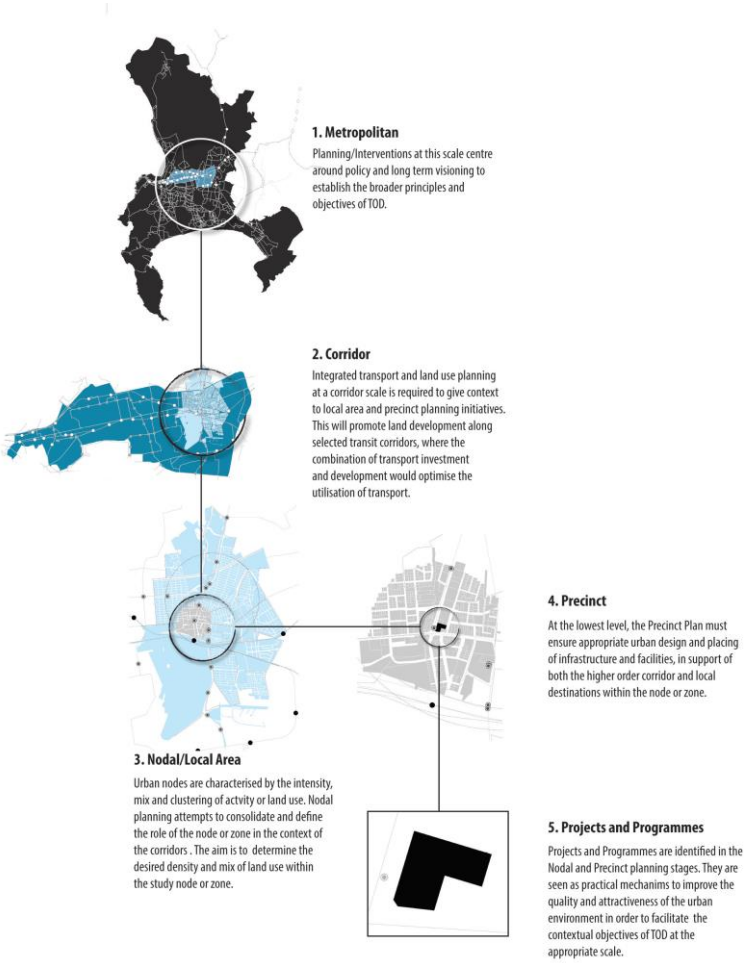


Figure 6.1 Transit Oriented Development at Various Scales (Source: TOD SF, 2016: 24)

At a corridor scale, transport system optimisation 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.

6.2 Strategic Parameters & Informants

The City of Cape Town 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. An overview of these strategies is provided in section XX.

6.2.1 District Specific Transport Strategies

Strategies that have specific impact on the Blaauwberg District are highlighted below:

6.2.1.1 Blaauwberg Road Corridor Study

The purpose of the Blaauwberg Road Corridor Study is to provide a guideline document that will assist the local authority to adjudicate and encourage the desired redevelopment of properties along Blaauwberg Road. The study should also identify what the optimum road access and parking guidelines should be to achieve the desired spatial form or full development.

The study aims, through a series of steps, to assess the development and transport status quo within this corridor, assess the future traffic operations and possible access arrangements for the planned redevelopment of the Blaauwberg Road properties and establish a guideline document that will encourage the desired redevelopment of properties along Blaauwberg Road, while meeting all of the various authority land use and transport requirements.

6.2.1.2 Blaauwberg North: Macro Transport Impact Assessment (2017)

According to the report, "the purpose of the Macro TIA is to link future land use developments with major transport infrastructure provision to facilitate movement capacity into and out of Blaauwberg North at acceptable levels of service." This area needs particular attention because it contains large tracks of land on the periphery of the built up area of the city, which is likely to be developed in the period of this plan.

The report is a useful informant in that it synthesizes the data on known future developments. While the timing of such developments cannot be predicted, it does provide an indicative programme for road upgrade and construction. It also proposes an increased MyCiTi service, and the implementation of the Atlantis Rail Passenger service. It is also an informant to more localized TIAs, which then inform the conditions imposed on land use and building development applications in the area.

6.2.1.3 Koeberg Nuclear Evacuation Plan (2015)

The City of Cape Town (on behalf of ESKOM) submits a Traffic Evacuation Model (TEM) to the National Nuclear Regulator for approval as part of the Koeberg Nuclear Emergency Plan. This must be updated annually. This does regulate the population size, and the nature and intensity of development in the Precautionary Action zone (within 5km of the reactors), and the Urgent Protection Action zone (5-16km radius), unless the road network is significantly upgraded.

6.3 State of Public Transport

The Blaauwberg district has benefited more than the other districts from the roll-out of the MyCiTi bus rapid transport (BRT) infrastructure and services, implemented in 2009. Trunk services were provided to make up for a lack of passenger rail services, and recognising the significant levels of congestion, which has partly been fuelled by the significant residential developments implemented since 2012.

6.3.1 Existing Infrastructure and Services

6.3.1.1 High Order Public Transport

The roll-out of MyCiTi trunks and related feeder routes (Phase 1A and 1B) has been extensive in the Milnerton to Melkbosstrand area, Paarden Eiland to Du Noon, Atlantis and Century City, linking these areas to each other, and the Cape Town CBD. The extent of the network can be seen on the schematic route maps below.

Phase 1A provides services in the West Coast from Atlantis to Paarden Eiland, and the Central City area. It includes 27.3km of dedicated bus lanes, 35 closed stations and 568* open feeder stops, 3 depots, 52* trunk service vehicles operational and 190 feeder vehicles.

Phase 1B is an extension of IRT into Montague Gardens, Century City and Summer Greens etc. includes 4.12km of dedicated bus lanes, 6 stations, 1 depot extension, 6 feeder bus priority intersection improvements, 77* open feeder stops, 15* trunk service vehicles operational and 32* feeder vehicles.

The service has experienced significant uptake in ridership since its inception, to the extent that it is over-subscribed in peak periods. However, the Business Plan for the MyCiTi service does speak to a projected operating deficit, particularly because of the low ridership in off-peak periods. This is due to the strong "tidal" movement patterns: with limited two-way flow. This needs to be addressed through spatial restructuring, in particular improved densification and diversification of land use linked to the City's TOD Comprehensive land use model.

There is limited rail access in the district, particularly for passenger services: only the Monte Vista line is adjacent to the southern boundary of the district, with only Century station providing direct access.

*these figures change from time to time for operational reasons

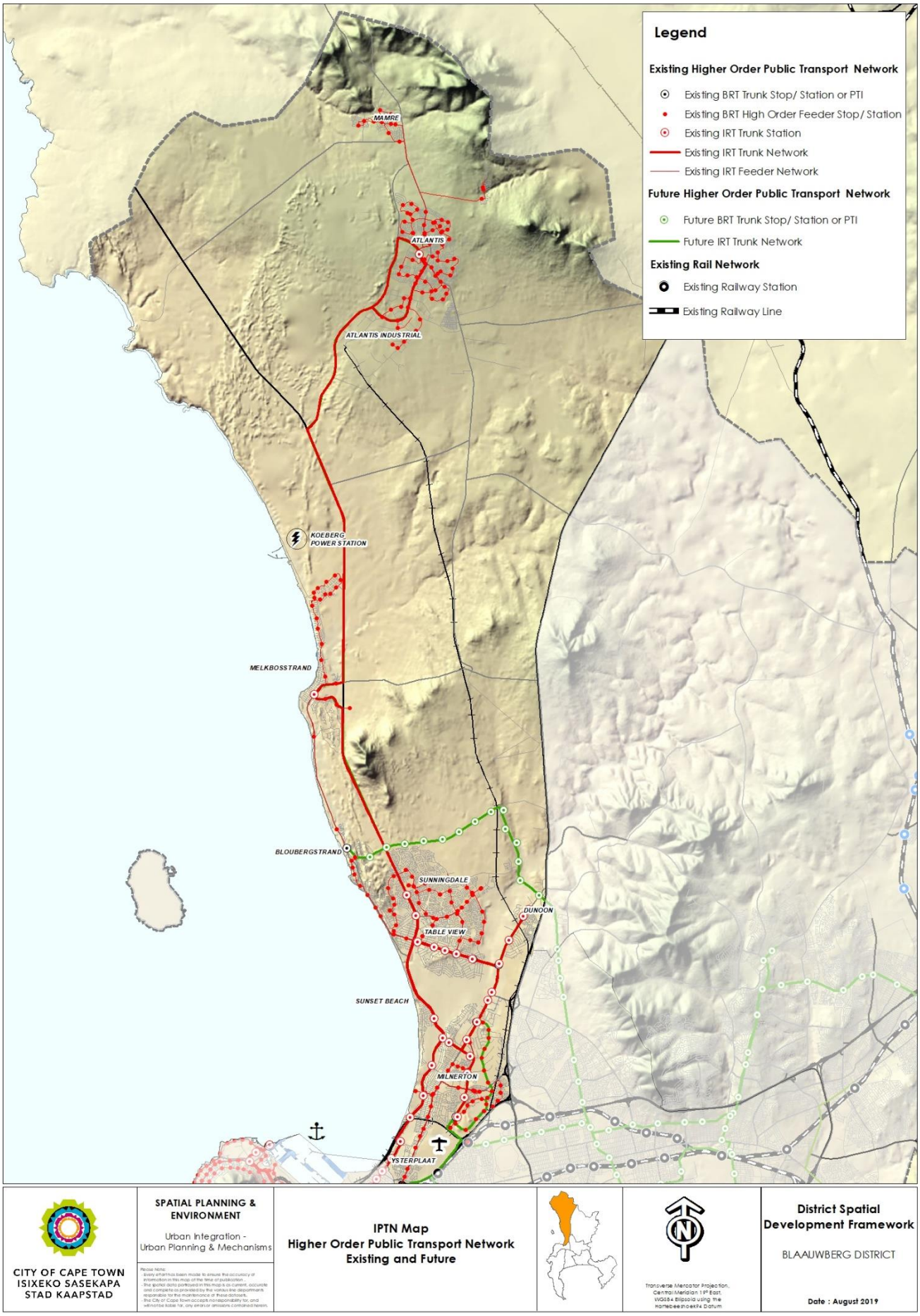


Figure 6.2 Existing and Future High Order Public Transport Services: Blaauwberg

6.3.1.2 Low Order Services (Mini-bus Taxis and Quality Bus Services)

The district is also served by minibus taxi operators and quality bus services, which operate along the main routes in the area, particularly in a north-south direction along Koeberg Road and the R27/Marine Drive. Public transport interchanges (PTIs) include Atlantis (corner of Wesfleur circle and Sampson Road), Table View (corner of Marine Drive and Blaauwberg Road), Killarney (corner of Blaauwberg Road and Potsdam Road) and Century City (off Ratanga Road).

6.3.1.3 Public Transport Interchanges

The following PTIs and taxi ranks serve the district:

Table 6.1 PTIs and Taxi Ranks in the Blaauwberg District

No.	Name	Formal/ Informal	Plans in Pipeline / Upgrades
1	Atlantis (Wesfleur) Public Transport Interchange	Formal	
2	Century City Public Transport Interchange	Formal	
3	Du Noon Minibus-taxi Terminus	Formal	Construction phase
4	Edgemead Public Transport Interchange	Formal	
5	Killarney (Potsdam) Public Transport Interchange	Formal	
6	Mamre Minibus-taxi Terminus	Formal	
7	Melkbos Minibus-taxi Terminus	Informal	
8	Parklands Minibus-Taxi Terminus	Formal	
9	Pella	Formal	
10	Summergreens Minibus-Taxi Rank	Formal	
11	Table View Public Transport Interchange (Westbound)	Formal	
12	Witsand	Informal	

Information on usage and trips of these facilities

An audit of the condition of all PTIs in the city will be undertaken in 2020. Usage information is currently gathered on a facility–by-facility basis, as part of the planning work for PTIs being upgraded.

6.3.1.4 Non-Motorised Transport

The NMT network has been extensively developed in support of the MyCiTi BRT. Atlantis is well-served with shared class 2 cycle lanes, and proposed long-distance routes linking Atlantis to surrounding areas such as Mamre, Pella and Melkbosstrand.

There is also a well-developed class 2 cycle route system in conjunction with the MyCiTi trunk routes, also providing a feeder service to the BRT.

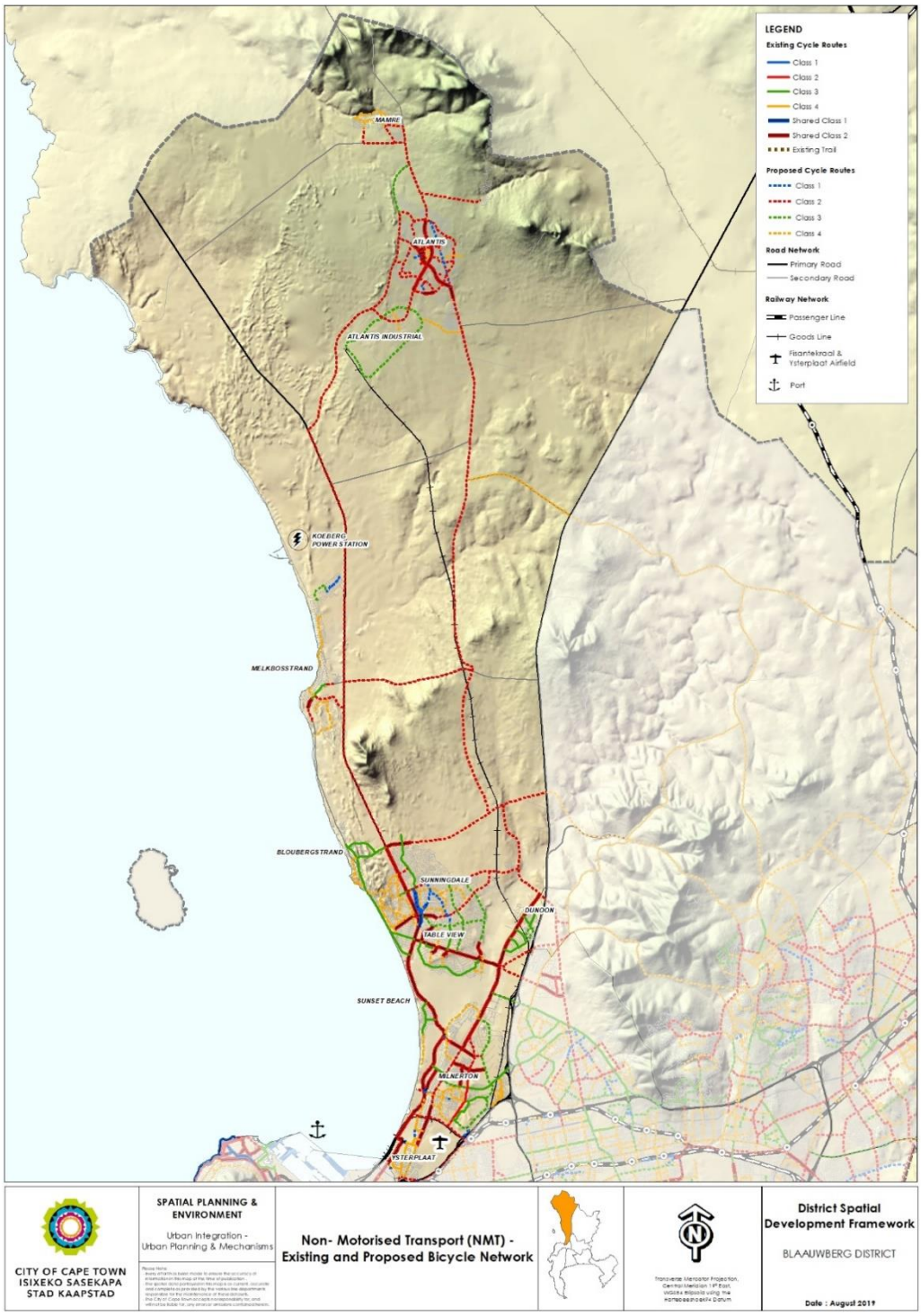


Figure 6.3 Existing and Planned Cycle Routes.

6.3.2 Planned Infrastructure and Services

6.3.2.1 BRT trunks and feeders

Apart for the Trunk route T17 between Khayelitsha and Century City via Milnerton, no additional MyCiTi routes are planned for the area in the medium term. In the long term, route T16 is planned to link Eersteriver to Blaauwberg, via Sandown Rd. These future routes are shown in figure #.

6.3.2.2 Rail

Although the Atlantis rail line runs from Atlantis to the City, the line currently only functions as a goods line, operated by Transnet. Previous proposals have been made to upgrade the line to a passenger service. This proposal is supported by PRASA which would be responsible for conducting a feasibility study for the proposal in conjunction with the City. This has implications for the potential of intensification of development around the stations, and opportunities for multi-modal travel, if the current occupations affecting the line can be resolved.

6.3.2.3 Public Transport Interchanges

No PTIs are planned in the district.

6.3.3 Level of Public Transport Accessibility

As part of the TODC model an analysis of the various Transport Accessible Precincts (TAPs) around stations and stops in the city was conducted. It provides an indication of the 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 a 500m radius of a station/core feeder stop

Note that this does not take into account the functionality of the public transport services. It is purely a measure of location potential. Based on the analysis, the following patterns are highlighted for the Blaauwberg district:

- The TAPS in the southern portion of the district have particularly high accessibility.
- The Century City region and surrounding area has best accessibility the district.
- The precincts surrounding the Paarden Eiland MyCiTi stations also have good accessibility.
- The Blaauwberg Road, Parklands Main Road, Koeberg Road and Sandown Road corridors all perform well in terms of overall accessibility.

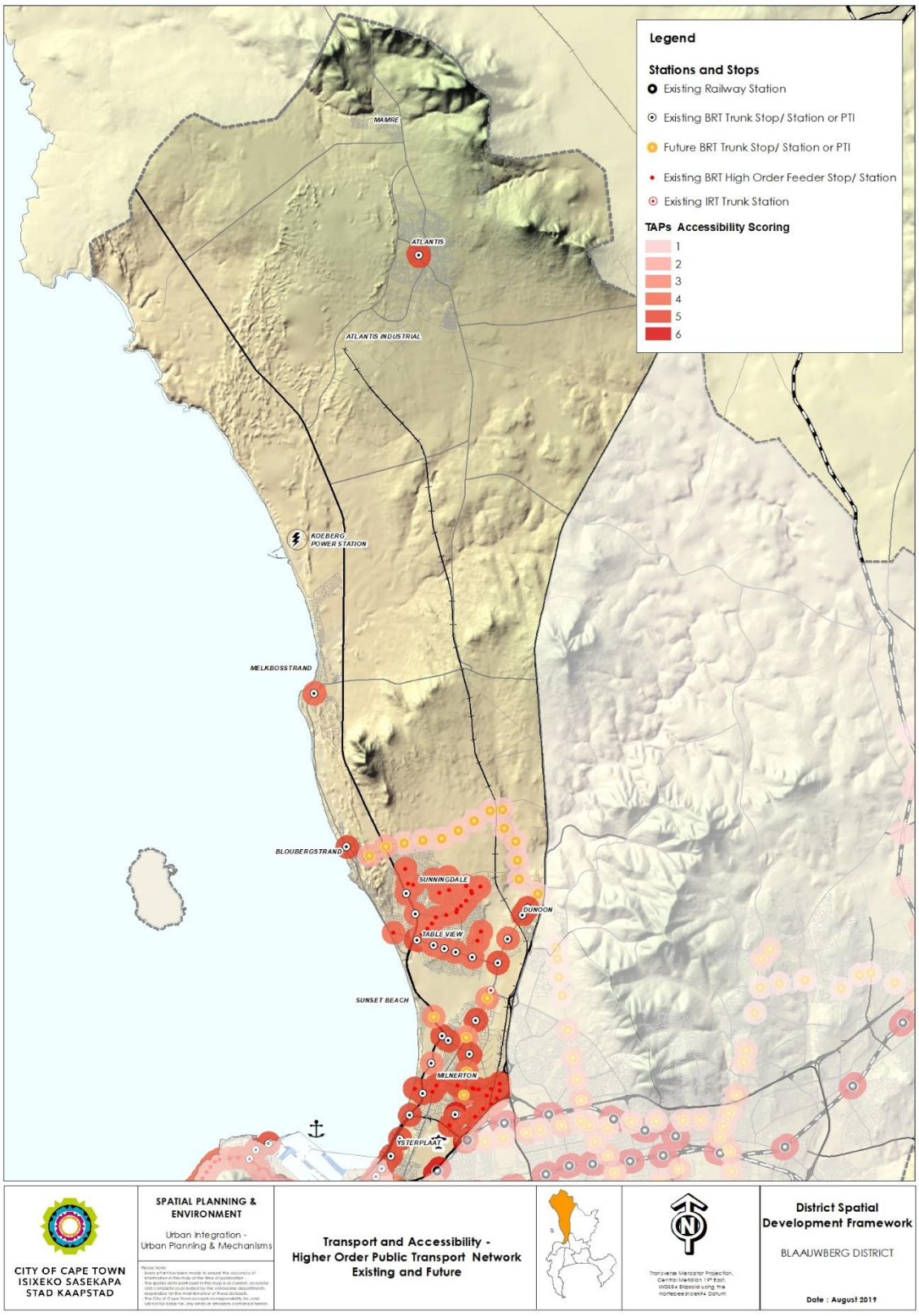


Figure 6.4: TAPs Accessibility Rating

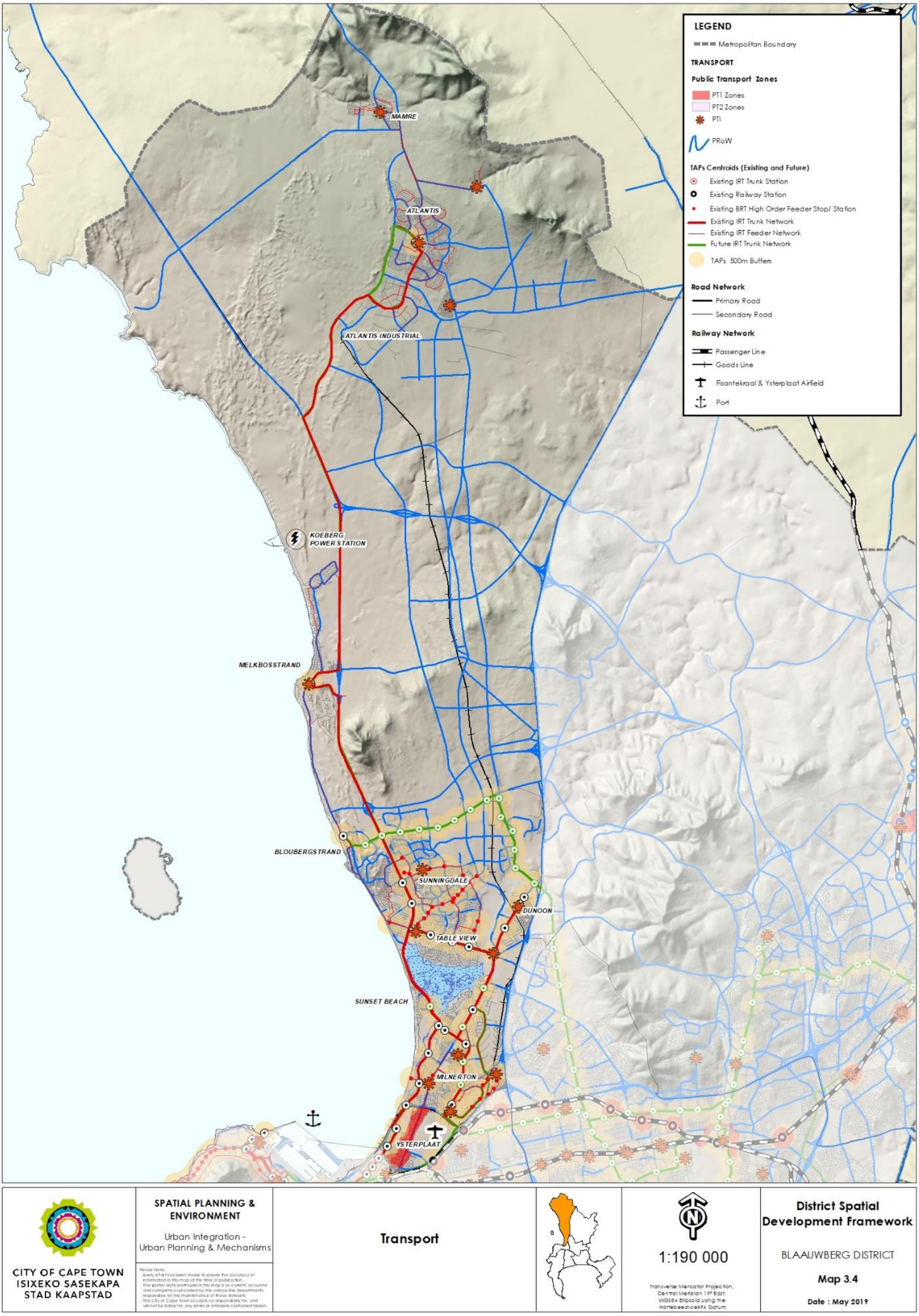


Figure 6.5: Current Public Transport and related infrastructure

6.4 State of Road Infrastructure

6.4.1 Overview of the district road network

Road infrastructure in the Blaauwberg district is characterised by strong north-south routes (R27, Koeberg Road, R304 and N7) and a limited number of east-west routes (Melkbosstrand Road, Blaauwberg Road via Plattekloof Road, Racecourse Road via Montague Drive and Bosmansdam Road) linking the coast (R27) to the internal north-south mobility route of the N7. As a result of limited east-west linkages, congestion on the north-south routes of the R27 and Koeberg Road is exacerbated, particularly at the interchanges of R27/Blaauwberg/Koeberg Road, as well as at interchanges with the N1. North-south trip movements are largely as a result of residents accessing job opportunities in the City centre and the Bellville node. Congestion is therefore also partly caused by the limited number of job opportunities in the district.

6.4.1.1 Roads constructed over the past 5 years

The following projects have been completed outside of the MyCiTi implementation: Berkshire Boulevard from Sunningdale Drive to Wood Drive; Oaklandshill Road from Braselton to Wood Drive; and Wood Drive from Sandown Road to Berkshire Boulevard.

6.4.1.2 Current road projects

The dualling of Sandown Road – Sunningdale Drive to N7 (Potsdam Interchange) is part of the MyCiTi trunk and feeder rollout (see below).

The following projects have been completed outside of the MyCiTi implementation: Dualling Bosmansdam Road from Montague Drive to Koeberg Road, and the construction of Tryall Road from Wood Drive to Dorothea Drive.

6.4.1.3 Historic Road Schemes to be reviewed

The only notable historic road scheme in this district is the extension of Prestige Drive through Ysterplaat and along Piet Grobler Street in Brooklyn. This is a planned MyCiTi trunk route (T17), linking Khayelitsha to Century City, so is likely to remain.

6.4.2 Congestion Management

The following sections of road within the Blaauwberg District have been identified in the top 40 prioritised areas in the Congestion Management Strategy:

- The N1 between Vanguard Drive and Sable Road
- The N7 between Bosmansdam Road and Plattekloof Road
- Malibongwe Drive and Sandown Road
- Koeberg Road, north of Plattekloof Road
- Link Road between Montague Drive and the N7

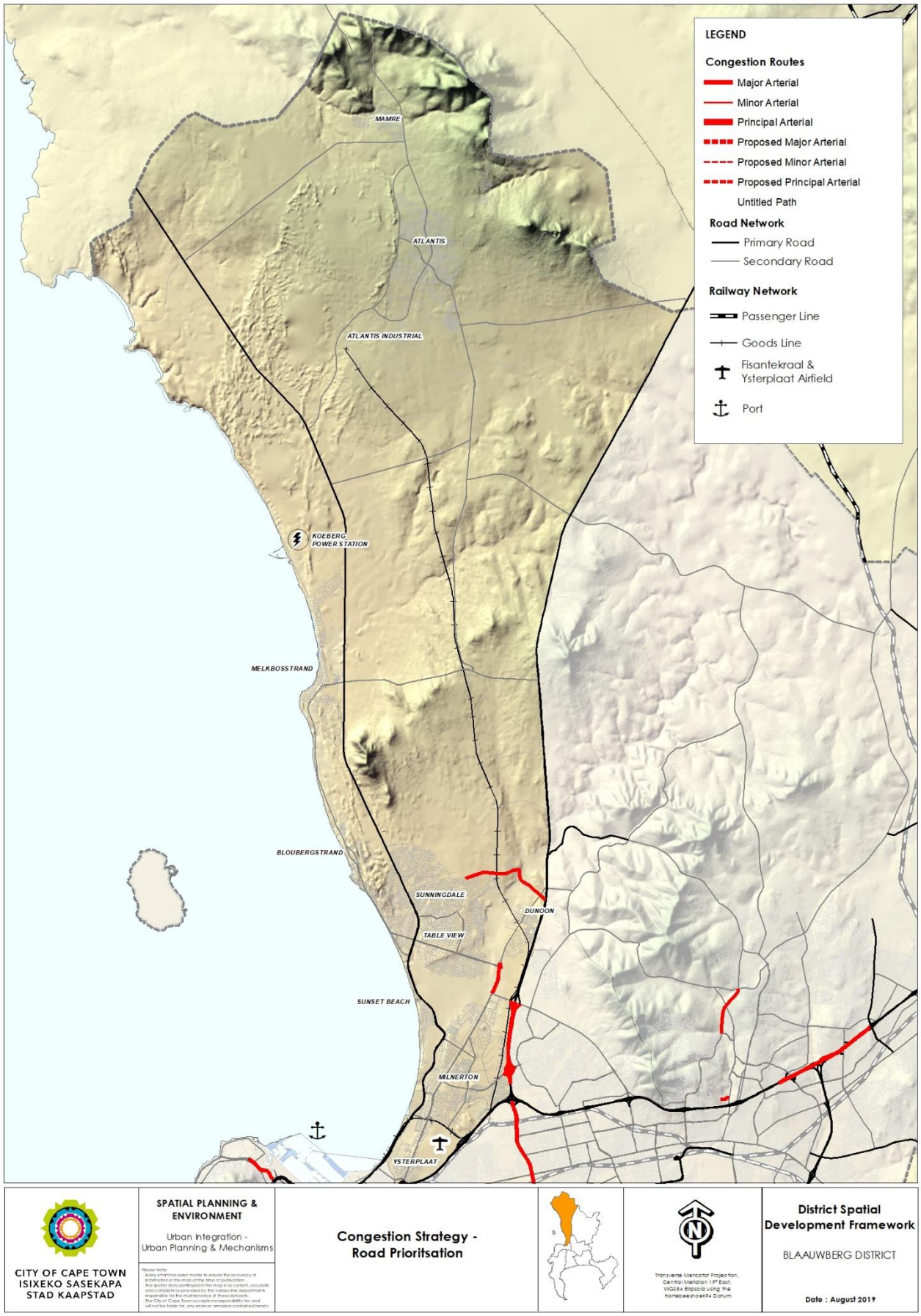


Figure 6.6: Congestion Strategy road prioritisation

6.4.3 Parking

Parking provision in the Blaauwberg district is becoming a problem, specifically in the following areas:

- In Montague Gardens and Killarney Gardens industrial areas, vehicles are parked on verges;
- At apartment complexes in Blaauwberg Road and Porterfield Road cars park on the wide verges;
- In Grey Avenue, Table View, MyCiTi users use the section between Blaauwberg Road and Arum Road as a park-and-ride;
- In Millvale Road, Milnerton and Table View Mall, Table View, the shopping centre's parking area is being used by MyCiTi passengers as a park-and-ride facility;
- At Wesfleur Circle, Atlantis, insufficient parking and taxi facilities exist;
- There is inadequate parking at guest houses with cars parking on the verges.
- In Parklands, Montague Gardens and Atlantis, efforts to improve pedestrian access are being thwarted by parking on sidewalks. While this is a parking management and enforcement Issue, the DSP needs to take cognisance of potential NMT/parking conflicts, and protect the NMT right of way.
- Parking in PT zones must be monitored and evaluated.
- The level of utilisation of park-and-ride facilities must be recorded, analysed and monitored.

6.4.4 Planned Road Infrastructure

6.4.4.1 Required in the short term (5 years)

- Extension of Tryall Road
- Extension of Berkshire Boulevard
- Extension of Koeberg Road
- M12 Sandown Road to Enterprise Way
- R27 dualling between Tryall Road and Berkshire Boulevard

6.4.4.2 Required in the medium term (10 years)

- Extension of Berkshire Boulevard to the N7
- Extension of M12 to Berkshire Blvd
- East West Arterial

The map below (Figure 6.7) shows the existing plans for future public right of way improvements (roads and streets).

