



**Western Cape
Government**

Environmental Affairs and
Development Planning

BETTER TOGETHER.

State of Environment Outlook Report for the Western Cape Province

Human Settlements

February 2018

DOCUMENT DESCRIPTION

Document Title and Version:

Final Human Settlements Chapter

Client:

Western Cape Department of Environmental Affairs & Development Planning

Project Name:

State of Environment Outlook Report for the Western Cape Province 2014 - 2017

SRK Reference Number:

507350

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Date:

February 2018

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ABBREVIATIONS AND ACRONYMS

ABS	Access to Basic Services
BEPP	Built Environment Performance Plan
BRT	Bus Rapid Transit
CCT	City of Cape Town
CS	Community Survey
DEAT	Department of Environmental Affairs and Tourism
DHS	Department of Human Settlements
DSD	Department of Social Development
DTPW	Department of Transport and Public Works
DWS	Department of Water and Sanitation
GP	Growth Potential
HSF	Human Settlements Framework
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
IUDF	Integrated Urban Development Framework
IRT	Integrated Rapid Transit
PDG	Palmer Development Group
PERO	Provincial Economic Review and Outlook
PRASA	Passenger Rail Agency of South Africa
PSDF	Provincial Spatial Development Framework
RDP	Reconstruction and Development Programme
RSC	Regional Services Centre
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SDG	Sustainable Development Goal
SoEOR	State of Environment Outlook Report
SPLUMA	Spatial Planning and Land Use Management Act 16 of 2013
StatsSA	Statistics South Africa
TCT	Transport for Cape Town
TDA	Transport and Urban Development Authority (previously TCT)
TOD	Transit-oriented development
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WCG	Western Cape Government

GLOSSARY

Basic sanitation	The prescribed minimum standard of services necessary for the safe, hygienic, and adequate collection, removal, disposal, and purification of human excreta, domestic wastewater, and sewage from households, including informal households.
Biodiversity	The variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. The term also includes diversity within species, between species, and of ecosystems.
Birth rate	The number of childbirths per 1,000 persons per year.
Carrying capacity	The maximum population of a given organism that a particular environment can sustain.
Climate Change	A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions, and persistent anthropogenic changes in the composition of the atmosphere or in land use. According to the Intergovernmental Panel on Climate Change (IPCC), climate change refers to any change in climate over time, whether due to natural variability or as a result of anthropogenic activities. Note that the Framework Convention on Climate Change (UNFCCC) differs in that it defines climate change as in addition to natural climate variability, i.e. ' <i>a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods</i> '. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.
Conservation	The maintenance of environmental quality and functioning.
Consumption	The purchase and/or use of goods and services.
Degradation	The reduction or loss of the biological or ecological productivity of an area (see Desertification).
Development	A process of change that represents planned progress of some kind. For example, developing the economy of a region or country can take place through the expansion of economic activities, the improvement of people's skills, or job creation.
Drivers	These are the primary agents driving change in the environment, and may be human induced or natural. They include the underlying socio-economic and political agents of change, such as population growth and the desire for increased consumption. Drivers can also be described as 'wants'. Some indirect drivers such as governance structures, socio-cultural perceptions, population demographics and technological dependence can also be included. Driving forces emanating from natural processes (e.g. solar cycles) are possible, but are typically too infrequent, not well understood or operate over timescales that are easily related to the 4-yearly reporting framework of the State of Environment Report.
Ecological footprint	A measure of the 'load' imposed by a given population on nature. It represents the land area of average quality needed to sustain current levels of resource consumption and waste discharge by that population. The bigger the footprint the greater is the impact that it represents.

Ecosystem	A dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.
Ecosystem services	Ecological processes or functions which generate outputs from which people derive benefits, which therefore have monetary or non-monetary value to individuals or society at large. Without these benefits, humanity would not be able to survive. These services are frequently classified as (i) supporting services such as productivity or biodiversity maintenance, (ii) provisioning services such as food, fiber, or fish, (iii) regulating services such as climate regulation or carbon sequestration, and (iv) cultural services such as tourism or spiritual and aesthetic appreciation.
Environment	In terms of the National Environmental Management Act 107 of 1998 (NEMA), "Environment" means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) an part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
Environmental degradation	The reduction of the capacity of the environment to meet social and ecological objectives and needs.
Environmental health	Well-being based on the health of the environment, both natural and built.
Human settlements	An integrative concept that comprises: (a) physical components of shelter and infrastructure; and (b) services to which the physical elements provide support, that is to say, community services such as education, health, culture, welfare, recreation and nutrition.
Impacts	'Impacts' describe the consequences of the good or bad state of elements of the environment for sustainability, specifically on humans, the economy, ecosystems, as well as other environmental systems, and could include regional or global effects. For example: high levels of indoor air pollution may result in respiratory tract infections; land degradation may lead to decreased food production, increased food imports, increased fertilizer use, malnutrition and siltation of aquatic systems. The impacts should be seen as changes that are occurring within environmental, economic or social systems and their ability to perform functions or services for society.
Inadequate Housing	Informal dwellings – whether located in a backyard or informal settlement – and overcrowded formal dwellings.
Indicator	A measure that helps to assess the extent of the success with which goals are being achieved. Based on complex information or data, indicators are often used in State of the Environment reports to measure how resources are being managed.
Informal Settlement	An unplanned settlement on land which has not been surveyed or proclaimed as residential, consisting mainly of informal dwellings (shacks)
Migration	Movement of all or part of a population to and from a geographical area. The movement may be temporary or permanent.

