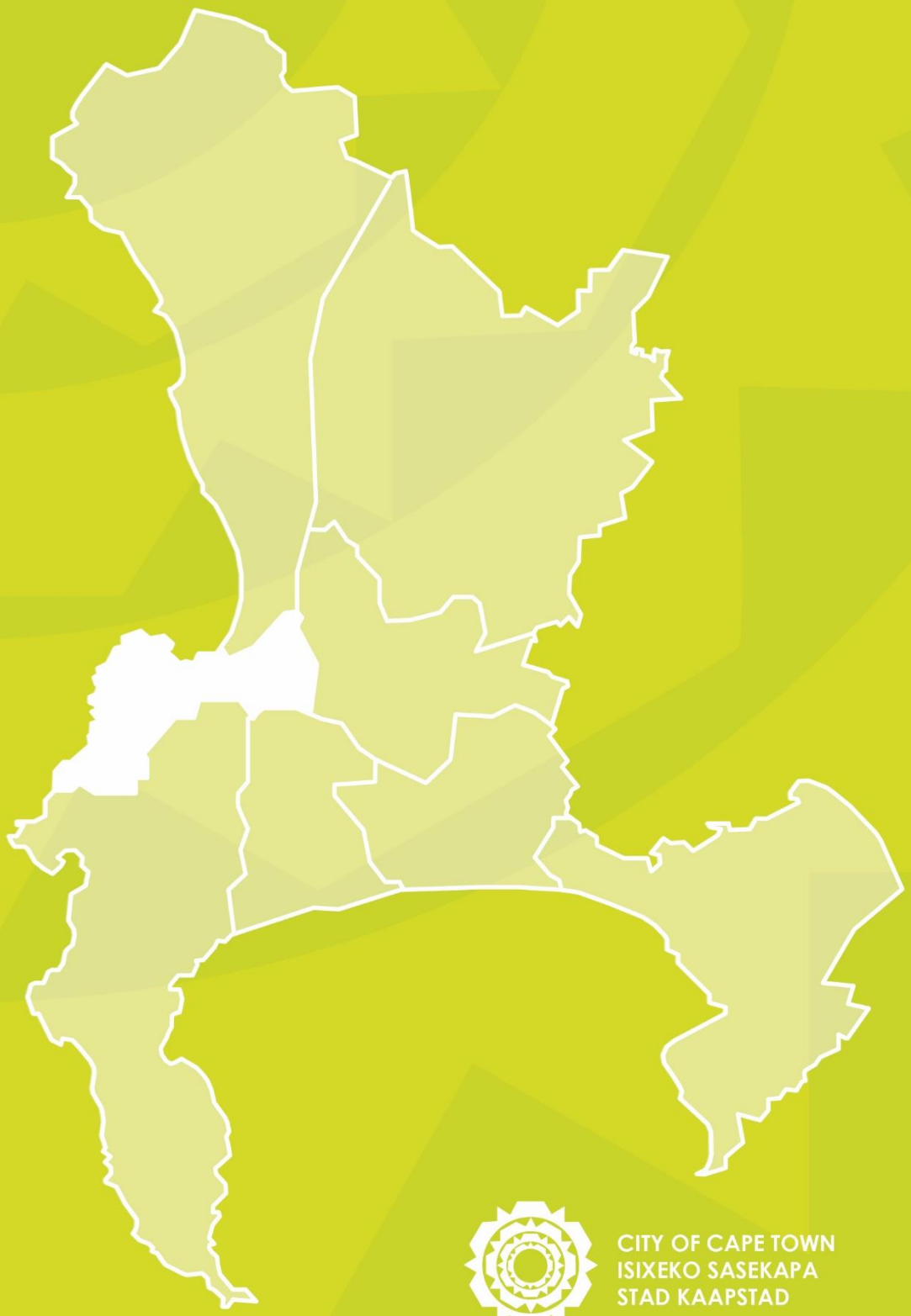
TABLE BAY
DISTRICT PLAN

Integrated district spatial development framework
and environmental management framework

APPROVED - Vol. 1: Baseline & Analysis Report



JANUARY
2023

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

CONTENTS

LIST OF FIGURES

1 INTRODUCTION

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

1.1 Structure of the District Plan Suite of Documents

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

Figure 1 Structure of the District Plan

1.2 Purpose of the Baseline and Analysis Report

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

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

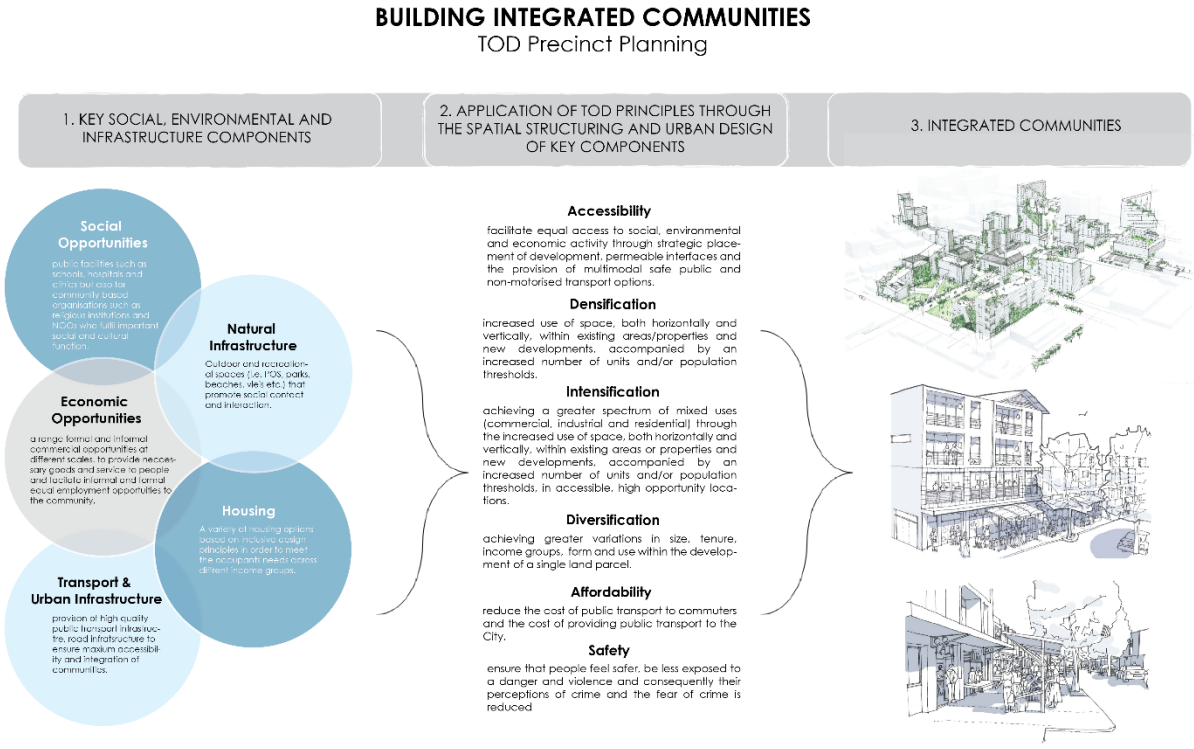


Figure 2: Building Integrated Communities

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

1. **What is there and what are the trends?** This entails a brief description of the status quo, showing the trends since 2012, i.e. projects built, pressures, constraints and the opportunities;

2. **What does this mean and what are the implications?** This entails an indication of the implications of the above constraints or opportunities for spatial planning (District SDF), i.e. where are is available, physical space and where is more needed. Where are land use guidelines or policies, or interventions, e.g. physical projects, needed;

3. **How is this linked to other elements/layers?** This is the synthesis, that has not been completed, but explores the interrelationship between the constraints and the opportunities as they relate to the various layers analysed as they all work

together to form the basis for plan making, using an analysis informs plan making approach.

1.3 The Structure of the Baseline and Analysis Report

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

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

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

3. **State of the Built Environment:**
    a. What and where are the current development trends and pressures in the district?
    b. What is the current state of supply and demand for transport and urban infrastructure, social and recreational facilities and housing to enable more integrated and resilient communities?
    c. What areas currently have capacity for intensification of land use and which areas require upgrades to the current transport, social, recreational, urban infrastructure to enable further intensification of land use?
    d. What is the current state of transport accessibility and mobility in each district of the city (internally and externally)? This will help identify areas appropriate for intensification (densification and diversification).
    e. What is the extent of underutilised vacant land in the district?

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

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

1.4 Key informants and limitations of the Baseline and Analysis Report

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

1.5 District Overview

The Table Bay District is the historic heart of Cape Town and the economic center of the City. All main roads, national roads and rail in the Western Cape begin here and the Port of Cape Town, the second busiest port in South Africa is located here. Roughly 28% of the City's economic opportunities are located in the district which has seen growth in its economic contribution to the region of approximately 2% a year in the past 8 years.

The district is the commercial and tourist center of Cape Town, including the Central Business District and Atlantic Seaboard and has a distinct urban character and sense of place. The City bowl, overlooked by Devils Peak, Table Mountain, Lions head and Signal Hill and surrounded by the sea, is a globally significant destination. Of the 5.2 million airport arrivals at Cape Town international airport, the majority will visit the CBD, with the most popular attraction, the V&A waterfront, and receiving over 23million visits a year. Above the City bowl is the Table Mountain Aerial Cable Way, the most popular point of access to the Table Mountain National Park, a world heritage site and global center of biodiversity.

Cape Town CBD is the oldest urban center in the City of Cape Town (and the Western Cape). The historic narrative of this oldest part of the City includes its origins as a Dutch refreshment station established by the Dutch East India company; an economy built on slave labour; the military competition between Dutch and British trade for the control of the Cape and the start of British empire-building and expansion of colonial interests from 1806 onwards. The urban landscape of Cape Town gives testament to the inequalities of the Apartheid town planning, with the landmark site of District Six and the high density townships on the periphery of the (old) City. The legacy of Apartheid town planning continues in the expansion of high density, low quality urban development.t

In the past ten years, redevelopment, rising land values and rising rents and rates have changed the urban fabric, particularly in the CBD and surrounding areas, leading to affordability battles for the areas historic communities.

The District population is approximately 236 010 (which is 5.7 % of the total population of the city), however more than 30% of the City's employee's work here, trips generated in the District leads to congestion for much of the year and a greater demand for housing closer to the CBD.

Of the approximately 81337 households in the District than half of all households have either 1 or 2 members. Living conditions across the district are diverse, with some of the wealthiest areas and highest land values in the West of the District and the start of the Cape Flats with some of the most impoverished living conditions at Langa Township in the East.

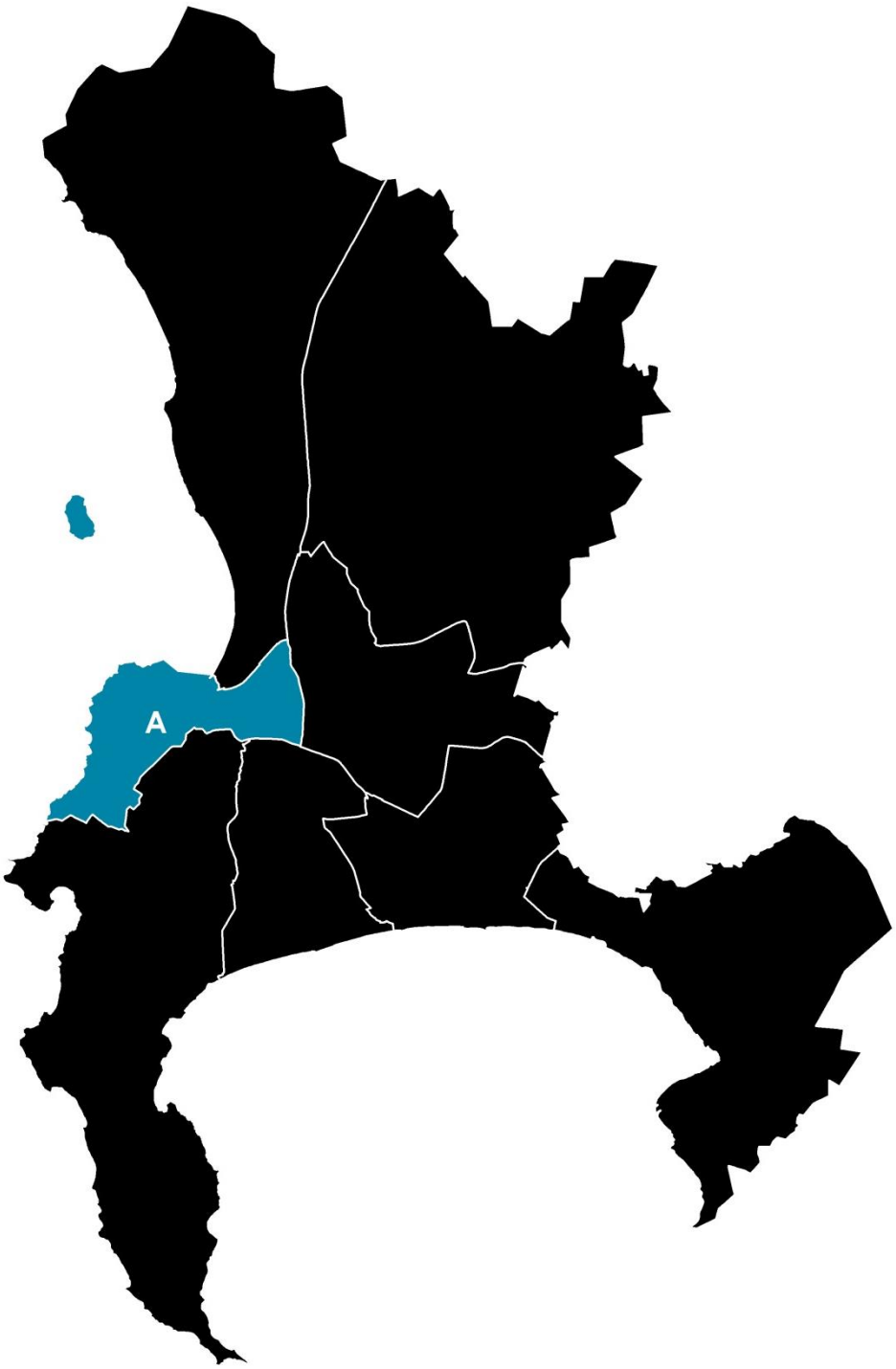


Figure 3: District Locality

A. STATE OF THE POPULATION

2 DEMOGRAPHICS

2.1 Population

The population of the Table Bay Planning District was estimated to be 236 010 at the end of 2016. Although the Table Bay District includes major metropolitan nodes, including the Cape Town CBD, this comprises only 5.7 % of the City's total population. The relatively low proportion of residents in the district reflect that the area has a varied land use profile, with a large area devoted to economic uses. As such, the role of the District as an employment centre of the Cape Town means that in addition to the 236 010 people residing there, 30% of the City's employed population transition through the area.

Growth

The districts population has seen an average annual growth rate of just over 2.8% between 2011 and 2016. This growth is significantly higher than the rate between 2001 and 2011of 2.1 %(See Table 1). While the district experienced lower average growth rate compared to the city-wide average of 2.93 % between 2001 and 2011, between 2011 and 2016 the Table Bay district experienced higher average annual growth rates than the metropolitan average of approximately 2.3%. This trend, illustrated in Figure 1 is likely representative of the demand for residential and property opportunities closer to areas of employment.

Table 1: Population Trends

	2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2016	2016
Table Bay	170 800	2.11%	206 805	2.82%	236 010
Cape Town Average	2 893 249	2.93%	3 740 026	2.32%	4 174 510

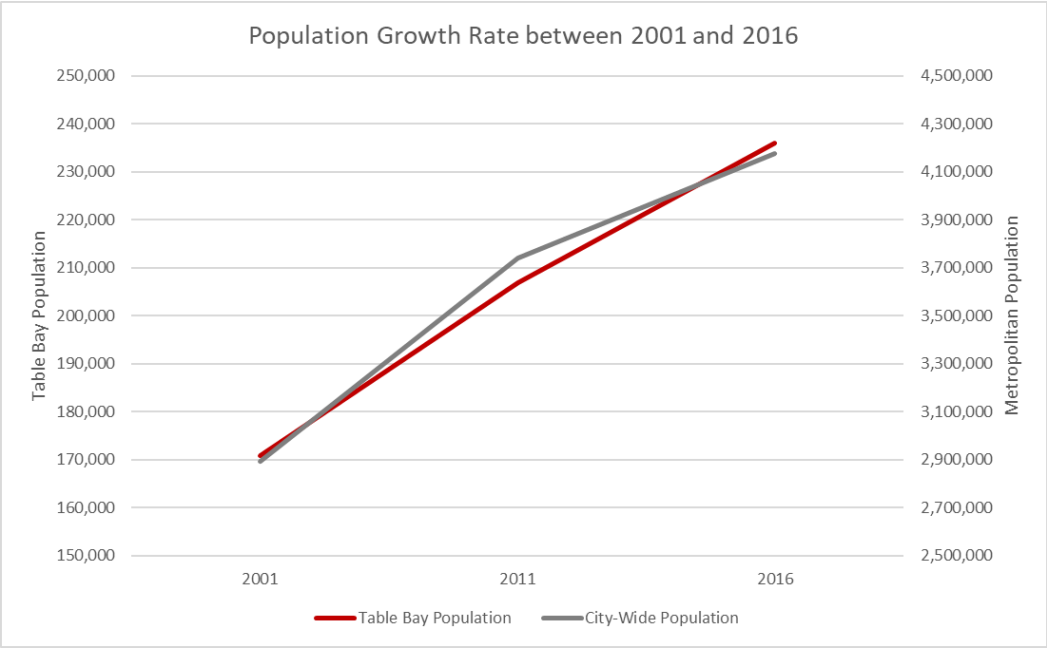


Figure 4: Graph showing change in Population Growth Rates

2.1.2 *Spatial Distribution*

Within the Table Bay District, the population is distributed fairly evenly across the district with the majority of the areas built up. However, there are areas of higher population concentration including the sub places of Lange, Kensington and Sea Point. The Table Mountain National Park, with no population, takes up a large proportion of the District, as do the industrial areas of Pardon Eland, Epping and Ntabeni with very few if any residents. See Figure # showing the approximate distribution of population by sub place.

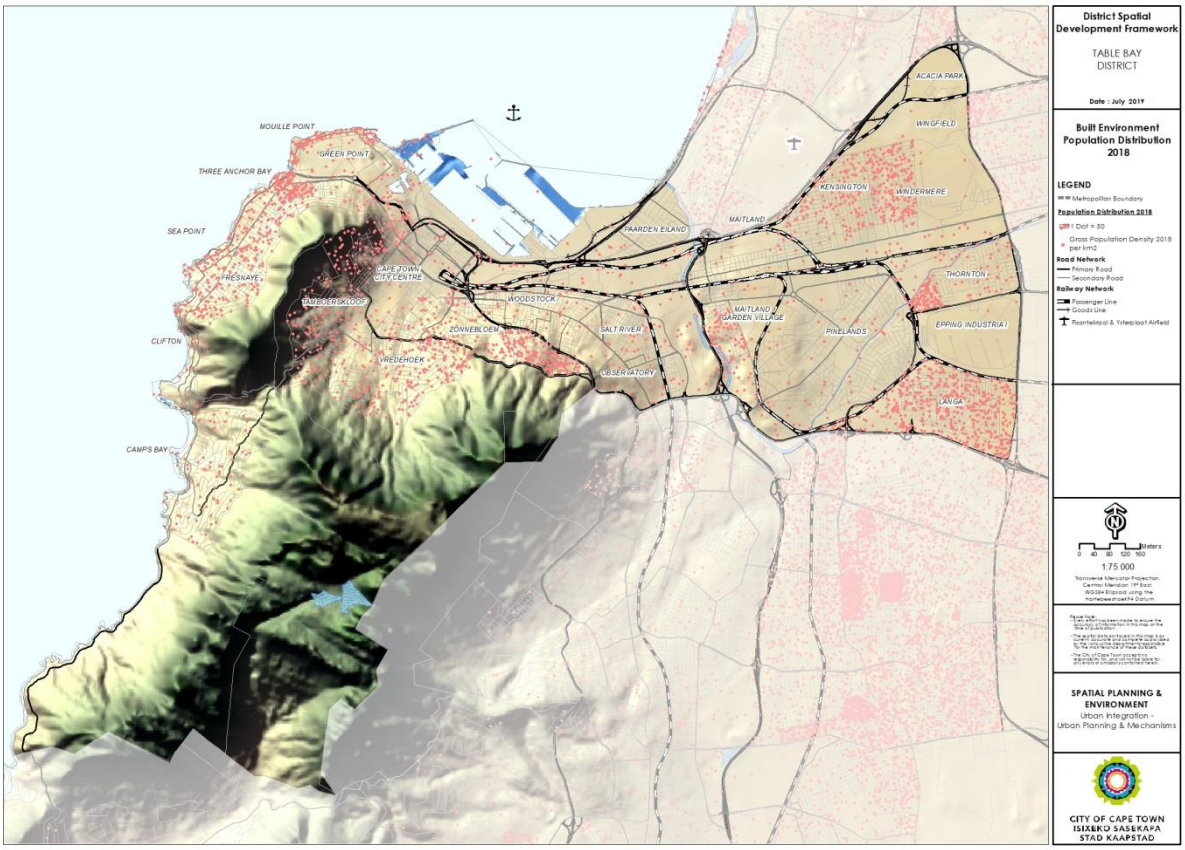


Figure 5: Map showing Population distribution across the district by sub place (2011 Census)

The district has seen a population increase of over 11% between 2011 and 2016. Areas that have experienced the greatest population growth between 2011 and 2017 include Langa and De Waterkant, whose population increased by nearly 40 % between these years. Other areas including the V&A Waterfront, Fresnaye, Viking Park, Maitland, Zonnebloem and Ndabeni have all seen population increases of over 15 %. Figure 3 shows the percentage increase in population between 2011 and 2017 per sub place. Langa and Maitland saw the highest nett population increases, driven by the availability of relatively affordable accommodation and lower transport costs as these neighbourhoods are closer to areas of employment.

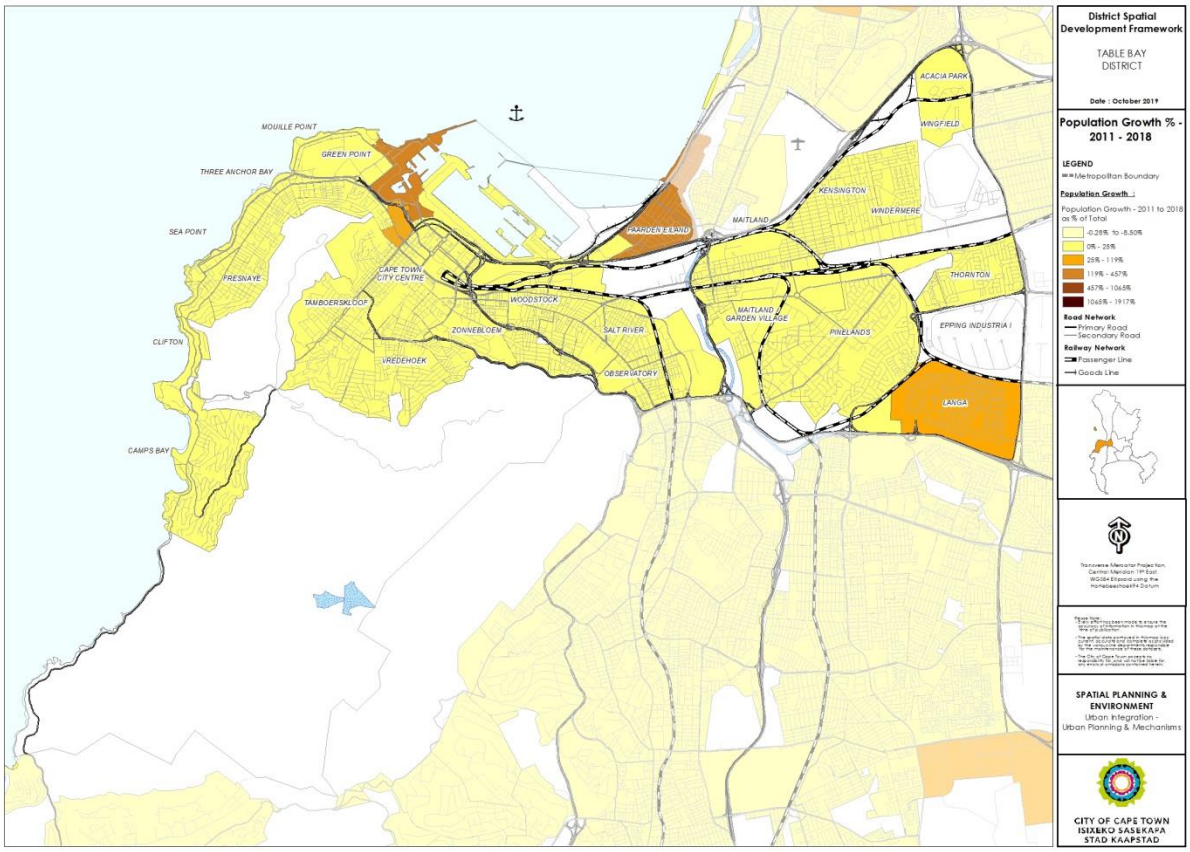


Figure 6: Map showing Population Growth by sub place in Table Bay between 2011 and 2018

Understanding population density provides valuable information on the market demand in an area as well as informing the delivery of services including transport and waste management. Langa, Sea Point and Windermere areas all have a gross population density of over 80 people per hectare. Langa has a population density of close to 170 persons per ha making it by far the densest area in the district and one of the denser areas in the city. By contrast Pinelands has a far lower population density with a gross population density of 24 people per ha.

The economic profile of the higher density neighbourhood's contrast. Sea Point is characterised by high incomes and luxury housing and Langa characterised by lower incomes and a mix of more affordable housing types, including subsidy or informal housing.

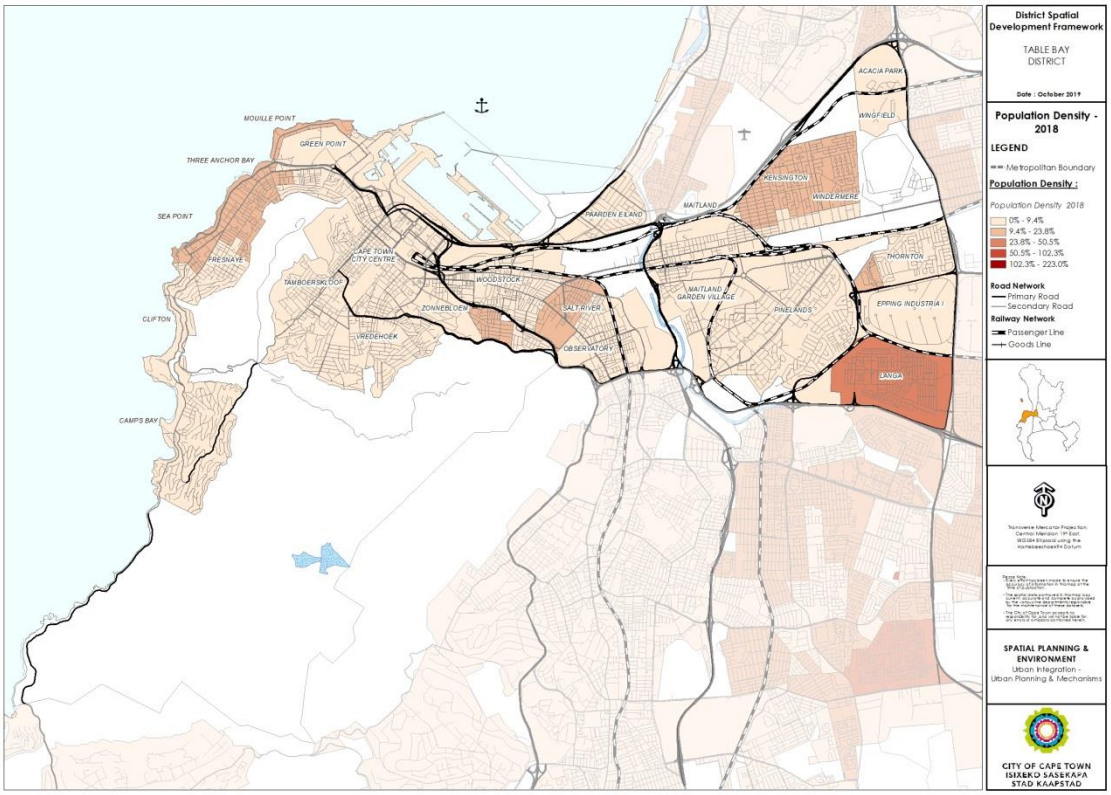


Figure 7: Map showing Gross Population Density by sub place in Table Bay (Census, 2011)

Note on Population and Household Estimates:

The estimated dwelling units and population by census sub-place to end December 2017 should serve as a reasonable estimate only. Assumptions regarding fertility, mortality, migration and the prevalence patterns and future spread of HIV and AIDS were not made. Population and household data from multiple sources is used, including Census 2011, Aerial Photography Counts 2011 and Solid Waste Door and Roof Counts 2017. While ever effort has been made to ensure duplication doesn't occur, these sources have different categories and use a variety of methods to obtain these counts. These figures are illustrative of broad trends only. 2nd and 3rd Dwellings (Formal) are included in the formal estimates. Informal Backyard dwellings are only partially accounted for.

To avoid distortion of density-related data, sub-places with fewer than 16 households in the 2011 Census data are excluded.

2.1.3 *Population Structure*

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

Age Distribution

The population pyramid for district is shown in Figure 5. A relatively high proportion of the population- 42% in the Table Bay District falls within the age categories between 20 and 35 years.

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

The dependency ratio (measure of the number of people in the potential labour force in relation to those in the "dependent groups," the youth and aged expressed per 100) at 36% has decreased since 2001. The index of ageing (number of aged relative to the number of youth expressed per 100) remains relatively high at 46%.

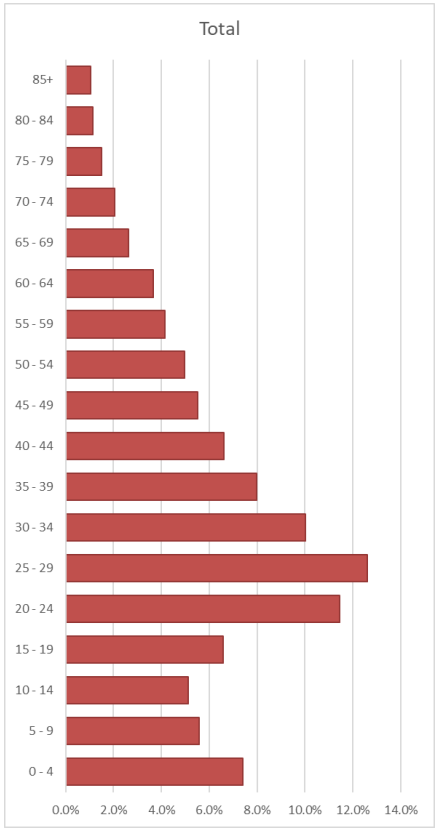


Figure 8: Population Pyramid for the Table Bay District (Census 2011)

Table 2: Age Distribution of Population in Table

	0 - 14		15 - 64		65 +		Dependency Ratio	Index of Ageing
	Number	%	Number	%	Number	%		
2001	33 412	19.6	121 779	71.3	15 650	9.2	40.29	46.85
2011	37 446	18.1	152 025	73.5	17 328	8.4	36.03	46.27

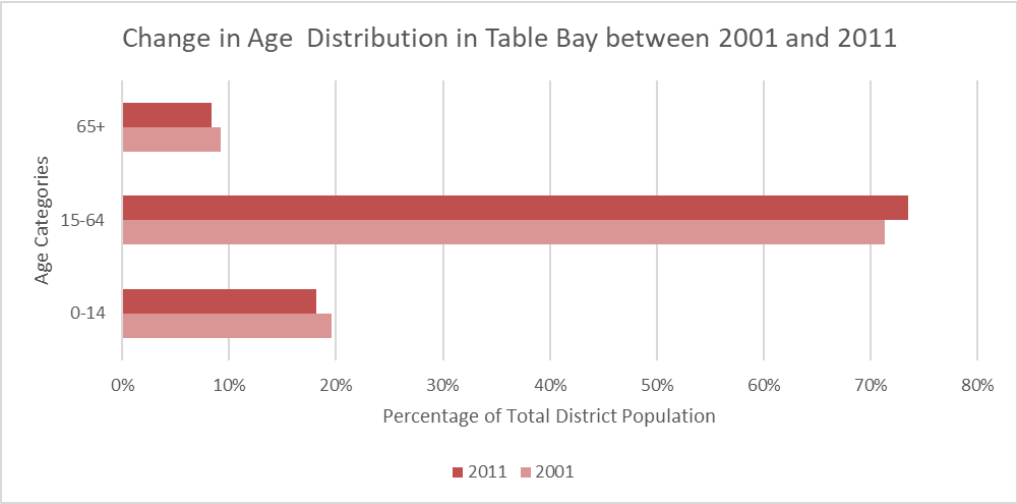


Figure 9: Chart showing change in Age Distribution in the Table Bay District

Education (aged 20+)

The Table Bay District has generally high levels of education compared to city averages. In particular, the level of higher education in the district is notable. Approximately 33% 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.

Table 3: (CCT and Census 2011)

	No Schooling		Matric		Higher Education	
	2001	2011	2001	2011	2001	2011
Table Bay District		1.1%		31.4 %		33.0%
City of Cape Town Average	4.2 %	1.8 %	25.4 %	30.2 %	12.6 %	16.2 %

2.2 Households

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

The number of Households in the Table Bay District was estimated to be 81 337 at the end of 2016. The district contains the fewest households in the city. The average household size for the district was 2.90 in 2016.

2.2.1 *District Trends*

The number of households increased by 21.2% between 2001 and 2011 and a further 15.43% between 2011 and 2016. The average annual rate of household growth has increased substantially between 2011 and 2016, by almost a percent when compared to the rate of growth between 2001 and 2011. In both periods that average annual

growth rate of households has been higher than the population growth rate of the district for the equivalent periods.

Concurrently, the average household size decreased in both periods. The rate of decrease in household size increased significantly between 2011 and 2016 in the District.

The increase in the number of smaller households has implications for housing supply and typology, more housing delivery is needed and at types that can accommodate smaller households.

Table 4: Household Growth in Table Bay District

		2001	Average annual growth rate 2001-2011	2011	Average annual growth rate 2011-2016	2016
Households	Table Bay	58 122	2.12%	70 467	3.09%	81 337
	Cape Town Total	776 781	3.76%	1 068 573	3.03%	1 230 590
Average Household Size	Table Bay	2.94	- 0.013%	2.93	- 0.23%	2.90
	Cape Town Average	3.72	- 0.59%	3.50	-0.63%	3.39

2.2.2 *Spatial Distribution*

Within the Table Bay District, the distribution of households closely mimics the distribution of population through the sub places. Throughout the district, there are a range of household sizes. The increase in households outpaces the increase in population. The following key aspects are noteworthy.

The V&A Waterfront area has seen a substantial increase in the number of households since 2011 counts. This is due in part to the increase in developments in the area. Langa has also seen a notable increase in the number of households of 43%.

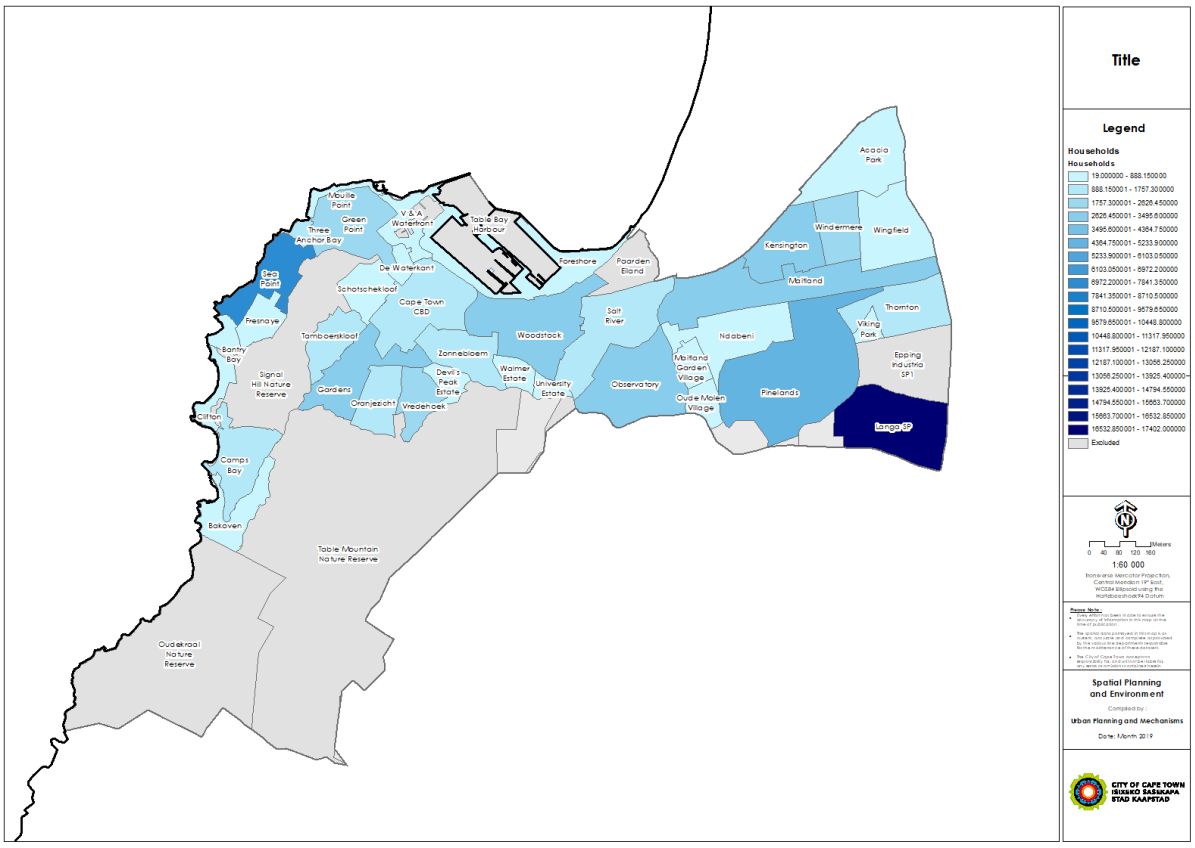


Figure 10: Map showing Household Distribution in Table Bay

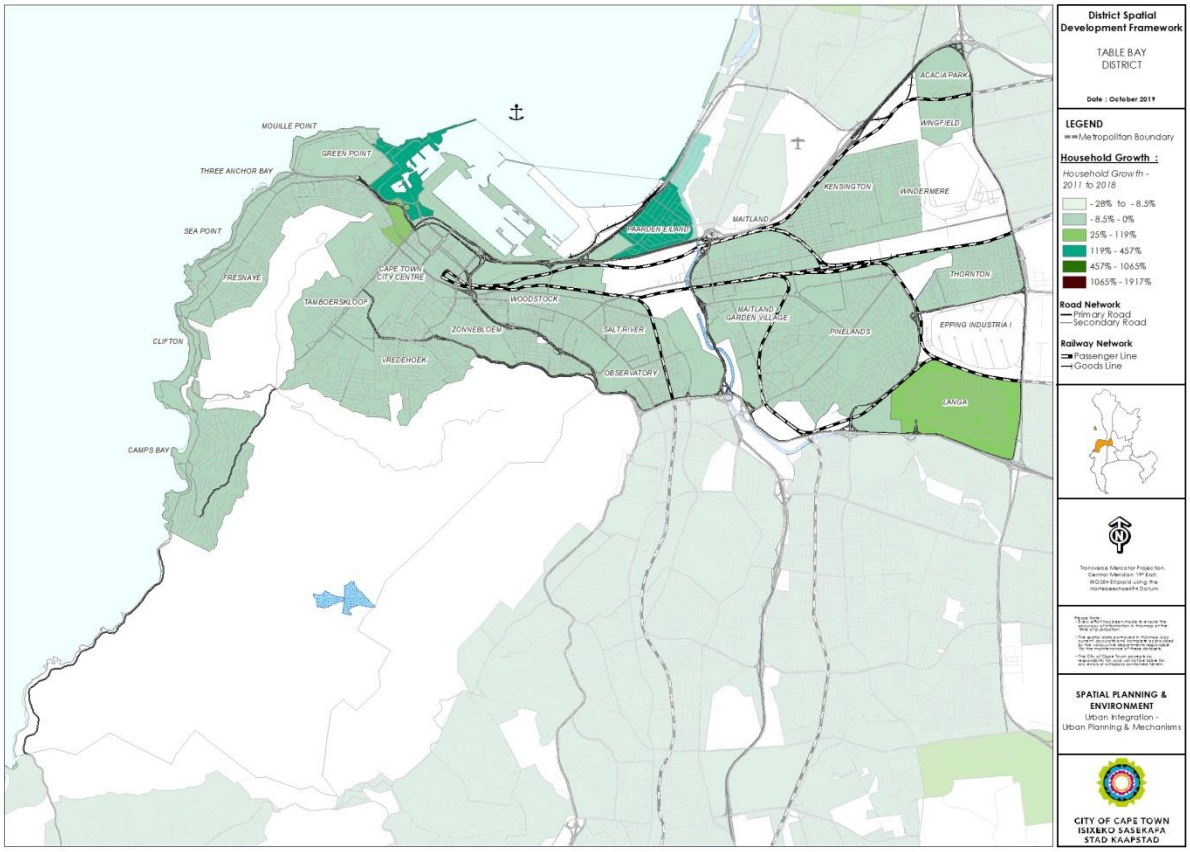


Figure 11: Map showing change in Households between 2011 and 2017 in Table Bay

2.3 Employment

Cape Town and South African Employment Trends.

Employment figures have shown downward trends in 2019, more people are entering the workforce than employment being created. National unemployment is now at 29%, the highest since 2008 (QLFS 2019). A strict unemployment rate of 21.8% across the City in 2019 is 0.6% higher than the previous years, but the lowest amongst the metros in South Africa and the trend has shown a general decrease in unemployment from the 2011 census figure of 23.9%.

Table Bay District 2011 Economically Active Population

In 2011 the Table Bay District 74% or 152 022 people of the Table Bay District's population were of working age (15 to 64 years). Of the working age population, approximately two thirds made up the 96 000-person strong labour force, with the remaining third classified as 'Not Economically Active'. Only 1.5% of the 'Not Economically Active' population identified as 'discouraged work-seekers' (2 406 people in the District). The vast majority of the 'Not economically active population have other reasons for not working.

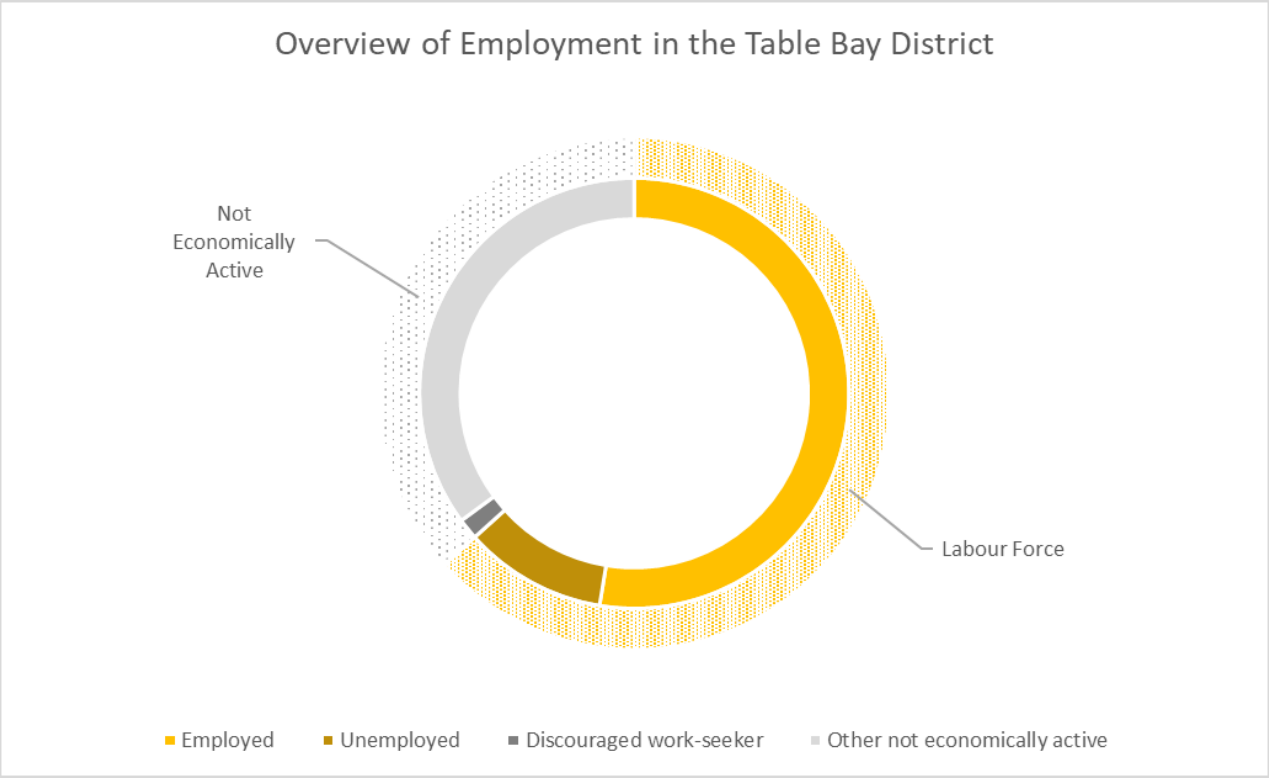


Figure 12: Chart showing Overview of Employment in the Table Bay District 2011

Employment and Unemployment

Table Bay had an unemployment rate of 16.9% in 2011, 7% points lower than the City average. It is likely that the Cape Town trends of lower unemployment are driven by activity in the Table Bay District as it is the economic hub of the City, and a focal point of development and growth over the past 10 years. A linear projection estimates that the unemployment rate may be closer to 10% in the District currently, though this will have to be confirmed when future sub-place counts are released.

In 2011, the majority of the labour force, just under 80 000 people, were employed. Unemployed people comprised the remaining 16 341 people. This indicates that approximately 5 out of every 6 people that wished to be employed were, while 1 out of every 6 people who wished to be employed could not find work.

The large proportion of 'Not Economically Active' people results in a labour force participation rate, of 63.34%.

Labour Absorption Rate

The labour absorption rate of 52.59%, indicates that approximately half of Table Bay District's working age population was employed in 2011. 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.

2.3.1 *Trends*

The following trends with regards to employment in the Table Bay District between 2001 and 2011 are noted. However an expanded analyses of employment trends is found in section X

Table 5: Table Bay Labour Force Indicators 2001 - 2011

Table Bay Planning District Labour Force Indicators	2001	2011
Population aged 15 to 64 years	**122 762**	**152 022**
Labour Force	**84 002**	**96 288**
Employed	64 951	79 947
Unemployed	19051	16 341
Not Economically Active	**38754**	**55 734**
Discouraged Work-seekers	3366	2 406
Other not economically active	35388	53 328
Rates %		
Unemployment rate	22.68%	16.97%
Labour absorption rate	52.91%	52.59%
Labour Force participation rate	68.43%	63.34%

The Unemployment rate has decreased from approximately 23% in 2001 to 17% in 2011 (recent employment trends are described in more detail in the section on the Economy). The number of discouraged work seekers have also decreased. Generally, there have been upward employment trends within the district; however the downward trends within the country following the credit rating downgrade and recession in the last 3 quarters are likely to have impact in the District.

2.3.2 *Spatial Distribution of Employment*

Unemployment Rate is shown for the various sub places in the Table Bay District. Comparison between 2011 and 2001.

Based off the 2011 data, Langa has an unemployment rate of over 40%. More than double the districts average. Maitland Garden village has the next highest unemployment rate at approximately 22%, followed by Windermere and Bo Kaap at 21%.

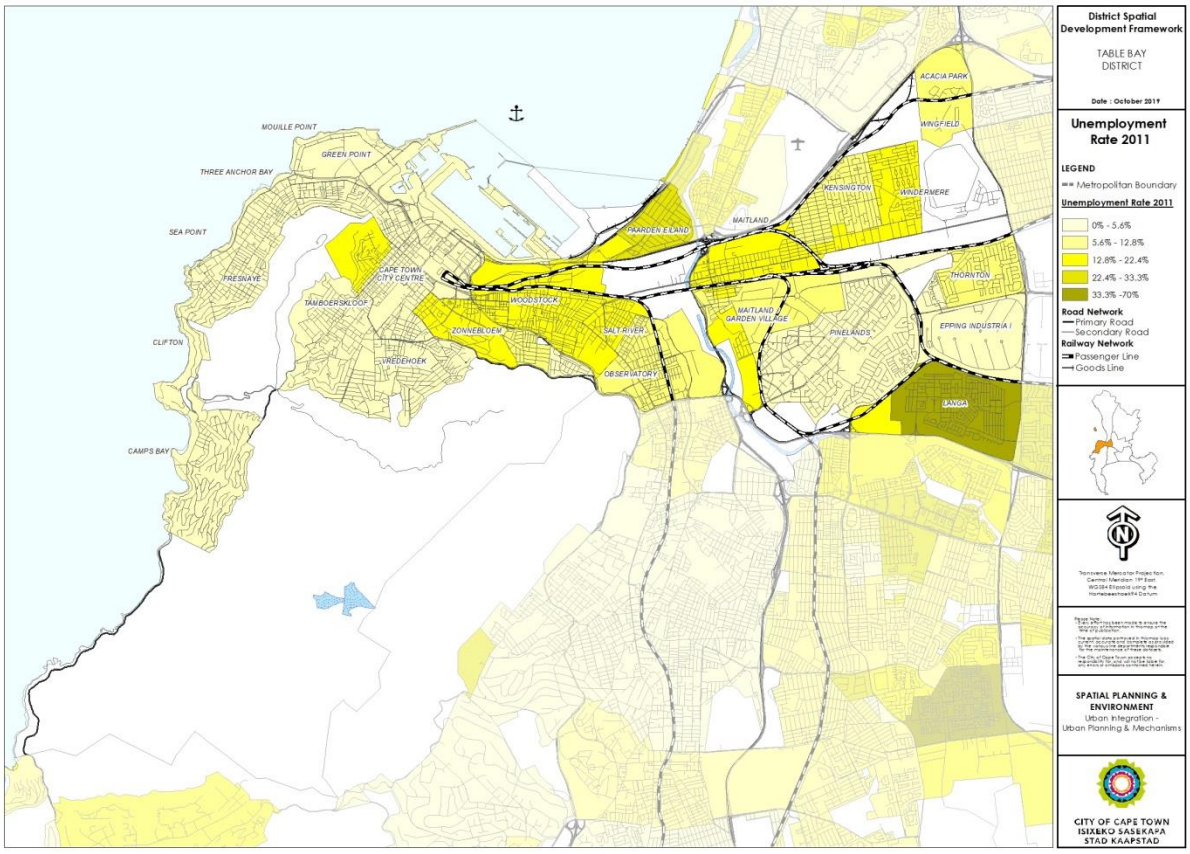


Figure 13: Map showing Unemployment Rate in Table Bay (Census, 2011)

2.4 Income (Households)

34.9% or roughly 25000 households earned under R3200 a month, an amount that equates to impoverished circumstances for these households. This is less than the City figure of 47% in 2011 but still reflects a trend of relatively low incomes.

14% of households in Cape Town had a monthly income of R25 601 or more in 2011 whereas in the District 23% of households earned R25601 or more. This reflects the relative prosperity of households in some areas of the District.