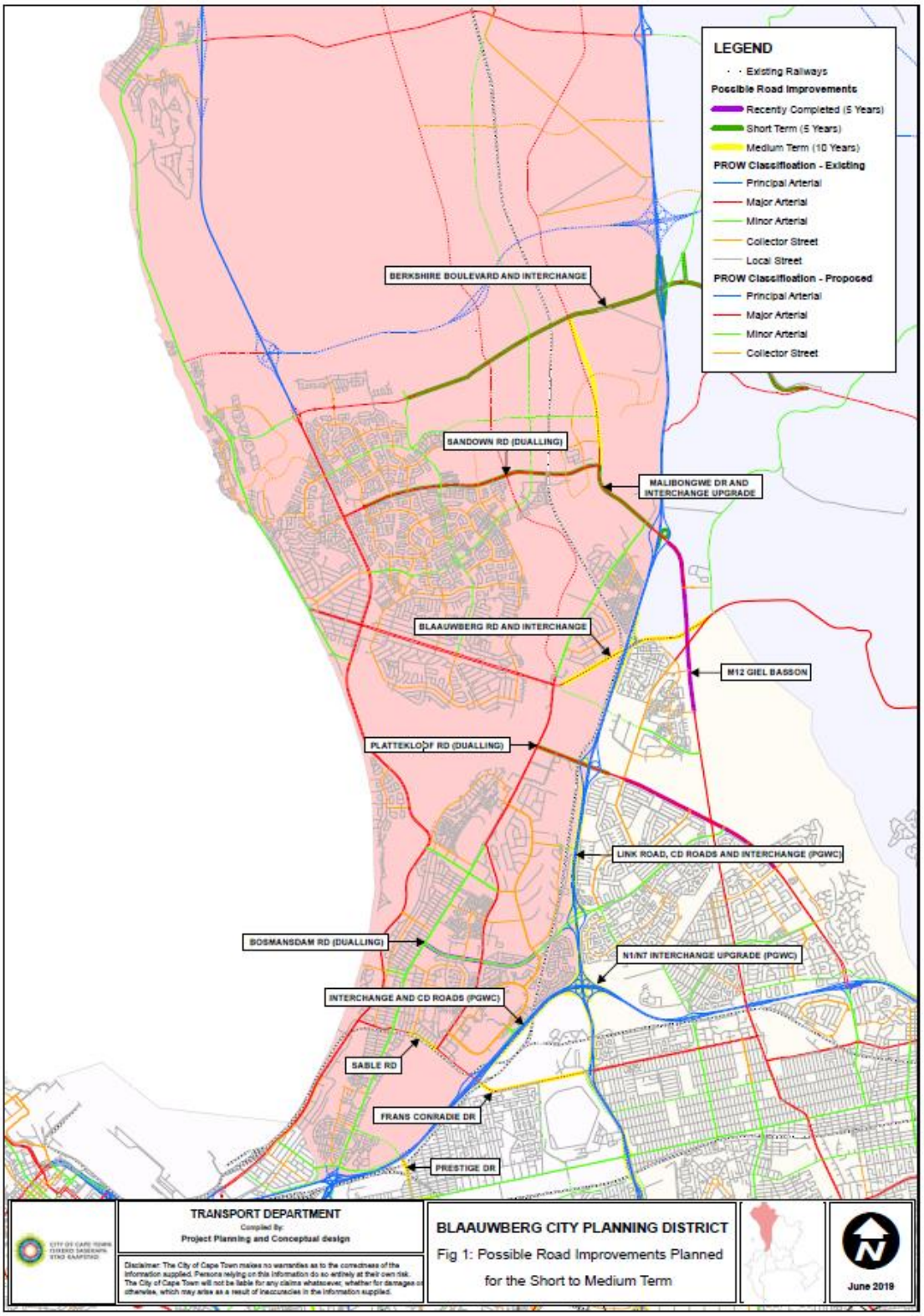


Figure 6.7: Planned road/street improvements planned in the short to medium term

6.5 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 in Figure 6.8. The largest volumes are clearly 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.

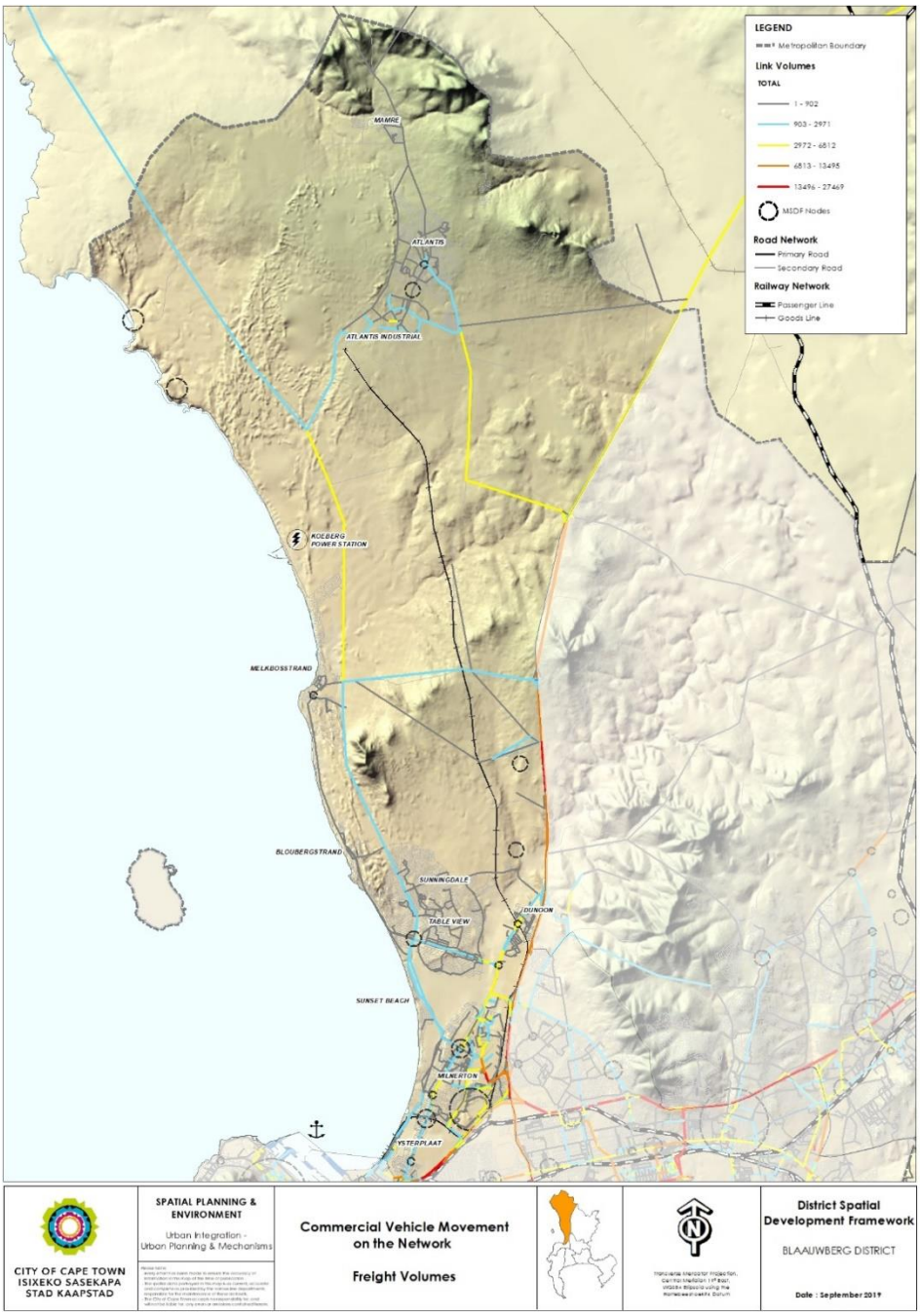


Figure 6.8: Road Based Freight Volumes

The map in Figure 6.8 shows that the district experiences road-based freight movement from the port along the N7 on its boundary to as far as Namibia, but also servicing the industrial areas within the district (Montague Gardens and Killarney Gardens totalling about 478 ha, according to the CITP 2018-2023).

There is currently a single goods line between the Port and Atlantis, via Montague Gardens, managed by TRANSNET, which is currently under threat due to encroachments adjacent to Du Noon.

6.6 Travel Patterns

The section examines the current travel behaviour of residents in Blaauwberg taking to account the current spatial form of the district in relation to greater city and the state of transport discussed in sections 6.3 - 6.5.

6.6.1 Current Travel Patterns[6]

The travel demand patterns and origin/destination maps for the Blaauwberg District are exhibited in Figure 6.9 and Figure 6.10, which depicts the travel behaviour of residents in Blaauwberg. The following travel patterns for the district as whole are observed:

- Development is thinly spread across the district, with the major trip attractors concentrated at the south end adjacent to the N7.
- This results in long average trip distances for those living throughout the district, with many having to move out of the district for work, education and other services.
- Atlantis is isolated from the rest of the city, but is managing to house a fairly even ratio of trip generators to trip attractors. However, many Atlantis residents are still having to move out of the area for work and education.

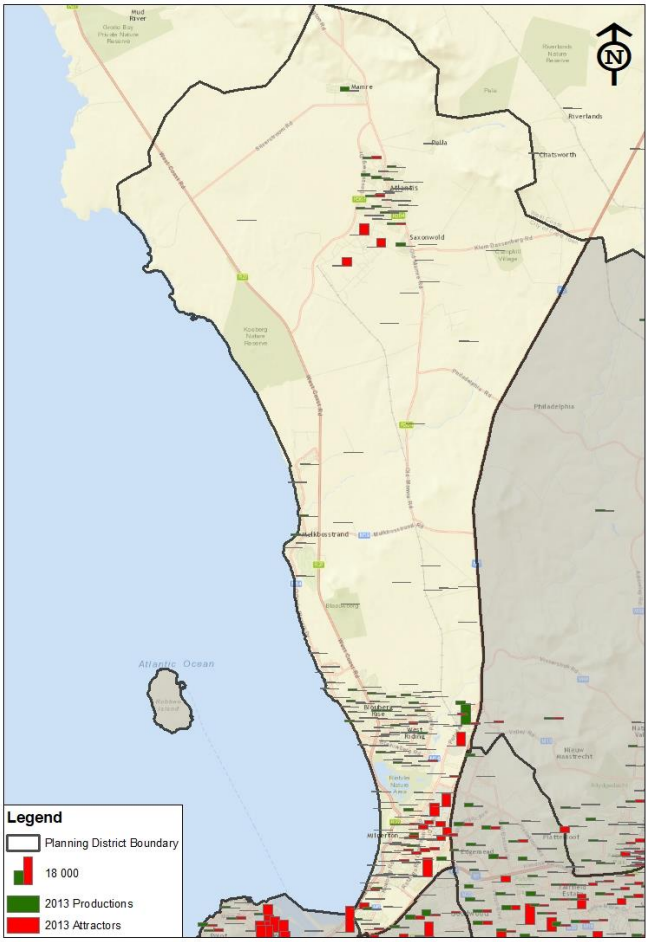


Figure 6.9: Base Year Trip Generators and Attractors (2013)

[6] EMME Transport Model: Demand (base year: 2015)

6.6.2 2015 Origin and destination movements

The peak period demand desire lines between planning districts are shown on origin-destination maps for the Blaauwberg District. Red lines show trips into the district while blue lines show trips originating from the district. Figure 6.11 and Table 6.2 shows the breakdown between public transport and private car trips. The following patterns are highlighted:

- Public transport accounts for two thirds of motorised trips within the district. The MyCiTi service accommodates close to 45% of these trips.
- Many residents travel outside the area, mainly to the Table Bay district. Public transport accounts for the majority of outbound trips from the district. Modal share varies between districts.
- Between 2010 and 2013 a shift to predominantly public transport utilisation as opposed to private vehicle utilisation occurred, facilitated in part by the MyCiTi service.
- The district attracts trips primarily from the Tygerberg District. There is an approximately 50:50 split between public transport and private car usage for these trips.
- Significant trips are also attracted from the Khayelitsha/Mitchells Plain area. The majority of the trips from this region are made using public transport with only 6% of trips made by private car.

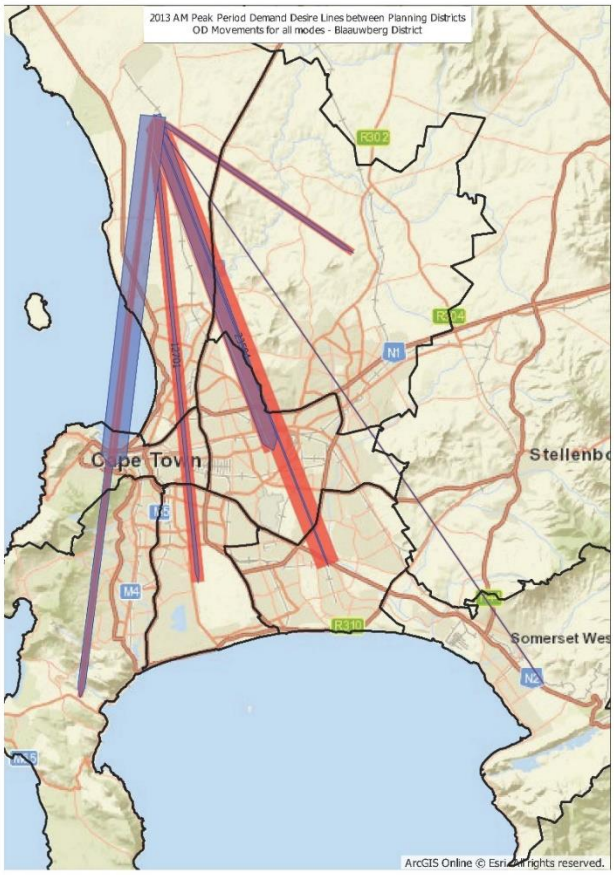


Figure 6.10 2013 Morning peak period demand desire lines for all modes: origin-destination

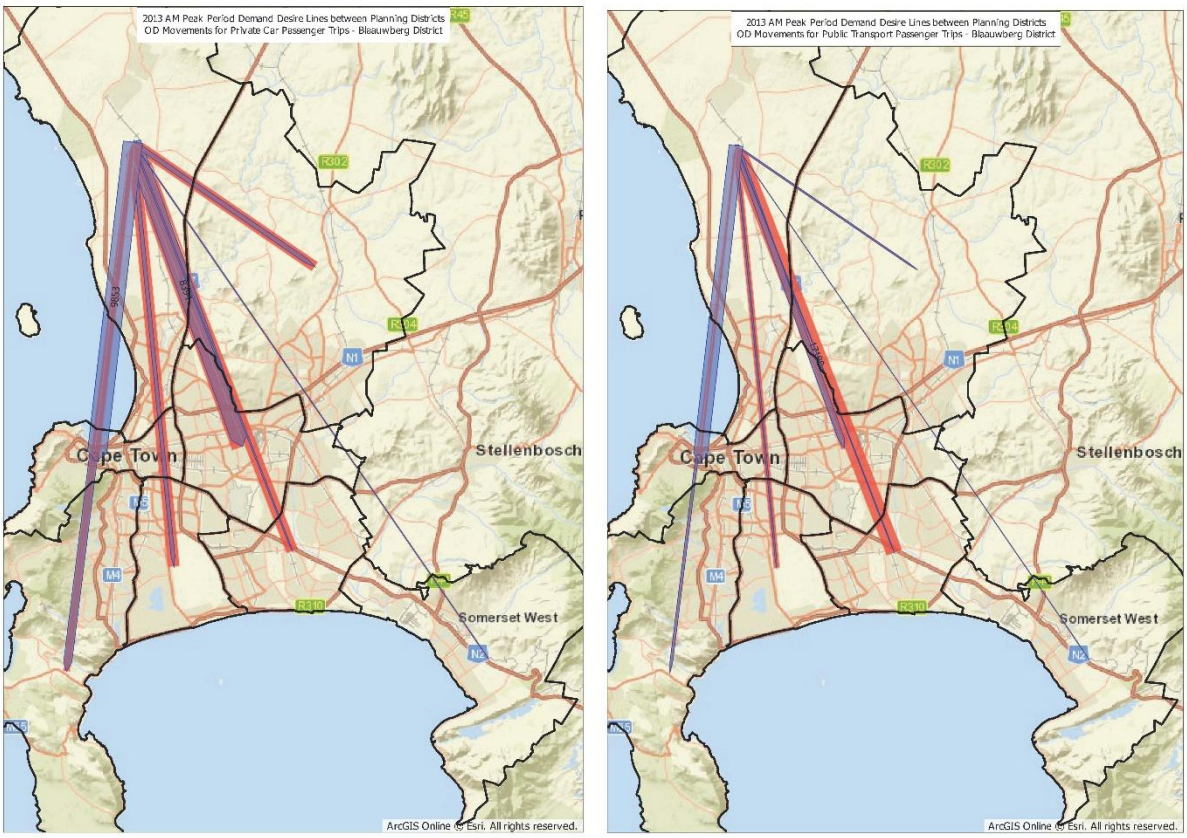


Figure 6.11 2013 Morning peak period demand desire lines for (a) private cars and (b) public transport: origin-destination

Table 6.2: Transport Modal Split for trips between Blaauwberg and other plannign districts

Origin	Destination	NMT	Car	Taxi	Bus	BRT	Train	Public Transport	Total
Blaauwberg	Table Bay	586	6306	1679	1226	2395	389	5689	**12581**
Blaauwberg	Northern	61	390	304	311	3	32	650	**1101**
Blaauwberg	Tygerberg	167	569	1195	1360	42	230	2827	**3563**
Blaauwberg	Helderberg	0	42	85	82	1	15	183	**225**
Blaauwberg	Khayelitsha / Mitchells Plain	0	28	49	58	72	32	211	**239**
Blaauwberg	Cape Flats	5	162	284	290	2	168	744	**911**
Blaauwberg	Southern	42	688	574	549	9	254	1386	**2116**
		861	**8185**	**4170**	**3876**	**2524**	**1120**	**11690**	
Blaauwberg	Blaauwberg	2837	4585	2235	2737	3998	73	9043	**16465**
Table Bay	Blaauwberg	53	1511	412	258	261	334	1265	**2829**
Northern	Blaauwberg	2	2505	441	254	6	258	959	**3466**
Tygerberg	Blaauwberg	179	3951	2295	911	11	753	3970	**8100**
Helderberg	Blaauwberg	0	877	1359	721	1	108	2189	**3066**
Khayelitsha / Mitchells Plain	Blaauwberg	0	351	2133	1967	1030	396	5525	**5877**
Cape Flats	Blaauwberg	7	1041	1832	973	7	382	3194	**4242**
Southern	Blaauwberg	7	1503	428	254	18	459	1160	**2669**
		248	**11739**	**8900**	**5338**	**1334**	**2690**	**18262**	

6.6.3 Cost of Travel

The non-bidirectional movement of travel during peak periods results in an inefficient and costly use of public transport.

6.6.3.1 User costs

The increasingly unsustainable cost of transport for low income households, as revealed by the City's TDI (2014) the average ratio of direct transport cost versus income for the low income PT user group is estimated at 43.1% of the monthly household income. This is much higher than the national norm of 10% as stated in the White Paper on National Transport Policy.

The newly-developed Urban Development Index (UDI) measured the cost of travel for different income groups, different travel modes, and to the top 5 destinations. It revealed that in Melkbosstrand, low income groups spends an average of 42% of monthly income on direct costs using private transport, and 27% using public transport. Public transport costs to the low income group as a percentage of income vary from 8% in the Paarden Eiland area, to 24% in Atlantis and 27% in the Melkbosstrand / Blouberg area.

The district also experiences some of the highest average travel times[7] to the top 5 destinations in the city: 32min by private car from the Blouberg area, 42min by minibus taxi from the Table View area; and 51min by MyCiTi from the Koeberg area.

The Koeberg area also experiences the furthest average travel distance by public transport compared to any other part of the city to the top 5 destinations: 35km.

6.6.3.2 Operational costs

Table 6.3: Funding based on existing grant framework (constant 2014 Rands) (Source: Table 7-8: IPTN Business Plan, 2017)

	2014/15	2015/16	2016/17	2017/18
Deficit before funding (System revenue - system costs)	**-519 877**	**-486 743**	**-489 501**	**-484 583**
PTNOG	193 135	206 302	150 924	151 789
PTOG (re-assigned)	0 *	37 275	37 275	37 275
City rates contribution set at 4% of rates	237 701	237 701	237 701	237 701
Unfunded deficit	-89 042	0	-51 238	-45 454

* PTOG for 2014/15 not reflected since assignment has not yet been confirmed. Assumed that PTOG is re-assigned in future years.

There is a high cost to operate public transport in a sprawling urban environment. If the travel demand patterns in the city endure it will translate into a deterioration of the recurrent annual operating deficit for the whole system by approximately R1 billion (IPTN Business Plan, 2017). For Blaauwberg, the 2015 MyCiTi Business Plan for Phase 1A and the N2 Express projected a R52 million deficit, after accounting for fare income and subsidies.

6.6.3.3 Environmental and Economic costs

[7] Measuring the in-vehicle time spent on the main mode of travel

- 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: After energy consumption, transport accounts for the second largest contributor to Cape Town's emissions profile, constituting almost 30% of citywide emissions.

Congestion currently costs Cape Town **R2.8 billion per year** and puts serious constraints on economic growth and development.

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

While travel demand can be managed to a degree, ultimately the most important factor to improve the cost of public transport is improved land use (optimised trip generation and attraction in the required location). An optimum mix and intensity of urban activity should be strategically located along existing and planned higher-order public transport infrastructure to improve the ratio of peak to off-peak services, stimulate greater seat renewal and reduce the extent of tidal flow.

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 areas, which are located far from existing trip attractors, needs to be countered/matched by new non-residential (/ trip-attracting) land uses in order to achieve this goal.

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

The following features for the district as whole are required:

- Century City and the industrial areas to the north thereof must expand as significant trip attractors, and thus require good connectivity to other parts of the city (particularly those districts with strong trip generation).
- Atlantis should be enabled to meet its own needs internally, with a "live-work-play" planning premise, to reduce the need for the long commute to the rest of the metropole.

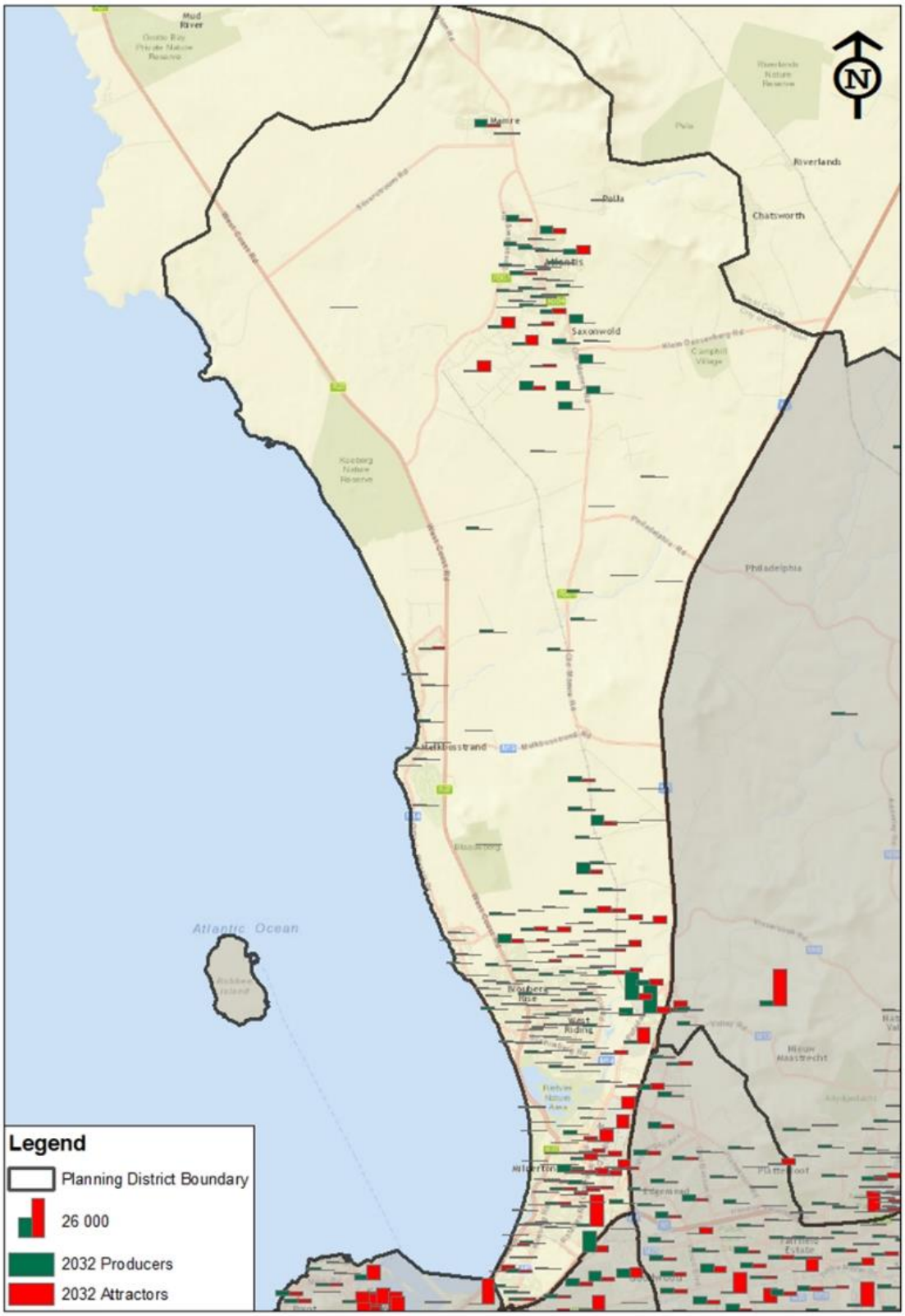


Figure 6.12 Future trip producers and attractors: 2032

6.7 Key Challenges and Opportunities

6.7.1 Constraints

Sprawling Urban Environment

The pattern of urban development in the Blaauwberg district is dispersed due to the topography, the occurrence of protected natural areas, …, which results in long average trip distances and movement patterns that remain strongly tidal making the provision of public transport and road infrastructure expensive and inefficient. This expansive urban environment results in a high cost to operate public transport efficiently.

Congestion

- Inefficient travel patterns are responsible for increasing negative environmental impacts through increased CO_2 emissions and energy consumption
- The rail line through the district operates as a goods line, but the rail reserve is under threat of invasion, partly due to the fact that it has been underutilised.
- Limited east-west linkages in the road network exacerbates congestion on the north-south routes of the R27 and Koeberg Road. The interchanges of R27/Blaauwberg/Koeberg Road, as well as interchanges with the N1 experience particular congestion.
- The Koeberg Nuclear Emergency Plan regulates the population size, and the nature and intensity of development in the Precautionary Action zone (within 5km of the nuclear reactor), and the Urgent Protection Action zone (5-16km radius), and requires significant "over-design" of the road network which is not in line with the City's TOD aspirations.

6.7.2 Opportunities

Points of high accessibility

- Century City and industrial areas to the north thereof act as significant metropolitan trip attractors.
- Several areas within the district are highly accessible. The southern part of the district is particularly well-located in terms of access to opportunities, and transport.

Existing Public Transport Network

- The Blaauwberg District has the most extensive roll-out of the MyCiTi bus rapid transport infrastructure and services in the city, with the majority of the network in place and operational. The MyCiTi service accounts for a large proportion of public transport trips within the district (Approximately 44%).

6.7.3 Spatial Implications

At a district scale, while the presence of good transport infrastructure and services is attracting "greenfield" developments to the north of the district, this is contrary to the growth management principles in the CTMSDF.

As this district has vulnerabilities, it may well be worthwhile aligning 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?

At a local scale, the development of the nodes around MyCiTi stations, and the management of parking in a way which enforces economic opportunities there, needs to be carefully considered.

The current state of mobility is unsustainable with the barriers of cost and inefficiency entrenching economic exclusion.

Inefficient urban form with low densities and singular land uses

7 INFRASTRUCTURE

The follow section examines the current provision of infrastructure provision in the city for electricity, water, sanitation and stormwater.

7.1 Electricity

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 120 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 1 and 2, which have different geographical delineations when compared to the substation supply areas.

Table 7.1: Definitions 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

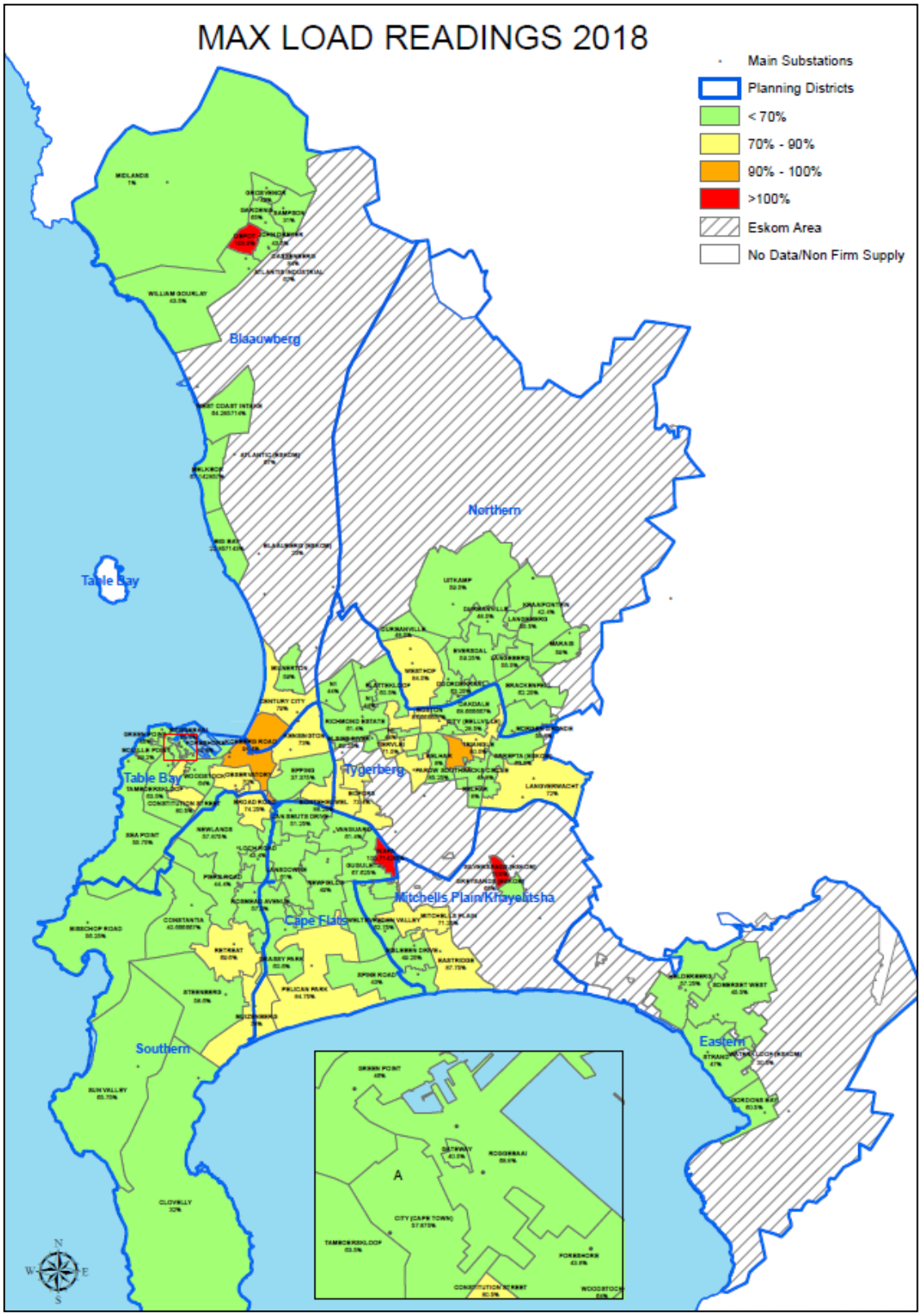


Figure 7.1: Substation Loading 2018

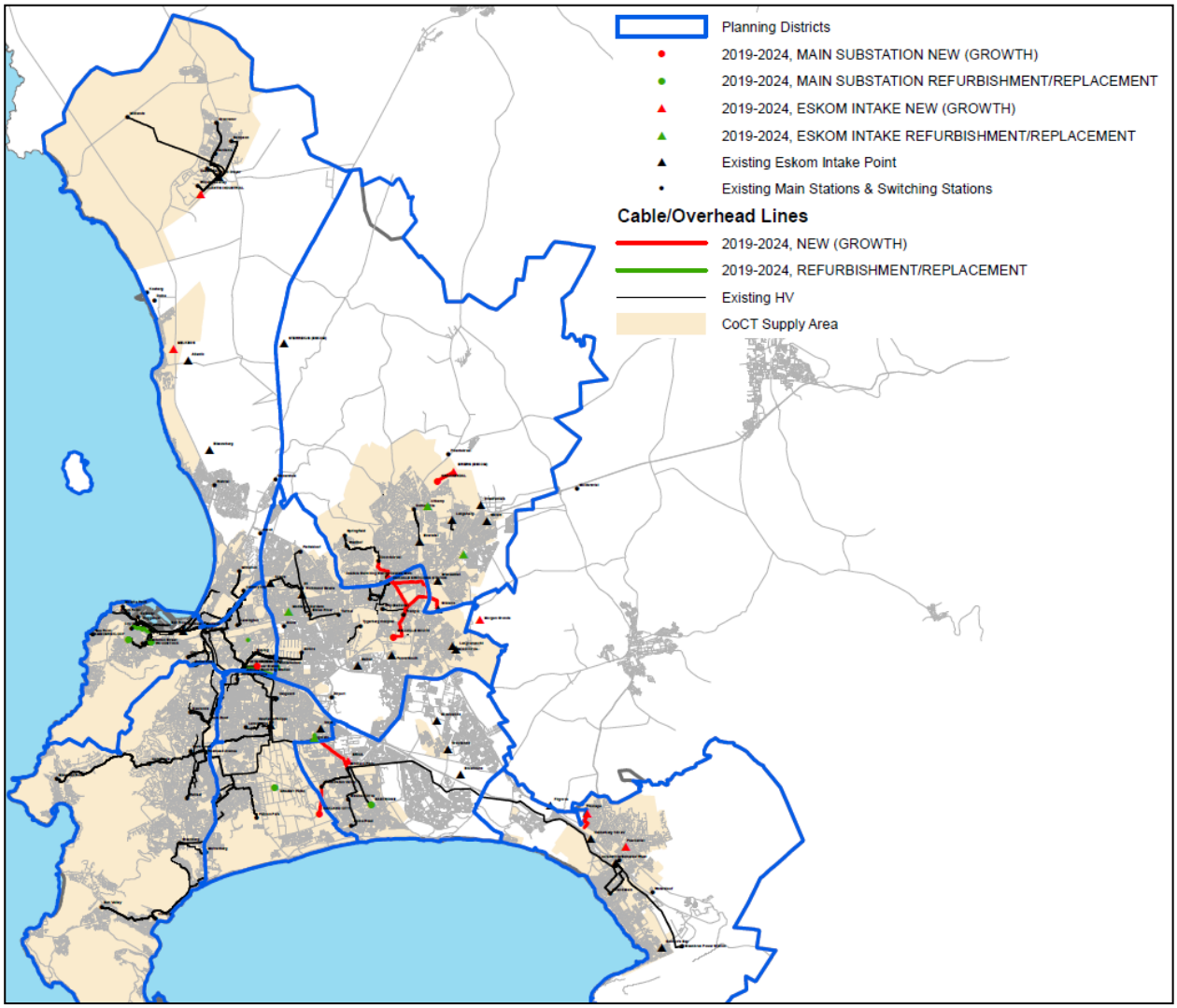


Figure 7.2: Proposed electricity infrastructure projects

In **Blaauwberg district**, there is one area in Atlantis with **severe lack of capacity** and a **slight lack of capacity the** Paarden Eiland area.