Pollution	The accumulation of harmful or poisonous substances in the environment that leads to environmental degradation.
Population growth	An increase in the number of organisms or species. In human demography, the population growth rate refers to the annual growth rate of the population calculated from mid-year.
Poverty	A certain level of material deprivation below which a person suffers physically, emotionally, and socially.
Pressures	The human activities and processes that act on the environment and cause environmental change. They are distinct from the driving forces since they relate directly to the use and exploitation of natural resources, as opposed to the driving forces, which determine the scope or extent of the pressures. Effectively, the pressures satisfy the 'wants' or driving forces. Pressures can be divided into three main types: (i) excessive use of environmental resources; (ii) changes in land use; and, (iii) emissions (of chemicals, waste, radiation, noise) to air, water and soil.
Response	The societal actions taken collectively or individually to ease or prevent negative environmental impacts, correct damage or conserve natural resources can be seen as 'responses'. Responses may include policy and regulatory action, environmental or research expenditures, public opinion and consumer preferences, changes in management strategies and the provision of environmental information.
State	The 'State' describes the actual condition of the environment resulting from the pressures. For example, air quality in terms of the level of air pollution, and proportion of degraded area of land. The 'State' is described both in terms of current state and trends over time. A study of environmental trends will reveal whether the state of the environment is getting better or worse. It also gives an indication of how quickly changes are happening (the rate of change) and whether rates of change are increasing or decreasing.
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

1 INTRODUCTION

Anthropogenic activities, including human settlement activities, are large contributors to environmental change. The development and growth of human settlements, regardless of their size, affects the Western Cape's natural resources, placing increased pressure on renewable and non-renewable resources, including land, water, energy and minerals. In addition, human settlement expansion risks further degradation of biodiversity and sensitive ecosystems in the Western Cape. This is further compounded by a growing shortfall in productive, unpolluted land for agricultural activities, which is key to local food security, livelihoods and the provincial and national economy. Nevertheless, human settlements are vital and critical components of social and economic systems.

This chapter assesses the quality of the living environment rather than social conditions. Social indicators such as population growth, poverty, education, employment and food security are discussed in the introductory chapter of the State of the Environment Outlook Report (SoEOR) as conditions that determine the overall ability of society to respond to environmental issues. This chapter presents information about the condition and quality of the environment in which people live and on aspects that threaten human health and well-being. It considers the key drivers and pressures on human settlements, related mainly to population growth and urbanization; and describes the current state of human settlements in the Western Cape in relation to the natural resource base and impacts on the natural environment. Indicators serving as proxies for the state of human settlements have been identified including: housing type; housing delivery; access to basic services; the quality of available drinking water (Blue Drop); the quality of wastewater treatment (Green Drop); transportation services; and the provision and function of open space resources. This chapter further discusses the impact of human settlements on the receiving environment and the responses from the provincial, district and local authorities.

2 DRIVERS AND PRESSURES

Between 2011 and 2015, the Western Cape population increased by almost half a million people, with an estimated 6.51 million people currently living in the province (StatsSA, 2017). Given declining fertility rates in the province (Western Cape Treasury, 2016), net in-migration is one of the primary drivers of population growth in the Western Cape. Between 2011 and 2015, the City of Cape Town Metropolitan Municipality (CCT) population grew by 1.2%, while the West Coast District Municipality increased by 1.5%, the Overberg District Municipality by 1.4%, the Cape Winelands District Municipality by 1.4%, the Eden District Municipality by 1.1% and the Central Karoo District Municipality by 0.9%.