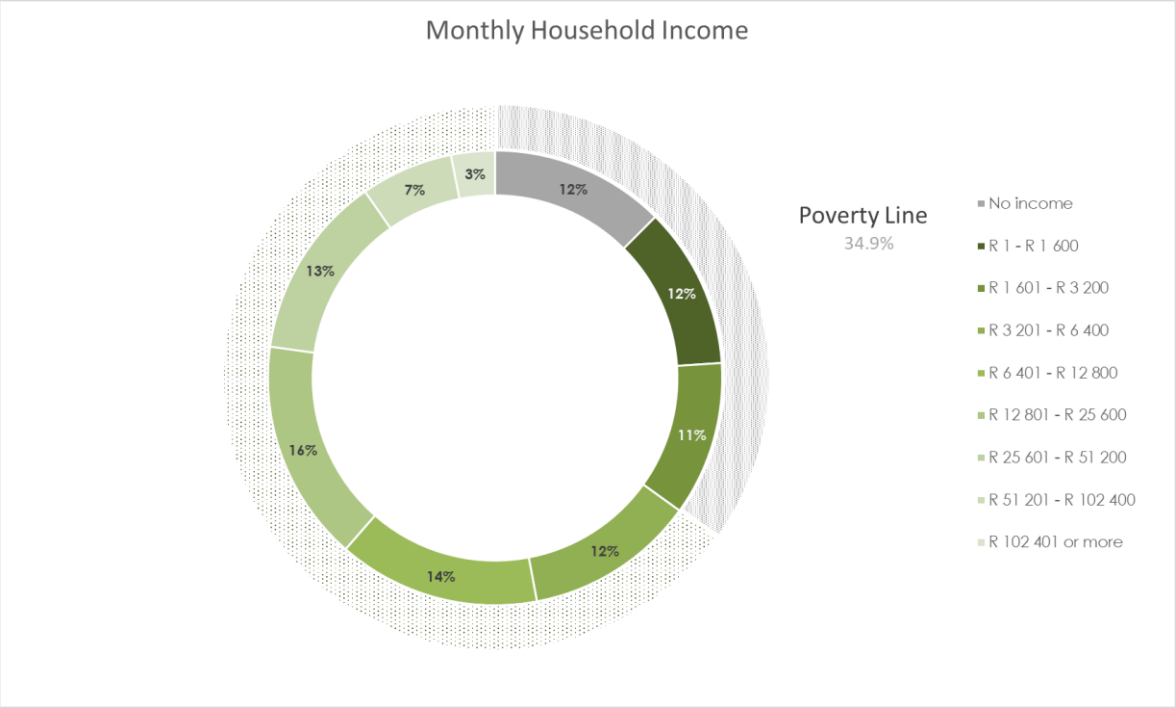


Figure 14: Graph showing Monthly Household Income in Table Bay District

2.4.1 *Spatial Distribution of household incomes.*

Household Incomes vary dramatically across the District. The Median Household incomes are shown for the district in Figure 17. Langa and Oude Moulen Village have the lowest median household income of between R 1600 and R3200 per month.

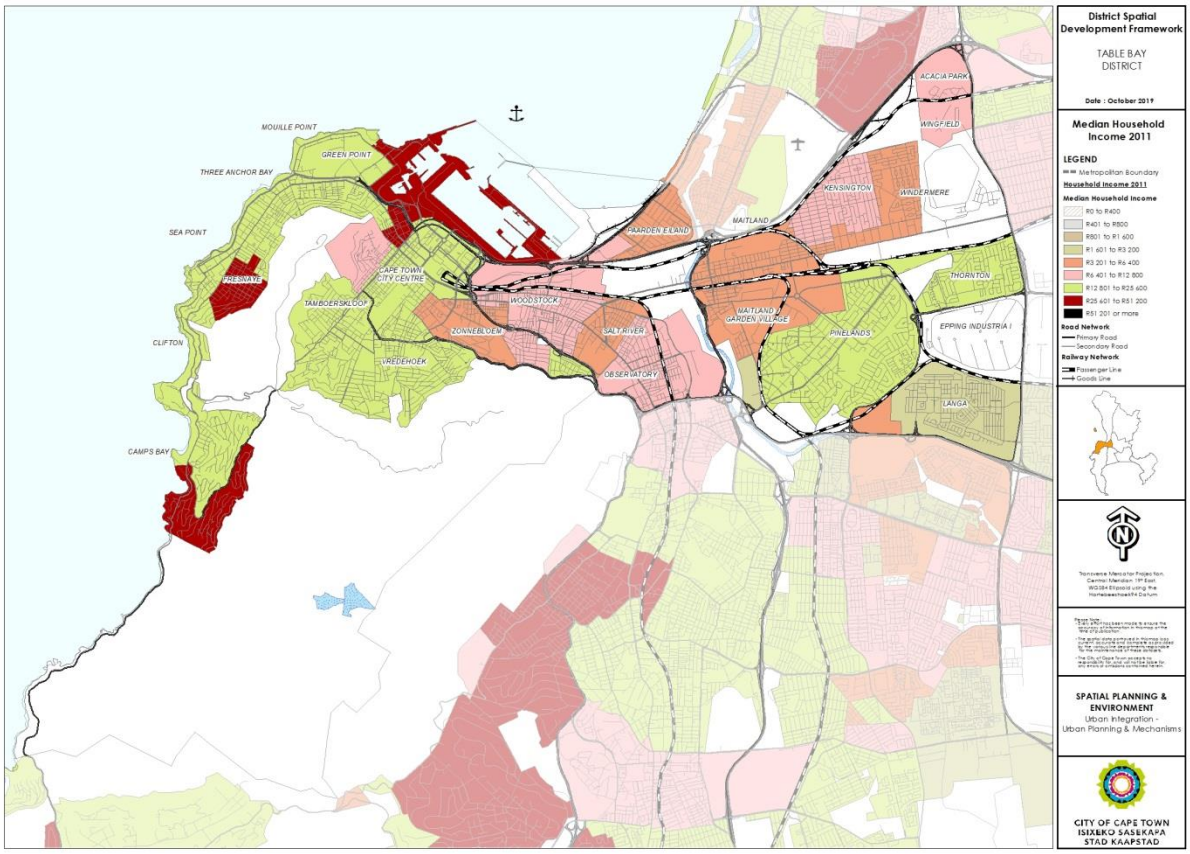


Figure 15: Map showing Median Household Income by sub place for the Table Bay District (Census, 2011)

2.4.2 *Income Inequality*

The Gini coefficient is an income inequality measure. The coefficient ranges from 0, which represents "absolute equality", to 1, which represents "absolute inequality" (Statistics South Africa, 2014). Table Bay has one of the lowest measures at 0.58. However, it is concerning to observe an increase in income inequality between 2014 and 2018, mirroring the Metro's trend.

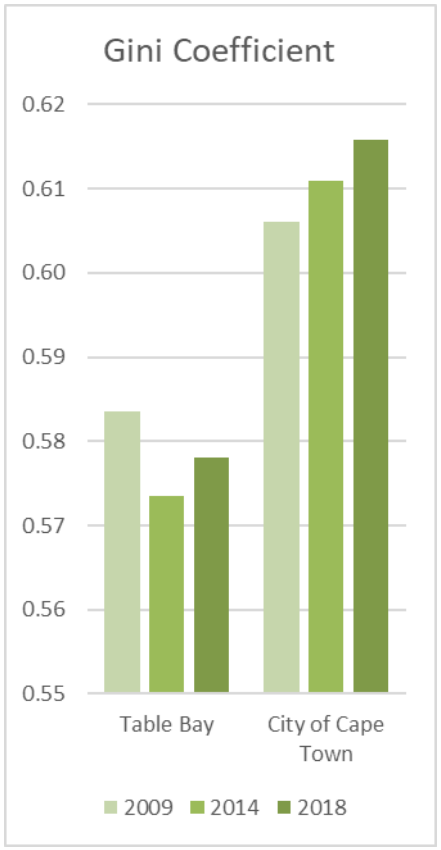


Table 6:

Districts	Gini Coefficient		
	2009	2014	2018
Table Bay	0.58	0.57	0.58
City of Cape Town	0.61	0.61	0.62

2.4.1 Human Development Index (HDI)

The HDI is a composite indicator reflecting education levels, health, and income. The HDI ranges from 0 (no human development) to 1 (high level of human development) (United Nations, 2018). The table xx below reflects the improvements in human development relative to the City over time.

District	Human Development Index (HDI)		
	2009	2014	2018
Table Bay	0.77	0.80	0.81
City of Cape Town	0.70	0.73	0.74

Source: IHS Markit, 2019.

B. STATE OF THE ENVIRONMENT

3 NATURAL ENVIRONMENT

The following section outlines the key environmental qualities, 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 geographic 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 underlying rock formations of an area, i.e. the area's geology, comprise the foundation of its physical environment. The geology of an area is shaped by hydrological and weathering processes, which create the topography of the area. The underlying geology also gives rise to various soil types, which influence the indigenous fauna and flora of an area, as well as human agricultural practices. The Cape Peninsula is composed of three main rock formations of varying ages (after http://www.sanparks.org/ parks/ tablemountain/ conservation/ geology.php):

- The **Malmesbury Group**, around 540 million years old, consists of dark grey mudstones and lighter coloured sandstones;
- **Cape Granite**, around 540 million years old, is much harder and coarse-grained characterised by large white feldspar crystals, shimmering flakes of black mica and grey glassy quartz. This formation is the foundation for most of the Table Mountain Chain; and
- **Table Mountain Group**, only 520 million years old, are extremely weather-resistant sedimentary rocks and currently form a geological formation that is approximately 2 km thick.

The **Malmesbury Group** forms the basement of much of the district. Malmesbury Group rocks are not often exposed, as they weather quickly, and are mostly covered by soil or windblown sand (Compton, 2004). However, examples of this formation can be seen on Signal Hill and the lower slopes of Devil's Peak as well as along the rocky Sea Point shoreline and all around Robben Island where it forms a wave-cut platform. Many tall buildings in the Cape Town CBD are founded on these rocks (UCT Department of Geological Sciences).

The **Cape Granite** batholith (a rock mass formed by the upwelling of magma) intruded into the Malmesbury Group as molten rock and crystallized deep in the earth, but has since been exposed by prolonged erosion. (UCT Department of Geological Sciences). Lion's Head is a good example of a granite outcrop, and the characteristic spheroidal shapes of granite boulders, well displayed around Clifton and Camps Bay, are a result of preferential weathering along intersecting fractures.

The contact zone where the Malmesbury Group was intruded by molten Cape Granite can be seen at Sea Point and was made famous by Charles Darwin during his voyage of scientific discovery on H.M.S. Beagle in 1844 (UCT Department of Geological Sciences). The site was declared a national monument in 1953 and bears a plaque explaining its significance.

Younger sedimentary rocks of the **Table Mountain Group** lie above the unconformity of the Malmesbury shales and the Cape Granite intrusions. Many of the Western Cape's mountain ranges are formed primarily of Table Mountain Sandstone, including the famous Table Mountain that dominates the district. The Table Mountain Group is comprised of three formations:

- **The Graafwater Formation**: around 25m-65m thick and consists of sandstone and mudstone in red and purple hues, best seen in road cuttings on the slopes of Table Mountain;
- The **Peninsula Formation**: around 700m thick and comprised of light grey, pebbly quartzitic sandstones, forming the bulk of Table Mountain and visible on the exposed cliffs of the mountain; and

- The **Pakhuis Formation**: tillite (a lithified glacial outwash gravel), occurs on the highest points of Table Mountain and was deposited at a time when the Gondwana landmass was situated close to the South Pole (UCT Department of Geological Sciences).

The most recent geological formations include the Springfontyn (part of the Sandveld Group) and other Quaternary (~2 million year old) formations (Reid et al., 2001). The Springfontyn Formation was developed through the deposition of windblown sand (an aeolian deposit), consisting of reddish to grey, unconsolidated quartzose aeolian sand and is most common in the flatter, eastern parts of the district. Recent marine sediments are particularly prominent on Robben Island, where shell-bearing dune sands overlay the Malmesbury basement over much of the interior of the island and have calcretised to form the limestone that was famously quarried by Nelson Mandela during his imprisonment on the island (UCT Department of Geological Sciences).

3.1.1.2 Topography

The topography of the district is dominated by Table Mountain, Cape Town's most prominent and famous feature, a World Heritage Site showcasing the Cape Floristic region. The 'table' itself, an approximately 3 km-long, level plateau, runs in an east-west direction. The highest point (1 084 m above mean sea level) of Table Mountain, and in fact the entire Cape Peninsula mountain chain, is located towards the eastern end of the plateau, marked by Maclear's Beacon (a stone cairn built in 1865 by Sir Thomas Maclear for trigonometrical survey). The plateau is flanked by Devil's Peak to the east and by Signal Hill and Lion's Head to the west, all of which form the dramatic backdrop to the City and the Table Bay harbour. These mountain features drop off rapidly to form the natural amphitheater of the City Bowl.

The landscape of the district has been shaped by prolonged erosion that has removed large parts of the once continuous Table Mountain Group sandstones, leaving high residual mountain ridges and the flat, low-lying expanse of the Cape Flats to the east (the eastern extent of the district, including Pinelands, Maitland and Langa, forms the start of the Cape Flats).

Where faults occur in the rock, natural erosion has cut across and displaced the upper rock layers, resulting in the formation of deep ravines and gorges carved out down the flanks of the remaining mountains. The Twelve Apostles, an impressive range of peaks that run southwards along the Atlantic coast from of the back of Table Mountain, are separated by deep ravines that are a good example of this erosion process.

Robben Island, located in Table Bay, is very flat and low-lying with the highest point (Minto's Hill) being only 24 m asl. The shoreline of Robben Island is almost entirely rocky and drops fairly steeply into the sea.

3.1.1.3 The topography of the District has influenced the built form of Cape Town, as the mountainous areas create a barrier for connectivity and discourages development up steep mountain slopes in favor of the flatter parts of the City. Soils

Soil is a term used broadly to describe the surficial or uppermost layer of the ground. Soil is largely the product of mechanical and chemical weathering of the parent material (geological rock type) and its formation is determined by a number of climatic processes, the nature of the underlying material and the geological and topographical characteristics of an area, such as slope. Soils have an important biological function in supporting plants and animals as well as an economic function in supporting agriculture.

Three main soil types occur in the district (see Figure 16 Geology - Soils):

Red and yellow apedal soils: these soils occur over the south-eastern section of the district, i.e. predominantly covering the plateau and eastern slopes of Table Mountain. These shallow, acidic, sandy soils derived from Table Mountain Group sandstone are structureless and generally nutrient poor. Although they provide an apparently inhospitable medium for plant growth, fynbos vegetation has adapted to these harsh growing conditions (McVicar, 1991). Two subtypes are present in the District:

(Ah) Red and yellow apedal soils with <15% clay content, resulting in nutrient-poor soils with poor water retention properties, occur over most of the plateau and eastern slopes of Table Mountain (where soil is actually present).

(Aj) Red and yellow apedal soils with >15% clay content, resulting in a slightly higher nutrient status, occur mainly outside the eastern edge of the district, but with a small section occurring in the south eastern corner.

Shallow, non-hydromorphic soils on weathering rock or clayey substances (Glenrosa forms: Fa) occur over the western and northern mountain slopes. These generally shallow soils consist of topsoil directly underlain by weathered Cape Granite, and are usually found in moister areas or where parent material is acidic and little lime exists.

Soils with a diagnostic ferrihumic horizon (**Ga**) occur in the northern section of the district (underlying the City itself) and the eastern portion of the district (Observatory, Pinelands, Maitland). These deeper, sandy, calcareous soils dominate the low-lying areas of the Cape Flats. They are less acidic than the previous types and their nutrient status, while still low, is higher than the red and yellow apedal soils. The low-lying nature of the environment in which they typically occur implies that these soils are often subject to waterlogging during the winter months (McVicar, 1991)

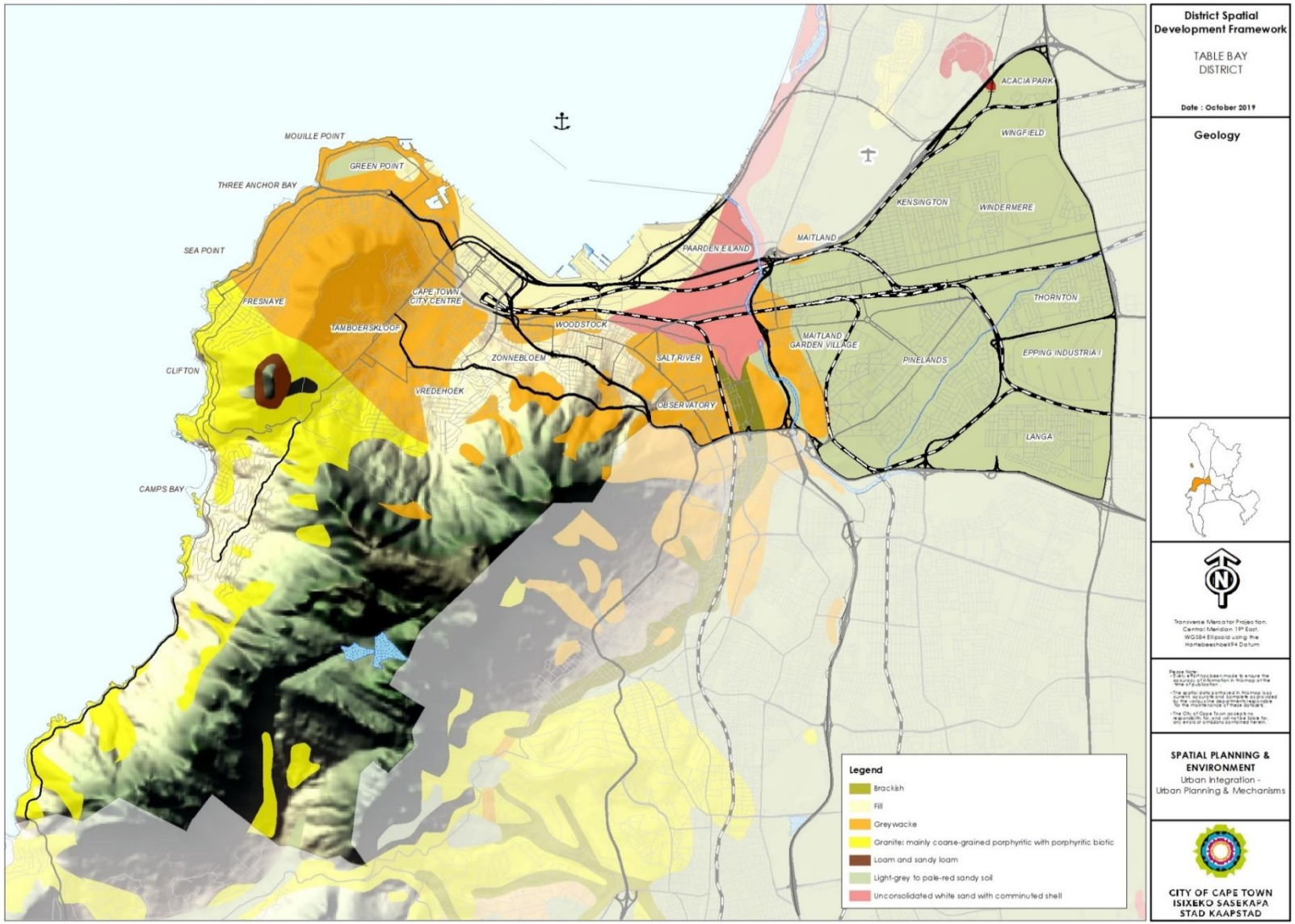


Figure 16 Geology - Soils

3.1.2 Biodiversity

The City of Cape Town falls within a unique and globally significant biodiversity hotspot. The City's biodiversity is a valuable part of its heritage and is an important driver of tourism, economic growth and social upliftment in the City.

3.1.1.4 Vegetation

Peninsula Granite Fynbos and Peninsula Shale Renosterveld occur on the mountain slopes, extending through the residential areas along the Mountainside.

With the exception of those areas falling within the TMNP, most of Table Bay District is highly developed and transformed, and very little natural vegetation remaining.

However, the district does contain some of the remaining tracts of three of South Africa's critically threatened ecosystem types, namely Cape Flats Sand Fynbos (very small and isolated patches) and Peninsula Shale Renosterveld (within the TMNP on Signal Hill). Both these types are exceptionally high in species diversity, and have a high incidence of vulnerable and endangered Red Data plant species and many endemic faunal species.

Biodiversity in the district is under threat from rapid development, frequent veldfires, infestation by invasive alien species and overexploitation of water and marine resources.

Table 7: Conservation status of national vegetation types occurring 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	2009 km2	Current km^2	% Remaining	PA km^2 ^	Status#	CCT protection level*
Cape Flats Sand Fynbos	540	85	59	11.0	10	CR	Poorly protected
Cape Winelands Shale Fynbos (incorporates peninsula shale fynbos)	53	24	29	55.7	19	VU	Well protected
Peninsula Granite Fynbos	92	39	40	42.9	24	CR	Well protected
Peninsula Sandstone Fynbos	219	213	210	95.9	156	EN	Well protected
Peninsula Shale Renosterveld	24	7	3	11.6	2	CR	Poorly protected
Southern Afrotemperate Forest	3	3	3	99.4	3	LT	Well protected

3.1.1.5 Fauna

All development applications must be informed by the National environmental web-based screening tools for EIA's (**https://screening.environment.gov.za/screeningtool**). This initiative consists of a number of spatial biodiversity priority and feature layers that details ecosystem and species level data to assist in identifying sensitive areas and needed specialist assessments. It is also important to note that while the information detailed here

was current at the time of writing, taxonomic and status changes occur from time to time. As such, it is critical that the latest available information must always be sourced and utilized during decision-making processes.

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

Fish Fauna

Due to the lack of large perennial river systems, only two indigenous freshwater fish species are recognized as occurring within the boundaries of the CCT. Both of these are found within District A. The Cape Galaxias (*Galaxias zebratus*), has been shown to be a species complex consisting of numerous species across the Western Cape. Ongoing genetic work will eventually allocate all the populations within the CCT to species level. Conservation assessments can then be done to ascertain the conservation status of the various taxa. Galaxias are found in flowing or standing water and can be expected to occur in any suitable habitat in District A. They are confirmed to occur in the Liesbeeck River and within the Two Rivers Urban Park precinct. The Galaxia lineage found in the Liesbeeck is also known to occur in the Disa, Silvermine, Lourens and Silverstroom rivers (Impson & Henning 2019).

The Cape Kurper (*Sandelia capensis*) is found throughout much of the Cape Floral Region. The latest taxonomic evidence has shown that what was previously thought to be one species represents a species complex of several taxa. The distribution and conservation status of each of these taxa needs to be defined and presently it is unclear which taxon or taxa, would occur within District A. Within the CCT however, the Cape Kurper has largely been extirpated from the lowlands due to habitat degradation and invasive fish species, The remaining populations are in the upper reaches of streams and in dams within the mountain catchment areas. Within District A, there is a small population at the Waterhof Spring in the Gardens. It is however unclear whether this population was introduced. The presence of any Cape Kurper (*Sandelia* sp.) in the CCT is to be considered of conservation significance.

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

Several rivers and inland waters (such as the Black River) within District A have invasive fish species which cause moderate to severe ecological impacts, including Banded Tilapia (*Tilapia sparmanni)*, Mozambique Tilapia (*Oreochromis mossambicus),* Carp *(Cyrpinus carpio),* Sharptooth Catfish *(Clarias gariepinus)* and Mosquitofish *(Gambusia affinis)*.

Of the 15 rivers that have been identified as key rivers for fish conservation in the Berg Water Management Area (Impson & Henning 2019), the Liesbeeck is classified as an Important Fish Area. The fish fauna section is based on information provided by Dean Impson, a CapeNature Fauna Resource Ecologist.

Mammalian Fauna

Of the 74 species of indigenous terrestrial mammals found or presumed to occur within the CCT, nine are included in the 2016 Red Data Book of South African Mammals (Child, 2016). Two of these are found or could be expected to occur within District A. These are as follows:

- Laminate Vlei Rat (*Otomys laminatus*) – Near Threatened.

Confirmed to occur in fynbos seeps in the Cape Point section of the Table Mountain National Park. They could also occur in other high quality fynbos seepage wetlands in other parts of the Peninsula. As such, this species is likely to occur in the Fynbos seeps on Table Mountain within the District. Difficult to differentiate from the more common *Otomys* species without looking at the dentition.

- Cape Clawless Otter (*Aonyx capensis*) – Near Threatened.

This species is fairly common along the coastline and uses most wetlands and rivers in the region. This includes the Cape Town Harbour and the Biodiversity Showcase Gardens within District A.

Several species of bats are known to occur in the CCT but very little is known about their distribution. Within the Table Mountain National Park in District A, the Bat Cave on the Back Table is home to the only known roosting site of Egyptian Fruit Bat (*Rousettus aegyptiacus*) on the Peninsula. Any significant bat roosting sites identified within or near proposed developments would require a specialist report, which would assess the significance of any potential impacts. All proposed wind turbine installations would need to consider potential impacts on bat fauna.

With regard to the larger terrestrial mammals which still occur within the District, such as Porcupines (*Hystrix africaeaustralis)* and Caracal (*Caracal caracal*), all have a red list 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 vulnerable as the populations are isolated and potentially locally threatened. These species play an important role in the ecosystem and their continued existence in the City is important. Their future survival in the District is dependent on there being large natural open spaces to ensure that viable populations exist and persist. Ecological linkages that provide the opportunity for faunal movement between remnants is also critical for larger fauna.

Avifauna

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

Of the bird species of conservation concern that are known to occur in District A, six are exclusively coastal. These are:

- The Endangered Cape Cormorant *(Phalacrocorax capensis)* feeds and roosts along the coastline and they breed on Robben Island. There are also several nests within Cape Town Harbour.
- The Bank Cormorant (*Phalacrocorax neglectus)* is also Endangered and regularly seen along the coastline. The largest colony in South Africa is in Dirstrict A on Robben Island.
- The Near Threatened Crowned Cormorant *(Phalacrocorax coronatus)* roost and feed along the coastline of District A and are known to breed on Robben Island.
- The African Oystercatcher (*Haematopus moquini*) is classified as being Near Threatened and is found along the entire coastline. They breed on the ground, just above the high-water mark in summer and as such are very sensitive to disturbance from recreational beach goers and dogs.
- The Endangered Antarctic Tern (*Sterna vittata*) is a winter visitor from the sub-antarctic islands and they occasionally roost along the coast in the district.
- The African Penguin (*Sphenicus demersus*) colony on Robben Island is highly significant and essential for this Endangered species' survival. This is discussed in more detail under the Robben Island Important Bird Area below.

Many of the remaining birds of conservation concern are associated with wetlands. These include:

- The Near Threatened Old World Painted Snipe (*Rostratula benghalensis*) is secretive and therefore seldom recorded. They however could be recorded in District A from time to time as they can be encountered in any wetland with shallow vegetated fringes.
- Both African species of Flamingo, Greater Flamingo (*Phoenicopterus ruber*) and Lesser Flamingo (*P. minor*) are considered Near Threatened and occasionally visit the Black River and the Two Rivers Urban Park.
- The Great White Pelican (*Pelecanus onocrotalus*) is classified as Vulnerable and occasionally visits the Two Rivers Urban Park area.

- The Vulnerable Striped Flufftail (*Sarothrura affinis*) is confined to high quality Fynbos seeps in the Table Mountain National Park and is unlikely to be found anywhere else in in the district.

Raptor species of conservation concern:

- There is only one remaining breeding pair of the Vulnerable Verreaux's Eagle (*Aquila verreauxii*) on the Cape Peninsula. This pair nests and frequents the central portion of the Table Mountain National Park in District H but the birds regularly forage over the mountainous areas in District A.

Important Bird and Biodiversity Areas (IBA's):

Robben Island falls within District A and is classified as an Important Bird Area (Marnewick, et. al., 2015). It is a critical breeding site for African Penguin (*Spheniscus demersus*), Bank Cormorant (*Phalacrocorax neglectus),* Cape Cormorants *(P. capensis)* and Crowned Cormorant *(P. coronatus)*. The African Penguin is currently classified as Endangered with the population decreasing at approximately 6.4% per year. The more than 1600 breeding pairs at this site are of immense conservation significance. The Bank Cormorant breeding colony on Robben is also considered the largest in South Africa. There are also significant colonies of Swift Tern (*Thalasseus bergii*) and Hartlaub's Gull (*Chroicocephalus hartlaubii*) and numerous pairs of African Oystercatchers (*Haematopus moquini*) are known to breed on the island. In some years, a heronry forms which is largely dominated by Sacred Ibis (*Threskiornis aethiopicus*).

Amphibian Fauna

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

Within District A, four threatened amphibian species are known to occur. These are as follows:

- The Critically Endangered Table Mountain Ghost Frog (*Heleophryne rosei*) is endemic to the Cape Peninsula and is restricted to Districts A and H. The species is dependent on perennial streams in moist forested ravines. Within District A, this species has been recorded from the cave systems on the Back Table and was historically known to occur in Platteklip Gorge. While its entire distribution range falls within the Table Mountain National Park and the upper reaches of the Kirstenbosch Botanical Gardens, the species is considered to Critically Endangered due to its miniscule global range.
- The Endangered Western Leopard Toad (*Sclerophrys pantherina*) is known to occur within the Vincent Pallotti Wetlands, Oude Moulen, the Observatory and neighboring Raapenberg Bird Sanctuary within District A. The population of Western Leopard Toads in District A is at low levels and the habitat is intensely fragmented by development and major arterials. If the presence of this species is suspected on a site, then a comprehensive specialist assessment would need to be conducted.

The Western Leopard Toad Conservation Committee should be involved in proposed conservation or other activities that could impact on this species. This would also ensure that the most updated distribution and breeding locality information forms part of the planning phase. Please see www.leopardtoad.co.za for more information.

- The Near Threatened Cape Peninsula Moss Frog (*Arthroleptella lightfooti*) is found throughout the Cape Peninsula Mountain chain in seepage areas. This species is only found on the Cape Peninsula and is endemic to Cape Town.
- The Near Threatened Cape Rain Frog (*Breviceps gibbosus*) occurs in this district and is known to occur on the slopes of Lions Head and around Observatory. This species is not associated with wetlands and is often found in suburban parks and gardens. Preventing movement barriers, such as solid boundary walls, and retaining unpaved garden space within residential areas are important in allowing these charismatic frogs to persist in some of their historic distribution range within the City

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

Reptile Fauna

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

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

The range restricted Black Girdled Lizard (*Cordylus niger*) is common in most rocky fynbos areas on the Cape Peninsula. While not listed as threatened, this species is almost confined to the Cape Peninsula and therefore of significance.

Invertebrate Fauna

Little is known about the insect and other invertebrate fauna in District A. Ongoing research into invertebrates in Cape Town frequently elicits new species reflecting the high level of endemism within this region. The recent discovery of the new genus *Saltoblatella* (Leaproach) in the neighbouring District H as an example. Butterflies and Odonata (dragonflies and damselflies) are relatively well known and some information is provided for below.

Butterflies

- The Peninsula Scarce Mountain Copper (*Trimenia malagrida malagrida*) is classified as being Critically Endangered, Presumed Extinct (Rautenbach, 2020). This taxon, which was known to occur on rocky west facing slopes of the Table Mountain Range, now appears to have become extinct. The colony in the vicinity of Apostle Buttress above Llandudno was destroyed by a Eucalyptus plantation while the last colony on Lion's Head appears to have been destroyed by too-frequent alien vegetation enhance fires. (Edge, 2013)
- Although considered of Least Concern, the Sky Blue Giant Cupid (*Lepidochrysops oreas oreas*) is classified as Rare – range restricted. It is endemic to rocky fynbos on the Cape Peninsula (Williams, 2020).
- Also considered of Least Concern, the Peninsula Skolly (*Thestor yildizae*) is classified as Rare – range restricted. It is endemic to fynbos on the Cape Peninsula (Morton, 2020).

Dragonflies and damselflies (Odonata)

There are seven species of dragonfly that are of conservation concern in the Western Cape. One of these species, the Endangered Elusive Skimmer (*Orthetrum rubens*), was described from Table Mountain but has not been recorded there since. It has however been rediscovered near Victoria Peak in the Hottentots-Holland Mountains (Turner, 2017). It is a little-known species that can be overlooked and could potentially occur in the more remote parts of the Table Mountain National Park in District A. The Mahogany Presba (*Syncordulia venator*) is also considered as globally threatened and is classified as Vulnerable (Turner, 2017). Within District A they have also been recorded on the Peninsula mountain chain.

Threats to these and other dragonfly and damselfly species within Cape Town includes alien and invasive plant species, predation by alien fish, water quality deterioration and watercourse degradation.

Proclaimed Nature Reserves:

Nature reserves in the District are the Table Mountain National Park, the Raapenberg bird sanctuary at the confluence of the Black and Liesbeek rivers, the Waterhof Bird Sactuary and the Palotti Wetlands, the latter three are all part of the Two Rivers Urban Park. .

The **Raapenberg Bird Sanctuary** is a Local Authority Nature Reserve of approximately 0.15km^2 located along the Liesbeek River north of the N2. Raapenberg is known as an important breeding site for many species of duck. The reserve forms part of the area known as the Two Rivers Urban Park, an area where the CoCT recognises the need to protect and rehabilitate ecological systems and where mutually beneficial relationships between people and the natural environment are encouraged.

About 16% of the **Table Mountain National Park** (TMNP) falls within the Table Bay District The TMNP is managed by South African National Parks (SANParks) and is considered to be one of the centres of endemism within the Cape Floral Region. One of the highest concentration of plant biodiversity within the Cape Floral Kingdom is found in the TMNP. There are over 2200 species of flowering plants growing in the Table Mountain National Park with 90 endemic species (occurring nowhere else) (source: Siyabona Africa - South Africa's nature reserves and national parks.

3.1.3 Hydrology

3.1.1.6 Rivers and Estuaries

The district contains a number of rivers, including the Salt, Liesbeek, Black and Elsieskraal Rivers, as well as a number of small streams and rivers flowing from the Table Mountain Range. Flows are generally much stronger in winter than in summer, given that Cape Town has a Mediterranean climate that is characterised by winter rainfall.

The eastern portion of the district is dominated by the Salt River and the lower reaches of its tributaries, namely the Elsieskraal, Black and Liesbeek Rivers. The western portion of the district contains a number of streams that drain Table Mountain and the Twelve Apostles, including the Camps Bay, Diepsloot, Kasteelpoort, Blinkwater and Lekkerwater Rivers.

The Salt River system is the largest in the district. The Salt River is 2.5 km long, beginning at the confluence of the Liesbeek and Black Rivers and draining into Table Bay just north of the Port of Cape Town (eWisa). The Salt River system has a total catchment of approximately 200km^2, draining Table Mountain, the Cape Flats and the Tygerberg Mountains and thus extending beyond the borders of Table Bay District into the Southern, Cape Flats, Tygerberg and Northern Districts (River Health Programme, 2005).

The main tributaries of the Salt River are the Elsieskraal River, which drains the Tygerberg Hills, the Black River, which drains the north-western portion of the Cape Flats, and the Liesbeek River, which drains the east-facing slopes of Table Mountain (River Health Programme, 2005). Other tributaries include the Jakkelsvlei (located in Tygerberg District)

and the Vygekraal, Blomvlei and Kromboom Rivers (all located in Klipfontein/ False Bay District).

The rivers in the western portion of the district, including the Camps Bay Stream and Diepsloot, as well as the Blinkwater, Kasteelspoort, Platpoort and Lekkerwater Rivers, drain the western slopes of Table Mountain and flow into the Atlantic Ocean. These are all small, short rivers. They have been less severely encroached on by development and fall partly within the protected area of the TMNP. Several streams that drain Table Mountain northwards, including the Platteklip and Silver Streams, flows under the CBD in mostly underground canals towards Table Bay and the harbour.

River Health

River health in the District is heavily impacted on by the surrounding urban development. The majority of the river systems are canalised, which disrupts natural systems functioning.

The on-going organic and inorganic pollution and littering of Cape Town's storm water and freshwater systems pose a threat to both biodiversity and human health. Contamination of the citys' freshwater systems is primarily due to contaminated urban storm water and raw sewage from informal settlements, leaking sewers and pump stations.

The large river systems that terminate in the Eastern part of the District are not suitable for recreational use and the ecosystem health is poor. Ecosystem health is measured by the amount of phosphorous in the system, known as the trophic tendency (State of Environment Report 2018). The Salt River system is severely hypertrophic, it is one of the most polluted systems in the City and prioritised for intervention. The Black River has exceptionally high levels of E.coli and other pollution, which render it unsafe for any human contact.

Dams

Five moderately-sized, in-stream dams are located within the district on top of Table Mountain, namely: the Woodhead, Hely-Hutchinson, Victoria and Alexandra Reservoirs and the De Villiers Dam. The dams were built between 1897 (Woodhead Reservoir) and 1907 (De Villiers Dam) to provide water to the residents of Cape Town. The five dams yield approximately 4 million m^3/annum and currently provide approximately 1.2% of the total water supply to the greater Cape Town area (River Health Programme, 2005).

The Molteno reservoir, located in the De Waal Park on the foot of Table Mountain, was constructed in the late 1800s to supply water to Cape Town.

3.1.1.7 Wetlands

Riparian wetlands are associated with the Black and Liesbeeck Rivers within the Two Rivers Urban Park (the Raapenberg, Pallotti and Valkenberg wetlands). The Raapenberg and Palloti wetlands are all that remain of the once extensive wetland system that originally occurred along the Black River (CoCT, 2002). These wetlands have conservation value as habitat and flood amelioration.

3.1.1.8 Groundwater

The District has various aquifers storing groundwater. However, these have low yields and are therefore much less significant than many of the aquifers found in other districts of the City. Most of the district west of the Salt River, is situated on a *fractured aquifer* which has low median yields of 0.1–0.5 litres per second (ℓ/s) (DWAF, 2000).

Groundwater abstraction in the district is mostly limited to private boreholes for domestic/garden use.

An *intergranular aquifer* is located east of the Salt River, where Springfontyn deposits of the Sandveld Group are located. The Sandveld aquifer is essentially a coastal aquifer, extending along the West Coast from False Bay to Saldanha. The aquifer is most productive in the south at False Bay in Klipfontein/ False Bay and Khayelitsha/ Mitchells Plain Districts and becomes gradually less productive as it extends north into Table Bay and Tygerberg Districts. The south-eastern corner of the district falls within the part of the aquifer that has a moderate yield of 0.5–2.0ℓ/s, while most of the intergranular aquifer falling within the district has a low median yield of 0.1–0.5ℓ/s (DWAF, 2000).

The western coastal area of the district is underlain by the Cape Granite Suite and is situated on an *intergranular and fractured aquifer* that has a very low median yield of up to 0.1ℓ/s in this area (DWAF, 2000).

Groundwater quality in the district is generally very good to moderate. The quality (electrical conductivity[1]) of groundwater in the southern half of the peninsula and in a strip reaching from the north-western corner of False Bay to the border of the Southern and Table Bay Districts ranges from 0-70 milli Siemens per meter (mS/m), indicating very good quality. Groundwater in the northern half of the peninsula and along the eastern border of the Southern District has higher conductivities of 70–300mS/m, indicating moderate quality (DWAF, 2000).

Due to the proximity of the aquifers to the sea and frequent extension to below sea level, coastal aquifers are vulnerable to saline water intrusion, especially if there is excessive abstraction or mismanagement of groundwater. Careful control of abstraction rates is thus important to preserve the quality of the groundwater (DWAF, 2000).

[1] Conductivity is a measure of the ability of water to pass an electrical current. Each stream tends to have a relatively constant range of conductivity that, once established, can be used as a baseline for comparison with regular conductivity measurements. Significant changes in conductivity could be an indicator that a discharge or some other source of pollution has entered a stream.

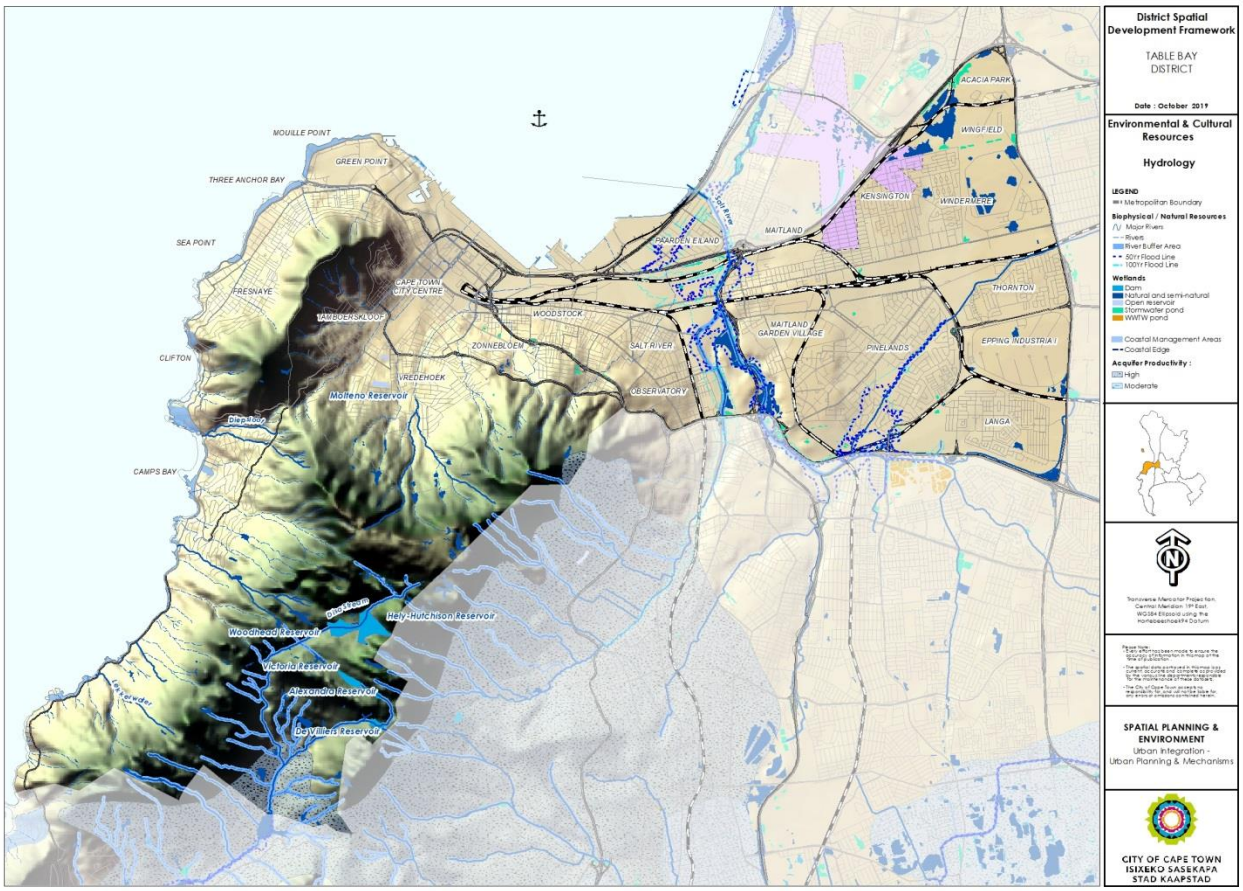


Figure 17 Hydrology

3.1.4 Coastal Areas and Dunes

3.1.1.9 Coast

The coastline of Table Bay District is reasonably varied, the northern shoulder of the Peninsula, encompassing Sea Point to the Port, is characterised by a rockier shore, with small bays and mainly shells, gravel (and some sandy) beaches.

A large part of the Coast is reserved for public space and recreation through the construction of the Sea Point Promenade.

The western coastline of the Cape Peninsula is dominated by rocky shores, backed by steep mountain slopes that drop off into the sea, these source to sea linkages presenting an opportunity to preserve ecosystem functioning. The rocky shoreline is interspersed with occasional sandy beaches, notably at Clifton and Camps Bay, Clifton 4th beach and Camps Bay both have Blue Flag status.

The coastal zone from Mouille Point to Camps Bay is a mixed-use area (commercial, residential and recreation use activities) the Promenade between Mouille Point and Bantry Bay is a dominant recreational feature, with a sea wall requiring regular maintenance. Rocklands and Three Anchor Bay are prone to storm surges. Stormwater outfalls and sewerage outfalls are a threat to coastal water quality in the District.

The area south of Camps Bay is an undisturbed natural area with some recreational activities, mainly at the small sandy beaches.

Approximately 4km of the coastline in the south of Table Bay comprises the Port of Cape Town (and V&A Waterfront) and consist of artificial shore protection and breakwaters. This section of the coastline is used for industrial and commercial activities.

3.1.1.10 Coastal Water Quality

Coastal water quality is impacted by numerous sources of bacterial pollution, with the three main sources being overflows from the sewage reticulation network, wastewater discharge from waste water treatment works (WWTWs), and storm water run-off. Water quality in Table Bay is affected by discharges and spills from activities in the Port of Cape Town as well as effluents and contaminants from the City's storm water outfalls.

Three Anchor bay and Saunders beach both failed department of Water and sanitation strict guidelines for acceptable levels of pollution in 2016. While all other beaches in the District tested at acceptable levels. The two Blue Flag beaches, Clifton and Camps Bay are tested every two months to ensure they maintain low levels of pollution and are acceptable for all forms recreation. (State of Environment 2018)

3.1.1.11 Dunes

Dune activity has been impacted on by urbanization with only two smaller dune areas remaining in the District.

Embryo dunes are found in three locations along the coast of Table Bay District. Two dunes along the coastline of Table Bay (at Paarden Island and Granger Bay, respectively) are fragmented and highly impact on by urbanisation and road infrastructure, as well as parking (at Granger Bay) (Low, 2008). The more extensive embryo dunes at Koeëlbaai (between Camps Bay and Oudekraal) are impacted on by roadside parking and infestation by alien acacias (Low, 2008).

The development of Granger Bay around the Port has resulted in erosion of beaches to the North, in particular Milnerton beach, which no longer receives sand deposits.

Coastal thicket vegetation characterizes the slopes along the Atlantic seaboard South of Camps Bay.

3.1.1.12 Coastal Management and Protection:

The coast of the district is also exposed to wave erosion, storms, extreme events and inundation caused by storms and tidal action. Investment in coastal defenses provide some protection, but attracts high maintenance costs. Many private and public land areas are still at risk from coastal processes. Pragmatic coastal management measures are proposed in the City's Integrated Coastal Management Policy (2014) including improved defenses, managed retreat of urban development where appropriate and avoiding development in high risk areas.

3.1.5 Agriculture and Mineral Resources

There are no significant areas for commercial agriculture in the District. However there is an increasing recognition of the role of urban agriculture in social and community development.

Urban farms such as the Oranjezicht City Farm and Market in the CBD, Urban Rural Development and Capacity Building food garden project in Langa provide different examples of how urban agriculture can contribute to economic development or community and social well-being respectively.

Sand mineral resources underlie urban development in the Eastern part of the District and are not feasible for extraction.

3.1.6 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 are above the accepted standards within the Cape Town CBD this is due to local geographic conditions trapping pollutants closer to the ground as well as higher traffic volumes. 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 these are affected by a range of urban behaviours and events, including fires and building developments.

The City's Air Quality Management Plan outlines processes to monitor and manage air pollution. Management actions include greening, community awareness and enforcing the City's air quality by law.

3.1.7 Green Infrastructure

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

In addition to further motivating for the protection of existing natural assets such as biodiversity and the coast, green infrastructure recognizes the role and importance of a

range of urban green spaces or parts of the urban system, including but not limited to gardens, trees, parks 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 x (chapter 4) a metropolitan open space network was prepared for the 2018 MSDF and will be reviewed through the GIN.

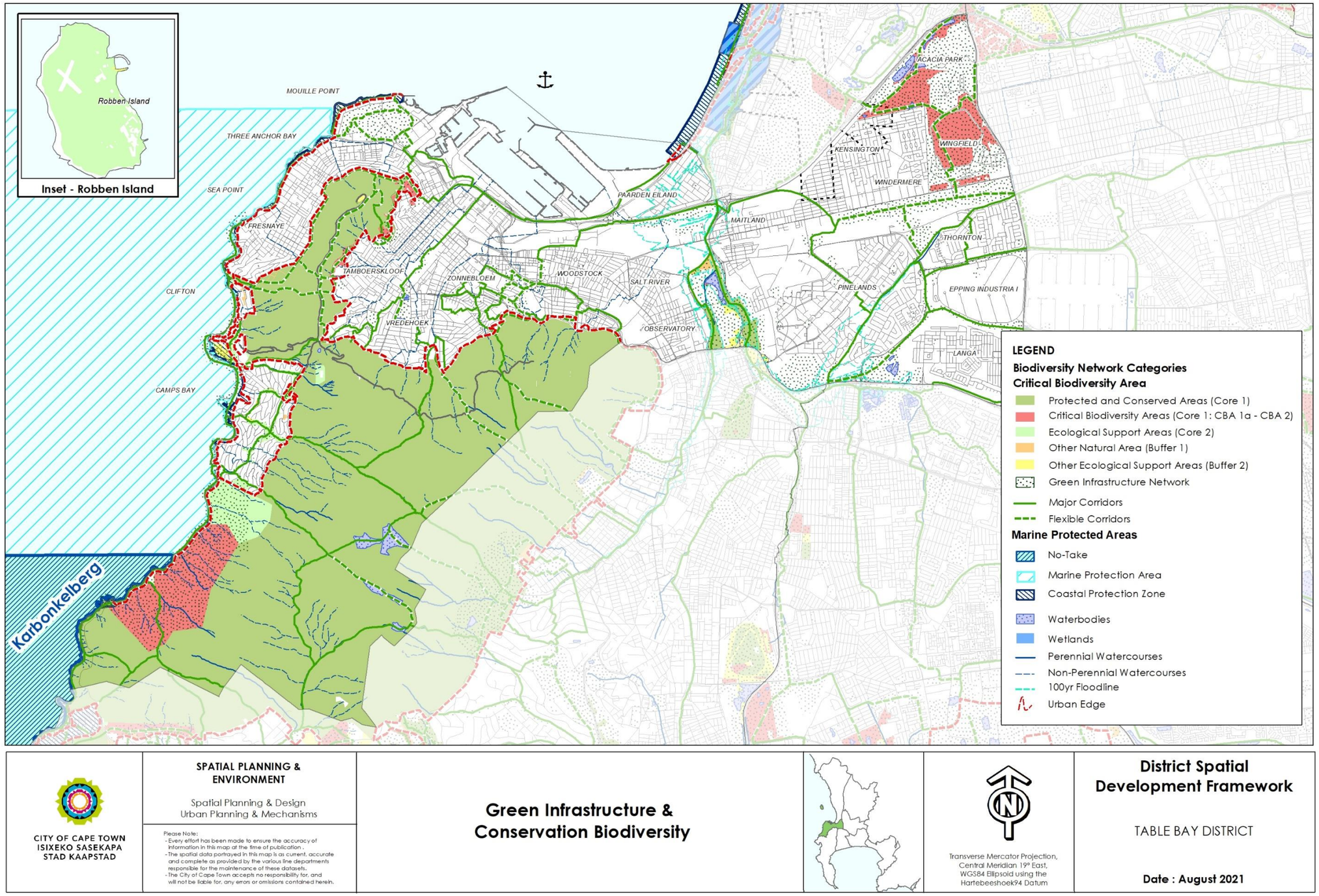


Figure 18: Green Infrastructure and Conservation Biodiversity

4 CULTURAL AND HERITAGE RESOURCES

4.1 Historical development (of the district)

The Table Bay District is the oldest district in the Cape Town Metro. In addition to the CBD which is the oldest part of the City, it contains a number of historical municipalities that were amalgamated in 1910 to form the first 'city'. It is the district that has the highest concentration of heritage places and areas identified for protection in terms of their environmental and heritage qualities.