The rest of the District has **adequate** or **spare capacity**:

A new Eskom intake point was created in Atlantis to handle the lack of capacity and projects are being planned to transfer load to the new intake point.

7.2 Water

For the purposes of this project bulk water infrastructure included 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 impacts of the drought in terms of water infrastructure and provision have not been accounted.

Table 7.2: 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 Blaauwberg, the following areas have a **severe lack of capacity**:

- The Milnerton Reservoir's supply zone in the Table View, Montague Gardens, Richwood and Dunoon area. The whole of Table View, Blouberg, Parklands and Du Noon – predominantly residential areas
- The area serviced by the Milnerton Reservoir, including:
    - Most of Table View, Blouberg and part of Parklands
    - All of Milnerton, Sunset Beach to Woodbridge Island and Du Noon – predominantly residential areas
    - Killarney Gardens and Paarden Eiland Industrial and the oil refinery.

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

- Blouberg to Big Bay
- Klein Duesenberg and Vissershok Smallholding area
- The whole of Melkbosch, Atlantis western area around the town centre, Witsands area – Residential town

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

- Mamre, Pella-Katzenberg, Most of Atlantis including Atlantis Industrial
- Summer Greens, Sanddrift, Tijgerhof, Rugby, Brooklyn, Joe Slovo – predominantly residential areas
- Marconi Beam Industrial/Warehousing, Century City and Ysterplaat Airbase
- Koeberg Nuclear Power Station
- Parklands, Sunningdale and Rivergate went through a detailed planning process with. With localised master planning on water and sewer infrastructure. So many of the sub areas have adequate bulk supply infrastructure in place. Link services are being provided as development roles out.

7.2.1 Current and planned work

The major concern is the Potsdam wastewater treatment works. Upgrade is planned and is expected to be in place by 2026 – sized for the next 20-30 years

Atlantis and surrounds

- A single supply serves Mamre and there is a need to augment supply from Pella to Mamre.
- During the drought there was an effort made to expand the well feels of Atlantis which made the area self-sufficient in terms of ground water- Enabling production of 15-20Ml/d. so no need to draw from the city bulk water system. There is a plan to expand the extraction capacity over the next 5 years for an additional 20ML/d that could be injected into the city system. Extraction rate testing is also ongoing.
- The well system also makes use of treated effluent from the Atlantis WWTW to recharge the aquifer.
- The ground water extraction infrastructure is ageing so the maintenance programme is critical and expensive.

7.3 Sanitation/ Waste Water

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 7.3:Definitions of 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 Blaauwberg, the following areas have a **severe lack of capacity**:

- Mamre, Melkbosch, Big Bay, The eastern part of Table View, Parklands, part of Sunningdale, Sunset beach to Woodbridge Island, Milnerton and Brooklyn – predominantly residential areas
- Paarden Eiland – Industrial/Warehousing

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

- The south western portion of Atlantis Industrial
- Table View western portion and Blouberg – Residential

- Northern area of Melkbosch, most of Atlantis including Atlantis industrial, Pella-Katzenberg - All these areas drain to Potsdam WWTW which is reaching capacity. Upgrade of Potsdam is planned. Additional 50 Ml/d will be in place by 2025/6

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

- Ysterplaat Air Base
- Century City, Rugby, Tijgerhof, Summer Greens, Joe Slovo – Residential
- Marconi Beam, Montague Business park – Industrial and Warehousing
- Killarney Gardens Industrial
- North eastern corner of Parklands into Rivergate southern portion - residential/industrial
- Wesfleur WWTW has spare capacity and will not be considered for expansion in the next 3 yrs.

There is also a large project with an EIA in hand but awaiting implementation (Northern Biosolids Beneficiation Facility) under WWT's control. This project can be considered "alternative service delivery infrastructure", which is not noted in terms of specifics, even though there is mention of this term in another document

7.4 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, builders rubble, recyclables, household hazardous waste)
- Buy-back centers
- Fleet (Workshop, Collection vehicles, Cleansing vehicles)
- Material recovery facilities
- Alternative treatment technologies

In this district, the potential land use requirements for SWM are significant (will depend on the outcome of court proceedings regarding the location of the planned landfill).

The information is based on data from 2019

Table 7.4: 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.	Landfill sites are not area bound. The city only has 3 operational landfills. Due to Limited capacity at landfills, based on license conditions.

	Excludes regional landfill site of which the authority is under consideration.	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 sustainably managed and compliant with License Authority regulated audits. The Regional landfill will receive most household/business waste via refuse transfer stations
Refuse transfer stations (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	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

	to improve accessibility.	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.
Material Recovery Facilities (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.

7.5 Stormwater

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 Blaauwberg, the following areas have a **severe lack of capacity;** mainly due to the areas being very flood prone:

- Paarden Eiland Industrial area;
- Brooklyn – Residential

Two key planned projects in the Blaauwberg district, that provide additional capacity include the following:

- The Bay side canal will reduce flood risk and also reduce pollutants entering Rietvlei.
- The Big Bay outfall will be required when the area north and east of Table Bay mall is developed.

Water quality is the biggest concern in the district, which deteriorates annually. This is due to inadequate service provision in the catchment and regular sewers spills. This issue is is currently in the process of being addressed by the infrastructure line department.

7.6 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.

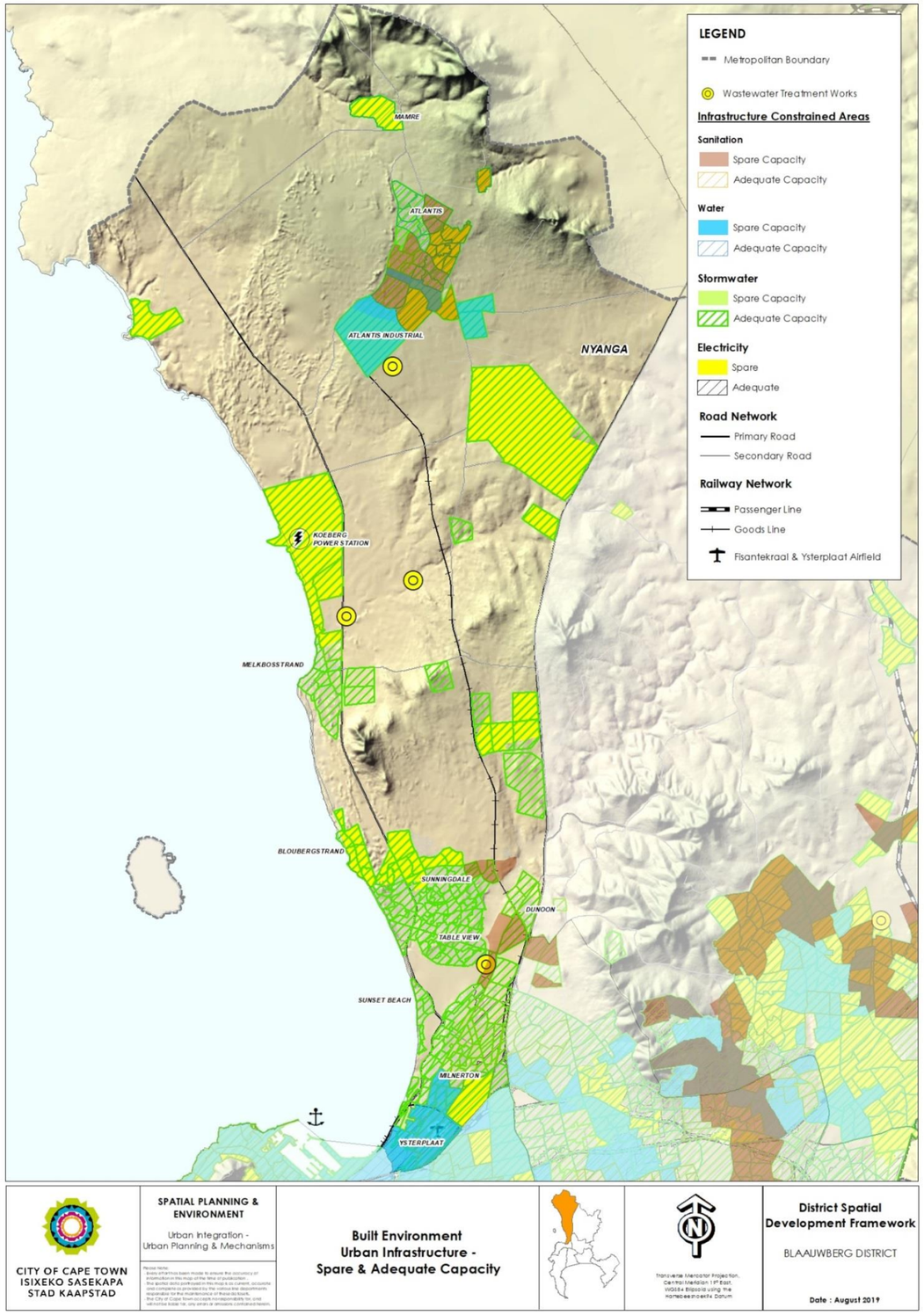


Figure 7.3: Map showing lack of capacity of bulk infrastructure

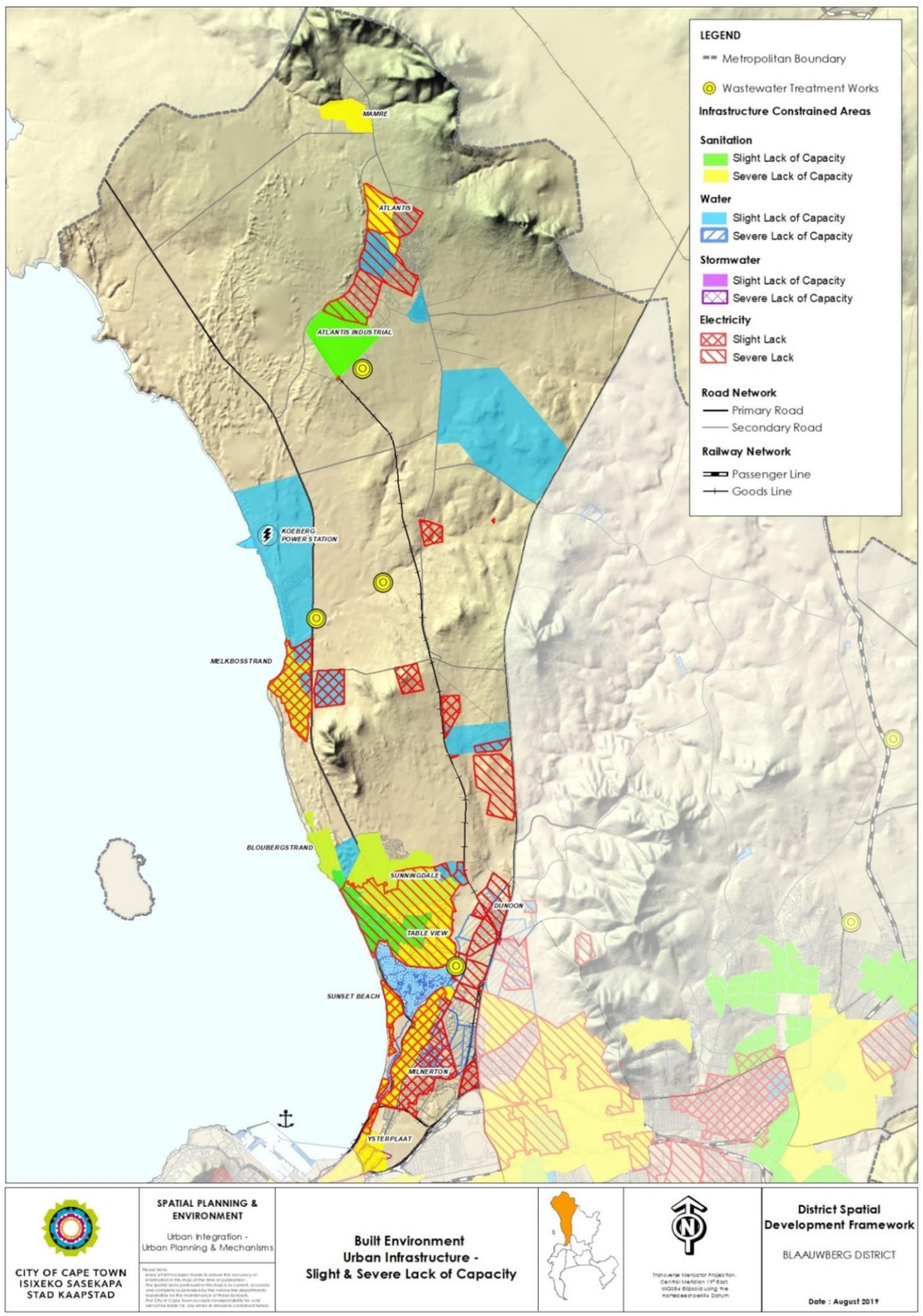


Figure 7.4: Map showing spare and adequate capacity of bulk infrastructure

8 HOUSING

The concept of integrated human settlements goes beyond providing housing only. It entails 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 only one of the basic infrastructure components required to build integrated and resilient communities (see Figure 8.1 below). Housing must be integrated within areas through housing mix, typologies, design and income, and be close to transport routes supporting transit-oriented development.

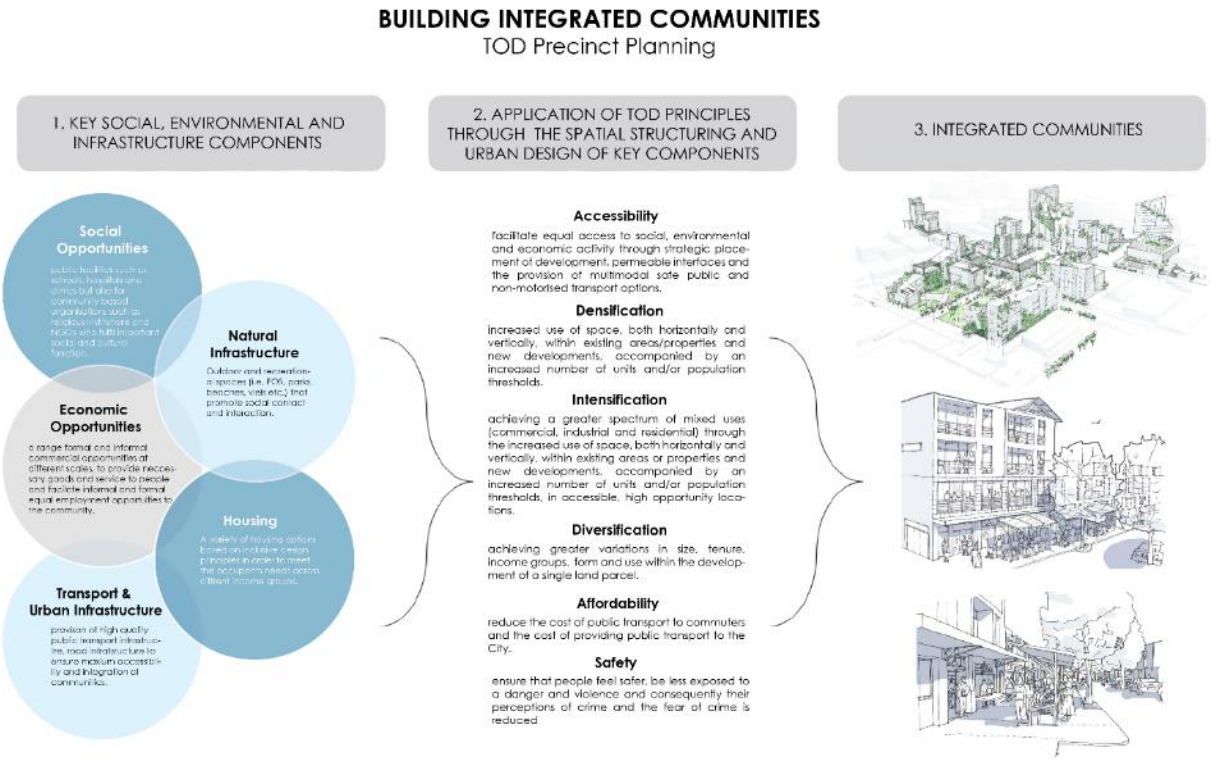


Figure 8.1: Building integrated communities

8.1 Housing Overview

8.1.1 Type

In 2011, there were a total of 87 517 dwellings. Of that total 76% were formal dwellings and 18% informal dwellings. As per Figure 8.2 the formal dwelling typologies are predominantly freestanding houses or flats. The district has a small number of semi-detached and town houses (approximately 5%). The table and chart below give a detailed breakdown of dwelling typologies. The spatial distribution of the various formal typologies is shown in the accompanying map.

The residential informal structures in the Blaauwberg district are also mapped. These are based on the 2017 informal door and roof count. The areas in the district with the vast majority of informal dwellings are Witsand near Atlantis, Joe Slovo, Race Course and Du Noon.

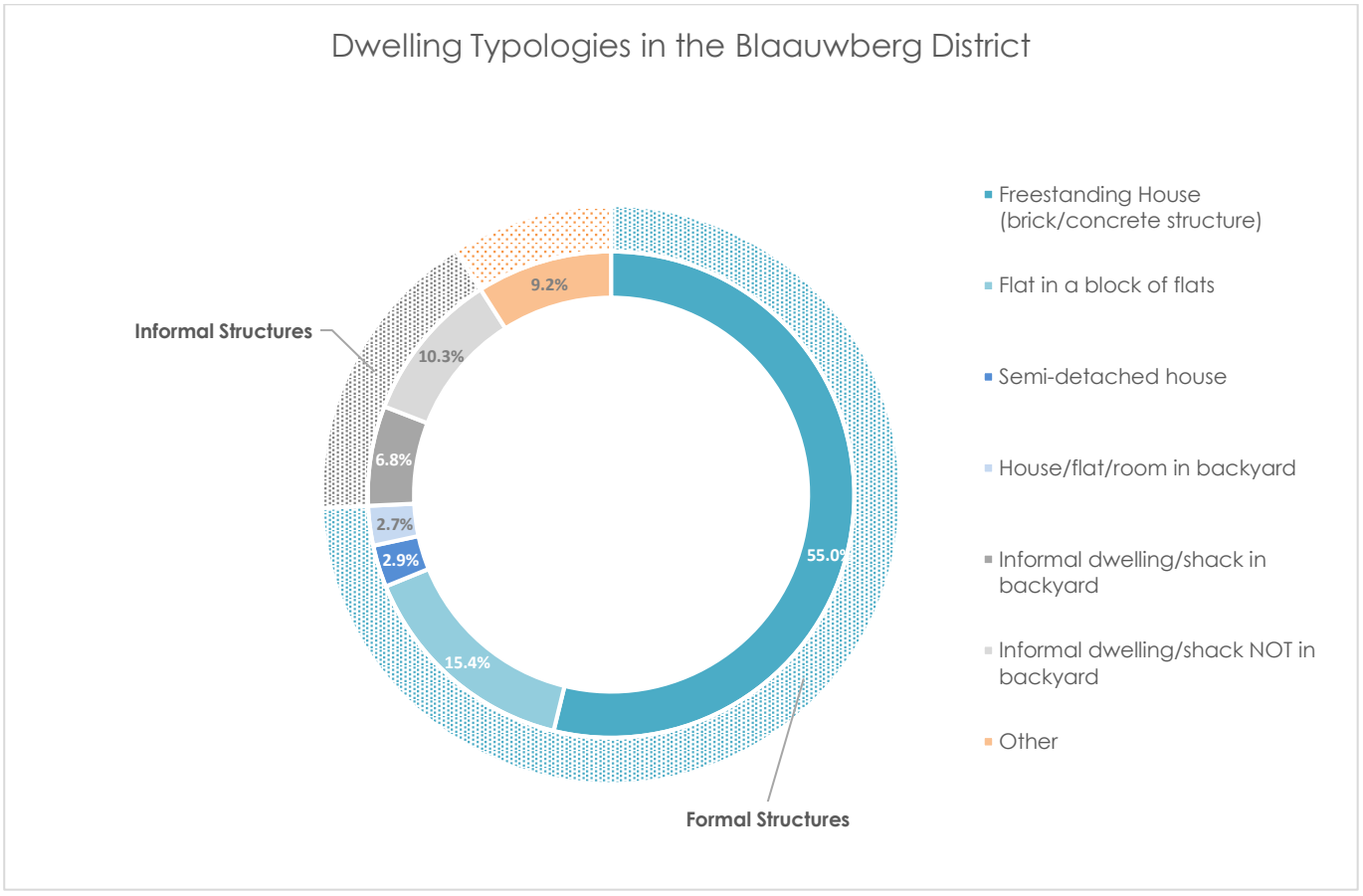


Figure 8.2: Chart showing Formal versus Informal Dwelling Typologies

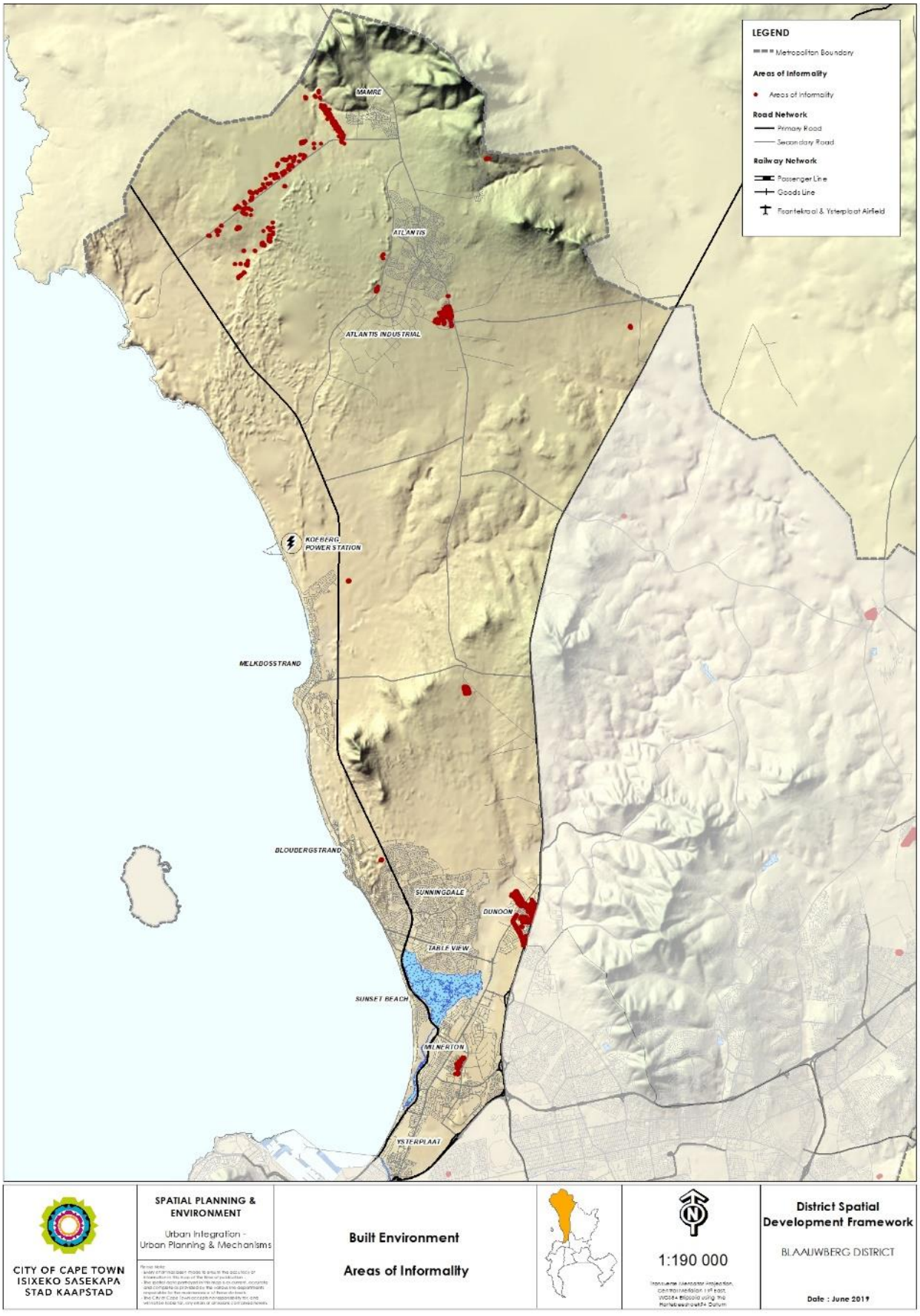


Figure 8.3: Map showing Informal Structures in the Blaauwberg District (Informal Structure Count, 2017)

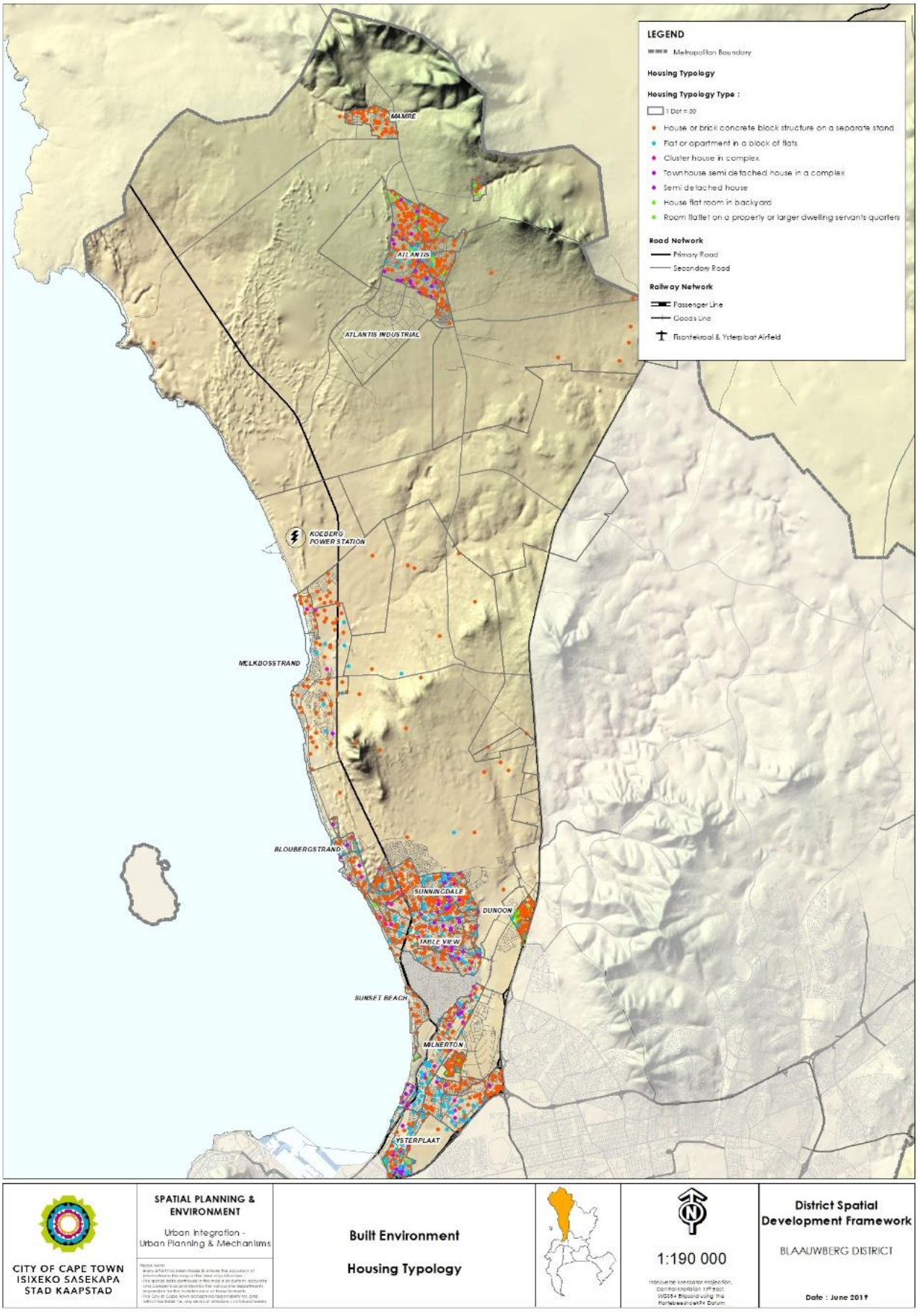


Figure 8.4: Map showing distribution of Formal Household Typologies in Blaauwberg (Census, 2011)

8.1.2 Tenure Status

Just over half of the households in Blaauwberg own their house while over a third of households rent.

Table 8.1: Tenure Status in Blaauwberg District (Census 2011)

Tenure Status	Number	%
Owned and fully paid off	22 983	26.3%
Owned but not yet paid off	23 065	26.4%
Rented	33 455	38.2%
Occupied rent-free	6 272	7.2%
Other	1 739	2.0%

The tenure status of households in the Blaauwberg District is shown in Figure 8.5 below.

- Most of the "occupied rent free" households are clustered in Witsand, Du Noon and Frankdale
- Most households in Mamre are owned and paid off, while in Atlantis most households own and are still paying off their houses.
- A large proportion of households in Parklands and the surrounding area are rented and owned but not yet paid off. This is expected in a newly developed area.
- There is a clustering of Owned and Paid off households in Blouberg Rise and West Beach.
- Most of Brooklyn, Tjgerhof and Century City are rental households.

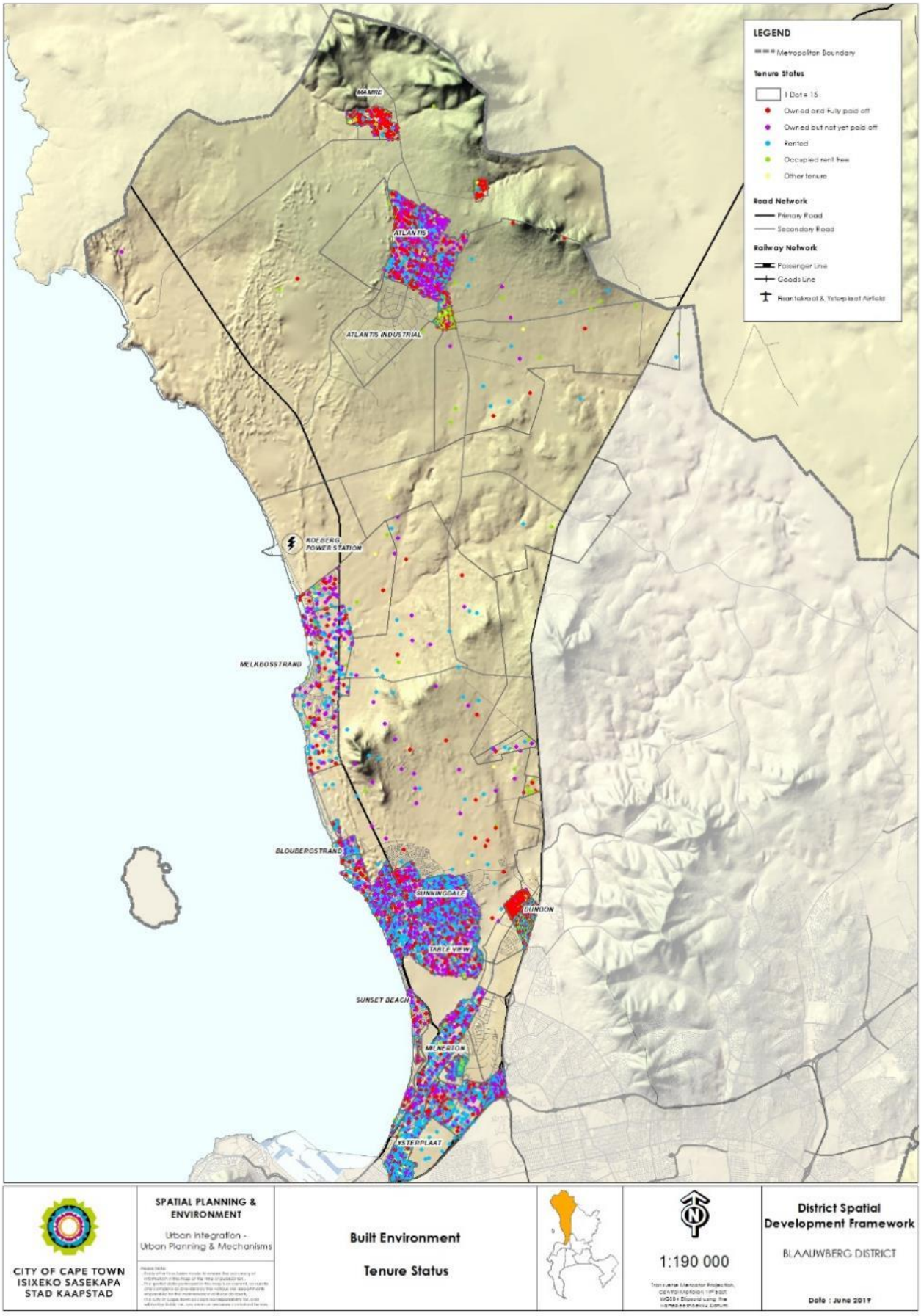


Figure 8.5: Map showing distribution of Tenure Status in Blaauwberg (Census, 2011)

8.2 State-assisted Housing Demand

Housing demand in Blaauwberg is assessed using a proxy[8] 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. It is recognised that people who have registered their need for housing might also be living in informal settlements in the area.

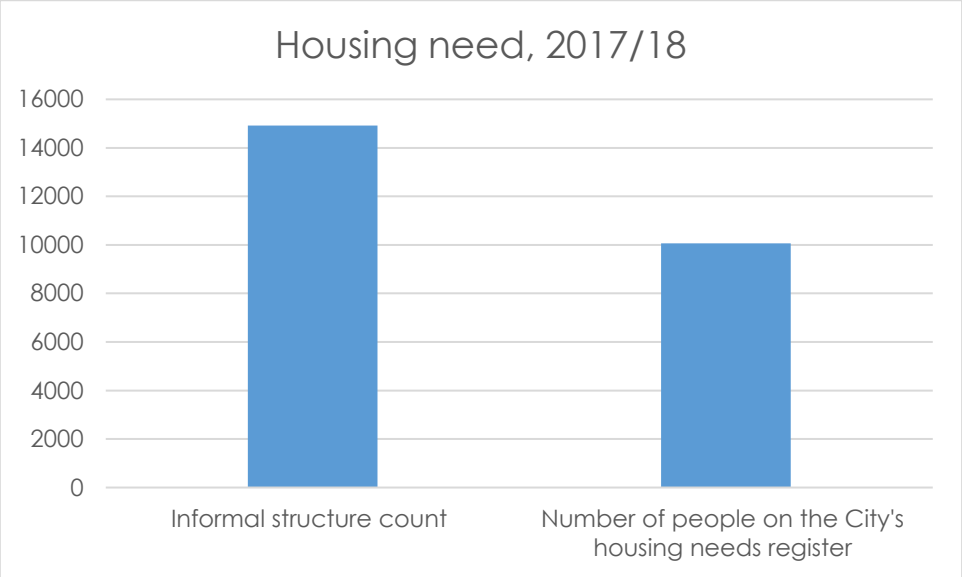


Figure 8.6: Housing need expressed through informality and people registered on the Housing Needs Register

There were 14 923 informal dwellings in the District (8% of the total number of informal dwellings in the City), according to a 2017/18 roof count by the City of Cape Town. Most informal dwellings were located in Du Noon, Doornbach, and Witsand. Blaauwberg District has the third highest number of informal dwellings, behind Mitchells Plain/Khayelitsha District (98 943) and Cape Flats District (29 899).

By the end of 2018, some 10 067 people in Blaauwberg District 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. As a cautionary note, it must be mentioned that many of the people registered might not qualify for housing, or their circumstances may have changed over time. 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 Blaauwberg suggest that housing demand will continue to grow in the area. This is particularly the case in Du Noon and Joe Slovo where population growth has led to an increase in the number of informal dwellings.

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

Of particular concern in Blaauwberg, is the increase in the number of households with no monthly income. These individuals are likely to be living informally, and would rely on the state to provide formal housing.

8.3 State-assisted Housing Supply

8.3.1 Constructed/Delivered

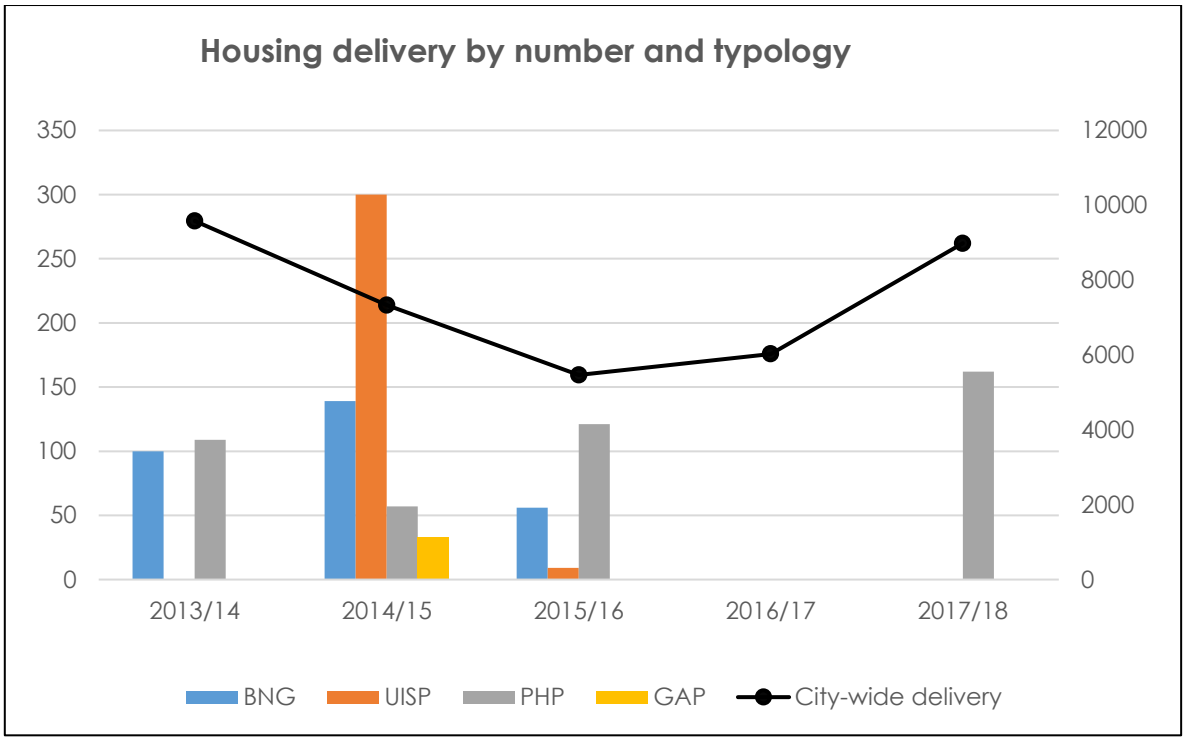


Figure 8.7: City's Human Settlements delivery data, 2013/14 – 2017/18

Over 2013/14 to 2017/18, 1086 housing opportunities were created in the Blaauwberg District. This included 295 Breaking New Ground houses built in Atlantis, and transferred to housing beneficiaries on the City's Housing Needs Register who earned R3500 and below. Some 309 households were relocated to Wolverivier from a dumpsite in Vissershoek, as part of the Upgrading of Informal Settlements Programme. Over the same period, 449 top structures were developed for households as part of the People's Housing Process, in Atlantis and Witsand. This programme allows households to be actively involved in decision-making around the housing process and product, and caters for households earning R3500 and below. Finally, 33 GAP housing units were developed in Atlantis, which catered to households earning R15 000 and below. This income bracket has since been increased to R22 000.

While government is a key provider of housing to 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.**

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 1086 housing opportunities were developed in the Blaauwberg District. However, over the same period some 3352 additional individuals in Blaauwberg expressed their need for housing by registering on the City's Housing Needs Register, over and above the 6715 that were already registered in the District. This means that while housing delivery increased by an average of 4% per annum, the number of people registered on the City's Housing Needs Registered 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.

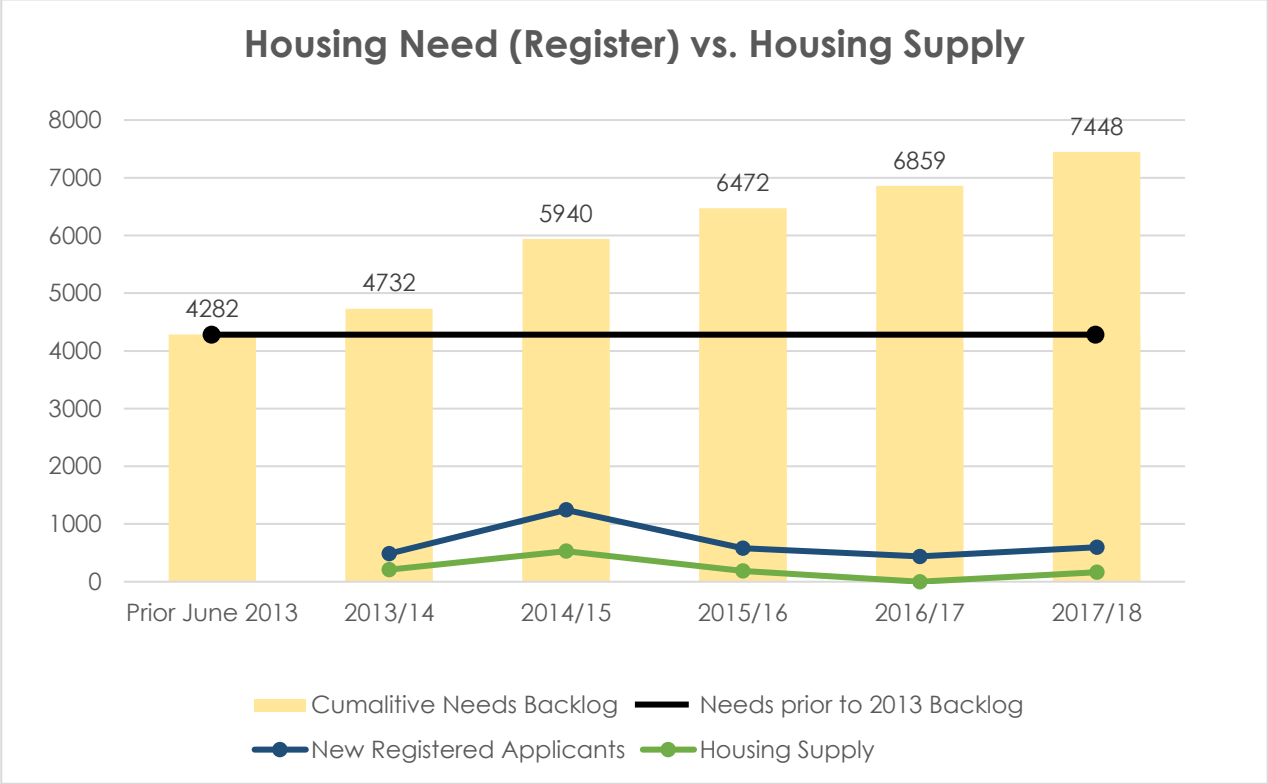


Figure 8.8: Comparison of Housing Needs Register to the number of housing units delivered by the City

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 subsidised 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 a 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 – person 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.

- 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 caters for households with an income up to R15 000 per month. Prospective tenants apply directly to the respective Social Housing Institutions for rental vacancies.

8.3.2 Pipelined, Planned and in Construction

While the data above outlines the housing delivery, the map (Figure 8.9) 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). The actual yield per development stage is depicted in the graph in Figure 8.10. The combined total of housing units pipelined, planned or under construction is 9282, of which **955 is under construction**, 4127 is planned and 4200 is pipelined. Although the combined total covers the total housing needs (register) backlog depicted in Figure 8.8, it is currently being supplied at rate slower that than rate of increase in housing need.

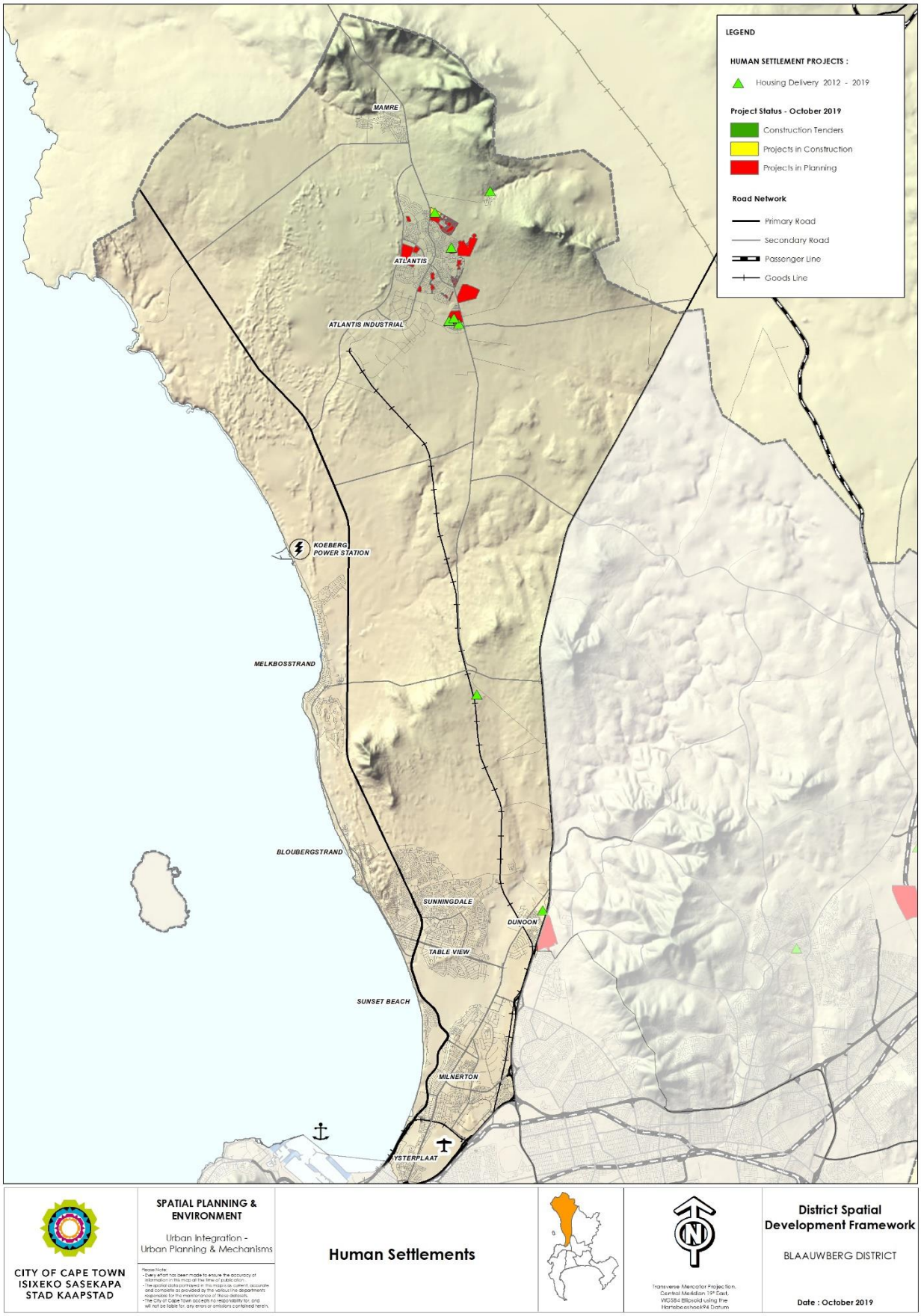


Figure 8.9: Housing Pipeline for Blaauwberg

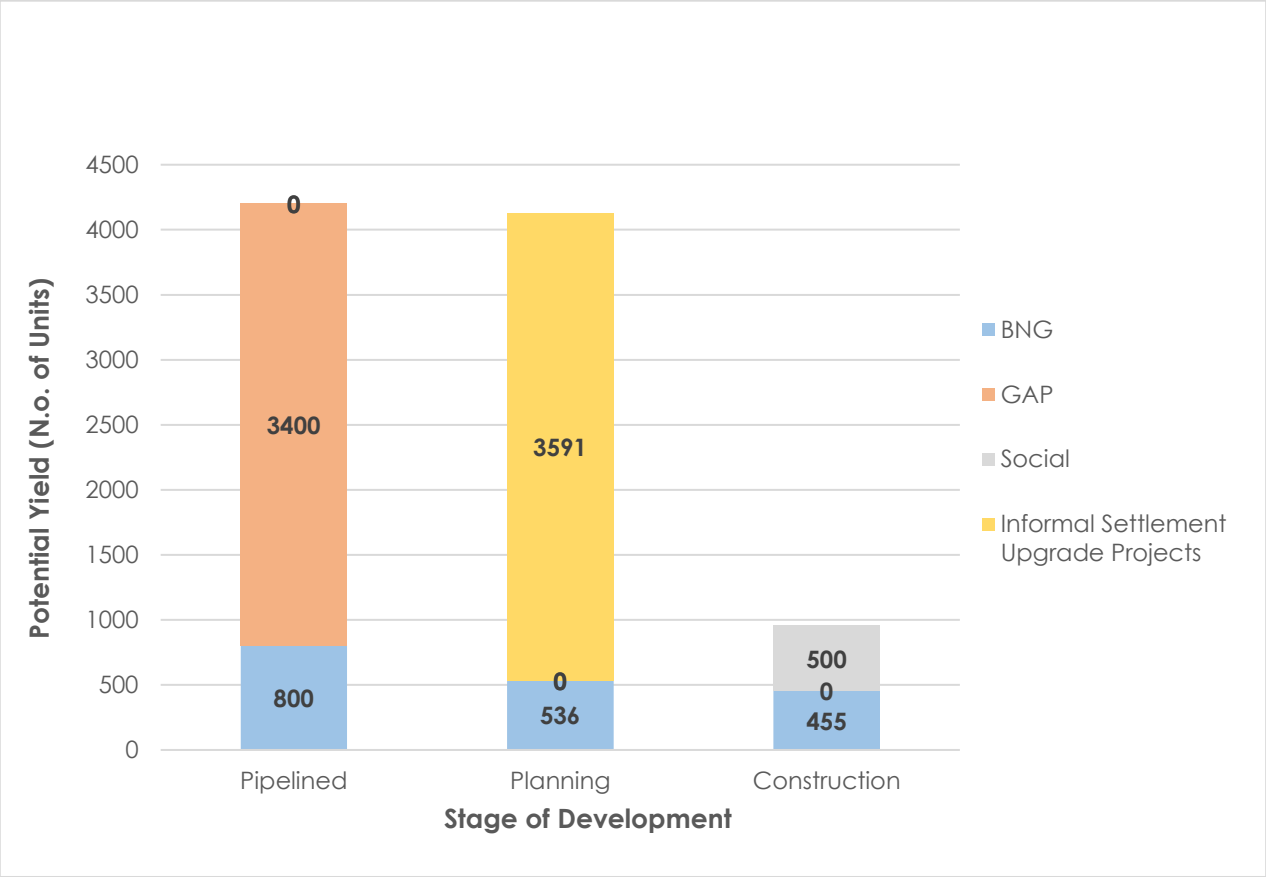


Figure 8.10: Planned housing provision in Blaauwberg

8.4 Key Opportunities and Constraints

8.4.1 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 (in-migration) is a worldwide trend – particularly in developing country contexts. Thus housing interventions need to prepare for increased population sizes, who often reside informally.

It is thus strategically important to question whether the City can 'build' it's 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.

One must also consider the impact (infrastructure, safety, etc.) and potential contribution (towards housing provision) of "micro-developers" providing "boarding house style" developments in areas like Du Noon and Joe Slovo. This is currently under investigation.

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.

The development of integrated human settlements also 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, high density developments than the large-scale, single dwelling BNG developments that are often on cheaper land.

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.

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 the redirection of resources to respond to land invasions. 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.

8.4.2 Local constraints and opportunities:

Constraints

- Housing demand in Blaauwberg is outstripping supply, as is evidenced by the increase in those living in informal settlements in Blaauwberg. This trend, together with a proportional increase in household numbers, as well as an increase in households earning no income suggest that government housing interventions need to be targeted.
- Population growth is experienced in the informal settlements of Du Noon and Joe Slovo. There is an existing threat of land invasion and encroachment onto recreational and public open spaces due to high demand. These areas are incredibly dense, which makes utilising in situ upgrading through the Upgrading of

Informal Settlement Programme a challenge. The City should therefore concentrate on enabling formalisation by the local community, and encourage the development of an affordable property market in the area through support for micro-developers.

- Temporary and Incremental Housing Opportunities are usually located in inaccessible locations. Some IDAs (Incremental Development Areas) such as on built in Wolverivier is located far away from core social and economic opportunities. Albeit, social facilities are planned in terms of the long term IDA, job opportunities are difficult to stimulate in new development areas with limited market potential. The design for most IDA/TRAs type structures in Cape Town and other South African cities lack elements of integrated human settlements. The form and infrastructure provided for affected households, are often designed or laid out in way that negates any social cohesion. The structures appear monotonous, whit a complete lack of integration with surrounding land uses, no provision of communal/recreational space or creative design present.

Opportunities

- Mixed-income inclusionary developments, which could have an element of social or GAP housing should be encouraged in northern Paarden Eiland and areas in Table View that are accessible by public transport or close to existing public services. There has been precedent in Parklands in the last 10 years, where subsidised and affordable housing opportunities were negotiated with private sector developers, as condition of receiving enhanced development rights.
- Organic conversion of existing smaller BNG units into multi-story developments in areas like DuNoon, are seen as an opportunity to densify. However, this must be appropriately planned to ensure there are sufficient social, recreational and infrastructural capacity to accommodate the increase in density.

9 PUBLIC FACILITIES

9.1 State of Supply and Demand

The following section provides an overview of the analysis on current supply of community facilities 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 type of facilities assessed linked to the different nodal hierarchies is illustrated in Figure 11 below.

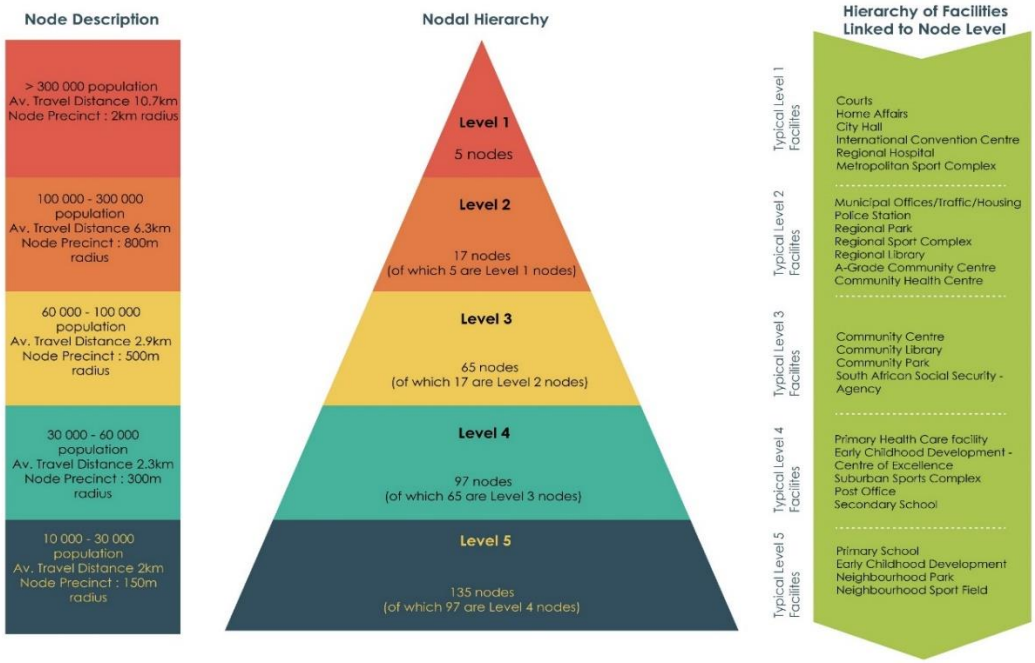
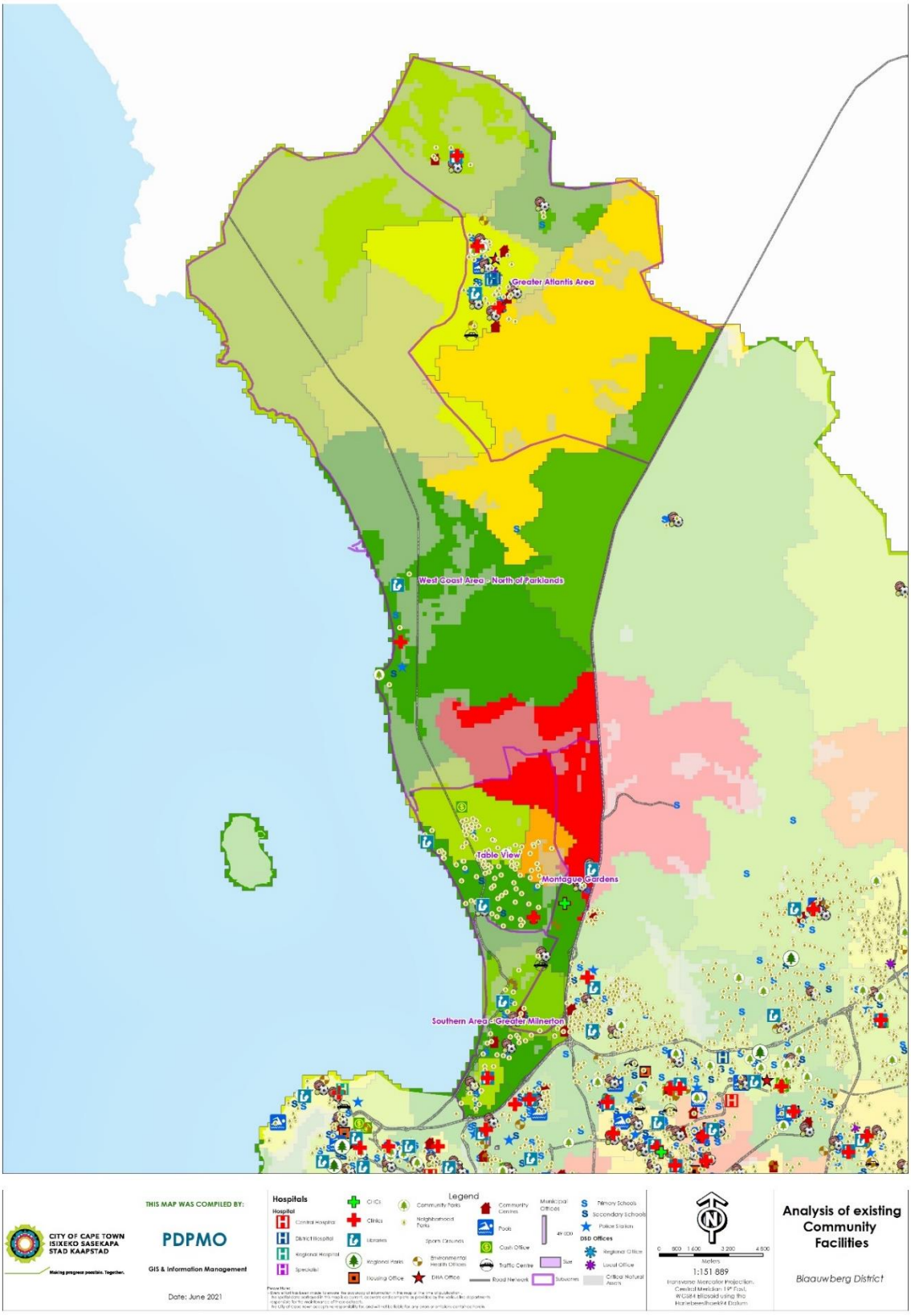


Figure 11: Conceptual Hierarchy of Community Facility Nodes/Civic Clusters

The map below illustrates the distribution of existing facilities and highlights sufficiency/insufficiency in the form of a heat map. The neighborhoods that fall within areas shaded red and orange are the most underserved areas in the district.

Blaauwberg district is relatively well served with community facilities compared to other districts, with the exception of DuNoon and Atlantis, which have a high number of informal settlements and overall low socio-economic index. There is a need to optimize existing facilities in these areas by upgrading and expanding existing facilities in order to improve the quality of service delivery and expand on the basket of services offered.



The table below show the results generated from a modelling exercise that was undertaken to identify the type of facilities required to meet the needs of the population growth estimated for 2020 and 2040 within the service catchment areas of need as identified above. The results have taken into account sector specific assumptions, guidelines and standards for facility provision.

Table 2: Backlog and Areas of Need in teh Blaauwberg District

	2020			2040		
Facility Type	**Node/Area**	**Population Demand**	**Facilities Required ***	**Node/Area**	**Population Demand**	**Insufficient Supply***
Community Centres	• Rivergate	95 744	-1.3	• Rivergate	128 324	-1.9
Education	**Primary School** • Rivergate • DuNoon • Parklands/ Sandown **Secondary School** • Rivergate • DuNoon • Parklands/ Sandown	86 904 130 286	-5.6 -5	**Primary School** • Atlantis • Rivergate • DuNoon • Parklands/ Sandown **Secondary School** • Atlantis • Rivergate • DuNoon • Parklands/ Sandown	235 371 286 563	-14.6 -11.1
Libraries	**Community**		0	**Community** • Rivergate	128 324	-0.8
	Regional		0	**Regional** • Atlantis	130 135	-1
Primary Health	**Clinic** • Parklands/ Sandown	56 095	-0.5	**Clinic** • Parklands/ Sandown • Rivergate	113 466	-1.1
Parks	**Neighborhood Parks** • DuNoon **Community Parks Parks** • Rivergate • DuNoon • Atlantis **Regional Parks** • Atlantis	40 612 236 817 102 684	-14ha -3.1ha -0.5ha	**Neighborhood Parks** • DuNoon **Community Parks** • Rivergate • DuNoon • Atlantis **Regional Parks** • Atlantis	77 452 333 221 130 135	-27ha -5.6ha -0.7ha
Sports grounds	**Sports Ground** • Rivergate • DuNoon • Parklands/ Sandown • Atlantis	292 912	-16.2ha	**Sports Ground** • Rivergate • DuNoon • Parklands/ Sandown • Atlantis	405 730	-25.9ha
	*** Equivalent to No. of Facilities / No. of unserved population/ha of land required**			*** Equivalent to No. of Facilities** Positive values indicate an over provision; Negative values indicate a shortfall relative to the standards		

The map below (Figure 12) 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 & Secondary). It is clear from the map that Rivergate Dunoon and Atlantis are among the top areas of need in this district in terms of the aforementioned facilities.

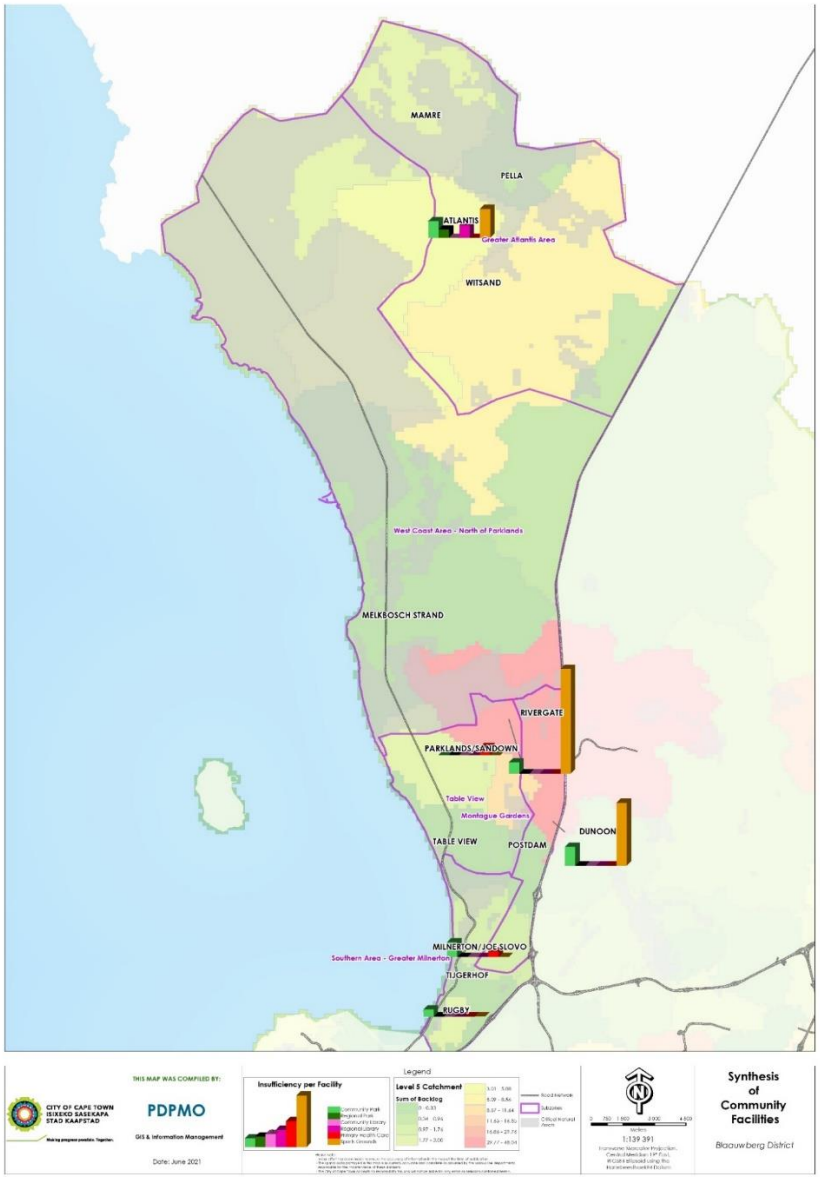


Figure 12: Facility and Blaauwberg District

Dunoon is densely populated with a growing population and faces pressure for development and continuous growth of informal settlements. Although the node is ranked 27th within the Metro, the need for recreational spaces and schools is very high and continues to grow. It is recommended that all public and private human settlements development within the area carefully consider and plan for such facilities to ensure the sustainable growth of the area. Atlantis has a high need for regional scale facilities. The location of the area does not allow its residents ease of access to higher order facilities, within close proximity. The area is also experiencing some steady growth in population.

Table 1 lists the top areas of need in the Blaauwberg district and indicates the facilities that are needed based on the modelling exercise. It should be noted that the nodes identified as an area of need represents not only the name of the area/suburb but a larger catchment which includes other suburbs.

9.1.1 Education

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/Wallacdene, Delft/Mfuleni, Imizamo Yethu/Hout Bay, Ocean View/Masiphumelele and Lwandle/Nomzamo.

Education Needs Assessment: Blaauwberg

From an education perspective, there are areas within the Blaauwberg District which requires additional education provisioning. However, challenges such as access to land, budget and insufficient municipal services prevents the WCED from addressing the needs timeously. Within this District, the rate of densification especially to the southern parts is challenging from an education perspective. Developers often promote their development proposals using existing school facilities without understanding the pressures each of these facilities are faced with and how it impacts a community/neighbourhood at large. Furthermore, inadequate municipal services do not support the spatial rationale (i.e. STAs, Densification Policy etc.) and therefore the timing of densification is of utmost importance irrespective of its current location being within or beyond the Urban Inner Core (UIC). Many schools have and are still experiencing utility challenges (i.e. blocked sewers, low water pressure etc.) despite being with an UIC.