This district contains remnants of the oldest historic urban landscapes in the Western Cape. The settlement around Table Bay was established in 1652 as a refreshment station for the Dutch East India Company (VOC). The Castle of Good Hope, the Company's Garden and the Slave Lodge (Iziko Museum) form part of this early history of Cape Town, which focused on the production of fresh produce (using slave labour) for the VOC ships *en route* to the East. The earliest urban residential development was focused between the Company's Garden and the Castle: the areas along the slopes of Table Mountain were market farms.

For most of the 18th century, urban development remained focused on the area between the Castle and the Company's Garden, but had expanded as far as Bree Street. By the 1830s, discrete settlements were already developing on the outskirts of the City – such as Bo-Kaap – often where freed slaves and less affluent people moved. The discovery of diamonds and gold in Kimberley and Witwatersrand led to a boom in the development of Cape Town and an influx of immigrants to the Cape. During this period, Tamboerskloof, Oranjezicht and Green Point developed a suburban character.

The mid-19th century saw the expansion of farms/market gardens and residential estates into Green Point and Sea Point on the Atlantic seaboard, with dwellings clustering along Main Road. The development of the urban landscape beyond Buitenkant Street, into what was to become District Six dates to this period. Woodstock followed a similar pattern to Green and Sea Point, farms and market gardens giving way to suburban estates between Main Road and the mountain and lower income, higher density residential and commercial developments below Main Road. The development of the railway line intensified this process.

An outbreak of bubonic plague in 1901 lead to the first forced removals in Cape Town under the name of slum clearance and sanitation. Black migrant dock workers were removed to the Uitvlugt camp, which later developed into the Ndabeni Native Location (Bickford-Smith, 1999).

Heavy industrialization took place during the periods surrounding the two World Wars, and the high demand for housing post war provided the impetus for apartheid planning with separated residential areas for the different race groups - well before the Group Areas act was passed. Langa was already laid out in 1927 to accommodate the residents from Ndabeni who were to be removed to make place for the planned 'Garden City of Pinelands'. Residential areas such as Windermere and Crawford were planned as

coloured residential areas, and Maitland Garden Village was built for the coloured municipal employees (Bickford-Smith et al, 1999).

Langa is situated in the Table Bay District and is the oldest planned black township in the Western Cape. It was planned in the 1930s along the lines of the "Garden city" movement, but adapted to the perceived needs of an (African) migrant community. Maitland Garden village, similarly, formed part of the "Garden City" movement, but was adapted to the requirements of a so-called 'coloured' blue collar community. This grouping of "Garden cities" is completed by Pinelands, which was planned for white collar workers.

The effects of the Apartheid planning and the Group Areas Act forced removals are most evident in this district, but was by no means limited to District Six. Tramway/Ilford Road, Sea Point, as well as areas in Salt River and Observatory were affected. Woodstock was one of the few areas within the City that was affected to a lesser degree.

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 traditional access to sites and/or places (e.g. Oudekraal; kramats of the foothills of Table Mountain; the coast etc.) and living heritage practices (initiation; morning call to prayer etc.). Space for intangible heritage recognition is an important consideration in planning as social facilities or heritage spaces may need to make specific accommodations for cultural events and practices.

4.2 Heritage management

The following two sections outline the formal heritage management instruments and their role in the District:

4.2.1. National Heritage Resources Act, Act 25 of 1999

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

A summary of the number of places and spaces formally protected under the NHRA is included in Table 1.

Neighbourhood/Area	National Heritage Sites (GRADE I)	Provincial Heritage Sites (GRADE II)	Heritage Register (GRADE III)	Heritage Area
Bantry Bay		1		
Bo-Kaap	25	82		

Camps Bay/Clifton	3			Clifton Bungalow Area
Cape Town/CBD	17	58		
District 6				
Gardens		41	1	
Green Point		7	1	
Observatory	1	8		
Robben Island	(whole island)			
Oranjezicht		25		
Pinelands		18		
Salt River		1		
Sea Point		3		
Tamboerskloof		5		
Woodstock		64		
Waterfront V&A		Various elements		
Table Mountain National Park (WHS)		Various cadastral units		

4.2.1.1 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.

- 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.

- 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.

The South African Heritage Resources Agency (SAHRA) has declared over 40 heritage sites within the Table Bay District as National Heritage Sites (Grade 1) (see Table x). These heritage sites are of exceptional heritage significance and are relevant across the nation. These sites include the Parliamentary precinct, the Lutheran Church and associated

buildings, various buildings in the Bo-Kaap, the Royal Observatory and Robben Island. Not included in the table x, are the number of heritage places that SAHRA has identified as being of national significance, but that have not yet been formally protected by means of a notice in the Government Gazette (e.g. various churches and schools in Langa and Langa as a historical urban landscape).

The Table Bay District has a number of Provincial Heritage Sites. 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. These sites include areas of high scenic qualities (e.g. Clifton Scenic Reserve), historical residences, urban features (e.g. Hurling swaaipomp) and sites of geological significance (e.g. the contact point in Sea Point). The Green Point Common has been proposed as a Provincial Heritage Site.

A number of areas have been identified for investigation for protection in terms of S31 of the NHRA. These include but are not limited to:

- The extended Woodstock area, including the Two Rivers Urban Park
- Langa historical core
- Vredehoek
- Somerset Road
- V&A Waterfront

4.2.1.2 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.

  Archaeological evidence relating to the occupation of Table Bay by indigenous groups prior to the establishment of the refreshment station in 1652, have largely disappeared underneath the urban form of the City. Occasionally during the course of development, archaeological evidence may be disturbed.

Later Stone Age burials were uncovered during a development in Green Point. This area was used by the early inhabitants of the Cape to bury their dead, as well as the 18th and 19th century inhabitants and the extensive burial grounds extended from Buitengraght Street to Gallows Hill and from Somerset Road to the shoreline. This area may experience future triggers of Section 35 as the burials extend underneath the existing cadastral layers and road network.

Many other Archaeological features and deposits relating to the early history of the settlement are preserved under the existing urban form and May trigger Section 35: The old fort (built by Jan van Riebeeck in 1652 and which was replaced by the more robust stone Castle c1666) lies underneath the Grand Parade; remnants of the fortifications that defended Table Bay[2] e.g. Amsterdam Battery, Chavonne Battery and the Central Redoubt in Trafalgar Park in Woodstock; Wagenaar's dam in the Golden Acre as well as more mundane remnants of household middens.

The extensive foreshore reclamation extends over much of the original Table Bay shore and anchorage. Shipwrecks, anchors, as well as artefacts (historical and Stone Age) have been found in the foreshore area during the course of development. The reclamation and construction of Ben Schoeman claimed Woodstock Beach. This beach extended from the Castle to Paarden Island and a number of fortifications protected the eastern extent of the Bay. Remnants of these fortifications are still evident in Woodstock and in areas along the present railway route. Woodstock Beach was known for the number of ships that wrecked on its shore during the winter storms[3]. A number of burial grounds were also located along the eastern edge of the Bay (comparable to those found in Green Point). The exact location of these burial grounds have not yet been confirmed, but increased development in the area below Albert Road, is likely to do so in the near future.

4.2.1 Municipal Planning By-Law

The Municipal planning by law in section 99 provides criteria for decision making on land use applications. Heritage is one of the criteria to assess when determining the suitability and desirability of a development.

4.2.1.3 Heritage Protection Overlay Zoning (Chapter 20 Part 1)

The existing HPOZ in the Table Bay area originated from the Urban Conservation Areas established in the 1980s. The Heritage and Cultural Areas Map shows the location of these areas as well as the location of proposed heritage areas.

[2] These fortifications were so formidable, that Table Bay was never attacked directly. Unfortunately, the Dutch focused all their defences on Table Bay and left themselves vulnerable on all other fronts! In 1795, the British successfully attacked the Cape from Muizenberg and occupied it until 1803. In 1806, the British occupied the Cape for the second and last time, having won the Battle of Blaauwberg.

[3] The loss of ships during these storms lead to the establishment of Simonstown as an alternative winter anchorage.

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.

A list of the existing HPOZ/old Urban Conservation Areas is included in Table 2.

Heritage Protection Overlay zoning areas	Description
Green Point	Green Point HPOZ is an area of heritage significance comprising a rich and dense composition of housing typologies and periods, ranging from substantial mid-19th century decorated villas to turn of the century row houses – both single and double storey, interspersed with Edwardian houses and intuitional buildings. From the early-mid 20th century to today blocks of flats have been replacing more historical fabric. Some of these flats themselves are of architectural interest and contribute to the richness of the area.
Sea Point	Sea Point HPOZ is an area of heritage significance comprising a rich and dense composition of housing typologies and periods. A sprinkling of houses date back to the mid-19th century while most of the building stock is turn of the century row housing – both single and double storey, interspersed with Edwardian houses and intuitional buildings. From the early-mid 20th century to today blocks of flats have been replacing more historical fabric. Some of these flats themselves are of architectural interest and contribute to the richness of the area.
St Bedes	One of the most intact historical areas on the Atlantic Seaboard St Bedes HPOZ is an area of heritage significance comprising fine detached Victorian villas with decorative mouldings and ironwork and late 19th century double storey terraces. These are generally in a fine authentic condition and are highly conservation-worthy.
Loader Street (de Waterkant)	Loader Street HPOZ has a significant number of historical terraced houses and cottages, both single and double storey, mostly flat roofed in the Cape town house idiom. Historically an extension of District Six, Snow indicates densification was already taking place before 1862 – and by 1895 the area was already developed. While originally a working class area Loader Street has prospered over the last 50 years with the double storeying of cottages and general gentrification of the area.
Central City	The Central City is the heart of historical Cape Town. Buildings, streets, open spaces and vistas are central to the identity of Cape Town, and important economic generators through tourism and related industry. While Cape Town has undergone centuries of redevelopment, many areas still retain their historical character. Behind many Victorian facades lies the 18th century fabric of the earliest development. These buildings and spaces are an important tangible link to the City's history and all those people who lived in it and who contributed to its current state. There is a rich texture of built environment with buildings and fabric spanning nearly 4 centuries.
Upper Table Valley	The Upper Table Valley is a unique heritage environment with a high density of highly conservation-worthy heritage resources. The environment

	includes buildings, infrastructure, streets and spaces associated with the development of the Upper Table Valley from the earliest homesteads and farms to significant twentieth century buildings. There are areas of excellent Victorian building stock, detached, terraced, single and double storey. These are mainly of good quality and represent the homes of the middle classes of Cape Town. Many are decorated with ironwork, fretwork, quoining and other plaster details. There is a large collection of exemplary early twentieth century villas built by established as well as avante guard architects of the time. A fine grain of buildings with significant canopies of stone pines, and gardens. Numerous institutions and sports fields are interspersed within this important cultural landscape.
Albert Road, Woodstock	Albert Road is an exemplary streetscape of later 19th and early 20th century commercial buildings, demonstrating the expansion of Cape Town along a historical route to both the south and the hinterland. Later commercial buildings from art deco and modernist period offer an interesting counterpoint to the colonnaded Victorian buildings. The continued improvement of the streetscape through maintenance and restoration promises to anchor Albert Road as an important small business hub. Colonnades, shop fronts, parapet walls and the fine grain of the area are critical components of the streetscape.
Victoria Road, Woodstock	Victoria Road is an exemplary streetscape of later 19th and early 20th century commercial buildings, demonstrating the expansion of Cape Town along a historical route towards both the south and the hinterland. Later commercial buildings from art deco and modernist period offer an interesting counterpoint to the colonnaded Victorian and Edwardian buildings. Colonnades, shop fronts, parapet walls and the fine grain of the area are critical components of the streetscape.
Cavendish Square, Woodstock	A well preserved area of hof late 19th century housing centred on Cavendish Square. A mixture of row housing, detached housing, both single and double storey. Houses tend to be of a higher quality that those found in Salt River, and more space is given to vegetation.
Roodebloem Road, Woodstock	
Regent Street, Woodstock	An area of dense late 19th and early 20th century working class row and semi-detached housing, interspersed with institutional buildings and churches. The area represents a time of rapid growth as the City spilt beyond the City Bowl.
Chapel Street, Woodstock	The last remaining portion of District Six. An area of dense working class housing in generally authentic state. Small row houses with wooden fretwork verandah's and corrugated iron roofs. Interspersed with institutional buildings and workshops. Stark treeless area with little room for vegetation.
Wandel Street, Gardens	Wandel Street HPOZ contains a high density of historical terraced housing from the later 19th century, interspersed with structures of greater age. It is in good authentic condition and highly conservation-worthy.
Maynard Street, Gardens	Maynard Street has a high density of single storey late 19th century row housing. While the grain and texture remain the buildings are often hidden behind high walls. The City owned buildings are generally the best preserved with the best street interface.

Queens Street,	A largely intact area of dense late 19th and early 20th century single storey row housing and more decorative detached housing. The area represents a time of rapid growth and densification as the City spilt beyond the City Bowl. Veranda's, ironwork, low boundary walls and corner shops typify the area.
Chester/Coronation Street, Woodstock	An area of largely 1920s or 1930s housing interspersed with Victorian. Mixture of row and freestanding. Fairly modest buildings with a dense grain, but allowing for some planting in front and behind houses. Many houses have had later alterations. Subdivision of Zonnebloem which together with the sports fields forms part of the HPOZ.
Salt River	Salt River is an excellent example of late 19th century and early 20th century working class housing developed at a time of intense growth and industrialization. Factories and workshops in the area provided job opportunities, while the cutting up of the old farms provided building speculators with development opportunities. Much of the character and texture of Salt River remains today.
Upper Observatory	A rich texture of Victorian housing of various types and quality, from decorated villas to working class row housing. Interspersed with institutions and commercial buildings. Largely intact.
Lower Observatory	Lower Observatory HPOZ is an environment with a strong authentic Victorian character. There is a high density of single storey Victorian villas with bay windows, decorative plasterwork, verandahs, fretwork and ironwork. There are also fine detached and semi-detached double storey Victorian houses with upstairs and downstairs verandah's as well as a large collection of 1920s cottages. The area is interspersed with early homesteads such as Westoe and Bellvliet.
Pinelands	South Africa's first Garden City, Pinelands was established in the 1920s soon after the Spanish flu epidemic as an ideal and healthy suburb. Today Pinelands retains many of the features of the original Garden City concept including wide verges, tree-lines avenues and low hedges. The architecture of Pinelands has a strong arts and crafts influence with thatched multiple pitched roofs, wooden window frames and leaded glass. Pinelands is the forerunner of many later variations of the garden city, and retains largely intact the architecture and design principles of its conception.
Bo-Kaap	Oldest residential suburb in Cape Town with high socio-historical significance and association with the Muslim community of Cape Town

4.2.1.4 Scenic Drives Overlay Zoning (Chapter 20 Part 4)

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 Table Bay District has a number of identified scenic routes shown on the Map of Heritage and Cultural Resources.

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

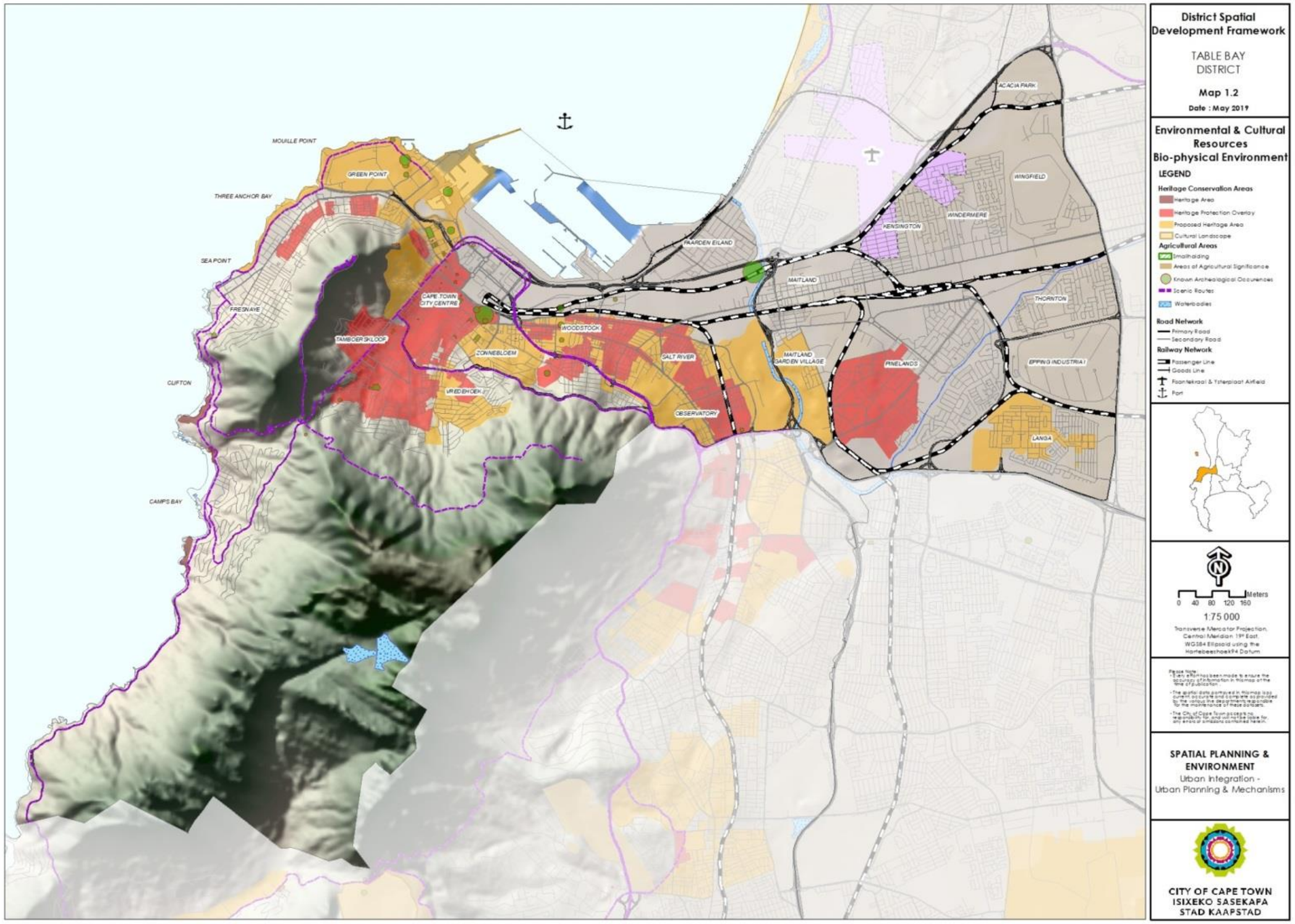


Figure 19: Agricultural Potential and Cultural Resources

4.3 Key Development Pressure and Opportunities

4.3.1 Development Pressures and Constraints

4.3.1.1 Biodiversity

- As the District most strategically located in terms of proximity to Jobs and transport connections, pressure to develop the remaining vacant land is substantial.
- The Two Rivers Urban Park area has different land owners in the surrounds with various development proposals that have potential to impact on the remaining biodiversity and ecological support areas.
- Invasive alien plant species are spreading aggressively and not being controlled by landowners
- Pockets of critical biodiversity exist in Wingfield, an area highly strategic for urban development
- Bad 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 City 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.

4.3.1.2 Hydrology

- Inappropriate planning and historic modification of rivers, with many industrial areas located along the rivers in this district has resulted in rivers where restoring ecological function will be at a high cost;
- Increased demand for municipal water due to Population growth and urban/economic development;
- Extensive hard surfacing and canalisation means aquifer recharge in the District is limited, there is a high probability of potential for increased demand on ground water during drought.
- The Salt River system has some of the worst water quality in the City this is a result of a number of pollution management challenges between source and sea, including inadequate waste collection in informal settlements and sewerage outflows;
- Some areas alongside the black and salt rivers are especially prone to flooding.
- Poor interfaces between rivers 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.

4.3.1.3 Coastal Areas

- Development along the coastline and the resulting modification of the coastal environment, particularly around Paarden Eiland, Table Bay harbour and the Atlantic Seaboard;
- Interference with coastal dynamics and processes has led to increasing erosion, loss of amenity and tourism opportunities and increasing damage and risk to coastal infrastructure and property;
- Destruction and fragmentation of dune systems due to urbanisation, for example at Paarden Eiland and Granger Bay;
- Invasive alien vegetation (particularly Acacia) has impacted on embryo dunes at Koeelbaai;
- Global climate change resulting in an increasing likelihood of more frequent and more intense storm events and (in the longer term) sea level rise;
- Reduced freshwater inflow and sediment supply to the coastal system from the Salt River system;
- Polluting effluent discharges (industrial and domestic) and stormwater runoff; and
- Increasing ship traffic and the resulting increase in pollution, ballast exchange and dredge dumping.
- Continuous development pressure in higher risk coastal areas.

4.3.1.4 Cultural, Heritage, Agricultural and Mineral Resources

- Increased urban development pressure, densification, industrialisation in the City Bowl, Woodstock, Sea Point, Green Point and V&A Waterfront areas,
- Pressure in central sensitive heritage areas containing smaller houses, e.g. Bo-Kaap, Vredehoek and residential areas bordering on the National Park, to enlarge houses, develop accommodation establishments or increase lettable space;
- Development pressure in areas identified for the protection and conservation of heritage in some cases risking the loss of identify and unique urban landscape
- Encroachment of development on mountain edge;
- Increasing tourism pressure, requiring further development and infrastructure provision; and
- Unmarked historical burial grounds situated along the shoreline of Table Bay (e.g. Green Point; Woodstock) pose a challenge when discovered accidentally during the course of development. High risk areas are mapped. Mitigation is a challenge where NHRA compliance is not obvious (where the building is not older than 60 years and where no S38 process is followed).
- Inadequate mapping of significant urban agriculture projects and local food systems.

4.3.2 Integrated Opportunities

Conservation of core environmental features and assets (including POS, beaches, rivers, wetlands, biodiversity, culture and heritage 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:
    - maintaining and managing proclaimed areas;
    - sustainable harvesting of medicinal and flowering plant species
    - Leveraging off and linking attractive environmental features through development of the green recreational network and associated NMT routes
    - enabling a host of tourism value adding businesses

b. Strengthens the city's resilience to climate change and mitigate risks associated with natural and unnatural disasters:
    - Rivers and wetlands provide flood control;
    - Aquifers and ground water sources are critical for water security especial in today's context;
    - Preservation 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.
    - Development of green infrastructure

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.

4.3.3 Spatial Implications for District Plan

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

Table 8: Environmental Spatial Implications

NATURAL/CULTURAL RESOURCE	SPATIAL IMPLICATION
A. Biodiversity 	• Conserve identified biodiversity linkage corridors of sensitive and threatened vegetation types and control development pressure in the key sensitive areas • Conserve, maintain and enhance green corridors from the mountain through urban areas • 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 Two Rivers Urban Park and Wingfield.
B. Rivers, Wetlands and Ground Water 	• Protect and conserve existing natural river corridors and waterbodies and ensure the health of the system as a whole. • Ensure that proposed new developments recognise the amenity value of rivers or waterbodies, where they can enhance the greater public good, and do not compromise the ecological functioning of the system. Identified suitable areas include the Black River through Mowbray and Observatory and its confluence with the Liesbeek River (the Two Rivers Urban Park); • Identify and implement measures to prevent E.coli contamination of rivers and wetlands (this is particularly bad in the Salt River system). Measures should include the provision of basic services to informal settlements (e.g. at Langa);

	• Investigate and implement measures to reduce flooding along the Salt River system, particularly at the River Club and Paarden Eiland areas. Mitigation may take the form of enhancing stormwater absorption elsewhere in the river system. • Remove invasive alien vegetation (particularly along the Black River and within the green corridors along the water courses that flow from Table Mountain through Camps Bay) and restore indigenous riparian vegetation; • Promote an active interface and permeable perimeter fencing on properties bordering natural resources and provide roads interfacing with biodiversity corridors for fire management • Prevent inappropriate land uses in identified flood prone areas; • Protect the re-charge and extraction areas for Aquifers • 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 	• Prevent inappropriate development in or close to the sensitive coastal area south of Bakoven; • Continue to maximise amenity and economic opportunities on the coast, with minimum disturbance to the coastal environment and processes. Identified areas include the beaches along the Atlantic coastline (Camps Bay, Clifton) and the Sea Point promenade; • Avoid land use development that will impact negatively on the ongoing operations and expansion of the Port of Cape Town. • 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 	• Confirm and adopt the heritage listings and mapping • Treat sites and places with heritage value as possible development opportunities that can add value to the quality and sense of history of the townscape; • Maintain the interface between the City and Table Mountain and avoid large structures that block views in accordance with the tall buildings policy; • Maintain the green corridors extending from the mountain into the City (e.g. parks and public spaces located in the upper reaches of the City Bowl), including remnants of historic plantations. • Adhere to the Urban Design policy to ensure new developments contribute to sense of place. • Adhere to the guidelines of the Scenic Drives network management plan. • Consider where heritage exemptions may be applicable with due consideration to the NHRA

E. Agriculture 	• Identify urban agricultural areas and ensure the sustainability of the urban food system • Understand the spatial and socio-economic dynamics of urban agriculture and the urban food system in the District.

C.STATE OF THE BUILT ENVIRONMENT

5 LAND USE AND DEVELOPMENT TRENDS

The Table Bay area is home to Cape Town's earliest settlements and has a range of desirable location attributes that have kept it a continuous focus of investment into the present. The attractiveness of the area for development can be attributed to:

- A higher concentration of industrial, commercial and retail economic activity in the District;
- location near the port;
- dramatic topography and connection to Mountain and sea;
- well managed public environment and sustained investments in public space;
- High concentration of residential areas with scenic qualities
- landmark private investments; and
- major tourism investments, a thriving tourism sector and complimentary creative sector

While the Table Bay area has seen a high degree of change in land values and the character and amenity value of areas. The private sector has gained from improved opportunities for development and a thriving market, this has resulted in a challenge for creating affordable housing opportunities in the area.

The CBD has seen positive changes at street level due to improvements in the public environment. The skyline has also changed as a number of significant building developments have been completed- the Portside building become the new highest building in 2013, and is soon to be eclipsed by 16 on Bree Street and Harbour Arch set to be developed in the near future. There is a steady stream of development proposals for even higher buildings and rezoning applications focus on increasing the allowable bulk on sites.

Public sector opportunities for transformation in the District are around the Two Rivers Urban Park, the Athlone Power Station and smaller pockets of state owned land across the District.

The pace of development has put pressure on aging infrastructure in the District, with sanitation infrastructure most affected.

5.1 Residential

The District reflects a range of residential neighbourhoods of varying character and residential densities. The highest population density is in Langa followed by portions of Maitland and Observatory. Noticeably high densities are evident in Sea Point and Green Point.

The form of the urban fabric has been greatly influenced by the natural context, with a band of intense development around the Atlantic Seaboard as a result of topographical constraints and desirable sea and mountain views. From Woodstock & Salt River to Observatory and the areas of Oranjezicht and Higgovale are characterized by a slightly

lower density residential pattern. Predominantly single residential land uses also feature in the established Garden City suburb of Pinelands.

The congestion travelling into the CBD and accessibility to jobs has led to an increased demand for residential properties in the CBD and the surrounding areas of Woodstock, Salt River and Observatory, and this demand is beginning to spill over into the North Eastern suburbs. The need for student housing for UCT has driven increasing densities in Observatory in particular. The area from the CBD to Observatory has experienced a surge of development in the past 10 years. With both apartment buildings and mixed use residential buildings contributing to increased densities in De Waterkant, Green Point, Woodstock, Salt River and Observatory.

Congestion also contributes to transit oriented development and the increased desirability of residential properties in proximity to efficient public transport. MyCiti routes in particular have had an impact on applications alongside and also impacted the need for urban design suitable for greater pedestrian movements stimulated by the uptake of public transport.

Development in the CBD to Observatory introduces a trend towards apartment living in smaller units, in some cases micro-units are being developed from the skeletons of older office buildings. Many of these properties are being purchased by investors rather than owner occupiers and are targeting an exclusive rental market including the tourist and Airbnb market.

In the Observatory and Salt River areas, the University of Cape Town maintains a steady demand for smaller rental units, consequently impacting on the density of the area through the development of new apartments such as the Paragon and the Eden developments.

Large areas of this district experience international demand which subsequently reflects in land and property values and has triggered further developments in the Waterfront and De Waterkant areas. An increase in the transitory tourist population has led to an increase in rent and a scarcity of affordable rental properties for the local market.

There has been little to no investment in affordable housing in most of the District and increase in land values has triggered concerns about the area excluding the local and historic populations. Protest against this trend is represented through retaliation from affordable housing advocates who have occupied strategic pockets of state owned land in the District.

Second Dwellings and sub-divisions

The upward residential market pressure has led to an increase in sub-divisions, building plans submitted for second dwellings and additional building units in the areas of Kensington, Maitland and Pinelands.

5.2 Tourism, Recreation and Conventions

Tourism is a significant built environment structuring element in the District. Tourism can act as a disruptor to conventional property market cycles and arguably has served to catalyse and maintain a boom period in real estate and international interest in the District, with related high selling prices.

The Convention Centre extension is a key change in the Foreshore District and together with this; public environment links between the CBD and the V & A Waterfront have been improved, creating a legible pedestrian environment in the precinct and developing the Roggebaai Canal area further as a destination.

The Cruise liner terminal at the port is another significant addition to the areas tourist infrastructure.

There has been an increase in hotel rooms in the CBD area from roughly 4600 in 2012 to just over 7300 in 2018, with 5 new hotels opening in the Central City in the past year. Applications for hotel rooms in the foreshore area have increased, citing the Convention Centre extension as a motivating factor in their developments (CCID 2012 &2018).

Hotels also contribute to and are linked to the arts and design sector, exposing South African art, architecture and interior and landscape design to a broad market, the Zeitz museum and hotel complex at the Silo Precinct is at the heart of this trend.

New hotel developments have moved towards not just providing rooms but also managed full suite units that can be either rented out long term or day to day as part of the hotel, the Onyx is one of these developments.

Boutique hotel developments are driving the regeneration of some heritage buildings; this is represented in rentals of redeveloped Waterkant cottages and the Grand Daddy hotel and Gorgeous George developments. Many of these hotel developments are 4 or 5 star indicating a high cost of architectural finishing's and furnishings influencing on the character of the public environment.

The visitor and recreation economy supports a food and beverage industry and café culture has proliferated in the CBD, with a change in the way streets are used, as café's galleries, theatres and restaurants spill out onto the streets in the day and into the evening. The number of restaurants in the Central City has grown, estimated at 153, up from 114 in 2017.

5.3 Industrial

Industrial land use is concentrated in Epping, Paarden Eiland, Maitland and Salt River and extends along Voortrekker Road towards Maitland which is industrial south of the Railway line.

Historic industrial areas closer to the CBD, including Salt River, Maitland and Paarden Eiland are experiencing continued pressure for land use change.

Paarden Eiland is particularly strategic as an industrial area due to its location near the port, and is experiencing recent pressure for commercial and residential development within the industrial fabric.

5.4 Retail and Office

The CBD and V&A Waterfront are the main focal points of commercial activity in the district. Office developments in the CBD have had an impact on the urban fabric and the number of people employed in the District.

The Central City has added 277 103m2 of office space since 2012, bringing the total office space to 1062023m2, at 2018 vacancies of 11%, these are some of the lowest vacancies in the Country (CCID 2018). New developments have focused on demand for "A" grade or highest quality office space, green building office space is experiencing the highest demand, 5 green buildings have been developed in the Waterfront area.

In the CBD the CCID (2018) indicates 93% occupancy of the 266478m2 retail space. Traditional retail as well as retail targeted at the luxury and international markets has grown, with a proliferation of art galleries and restaurants.

The demand for commercial property is driving a change in older industrial areas, particularly along Albert Rd in Woodstock; this change has centred on the creative industries as well as food and beverages.

A variety of linear retail activity is located along Somerset Road, Main road Sea Point and dotted along Victoria road, Albert road and Voortrekker Road.

Many retail developments have focused on the recreation and tourist market, examples include the Watershed at the V& A, Mojo market in Sea Point and the businesses trading on the Sea Point promenade.

Informal retail areas are concentrated around the Cape Town train station deck, the Grand Parade and Adderley Street around 597 permits for informal traders are currently active in the district with informal trade taking place in association with other retail areas of the District.

5.5 Mixed Use

The District has a diverse land use mix horizontally, with a number of developers interpreting the need for land use diversity vertically. Due to the range of activities in the District it is viable for developers to combine retail, office and residential into one development.

Diversity of land uses often contributes to urban vibrancy and allowing people to live close to work, often creating high value residential areas as a result, however areas like Maitland offer proximity to economic opportunity and still have some affordable housing opportunities. While generally mixed use areas can balance the needs of residential and

commercial areas, there are some urban management challenges with noise that must be considered. There are also risks with mixing heavy industrial uses and residential uses that must be considered in applications in for residential buildings in industrial areas.

The 36 ha Athlone Power Station site has been envisaged as a site for redevelopment. It is the intent of the City to redevelop the existing Athlone Power Station site to ensure its utilization is aligned to strategic priorities including load-shedding mitigation, energy security for economic growth, climate change mitigation, and the sustainable delivery of essential services. As such, there is an opportunity to consider utilizing the site for renewable, low-carbon or sustainable energy technologies and to potentially leverage public sector investment to catalyze investment by the private sector in the development of green energy hub.

The Two Rivers Urban Park is an opportunity for a mixed use precinct, while the majority of the land is publically owned the River Club has submitted development applications to the City based on substantial demand for development on the site.

5.6 Public Spaces

The District contains several public spaces of metropolitan significance, including Sea Point Promenade and the Grand Parade. In addition, high quality linking streetscapes contribute to economic development, improve the pedestrian experience, and create opportunities for public interactions. While the CBD and Green Point area have examples of these linking streetscapes, such as St Georges Mall and Somerset road, other parts of the District, for example Kensington and Maitland, remain car dominated.

The central CBD's urban fabric is influenced by its underlying 60m grid system. This results in a walkable and human scaled environment. The Foreshore is characterised by larger modernist style super-blocks, standalone towers, and is car dominated. These elements limit finer grained development and appropriately human scaled public spaces and streets. Pipeline developments within the Foreshore, as well as the East City / District 6, should continue to enhance 'north-south' as well as 'east-west' pedestrian linkages, with associated human scaled public open spaces.

Precinct implementation and management should be considered in the creation of public open space, especially to activate public open space rather than the privatization thereof. Community group initiatives that promote public open space activation should be supported. Residual space should be reconceptualised as a positive public open space opportunity, that supports local communities and business opportunities (e.g. Langa, King Langalibalele Drive/Bhunga).

Public Open space should facilitate multiple programmes and functions including socio-cultural (e.g. Grand Parade), as well as ecological and hydrological requirements, as well as other infrastructural constraints. (e.g. Mill Street Bridge Skatepark and bus station have transformed a formerly neglected underutilized road space). Pipelined projects such as the daylighting of rivers within TRUP should embody these imperatives.

Historic industrial areas closer to the CBD, including Salt River, Maitland and Paarden Eiland are experiencing continued pressure for land use, densification, and the need for inclusionary and affordable housing, hence the access to quality green and public open space should be considered alongside these imperatives.

5.7 Land Use Application Trends

The District is attracting catalytic developments set to change the Cape Town skyline-for example Harbour Arch plans to add up to 198000 square meters of bulk in the Foreshore area of the next 10 years.

There has been massive residential development pressure on the Atlantic Seaboard, from Camps Bay to Green Point. This has resulted in numerous land use applications for new residential developments that don't conform to the zoning development parameters (including floor space, heights, coverage and building lines). Similar development pressures have occurred from Woodstock to Observatory, where student housing (flats) mostly proposed in Observatory.

The development pressures on industrial land for its conversion to residential and business development are increasing, the loss of industrial land cannot be replaced within this district.

Within the CBD there have been numerous applications for tall buildings (over 60m) with mostly residential components above ground floor), with more proposed.

Developers are providing parking in developments despite TOD given the housing target market for such developments, this then has impacts on the development form.

Increasing subdivisions and second dwellings are proposed in almost all of the district, particularly in Camps Bay and the Atlantic Seaboard suburbs, some of these.

The majority of development pressure in this district is experienced in the CBD and central city area (roughly stretching from Green Point in the west to Woodstock and Salt River in the east). There is a trend in development applications for buildings that require additional bulk than the zoning permits.

In terms of the local economy, the district and in particular the central city which displays four key focus areas - finance and business services, the visitor economy, creative and cultural industries and iconic/ legislative institutions. These sectors, together with wholesale and retail trade, should be retained and attracted by developing and protecting the necessary spatial conditions. The interrelationships between these are influenced by planning decisions related to the character of the built environment, land use mix, public environment and facilities as well as public transport, parking and access.

Major investment in high-end residential units and business/ commercial buildings has taken place and is expected to continue in areas like the V&A Waterfront, the Roggebaai Canal area and foreshore, Observatory and the eastern city precincts towards Woodstock.

As a focal point for tourism, the District will need to maintain functioning tourist infrastructure and the amenity of the public environment, to maintain repeat visitors, increasing the diversity of tourist amenities will be important.

Redevelopment of heritage building stock has been stimulated by the UDZ and by the interest from the Creative industries in the East City and along Albert Road and Victoria Road in Woodstock.

As a result of its location close to the coast and the central city, Paarden Eiland is beginning to experience redevelopment pressure. It is expected that there will be a shift from the current industrial land uses towards a greater provision of mixed use with commercial and residential opportunities. This requires a re-evaluation of its character and potential built form.

The Two Rivers Urban Park Area is currently being prospected for development of higher density in the River Club area in addition to plans to develop on the Alexander road area and restructuring the strategic public land in the precinct. A local spatial development plan has been produced to outline the location of different land uses and proposed bulk for the site.

Despite the District being served by public transport, demand for parking in new building developments remains high and there is pressure to add more parking both by tenants and banks as developers are required to meet expectations for parking provided in "A grade" office space.

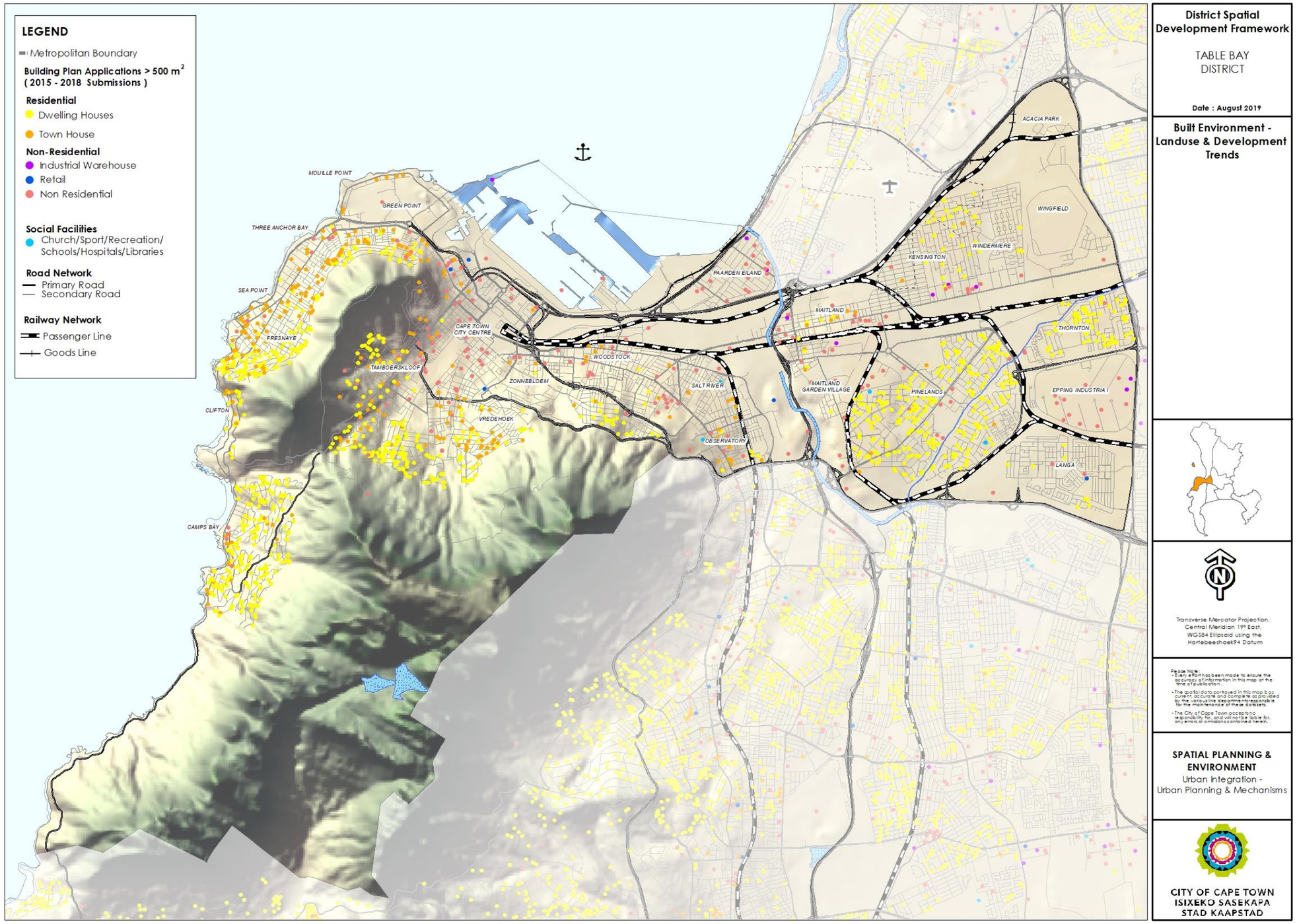


Figure 20: Building plan Applications > 500m2 (2015-2018)

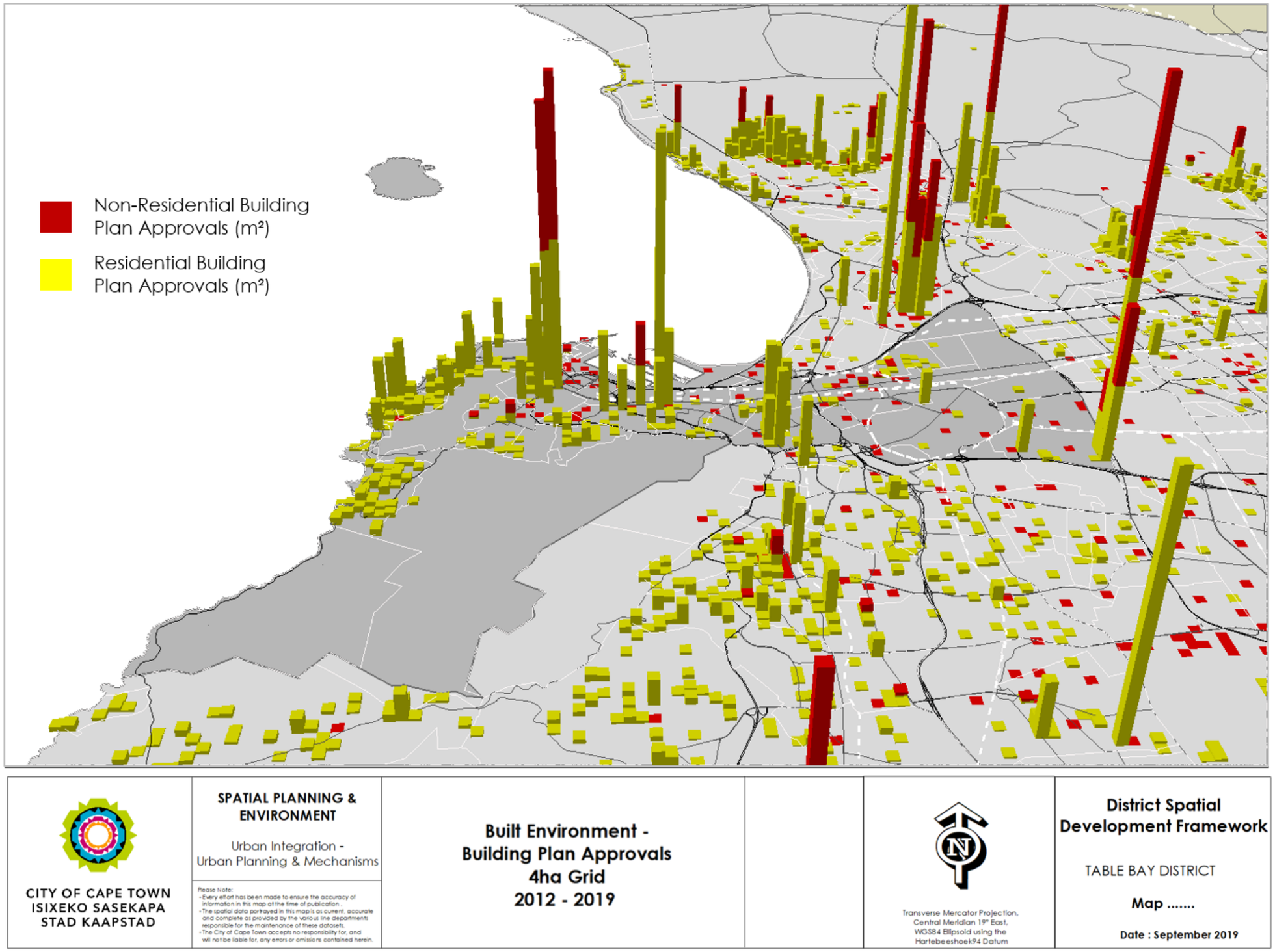


Figure 21: Building Plan Approvals - 4ha Grid

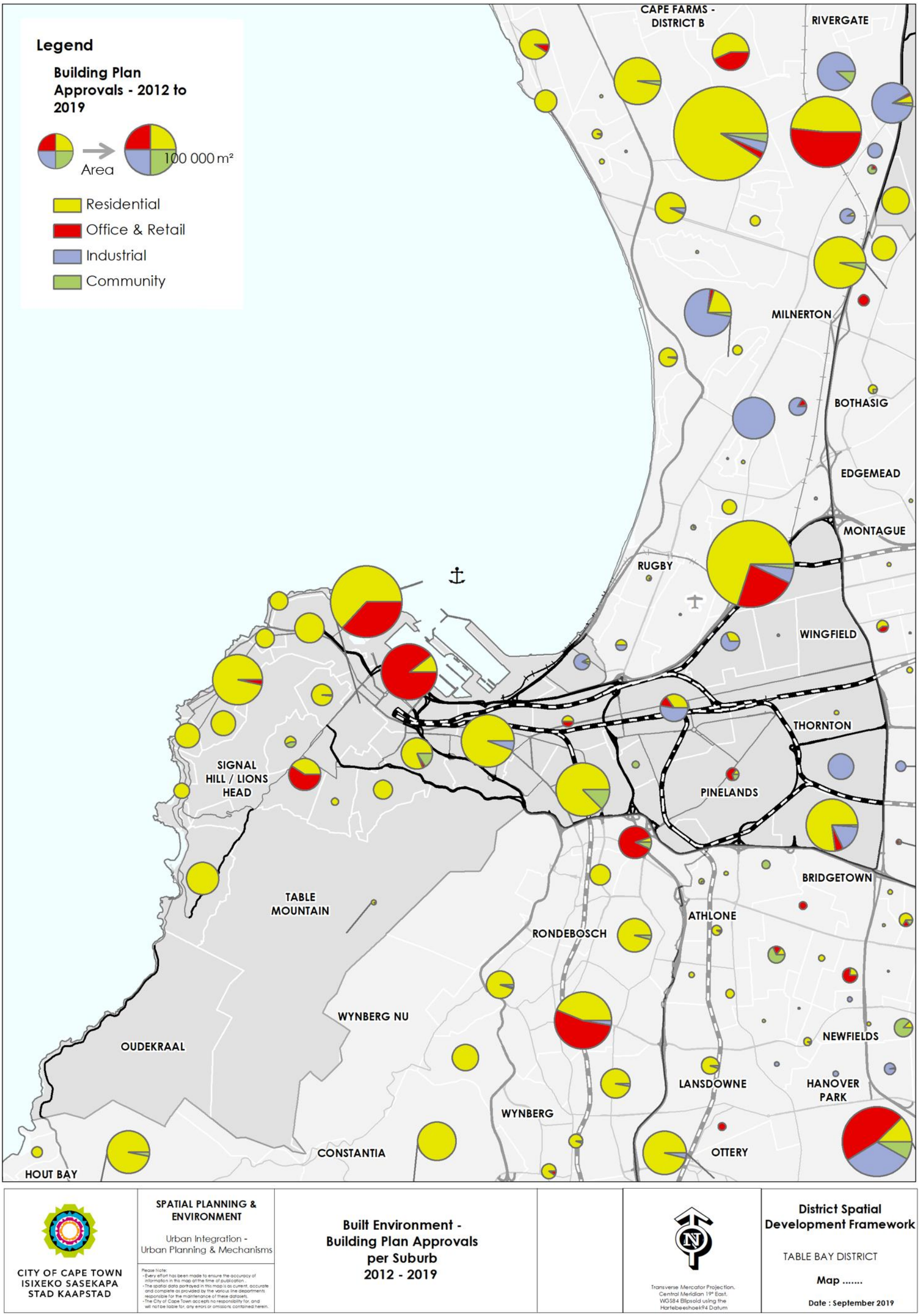


Figure 22: Building Plan Approvals per Suburb

5.8 Key Challenges and Opportunities

5.8.1 Opportunities

- The District is a focal priority for Transit Oriented Development, the substantial public investment in public transport can act as a stimulus to new developments.
- The success of the CBD as a private investment hub, creates the opportunity to overflow to nearby areas
- The urban management in the Central City has been a valuable tool in inspiring investor confidence, new developments can contribute further to managing the environment at street level.
- Investment in the public realm has been extensive when compared to other districts, with a number of historically significantly public spaces and pedestrian linkages having been upgraded. These not only contribute to spatial legibility but also play a tourism and amenity role by creating an image for the city and providing multi-functional open spaces. The potential to extend this is significant and should not be limited to the already well-establish urban environment of the CBD.
- Remaining pockets of vacant and publically owned land provide opportunities to provide public facilities or affordable housing.
- The area experiences enough demand for high end development to encourage and incentivise the development of Green Buildings and Carbon Neutral Development
- Developing the heritage and cultural amenity through redevelopment of heritage buildings and/or the design of outstanding buildings and urban precincts.
- Redevelopment and retrofitting of existing building stock.

5.8.2 Challenges

- Aligning the provision of development rights and the goal of transit oriented development will be a challenge when developer and community expectations are in conflict with the need to increase density.
- Transit Oriented development and the diverse use of available bulk is challenged by the high demand for parking in the District.
- Balancing the need for heritage conservation with the need to increase densities in transit accessible areas and meet the demands for development in the District;
- Aging infrastructure poses a risk and may constrain development in some areas (more in infrastructure section)
- Balancing the need to create more development opportunities in a well-resourced District with the need to conserve some areas important for biodiversity conservation.
- Maintaining accessibility to the areas opportunities- amenities, jobs and resources for people with lower to middle incomes.
- Ensuring the resilience of buildings and infrastructure in the face of climate related hazards.
- Increasing construction costs puts the costs of properties further out of reach of the majority of Cape Town.

- Balancing the need for industrial areas in key locations near the port against the pressure to develop different uses will have to be carefully planned and managed.
- A slowing property market on the back of recessive economic conditions will likely lessen the appetite for development and reduce the number of opportunities for private sector partnerships.
- Risk that the area remains exclusive and resident population declines as a result of properties being empty outside of tourist seasons.
- Opportunities to develop vacant land for affordable housing and public facilities are limited
- As densities increase, conflict with neighbouring properties emerges where building lines overlook existing properties and/or block views
- Building to the maximum permitted bulk at times brings properties in contravention with National Building Regulations, for example, developments cross boundary lines which are required in terms of fire regulations.
- Challenges with implementing mitigation conditions when dealing with applications that affect the environment and heritage
- Heritage Western Cape has to date not activated the Heritage Register. This is preventing the application for exemptions in terms of S34 of the NHRA which has an effect of slowing down and increasing the cost of building.