From an education provisioning perspective and its contribution to 'Equitable Access to Education', the following area-based needs are identified:

<u>Recently completed and Short-Term Need (1-3 years)</u>

Witsand: An area located south-east of Atlantis along the R304 which has a mixture of formal and informal housing structures. At the time of formalising this community a site was identified for a future school which had subsequently, been invaded. The need for a school has always been recognised on the WCED's User Asset Management Plan (U-AMP), however, access to a vacant site was not available at the time. The WCED entered into a 10-year lease agreement via the Department of Transport and Public Works (DTPW) to utilise a portion of Farm 1065-13 (City owned). In 2020 the WCED, completed the construction of a temporary Mobile Primary School.

Dunoon: This area is overpopulated with no/limited suitable land to build new schools. However, if informal dwellers are relocated then the necessary land can be made available for future education provisioning. Recognising the overall land challenges, the WCED will consider the promotion of a project for a school. The immediate need is a high school.

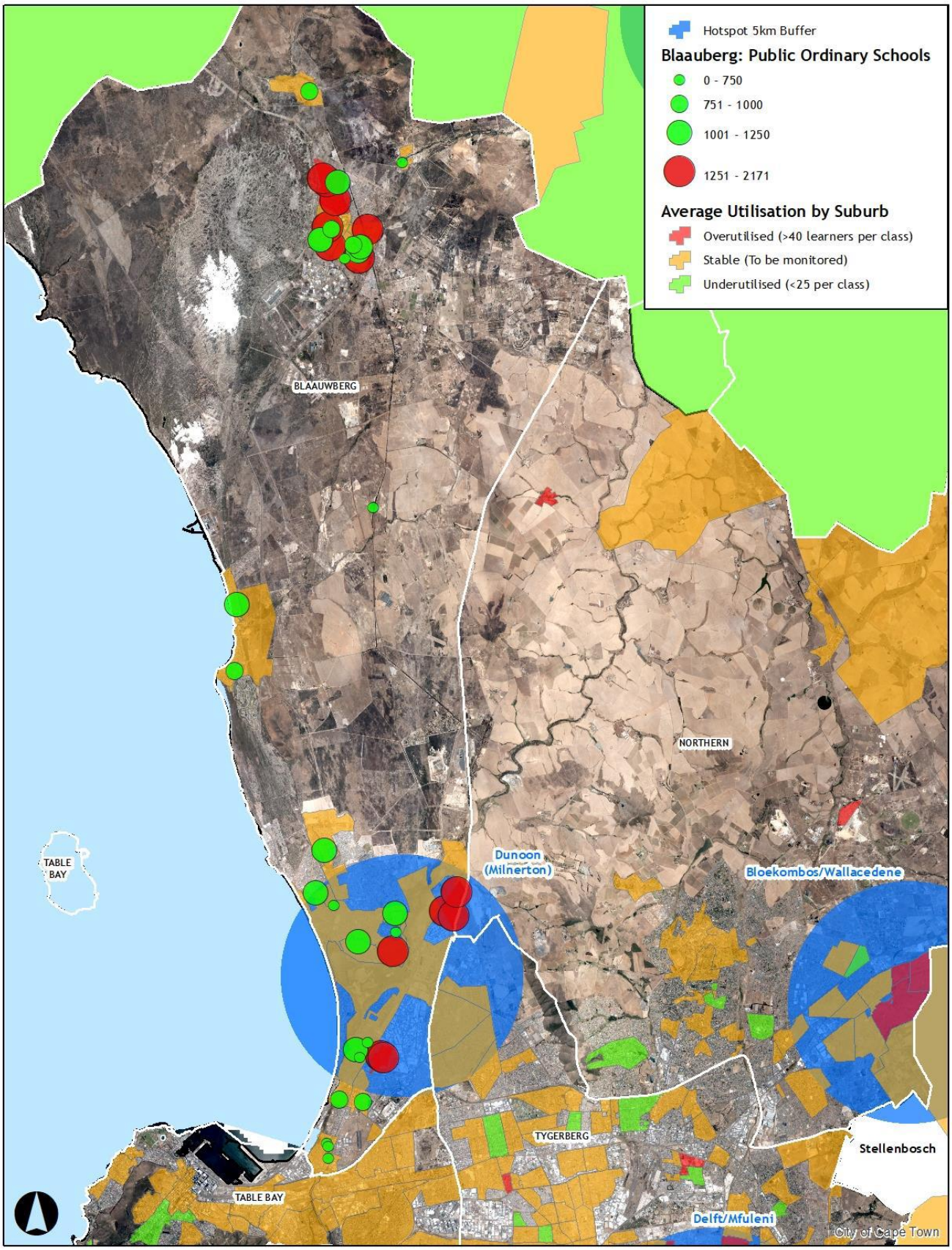
Medium-Term Need (3-5 year)

Sunningdale: With the rate at which growth is taking place, the need for an additional primary school is required. The WCED is also pursuing this as a project

Sunridge: While access to suitable land in the required locations are challenging, the WCED needs to optimise/leverage from its existing land assets. The contentious site as depicted in the media is aimed at making provision for both primary and high school accommodation which may present a different model. This will be developed incrementally which is foreseen to be supported by the existing MyCiTi network in terms of promoting access to learners from surrounding communities.

Long-Term Need (5 year+)

Due to the rate of growth taking place in the wider Milnerton areas, schools that are reaching their capacity are being monitored and where expansion can be accommodated the WCED will do so accordingly.



Fire Stations

There are four fire stations within the Blaauwberg District, namely Melkbosstrand, Milnerton, Atlantis and Brooklyn which serves the entire district.

An additional fire station is needed between Milnerton and Melkbosstrand to service the developing northern area.

9.2 Key Opportunities and Constraints

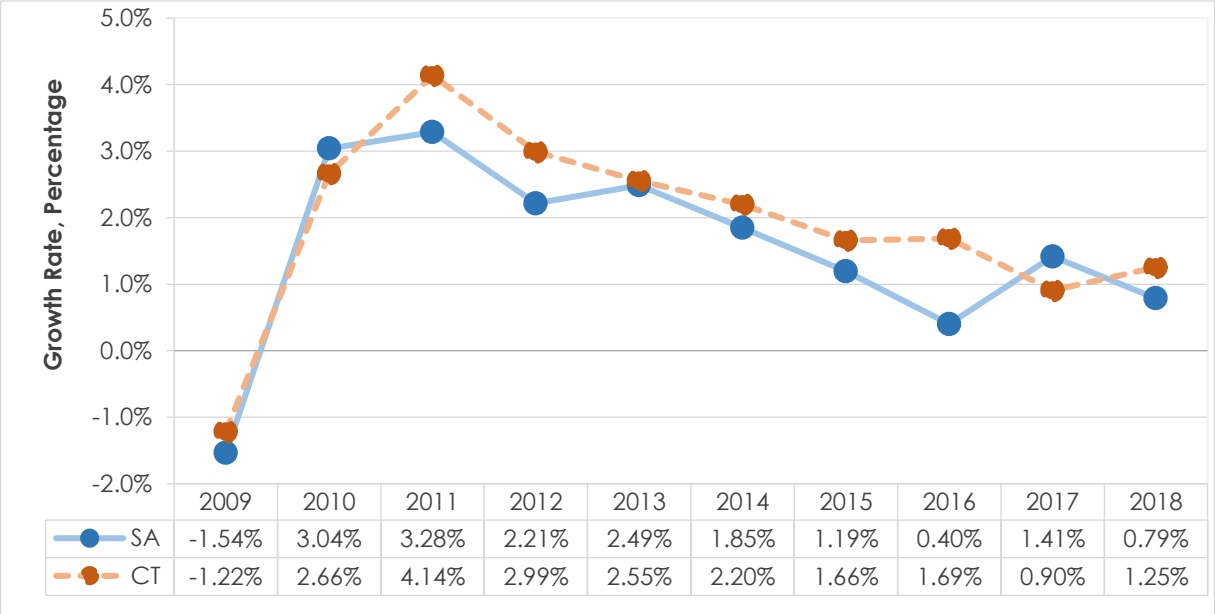
- A new civic precinct is planned for the Sandown/ Rivergate area and land is being made available by the developer for multiple facilities.
- Private developers in close proximity to Du Noon are in discussions to make land available for education facilities.
- In general, there is limited availability of land to accommodate new facilities, which mean there is a need to develop innovative solutions to vertically design/intensify community facility uses.
- Land assigned to existing recreational uses or future community facilities are under threat from settlement encroachment, particularly in areas like DuNoon and Joe Slovo.
- Opportunity to research the optimisation of existing social facilities, where possible, such as sport complexes, libraries, schools etcetera; and the combination of new facilities.
- A shared services precinct is being investigated for Doornbach whch could accommodate small facility/public services for the area.

D. STATE OF THE ECONOMY AND PROPERTY MARKET

10 THE ECONOMY

10.1 Macro-Economic Factors

In 2018, Cape Town's real Gross Domestic Product (GDP) growth averaged 2,1%, outperforming South Africa's average Real GDP growth of 1,67%. Both, however, are still reflecting an overall downward trend.



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
SA	-1.54%	3.04%	3.28%	2.21%	2.49%	1.85%	1.19%	0.40%	1.41%	0.79%
CT	-1.22%	2.66%	4.14%	2.99%	2.55%	2.20%	1.66%	1.69%	0.90%	1.25%

Figure 1: Average annual 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 / water scarcity faced in the region.

Cape Town's appealing lifestyle and access to skilled labour markets 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 municipalities[9] over the past five years (SAPOA, 2018), the negative effects of recent political, economic and environmental events (i.e. the water crisis) 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.

[9] The five largest municipalities being: City of Johannesburg, eThekwini, Nelson Mandela Bay, City of Tshwane and City of Cape Town

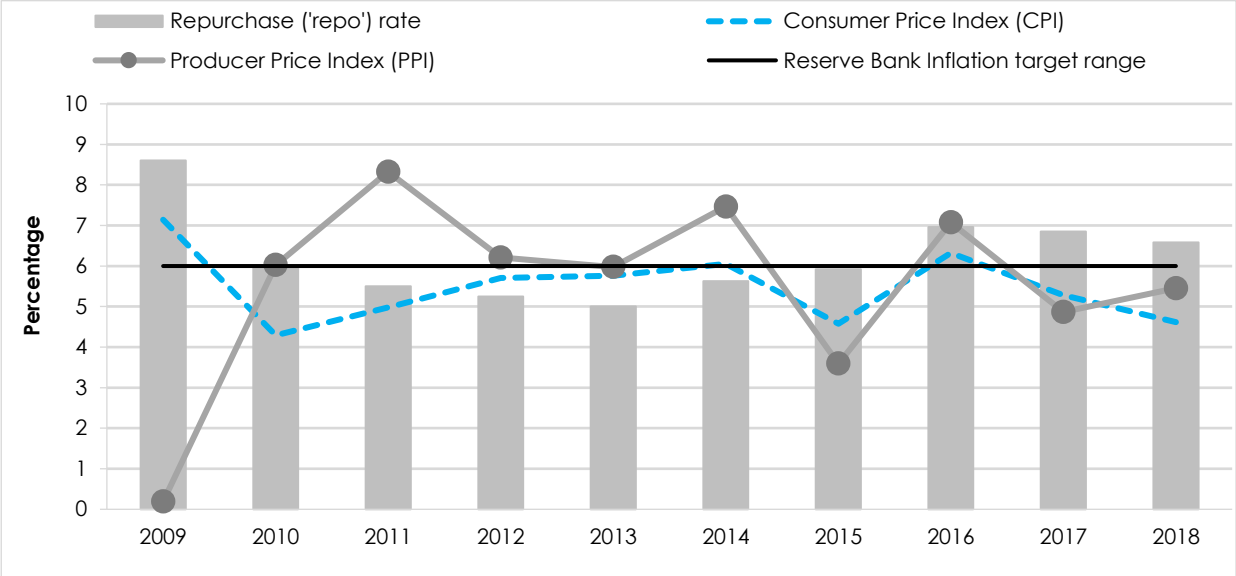


Figure 2: CPI and PPI trends in South Africa, 2009 to 2018 (Source: CPI and PPI extracted from Statistics South Africa, 2018-2019; repurchase rate extracted from SARB, 2018-2019)

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

It can also 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 secure 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 decreased bond yields and continued to discourage consumer spending. During this time, it appears that property developers began losing confidence in South Africa's property market.

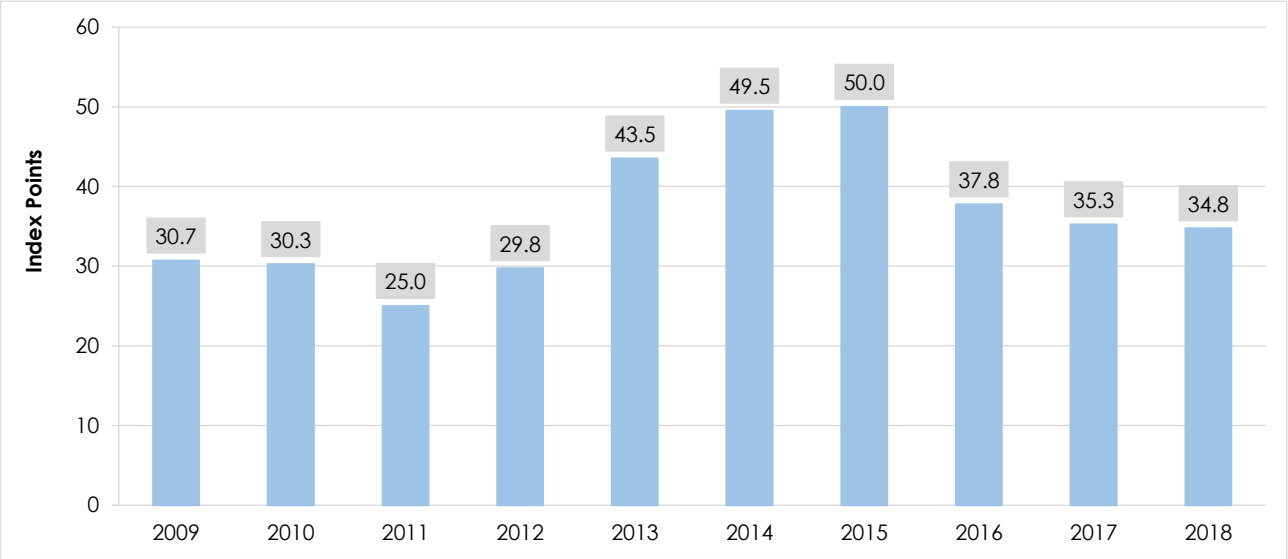


Figure 3: Building Confidence Index (BCI), 2009 to 2018 (Source: Bureau for Economic Research (BER), 2018, FNB/BER Building Confidence Index, 2018).

Figure 3 shows the First National Bank (FNB)/BER composite building confidence index for the 10-year period from 2009 to 2018. The Building Confidence Index (BCI) 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 FNB/BER composite 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).

10.2 Property Market

Figure 4 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.

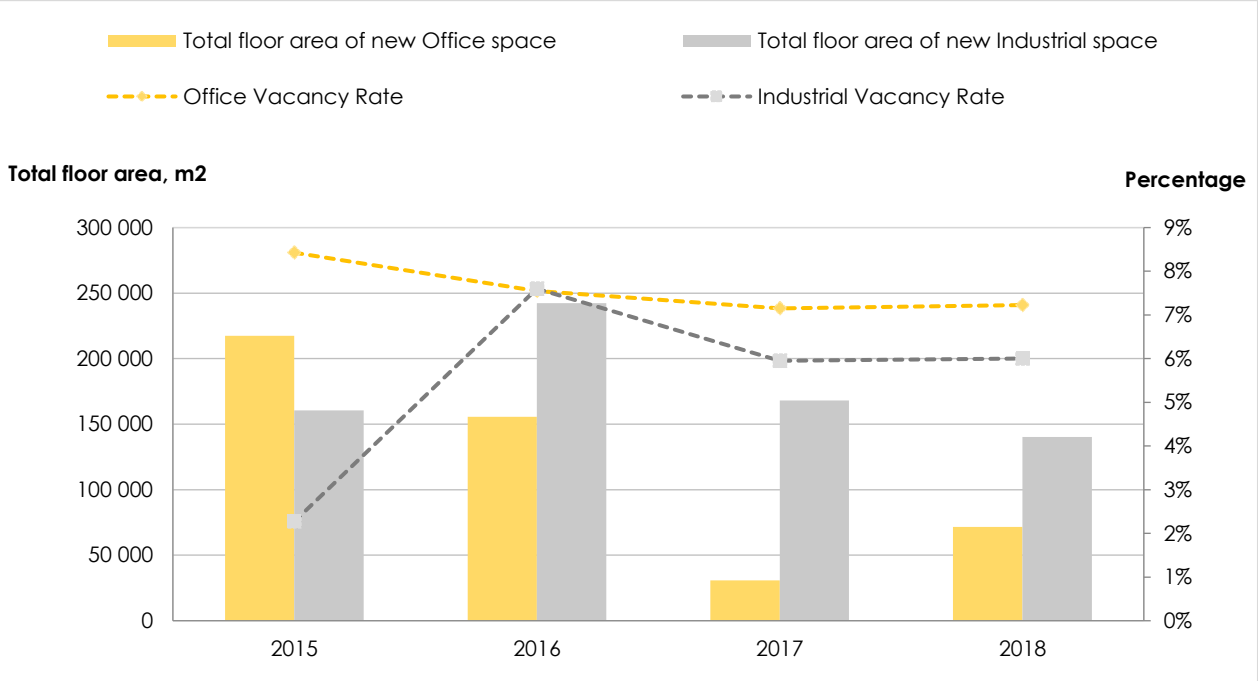


Figure 4: Cape Town's new building completions and vacancy rates for office and industrial space, 2009 to 2018 (Source: Transport Business Support Department; South African Property Owners Association (SAPOA), 2019).

The total floor area of new industrial space supplied increased by 51% compared to the previous year to reach a high of 242 394 m^2 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 municipalities (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, thereby increasing construction cost.

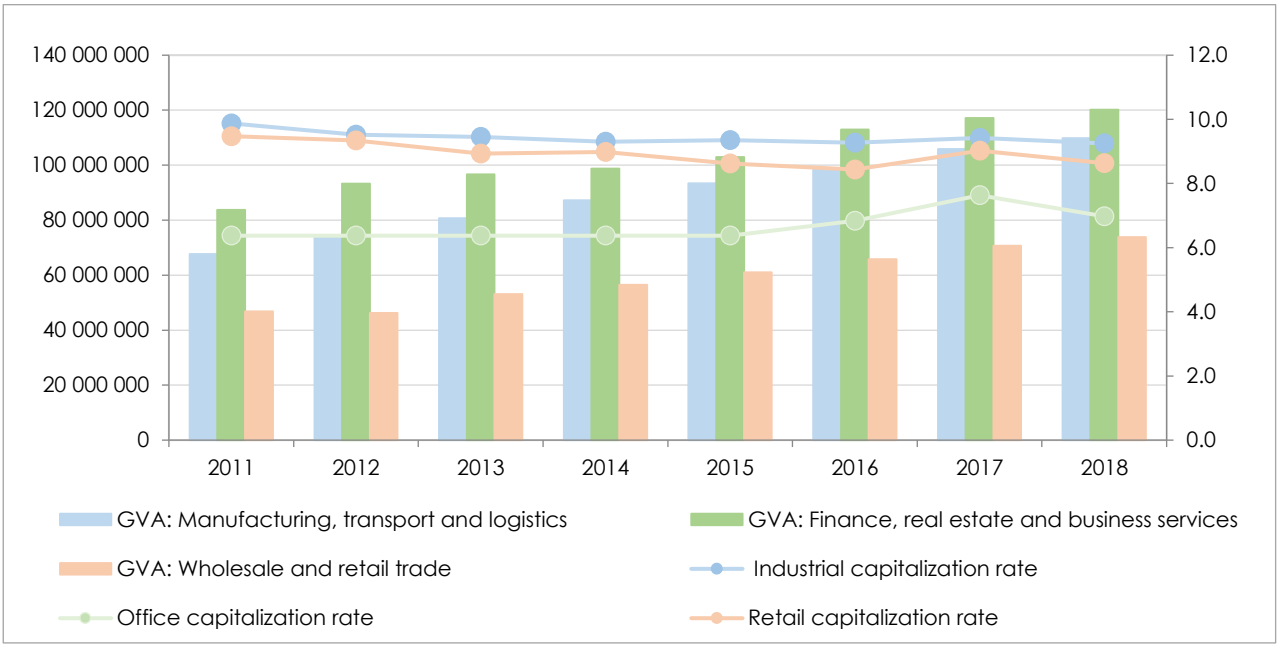


Figure 5: Cape Town's Gross Value Added (GVA) and Capitalisation Rate[10], 2011 to 2018 (Source: IHS Markit, 2019; South African Property Owners Association (SAPOA), 2019).

Figure 5 shows the industrial, office and retail capitalisation rates, as well as the Gross Value Added (GVA) for the finance and business services sector; manufacturing, logistics and transport, as well as wholesale 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 capitalisation ("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 rate implies lower risk and higher value; while a high cap rate implies higher risk and lower value. In figure 5 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 crisis and the credit ratings downgrade.

10.3 District Analysis

10.3.1 Economic Characteristics

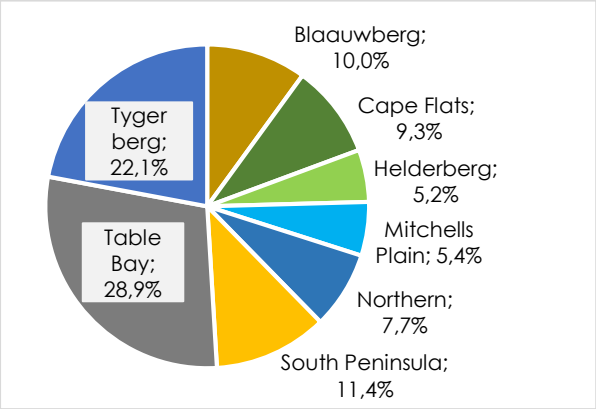


Figure 6: Gross geographic product (GGP) contributions at current prices in 2018 (IHS Markit, 2019).

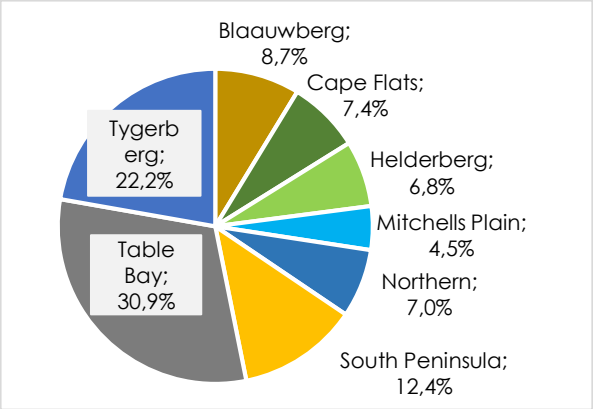


Figure 7: Employment contributions in 2018 (IHS Markit, 2019).

The largest contributor to the Gross Geographic Product (GGP) at current prices for Cape Town in 2018 was the Table Bay district (28,9%), an area characterised by an intense concentration of business and commercial activities. 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 22,1% share of the GGP, was the second largest district economy in 2018, and is largely dominated by finance, insurance, real estate and business services – with the significant economic infrastructure of the Cape Town International Airport located in this planning district.

The top three districts in terms of employment are Table Bay (30,9%), then Tygerberg (22,2%), followed by South Peninsula (12,4%). 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 occuring within the district, although there is a growing labour force living within this area.

10.3.1.1 Economic Performance

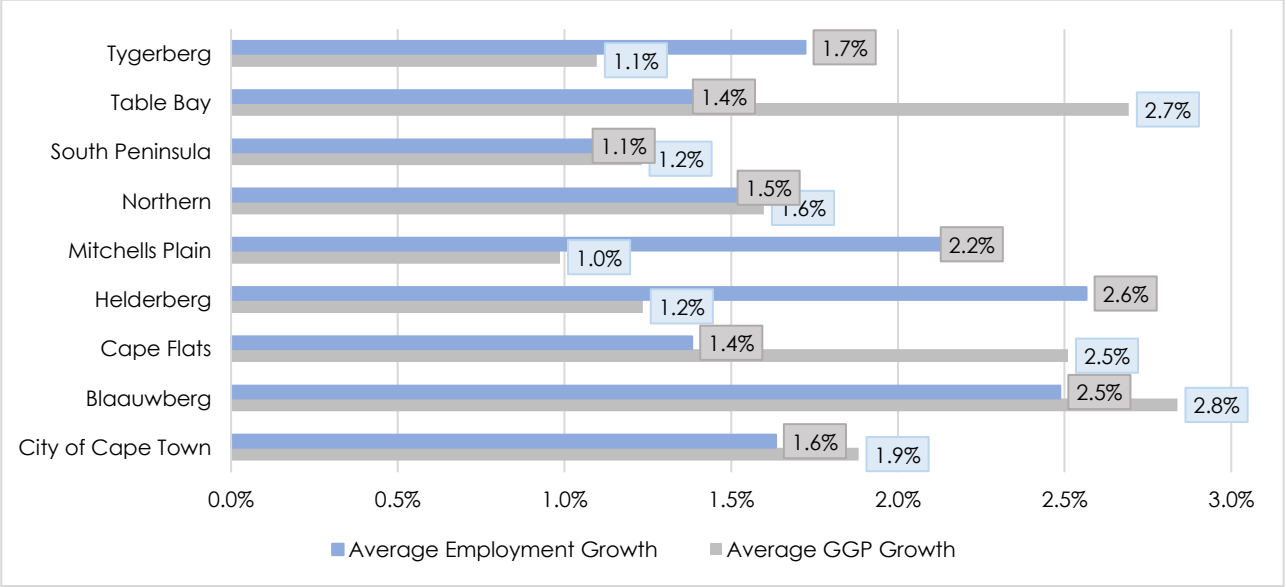


Figure 8: Average annual economic growth rates from 2009 to 2018 (IHS Markit, 2019).

Figure 15 shows that Blaauwberg district recorded the fastest rate of economic growth (2,8%) over the ten-year period, which is higher than the metro's average growth rate of 1,9% for the same period, despite being one of the smallest contributors to GGP. This can be attributed to the increasing commercial and property development in the area, particularly in the industrial market. The South Peninsula reported GGP growth of 1,2%, lower that 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.

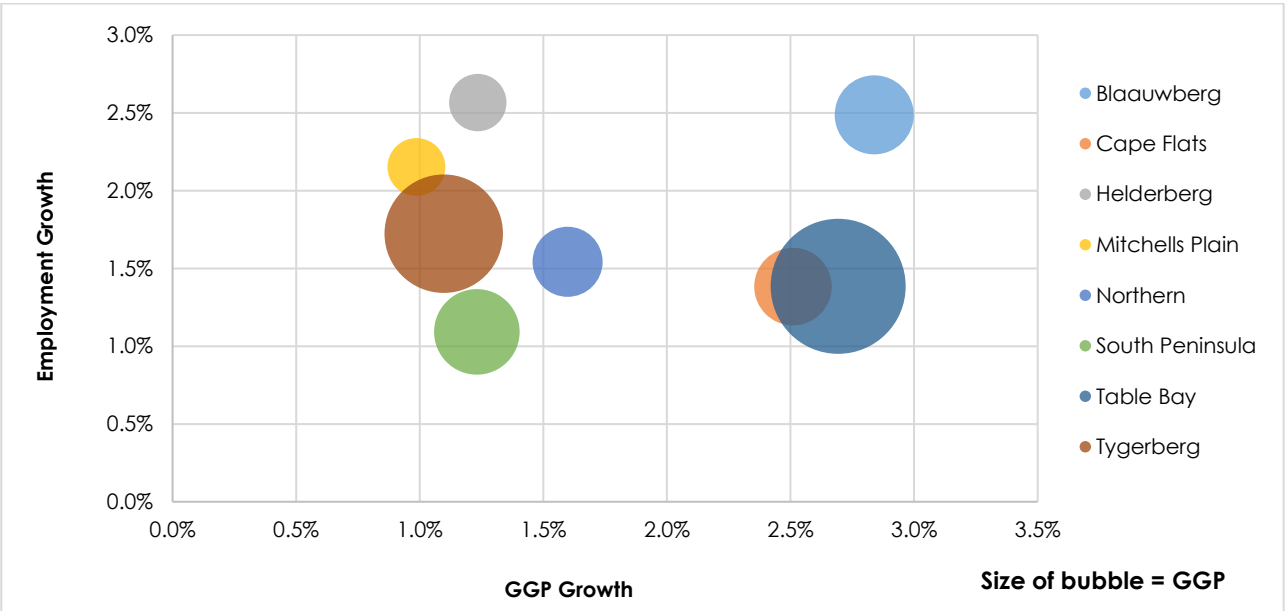


Figure 9: Performance comparison in 2018 (source: IHS Markit, 2019).

Figure 16 plots the average economic growth (GGP) on the horizontal axis and average employment growth on the vertical axis for the same ten-year period. The size of the bubble is the relative size of the economy as measured by GGP in 2018. The Blaauwberg district grew relatively faster than Table Bay in terms of both GGP and employment, despite its relatively small output size and employment levels when compared to Table Bay.

10.3.2 Sectoral trends

As observed in Figure 17, Table Bay district is the main contributor to the total gross value added (GVA) of most sectors in Cape Town, followed by Tygerberg district. Contribution by the former is especially pronounced in the transport (34,7%) and trade sectors (30,6%) as a result of the district containing the city's port and its function as the main retail hub in the city.[11] While Table Bay is the largest contributor to agricultural output (which includes fishing) in the city (possibly due to the "head office effect[12]"), Blaauwberg is also a strong contributor to agricultural output within the city.

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, which is largely attributable to this area's economy being highly reliant on the community services sector (public sector).

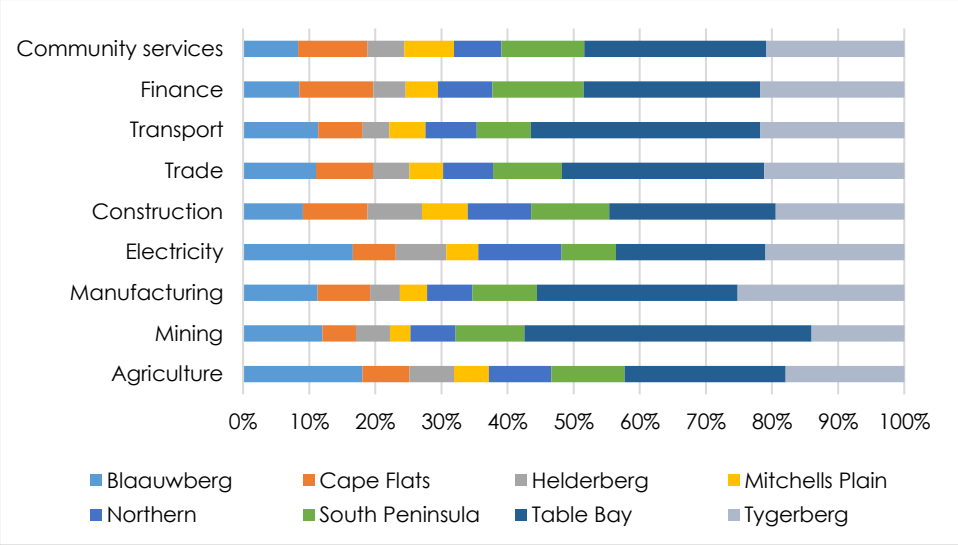


Figure 10: Gross Value Added (GVA) contribution by sector in 2018 (IHS Markit,

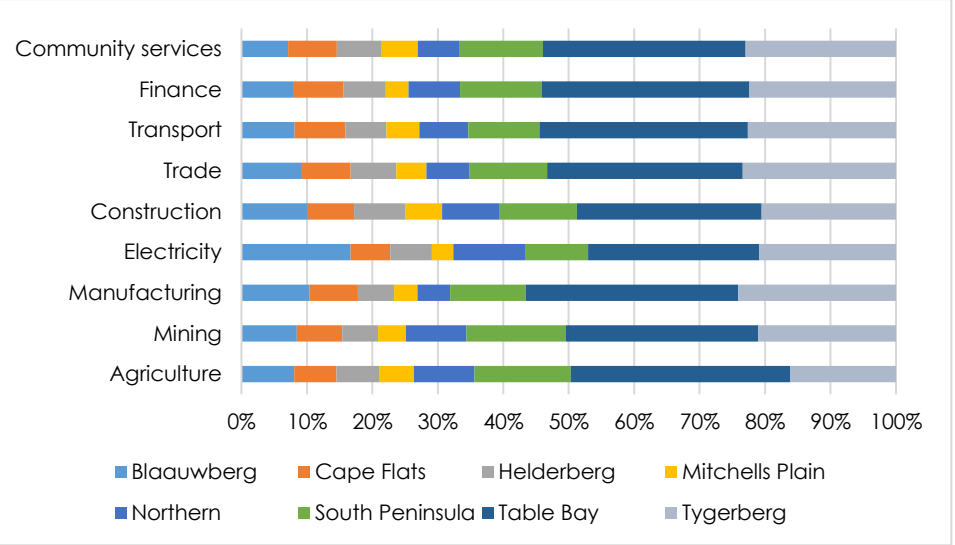


Figure 11: Employment contribution to Cape Town in 2018 (IHS Markit, 2019)

[11] The mining figures are for all districts are almost insignificant.

[12] The head office effect refers to the distortion of area based financial reporting due to the entire GVA of a company being captured at its head office location, regardless of where its operations take place.