5.9 Vacant Land

Figure 23 depicts all the vacant land opportunities in Table Bay. The vacant land has been grouped into four categories using the following criteria shown in Table 5.1:

Table 5.1: Vacant and underutilised land classification

Code	Category	Description
1	**Underutilised vacant land:**	Vacant Land **without any** of the following attributes: • reservations, • public projects (human settlements; social facilities etc.) • building plan approvals • rezoning land use approvals.
2	**Potentially-utilised vacant land:**	Vacant 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)	Vacant Land **with any** of the following attributes: • any public projects in planning or construction stage, • existing building plan approvals, • rezoning land use approvals
4	**Vacant Land Reserved and/or Zoned for Community or Recreational use:**	This will include vacant land currently zoned OS1, OS2, OS3, CO1, CO2. [Only applicable layers that did not fall within the utilised (3) of potentially-utilised (2) categories]
5	**Vacant Land Zoned for Transport Use:**	This will include vacant land currently zoned TR1, TR2 and Utility. [Only applicable layers that did not fall within the utilised (3) of potentially-utilised (2) categories]

It must also be noted that land located in the Critical Natural Assets and Discouraged Growth STAs should not be considered vacant or underutilized.

Most vacant land in the district is consists of small pockets within the urban fabric. Pursuit of a compact urban form makes these inner city opportunities particularly strategic due to

proximity to jobs and transit. Larger pockets of vacant land representing a substantial opportunity are around the Two Rivers Urban Park and Wingfield, both of these sites have environmental attributes that need to be managed and considered in future development applications. Large sections of the District six area remain vacant although planning efforts and investment commitments from the public sector place this area in the "potentially utilized" category.

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-scaled properties which can potentially accommodate additional mixed use development (non-residential and residential land uses), other than only community or recreation.

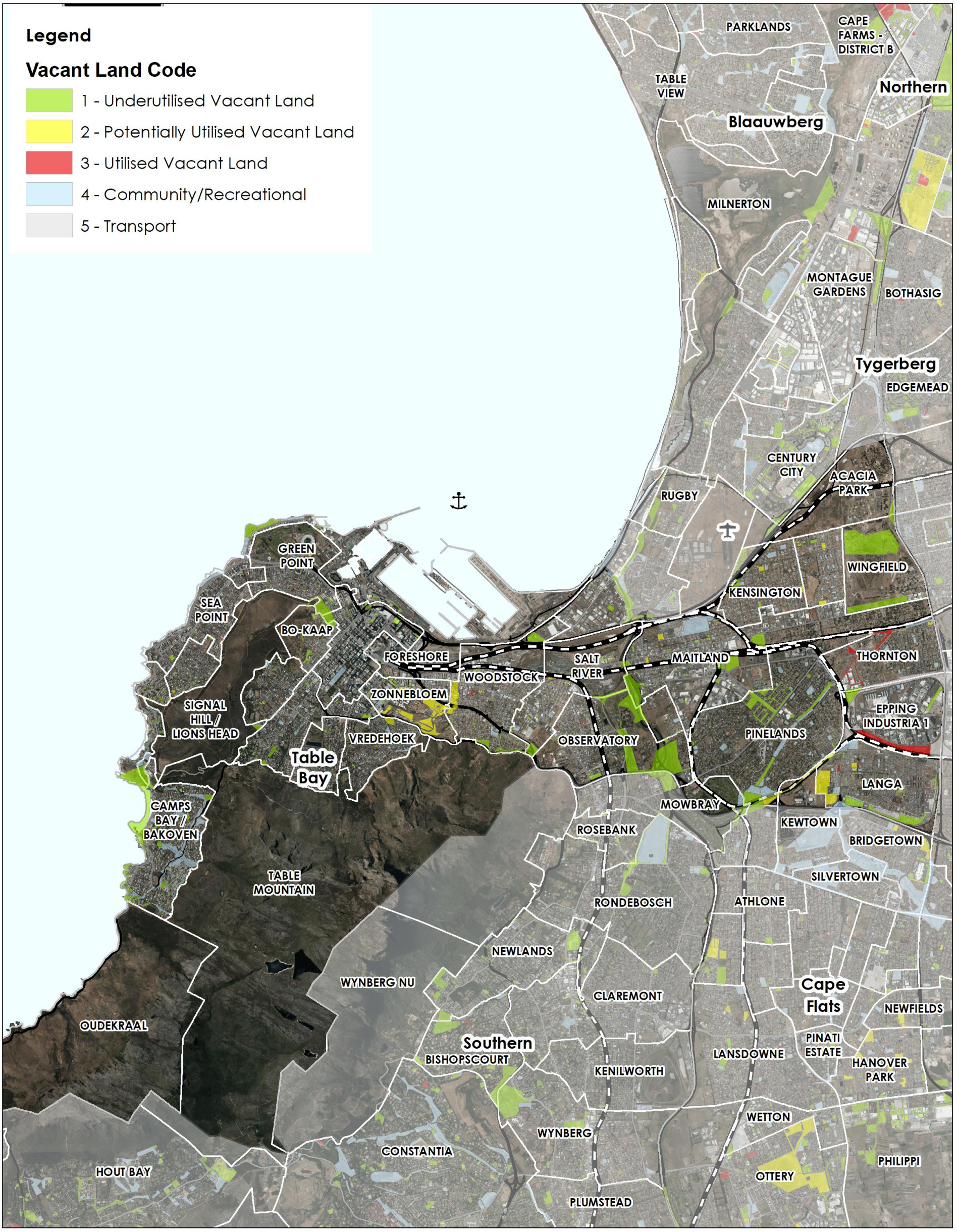


Figure 23: Partially Developed and Underutilised Land

6 TRANSPORT AND ACCESSIBILTY

6.1 Introduction

This section provides a status quo analysis of the mobility and accessibility networks within the Table Bay District.

There is a strong focus on transport as an informant of the CTMSDF, using the TOD Strategic Framework (2016), in line with international planning trends which recognizes the need for spatial planning tools to support public transport and non-motorised transport options, as well as reducing the need to travel.

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

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

At a corridor scale, TOD requires the generation of bi-directional flow (to replace the current "tidal" commuter patterns), reduced travel distances to public transport, and create 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.

6.3 District Specific Transport Strategies

6.3.1 *Central City Transport Plan*

A Transport Plan for the Central City has been developed in response to the challenges of growing congestion and continued investment in development in the CBD and surrounding areas as well as pressure to review the function of various streets in the area – i.e. more towards public transport and NMT priority.

The study area is shown in the figure below which highlights the Port and the V&A Waterfront as zones of high influence. The aim of the study is to create a framework to identify the key changes needed to ensure that the transport system is able to accommodate new and repurposed development and the movement of people in a sustainable, liveable and human centred Central City.

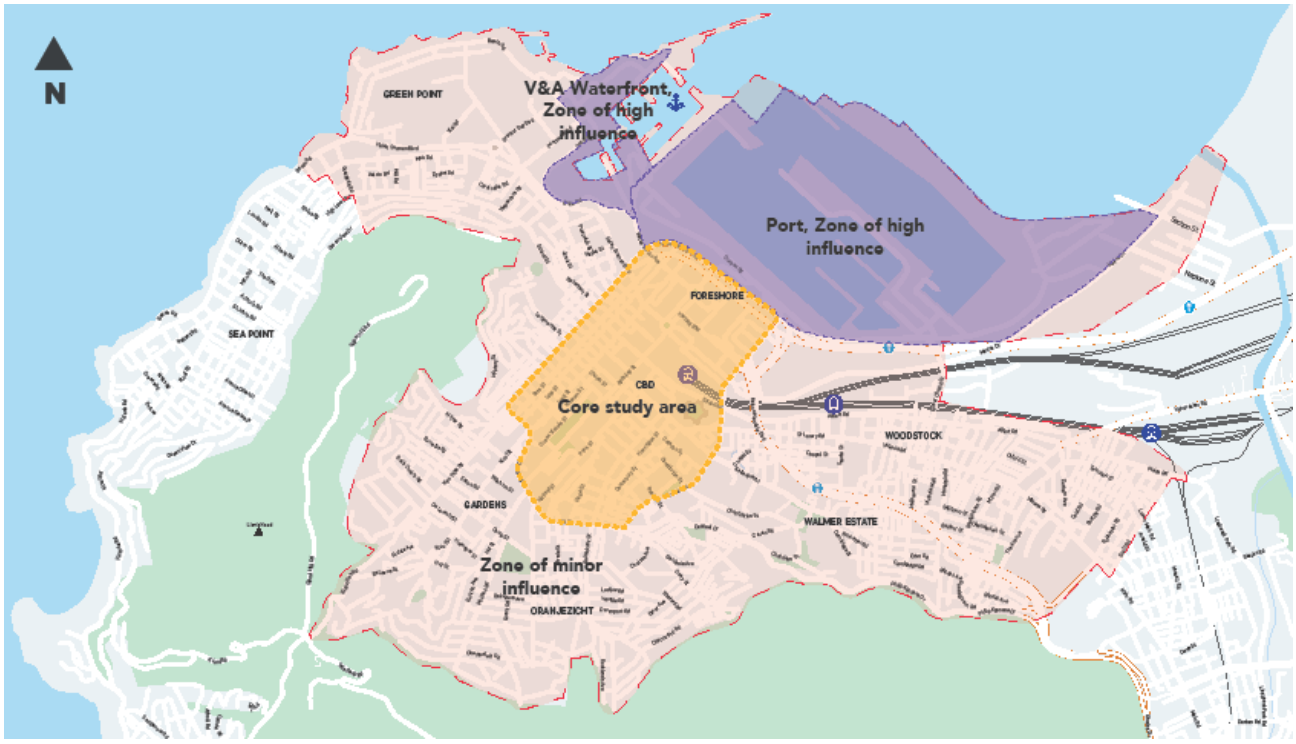


Figure 24: Study Area for the Central City Transport Plan

6.4 State of Public Transport

6.4.1 *Existing Infrastructure and Services*

The district is well served by passenger rail and stations.

6.4.2 *High Order Public Transport*

Rail

This district hosts the major rail terminus not only for the city-wide service, but for national services as well: the Cape Town station[4]. Due to the topography and layout of the city, all lines terminate at the station, which is then the main rail junction.

Mutual and Salt River stations are also major rail junctions, with the MyCiTi trunk services from the north connecting to Salt River station too.

In terms of the integrated transport plan, rail forms the major trunk service for the city. While the service has deteriorated since 2012, as a result of institutional failure, lack of maintenance and investment, and ongoing vandalism and crime, the system will endure, and it is expected that service improvements will eventually attract back choice users, even if this is only in the medium term. Hence the rail network continues to be an important structuring element in this plan.

[4] This includes the world-class Blue Train service to Pretoria, as well as Rovos Rail and Shosholoza Meyl

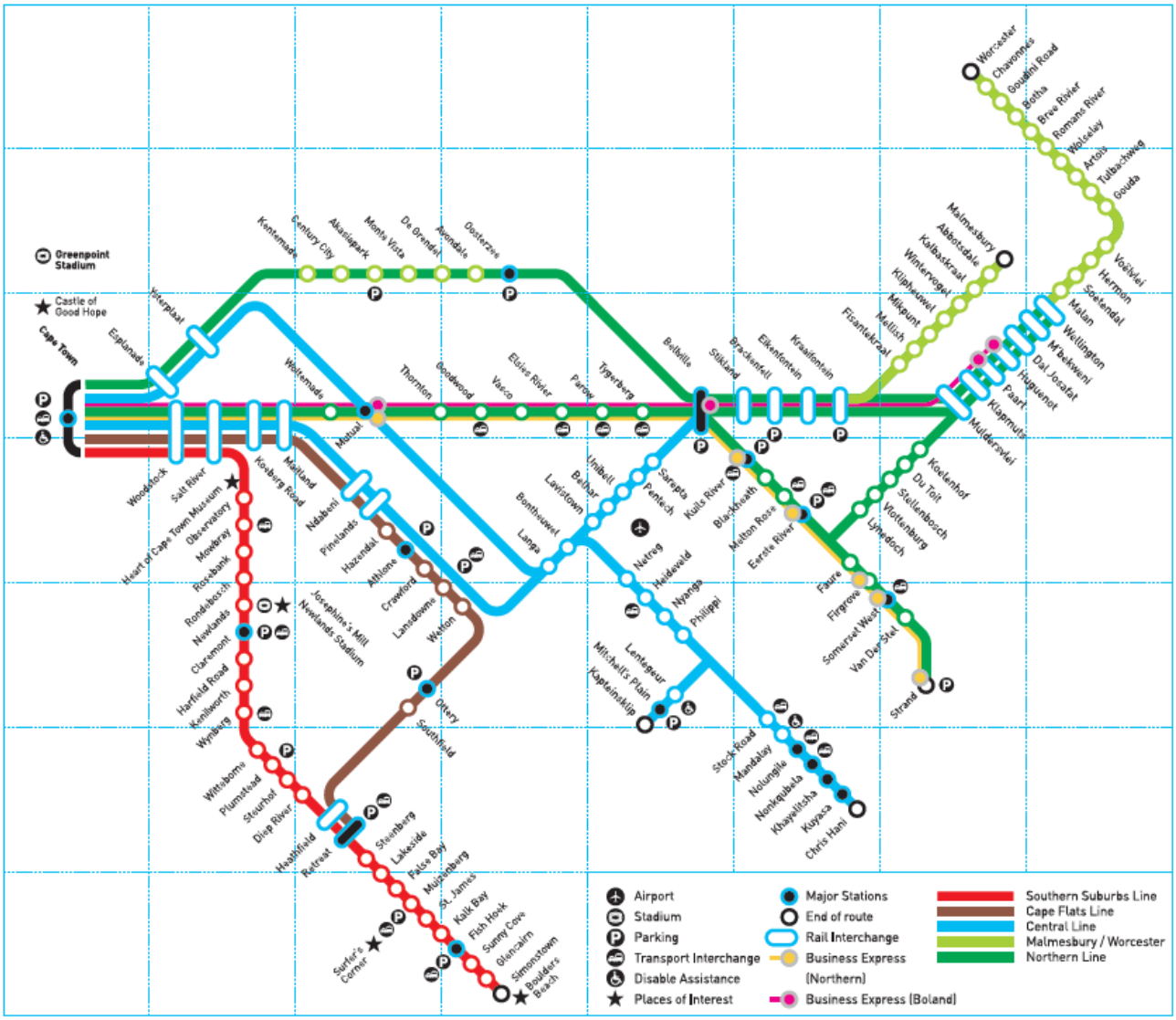


Figure 25: Passenger Rail Network for Cape Town

Bus Rapid Transit (BRT)

Significant investment in the City's BRT programme was implemented for the district, making it the district best served by the MyCiTi network (see Figure 26 below). It provides all the features of a BRT service: enclosed trunk stations with universal access operating predominantly on dedicated lanes; cashless ticketing; a scheduled service with a high level of off-peak service; clear branding, excellent signage and real-time information; and good security. The service is well-used not only by residents, but by tourists too.

Trunk routes link the district to the west coast: route number T01 to Du Noon, and T02 to Atlantis; and a direct service (A01) links the CBD to the Cape Town International Airport. Direct (express) routes link the CBD directly to Khayelitsha (D01; D02) and Mitchells Plain (D03; D04).

Phase 1A includes 17 trunk stations. In this district stations include: Civic Centre, Thibault Square, Stadium, Granger Bay, Section St, Neptune St, Paarden Eiland and Woodstock. The district also houses the most intense network of feeder services: within the CBD, and along the Atlantic Seaboard.

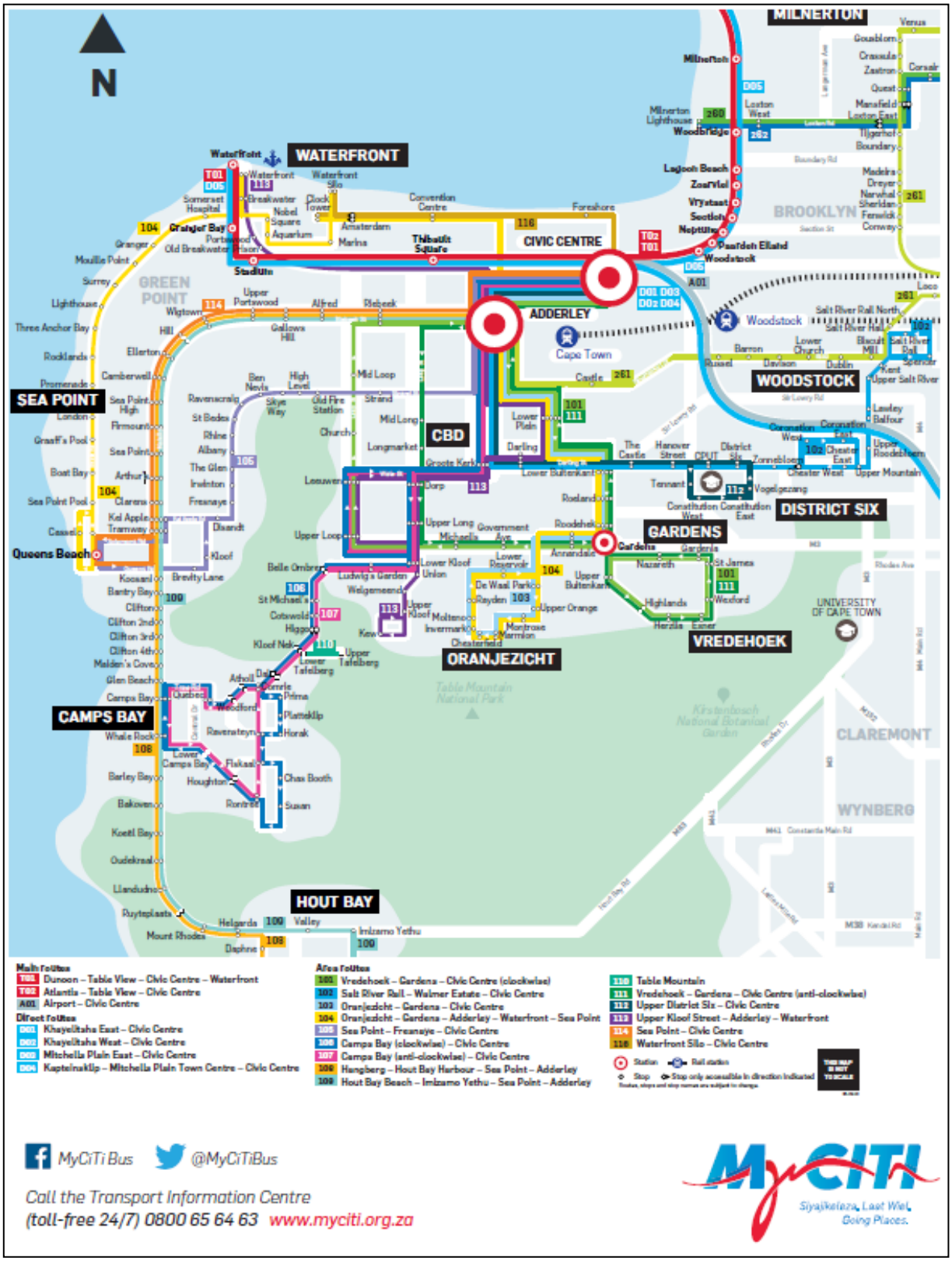


Figure 26: Current MyCiTi Services

(source: https://myciti.org.za/docs/741/Central%20City%20routes_27%20October%202018.pdf)

In fact, some feeders are so well used that they perform almost at the level of trunk services. Figure 27 indicates the feeder stops and their catchment from most intense patronage (in blue), to well-patronised (in red) to least patronised (in white).

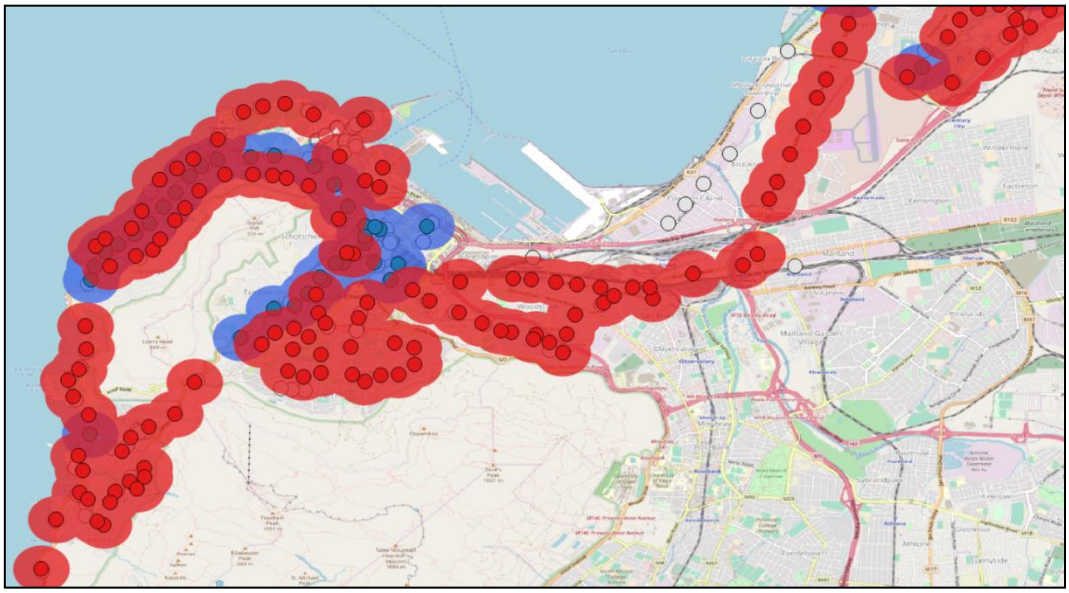


Figure 27: Current MyCiTi Services and Patronage

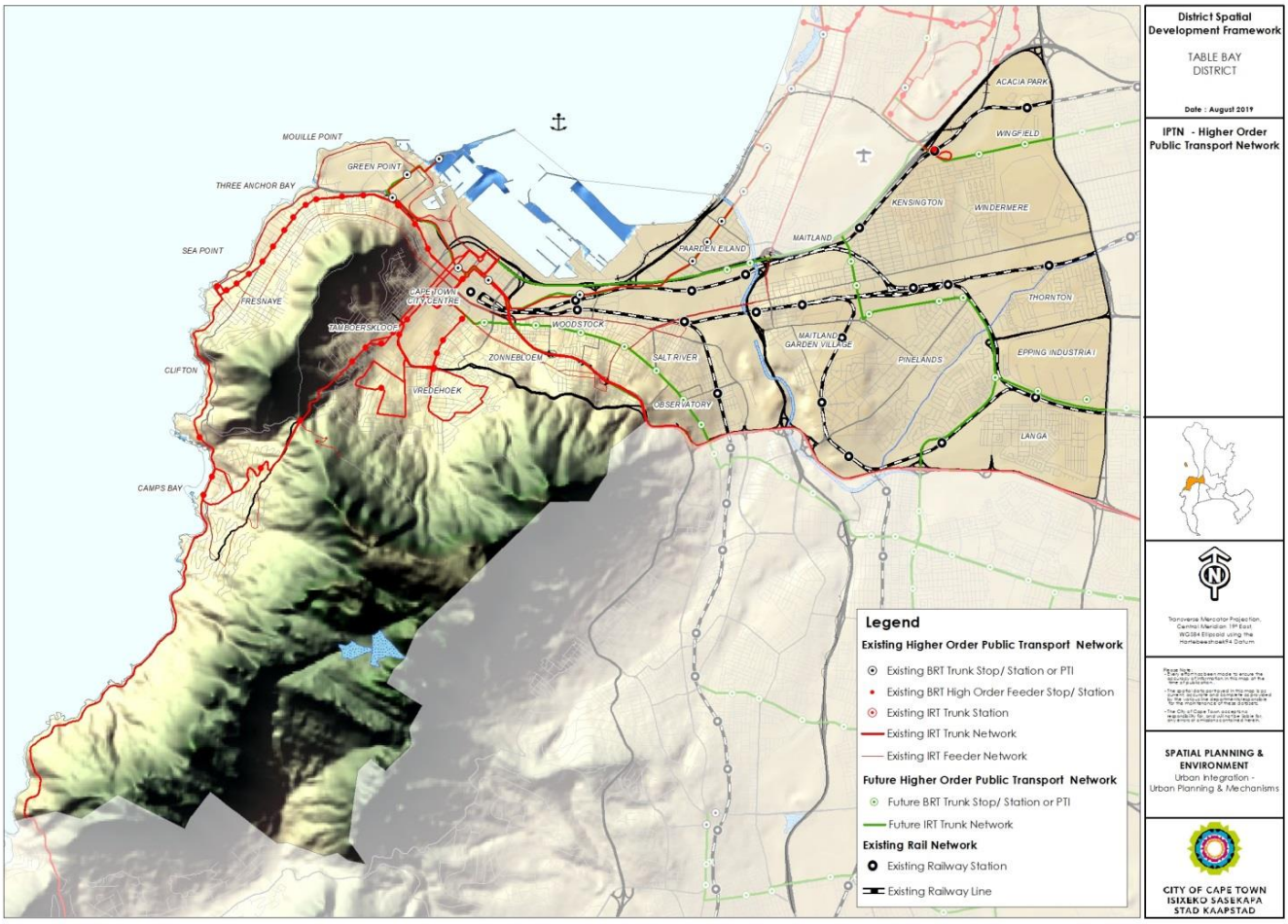


Figure 28: Map of IPTN - High Order Public Transport Network

6.4.3 *Low Order Services (Mini-bus taxis, Buses and NMT)*

Minibus Taxis and GABS, and associated Public Transport Interchanges (PTIs)

These still operate along the main routes in the area, notably Victoria Road, Sea Point Main Road and Voortrekker Rd. Victoria Road services serve multiple destinations in all the other districts via the N2, and Main Rd.

This district also houses the main minibus taxi terminus and the GABS bus terminus, linked to the main rail station. These represent the zone of highest boarding and alighting activity in the city.

The following public transport facilities serve the district:

Name	Formal/ Informal	Any plan for upgrading
Camps Bay Taxi Rank	Formal	
Cape Town (Adderley Street) Minibus-taxi Rank	Informal	
Cape Town (Corporation Street) Minibus-taxi Rank	Informal	
Cape Town (Heerengracht Blvd) Minibus-taxi Rank	Formal	
Cape Town Plein Street	Formal	
Cape Town Station Transport Interchange	Formal	
Factreton Minibus-taxi Terminus	Formal	
Groote Schuur Minibus-taxi Rank	Formal	
Joe Slovo Minibus-Taxi Rank	Informal	
Kensington Public Transport Interchange	Formal	
Koeberg Station Transport Interchange	Formal	
Langa Public Transport Interchange	Formal	
Maitland Station Transport Interchange	Formal	
Mutual Station Transport Interchange Southern Side	Informal	
Ysterplaat Station Transport Interchange	Informal	
Parow Station Transport Interchange Southern Side	Formal	
Tyger Valley Centre Minibus-taxi Terminus	Formal	

Non-motorised Transport (NMT)

The roll-out of the MyCiTi infrastructure has been accompanied by quality NMT infrastructure roll-out, including cycle and pedestrian routes. The CBD intersections have been retrofitted with bump-out side-walks, universal access, and extended pedestrian phasing. The Fan Walk linking the CT station to the CT stadium has contributed to urban revitalisation there.

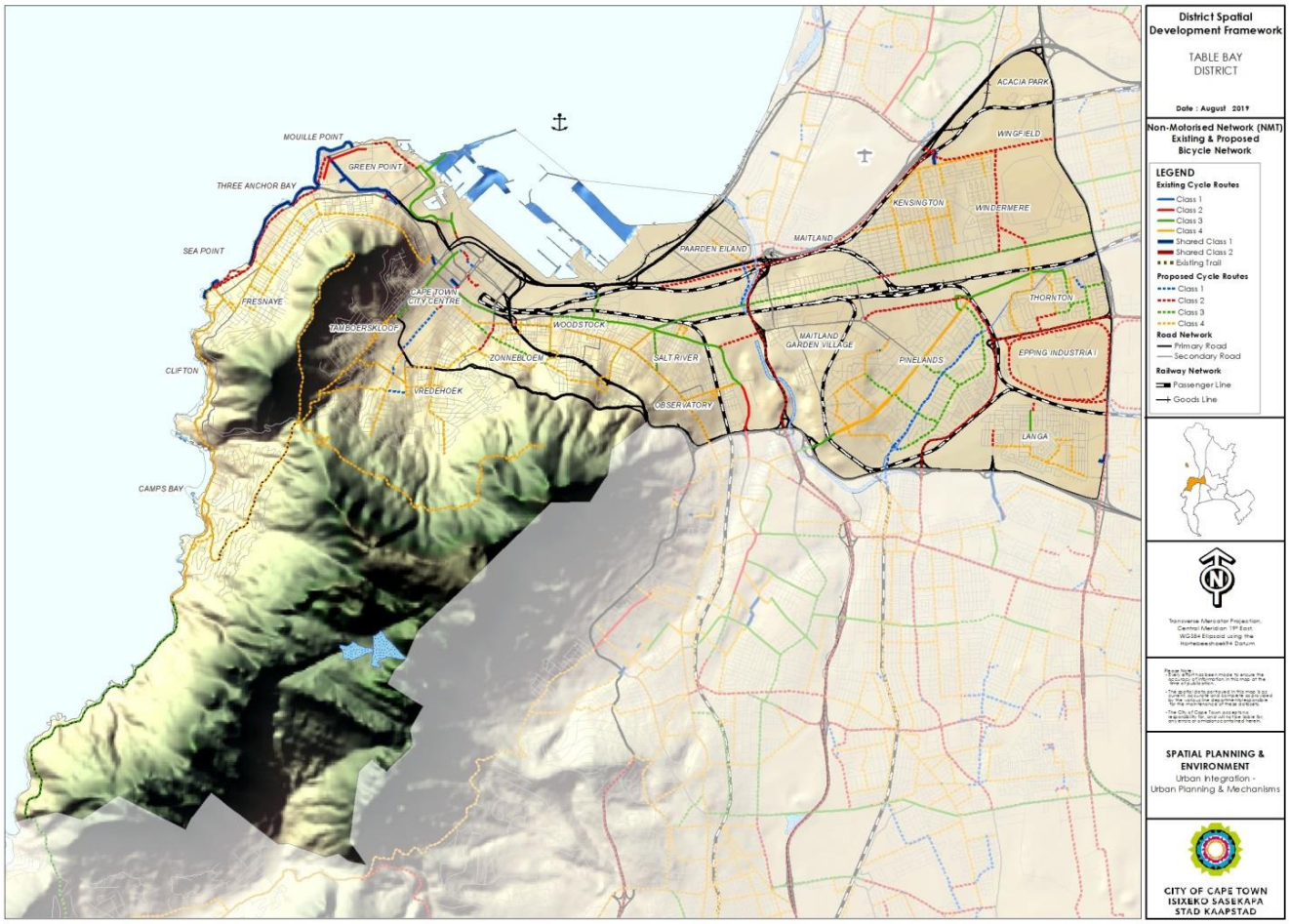


Figure 29: Map 1 Existing and Planned NMT Routes

An exception to the quality pedestrianisation is the poor quality of connectivity between the Civic Centre MyCiti station, and the CT Station and long distance bus termini.

Long Distance Bus and MBT Services

These are privately operated, with a terminal adjacent to the CT Station and on Adderley Street, but they are poorly integrated with the station or the MyCiTi stations. They exit the CBD via the N1 and N2 freeways.

Limited long distance MBT services operate from the station deck.

6.4.4 Planned Transport Infrastructure and Services

6.4.4.1 BRT feeders and trunks

Phase 2 makes provision for the D12 route: from Mitchells Plain to the CBD via Klipfontein Rd.

Phase 3 makes provision for T15 which links Strandfontein to the CBD via Strandfontein Rd and Jan Smuts Drive.

6.4.4.2 Rail

No new construction is planned for this district, except for the possible upgrade of the Atlantis line to a passenger line, which may access the CBD.

6.4.4.3 PTIs

No new PTIs are planned for the district.

6.4.5 Level of Public Transport Accessibility

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

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

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

- The existing TAPS along the railway lines have particularly high accessibility.
- The Cape Town CBD and surrounding area has the largest cluster of high accessibility scores in the district.
- Of the urban areas large parts of some neighbourhoods including Pinelands, Langa and Kensington score poorly.

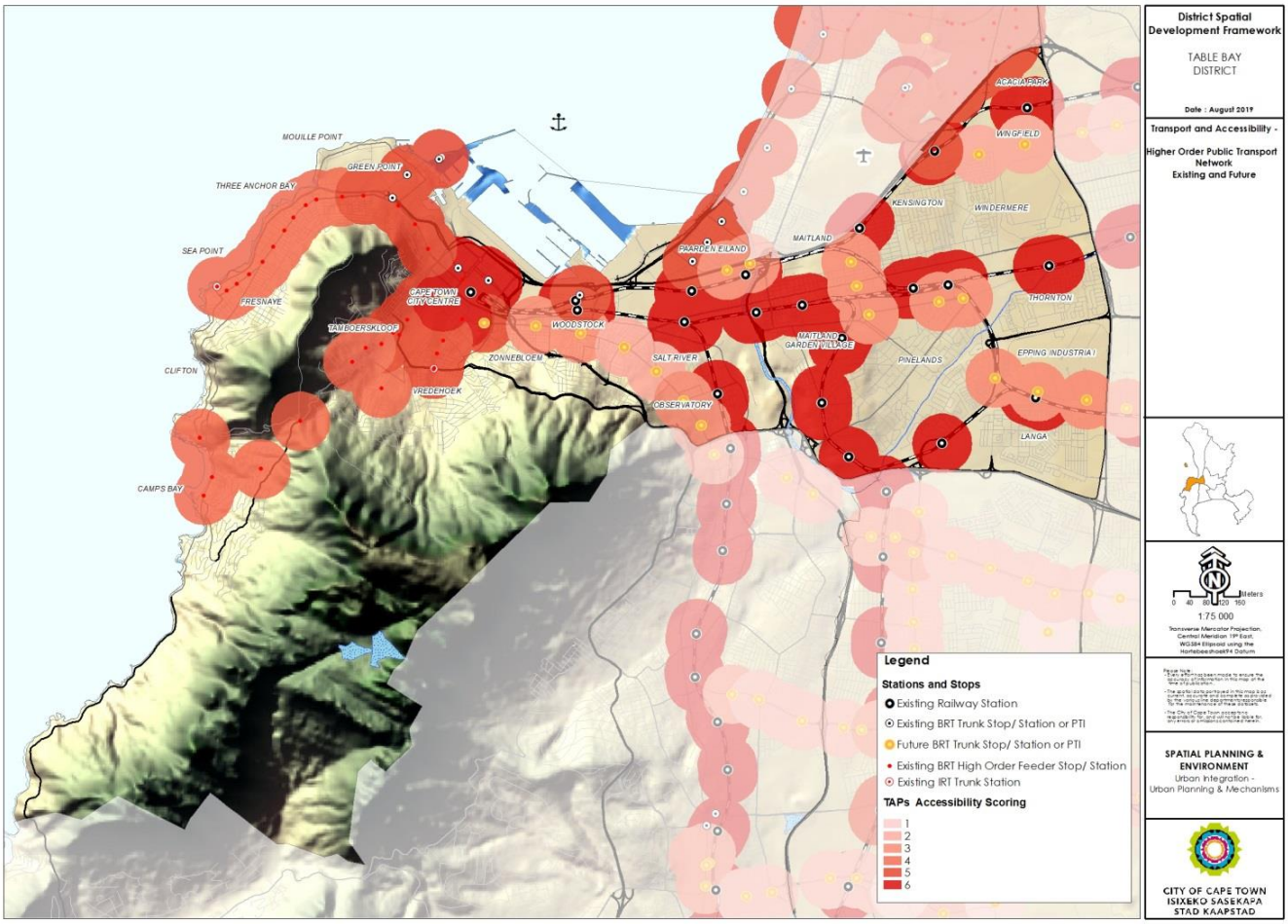


Figure 30: TAPs Accessibility Scoring

6.5 State of Road Infrastructure

6.5.1 Overview of the district road network

The road network in the study area is characterised by a strong provision of mobility oriented routes converging on the CBD. The most significant routes in terms of the road hierarchy are the two urban freeways of the N1 and the N2, the main arteries into the area. The N7/ Vanguard Drive (the eastern boundary of the district) and the M5/ Black River Parkway form important north-south linkages that connect across into other districts.

The connectivity of the district, particularly the CBD, with the wider metro area remains problematic as a result of its location and geographic constraints. This would have to be addressed by extensive improvements in public transport infrastructure together with a general shift towards the provision of mixed land use that is less car-dependent.

Two major road infrastructure upgrades, the Koeberg interchange upgrade and the Hospital Bend pre-selection scheme, were completed and help to improve the operational efficiency (of largely private vehicles) into the CBD.

The lower order roads in the older areas create permeability, while Apartheid developments such as Pinelands and Langa have a cellular structure, separated by freeways and railway lines. Topography restricts connectivity in the western part of the district.

6.5.1.1 Roads Upgraded / constructed over the last 5 years

No significant upgrades were done in the last 5 years.

6.5.1.2 Historic Road Schemes to be reviewed

There are a number of historic road schemes which are up for review (see those in light blue on Figure 31 below). Many date back to the era of freeway construction.

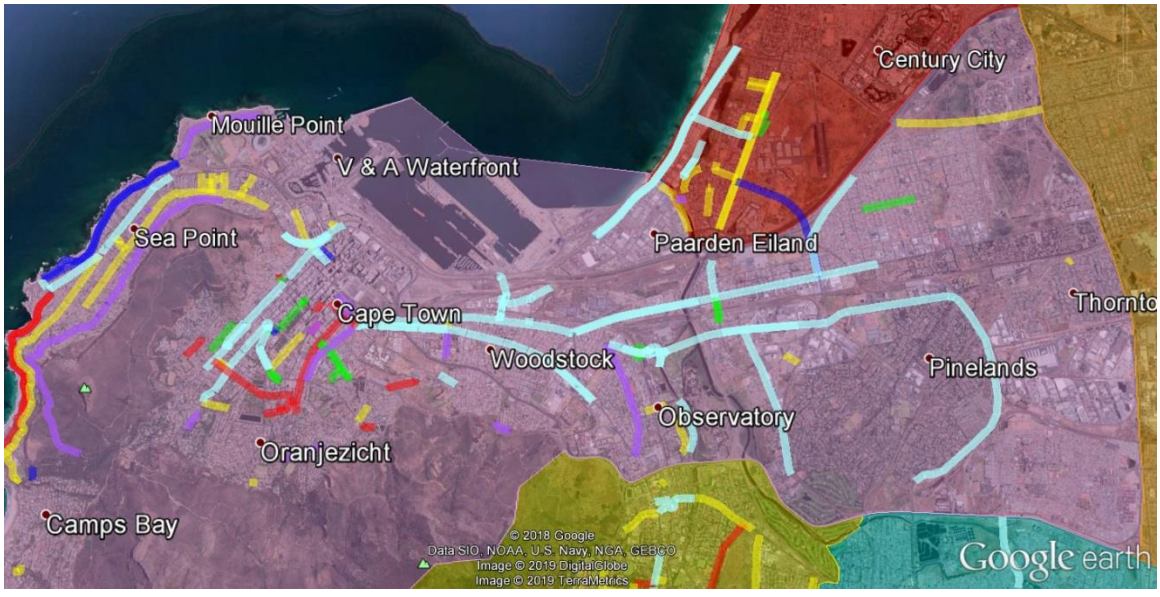


Figure 31: Historic Road Schemes to be reviewed

6.5.1.3 Parking

The issue of what is an appropriate approach to parking is pertinent to this district, as an area dominated by trip attractors. Ample, affordable parking encourages the use of private vehicles over public or shared transport, which results in congestion, and the dedication of valuable CBD land or air rights as "dead space" (parking facilities). On the other hand, there is a fear that an approach which discourages parking could chase investors from the CBD, to more "parking friendly" development areas, for example on the periphery of the city. This is most pertinent during a slump or recession in the economy.

6.5.2 Planned Roads and Streets

New road connections planned in terms of the metropolitan transport plan are shown in Figure 7. These include:

- Berkley Road extension: a proposed extension that connects Berkley Road with Malta Road/ Albert Road (Lower Main Rd) as part of an inter-district development route.
- Frans Conradie extension: The proposal is for an extension of Frans Conradie Road (connecting Goodwood and Wingfield and linking up with an extension of Sable Road) that would ultimately link into Koeberg Road in the Rugby area. Current planning calls for a grade-separated interchange at the N7/ Vanguard and Frans Conradie intersection.
- Aerodrome Road: This proposed road is planned from the Conradie Hospital site over Voortrekker Road and into Wingfield. It is envisaged that it will connect with Frans Conradie Drive. Some planning has been carried out but alignments are still to be confirmed. There are three proposed alignments which need to be explored further.
- Wingfield: the westward expansion of Milton Road might be required in future but further planning work is required in this regard. Similarly, the local level circulation network for the site is dependent on a number of development scenarios.
- Tennant/ De Villiers Road upgrade to replace the Canterbury road scheme.
- Foreshore Freeway

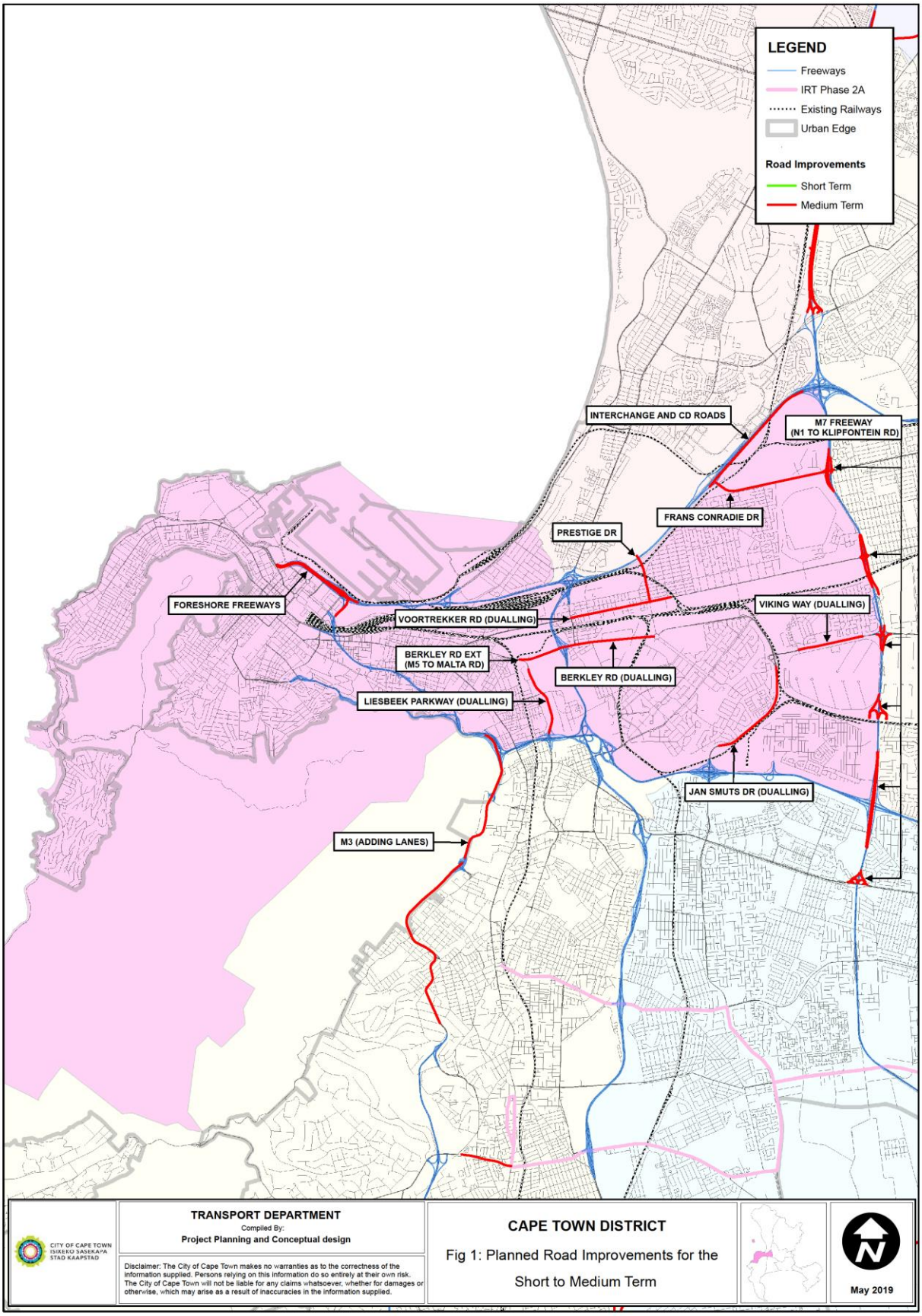


Figure 32: Planned Upgraded and New Public Right of Way Links

6.5.3 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.

Freight movement in the city as a whole can be seen on Map 5. The largest volumes are on the national roads, and related to the Port. 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. Epping Industria, the CTIA and Blackheath Industria generate the highest freight traffic volumes.

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 33: Map showing Freight Volumes

TRANSNET manages the goods line (Monte Vista line) which traverses the district and accesses the hinterland.

6.6 Travel Patterns

6.6.1 Current (EMME Demand – Base year 2015)

The following features for the district as whole can be observed in Figure 34 below:

- The district is dominated by trip attractors, which are focused on the CBD, with some concentrations in Epping, Maitland and, to a lesser extent, Salt River.
- Many residents from other districts must therefore access the district daily.
- Trip generators are concentrated in the Langa, and Kensington to a lesser extent.

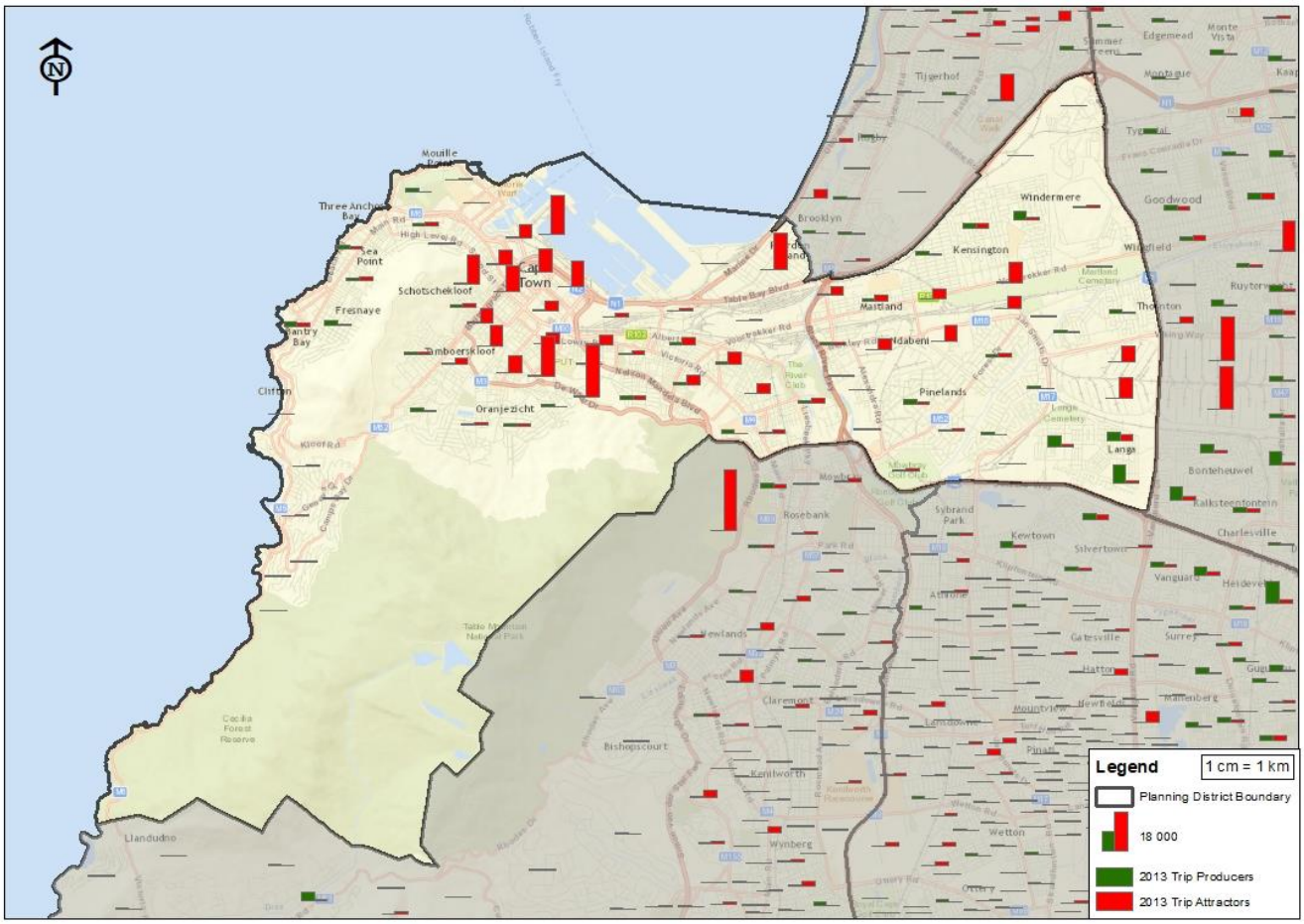


Figure 34: Trip Generators and Attractors in 2013

6.6.2 2013 Origin-Destination Movements

The metropolitan origin-destination survey; shown in Table 6.1, Figure 35 and Figure 36 show the following patterns:

- This district is the major destination for both private and public transport. There is a significant daily influx of commuters to this small district, with the largest movement coming from the Metro South East by public transport.
- There is minimal commuter movement out of the district, which is needed to support the transport system.