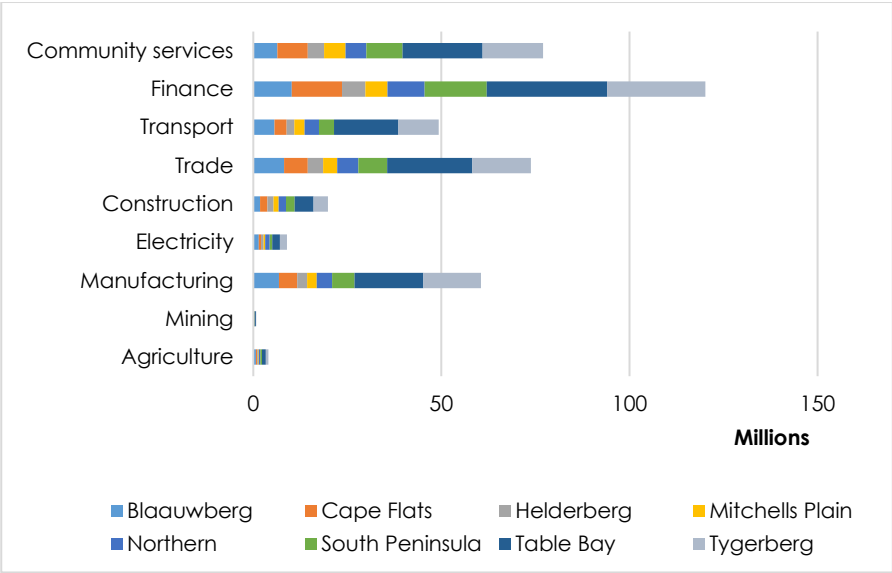


Figure 12: Gross Value Added (GVA) size by sector in 2018 (IHS Markit, 2019)

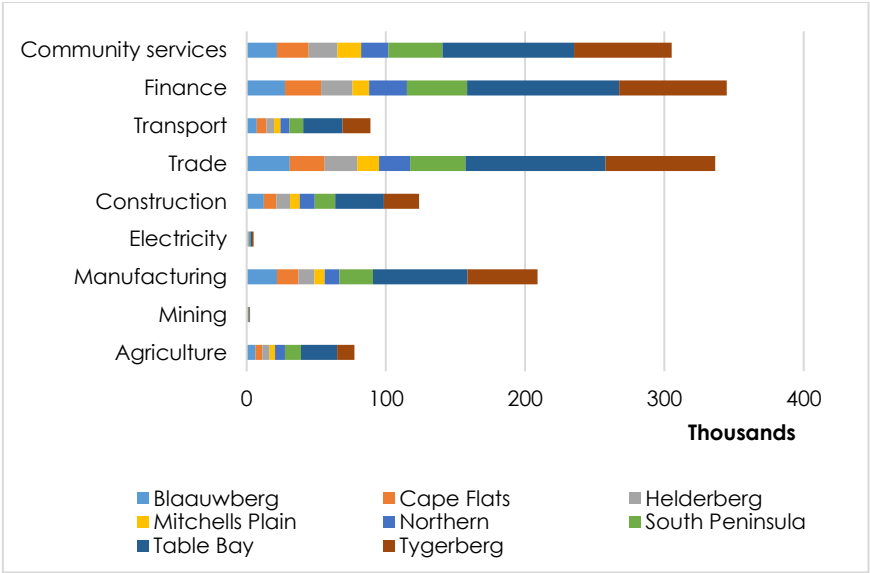
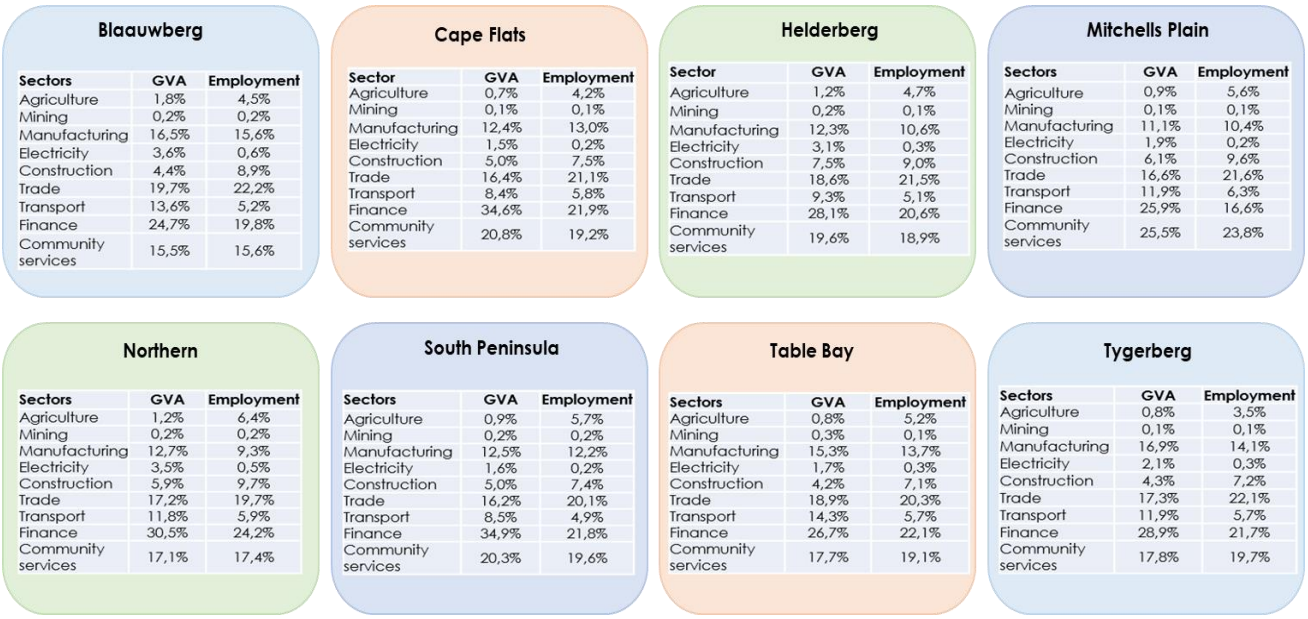


Figure 13: Total employment by sector in 2018 (IHS Markit, 2019)

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.



Blaauwberg

Sectors	GVA	Employment
Agriculture	1,8%	4,5%
Mining	0,2%	0,2%
Manufacturing	16,5%	15,6%
Electricity	3,6%	0,6%
Construction	4,4%	8,9%
Trade	19,7%	22,2%
Transport	13,6%	5,2%
Finance	24,7%	19,8%
Community services	15,5%	15,6%

Cape Flats

Sector	GVA	Employment
Agriculture	0,7%	4,2%
Mining	0,1%	0,1%
Manufacturing	12,4%	13,0%
Electricity	1,5%	0,2%
Construction	5,0%	7,5%
Trade	16,4%	21,1%
Transport	8,4%	5,8%
Finance	34,6%	21,9%
Community services	20,8%	19,2%

Helderberg

Sector	GVA	Employment
Agriculture	1,2%	4,7%
Mining	0,2%	0,1%
Manufacturing	12,3%	10,6%
Electricity	3,1%	0,3%
Construction	7,5%	9,0%
Trade	18,6%	21,5%
Transport	9,3%	5,1%
Finance	28,1%	20,6%
Community services	19,6%	18,9%

Mitchells Plain

Sectors	GVA	Employment
Agriculture	0,9%	5,6%
Mining	0,1%	0,1%
Manufacturing	11,1%	10,4%
Electricity	1,9%	0,2%
Construction	6,1%	9,6%
Trade	16,6%	21,6%
Transport	11,9%	6,3%
Finance	25,9%	16,6%
Community services	25,5%	23,8%

Northern

Sectors	GVA	Employment
Agriculture	1,2%	6,4%
Mining	0,2%	0,2%
Manufacturing	12,7%	9,3%
Electricity	3,5%	0,5%
Construction	5,9%	9,7%
Trade	17,2%	19,7%
Transport	11,8%	5,9%
Finance	30,5%	24,2%
Community services	17,1%	17,4%

South Peninsula

Sectors	GVA	Employment
Agriculture	0,9%	5,7%
Mining	0,2%	0,2%
Manufacturing	12,5%	12,2%
Electricity	1,6%	0,2%
Construction	5,0%	7,4%
Trade	16,2%	20,1%
Transport	8,5%	4,9%
Finance	34,9%	21,8%
Community services	20,3%	19,6%

Table Bay

Sectors	GVA	Employment
Agriculture	0,8%	5,2%
Mining	0,3%	0,1%
Manufacturing	15,3%	13,7%
Electricity	1,7%	0,3%
Construction	4,2%	7,1%
Trade	18,9%	20,3%
Transport	14,3%	5,7%
Finance	26,7%	22,1%
Community services	17,7%	19,1%

Tygerberg

Sectors	GVA	Employment
Agriculture	0,8%	3,5%
Mining	0,1%	0,1%
Manufacturing	16,9%	14,1%
Electricity	2,1%	0,3%
Construction	4,3%	7,2%
Trade	17,3%	22,1%
Transport	11,9%	5,7%
Finance	28,9%	21,7%
Community services	17,8%	19,7%

Figure 51: Gross Value Added (GVA) and Employment contributions in 2018 (IHS Markit, 2019)

The figure above illustrates the sectoral gross value added (GVA) and employment shares within each of the planning districts. It is apparent from the figures presented in Figure 14 that the smaller district economies (Cape Flats, Mitchells Plain) tend to be less diversified than the larger district economies with proportionally less contribution from the manufacturing sector and greater reliance on community services[13]. Among the productive sectors, manufacturing is relatively more important to Tygerberg district's economy, while agriculture is relatively more important to Blaauwberg economy in comparison with other districts.

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

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

Table 1: Top Five sectors by location quotient in each district (detailed SIC) in 2018 (IHS Markit, 2019)

While the analysis at a broad sectoral level is useful, it is too aggregated to adequately understand the nuances of a regional economy. As such, Table 2 undertakes a location quotient (LQ) analysis utilising the more detailed two-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 the

district economy as compared to the Cape Town economy as a whole. The table ranks the top five industries by LQ. 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 LQ 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.

10.3.3 Development Indicators

Planning District	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

Table 2: Human Development Index (HDI) in 2009, 2014 and 2018 (IHS Markit, 2019)

The HDI is a composite indicator reflecting education levels, health, and income. The HDI ranges from 0 indicating "no human development", to 1 indicating "high level of human development" (United Nations, 2018). In 2018, the South Peninsula (0,81), Table Play (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 that are largely due to income gaps and location which limits access to economic opportunities.

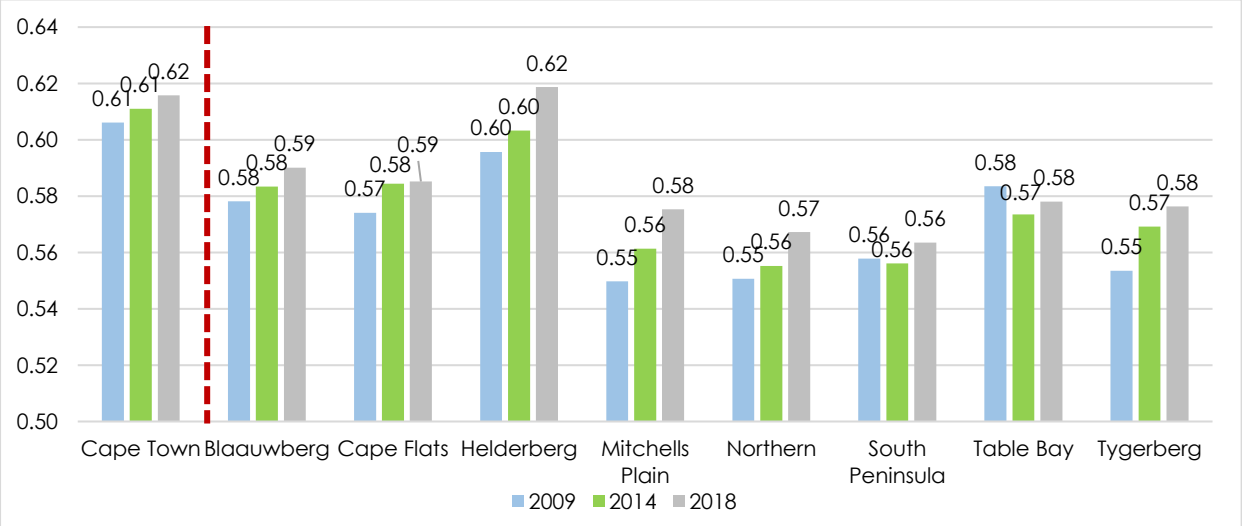


Figure 16: Gini coefficient in 2009, 2014 and 2018 (IHS Markit, 2019)

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. 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.

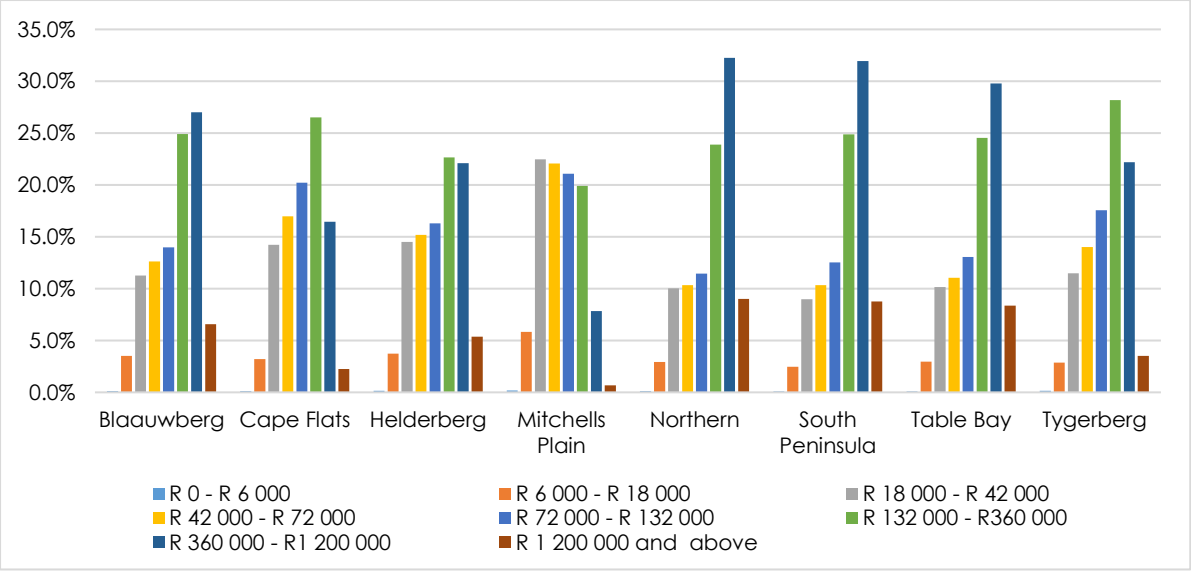


Figure 15: Percentage of households by income category in 2018 (IHS Markit, 2019)

In total, there are 1,302,946 households in Cape Town (IHS Markit, 2019) and the majority thereof are situated in Mitchells Plain (30,9%) followed by Tygerberg (17,6%). Mitchells Plain is predominantly a residential area; thus it is unsurprising that it has the highest number of households. 22,5% of the population in this district has an annual household income between R18 000 and R42 000, 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. A majority of the low to middle annual income levels are skewed in the districts with a high number of households and less economic activity such as Mitchells Plain with low HDI as compared to other districts. Therefore, this further reiterates the concern of inequality within the metro.

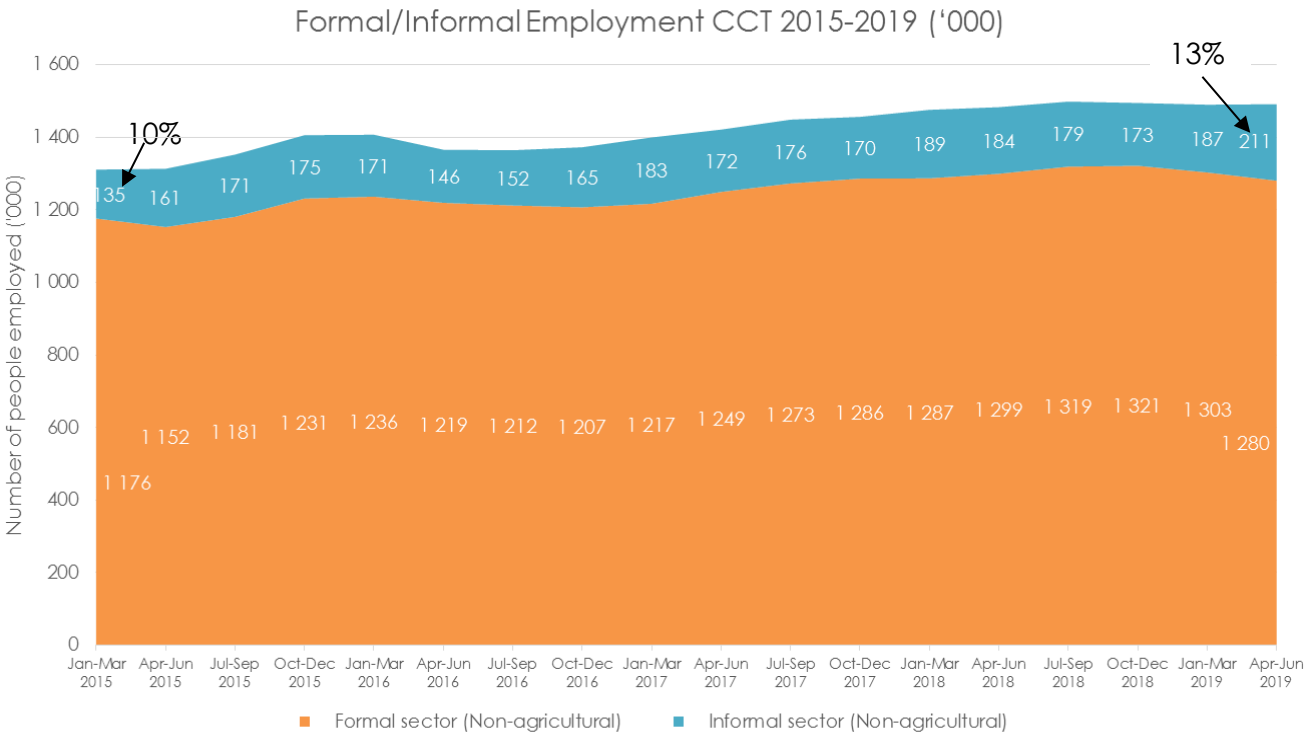
10.4 The Informal Economy

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.

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.[14] 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.[15] 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.

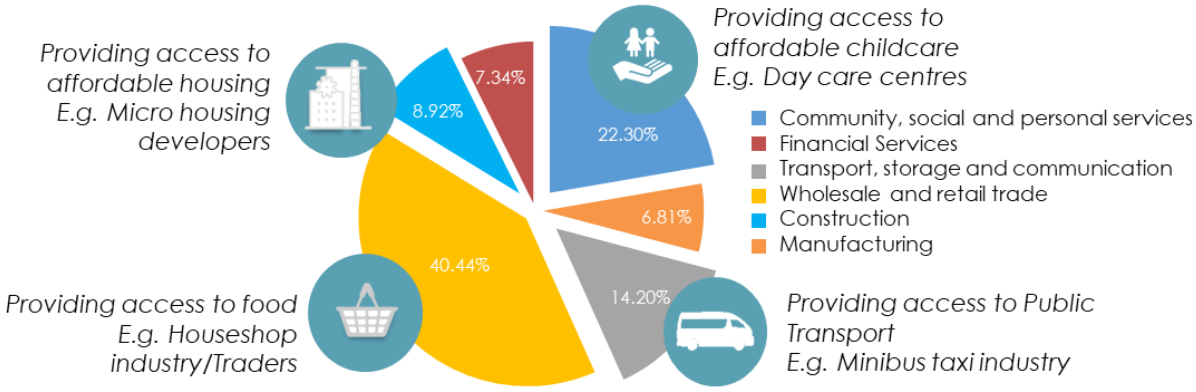


[14] StatsSA, 2019, Quarterly Labour Force Survey
[15] GHS 2013

Employment Distribution

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

Figure 52: Industry distribution of informal sector employees in Cape Town (Source: Stats SA, QLFS Q2, 2019)



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 margins[16]. 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*

[16] Human Science Research Council (HSRC), 2018, *Township Economies Workshop Notes*

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. **For this reason, further studies are being undertaken to assist in the preparation of the District Spatial Development Framework**

11 PROPERTY MARKET

11.1 Market Performance

Figure 15 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 3: District Property Market (Mean) Indicators (City of Cape Town Non-Res Market Research: 2018)

Market Segment	Year	Average Cap Rate (%)	Average Operating costs (R/m²/month)	Average Gross market rental (R/m²/month)	Average Vacancy Rate (%)
Industrial	**2012**	10.1%	R 6.06	R 32.05	3.5%
	2015	9.7%	R 7.03	R 36.96	5.8%
	2018	9.2%	R 10.32	R 71.23	4.8%
Retail	**2012**	10.5%	R 11.92	R 65.64	3.5%
	2015	9.6%	R 14.62	R 68.96	5.0%
	2018	10.6%	R 23.16	R 152.18	5.0%
Office	**2012**	10.3%	R 20.17	R 75.69	5.0%
	2015	9.5%	R 23.61	R 103.44	7.8%
	2018	10.2%	R 48.09	R 283.31	8.5%

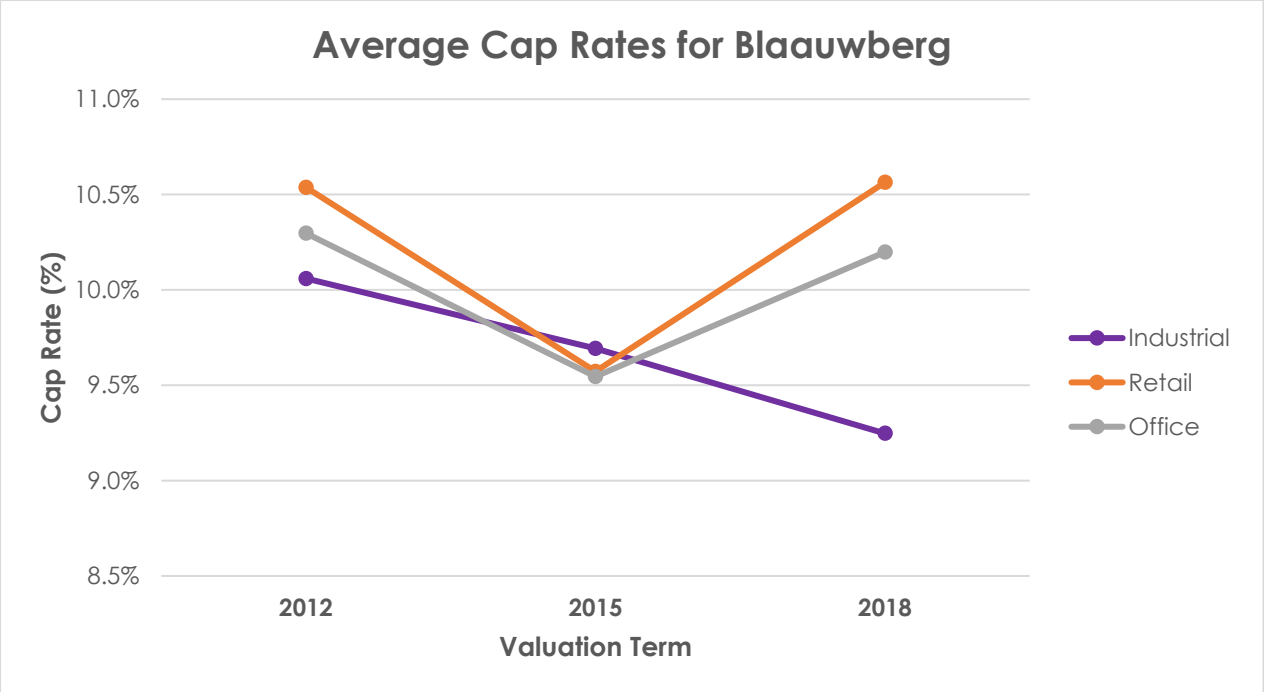


Figure 15: Average capitalisation rates per non-residential market segment (City of Cape Town Non-Residential Market Research, 2018)

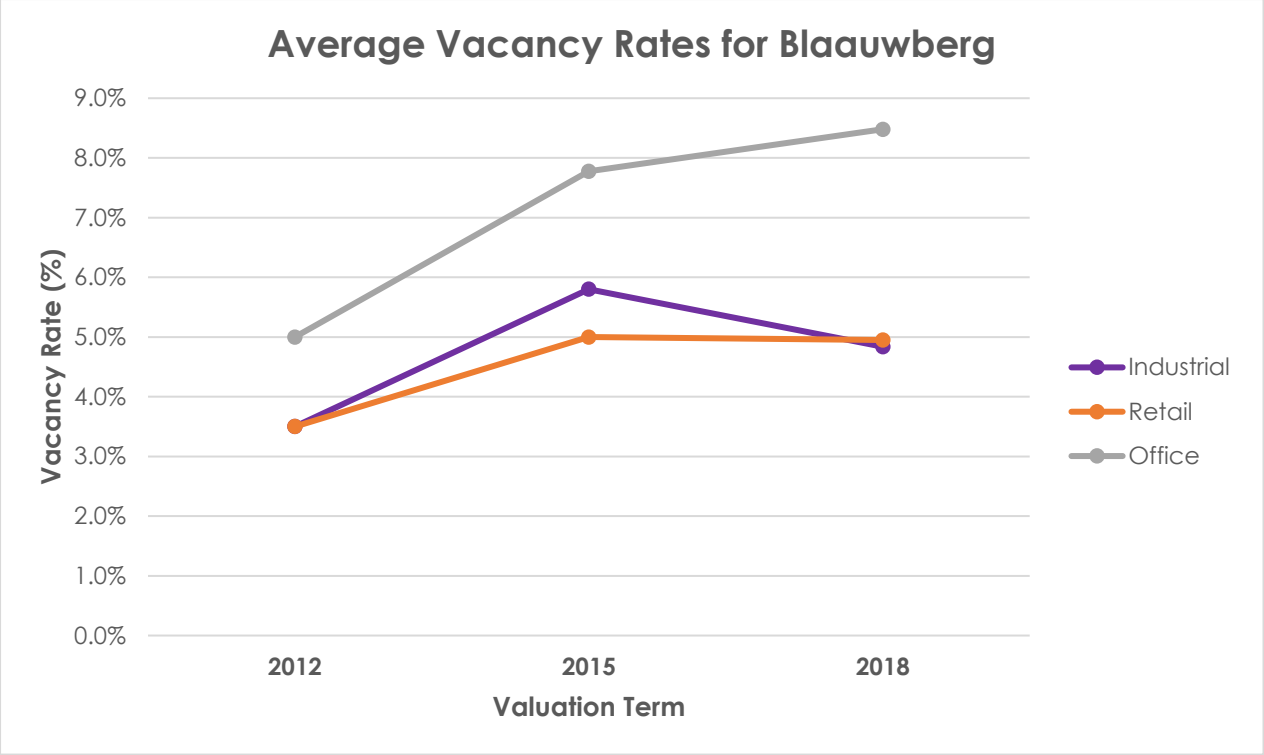


Figure 16: Average vacancy rates per non-residential market segment (City of Cape Town Non-Res Market Research, 2018)

11.1.1 Key Observations and Trends

11.1.1.1 Non-residential

a. Industrial:

The industrial sector in Blaauwberg is currently performing better than other market segments. The average capitalisation rate for industrial properties steadily decreased over the last three valuation terms and had the lowest vacancy rate in 2018, which indicates better market performance for industrial properties. This is reinforced by figure 4 which shows a high growth in property values for industrial areas in the Blaauwberg District, in particular Montague Gardens and Killarney Gardens; and explain recent trends to expand industrial areas in Rivergate and Atlantis. This supports national market indicators for industry, and growth in the online retail market. Business Day reported in 2018 that high-tech warehouses and distribution centres are fast becoming the most sought-after property assets in SA, with listed counters and private groups positioning themselves to benefit from future growth in online shopping and companies establishing supply chains. This indicates growing demand for well-located warehousing and distribution centres.

In terms of local market performance, established industrials areas in Montague Gardens and Paarden Eiland currently have the lowest cap rates in the range of 8.9% to 9.2%. This is followed by Kilarney Gardens in the range of 9.0% to 9.5%, and newer industrial areas Rivergate and Atlantis (new development initiatives) with the highest cap rates in the district in the range of 9.7% to 10.7%).

b. Street Front Retail:

In comparison to other market segments in the district, street-front retail is performing the weakest with a 10.6% cap rate recorded for 2018 (see Figure 15), which is higher that the metro average of 8.64%. However, the trade sector, which is made up mainly of retail activity, contributed the most to employment and had the highest GVA in the district (refer to **Error! Reference source not found.Error! Reference source not found.**. It should furthermore be noted that this section does not account for other larger scale retail typologies such as neighbourhood and regional shopping centres, which has a significant impact on the cumulative retail property market performance.

In the street-front retail market segment, Big Bay, Table View, Marin Drive, Century City and Montague Gardens are performing the best in the district (refer to figure 6 below).

c. Office:

Similar to street-front retail, the office sector experience weaker performance in Blaauwberg since 2015, with higher average vacancies and cap rates recorded for 2018, although slightly lower than retail. This may be due to a change in business culture that embraces telecommuting and remote working (work from home). With fewer employees at the office on a given day, space requirements are shrinking. Depending on what percentage of the company's employees are opting to work remotely, commercial property experts suggest that this could result in a significant reduction in floor space. However, the office market segment still had the best gross rental return per square metre, which correlates to the stronger performance of the trade and finance sector.

Century City, which contains the highest concentration of gross lettable office space in the district, had cap rates between 9.3% to 9.7% in 2018. These cap rates are not only the lowest in Blaauwberg, but also the lowest in the city (see figure 7 below). In contrast, Table View – the second-most significant area with office space in the district – had a weaker performance with cap rates in the range of 10.0% to 11.0%. Smaller office space, spread across the district, have cap rates more or less in line with Table View, however there are some just north of Paarden Eiland and in Lagoon beach with significantly lower cap rates on par with Century City.

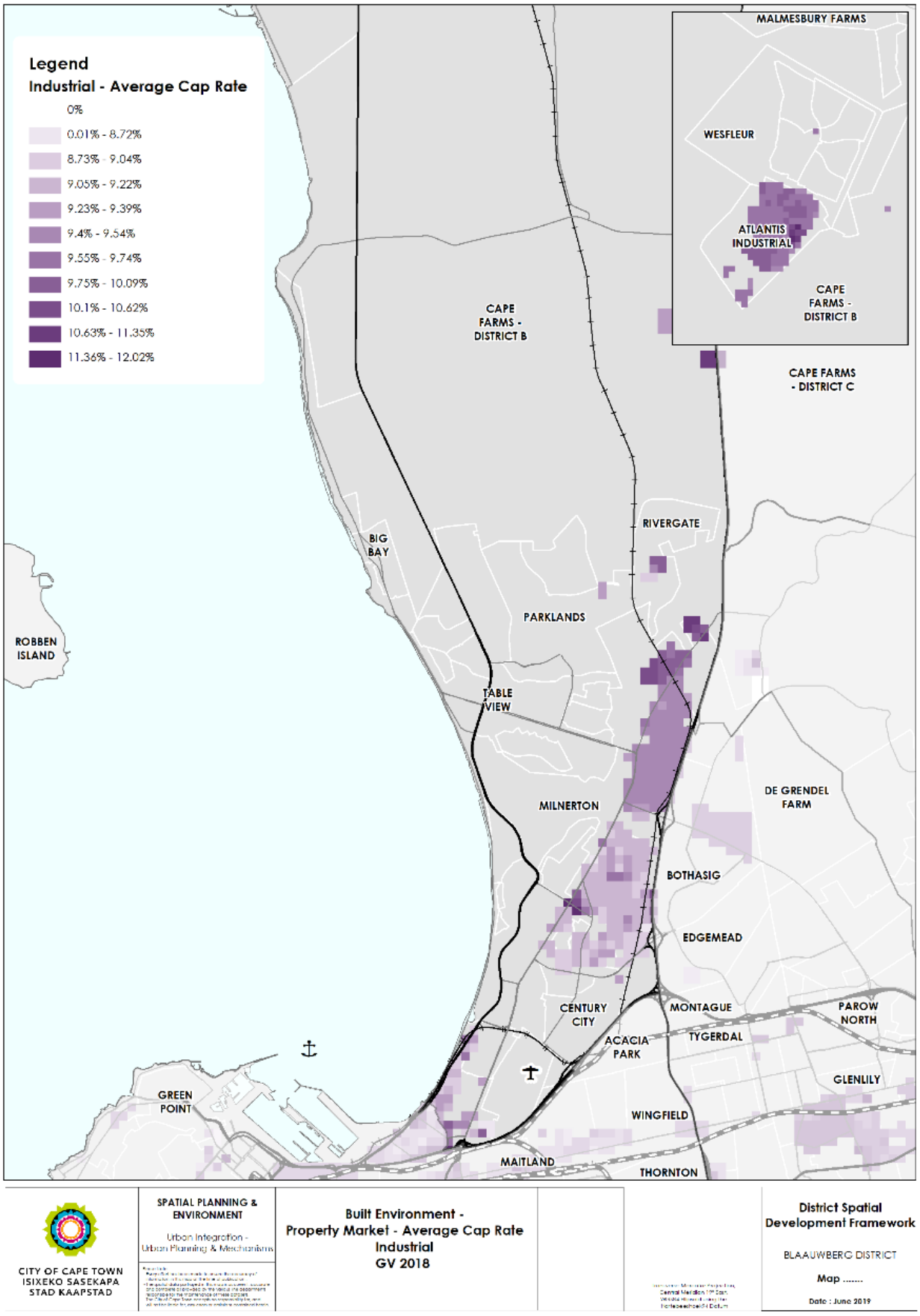


Figure 17: Average cap rates per 4ha: industrial property market

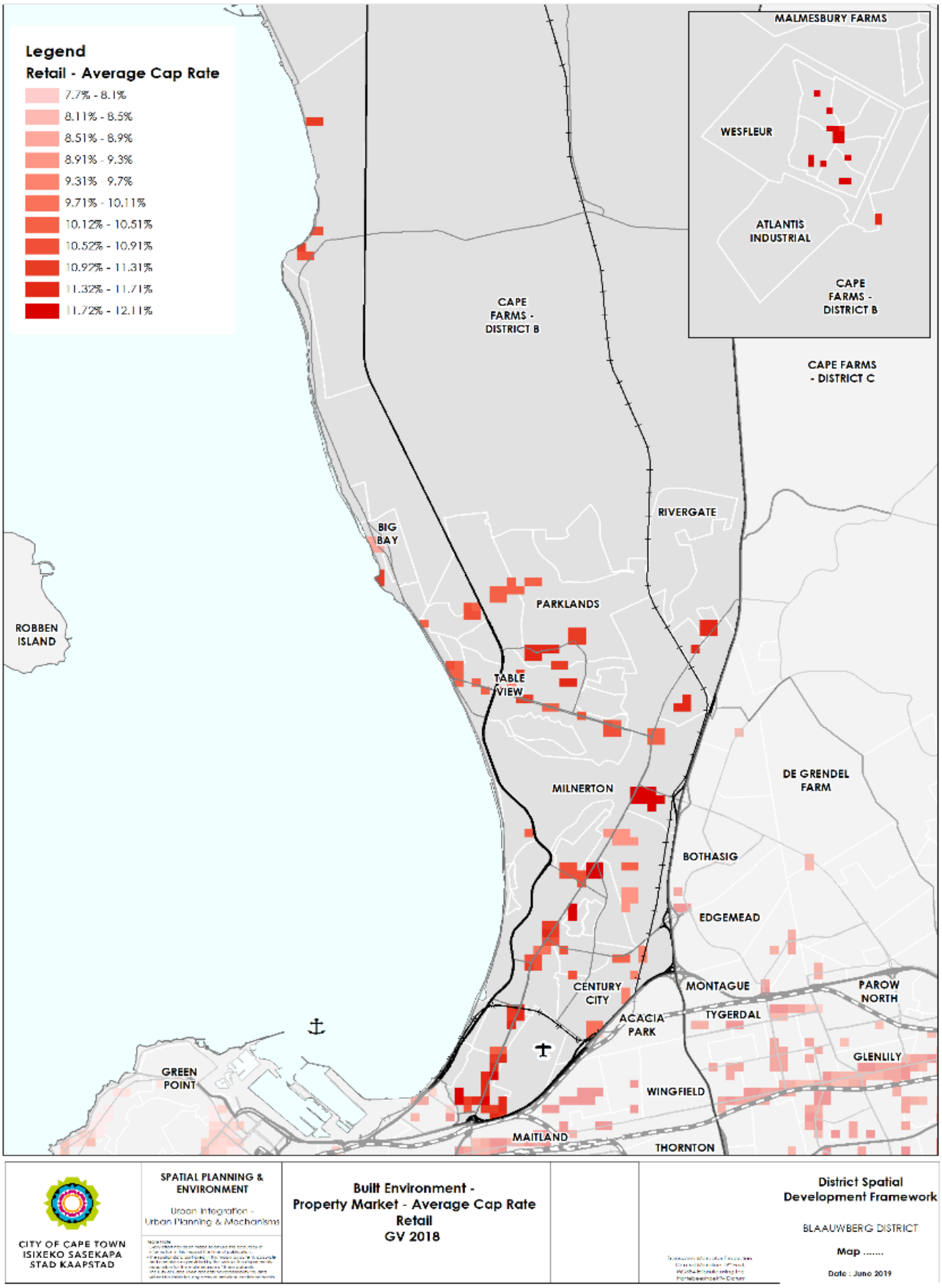


Figure 56: Average cap rates per 4ha: street-front retail property market

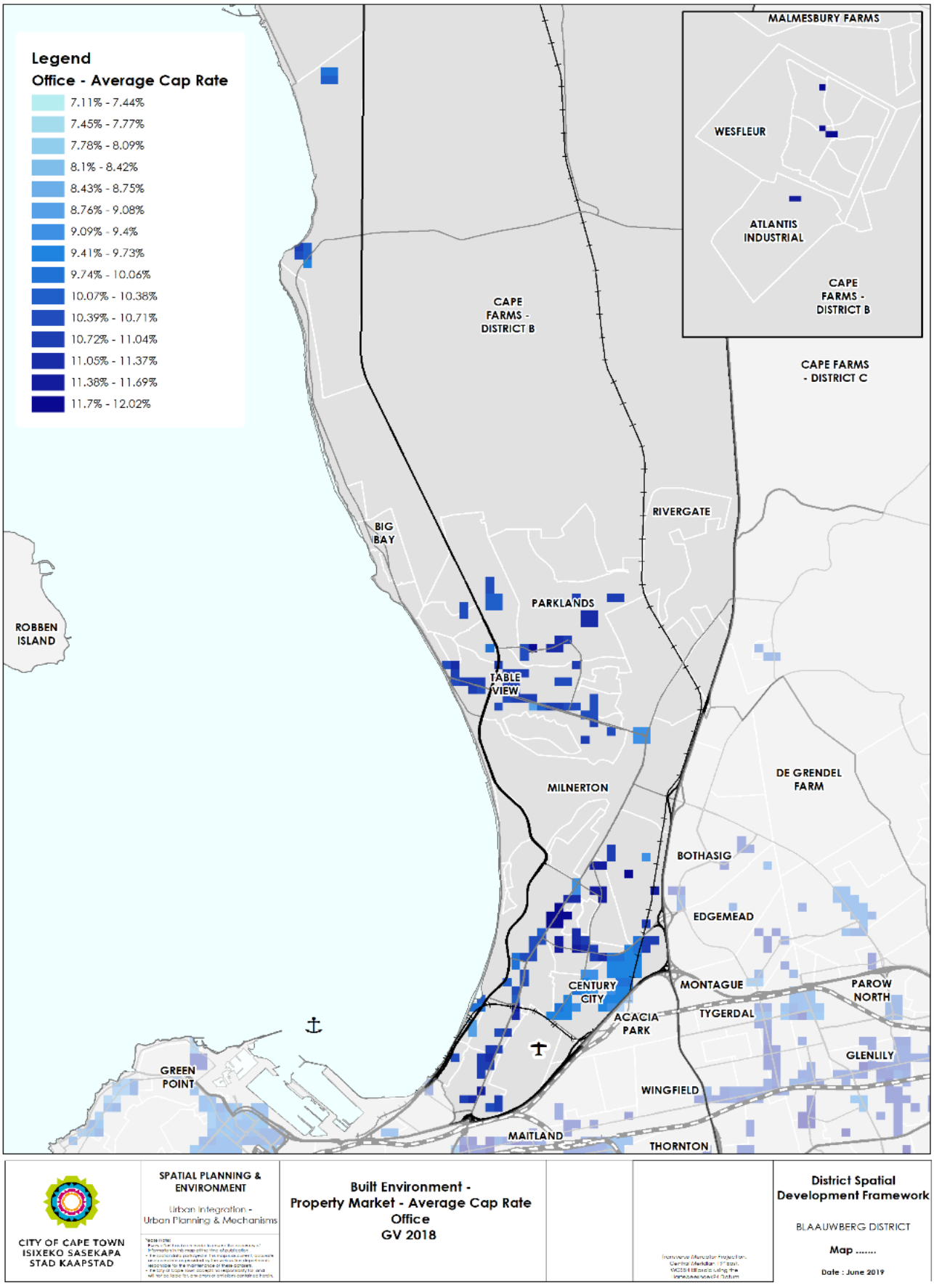


Figure 57: Average cap rates per 4ha: office property market

11.1.1.2 Residential

a. Sales

Figure 58 shows suburbs where the most property sales have occurred between 2012 and mid-2019. Parklands and Table View have the highest volume of residential sales with an average sale price of R 1,406,823 (Parklands) and R 1,715,153 (Table View) in 2018. The increase in sales volume in Parklands is the result of take-up of new residential development over the past 10 years. This indicates that there is a high demand for residential properties in these suburbs. 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), which explain why there is such a low volume of sales in DuNoon and Joe Slovo.

The data also reveals a lack of 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 4: Monthly income bands and the corresponding bond amount below depicts the total amount these household incomes are likely to obtain from end-user financing.

Table 4: Monthly income bands and the corresponding bond amount

E.	**Household Monthly Income**	F. G.	**Affordability** (assuming a bond on a 13% interest rate)
H.	**R22 000**	I.	**R560 000**.
J.	**R20 000**	K.	**R510 000**.
L.	**R18 000**	M.	**R460 000**

The residential sales data reveals that there are 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 8 depicts the average value per square metre 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. Big Bay and Sunset beach currently contain properties with the highest value per m². This map illustrates that the traditional bid rent theory [17]does not entirely apply to Blaauwberg, and that access and convenience is not the driving force behind the residential market.

[17] 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 60 and Figure 61 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.

Most residential property values in the Blaauwberg district grew between 50-70%. The increase in value could be attributed to a number of factors, improvements in the urban realm, consistent new development over time, the implementation of the MyCiTi service. Areas experiencing the highest growth include Dunoon (due to a significant increase in demand) and Melkbostrand. Northern areas of Parklands and Sunningdale show a significant increase in value as a result of new greenfield residential developments.

In terms of non-residential or commercial properties, values have significantly increased by more than 100% along key public transport corridors like Blaauwberg Road, Parklands Main Road, Koeberg Road and the southern section of Otto du Plessis. Industrial property values have also increased by 100%, which is more a reflection of current property market and economic trends.

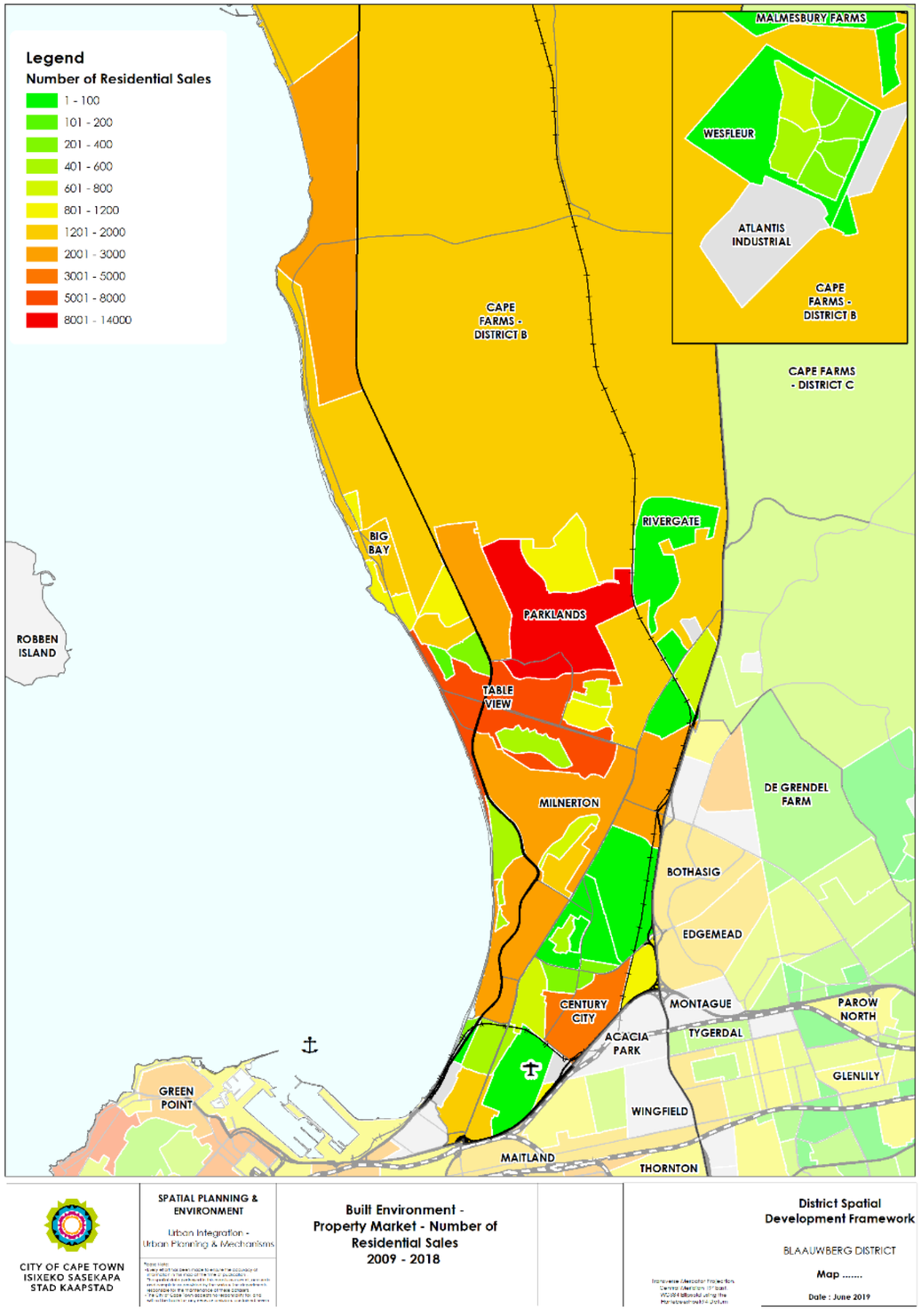


Figure 58: Number of Residential Sales per Suburb (2009-2018)

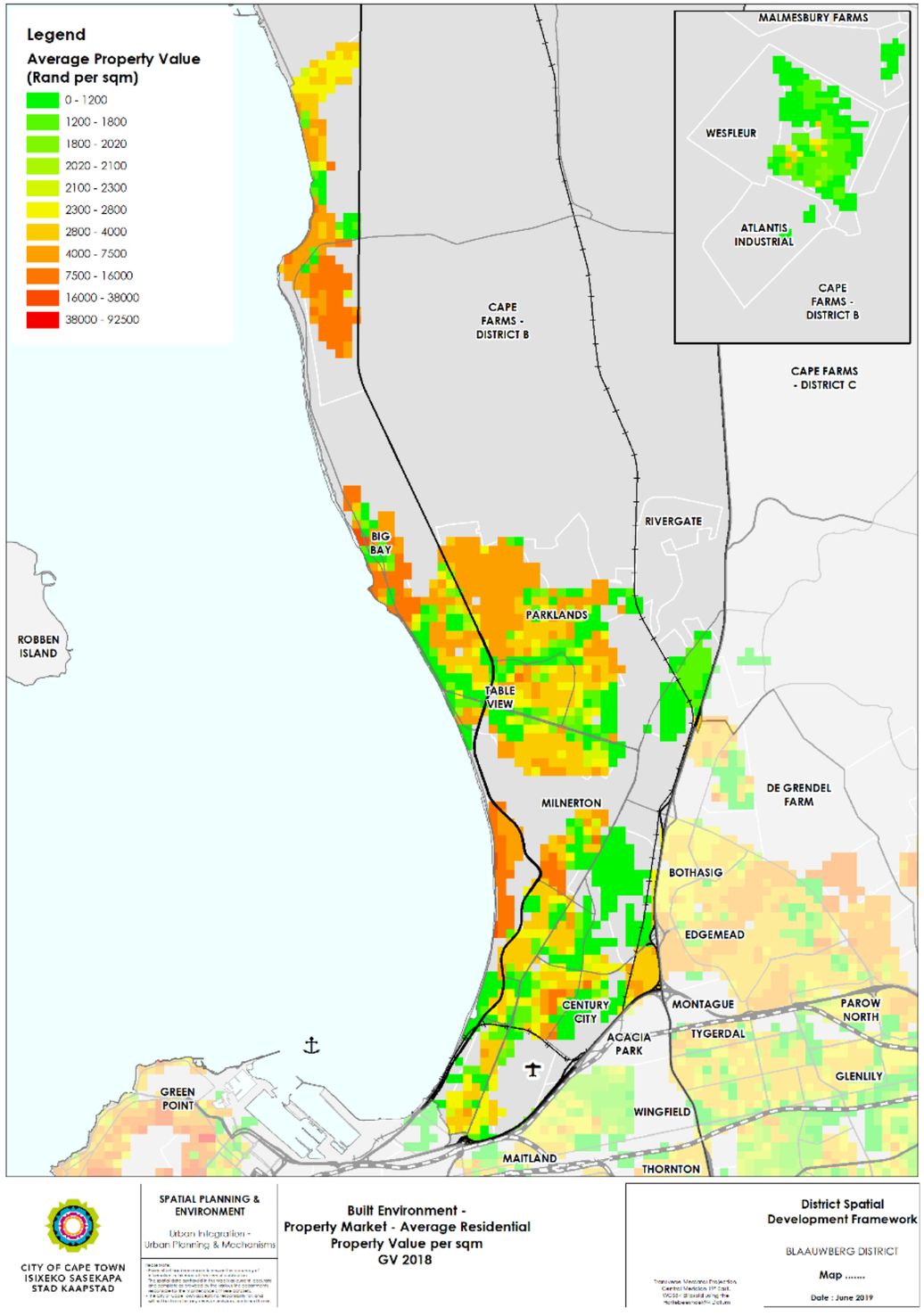


Figure 59: Value (R) per m²

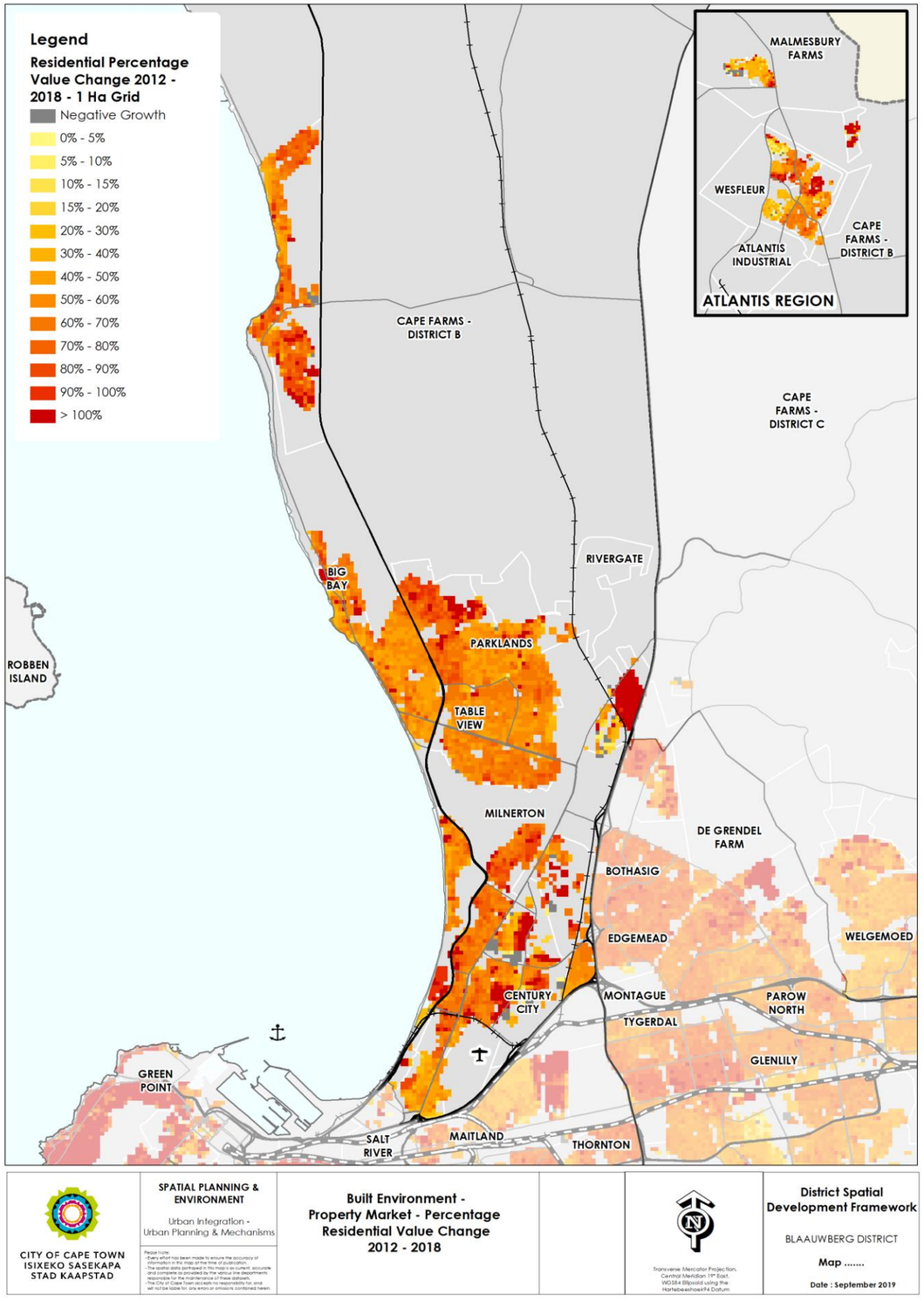


Figure 60: : Percentage Value Change for Residential Properties between 2012-2018

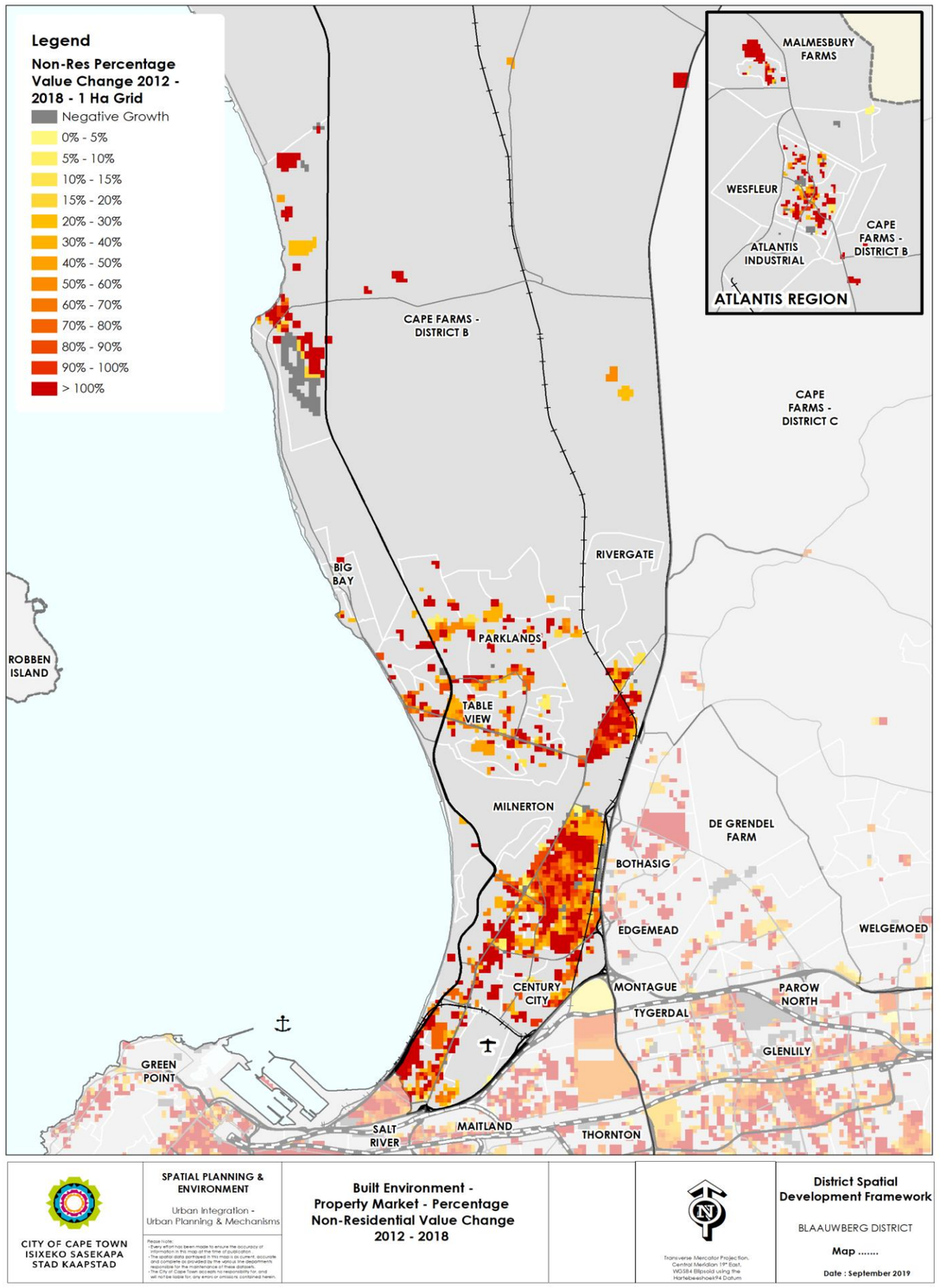


Figure 61: Percentage Value Change for Non-Residential Properties between 2012-2018

11.2 KEY OPPORTUNITIES AND CONSTRAINTS

11.2.1 Opportunities:

- The Blaauwberg district grew relatively faster than Table Bay in terms of both GGP and employment over the ten-year period, despite the relatively smaller size of its output and employment levels when compared to Table Bay. This is due to growth in the industrial sector, which has provided unskilled/semi-skilled job opportunities in the district. Based on the economic analysis, the manufacturing and trade sector is found to provide the most job opportunities in the district.
- The industries identified in should be supported to enhance their current local contribution to the City's GDP.
- On average residential properties have increased by 50-70% between 2012-2018.
- The MyCiTi service implemented in the Blaauwberg Road has had a positive impact on property values, especially among commercial properties. Commercial properties located along Blaauwberg Road, Koeberg Road, Parklands Main Road and the southern section of Otto Du Plessis increased more than 100% since 2012.

11.2.2 Constraints:

- Industrial land, in particular the logistic and warehousing sub-sectors, are land extensive/low density and low trip attracting land users. While this has contributed to job-creation, it does not support the City's approach to compact and dense development. To this end, opportunities for integration with other forms of compatible non-residential and residential land uses should be considered where contextually appropriate, to maximise space and intensify the existing built footprint.
- Lack of affordable housing products for the low-to-middle income households and high level of indebtedness for households present obstacles for obtaining home loans/financing.
- Blaauwberg has the third highest Gini-coefficient when compared to the 8 districts in Cape Town, which means high levels of income inequality remain.
- Blaauwberg had the fourth highest (0.79) human development index score (HDI), which implies there is room for improving access to education, health, employment, as well as other resources. However, the HDI score is higher than other districts, potentially due to the increase in industrial development (a source of jobs) and the implementation of the MyCiTi services, which provides efficient and safe access to services in the CBD resulting in a well-connected district.

E. SYNTHESIS

12 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 Spatial Development Framework, the purpose of this chapter is to investigate the type and level of integrated risks that has spatial implications for the future development in the district. A key focus of this chapter is to identify development parameters that will help the district and its residents avoid, mitigate or reduce the risk of disaster, by guiding development away from known hazards or in a way that the risk of being exposed to disasters[18] is lessened.

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

12.1 GUIDING POLICY ON RISK AND RISK MANAGEMENT:

The IDP focus area "The Safe City" 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 (2014), 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

[18] 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)

fuels. Doing so in the immediate future reduces the cost of implementing climate adaptation measures in the long-term.

Table 5: Sub-Strategy Appropriately Protect the Citizens of Cape Town from Risk Areas (Extract from MSDF 2018)

Sub-Strategy Appropriately Protect the Citizens of Cape Town from Risk Areas	
Policy Statement	What this Means/Requires
Policy 20 **Enable resource-efficient development**	The City can guide spatial development in a way that encourages the public and private sector to utilise sustainable practices and technologies that assist in reducing carbon emissions, reduce energy and water demand, promote public transport, non-motorised transport and support the recycling of water and waste materials.
Policy 21 **Direct urban growth away from risk areas**	Hazardous areas 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, where appropriate.
Policy 22 **Discourage urban growth in areas at risk from natural hazards/coastal processes which are expected to be amplified by climate change impacts.**	Areas vulnerable to climate change and natural hazards and risks have broadly defined through specialist studies or will be determined by future specialist studies.

The Disaster Risk Management Plan (2014) for Cape Town evaluates known hazards in terms of the following[19]:

Table 6: Known Hazards Scoring Criteria(The Disaster Risk Management Plan for Cape Town, 2014).

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		**HIGH PRIORITY**
	Insignificant		**MEDIUM PRIORITY**
Vulnerability of Community and/or Environment and/or Economy	Very Vulnerable		**LOWER PRIORITY**
	Vulnerable		
	Small Vulnerability		
Manageability/Coping Capacity by Responders to offset Hazards Impact and Vulnerabilities	Poor		
	Basic		
	Adequate		
	Good		

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

12.2 RISKS IN BLAAUWBERG

Taking the aforementioned guiding policy into the account the following section identifies the types of risk (see Figure 62 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 Table** 7 **- Table** 18 **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.

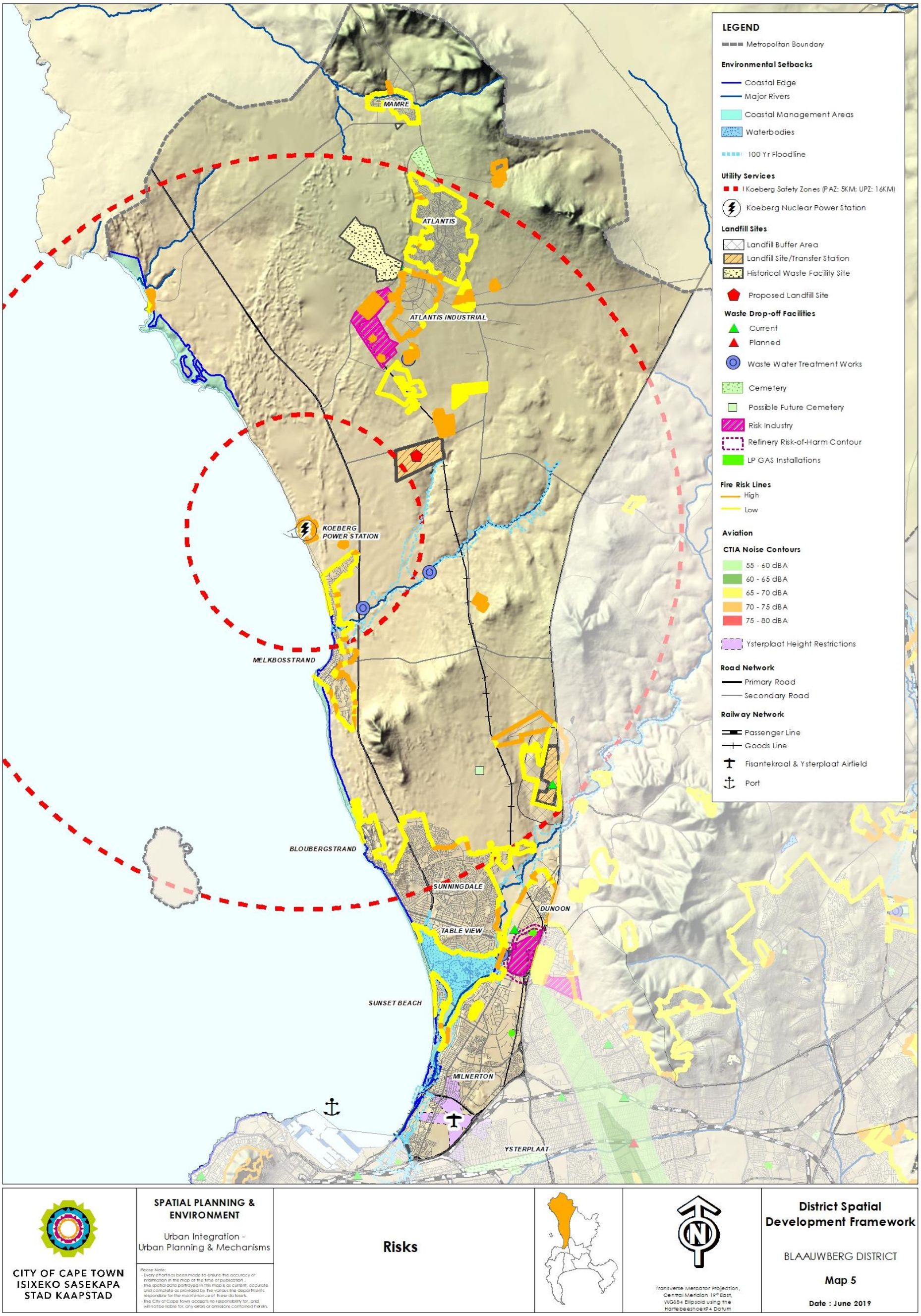


Figure 62: Integrated Bio-physical and Built Environment Risk Map

12.2.1 Natural Risks

12.2.1.1 Coastal Erosion

Extensive development along the coast and the disruption of natural sand movements caused by historic development has led to serious exposure to risk from coastal erosion processes along the Table Bay Coastline. This is anticipated to become more severe over time due to changes in coastal dynamics and sea level rise caused by climate change. The area from Milnerton beach to the harbour is experiencing the highest threat levels. It is a highly developed and utilised stretch of coastline that has seen in excess of 100m of erosion in the last 20 years.

Protection from coastal erosion and storm surges is needed at Table View beachfront and Blouberg beach. At Big Bay, development encroachment and interference with beach levels has resulted in the loss of the beach and dune systems. This in return has placed public infrastructure at risk

It is imperative that the dune areas are well maintained on an ongoing basis and small ongoing repair/rehab work is undertaken on the toe of the dune as beach levels change seasonally and storm surge events and spring tides occur.

Table 7: Risk Impact - Coastal Erosion

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely	Moderate	Vulnerable	Adequate	High	Development of coastal economic and social opportunities must be undertaken in a manner that does not reduce, harm or degrade our coastal environment or its ability to cope with climate risks in the future. For existing property in risk areas initiatives that enable adaptation and reduce risk must be encouraged. Alternative service delivery mechanisms in risk areas should be investigated in order to reduce the impacts of known hazards.

12.2.1.2 Sand Dune Migration/ Windblown sand

Windblown sand and sand migration affects the livability of the District and functionality of infrastructure in the District. Along the coast strong winds and salt water spray create harsh conditions.

Sand dune migration poses a risk to urban development and coastal infrastructure in particular, impacting the use and maintenance of coastal infrastructure and properties. Infrastructure at coastal resorts is affected, affecting the recreational amenity of the coast in this area. There is high seasonal demand for recreation at this stretch of the coast.

At Table View Beach, cessation of dune management has resulted in wind-blown sand problems in throughout the length of this stretch of coastline and erosion of the dune cordon between the beach and urban area. The dune system plays an integral role in creating a buffer between the beach and the urban environment which could absorb impacts of sea level rise.