Table 6.1 Origin Destination Trends 2013

Origin	Destination	NMT	Car	Taxi	Bus	BRT	Train	Public Transport	Total
Table Bay	Blaauwberg	53	1511	412	258	261	334	1265	**2828**
Table Bay	Northern	0	866	136	57	0	311	503	**1368**
Table Bay	Tygerberg	264	2775	1280	651	28	2799	4758	**7797**
Table Bay	Helderberg	0	306	89	46	0	242	377	**683**
Table Bay	Khayelitsha / Mitchells Plain	0	292	109	54	55	326	544	**837**
Table Bay	Cape Flats	132	1084	498	268	1	1093	1860	**3076**
Table Bay	Southern	201	2584	858	446	15	1209	2528	**5313**
		650	**9419**	**3381**	**1779**	**361**	**6314**	**11834**	
Table Bay	Table Bay	1221	8071	2279	1023	2196	3690	9188	**18481**
Blaauwberg	Table Bay	586	6306	1679	1226	2395	389	5689	**12581**
Northern	Table Bay	0	3212	878	523	2	3391	4794	**8006**
Tygerberg	Table Bay	583	4102	5128	3089	51	6453	14721	**19406**
Helderberg	Table Bay	0	289	3302	1768	10	4233	9313	**9602**
Khayelitsha / Mitchells Plain	Table Bay	4	411	6355	7098	3357	5874	22685	**23099**
Cape Flats	Table Bay	334	2466	5383	4543	73	5587	15586	**18386**
Southern	Table Bay	329	5804	1478	1114	200	3423	6216	**12349**
		1837	**22590**	**24204**	**19361**	**6088**	**29350**	**79003**	

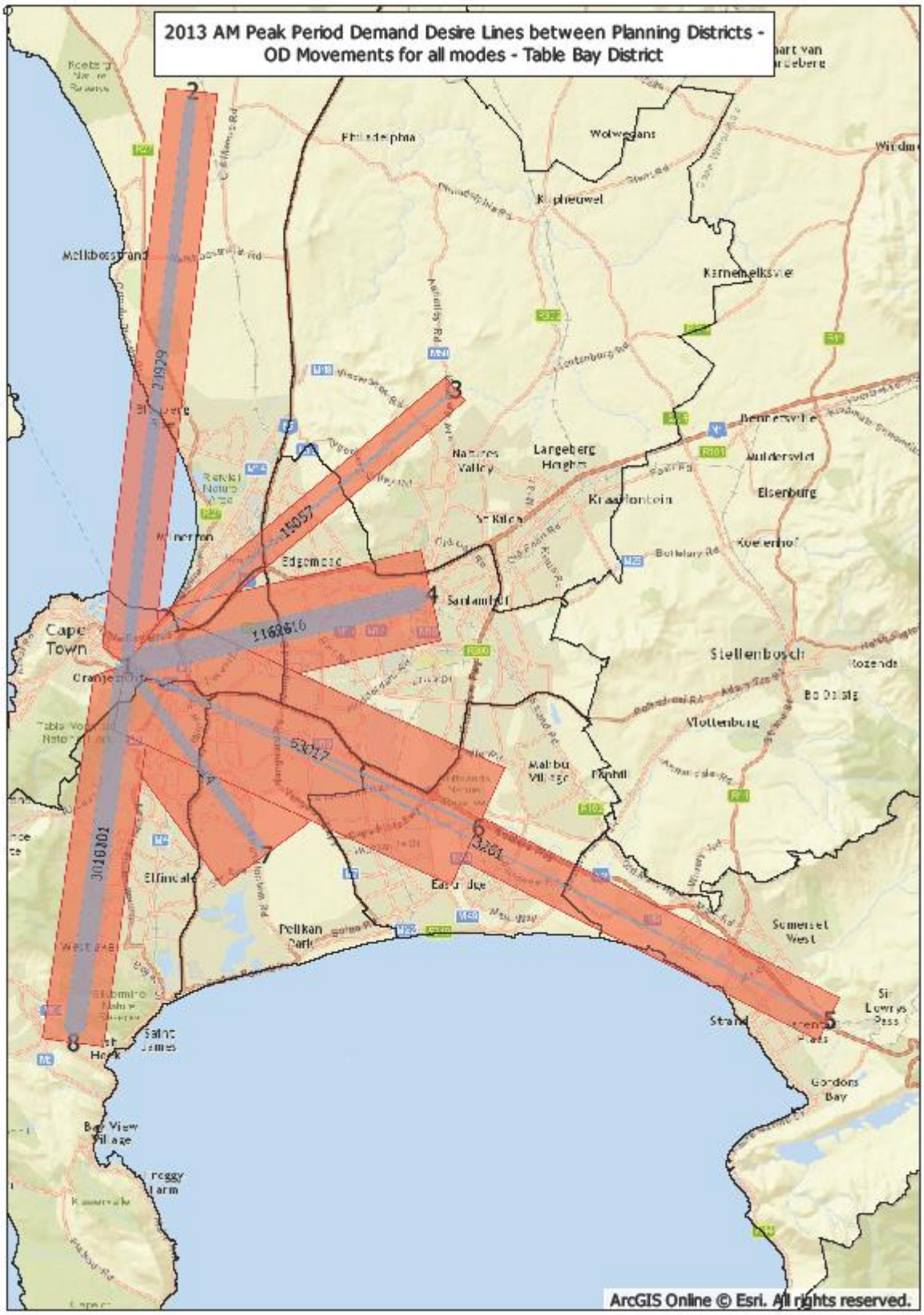


Figure 35 : 2013 Morning Peak Period Demand Desire Lines for all modes: Origin-Destination Table Bay District

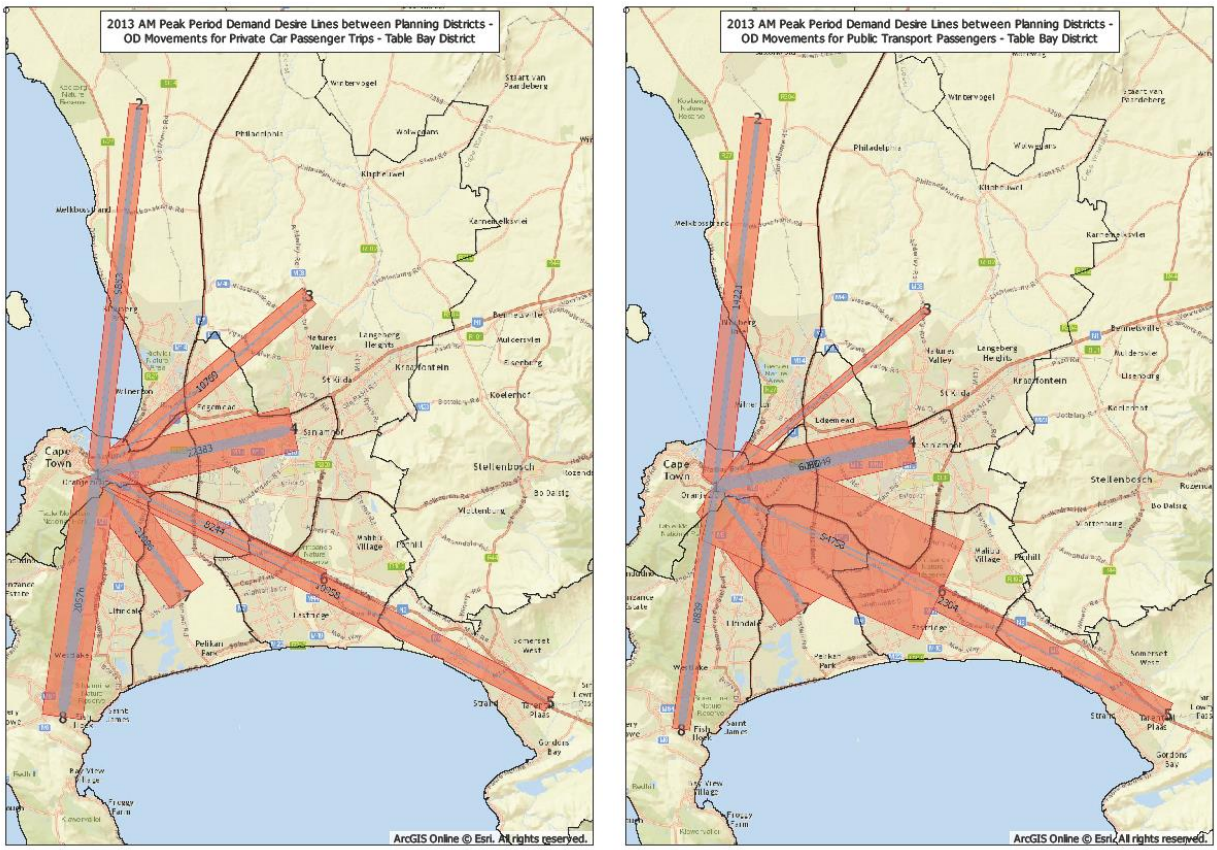


Figure 36: 2013 Morning Peak Period Movement Patterns for (a) private cars and (b) public transport

6.6.3 Cost of travel

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

6.6.3.1 User costs

The increasingly unsustainable cost of transport for low income households, as revealed by the City's TDI 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

6.6.3.2 Operational costs

There is a high cost to operate public transport n a sprawling urban environment. If the travel demand patterns of the city remain at current variables this 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 the MyCiTi Business Plan for Phase 1 A and the N2 Express projected a R52 million deficit, after accounting for fare income and subsidies.

6.6.3.3 Environmental and Economic costs

- Serious constraints on economic growth and development - Congestion currently costs Cape Town R2.8 billion per year.

- Increasing negative environmental impacts
- CO2 emissions and energy consumption

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)

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

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

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

The following changes for the district as whole are required:

- A continuation of the current pattern is inevitable, with increasing trip attractors in the CBD and surrounds
- However, some growth is needed in the number of trip generators, and is possible in District Six, as well as Langa, and Kensington.

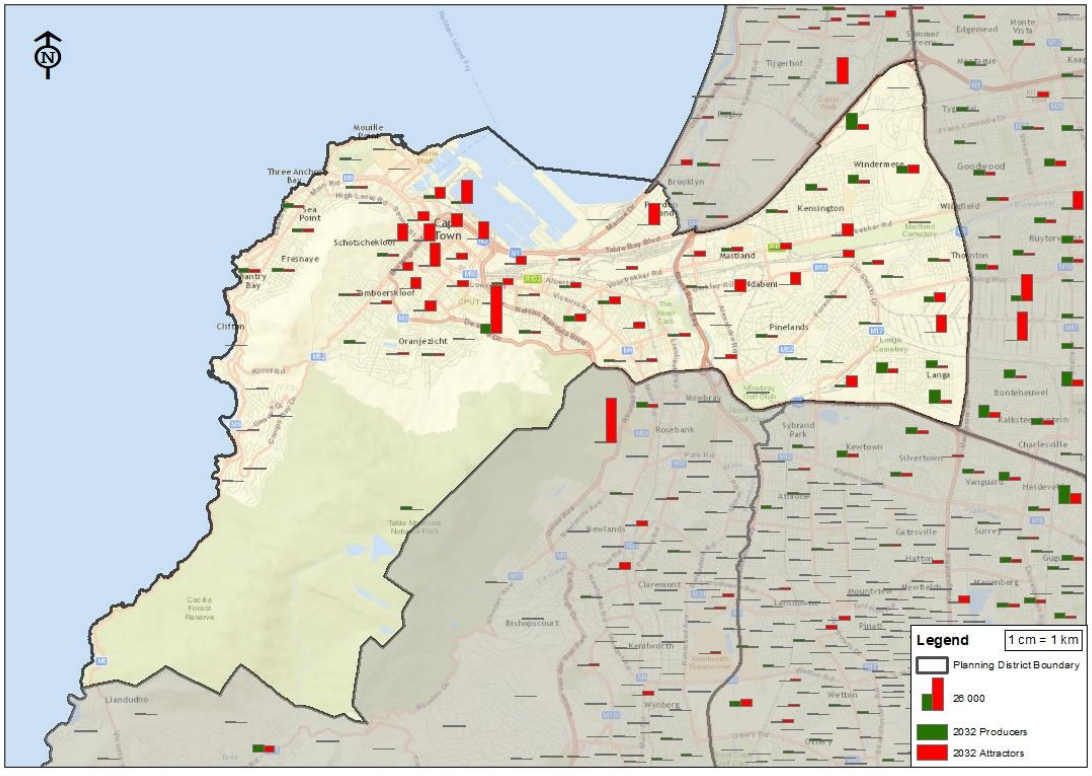


Figure 37: Ideal Mix of Future Trip Producers and Attractors (CTOD: 2032)

6.7 Key Transport Challenges and Opportunities

6.7.1 Constraints

The Central City is the city's most significant employment node and despite growth in commercial activity in other areas of the city, the CBD continues to attract investment despite extensive congestion in the morning and afternoon peak periods. The transport challenge for the Central City is that growth in business activity will attract an increasing number of trips during the peak periods and thus the overall transport system needs to be able to meet this demand. The built-up nature of the CBD means that conventional transport responses – widening or increasing road capacity – are limited and therefore changes in travel options and behaviour are required. This district needs to promote residential conversion of existing developments and intensification of mixed used development to support the transport system.

Some of the main challenges for this district includes:

- The rail crisis – The Rail network provides excellent coverage to most of the other districts and makes the CBD one of the most accessible nodes in Cape Town. The current crisis in rail need to be addressed as the main transport priority to keep the CBD accessible to all.
- The proposed growth around the Port and Culemborg will add to the congestion already experienced. There is a need to collaborate with Transnet to assure the node stays accessible.
- The bicycle network is disjointed and lanes are being abused. There is a need to address this in an integrated manner.
- The lack of NMT infrastructure outside the CBD, particularly in transit areas around employment nodes, such as Matiland Station, Salt River station and Epping is a challenge as commuter routes are often unsafe, poorly delineated or susceptible to flooding.

6.7.2 Opportunities

This district is the destination to showcase TOD. Developers should be incentivised to develop according to TOD principles which will support the transport system.

In support of the development of an exemplar TOD node the following opportunities exists:

- TDM measures: Flexible Working Programme; High Occupancy Vehicle lanes and Priority Measures; Green Travel Plans.
- Improving the Bicycle network by providing higher order cycle lanes from other districts.
- Development of the Foreshore Freeway Precinct.
- Improve and enforce non-motorised transport use to reduce intermodal conflicts.

6.7.3 Spatial Implications

This district needs to promote residential conversion of existing developments and intensification of mixed used development to support the transport system. Providing more residential opportunities in this District will assist with bi-directional flow on the Transport System as well as seat renewal on the Public Transport system

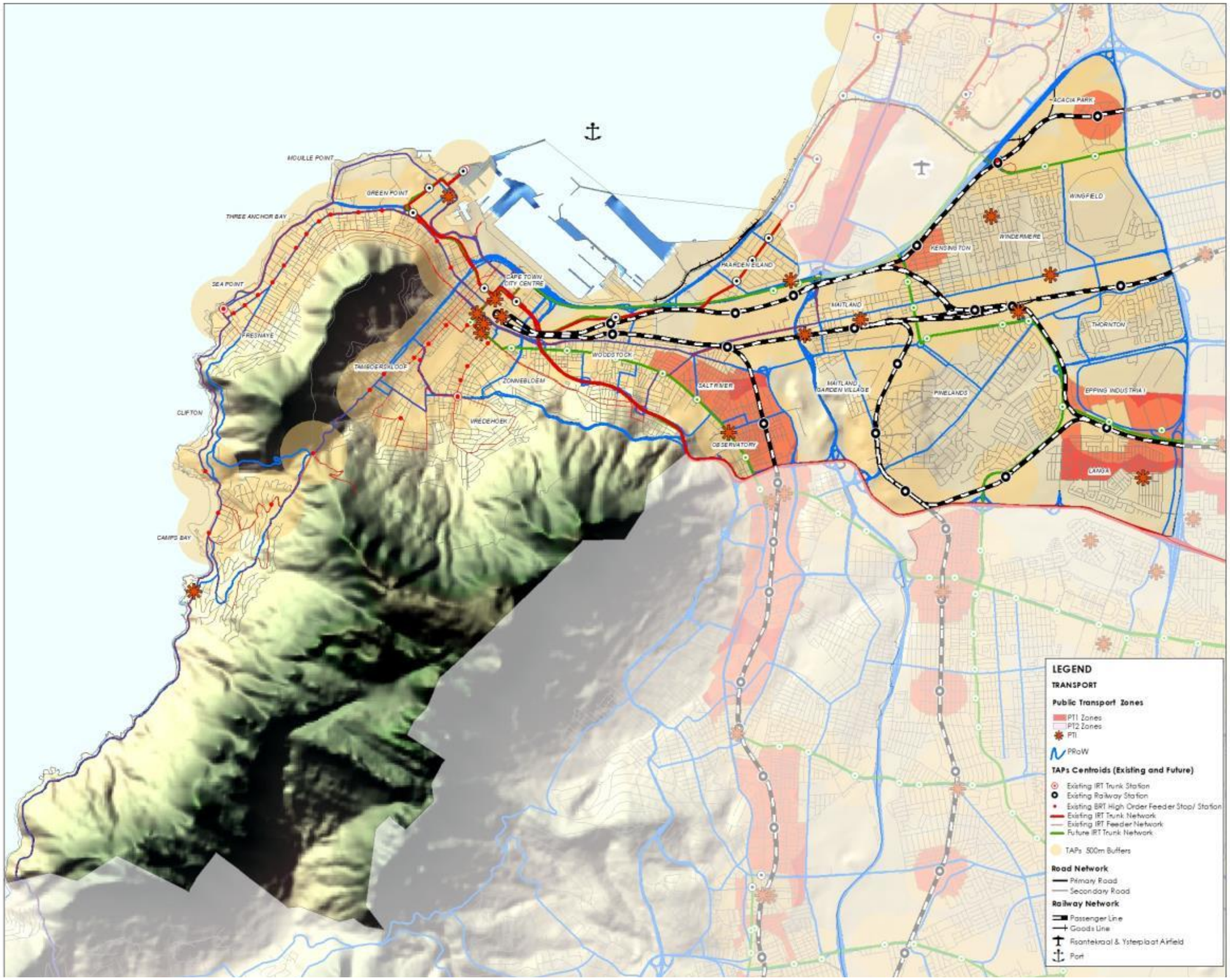


Figure 38: Map showing Current Public Transport and Related Infrastructure

7 INFRASTRUCTURE

Medium Term Infrastructure Investment Framework (MTIIF)

Figure 39 and Figure 40 show current level of supply of water, sanitation, electricity and stormwater infrastructure in the Table Bay district as identified in the 2015 Medium Term Infrastructure Investment Framework.

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

Most of the information used for the assessment of bulk electrical infrastructure capacity is from 2014 peak loads at distribution stations. The information was processed and each substation supply area classifies according to its level of existing capacity. There are 114 substation supply areas in the metropolitan. 82 of these are within the City of Cape Town's distribution area, while 38 are within Eskom's area of distribution. Table 7.1 gives the definitions used to classify the capacity of a substation area. The assessment was done using Transport Analysis Zones (TAZ's), which have different geographical delineations when compared to the substation supply areas.

Table 7.1 Showing definition of electrical system Capacity (MTIIF 2017 Draft, pg 68)

Capacity status	Definition
Severe lack of capacity	Over 100% of firm substation capacity
Slight lack of capacity	90% to 100% of firm substation capacity
Adequate capacity	70% to 90% of firm substation capacity
Spare capacity	Less than 70% of firm substation capacity

In Table Bay, no areas have a **severe lack of capacity**:

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

- Maitland, Maitland garden village and Paarden Eiland are at 90%-100% capacity

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

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

Table 7.2 showing 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

The Table Bay District has **adequate** or **spare** water capacity across the District.

[Awaiting further information, and a list of current and planned projects, from the line department]

7.3 Sanitation (Waste Water and Solid Waste)

7.3.1 Waste Water

Waste Water infrastructure includes the following components:

- All wastewater treatment works (WWTWs)
- Marine outfall
- 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 Description of waste water treatment 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 Table Bay, the following areas have a **severe lack of capacity**:

- Paarden Eiland, Salt River, Woodstock, Thornton and Epping

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

- The City Bowl and moving West to the suburbs on the Atlantic Coast.

There is significant ingress of stormwater in the sanitation system and steep slopes result in high velocities, any obstruction in the sewers results in back flow/ surcharging of raw sewage. The infrastructure is aged and requires replacement, this will have to be implemented with new developments and road upgrades.

New developments proposed in the next 10 years poses further challenges. The outfall sewer in Beach road in the Greenpoint Marine Outfall catchment is already experiencing capacity constraints. The Table Bay district has 3 sea outfalls where raw sewage is macerated however there has been an increasing public out-cry regarding sewerage been discharged into the ocean via Green Point (1.6km outfall pipe), Camps Bay and Llandudno Marine Outfalls.

7.3.2 Bulk solid waste

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

- Landfills and associated mechanical plant
- Refuse transfer stations
- Waste treatment facilities
- Drop-off facilities
- Collection vehicles
- Material recovery facilities
- Alternative treatment technologies
- Cleansing vehicles

The information is based on data from 2011 and 2014/2015.

Table 7.4 showing Existing bulk solid waste management infrastructure capacity status (MTIIF, pg 77)

Table 7.4 Solid Waste Capacity Definition

Infrastructure type	Capacity status	Comment
Landfills and mechanical plant	Lack of capacity	The banked airspace is less than the international benchmark of 15 years
RTSs	Spare capacity	The total transfer capacity available exceeds the total operating capacity
Drop-off facilities	Adequate capacity	The drop-off service coverage is sufficient
Collection vehicles	Adequate capacity	
MRFs	Adequate capacity	
Alternative treatment technologies	Investigating operational needs	The future basic requirements are under investigation
Cleansing vehicles	Lack in capacity	

7.3.3 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 Table Bay, the following areas have a **severe lack of capacity**:

- Parts of Pinelands and the lower lying areas of the District from Paarden Eiland through the Black River estuary to Observatory.

7.3.4 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.

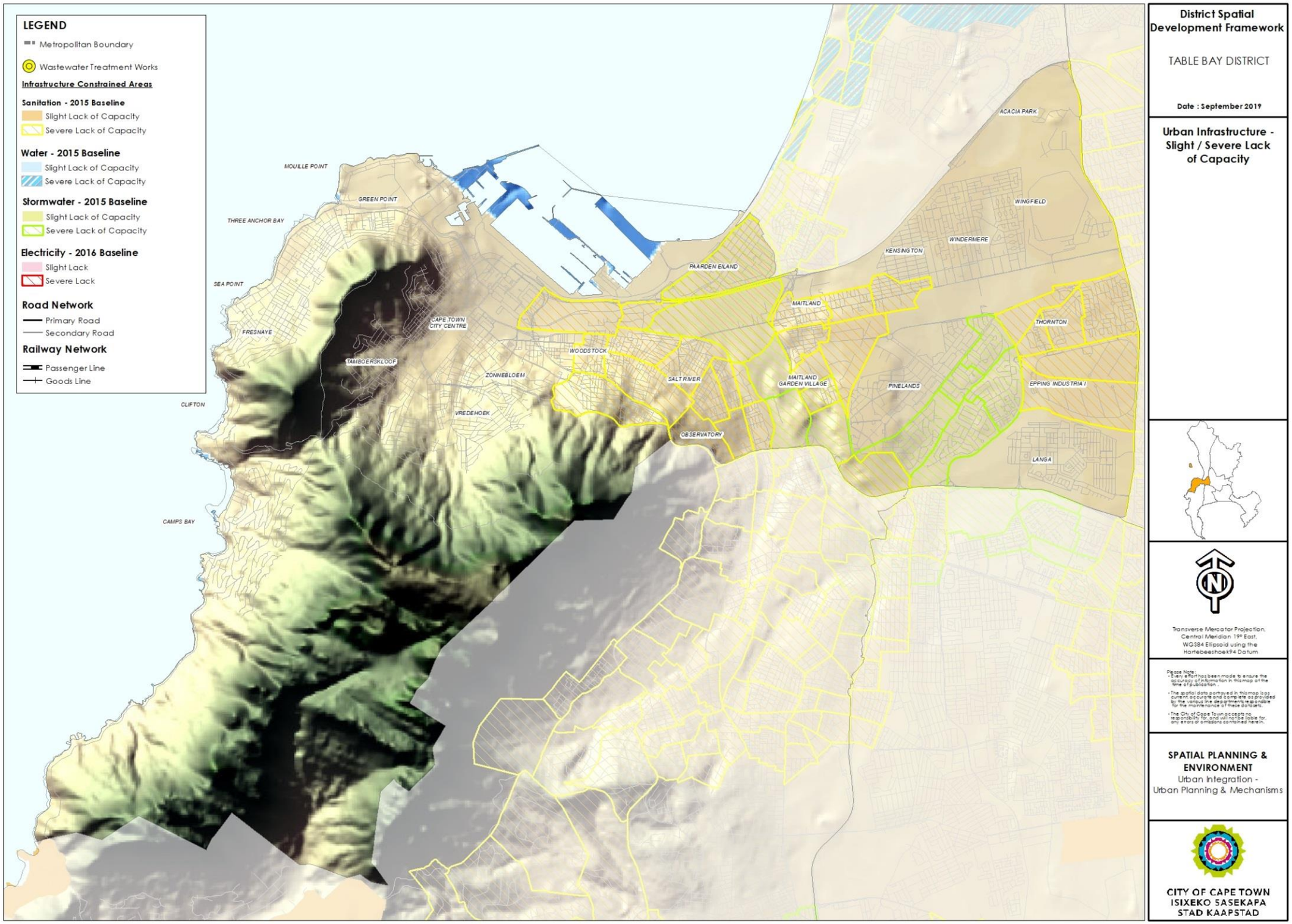


Figure 39: Map showing Slight and Severe Lack of Capacity in Table Bay District

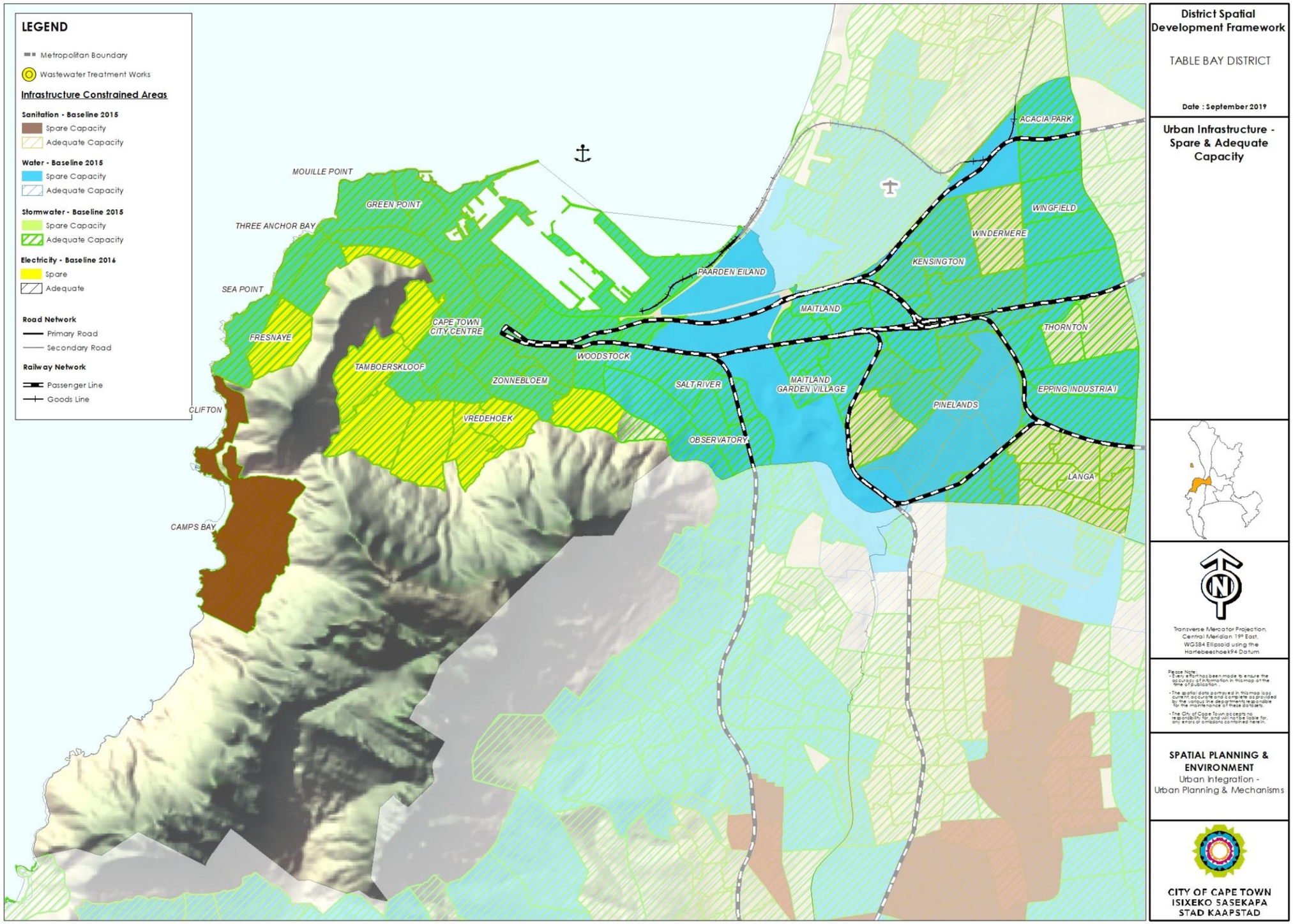


Figure 40: Map showing Spare and Adequate Capacity Table Bay District

8 HUMAN SETTLEMENTS

The concept of integrated human settlements goes beyond providing housing and speaks to creating environments that support the social, physical, and economic integration of housing developments into the existing urban fabric and establishing quality living environments that are sustainable. This means that housing is merely one of the basic infrastructure components required to build integrated and resilient communities (see Figure 41 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 41: Building Integrated Communities

8.1 Housing Overview

8.1.1 Type of Structure

The majority of structures in this district are formal dwellings (84.6%), compared to 10.9% informal dwellings. The Formal dwelling typologies are predominantly flats or single dwelling units. The district also has a large number of semi-detached houses. See Table 8.1 and Figure 42 below for a detailed breakdown of dwelling typologies. The spatial distribution of the various formal typologies is shown in Figure 44 below. There is clear clustering of various typologies throughout the district.

The residential informal structure in the Table Bay District are shown in Figure 43. These are based on the 2017 informal door and roof count. The area in the district with the vast majority of informal dwellings is Langa. There are also informal dwellings present in the Bo-Kaap (Schotschekloof sub place), Maitland, Woodstock, Kensington and border of the Epping Industria 1/Thornton areas.

Table 8.1: Dwelling Typologies in Table Bay District (Census 2011)

Dwelling Typology	Number	%
House or brick/concrete block structure on a separate stand or yard or on a farm	24,103	34.2%
Traditional dwelling/hut/structure made of traditional materials	265	0.4%
Flat in a block of flats	25,579	36.3%
Cluster house in complex	831	1.2%
Townhouse (semi-detached house in a complex)	1,102	1.6%
Semi-detached house	8,225	11.7%
House/flat/room in backyard	1,245	1.8%
Informal dwelling/shack in backyard	2,675	3.8%
Informal dwelling/shack NOT in backyard	4,983	7.1%
Room/flatlet on a property or larger dwelling/servants quarters/granny flat	885	1.3%
Caravan/tent	27	0.0%
Other	550	0.8%
Total	70,470	100.0%

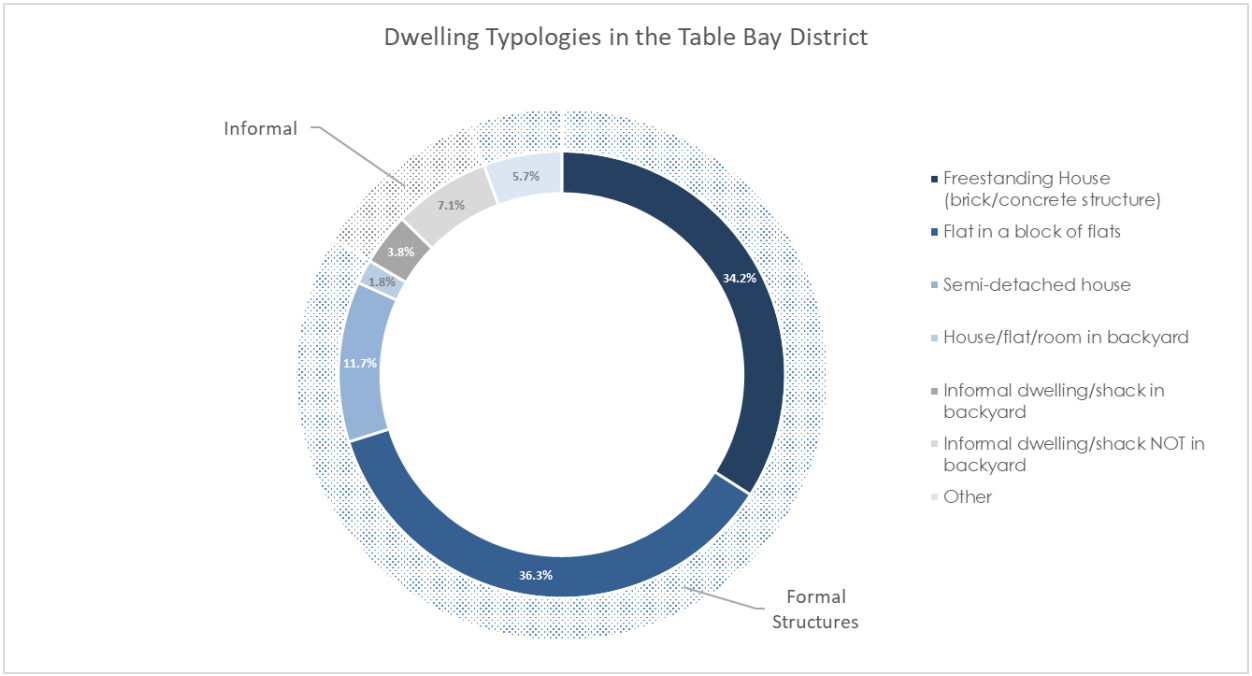


Figure 42: Chart showing Formal versus Informal Dwelling Typologies

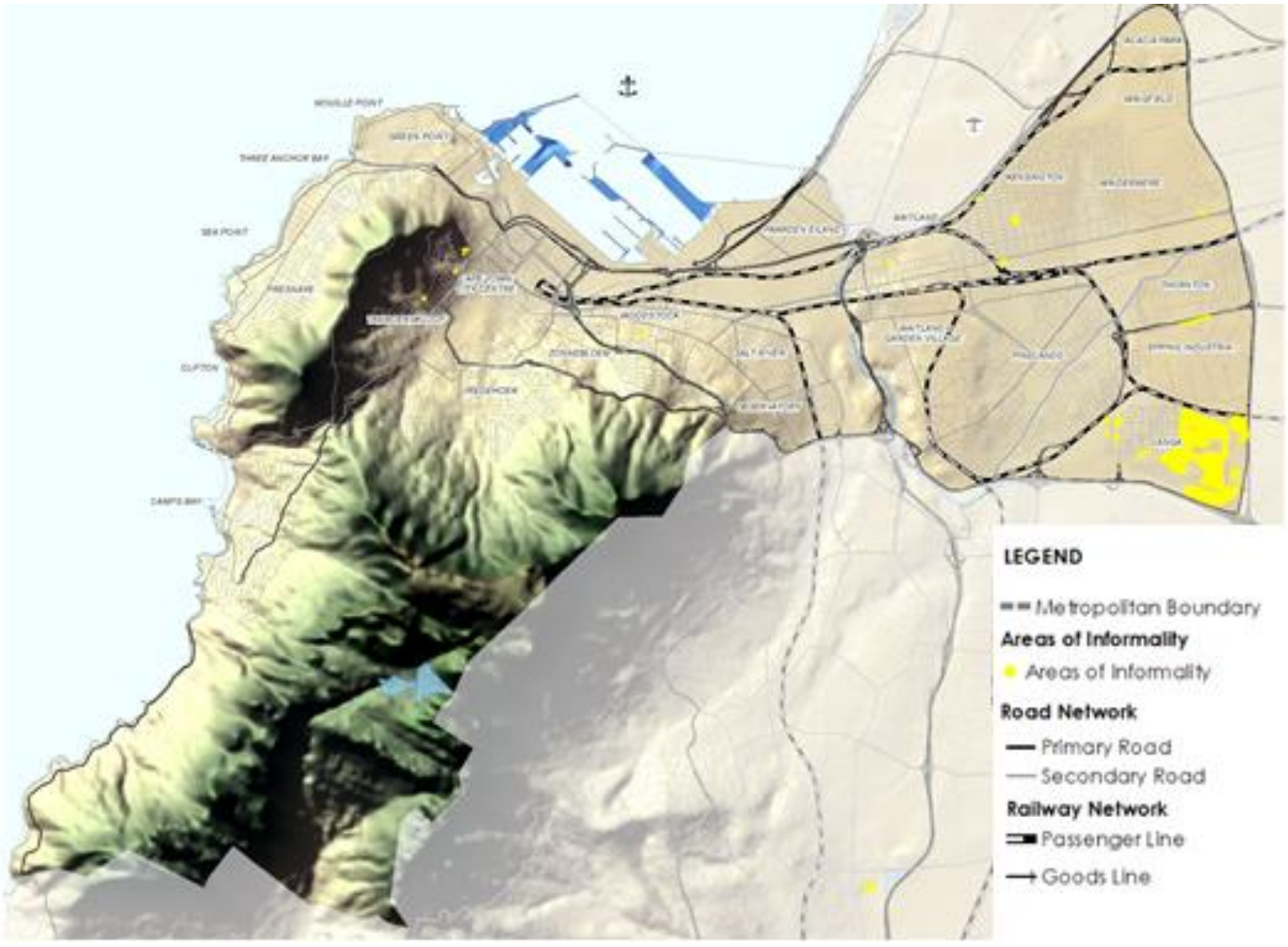


Figure 43: Map showing Informal Structures in the Table Bay District (Informal Structure Count, 2017)

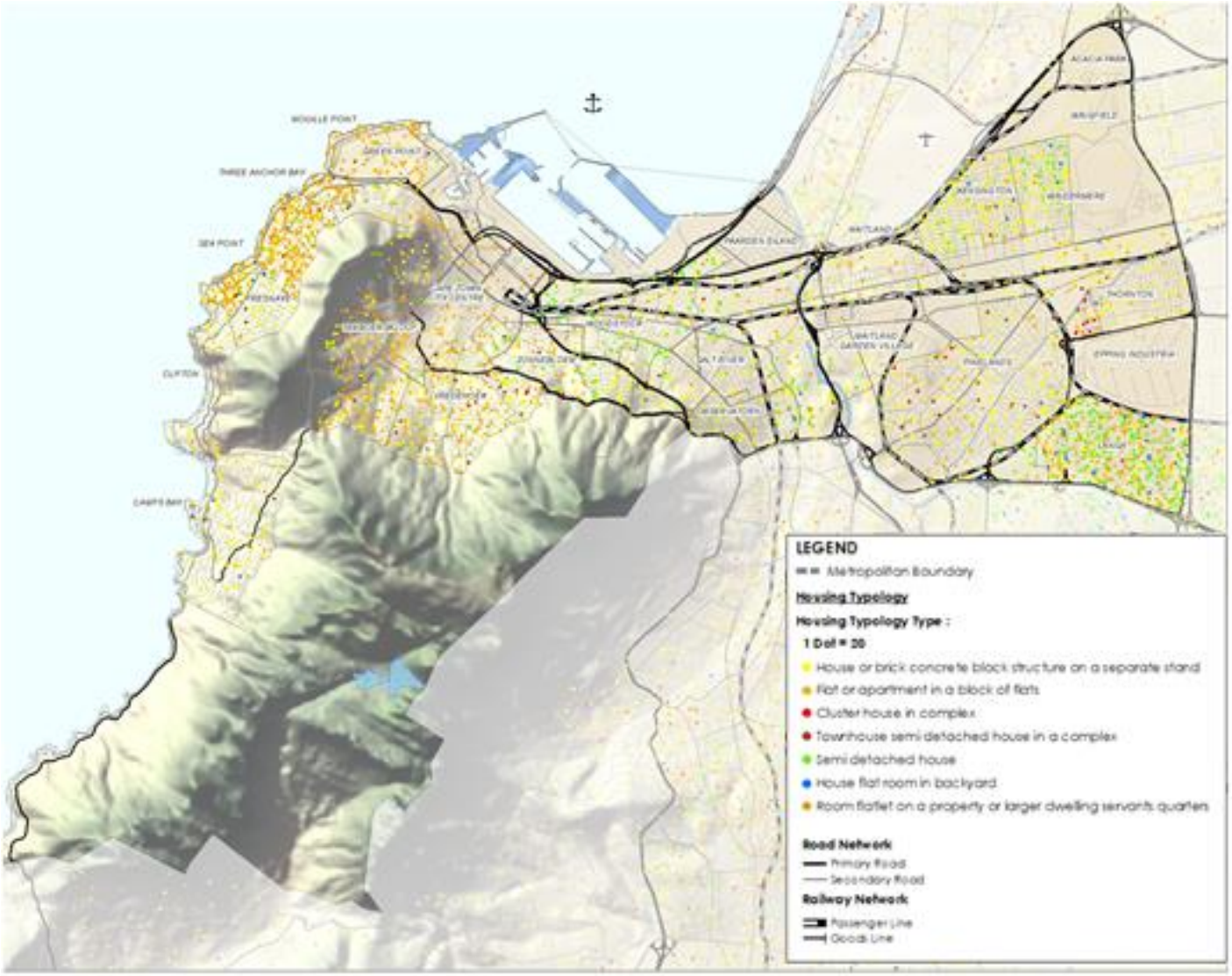


Figure 44: Map showing Housing Typologies

8.1.2 Tenure Status

Almost half of the households in Table Bay rent their homes. A quarter of the household heads in the district own and have fully paid off their property.

Table 8.2: Tenure Status in Table Bay District (Census 2011)

Tenure Status	Number	%
Owned and fully paid off	18044	25.6%
Owned but not yet paid off	11678	16.6%
Rented	33201	47.1%
Occupied rent-free	6316	9.0%
Other	1232	1.7%

The tenure status of households in the Table Bay District is shown in Figure 12 below. A large proportion of households in Windemere are owned and fully paid off. Langa has the

highest percentage of households with the tenure status occupied rent-free. Pinelands has a lower proportion of rented properties than the majority of the areas in the rest of the district.

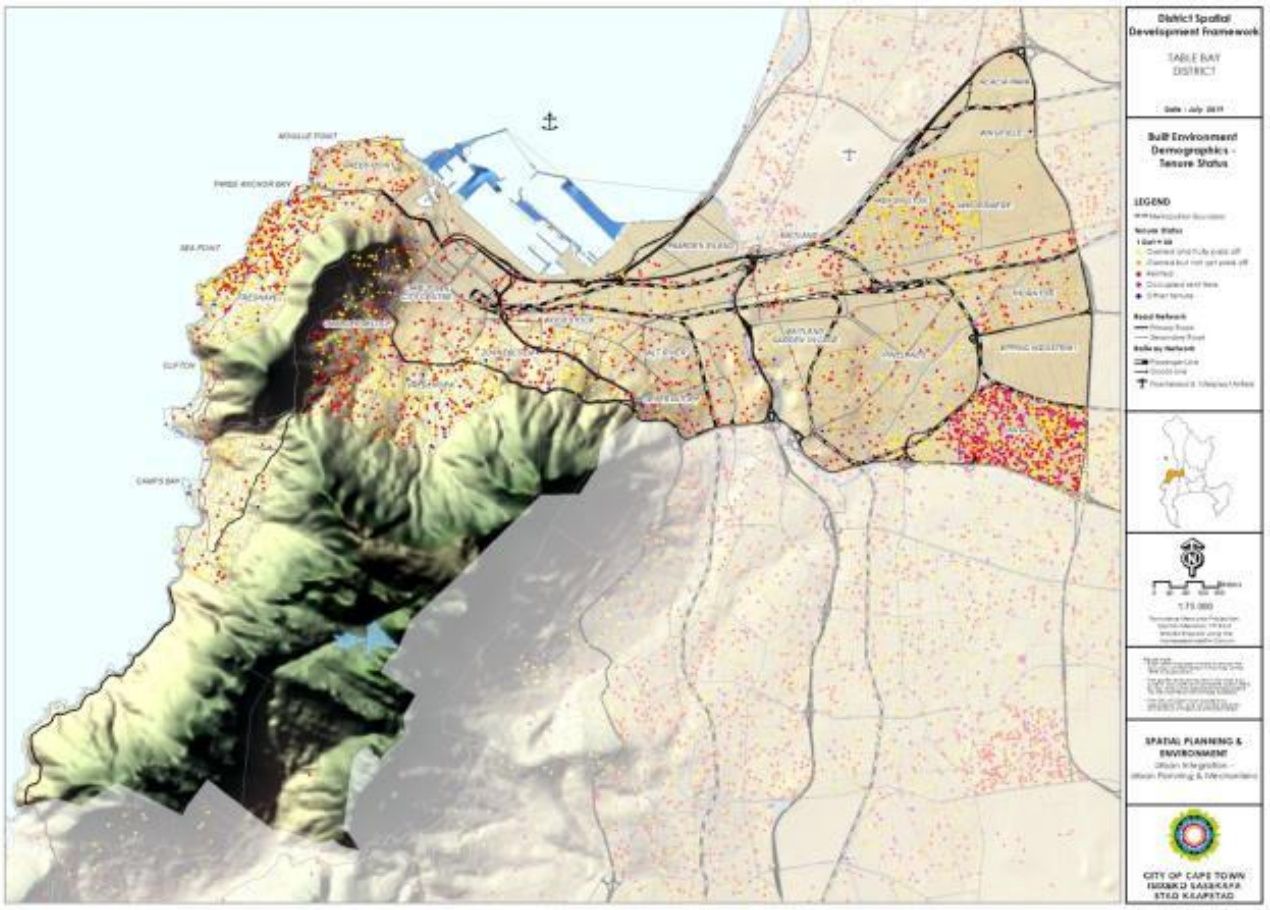


Figure 45: Map showing distribution of Tenure Status in Table Bay (Census, 2011)

8.1.3 Demand for State Subsidised Housing

The demand for State Subsidized housing generated in Table Bay is assessed using a proxy[5] of the number of informal structures in the District, as well as the number of people that have registered their need for housing on the City's Housing Needs Register. NOTE: People who have registered their need for housing might also be living in informal settlements in the area.

There were 9657 informal dwellings in the District, according to a 2017/18 roof count by the City of Cape Town. Most informal dwellings were located in Langa. The District has 5% of the informal dwellings in the City. The Table Bay District has just 10% the number of

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

informal dwellings of Mitchells Plain/Khayelitsha district, with the highest number of informal dwellings at 95 549.

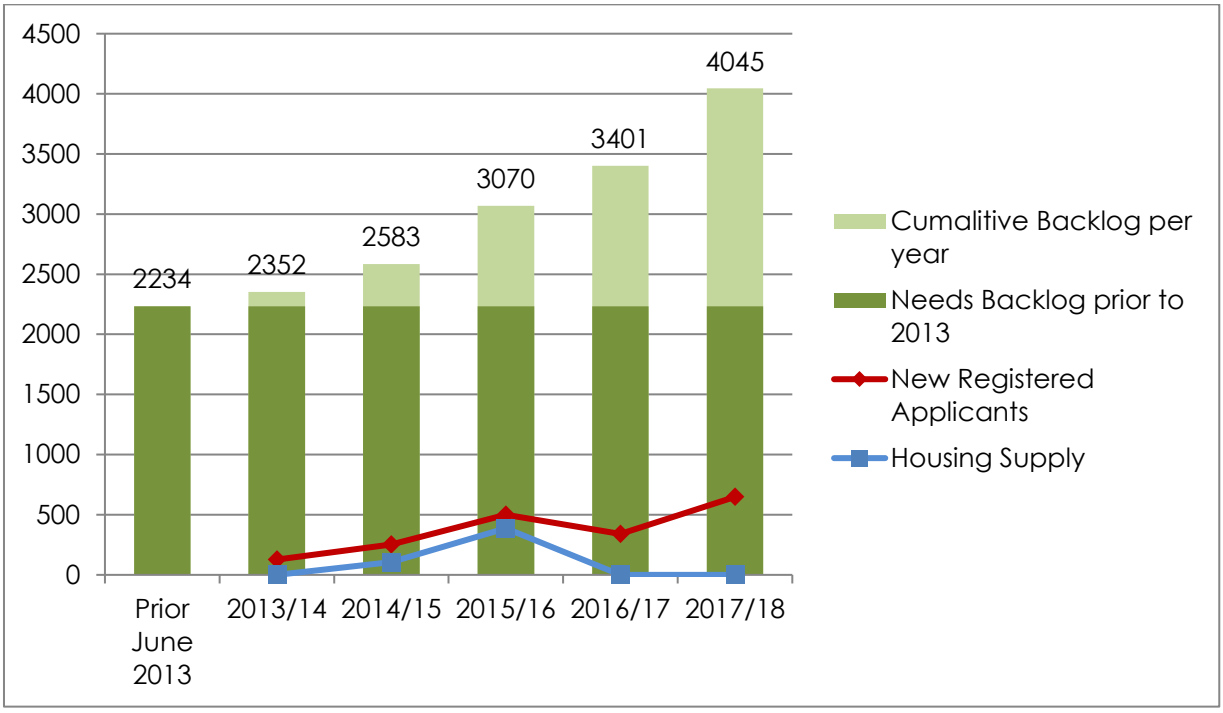


Figure 46: Housing Needs Registry

By the end of 2018, 4045 people in the District had registered their need for housing on the City's Housing Needs Registry. This accounted for 2% of all people who have registered their need across the City. NOTE: Anyone is able to register their need for housing on the Housing Needs Register, however many of the people registered might not qualify for housing, or their circumstances may have changed over time, thus the data needs to be treated with caution. A background check of beneficiaries registered on the database is only done at project inception.

The population growth in areas like Langa and the high number of job opportunities in the District as well as good access to public facilities and services mean that the demand for housing opportunities in the District is likely to remain high. While there may be a need for state supported housing delivery in some areas in the District, due to the active property market in the District, some of these opportunities could be provided in part or whole by the private sector.

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 Table Bay District. However, over the same period some 3352 additional individuals in the Table Bay District 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.

Limitation within Housing Demand and Supply data:

Needs Summary:

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

Supply Summary:

- UISP – persons who are beneficiaries within 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.

- Land Restitution/ Institutional - persons who are beneficiaries within this housing programme are not necessarily registered on the City's Housing Needs Register.

- Social and rent to buy - persons who are beneficiaries within this housing programme are not necessarily registered on the City's Housing Needs Register as this housing programme 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.

8.1.4 1.3.1. Constructed/Delivered

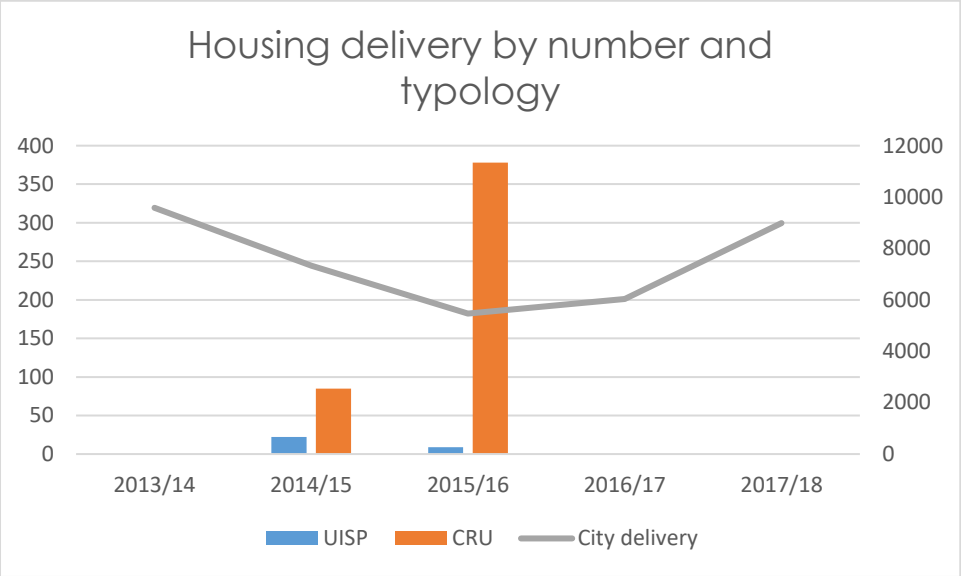


Figure 47: City's Human Settlements delivery data, 2013/14 – 2017/18

Through government housing delivery programmes over the period 2013/14 to 2017/18, 494 housing opportunities were created in the Table Bay District, all in Langa. This included 31 opportunities created through the Upgrading of Informal Settlements Programme[6] and 463 opportunities created through Community Residential Units[7].

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

8.1.5 Pipelined, Planned and in Construction

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

[6] Upgrading of Informal Settlements Programme (UISP): Upgrading of informal settlements by means of in situ upgrading, or relocation to greenfield sites. This programme gives households access to municipal services, or the incremental development of a top structure.