Table 28: Risk Impact - Sand Dune Migration/ Windblown sand

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Likely	Moderate	Vulnerable	Adequate	High	Development of coastal economic and social opportunities must be undertaken in a manner that does not reduce, harm or degrade our coastal environment or its ability to cope with climate risks in the future. For existing property in risk areas initiatives that enable adaptation and reduce risk must be encouraged. Alternative service delivery mechanisms in risk areas should be investigated in order to reduce the impacts of known hazards.

12.2.1.3 Wild Fire

Fire lines indicate the interface between the wild land's 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 29: Risk Impact - 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.

12.2.1.4 Flood Risk and Coastal Inundation

The presence of waterbodies 1:100 year flood lines and indicative sea level rise modelling reveal the areas with higher probability for flood and coastal inundation occur. The Diep River corridor and Rietvlei wetland areas are areas of concern, as well as points along the coast vulnerable to storm surges. The Coastal Management line does not indicate all the properties that are exposed to coastal risks.

Table 30: Risk Impact – Flood and Coastal Inundation

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.

Relative elevation (see Figure 63) reveals areas where the flow of water will speed up or where water will collect. The darker areas indicates where there may be more need for storm wate and storm surge management and precautionary development principles.

Table View beachfront has been identified as one of 16 hotspots across the City that would increasingly be affected by storm surges and sea-level rise into the future.

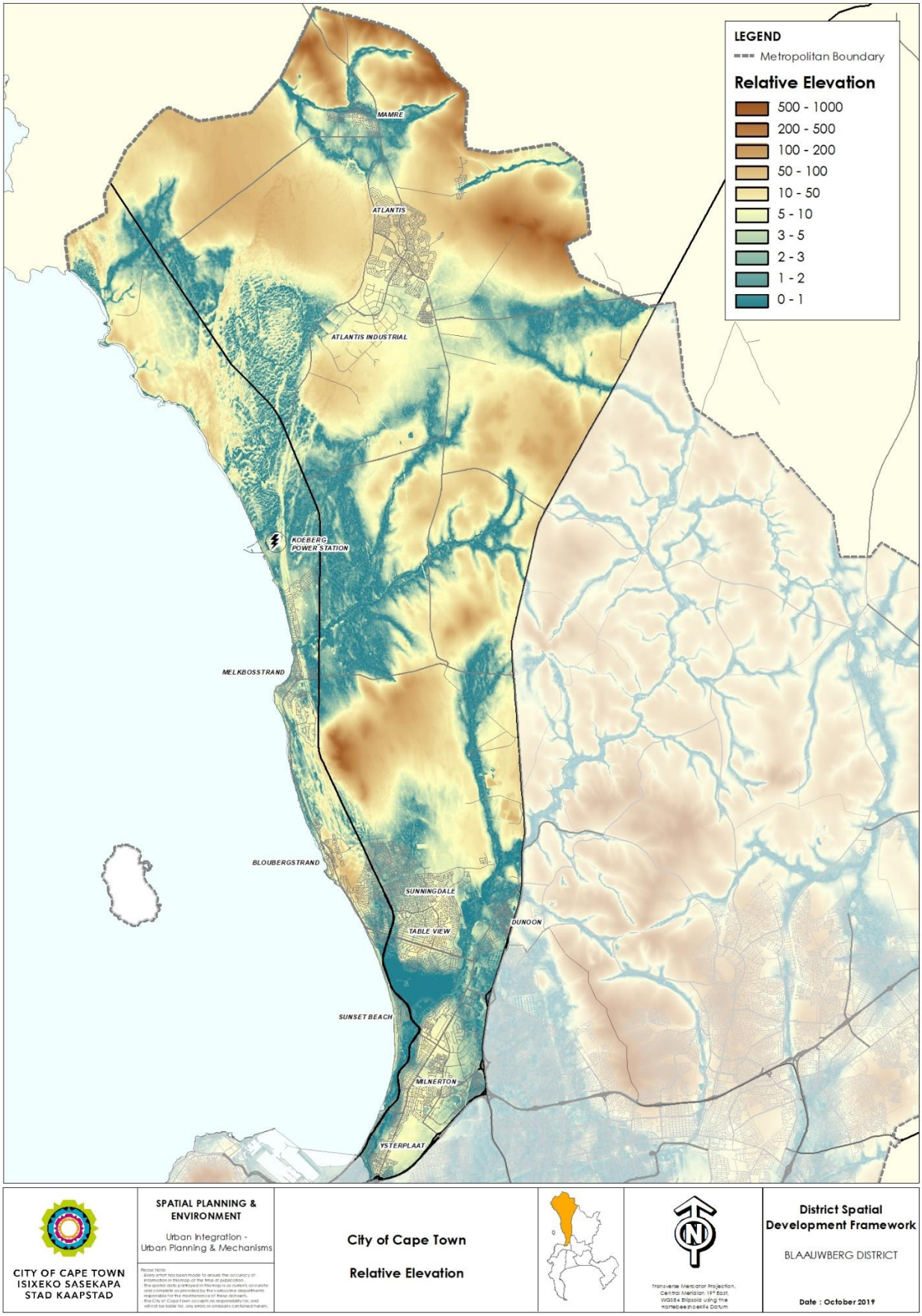


Figure 63: Relative Elevation

12.2.1.5 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.

Table 31: Risk Impact – Heat and 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 exiting green vegetation, and ensure that areas targeted for densification include sufficient green space and public spaces and facilities that are designed for cooling.

12.2.2 Built Environment Risks

12.2.2.1 Risk Industry

Risk industry zones include industries and industrial practices that pose a hazard to human health and well-being. These zones exist around Atlantis and around the Caltex refinery. The risk of accidental release of hazardous material is higher in these areas and nearby populations more vulnerable to this threat. The disaster probability rating includes the possible release while transporting risk substances and hazardous goods and is therefore higher than it might be for risk industry generally.

Table 32: Risk Impact - Industrial Development

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.

12.2.2.2 Koeberg Nuclear Power Plant

Koeberg Nuclear Plant is the most significant development inhibitor in the District. The location of Koeberg in proximity to a heavily populated urban area presents a significant hazard in the event of radiological release or any explosion incidence.

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 33: Risk Impact - Koeberg Nuclear Power Plant

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).

No new development is permissible within the PAZ (as defined above) other than development that is directly related to the siting, construction, operation and decommissioning of the KNPS or that is a result of the exercising of existing zoning rights. On this basis, no application for enhanced development rights (rezoning, subdivision, departure from land use, or Council's consent, including application for a guesthouse or second dwelling) that will increase the transient or permanent resident population, and that is not directly related to the siting, construction, operation and decommissioning of the KNPS, can be approved. Furthermore, the projected population within the PAZ must be evacuated within four hours from the time that an evacuation order is given, as demonstrated by means of a traffic evacuation model approved by Council and the National Nuclear Regulator (NNR).

Any new nuclear power station being developed in Cape Town must be located on the Eskom Holdings SOC Limited controlled area at the Koeberg site, and its exclusion zones must be smaller or equal to the existing KNPS's 5km exclusion zone (the PAZ).

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 project around Koeberg. This includes:

a) Land use applications located in the PAZ (0 – 5km radius from KNPS), should not be approved unless it is "place-bound" (related to the functioning of Koeberg Nuclear Power Station).

b) Exercise caution in the approval of applications which:

- increase transitory temporary visitors (i.e. tourist related uses) into the area;
- include special facilities like old age homes, accommodation for the disabled and schools which requires significant evacuation support in terms of transport provision commitment; and
- Generate a 10% increase in the population of the subzone (e.g. UPZ NE or SE sectors).

c) 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).

d) 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.

12.2.2.3 Landfills, cemeteries, solid waste disposal sites and waste water treatment works:

Exclusion buffers exist around waste disposal and waste treatment 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.

The City's Visserhok landfill site is located in the District and deals with general and low risk hazardous waste, a higher risk private hazardous waste facility is located next to the landfill. The exclusion buffer around this facility is necessarily larger than other City facilities.

Table 34: Risk Impact - Landfills, 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.

12.2.2.4 Infrastructure Availability:

The availability of infrastructure influences the type of development that can occur, higher infrastructure capacity can include a higher intensity of land use. Infrastructure needs to accommodate inward growth and demand that will allow cost recovery and a more efficient urban form. Refer to the infrastructre chapter in built environment status quo report to see areas with limited infrastructure availability.

Table 35: Risk impact - 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 in prioritised.

12.2.2.5 Ysterplaat Height Restrictions

The Ysterplaat airbase hosts a variety of aeronautical activities, height restrictions are in place in the surrounding area, governed by title deed conditions.

12.2.2.6 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 36: : Risk impact - Structural Fires 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.

12.2.2.7 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 37: : Risk impact - Structural Fire 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.

12.2.2.8 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 18: Risk impact - Unmanaged Land Occupation/Unregulated Development

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.

12.2.3 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.

12.2.3.1 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 mental health impacts
- 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 (see maps on pages xyz).

Figure 1 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 2 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 39: Indicators and associated Weighting used to determine vulnerability scores

Indicator	Description	Weighting
Crime Rate	Total number of crimes by police precinct area	5
Electricity for Lighting	Percentage of households with acces 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 opportunies , ranked zoning areas by potential formal employment areas assessed in a 1km radius	5
Employment variety within 1 km	Measure of job diversity opportunties: 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 3 shows an assessment of risk relative to resilience, based on figures 1 and 2; 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 4 presents the demonstrates the method for measuring exposure against resilience revealed in figure 3 risk hotspots and shows the position of the neighbourhoods along these scales.

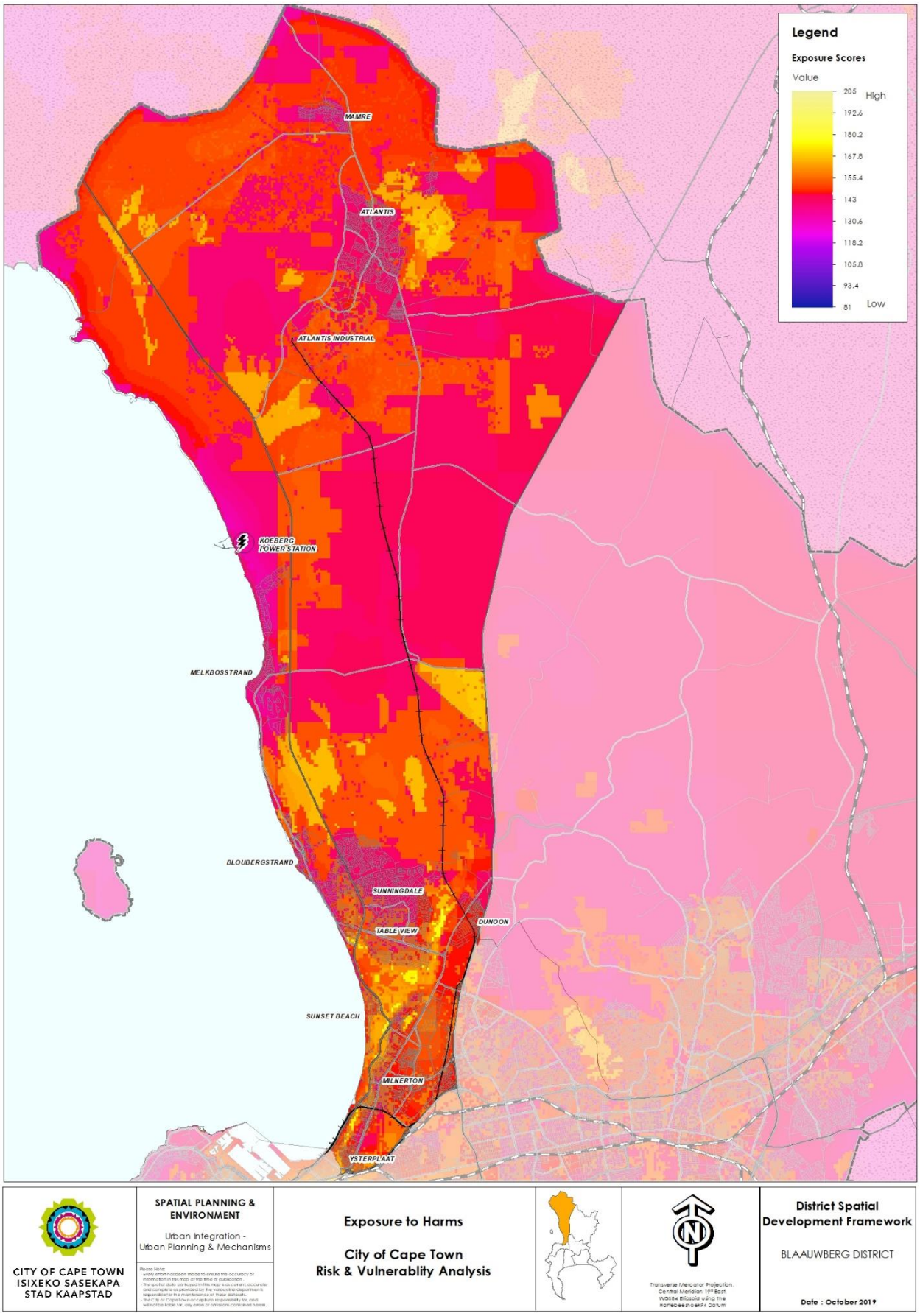


Figure 64: Exposure to harms

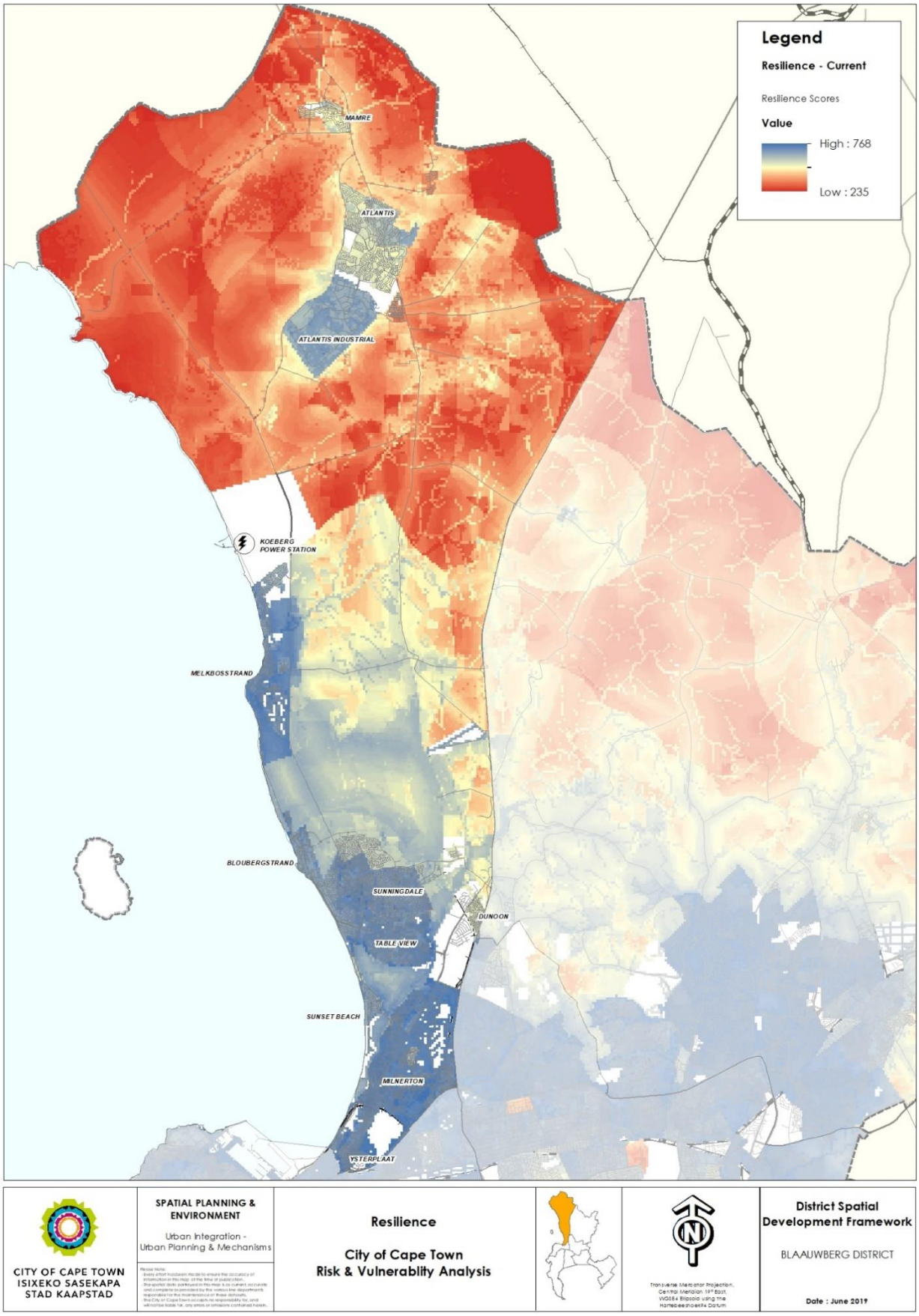


Figure 2: Present day resilience (higher score = higher resilience and lower vulnerability, lower score = lower resilience and higher vulnerability)

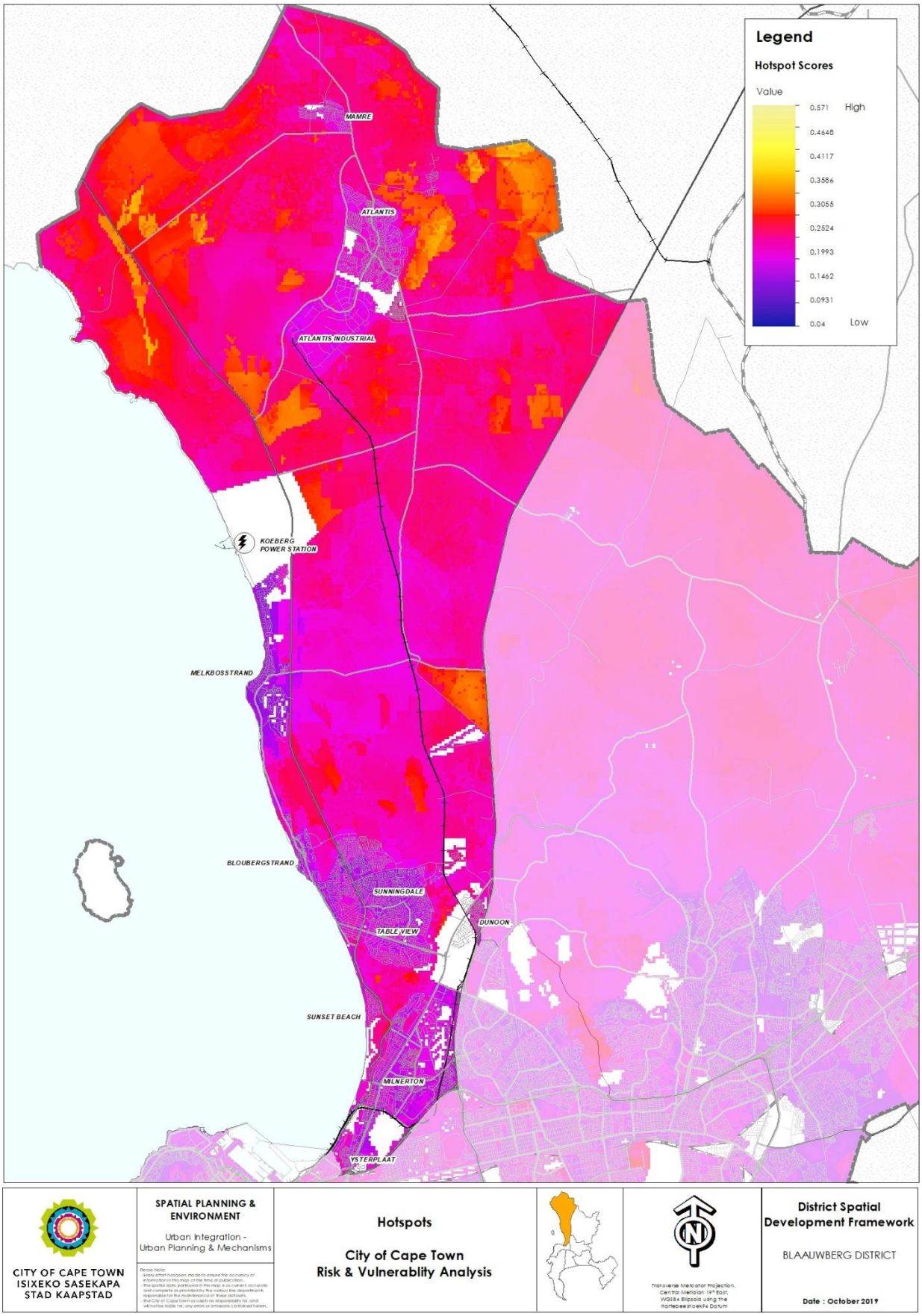


Figure 3: Climate risk hot spots (higher score = higher risk)

12.2.3.2 Implications:

Vulnerable areas and risk hotspots indicate areas that will need to be prioritised for resilience building, public sector intervention and support. Atlantis, informal settlements and properties in the low lying areas are more at risk.

12.3 KEY OPPORTUNITIES AND CONSTRAINTS

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

Table 40: Risk development parameters

Risk	**DRM Priority Rating**	**Impact Radius**	**Discouraged Types of Development**	**Encouraged Types of Development**
Koeberg	High	5km	All	None
	High	16km	All development above the maximum threshold…	Cemeteries Managed Biodiversity and Green Infrastructure
refuse transfer stations and waste disposal sites	n/a	800m	Residential Development within buffer	Non-Residential development; Circular economy related industry and commerce
Cemetery	n/a			Open space uses
Ysterplaat	n/a	Height restriction zone	All developments over regulated height	Development within restrictions zoning scheme
Structural Fire	High	Entire City but higher in informal settlements	Building materials and built forms that allow the spread of fire.	n/a applies to developed areas
Heat wave	Lower	Entire City	Planning built areas with no green spaces, shade cover or tree cover.	Green spaces with shade allowances.
Unmanaged Land Occupation/U	n/a for Disaster Risk Manage	Vacant and underutilised land	Left over spaces and derelict land that	Refer to human settlements policy and need to address

nregulated Development	ment however a priority for law enforce ment		encourages speculation.	affordable housing demand.
Flood Risk and Coastal Inundation Zones	High	Informed by 1:100 year flood lines and coastal urban edge line[20]	Intensification of urban development	Green infrastructure, non-motorised transport Open space recreation Feasible development to support identified public recreational nodes.
Wild Fire	High	Fire lines	Development outside the range of existing service response times.	Fire Breaks Development that incorporates fire protection measures.
Coastal Erosion Zones		Along entire coast	All urban development	Green Infrastructure Feasible development to support identified recreational nodes
Wind-blown sand	Lower	Dynamic dune systems		Rehabilitation and stabilization of degraded dune systems. Managed retreat Green Infrastructure Defenses of crucial infrastructure

[20] These are indicative and do not include all areas and properties at risk.

13 FIXES AND AREAS OF INFLUENCE

Spatial Implications - Biophysical

13.1 Environment

The Blaauwberg District covers a large expanse of land and boasts a wide variety of fauna and flora. However, Blaauwberg's rich biodiversity is currently under threat for a number of reasons. These threats and spatial implications will be discussed below.

One of the more pressing environmental impacts is the rapid development spreading northward **threatening areas of critical biodiversity**. Furthermore, the following anthropogenic processes; such as poor invasive alien species management, poor fire management, exploitation of water resources, and the conversion of natural land to agricultural land further threaten the health of Blaauwberg's environmental resources. The Blaauwberg District is home to some of the **last remaining tracts of two of South Africa's rarest vegetation types**, **namely the Sand Fynbos** (consisting of the Atlantis Sand Fynbos and Cape Flats Fynbos), **and Renosterveld** (consisting of Peninsula Shale Renosterveld, Swartland Silcrete Renosterveld, Swartland Granite Renosterveld, and Swartland Shale Renosterveld). The Sand Fynbos and Renosterveld species are endemic to the region and need to be protected.

Biodiversity linkage corridors have been identified as a key enabler of maintaining rich biodiversity levels. The **Sandown Fynbos corridor** is an ecological corridor linking the Diep River to the Blaauwberg Nature Reserve. Another **corridor linking the Blaauwberg Nature Reserve to the Northern District has been proposed as an important east-west ecological link**. This would cross the districts approximately at Frankendale. *The Frankendale industrial development to the west of the Vissershok Landfill site was approved in 2016, but has not been developed yet. The proposed development provided for more than 900 000m² of industrial floor space.* The proposed East-West ecological corridor is notionally delineated directly over the Frankendale development.

The Dassenberg Coastal Corridor Partnership is an opportunity/precedent for proactive conservation. It also protects a large part of the Witzands aquifer recharge area which supplies water to Atlantis.

Inappropriate land uses bordering on critical biodiversity or flood prone areas threaten ecological health. Flood prone areas around Diep River and Rietvlei have high biodiversity potential, across flora and faunal species. The **disposal of untreated effluent** by people living without access to toilets and from the under capacity Potsdam WWTW, has a negative impact these river systems health. Reed beds function as ecological infrastructure, by slowing and, to a limited degree, purifying the flowing water. From an ecological perspective (as well as a moral one) a better sanitation solution is needed, as is the upgrade of **Potsdam WWTW**. Large reed beds and other ecological infrastructure

solutions should be considered in providing long term mitigation measures, to assist and complement hard infrastructure solutions.

The **Vissershok landfill site** poses a constraint to development in the area. A private hazardous waste facility located adjacent to the City facility has resulted in a large **no-build area**. Access to the waste facility by train has stopped due to the railway line being invaded by. From a waste servicing and cost perspective (all waste is now being trucked in), relocating the population on the railway servitude is a priority in order to allow the waste facility to resume normal operations, as trucking in waste for disposal is substantially more expensive. Temporary and permanent relocation areas need to be identified and developed.

Aquifer extraction sites need to be added to the map. Generic guidelines for development in the **aquifer recharge areas** can be included in the EMF and SUDS guidelines in the sub-district guidelines. At a principle level, we need to ascertain what the development limit on these areas is so that the aquifers remain productive. This will help in delineating ecological corridors and conservation areas, parks and green belts in terms of size and distribution.

Flood prone areas in the district follow the rivers and coastal edge. The current district plan requires that the impacts of sea level rise are taken into account for development along the coastal zone, however this needs to be fleshed out to provide more specific guidance. The coastal area from the Harbour to Sunset Beach is at high risk and has experienced high levels of erosion. The Table View beachfront has been noted as another area which is set to have a high impact from sea level rise and storm surge. Design guidance for these two areas needs to better understood.

The coastal edge delineation at **Springfontein** needs to be looked at as a specific **pressure point** as there is disjuncture between the MSDF and the 2012 District PSDF

There is an opportunity for **sand mining** in the district. If not managed proactively the resource is mined illegally. This may become a larger issue in the future as other sand mining opportunities come to an end in other parts of the City.

13.2 Transport

The report has outlined the status quo mobility and accessibility network analysis for the district, highlighting a strong transport focus to guide accessibility and mobility. Blaauwberg has experienced rapid urban development in the northern area in the past 2 decades. Additional road infrastructure is required to accommodate future developments; however the pace of roll out is expected to be much slower due to general economic circumstances. The requirements surrounding the evacuation times and models of Koeberg Nuclear Power Station 16km zone require generous road infrastructure. This has largely been built by the development contributions.

Roads:

The completion of **Berkshire Boulevard** will be a significant East-West route which will unlock further development in the area. Berkshire boulevard is expected to function as a major mobility and development corridor.

Parklands Main Road is expected to emerge as an activity route, especially as land in its northern portions is developed.

The proposed R300 extension will run along the southern side of the Blaauwberg Conservation Area. This will be a mobility route with limited access onto it.

Blaauwberg Road is targeted for intensification as a current and future activity route. The current review of the Blaauwberg Road Management Strategy addresses the traffic and transport issues relating to intensification along Blaauwberg Road. A key finding is that restrictive title deeds conditions hinder densification as they limit coverage. Blaauwberg road continues to be a targeted development corridor due to the mix of land uses and public transport provision along it. However, it will not realise the vision of a high density corridor unless practical land use management issues are addressed. Currently densification is pursued by sectional title. This is limiting for the future consolidation and redevelopment of the corridor.

Traffic congestion was consistently flagged in public participation as a constraint to development along Blaauwberg Road in particular, and the wider Table View area.

Koeberg Road is an existing and emerging activity route. It has varied land uses along it including institutional, light manufacturing, retail, residential.

There is no working **passenger rail line** in Blaauwberg, except for the Century City stop which is on the Monte Vista line. There are existing railways in the district. The introduction of a passenger railway system is a large opportunity for the district.

The MyCiTi bus system operates extensively in the Blaauwberg district. It is generally well used, particularly during peak hours by commuters going into the Cape Town CBD. It provides a connection to Atlantis.

Congestion is a major issue in the area which needs to be addressed both through promoting a more balanced mix of land use and through thinking creatively of how to reduce peak time private car use.

NMT…

13.3 Built Environment

The district offers a diverse set of land uses including urban, rural and farming.

Existing and emerging nodes include Century City, Parklands and Table View. The growing need for housing in Cape Town has mainly been addressed by the private sector in the form of greenfield developments.

13.3.1 Residential

The majority of development in Blaauwberg continues to be driven by the private sector and consists primarily of **new township greenfield developments**, such as Parklands and Sunningdale. The rate of development has slowed since the global economic downturn, however new phases continue to be rolled out. **More discussion needed to understand how these residential product offerings have changed. Eg. In terms of demand for smaller houses? At a lower price point? Etc.

Greenfield developments are typically at a gross and nett density lower than is required to support the functioning of the MyCiTi or other public transport. **Density guidelines** need to be relooked. They are not aligned between District Plan and MSDF.

Redevelopment of existing urban fabric to dense/different uses is limited in many parts of the district by **restrictive title deed conditions** and a **lack of public will to live in a denser** urban environment.

Older residential suburbs of Brooklyn, Ysterplaat, Summer Greens and Rugby, may come under **gentrification pressure.** Their location – in close proximity to the CBD, Century City and arterial routes – drives the value of the land up. In instances where the urban environment has not been well maintained, including private top structures, properties may be undervalued. These conditions result in a situation where land is bought for its speculative value rather than its immediate use. To avoid displacement of working and middle class people as is happening in Salt River and Woodstock, the southern portion of the Blaauwberg built footprint needs to be considered. The pressure for well located land and willingness to purchase speculatively is evident in the purchase of industrial properties in Paarden Eiland. A development framework for Brooklyn was done by GAPP for Communicare in 2019 which may in a useful informant in the sub district guidelines.

Dunoon is one of the densest residential areas in the City. Almost all structures are informal. Back-yarding and micro-development of apartment blocks are key trends. Dunoon is a pressure point/priority area in the district. There is intense need for housing, bulk infrastructure and servicing. At the Dunoon public meeting a member of the public remarked the City 'knows it is a timebomb'. This was in reference to the cramped living conditions. The need for a police station in Dunoon was also raised consistently. Land use issues relating to it being a LFTEA area were also raised by the public. Dunoon is located near to the main industrial parks in the district which offer blue collar work opportunities.

There is a dispersed and sprawling informal settlement along the road to Springfontein from Atlantis. These are apparently predominantly pig farmers. They are not serviced by bulk infrastructure.

13.3.2 Industrial

The district has a number of **significant industrial nodes**, including the northern portions of Paarden Eiland, Atlantis, Montague Gardens, Racing Park, Killarney Gardens and Rivergate. Portions of Atlantis Industrial have been declared a Special Economic Zone (SEZ) with incentives for green-tech industrial uses. The City has invested heavily in the **SEZ**,

however has not been adequate communication with the project manager as to what the opportunities and constraints are. There is a concern that the SEZ project has not considered the wider needs to assist it in succeeding in terms of the demographic it is hoping to attract to locate in Atlantis and how the SEZ can be used to uplift Atlantis holistically.

Koeberg Nuclear Power Station is a major risk and casts a "no development" zone radius 5km around it and a constraint on development for the next 11km.

Rivergate Business Park is an **emerging industrial node**.

13.3.3 Retail and Office

From a transport perspective **Century City** is targeted to increase in scale to improve the balance of land uses in the city. Big Bay is an emerging node which has had a significant amount of new development around it, including the new Table Bay mall.

The main **development corridors** are Koeberg Road, Blaauwberg Road, Parklands Main Road, and Sandown Road.

Large block erven along Sandown Road and Parklands Main Road have resulted in "big box" retailers. This has created impermeable street blocks not designed at the human scale, which hinders pedestrian movement. Furthermore, the adaptability of large block developments for alternative uses is limited.

13.3.4 Rural and Agricultural

Rural and Agricultural land uses offer opportunities in terms of improving food security by growing food in the district; combatting urban heat island effects by containing sprawl; and offering recreational and tourism opportunities.

The **Klein Dassenberg Smallholding Area Development Framework** (2002) area has been under pressure for subdivision and rezoning. It may worthwhile to engage with this community specifically on the District Plan as the KDSADF will need to be reviewed in the next 10 years. There are service capacity constraints in the area, especially regarding water, and a high water table which impacts the type of development appropriate.

13.4 Bulk services

Water supply to Atlantis relies on the aquifer and Silwerstroom river. Maintaining these two ecological assets is extremely important from a water provision perspective. The water extraction infrastructure is aging – maintenance program necessary.

The upgrade of **Potsdam WWTW** should be completed by 2026. It is currently a pressure point in the district.

The need for **state assisted housing** outstrips the housing supply in the district. IN particular the areas of Dunoon, Doornbach, Marconi Beam, Witzands need assistance. New

approaches to housing provision are needed as the trend analysis shows the current approaches are insufficient/ too costly and timeous.

Opportunities for **inclusionary housing** should be pursued in northern Paarden Eiland, and Table View.

13.5 Economy

Based on values in MSDF:

13.6 Spatial Implications: (What, Where and why)

No go

Constrained

Dev opp: dens (definition, where and implications), intensification ()

- **Housing:**
- **Dens/intens**
- **Environment**
- **Econ**

Spatial targeting, supporting infra, constrained areas