[7] Community Residential Units (CRU): Affordable rental targeting the R0 – R3500 income group, but the City will allow households to access this programme if they earn up to R10 000 – however households above R3500 must pay additional rental amounts according to what they earn.

8.2 Key Opportunities and Constraints

8.2.1 Generic constraints:

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

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

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.

Capacity constraints regarding the social facilitation of human settlements developments can impact negatively on the outcomes of projects.

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

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

8.2.2 Local constraints and opportunities:

Constraints

The increase in population and household density in Langa indicates that the demand for affordable housing in the District is high. There is an existing threat of land invasion and encroachment on to public open spaces in and around Langa due to high demand. These areas are incredibly dense, which makes utilising in situ upgrading through the Upgrading of Informal Settlement Programme a challenge.

Most of the available public land in the District is constrained or reserved for other uses. Transitioning land used for social facilities to housing is a point of conflict amongst communities requiring sensitive resolution.

Land prices in the Table Bay are prohibitive, property values and rates are high in most areas and many institutional facilities such as schools and crèche facilities price poorer

families out. Leveraging public land in the area to include a wider range of affordable housing options will need to be coupled with planned facilities provision for the range of incomes moving to the area.

Opportunities

Remaining pockets of publically owned vacant land in the District are highly strategic for providing affordable human settlements opportunities in close proximity to jobs and areas of high amenity. Social rental units in integrated housing precincts will contribute to spatial transformation.

As public land in the District is frequently constrained, opportunities to purchase vacant and underutilised land for a range of housing types to enable more housing opportunities should be taken where feasible.

9 PUBLIC FACILITIES

9.1 State of Supply and Demand

The following analysis and proposals on Community Facilities are informed by the updated Community Facility Guidelines and Standards for Facility Provision reviewed in 2020. Each facility has a set of planning standards for providing facilities which have been articulated by line departments, work-shopped and agreed to with key stakeholders. The facilities guidelines and standards were incorporated into a modelling exercise that sought to understand sufficiency or insufficiency in the distribution of community facilities and build a hierarchy of civic clusters (a network of nodes with community facilities) across the City illustrated in Figure 1.

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

Figure 1: Conceptual Hierarchy of Community Facility Nodes/Civic Clusters

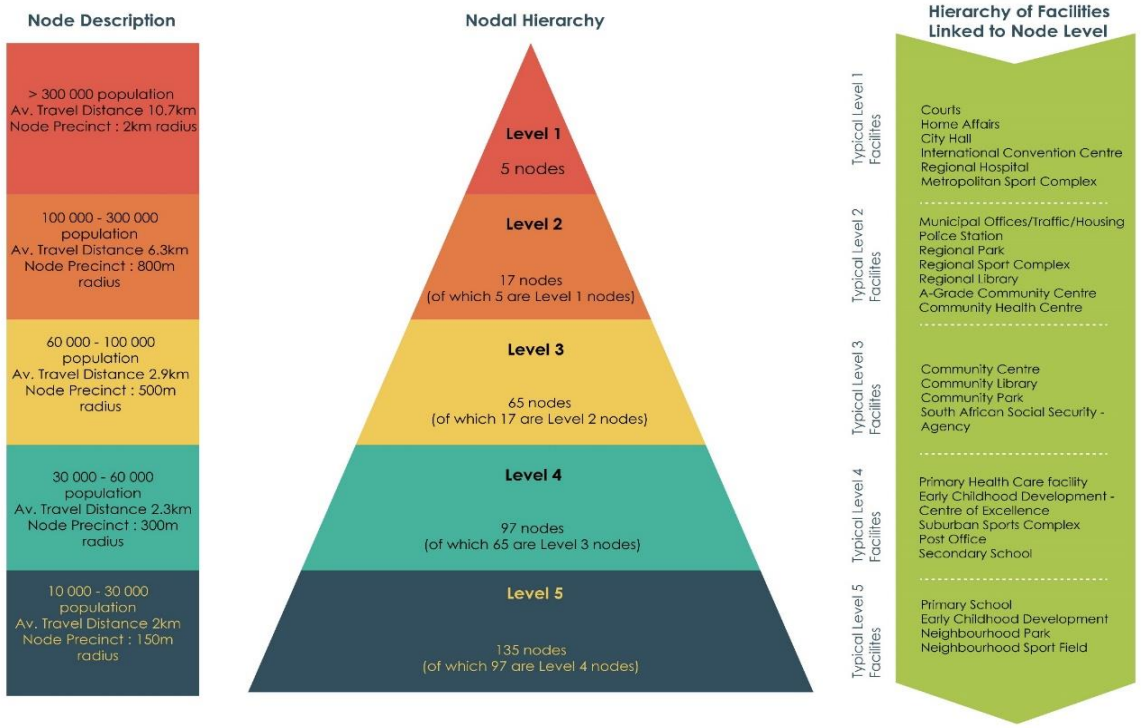
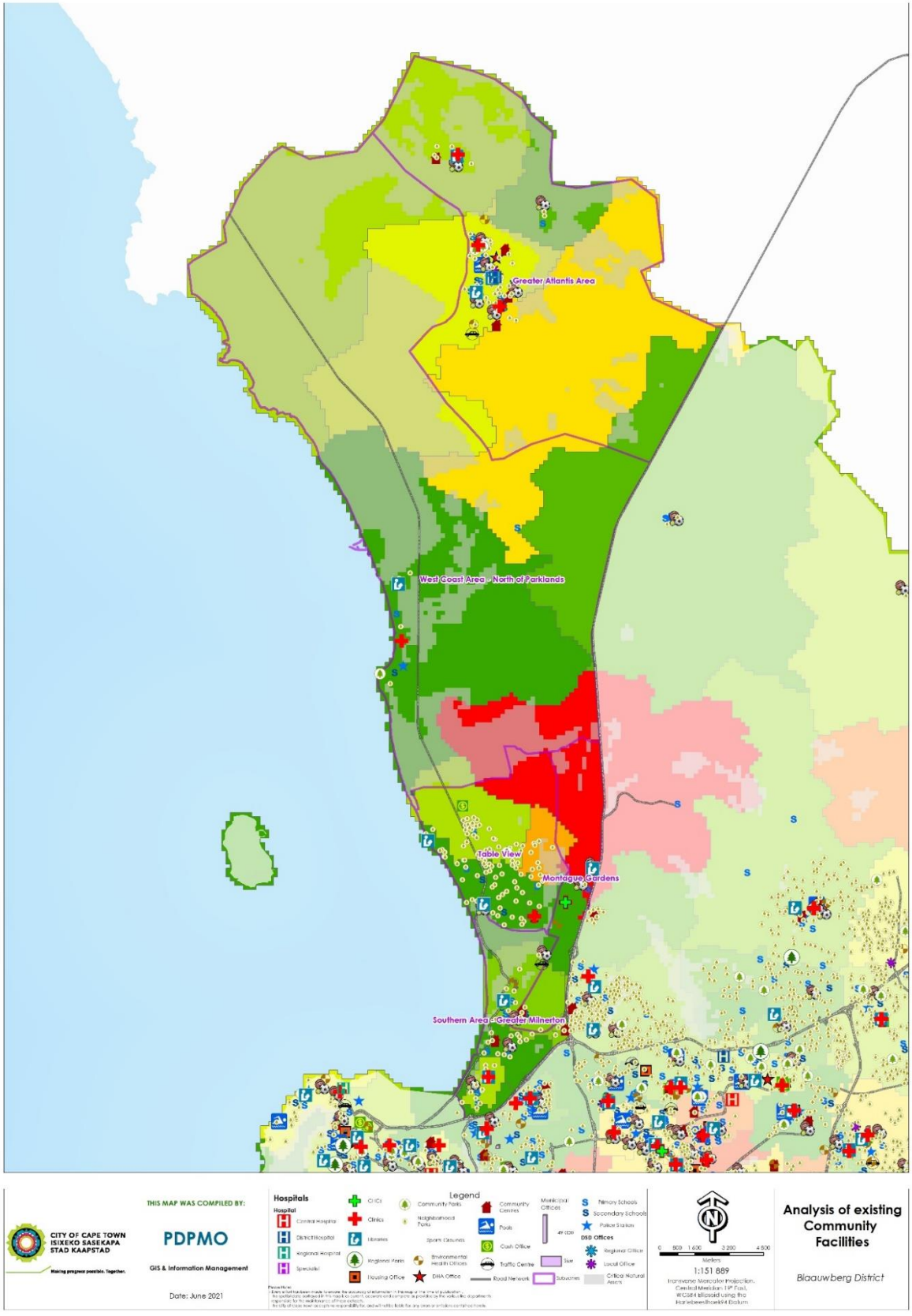


Figure 48: Conceptual Hierarchy of Community Facility Nodes/Civic Clusters

Map 1 illustrates the distribution of existing facilities and highlights sufficiency/insufficiency in the form of a heat map, neighborhoods that fall within areas shaded red, orange and yellow are the most underserved areas in the district. Table Bay District is one of the most well served districts in the City with a sufficient provision of community facilities compared to other districts. The majority of suburbs located in this district are well served with by a range of high to low order facilities that are well located within accessible distances for the majority of the population residing in this district. The map illustrates the insufficiency of facilities in Langa.



Map1: Distribution of existing facilities within Table Bay district

Table 1 and 2 show results generated from a modelling exercise that was undertaken to identify nodes/ service catchment areas of need and the type of facilities required in the district in order to meet the needs of the population in 2020 and 2040 taking into account sector specific assumptions, guidelines and standards for facility provision. It can be seen in both the 2020 and the 2040 outlook that this district is sufficiently provided for with community facilities, however Langa and the surrounding area has a significant need for community facilities.

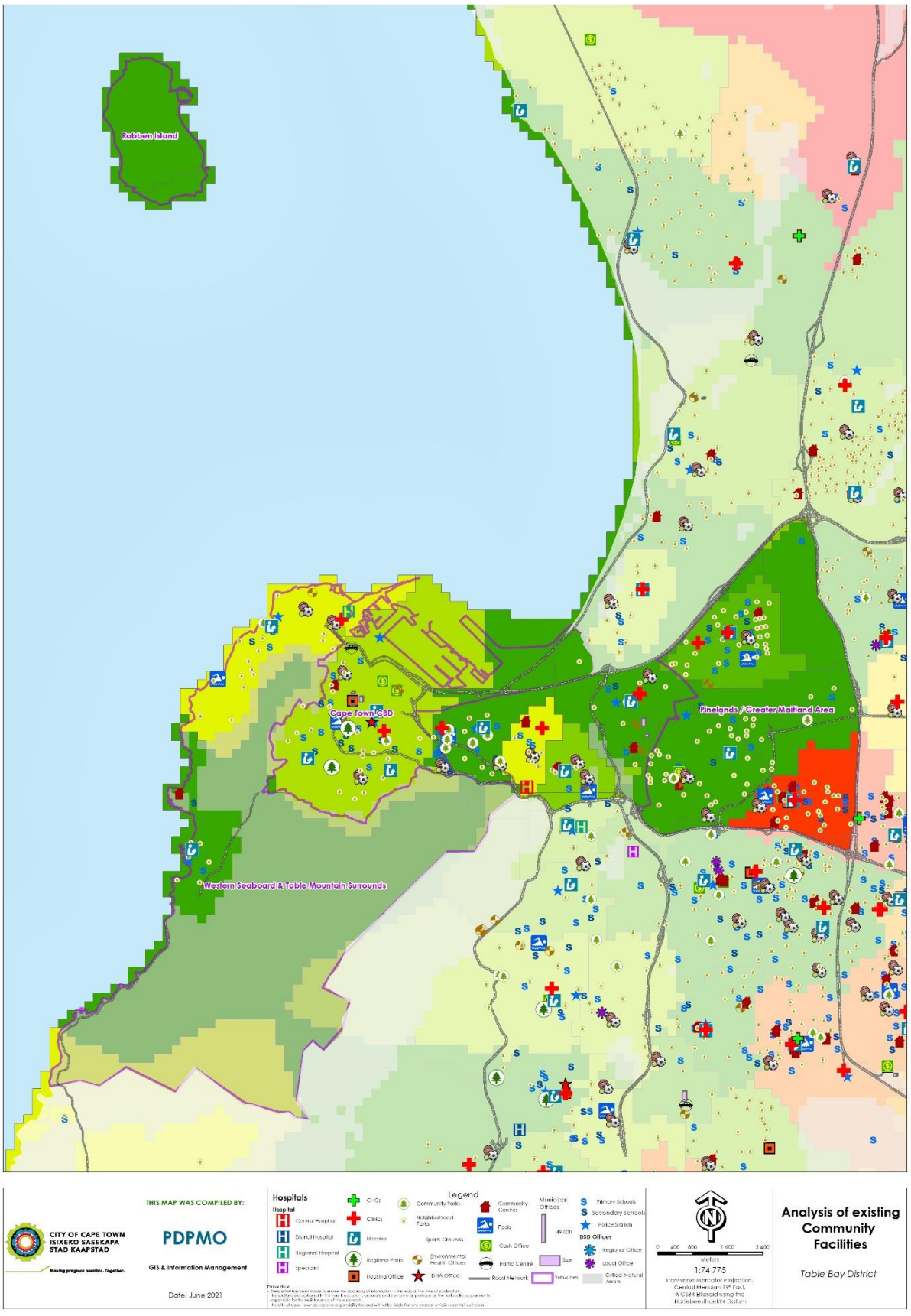
Table 1: 2020 Areas of need in the Table Bay District

Facility Type	Node/Area	Population Demand	Insufficient Supply - Equivalent No. of Facilities/unserved population/ha of land required
Community Centres	n/a	144 266	0
Education	**Primary School** n/a **Secondary School** n/a	28 557 14 741	-9 973 (number of PS learners) -3 694 (number of SS learners)
Community Libraries	**Community Libraries** **Regional Libraries**		Sufficient Sufficient
Primary Health	n/a	157 881	0
Parks	**Neighborhood Parks** **Community Parks** **Regional Parks**	293 648 144 266 245 512	-27.2 -6.3 Sufficient
Sports	n/a	144 266	-16.5
*Positive values indicate an over provision; Negative values indicate a shortfall relative to the standards			

Table 2: 2040 Areas of need in the Table Bay District

Facility Type	Node/Area	Population Demand	Insufficient Supply - Equivalent No. of Facilities/unserved population/ha of land required
Community Centres	Plumstead	178 165	1
Education	**Primary School** **Secondary School**	38 413 (PS learners) 19 522 (SS learners)	-16 860 (PS learners) -6 518 (SS learners)
Libraries	**Community Libraries** **Regional Libraries**		Sufficient Sufficient
Health	**Primary Health**	208 749	0.1
Parks	**Neighborhood Parks** • Observatory **Community Parks** • n/a **Regional Parks**	456 586 178 165 297 422	-54.0 -8 Sufficient
Sports	n/a	255 194	-23.7
*Positive values indicate an over provision; Negative values indicate a shortfall relative to the standards			

Map 2 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 (current supply of facilities, population number, facility standards, distance) specifically for the following facilities: Community Parks, Regional Parks, Community Library, Regional Library, Primary Health Care, and Sports Grounds). Langa has a high need for community facilities in this district.



Map2: Facility need Table Bay district

The following section provides a list of the current supply of public facilities in the area, and the demand of new facilities in the district accounting for the anticipated growth in population and required densification and intensification of land use in line with city policy.

9.1.1 Education

Figure 49 includes all public and private ECDs (early childcare development centres), crèches, primary and secondary schools in the city. However, the discussion that follows refers to government schools and excludes any private schools or Early Childhood Development centres (ECD). This information also does not include the current status of school infrastructure or the level of utilization of the facilities (i.e. capacity considerations) which could also impact on the level of education services that can be provided.

In total there are approximately 65 public education facilities in the planning district: 43 primary schools and 22 secondary schools that have been divided into three (3) categories namely; Grade R, Primary and Secondary schools. All operational Grade R facilities are assumed to be within existing government primary schools.

The information is based on 2011 figures obtained from the City of Cape Town's Department of Community Services and Health extracted from the revised 2011 Census. The assumed standard capacity ratio for each category of schooling is as follows:

- Grade R- 30 learners per class;
- Primary Schools- 40 learners; and
- Secondary Schools- 40 learners

Estimated number of pupils served by the schools

The Table 9.1 below indicates the current number of pupils served and unserved based on distance and capacity constraints within 5km of the school.

Table 9.1: Number of pupils served within 5km of a school category

(statistics to be confirmed/ updated: date?)

Level of Schooling	# of schools	Unserved pupils	Served Pupils	%served	Metro Average % served	Total Potential Pupils
Grade R	43	167	1941	92.09%	58.46%	**2108**
Primary School		3	14695	99.98%	96.23%	**14698**
Secondary School	22	16	9541	99.83%	81.71%	**9557**
Total	**65**	**186**	**26177**	**99.29%**		**26363**

Based on the number of school going aged pupils in 2011, the Table Bay District was performing significantly better than the Metropolitan average across the board in serving the population of the District. However, the number of potential pupils may be underestimated as many parents may prefer to admit children in schooling close to their place of work particularly in grade R.

Estimated travel distance of pupils to schools

Travel distance for various category pupils, based on 2011 Census figures are expressed in the Table below.

Table 9.2: Travel distance of pupils to schools

Category	Number of pupils			Percentage % of pupils		
Level of Schooling	<1km	<2km	<5km	<1km	<2km	<5km
Grade R	1765	502	253	70.04%	19.92%	10.04%
Primary School	10671	3136	963	72.225%	21.23%	6.52%
Secondary Schools	5851	3316	1375	55.50%	31.46%	13.04%
Total	**18287**	**6954**	**2591**	**65.70%**	**24.99%**	**9.31%**

Table 9.2 provides an overview of the accessibility of schools in relation to the number of pupils that it serves.

It can be concluded from the above table that in 2011 65,7% of the learners had access to a school within 1km; 25% between 1km and 2km and 9,3% between 2km and 5km from their homes. The majority of pupils, approximately 18287, are located within 1km from a school. In essence approximately 91% of the pupils are within 2km of a school.

If the aim is to increase the number of pupils within a 1km distance to a school, then this requires higher density development around existing schools with an increased capacity where needed and / or more schools dispersed within the area. The former may be a cheaper option, requiring less land, but will of course come with management and capacity challenges to the individual schools.

There is still a high number of pupils who are unserved, however, this does not seem to be related to the distance or accessibility to these facilities and is most likely subject to available capacity of existing schools; the preference of schools, relating to subject choice, family movement patterns and networks, etc.

The increase in population, especially the younger population in the district would increase the requirement for more school facilities. It should however be kept in mind that there are various private schools that also services pupils which are in most cases not linked to accessibility or place of residence and that a number of learners travel outside their residential area for education.

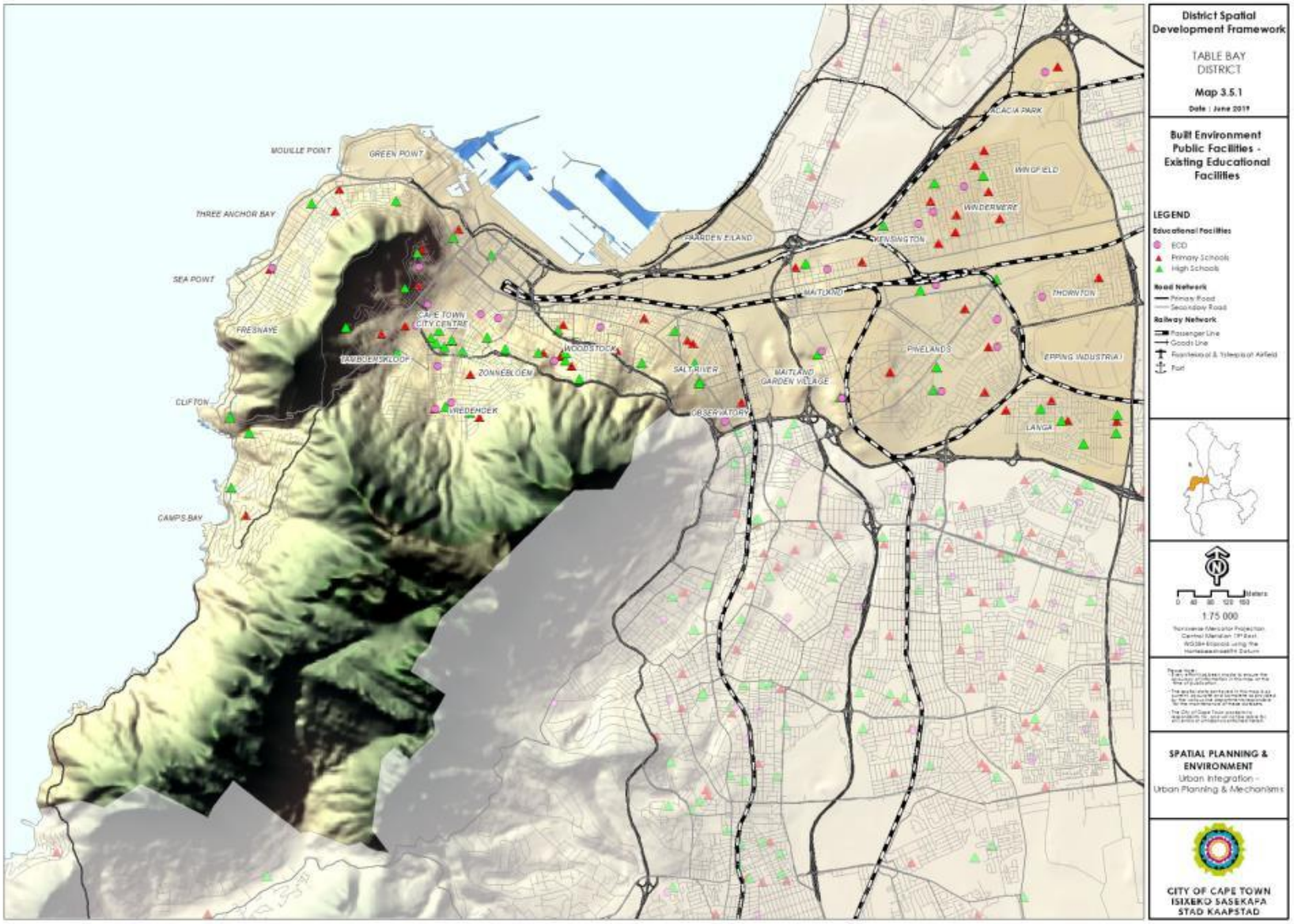


Figure 49: Map showing existing Education Facilities

9.1.2 Medical

In 2011 the Table Bay District had approximately 12 operational Primary Health Care (PHC) facilities.

Table 9.3 indicates the number of people served and unserved per **Health District** for the entire City of Cape Town. There is a clear indication that facilities are very well distributed in the City and that service problems are more likely related to issues of service capacity than to travel distance. However Metro SE, growth areas and periphery of City experienced limited capacity in 2011.

Table 9.3: Public Health Care Facilities 2011

PHC 2011 Served and Unserved Regions					
Health District	**Served within 1km**	**Served within 2.5km**	**Total pop. served < 4km**	**Unserved at 2.5km**	**Unserved at 4km**
Eastern	124591	293590	340318	123921	77193
Khayelitsha	137005	365782	380892	23584	8474
Klipfontein	141920	254875	304550	53421	3746
Mitchells Plain	176769	355486	408558	111255	58183
Northern	77501	131893	164707	86074	53260
Southern	104918	233113	298098	122325	57340
Tygerberg	157084	414251	450234	45512	9529
Western	96657	192573	218930	143207	116850
Percentage	**34%**	**76%**	**87%**	**24%**	**13%**
Grand total	**1016444**	**2241562**	**2566286**	**709299**	**384574**

Thus without any change to the capacity of current facilities, 76% of the dependent population can be accommodated within system based on a 2.5km access distance, while 87 % can be served within 4km from their place of residence.

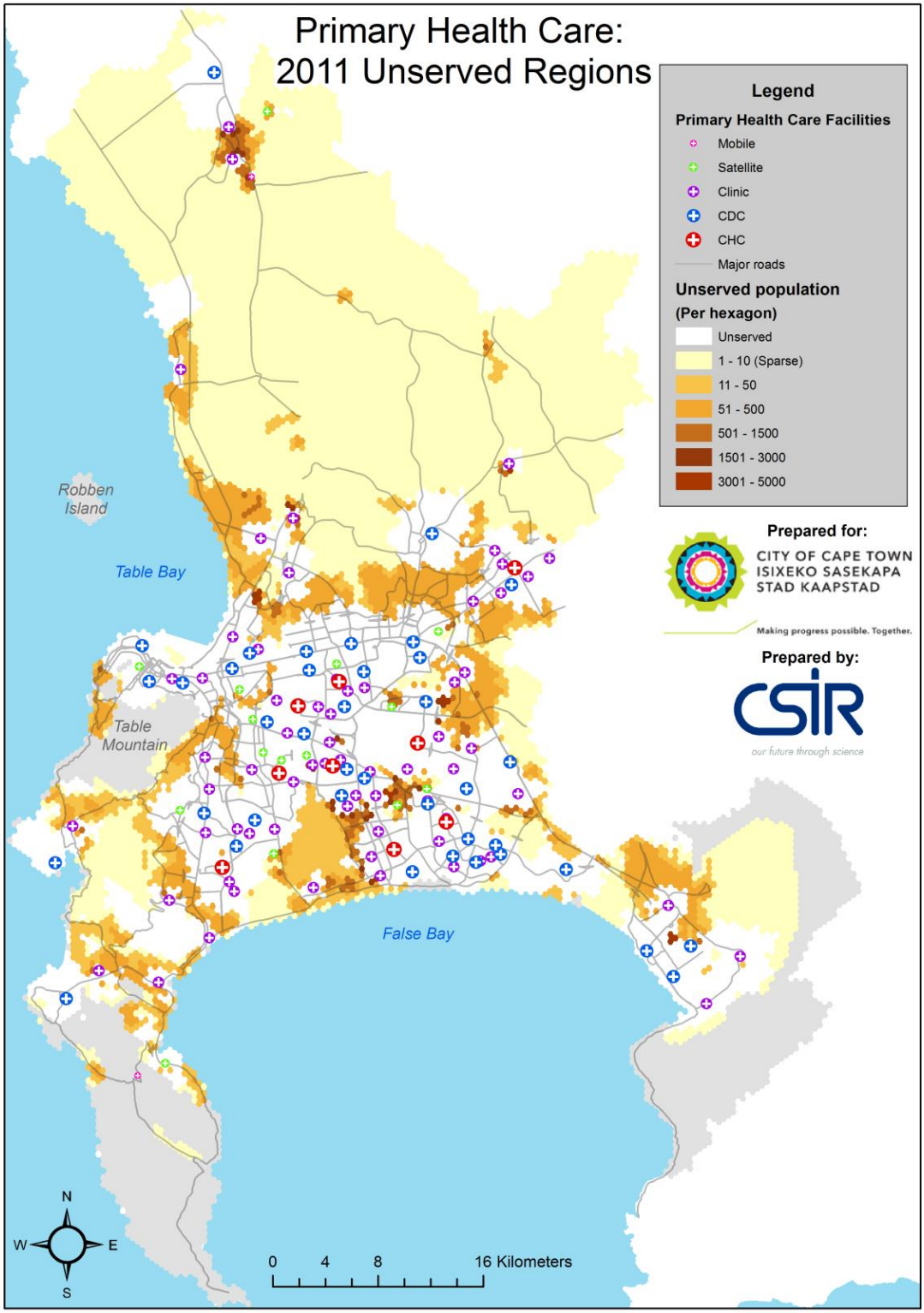


Figure 50: 13% unserved within 4km

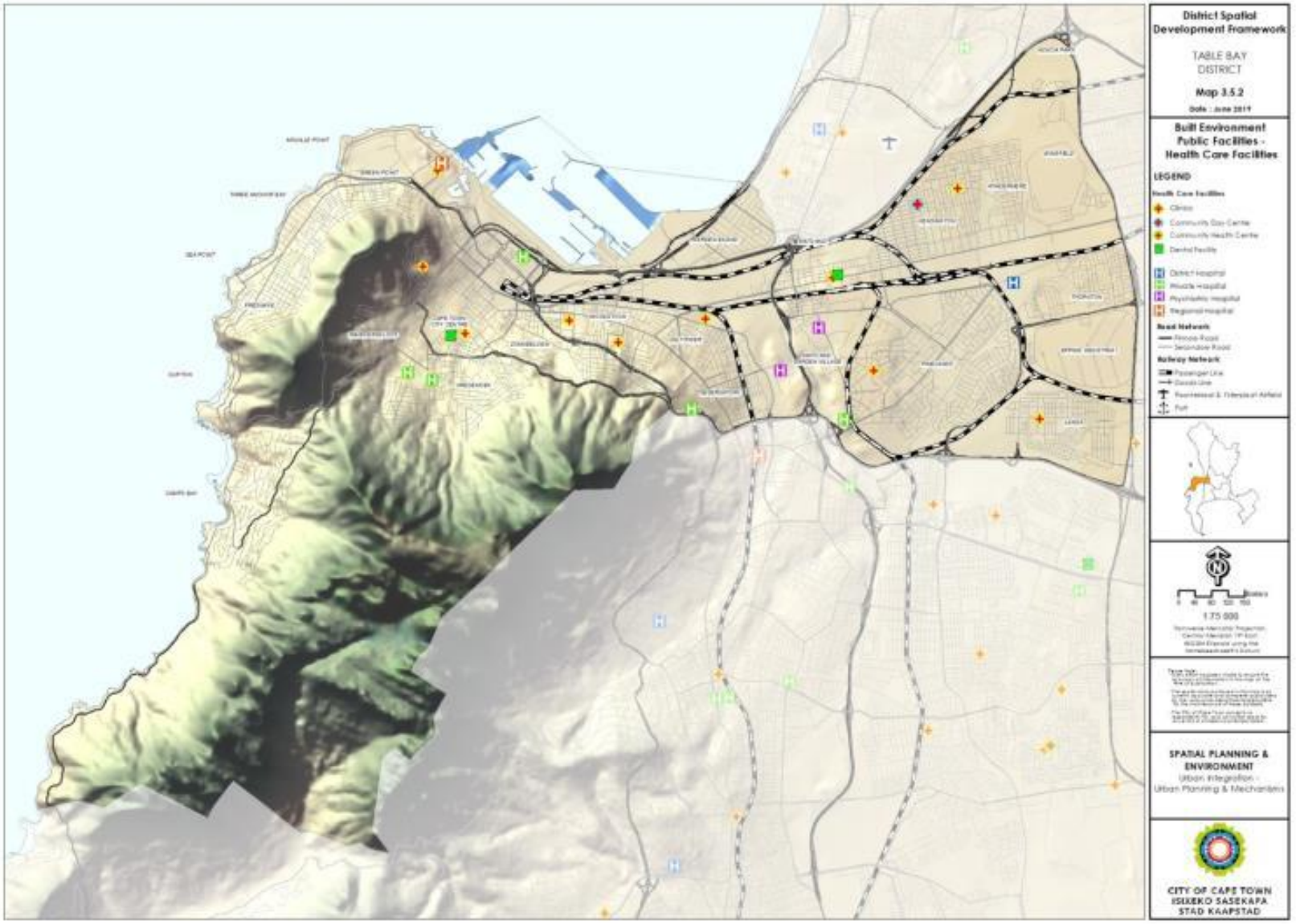


Figure 51: Map showing Health Care Facilities 2011

9.1.3 Community/Social Facilities

Municipal Halls

In 2011 the Table Bay District had approximately 15 municipal halls which included both Civic Centre and Multi-purpose centres.

The following key assumptions relating to this section were made:

- Demand: Entire population.
- Access distance: 5km.

Service capacity of each hall is related to hall grading as follows:

- Grade A = 60 000 people;
- Grade B = 30 000 people;
- Grade C = 20 000 people;
- Grade D = 15 000 people;
- Grade E = 10 000 people.

Table 9.4: Service Stats 2011: Distance and capacity constraints: within 5km & current supply

District	Served	Unserved	%Served	Total population
189 714	460	99.76%	190 173	189 714

Table 9.5 illustrates that the Table Bay District has sufficient supply of municipal halls across the district with nearly 100% of its population being served by municipal halls within a 5km distance. The potential for optimization of these facilities is a needed area of further investigation.

Fire Stations

There are four fire stations within the Table Bay District, namely Sea Point 3b, Roeland Street 4b, Salt River 5b and Epping 1b. The table below indicates the 2011 area and population served per fire station.

Table 9.5: 2011 area and population served per fire station

Station Name	Risk Category	Station #	Area served (ha)	Population served	% of population
EPPING	B	7973	5 520	328 164	8.96
ROELAND STREET	B	1810	1 660	31 311	0.85
SALT RIVER	B	8007	2 400	61 371	1.67
SEA POINT	B	8309	1 160	26 455	0.72

Epping Fire station serves the largest percentage of the population across a relatively small area when compared to the rest of the fire stations. This is generally due to the high population densities within the Epping fire station's service area. Other fire stations in the District serve areas with a high degree of land use diversity and density including the CBD and the areas of highest employment in the City.

Table 9.6 indicates Fire stations service statistics for 2011 at a metropolitan level. It shows that 89% of the metro area, representing 95% of the population, is served by fire stations.

Table 9.6: Fire stations: Service statistics 2011

Risk category	Area served (ha)	% Area served (ha)	Population served	% Population served	Area unserved (ha)	Population unserved
A- High	3800	51.91	22709	53.35	3520	19858
B- Moderate	280	100.00	5566	100.00		
C- Low	91460	93.96	3352266	98.09	5880	65274
D-Rural	111500	88.89	72427	98.52	13940	1088
E-Special	1280	27.95	29834	24.45	3300	92196
Total	**208320**	**88.66**	**3482803**	**95.13**	**26640**	**178417**

Libraries (Community and Regional)

In 2011 there were 11 Community and 2 Regional Libraries within the Table Bay District. Key assumptions regarding libraries (Community and Regional) include:

- The entire population of the City of Cape Town was deemed to be users of public library services;
- Larger facilities preferred up to a maximum of 120 000 thresholds per facility;
- Distance limit set at 5km maximum for Community and 10km for Regional Libraries; and
- All Regional facilities also serve as Community facilities but not *vice versa*.

Table 9.7: Community vs Regional libraries service coverage statistics

Type	Unserved	Served	% served	% served Metro	Total population
Community	7 947	160 801	95.29%	76.5%	168 748
Regional	17	186 893	99.99%	63%	186 910

Table 9.7 above provides and overview of the served and unserved in relation to the population. In 2011 the community libraries in the district served 95% of its population, this is higher than the metropolitan average of served population (76.50%). In terms of the population served by regional libraries, the Table Bay District performs significantly better than that of the metro as it has managed to serve more than 99% of its population, compared to 63%.

Figure 52 below encompasses all public and communal facilities in the city including: libraries, halls, community centres, post offices, magistrate courts, fire stations, police stations, municipal offices and cemeteries.

Figure 52: Map showing existing Community Facilities

9.1.4 Parks and Recreational Facilities

Sports facilities

Sports facilities are categorized into Municipal Multicode Sports Grounds and School Sports Grounds. The Table Bay District has approximately 79 hectares of sports facilities consisting of 11 municipal sports grounds and 39 School sports grounds.

The following assumptions have been made in this section:

- A maximum distance threshold of 10km was used in the analysis.
- School sports fields were also considered as additional supply.
- Only outdoor ball sports facilities were analysed.
- 0.2ha/1 000 people for formal ball sports facilities to provide sufficient facilities to meet the needs of residents was used in the final analysis
- Excluded: Pools, single code facilities (e.g. tennis & bowling greens) even though part of the 0.2ha/ 1 000 people provision standard.

Supply of existing sports grounds

Table 9.8 below provides an indication of the number of sports grounds that is located within the Table Bay District in comparison to the metro total. It should be noted that the population figures used was as per the Census 2011 data.

Table 9.8: Sports Grounds

	Municipal Multicode Sports Grounds		School Sports Fields		Municipal + Schools
Area	**No of grounds**	**Total size (ha)**	**No of fields (at schools)**	**Total size (ha)**	**Total hectares available**
Table Bay	11	48	39	31	79
City of Cape Town	147	921	445	434.84	1356

Table 9.9 provides an overview of the size of sportsgrounds in the Table Bay area in relation to the number of people that are being served by them. The Table Bays District is well served with multi code facilities meeting standards for facility provision.

Table 9.9: Supply of total sports Facilities

Planning District	Total population	Total Sports Facilities Supply in Hectares (Municipal & School)	Total Supply- People Equivalent (Municipal & School)	Total Supply- People Equivalent (Municipal Only)
Table Bay	164 444	79	395 000	240 000
City of Cape Town	3740025	1356	6 780 000	4 605 000

Travel Distance statistics

Table 9.10 provides an overview of the accessibility of Sports Fields as reflected in 2011 in relation to the number of the population. It can be seen that approximately 83% of the population are located within 2km of a municipal sport ground and approximately 89% of the population are located within 2km of a school sport ground. Thus it can be deduced that the majority of the population within the Table Bay district are within close proximity (2km radius) of sport grounds.

Table 9.10: Travel distance based on capacity and distance constraints

Type	0-1km	1-2km	2-5km	5-10km	Total
Population served by MMSG	302 048 (41.9%)	294 860(40.9%)	122 215(16.9%)	770(0.1%)	719 894(100%)
Population served by school sports fields	606 868 (84.2%)	30 923(4.3%)	30 741(4.3%)	51 362(7.1%)	719 894(100%)

9.1.5 Parks - Community & District Parks

In 2011 the Table Bay District had approximately 164 community parks and 4 District Parks.

The following key assumptions were made:

- Parks include: Developed open space (hard and soft spaces).
- Excluded any facilities with entrance fees.
- Excluded nature reserves (but may include specific picnic areas within reserves).
- Provision standards applied:
  - 0.35ha / 1 000 people for Community Parks at 1.5km access distance; and
  - 0.15ha / 1 000 people for District Parks at 20km access distance.

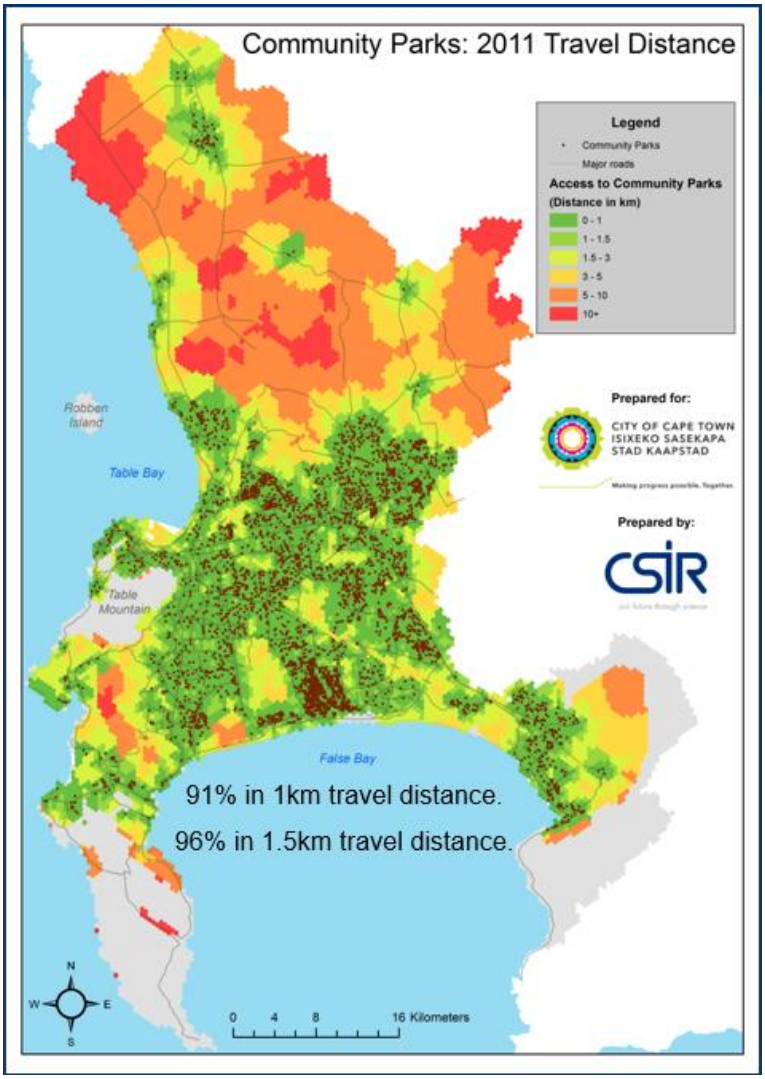


Figure 53: 2011 travel distance to Community Park

The figure shows that at a metro level there was good access to parks in 2011 with 90% of the City's population being within 1.5km of a Community Park. However, when taking into consideration the provision ratio of Community Parks, the service coverage of Parks was at 61% of the population for the 2011.

Areas of unserved population are thus evidence of a lack of Park capacity to serve local demand and not access distance.

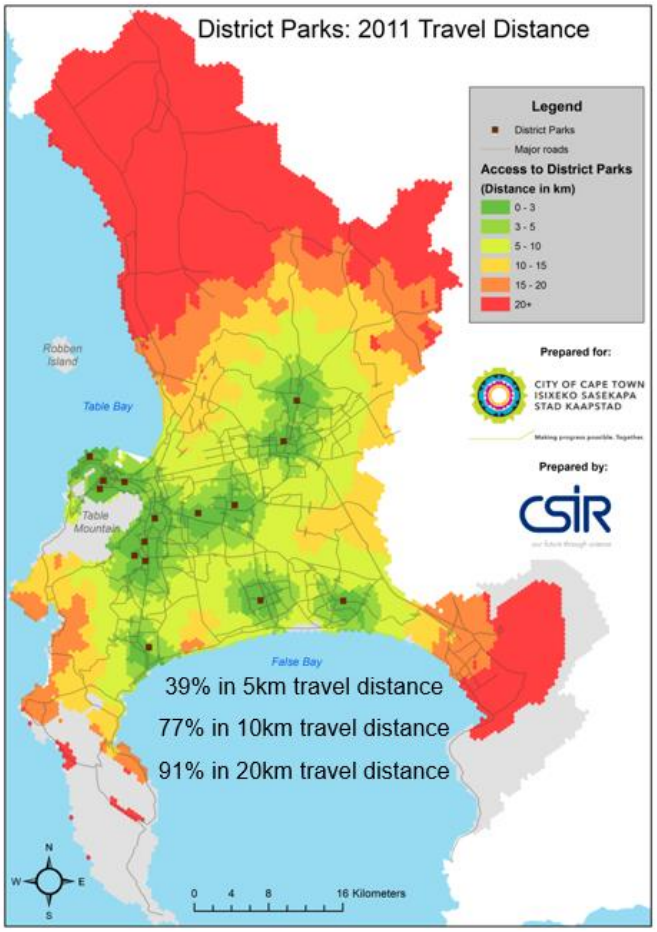


Figure 54: District Park travel Distance

According to the travel Distance Map, Figure 54 it can be deduced that the there is a relatively good spread of District Parks as most residents (90%) are within the travel distance standard of 20km, except for Atlantis and the Helderberg District.

Although at a city level there is overall sufficient developed District Park space, the service coverage statistics at a district level have shown that the Khayelitsha / Mitchells Plain areas are poorly served (12% in 2011 and 10% in 2032) when considering the provision ratio of District Parks.

What this means is that although the city has sufficient developed District Park space there is a spatial mismatch of supply and demand rather than an actual undersupply of District Park space, i.e. not in line with density patterns.

Table 9.11 below indicates the service coverage statistics for 2011. It can be seen that community parks served approximately 74% of the population and the 4 district park served 85% of the district's population. This is well above the standards for access and the City averages. The quality and management of these parks has an impact on their usability by the District population. In general, there are a number of well-managed, high quality parks in the District providing a range of services and passive and active recreational amenity supporting recreational opportunities for tourists and locals. These assets need to be maintained.

Table 9.11: Table Bay Service Coverage statistics- community parks (2011)

District	Unserved	Served	%Served	Total population
Community Parks	47 278	133 490	73.85%	180 768
District parks	33 402	202 158	85.82%	235 560

These encompass all parks and sports facilities in the district.

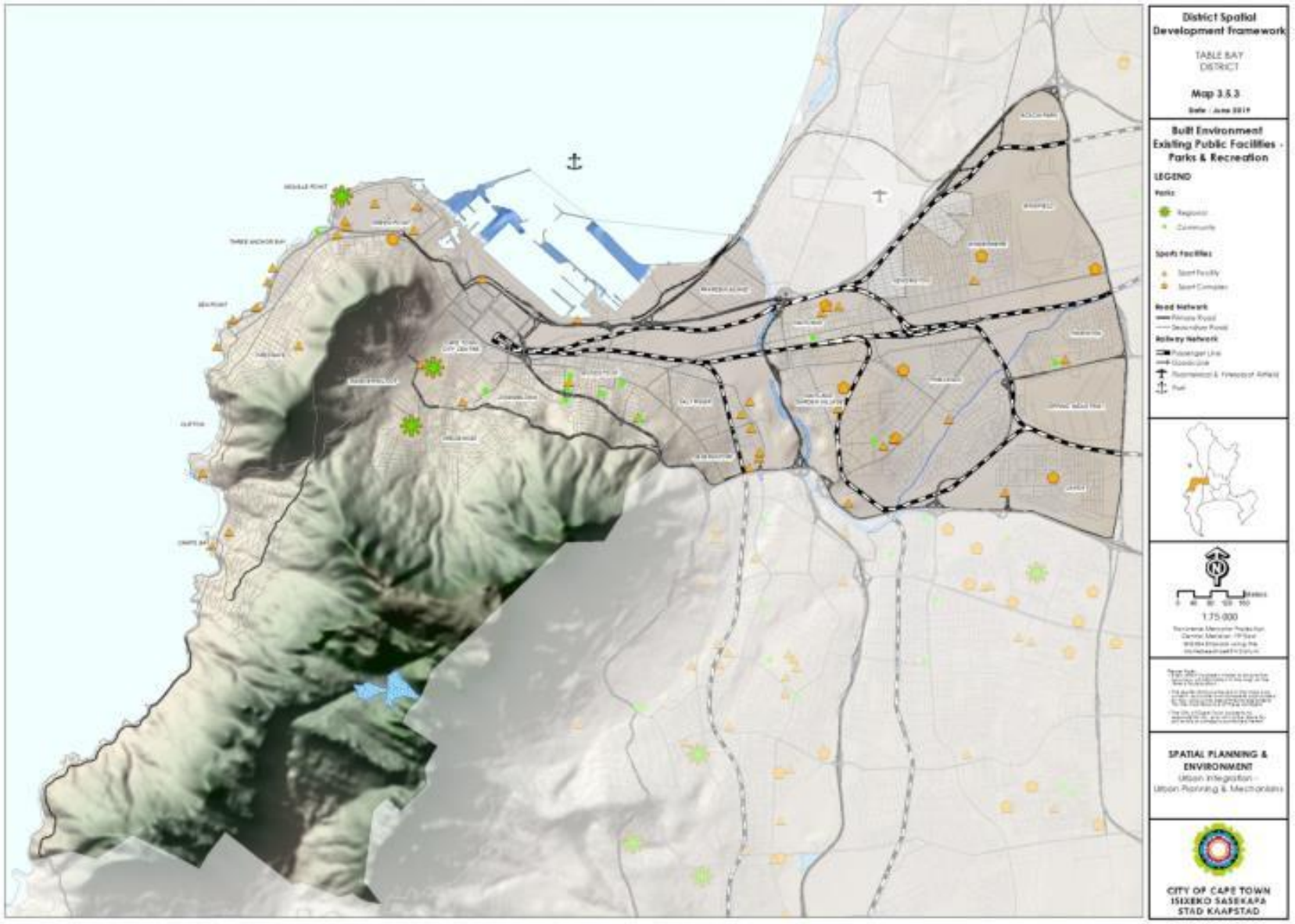


Figure 55: Map showing existing Parks and Facilities

9.2 Key Observations

The Table Bay District is generally well served with a range of private and public community facilities, with several regional facilities with capacity to serve a wider population than is living in the District. Maintaining and enabling access to the District and managing congestion is therefore crucial as facilities such as Groote Schuur will need to be accessed by communities living a distance away.

Maintenance of existing facilities is key both to maintain their amenity for existing communities and for economic development, parks and sports grounds create opportunities for economic development on their edges. Several of the parks in the District are a key component of the tourist economy, which needs to be maintained and provide consistency in order to maintain a flow of increasingly frequent repeat visitors.

It is crucial to investigate the feasibility of new uses for obsolete or underutilised public facilities. Public land for affordable housing is in high demand in the District, single use facilities may better serve communities if transitioned to multi-purpose facilities. Alternatively, high land values present opportunities to generate revenue to invest in spatial transformation projects.

Improvements to health care facilities are needed where population growth has increased demand, as is the case in Langa. Langa also requires investment in community park facilities.

Existing health care facilities may need to be optimised or rehabilitated in Green Point and Observatory at the Groote Schuur hospital complex.

As new housing is developed, social facilities planning will need to be revised to ensure it caters to the growing population. Human settlements reservations in Wingfield will have to be accompanied with appropriate social facilities provision.

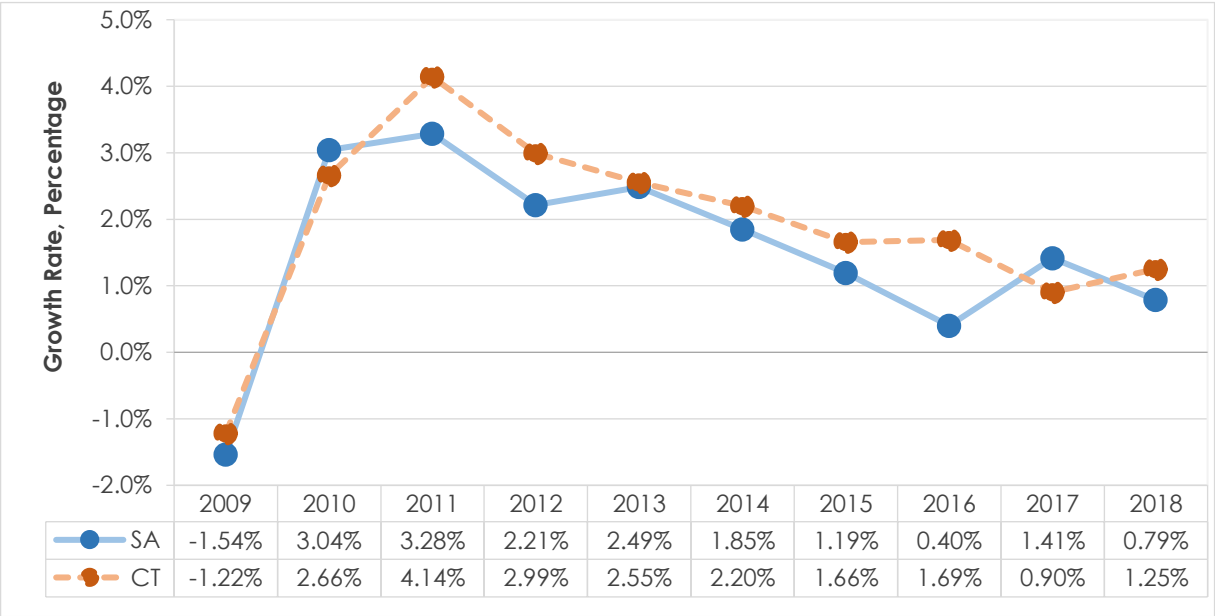
Cemetery land has sterilized a substantial proportion of strategic land in the District along the Voortrekker road corridor and represents a constraint.

D. STATE OF THE ECONOMY AND PROPERTY MARKET

10 THE ECONOMY

10.1 Macro-Economic Factors

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



	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 56: Average annual Gross Domestic Product (GDP) growth, South Africa vs. Cape Town for 2009 to 2018

(Source: IHS Markit, 2019).

Economic activity in Cape Town largely mirrors trends at the national level though often exceeding the performance of the national GDP. Deviations in these trends are observed since 2016; which may be attributable to the recent drought conditions faced in the region. Between the year 2009 and 2018, Cape Town's real GDP growth averaged 2.1%, outperforming South Africa's average Real GDP growth of 1.67%, however both still reflecting an overall downward trend.

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

Although Cape Town's office vacancy rate has remained the lowest among the five largest municipalities[8] (SAPOA, 2018) over the past five years, the negative effects of recent political and economic events have, nevertheless, damaged consumer and investor confidence. This has impacted negatively on an otherwise resilient office vacancy rate and caused a moderate decline in the city's rental growth rate.

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

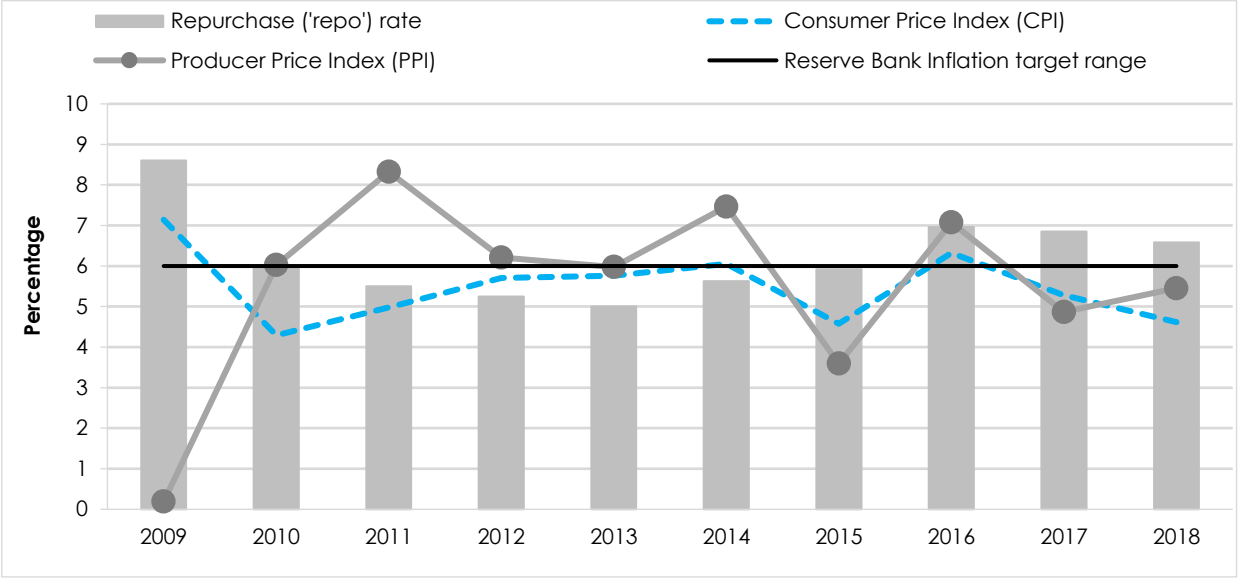


Figure 57: CPI and PPI trends in South Africa, 2009 to 2018

(Source: CPI and PPI extracted from Statistics South Africa, 2018-2019, and repurchase rate extracted from SARB, 2018-2019).

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

In Figure 57 above, it can be observed that inflation (6.33%) exceeded the upper limit of the target in 2016. This upward trend could largely be explained by the price increases in housing rentals, recreation and cultural activities. In response to the increase in inflation in 2016, the Reserve Bank increased the repo rate to 7%. While the rate has been adjusted downward since 2016, in response to lower levels of inflation, the repo rate (and, by extension, the prime lending rate) has remained significantly higher than in the 2010 -2015 period. As a result, property buyers have found it costlier to take out mortgage bonds between 2016 and 2018 than in the five-year period preceding that. Together with low levels of consumer confidence, this has resulted in dampened activity in the property market.

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

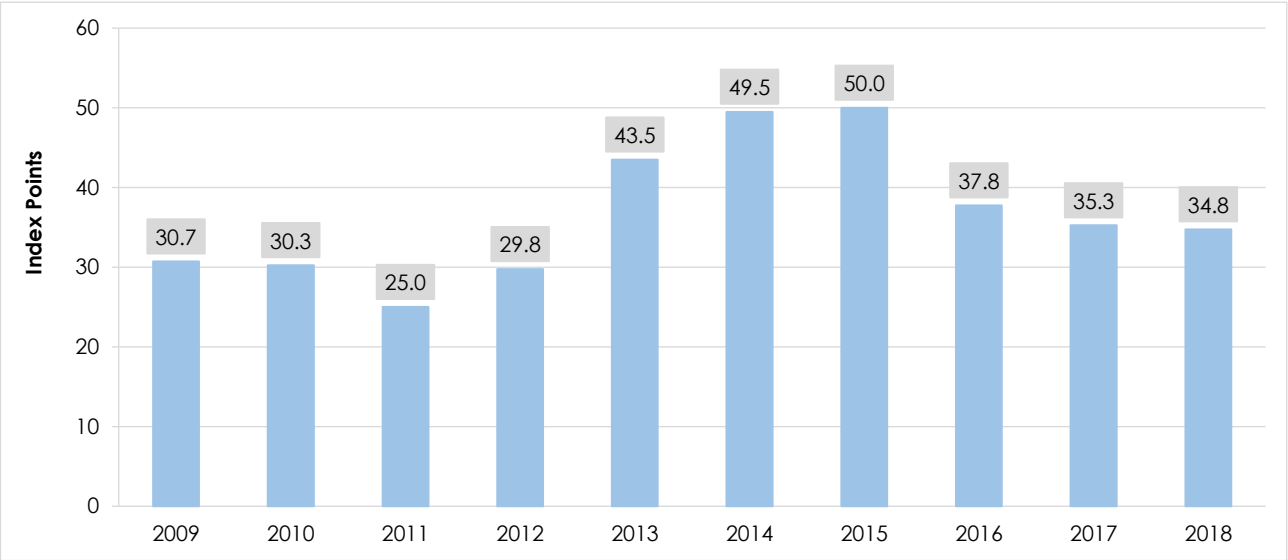


Figure 58: Building Confidence Index (BCI), 2009 to 2018

Source: Bureau for Economic Research (BER), 2018, FNB/BER Building Confidence Index, 2018.

Figure 58 shows the First National Bank (FNB)/BER composite building confidence index for the 10-year period from 2009 to 2018. The Building confidence index records the percentage of architects, quantity surveyors, and contractors and manufacturers of building material, who are either satisfied with or wary of the prevailing business conditions (BER, 2018).

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

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

10.2 Property Market

Figure 59 below, displays the total floor area of new office building space and new industrial building space added to building stock, against the observed variations in the office and industrial vacancy rates, from 2015 to 2018. There is generally, although not exclusively, a positive relationship between building completions and vacancy rates.

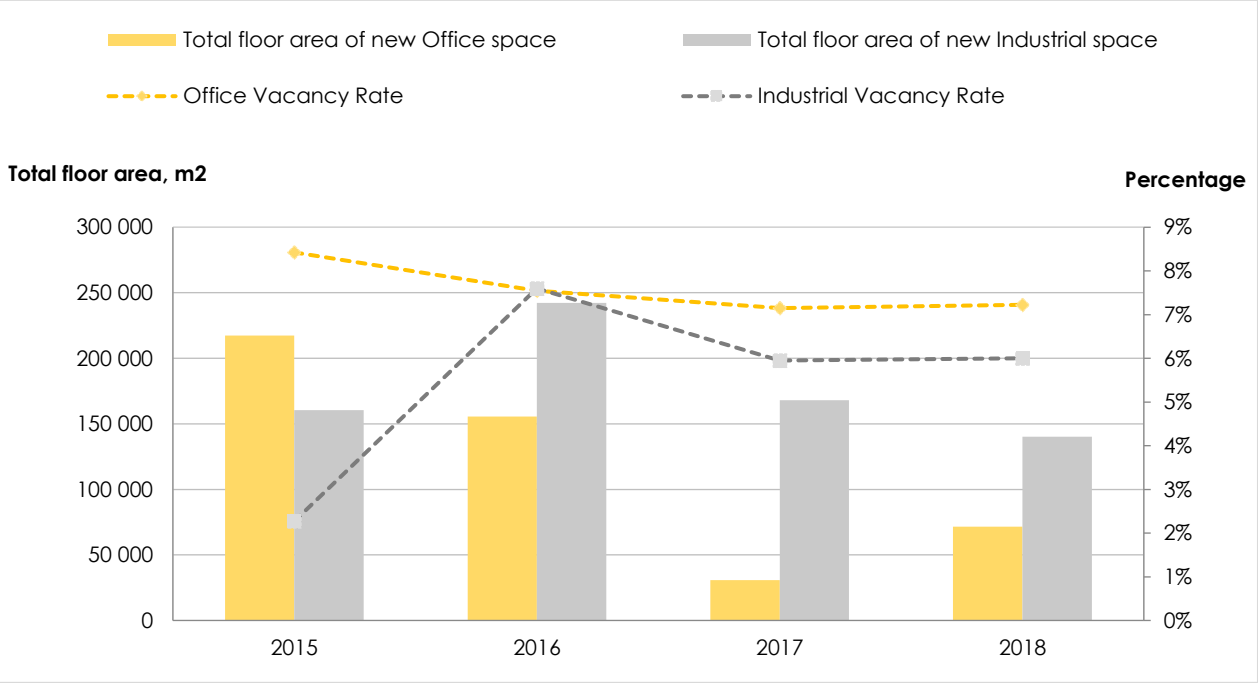


Figure 59: Cape Town's new building completions and vacancy rates for Office and Industrial space, 2009 to 2018
Source: Transport Business Support Department; South African Property Owners Association (SAPOA), 2019.

The total floor area of new Industrial space increased by 51% to reach a high of 242 394 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[9] (SAPOA, 2018), however the slowdown in the office-to-residential conversion, which has assisted in reducing office vacancies in Cape Town may reveal the weak demand for office space (JLL, 2018). The figure above shows that the vacancy rate begins to decline as new office building completions decreased (with 2018 as the exception). A significant drop in building completions (80%) was recorded for 2017; which may be largely attributed to the negative effects of the drought, as the water prices spiked making construction of buildings more expensive.

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

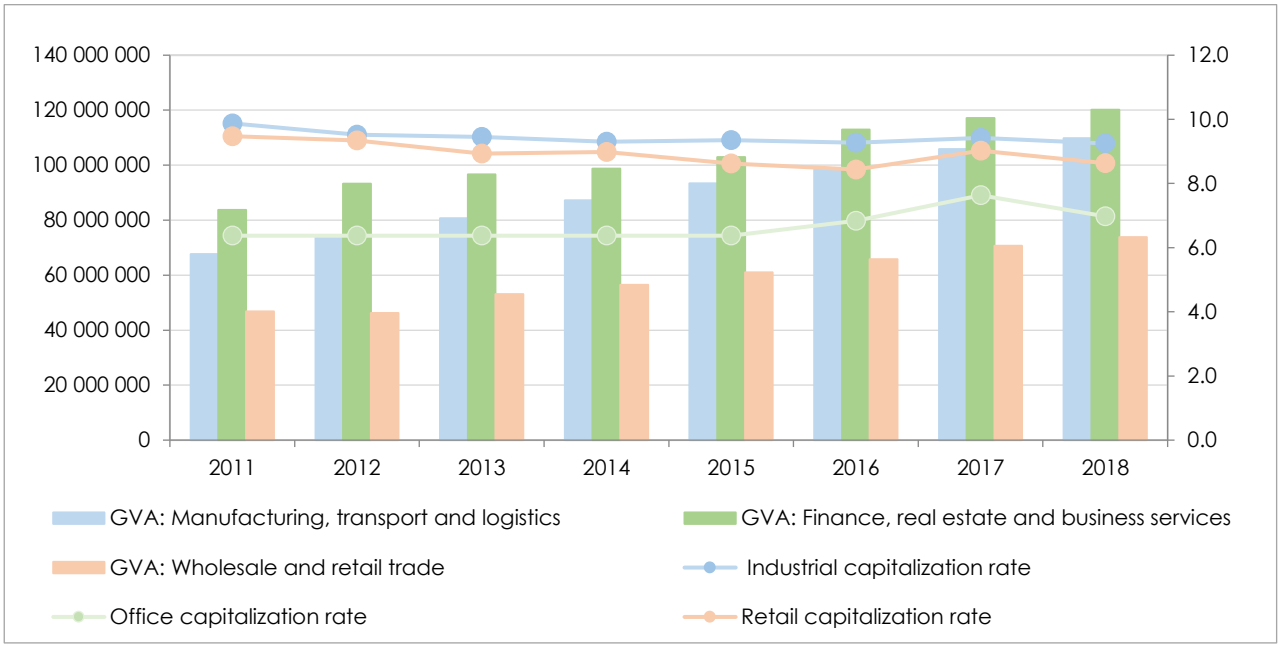


Figure 60: Cape Town's Gross Value Added (GVA) and Capitalisation rate, 2011 to 2018

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

Figure 60 shows the industrial, office and retail capitalization rates as well as the Gross Value Added (GVA) for the finance and business services sector; manufacturing, logistics and transport as well as whole sale and retail trade. The Gross Value Added (GVA) for industrial, office and retail space all followed a steady, though decelerating, and upward trend from 2011 to 2018.

A cap rate is one type of measurement used in evaluating an investment, indicating **risk** and the **potential rate of return** for a prospective property. A low cap rates imply lower risk, higher value and a high cap rates imply higher risk, lower value. In Figure 60 the capitalisation rates for office, industrial and retail property in Cape Town follow a similar trend between 2011-2015. From 2016 – 2017 the cap rates for all sub-segments increased despite a momentary upturn in 2017. The increase in 2017 may largely be explained by stagnating property prices, a consequence of Cape Town's water crises and the credit ratings downgrade.

10.3.1 Economic Characteristics

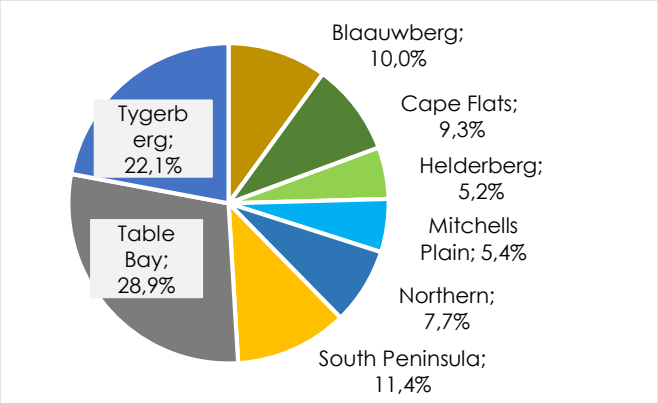


Figure 61: Gross geographic product (GGP) contributions at current prices, 2018 (IHS Markit, 2019).

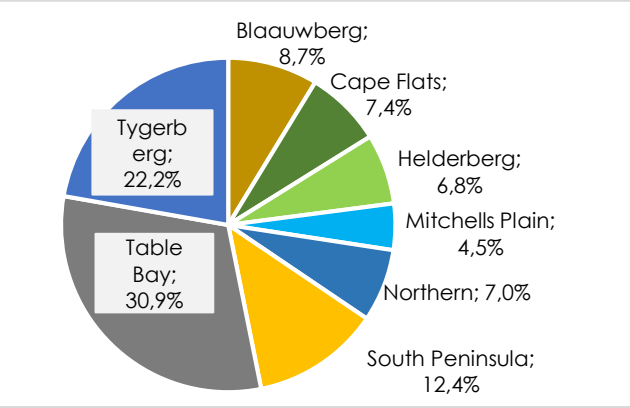


Figure 62: Employment contributions, 2018 (IHS Markit, 2019).

The largest contributor to the gross geographic product (GGP) at current prices for Cape Town in 2018 was the Table Bay district (28.9%), brought about by the intense concentration of business and commercial activities in the City. This area also comprises of the main tourist areas of the city such as the CBD, the City Bowl and the Atlantic Seaboard as well as the significant economic infrastructure of the port, the Cape Town International Convention Centre and the V&A Waterfront. Tygerberg district, with a share of 22.1%, was the second largest district economy in 2018 and is largely dominated by finance, insurance, real estate and business services.

Table Bay is also the top District in terms of employment at 30,9%, followed by Tygerberg (22,2%), and the South Peninsula (12,4%). The Mitchells Plain district had the lowest employment share at 4,5% (71 800 jobs) in 2018. This higlights the lack of employment opportunities as a result of low economic activity occuring within the metro south east and contributing to the high volumes of commuters from this area.

10.3.1.1 Economic Performance

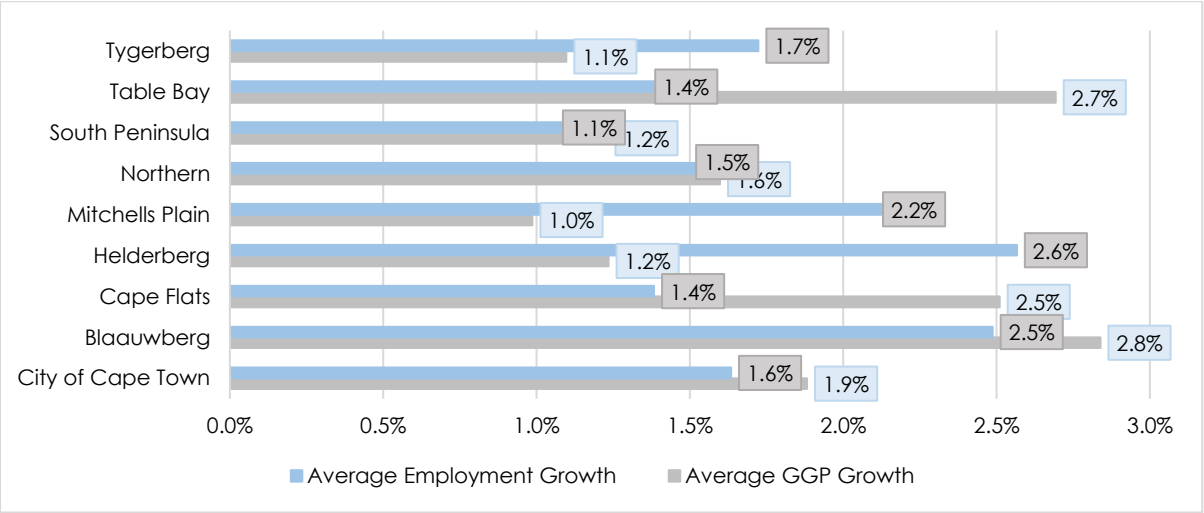


Figure 63: Average annual economic growth rates, 2009 to 2018 (source: IHS Markit, 2019).

The Table Bay economy not only remains the largest contributor to economic performance, the economic growth of 2.7% a year well outpaces the metro average of 1.9% a year. Other Districts are growing in their economic contribution; despite being one of the smallest contributors to GGP, the area which recorded the fastest rate of economic growth in Cape Town between 2009 and 2018 was the Blaauwberg district (2.8%). 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% over the ten-year period, lower that the Metro average. The Table Bay Districts employment growth of roughly 1.5% is lower than other Districts, but comes off a higher base employment level.

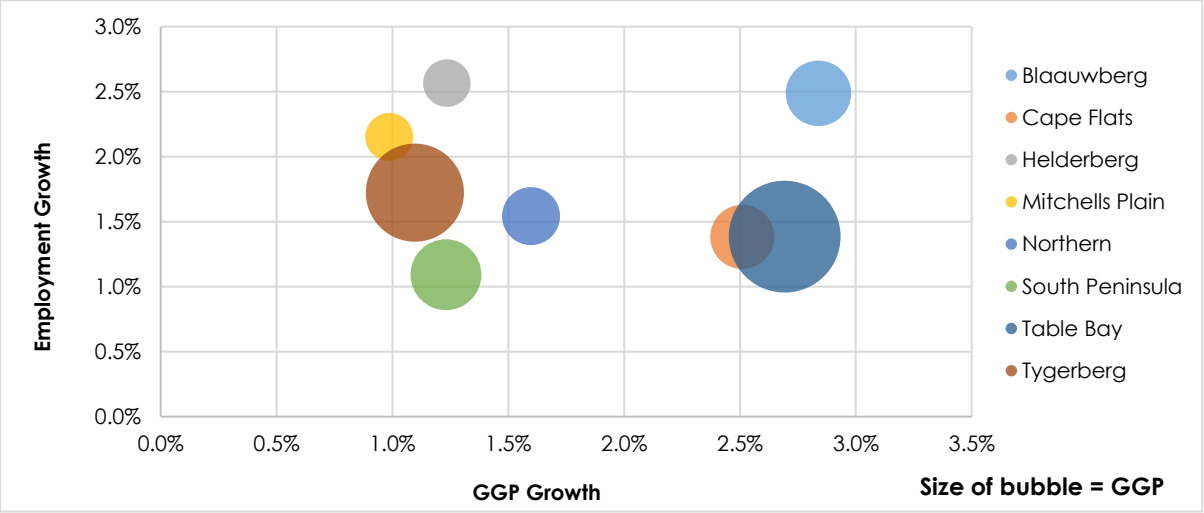


Figure 64: Performance comparison, 2018 (source: IHS Markit, 2019).]

Figure 63 plots the average annual economic growth over 10 years on the horizontal axis and average employment growth on the vertical axis. The size of the bubble is the relative size of the economy as measured by gross geographic product in 2018. The strong economic contribution and steady growth of employment and economic contribution signifies the importance of the District as a Commercial hub of Cape Town.

10.3.2 Sectoral trends

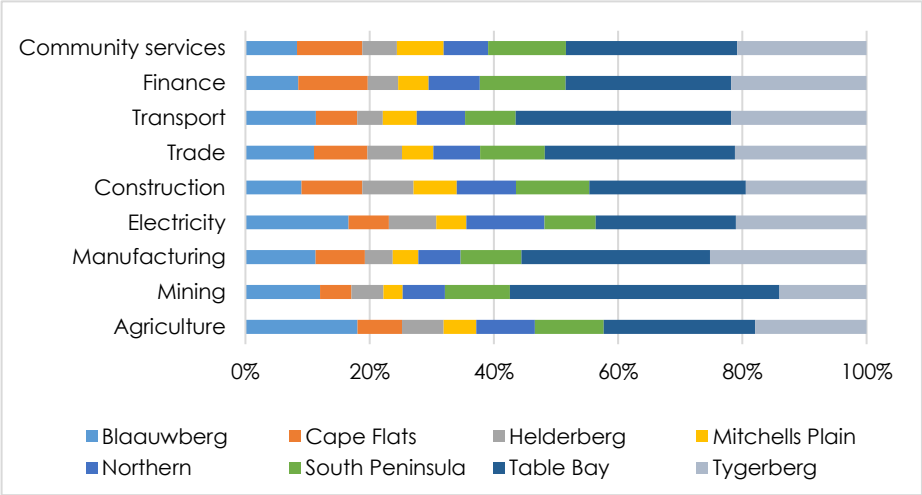


Figure 66: Gross Value Added (GVA) contribution by sector, 2018 (IHS Markit, 2019).

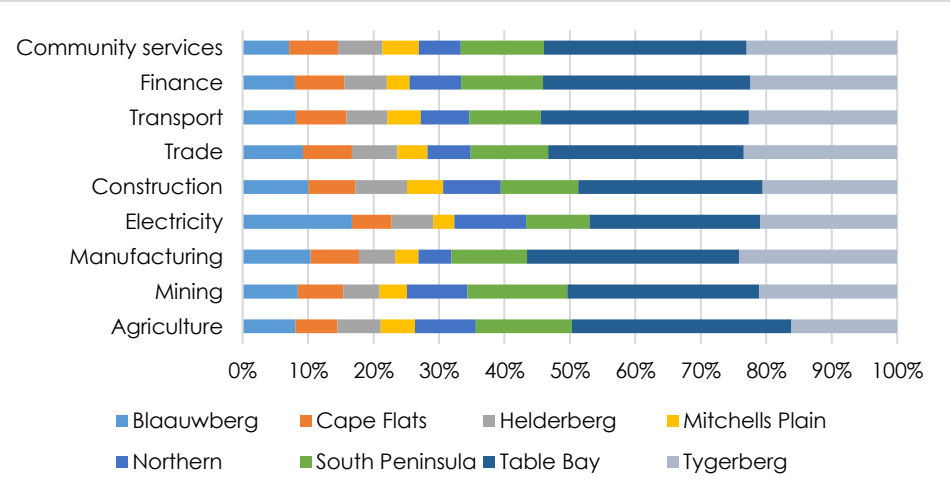


Figure 65: Employment contribution to Cape Town, 2018 (IHS Markit, 2019).

From the figures above, it is clear that Table Bay district is the main contributor to the total gross value added (GVA) of most sectors in Cape Town, followed by Tygerberg district. Table Bay district's contribution is especially pronounced in the transport (34.7%) and trade sectors (30.6%) – this is as a result of the district containing the city's port and also because it functions as the main retail hub in the city.[10] The tourism sector cuts across both the transport, trade and services economic sectors and is a strong contributor to the District, while it is difficult to quantify the size of the tourism sector in the District, spatial planning has a significant impact on the tourism sector as tourists are attracted to location factors and the likelihood of attracting future visitors is either enhanced or detracted by the ease of navigating the environment.

While Table Bay is the largest contributor to agricultural output (including fishing) in the city this is likely due to the head office effect. Employment trends, for the most part mirror the output trends, although Tygerberg district is seemingly more labour intensive (contributing more to employment than GVA) than Table Bay district. Mitchells Plain showed the lowest contribution to Cape Town's GVA across most sectors, largely attributable to this area's economy being highly reliant on the community services sector (public sector).

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

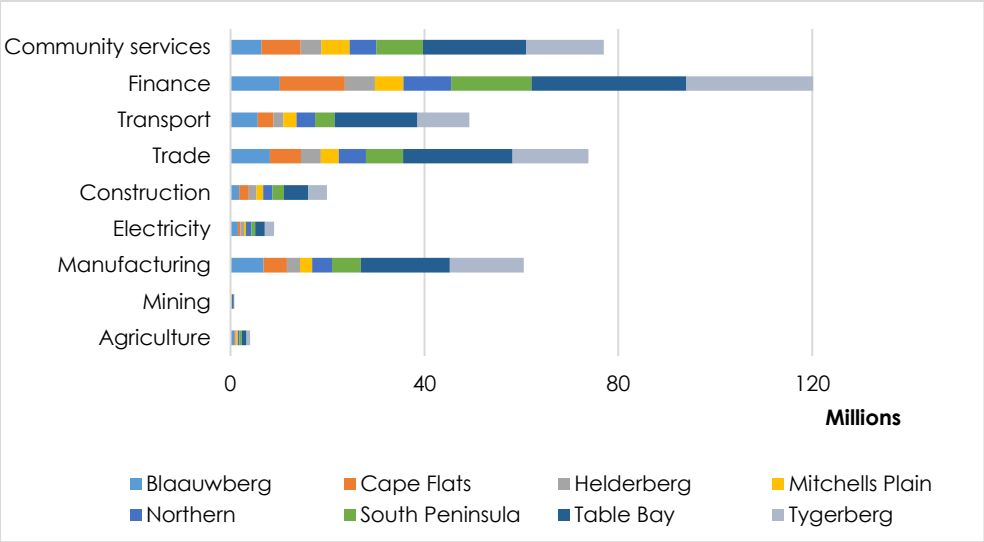


Figure 68: Gross Value Added (GVA) size by sector, 2018

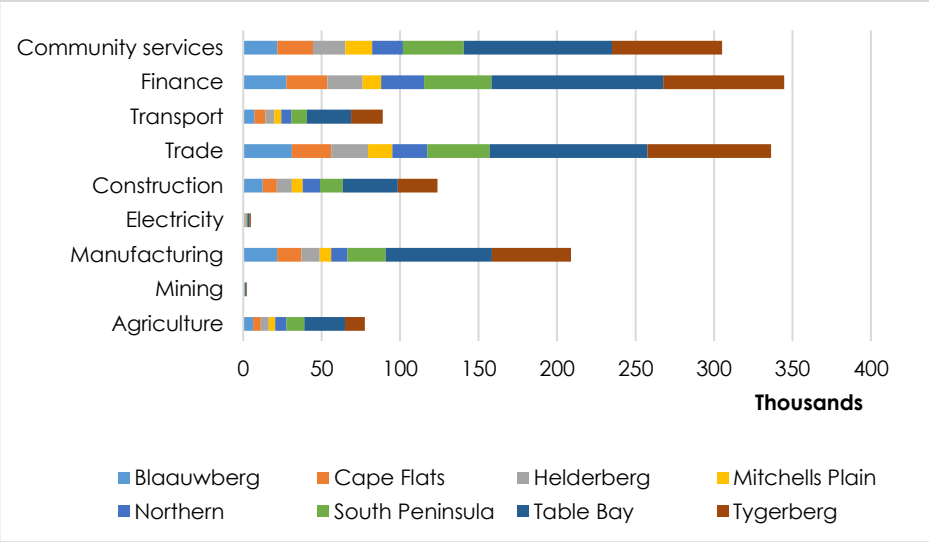
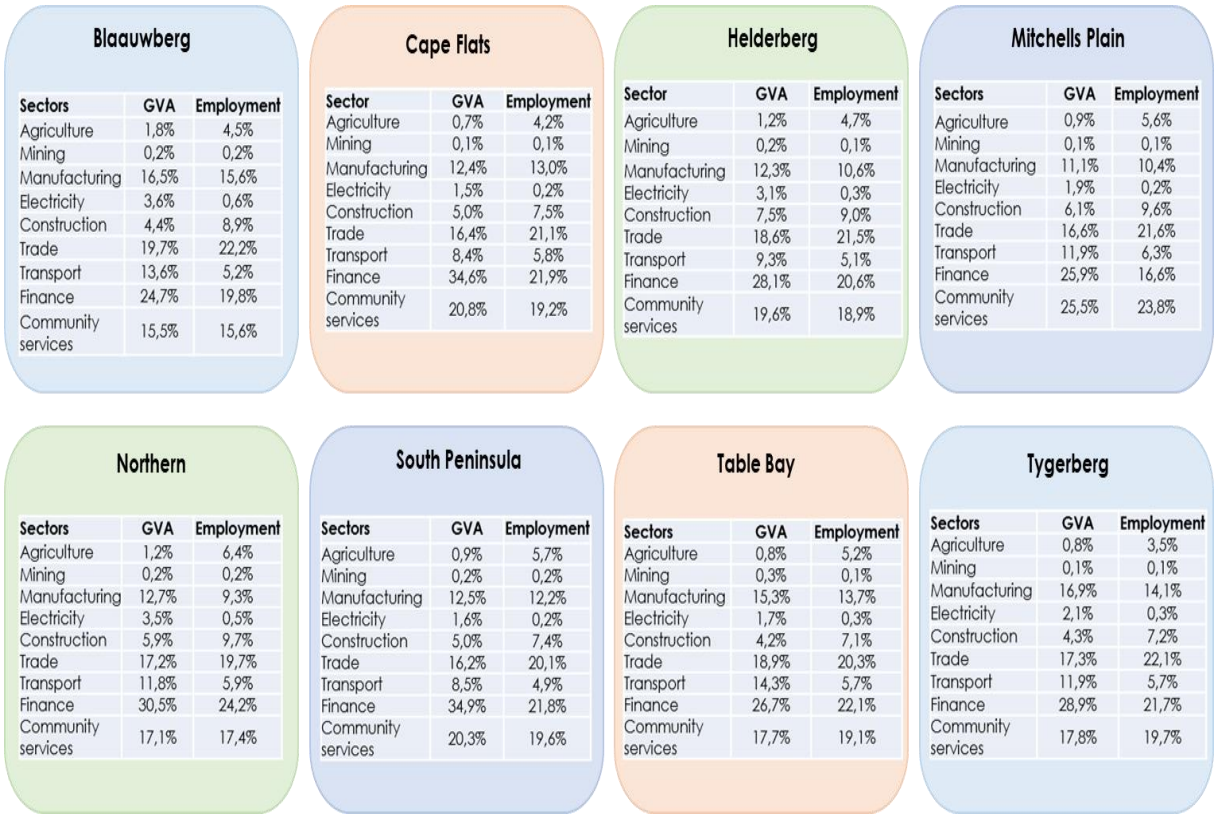


Figure 67: Total employment by sector, 2018

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 69: Gross Value Added (GVA) and Employment contributions, 2018 (IHS Markit, 2019)

Figure 69 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 69 that the smaller district economies (Cape Flats, Mitchell's Plain) tend to be less diversified than the larger district economies: with proportionally less contribution from the manufacturing sector and greater reliance on community services[11]. The Table Bay Districts economy is diverse, but focused and strongly on the Finance Sector, Trade, Community Services and Manufacturing.

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

Table 10.1: Top Five sectors by location quotient in each district (detailed SIC)[12], 2018

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

Source: IHS Markit, 2019.

While analysis of broad sectoral trends is useful, it can be aggregated in order to adequately understand the nuances of a regional economy. As such, Table 2

[12] Sectors with a gross value added (GVA) share of 0.5% to Cape Town's economy were excluded from the ranking of sectors by location quotient.

undertakes a location quotient analysis utilizing the more detailed 2-digit Standard Industrial Classification (SIC) codes. By comparing the relative share constituted by an industry in the respective district economies to its share in the city-wide economy, location quotient analysis provides an indication of the relative importance of industries to the district economy as compared to the Cape Town economy as a whole. The table ranks the top five industries by location quotient.

It is important to note that having the highest LQ does not necessarily mean an industry is the largest contributor to the district economy nor that it is most strongly represented in that district. Caution should also be exercised when considering non-tradable sectors within small economies. For instance, the fact that Education has the highest location quotient in Mitchell's Plain and Cape Flats is more a reflection of the weak economy in those areas rather than an indicator of them having a comparative advantage in Education.

10.3.3 Development Indicators

Table 10.2: Human Development Index (HDI)[13] - 2009, 2014 and 2018

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

Source: IHS Markit, 2019.

The HDI is a composite indicator reflecting education levels, health, and income. The HDI ranges from 0 (no human development) to 1 (high level of human development) (United Nations, 2018). 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, largely due to income gaps and location which limits access to opportunities.

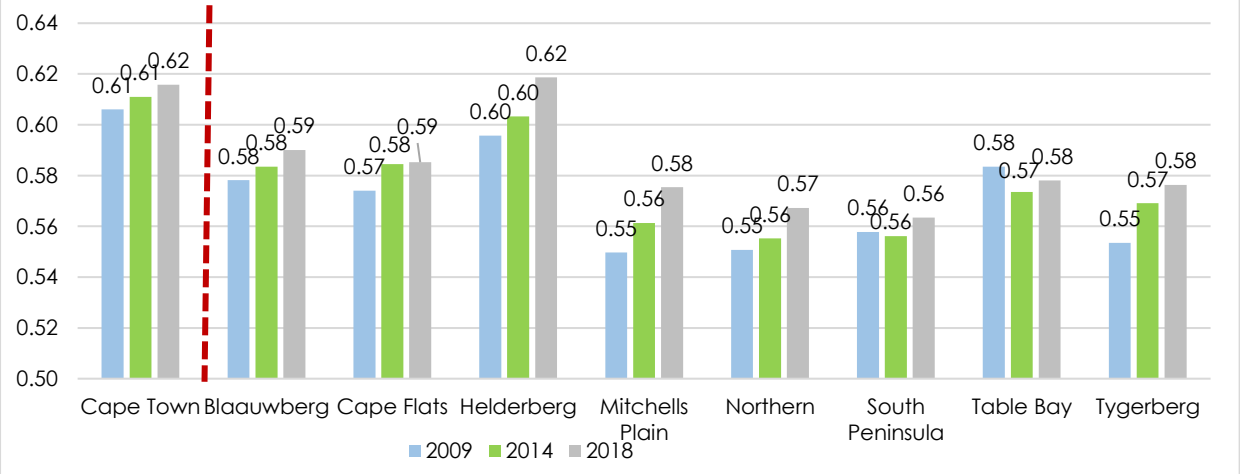


Figure 70 : Gini coefficient - 2009, 2014 and 2018

Source: 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 056 and Helderberg had the highest at 0.62. However, it is concerning to observe an increase in income inequality throughout the districts, mirroring the Metro's

[13] According to the United Nations (2018), there are four human development groups which are very high human development (0,800 and above); high human development (0,700 – 0,799); medium human development (0,550 – 0,699) and low human development (below 0,550).

trend. This shows that income inequality is still a major challenge within the City of Cape Town.

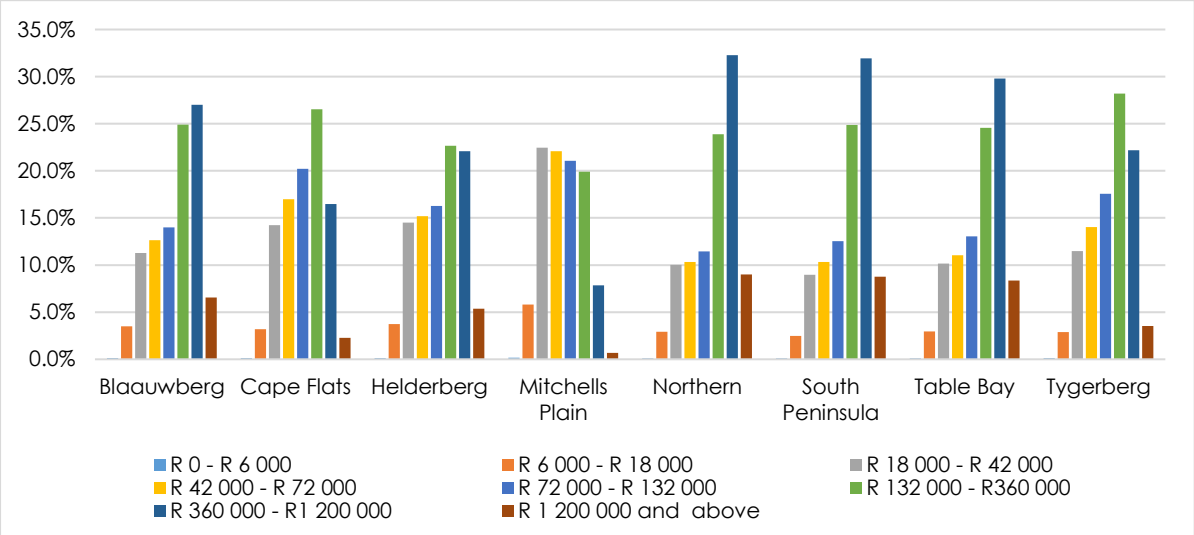


Figure 71 : Number of households by income category, 2018 (Source: IHS Markit, 2019.)

In total, there are 1 302 946 households in Cape Town and a majority of them are situated in Khayelitsha/Mitchells Plain (30.9%) followed by Tygerberg (17.6%). Mitchells Plain is predominantly a residential area; thus it is no surprise it has the highest number of households.

A majority of the population in the Table Bay District has an annual household income above 132 000, and nearly 30% with an income between R360 000 and R1 200 000 a year.

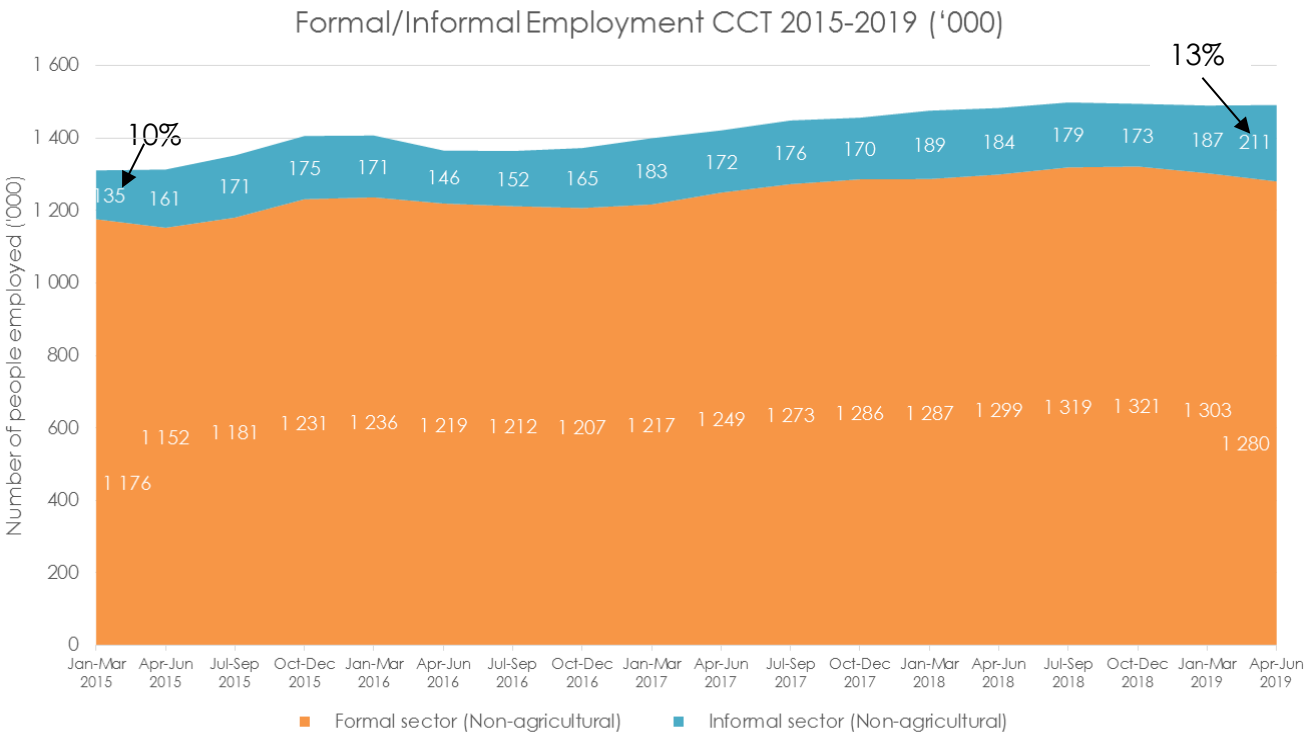
10.3.4 The Informal Economy

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.

10.3.4.1 Size of Informal Economy

Statistics South Africa estimates that 220 000 people were employed in the informal sector in Cape Town in the second quarter of 2019. This constituted 13.3 % of Cape Town's workforce, a significant amount.[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.

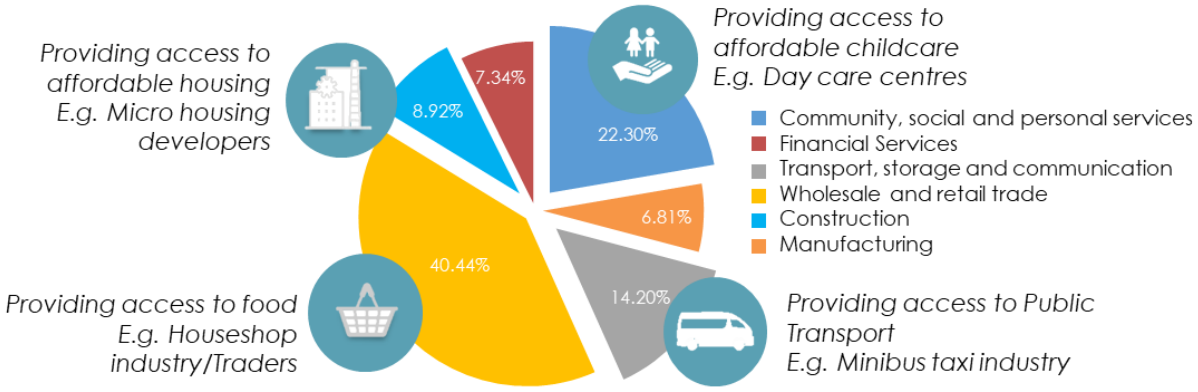


[14] StatsSA, 2019, Quarterly Labour Force Survey
[15] GHS 2013

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



10.3.5 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,

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

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

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

A capitalisation rate (Cap rate) is one type of measurement used in evaluating market performance and the viability of property investment in an area by indicating **risk** and the **potential rate of return** for a spatial area. The cap rate is the ratio of stabilised annual net operating income to purchase price. Thus, it measures income after deduction for 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, higher value and a high cap rate implies higher risk, lower value. 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; you can include rent for parking and other factors
- **Net operating income (NOI):** This is the annual income generated by an income-producing property after deducting all operating expenses
- **Operating expenses:** Expenses needed to 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 and is typically used in multi-unit properties
- **Growth**
- **Operating expenses:** Expenses needed to operate the property which includes property taxes, rental property insurance, management fees, repairs, maintenance and miscellaneous things like accounting and legal fees
- **Supply vs. demand:** This is how many properties are available in the area and, typically, the lower the inventory, the higher the demand, which tends to lead to properties with lower cap rates
- **Property type/Asset class:** This is the type of property such as multifamily, apartment building, industrial or commercial property and 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.

Figure 73 below depicts the average capitalisation in Table Bay

Table 11.1: 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	10.2%	R5.93	R31.34	3.5%
	2015	9.5%	R7.50	R41.01	5.8%
	2018	9.1%	R13.64	R107.67	5.3%
Retail	2012	10.4%	R13.79	R81.19	3.5%
	2015	9.3%	R17.63	R87.29	5.0%
	2018	9.9%	R38.18	R251.54	5.3%
Office	2012	10.9%	R17.45	R67.51	5.0%
	2015	10.3%	R18.60	R79.31	9.2%
	2018	10.0%	R32.18	R192.65	8.7%

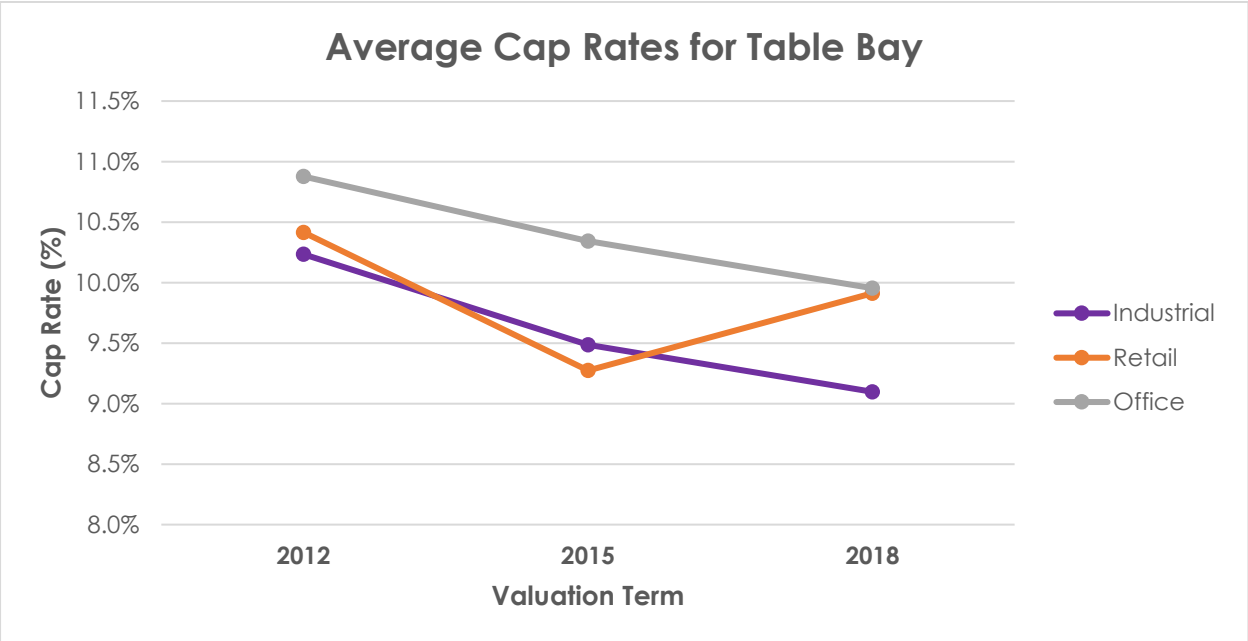


Figure 73: Average capitalisation rates per non-residential market segment (City of Cape Town Non-Res Market Research: 2018)

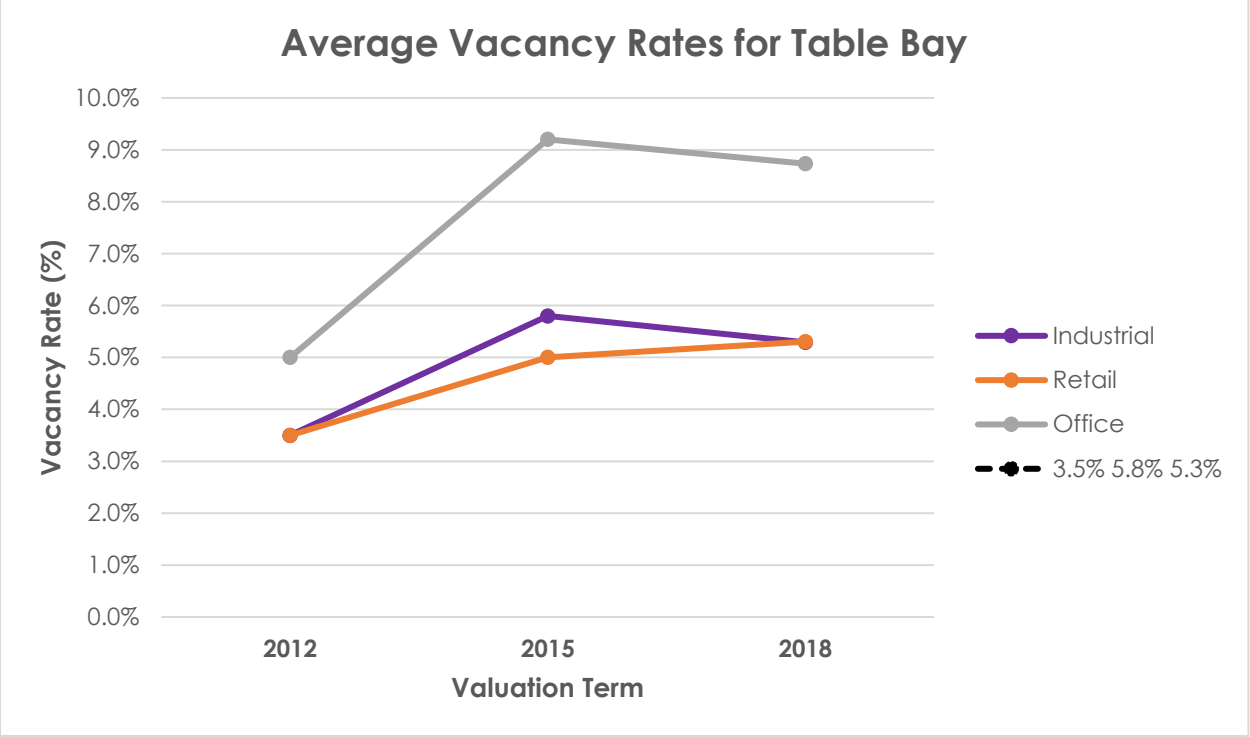


Figure 74: Average vacancy rates per non-residential market segment (City of Cape Town Non-Res Market Research: 2018)

11.2 Key Observations and Trends

11.2.1 Non-residential

a. Industrial:

The industrial sector in Table Bay is currently performing better than other market segments. The port access is a key driver of demand for industrial land across the metro. The average capitalisation rate for industrial properties steadily decreased over the last three valuation terms and had the lowest Cap rate in 2018, which indicates better market performance for industrial properties. This is reinforced by Figure 75 which shows a high growth in property values for industrial areas in the Table Bay District, 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 (https://www.businesslive.co.za). This indicates growing demand for well-located warehousing and distribution centres.

In terms of local market performance, older industrial properties in Central City and the suburbs to the East including Woodstock, Observatory and Salt River have the lowest Cap rates, around 8% in some cases, followed by established industrials areas in Epping and Paarden Eiland with cap rates, in the range of 8.9% - 9.2%. Paarden

Eiland and Epping 1 have seen property price growth of more than 100% from 2012 to 2018. Industrial property in the District is relatively high performing, a function of the clustering of economic activity in the District and location near the port and key freight routes.

b. Street Front Retail:

Retail has seen a dip in performance between 2015 and 2018 a trend that is likely to continue on the back of economic downturn. Street front retail compares to the Office market, with Cap rates around 10 on average. Trade as an industry, which encompasses largely of retail activity, is a significant employer in the District. It should be noted, however, that this section does not account for other retail typologies such as neighbourhood and regional shopping centres – which has a significant impact on the cumulative retail property market performance. Shopping centres have a cap rate between 8% and 9.5% on average in Cape Town (Rode 2018)

Locally, street front retail in the Central City, Green Point and Sea Point is performing well with Cap rates between 7.5 and 8.5%. Voortrekker rd. Maitland and Langa and parts of Observatory are performing the worst, with Cap rates over 11%.

c. Office

The office sector had a stronger performance in Table Bay since 2012, with lower cap rates recorded for 2018, however the sector had higher (average) vacancies recorded for 2018. This is likely a result of economic downturn, but the change in business culture that embraces telecommuting and remote working may contribute. 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 (www.commercialspace.co.za).

While demand in the Office sector has not kept up with supply in recent years, the demand for office space in Green Buildings has increased (Growthpoint 2016). Green star rated buildings have been built at the Silo Precinct and in the Granger Bay Area.

Locally, the CBD has some of the lowest Cap rates in the Country for Office properties, from 8.5% for A grade leaseback spaces, however C grade office space has high Cap rates of 11% indicating the greater demand for office space of higher quality (Rode 2018). Parts of Maitland show Cap rates closer to 12% indicating lower performance in these areas, most likely as a result of urban management challenges and a decline in investment in recent years. Office space in the District, particularly in the CBD and surrounds, shows less variation in Cap rates than other property sectors, revealing the office space across the District to be in high demand.

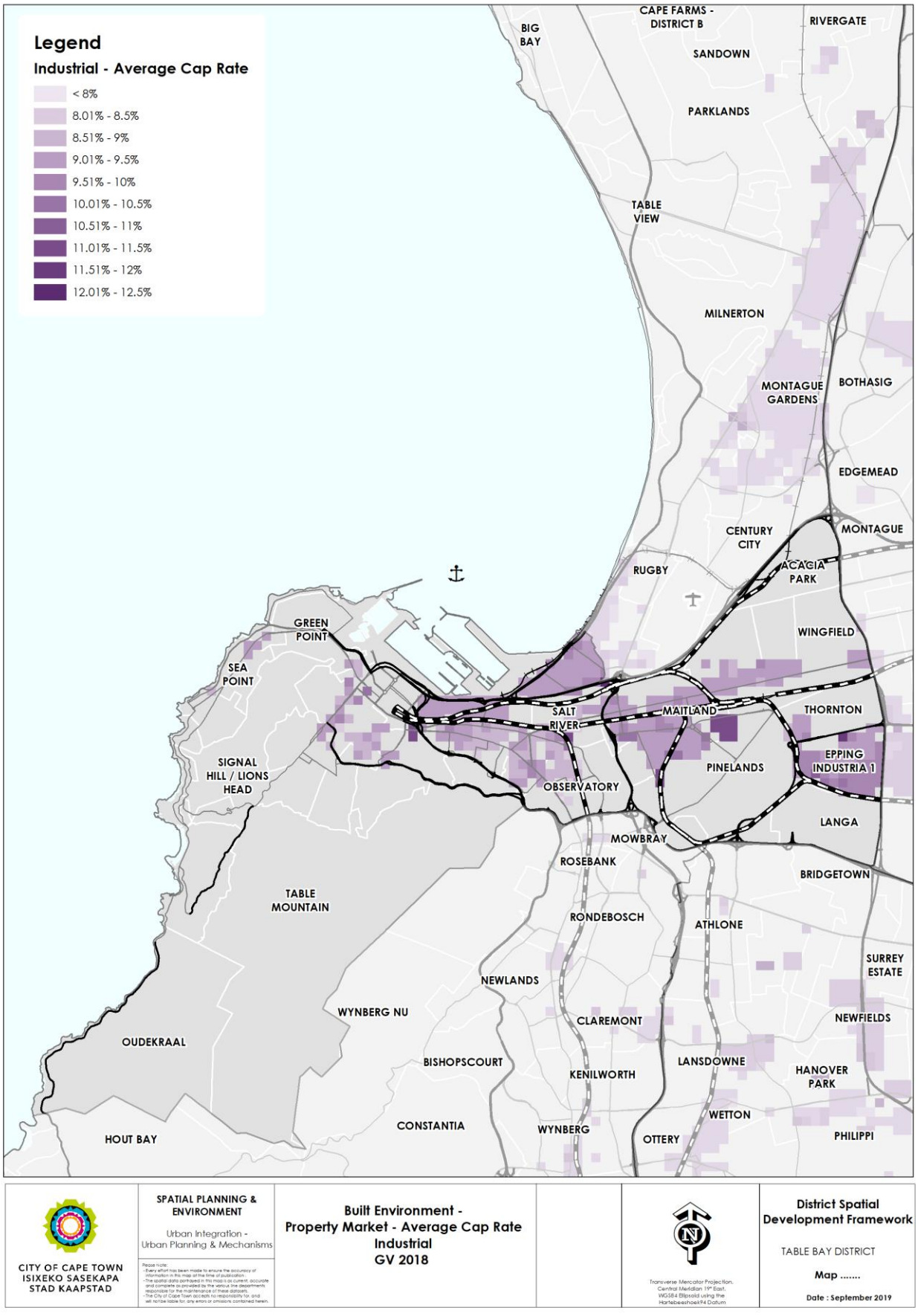


Figure 75: Average Cap Rates Per 4ha: Industrial Property Market

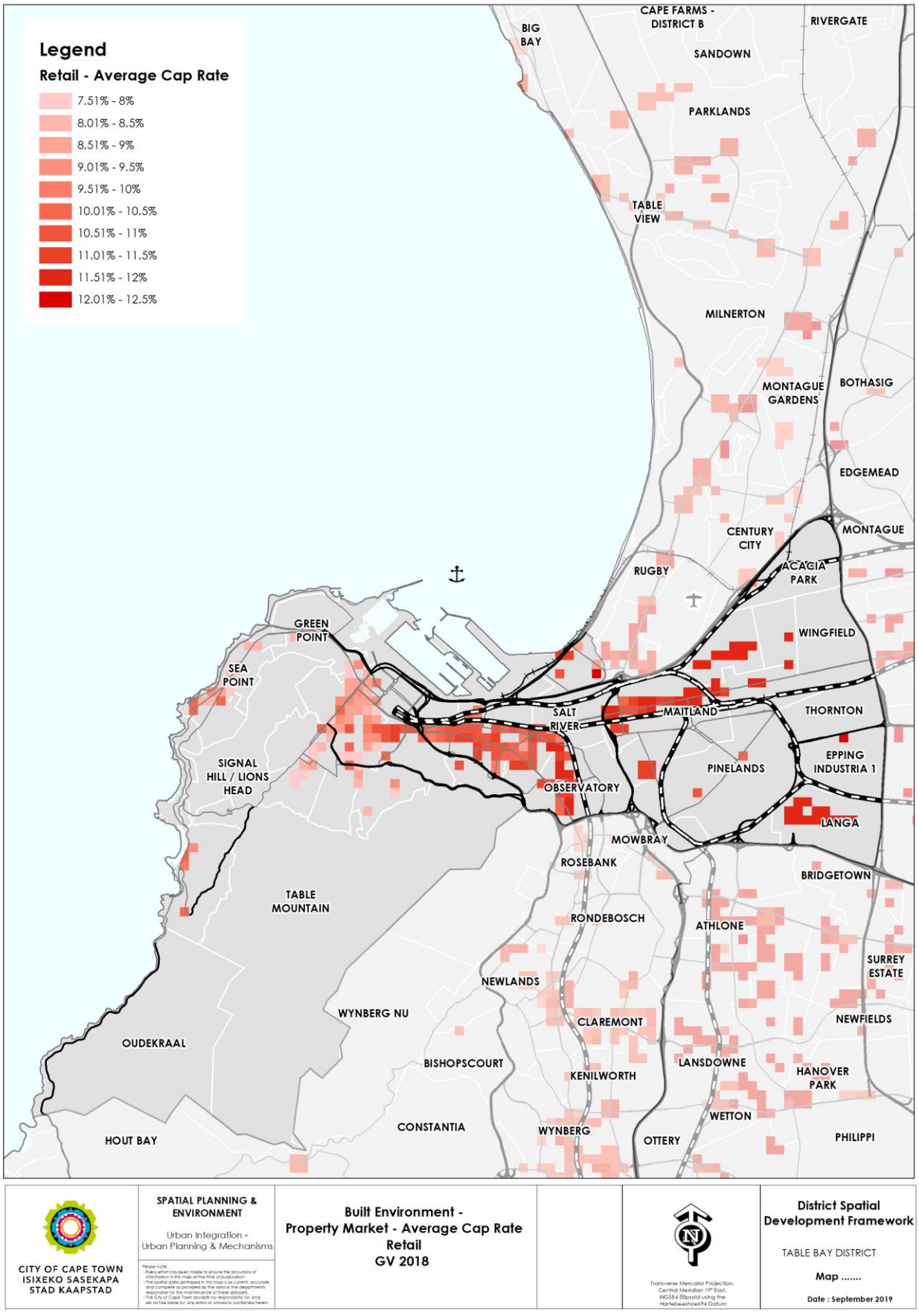


Figure 76: Average Cap Rates Per 4ha: Street Front Retail Property Market

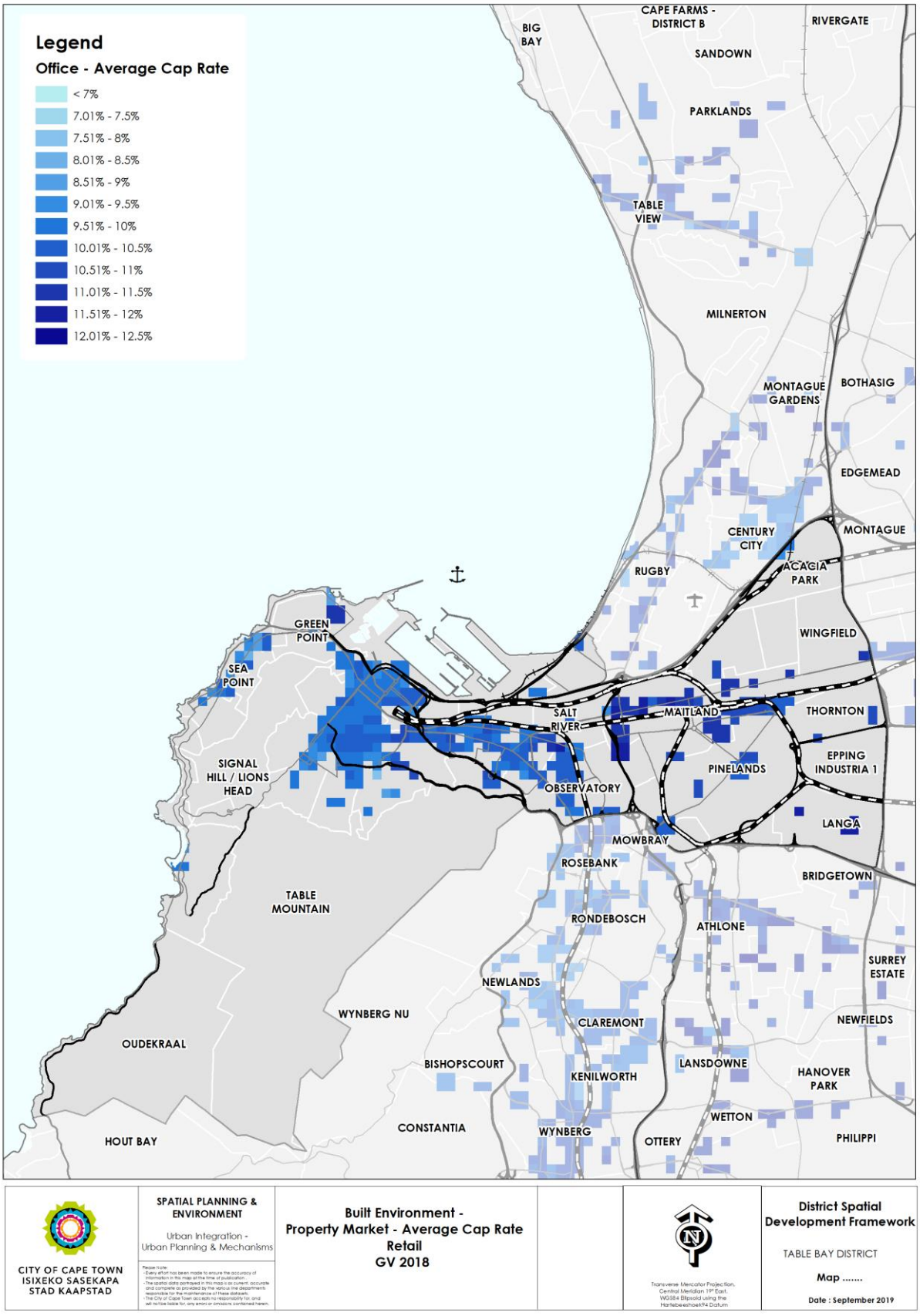


Figure 77: Average Cap Rates Per 4ha: Office Property Market

11.2.2 Residential

a. Sales

Figure 79 shows suburbs where the most property sales have occurred between 2012 and mid-2019. Sea Point and the Central City Area have the highest volume of residential sales, with an average sale price of R 4 322 886 (Sea Point) and R 6 657 000 (Table View) in 2018. The increase in sales volume in the Central City is the result of take up of new residential development over the past 10 years and in Sea Point is an effect of the higher densities and relative affordability of properties here compared with elsewhere in the Atlantic Seaboard. There is a high demand for residential properties across the District. However, it must be noted that the data depicted in these figures excludes informal sales transactions, which explain why there is such a low volume of sales in Langa in spite of a high degree of population change in the area.

The data also reveals that the majority of households in Cape Town are priced out of the formal property market in the District with only the areas of Maitland, Langa and Kensington providing some opportunities for households earning between R18000 – R22000. Table 11.2 below depicts income bands likely to obtain end user financing and the amount they qualify for.

Table 11.2: Affordable Monthly Income Bands

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

Figure 79 depicts the Rand per m² of **[sales value (R)/size of land (m²)]** of land in Cape Town. This map indicates the concentration of properties with the highest sales value in the district. The Suburbs along the Atlantic Seaboard, including Clifton and Bantry Bay, Camps Bay and Clifton and contain some of the properties with highest sales value per m² in Africa and the City with values of R38000-92500. The majority of land in the District is high value, with some lower value land towards the East in the areas of Langa and Kensington/Windermere

b. Growth in Value

Figure 78 below depicts the City's growth in value per property 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 Table Bay district grew in value dramatically over the time period. Lower growth figures are between 40 -50% after CPI and are seen in some parts of Langa, in Epping and Maitland, Kensington and Wingfield. Some properties in the highest value areas on the Atlantic sea board have seen slightly lower changes in value. However, the majority of properties showed growth of over 80% with a substantial number

growing over 100% in value. Areas experiencing the highest growth include the CBD, lower Woodstock and Salt River.

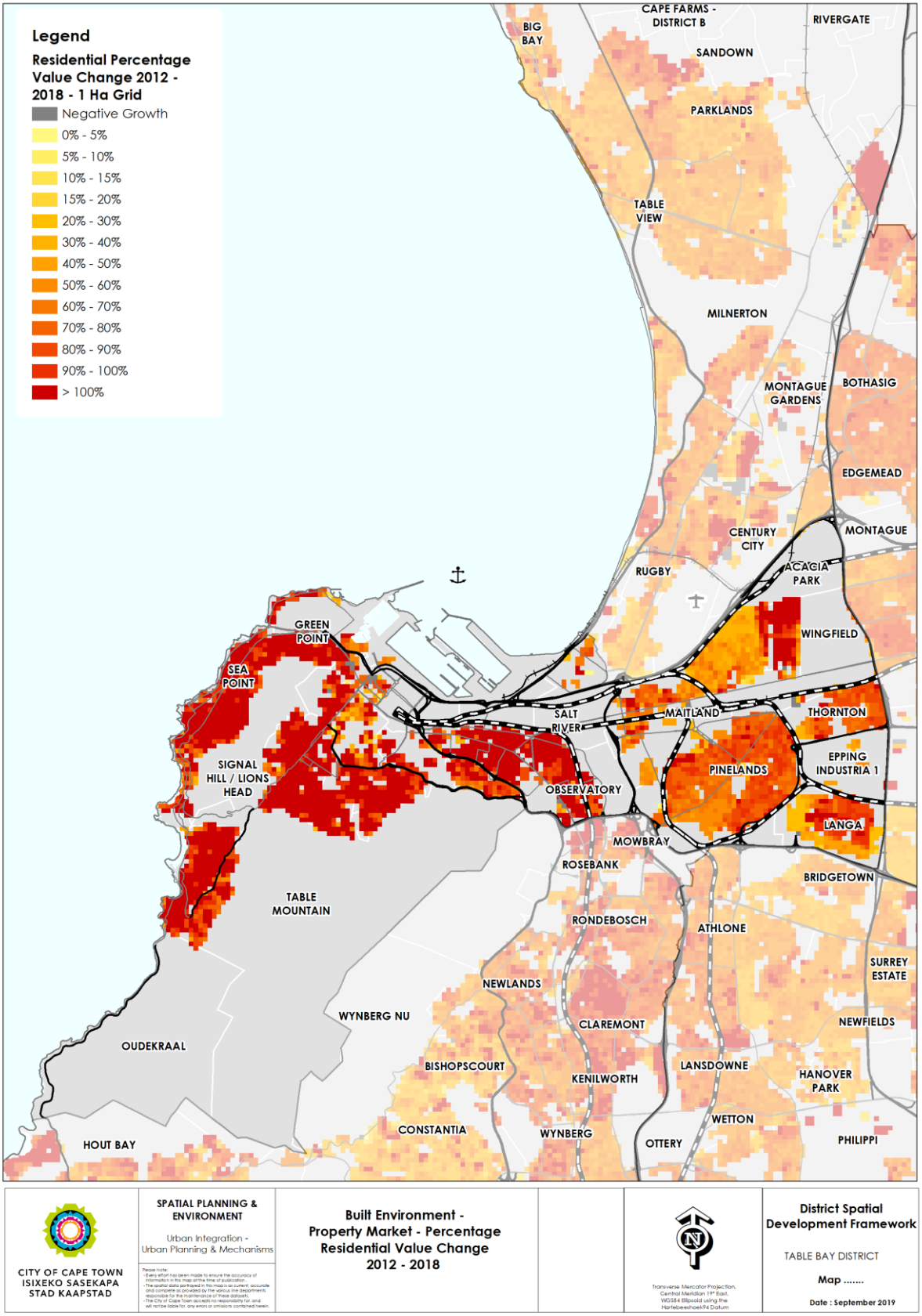


Figure 78: Residential Value Change

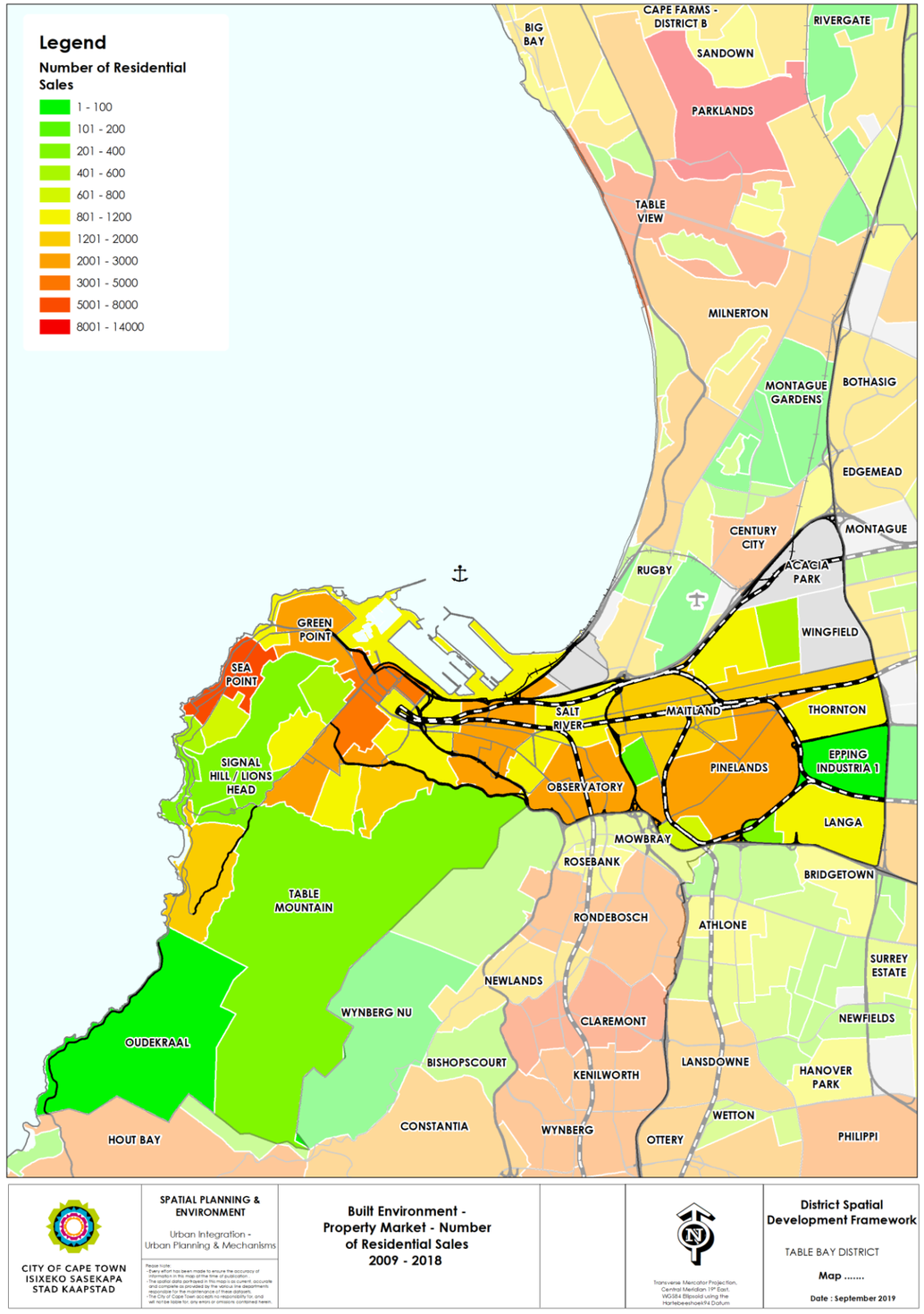


Figure 79: Number of Residential Sales per Suburb (2009-2018)

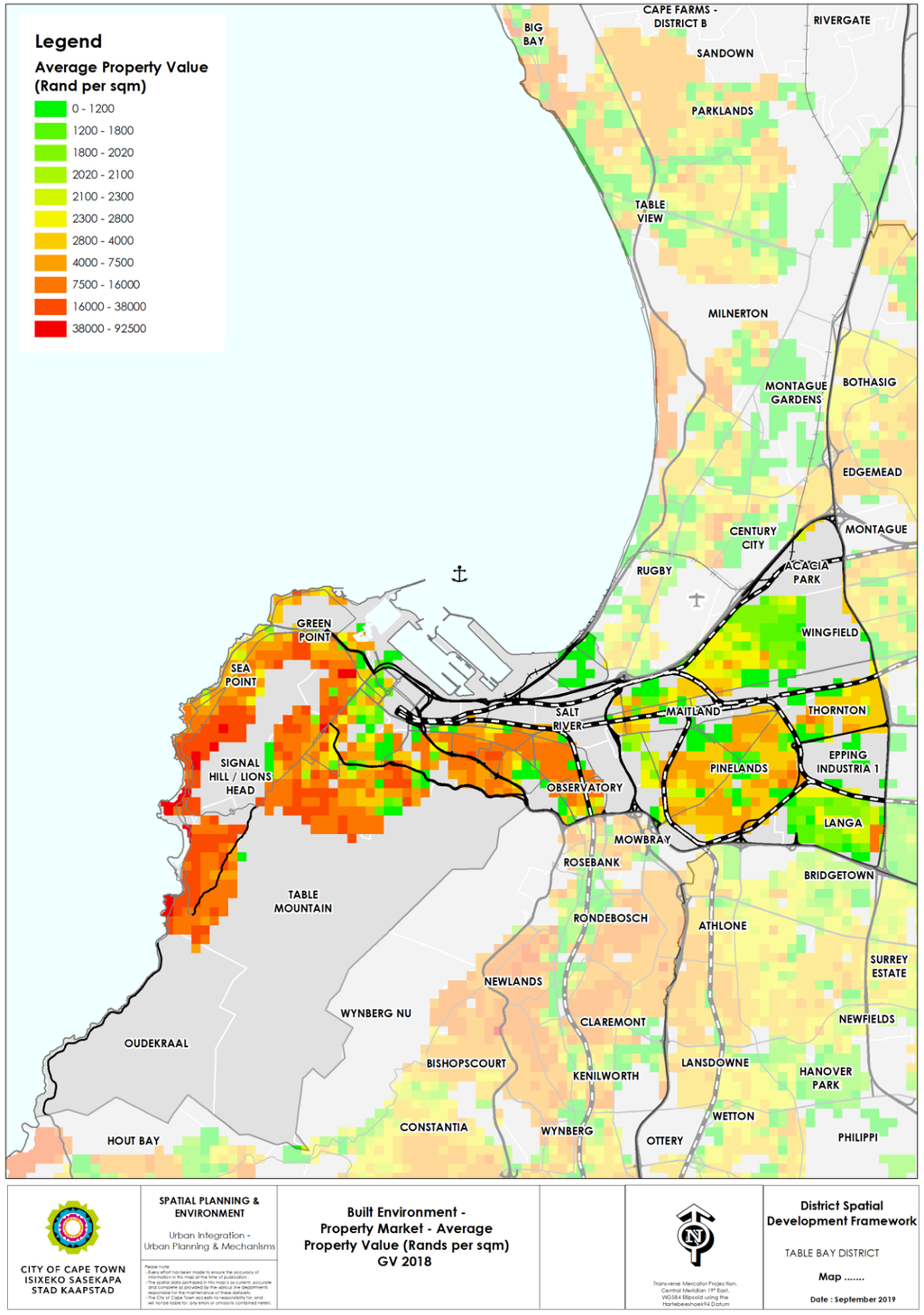


Figure 80: Value (R) per m²

11.3 KEY OPPORTUNITIES AND CONSTRAINTS

11.3.1 Opportunities:

- Table Bay has high scores on the human development index, indicating a combination of qualities which provide opportunities for people to thrive. There is opportunity to allow more people access to the benefits of this location.
- The Table Bay district has the highest volume of economic activity and value creation in the City and retains strong freight connections. Opportunities to consolidate these location advantages and develop stronger economic clusters can be improved by enabling increased intensity of development.
- The District is well positioned for tourism, which is a high volume employment sector.
- Increases in property value in the District create opportunities to capture the value of new investment in the area and channel it towards improvements in the public realm.
- Some areas of the District still have price points that allow opportunities for affordable housing, including Kensington, Maitland and areas around Langa.
- Green building/ green precinct opportunities are possible with a market from the finance, trade and services sector prepared to buy into high end, sustainable office space.

11.3.2 Constraints:

- The erratic performance of public transport means that more space is given to parking areas for A grade office space, with a reduction in active leasable space.
- There is little room for expansion therefore redevelopment opportunities of higher value, higher building cost properties are the more likely development trajectory in the District.
- Most industrial uses, in particular the logistic and warehousing sub-sectors are land extensive, low density and few trip attracting. Whilst this has contributed to job-creation, this does not support the City's approach to compact and dense development. To these 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-middle income households and high level of indebtedness for households, which present obstacles for obtaining home loans/financing.
- The increase in the take up of locations in the District for high tech, high skills entry or 4th industrial revolution businesses pose a risk to excluding the population whose skills don't match the changing needs of the economy.

E. RISK AND RESILIENCE

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 plan, the focus is on avoiding, mitigating or reducing the risk of disaster, by guiding development away from known hazards or in a way that the risk of being exposed to disasters[17] is lessened.

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

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

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

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

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

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

Table 12.1 Risk Strategy Extracted from MSDF 2022

Sub-Strategy: Appropriately Protect the Citizens of Cape Town from Risk Areas

[17] 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)

Policy Statement	What this Means/Requires
Policy 15 **Enable resource-efficient development**	The City can guide spatial development in a way that encourages the public and private sector to utilize sustainable practices and technologies that assist in reducing carbon emissions, reduce energy and water demand, promote public transport, non-motorized transport and support the recycling of water and waste materials.
Policy 16 **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 17 **Avoid inappropriate urban growth and development in risk areas.**	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 for Cape Town evaluates known hazards in terms of the following[18]:

Table 12.2 Hazard Measurement Extracted from Disaster Risk Management Plan City of Cape Town

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		

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

Manageability/Coping Capacity by Responders to offset Hazards Impact and Vulnerabilities	Good	[redacted]	
	Adequate		
	Basic		
	Poor		

12.1 RISKS IN TABLE BAY

Taking the aforementioned guiding policy into the account the following section identifies the types of risk (see Figure 81 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** Table 12.3 **to** Table 12.12 **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.

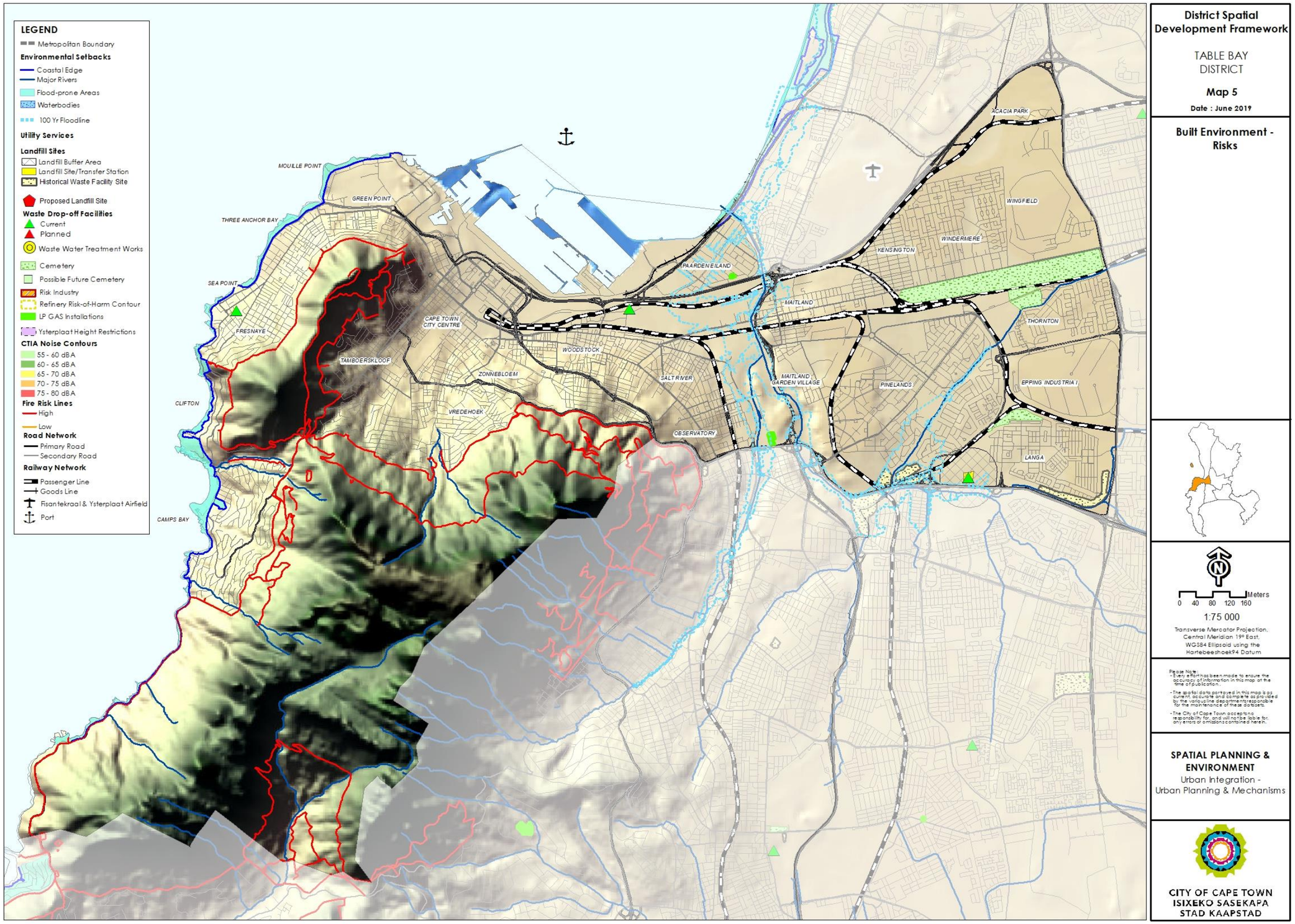


Figure 81: Integrated Bio-physical and Built Environment Risk Map

12.1.1 Natural Risks

12.1.1.1 Slope instability hazards, including rock fall, erosion, landslides,

The steeper slopes of Table Mountain pose a risk from falling rocks and unstable terrain. Rock fall is known to affect scenic drives in the Atlantic seaboard side of the District, this risk is exacerbated by erosion and fire.

Table 12.3: Slope Instability Risk

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Likely	Moderate	Vulnerable	Adequate	high	Development should consider engineering solutions for slope stability and protection of buildings and infrastructure where possible. New development areas should avoid this risk.

12.1.1.2 Coastal Erosion

Extensive development along the coast and the disruption of natural sand movements caused by historic development has led to exposure to risk from coastal erosion processes. This is anticipated to become more severe over time due to changes in coastal dynamics and sea level rise caused by climate change. The Atlantic seaboard is prone to sand loss caused by the disruption of the historical sand transport corridor between Hout Bay and Sandy Bay, due to urban development in Hout Bay. The Sea Point/Green Point area is protected by an existing sea wall, although this itself is prone to damage due to wave action and requires ongoing maintenance.

Table 12.4: Coastal Erosion Risk

Rating of Probability	Rating of Maximum Impact	Vulnerability Rating	Coping Capacity	DRM Priority Rating	Development Principles and Exceptions
Very Likely	Insignificant	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. Some examples of service mechanisms include dune stabilization, raising ground floor heights, berms and sea walls or investing in managed retreat or public infrastructure in high risk areas.

12.1.1.3 Wild Fire

Fire lines indicate the interface between the wild lands vegetation and urban areas, high risk indicates where there are larger volumes of combustible vegetation. The settlements around Signal hill, Lions Head and Table Mountain are in this risk area. Fire risk is anticipated to increase over time due to increased temperatures, increased drying, and higher wind speeds caused by climate change.

Table 12.5: Wild Fire Risk

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.

12.1.1.4 Flood Risk

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 Salt River and Black River corrido are areas of concern some points along the coast vulnerable to storm surges. NB: The Coastal Management line doesn't indicate all the properties that are exposed to coastal risks. Private properties will also be at risk from flooding and coastal inundation and will need to manage this risk.

Relative elevation modelling reveals the contrast between the higher and lower lying areas, where the flow of water will speed up or where water will collect.

Table 12.6: Flood Risk

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 adapt those developments already located in flood plains and to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent watercourses / wetlands.

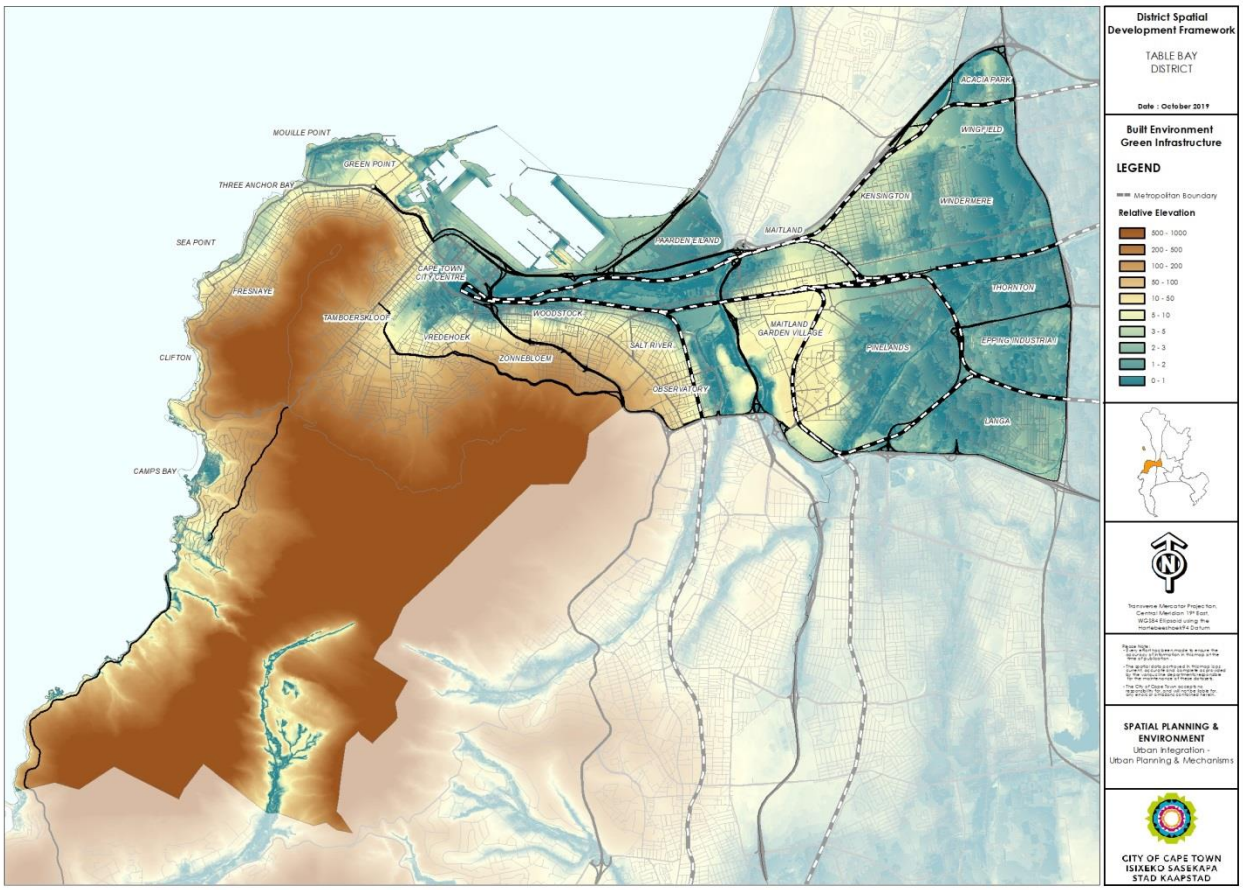


Figure 82: Relative Elevation

12.1.1.5 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 12.7: 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.

12.1.2 Built Environment Risks

12.1.2.1 Cemeteries, solid waste disposal sites, and waste water treatment works:

Exclusion buffers exist around land fill and waste disposal sites to protect surrounding populations from hazards and nuisances. Historic sites also exclude certain types of development for a period of time determined in the waste management regulations. Smaller sites and drop off facilities present fewer nuisances and hazards but may have an impact on neighbouring property uses.

The Voortrekker road cemetery is a significant development moderator, deactivating a substantial and well located portion of land.

Waste water outfalls along the coast present a significant challenge to Coastal Water quality, an issue which is becoming more relevant as interest in desalination in the wake of the 2017 drought increased.

Table 12.8: 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.

12.1.2.2 Infrastructure Availability:

The availability of infrastructure influences the type of development that can occur, higher infrastructure capacity can include higher intensity of land use. Infratructure needs to accommodate the growth and demand that will allow cost recovery and a more efficient urban form. Aging sanitation infrastructure is a risk in the historic areas of Woodstock and Maitland.

Table 12.9: Infrastructure Availability Risk

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.

12.1.2.3 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 12.10 Unmanaged Land Occupation Risk

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.

12.1.2.4 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 re-blocking and maintenance access routes for emergency services are interventions that may reduce risk.

Table 12.11: Structural Fire Risk- 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.

12.1.2.5 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 12.12: Structural Fire Risk - 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.

12.1.3 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.

12.1.3.1 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 exposure and risk hotspot mapping has been done for the mid-future (2021-2050) and is presented in these District Plans, while vulnerability/resilience mapping was based on the 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. (see maps on pages xyz).

Figure 83 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 84 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 12.13: Indicators and weightings for measuring resilience

Indicator	Description	Weighting
Crime Rate	Total number of crimes by police precinct area	5
Electricity for Lighting	Percentage of households with access to electricity for lighting	4
Flushing Toilets	Percentage of households with flush toilets (main sewerage connection and septic tanks)	4
Median Household Income	Median household income	5
Range of household income within 3km	Measure of income disparity in different neighbourhoods: maximum minus minimum household income within a 3km radius	4
Higher Education	Percentage of people over the age of 20 with higher education	4
Employment opportunities within 1km	Measure of employment opportunities , ranked zoning areas by potential formal employment areas assessed in a 1km radius	5
Employment variety within 1 km	Measure of job diversity opportunities: distance from multiple zoning areas related to employment opportunities assessed within a 1km radius	5
Refuse collection	Percentage of households without municipal refuse collection services	3
Tap Water	Percentage of households without access to tap water	5
Toilet Facilities	Percentage of households without access to toilet facilities	5
Population Density	Number of people living in the area relative to the size of the area	4

Tap Water Inside Houses	Percentage of Households with tap water inside their house	4
Travel Time to Hospitals	Estimated time to travel to the nearest hospital	3
Travel Time to Police Stations	Estimated time to travel to the nearest police station	3
Travel Time to nearest Spring	Estimated time to travel to the nearest spring	1
Travel Time to CBD	Estimated time to travel to the CBD	5
Employment Rate	Percentage of people unemployed in the formal sector	4
Weekly Solid Waste Collection	Percentage of households with weekly solid waste collection services	4
Jobs: Population Density	Measure of job opportunities relative to population densities	5

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

Figure 85 shows an assessment of risk relative to resilience, based on Figure 83 and Figure 84; 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 83: Risk Hotspots

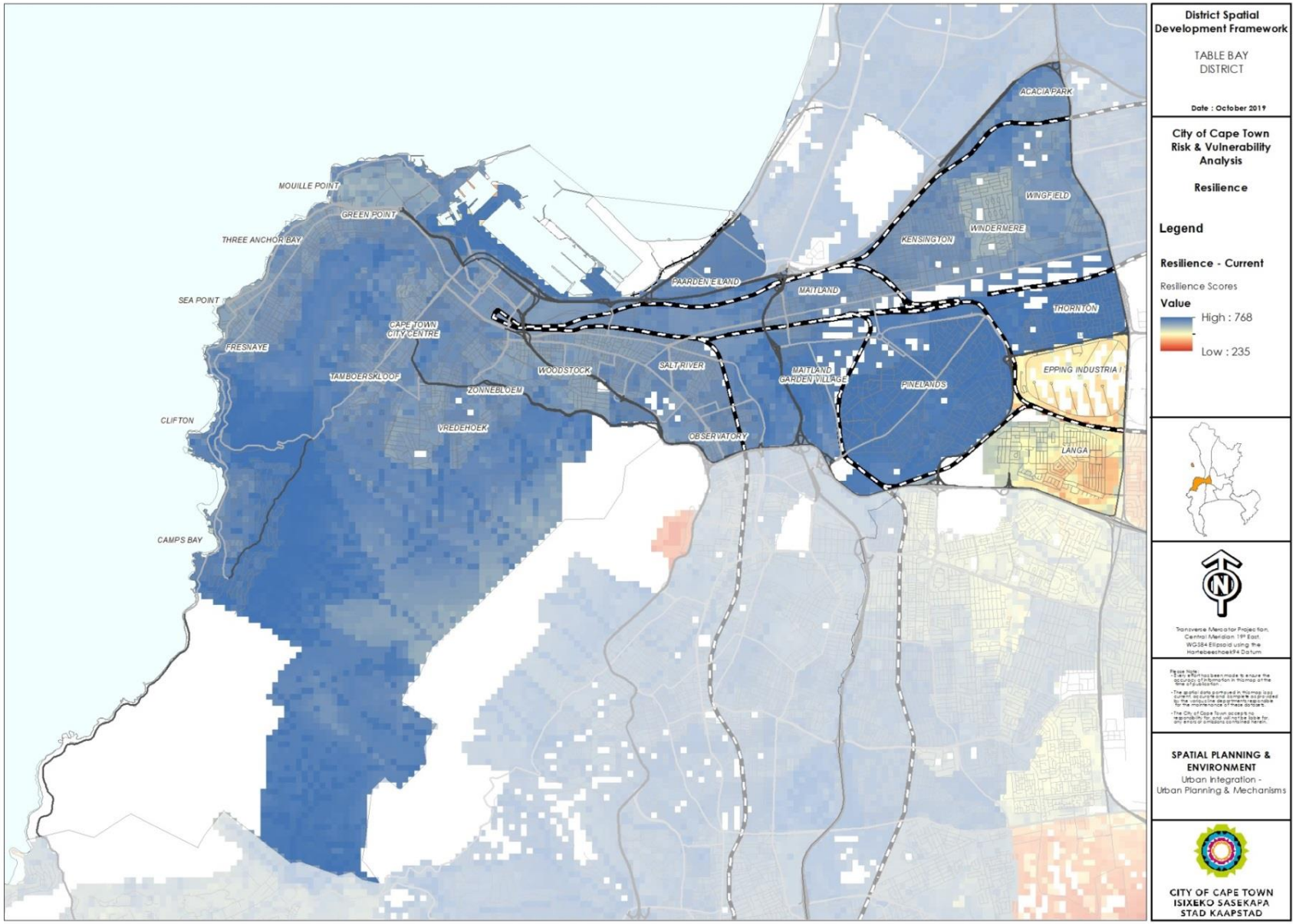


Figure 84: Combined Resilience score

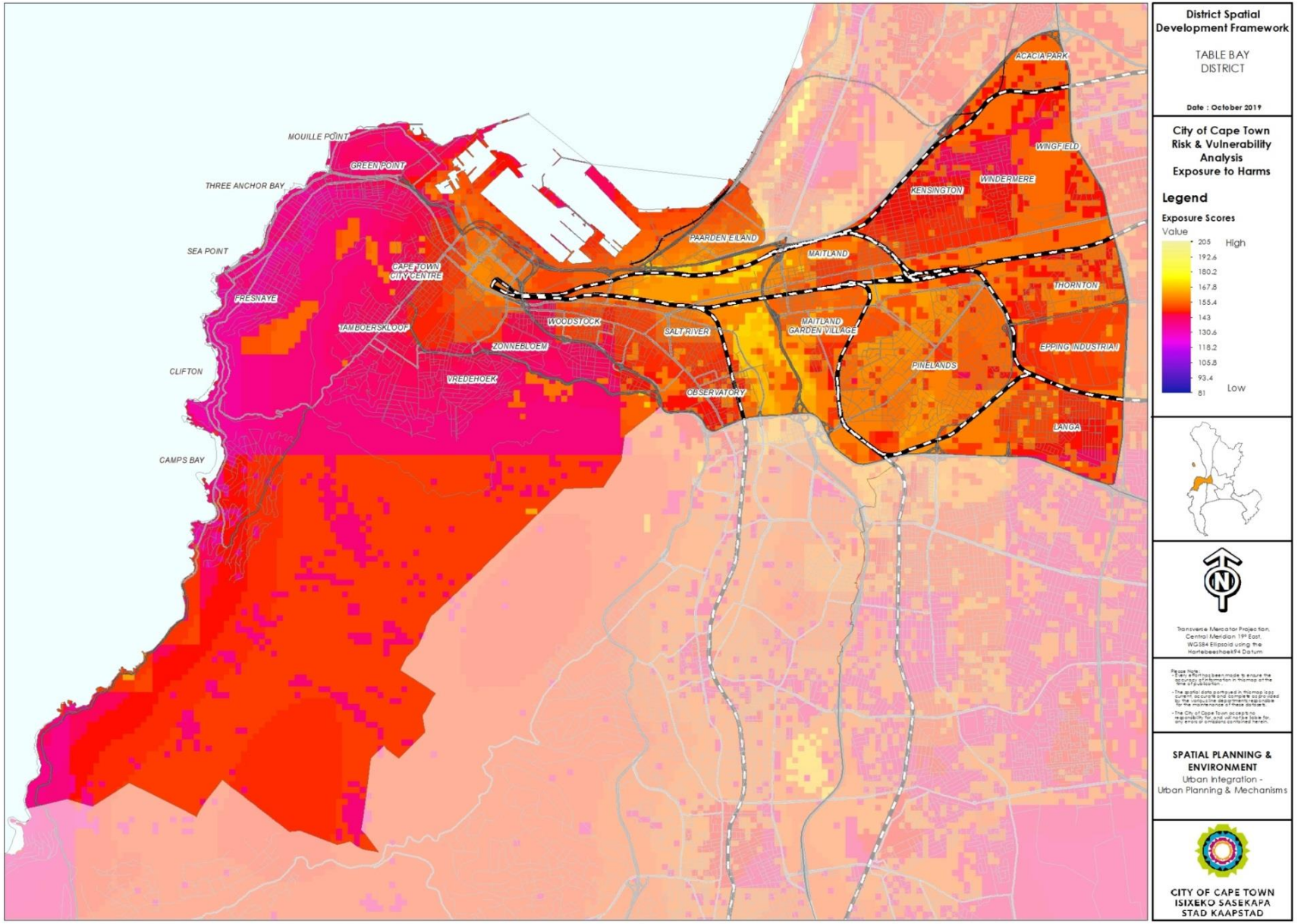


Figure 85: Exposure to Risk

Implications:

Vulnerable areas and risk hotspots indicate areas that will need to be prioritised for resilience building, public sector interventions and support. The District in general shows higher resilience than others in the City and is well resourced to cope with threats, Langa is the exception with a higher degree of vulnerability in the population.

12.2 KEY OPPORTUNITIES AND CONSTRAINTS

Table 12.14 identifies opportune **(encouraged)** and constrained **(discouraged)** area for development in Table Bay, informed by the aforementioned risk assessment.

Table 12.14 Encouraged and Discouraged Types of Development based on risk assessment

Risk	**DRM Priority Rating**	**Impact Radius**	**Discouraged Types of Development**	**Encouraged Types of Development**
waste disposal, sites, refuse transfer stations	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
Flood Risk and Coastal Inundation Zones	High	Informed by 1:100 year flood lines and coastal urban edge line[19]	Intensification of urban development	Green infrastructure, non-motorised transport Open space recreation Feasible development to support identified public recreational nodes.
Structural Fire	Very High	All settlements, but greater vulnerability in informal settlements	Development that doesn't adhere to building regulations. In informal settlements development that blocks access for	Compliance with building regulations, the use of fire retardant materials and community planning for emergencies in informal settlements.

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

			emergency services.	
Heat wave	Lower	Entire City	Planning built areas with no green spaces, shade cover or tree cover.	Green spaces with shade allowances.
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