In addition to the key drivers and pressures, the following emerging issues relate to human settlements:

- **Smart growth and transit oriented development** as a means to address spatial inequality
- Preservation of **Sense of Place**

Population growth and distribution (including that associated with urbanisation) continues to be a notable driver for change in the Western Cape. The Western Cape Department of Social Development (DSD) (2014) projects continued population growth across the districts (Figure 2-1), likely to spur expansion of human settlement growth in the province. Population growth is the most common driver of increased housing demand or additional housing development; however, economic status, race, age, gender and employment opportunities can increase housing demand even in the absence of population growth (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

Economic growth is also a significant driver of environmental change in the Western Cape. Economic growth is hampered by skill shortages, or the availability of skills unsuited to the needs of the economy. Increased natural resource consumption for human settlements and basic service delivery also drives environmental change: energy demand (from non-renewable coal); increased waste generation; and continued air quality degradation continue to be a cause for concern. Emerging climate change risks, such as the food-energy-water nexus (the provision and consumption of which are intrinsically interlinked), have become central to the sustainability of human settlements in the Western Cape (Carter and Gulati, 2014).

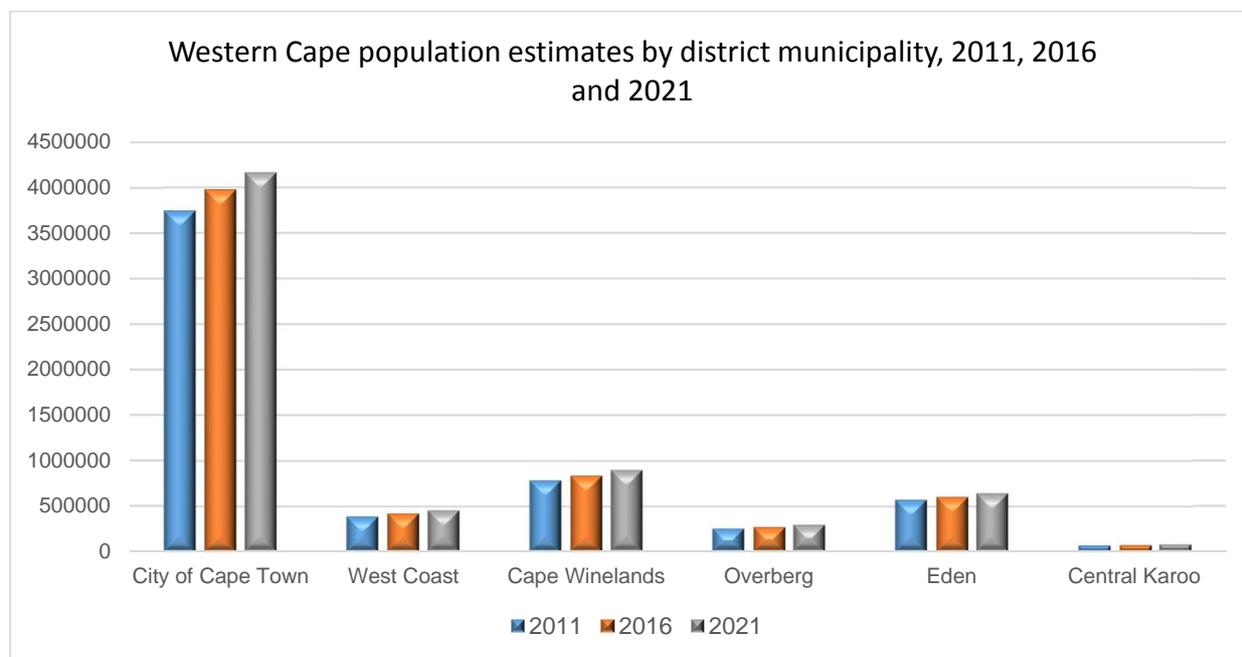


Figure 2-1: Western Cape population estimates by district municipality - 2011, 2016 and 2021

2.1 Migration and urbanisation

The continued increase in migration into the province and urbanisation (i.e. the movement of people from rural to urban areas) exerts pressure on human settlements in the province. Historical trends indicate that the largest migrant stream is from the Eastern Cape. A significant increase in intra-provincial migration from urban centres in the interior to coastal urban nodes is evident. Migrants are largely young, unmarried, unemployed, and a significant number of them (31.3%) live in informal dwellings, particularly in the CCT. Between 2011 and 2016, net in-migration reached 292 372, projected to rise to 309 729 between 2016 and 2021 (StatsSA, 2017): only Gauteng has a higher migration rate. Figure 2-2 depicts the increasing migration pattern into the Western Cape between 2001 and 2016, while Figure 2-3 shows population growth in the Western Cape Districts between 2011 and 2016.

Urbanisation is a major global challenge caused by perceived employment opportunities and access to services and infrastructure in urban areas. . Settlements expanding the fastest in the Western Cape Province are located in the CCT's northern suburbs, in the coastal towns of Vredenburg, Langebaan, Mossel Bay, George, Knysna and Plettenberg Bay and the inland towns of Malmesbury, Worcester, Wellington, Robertson, Caledon, Oudtshoorn, Bredasdorp, Swellendam, Riversdale and Beaufort West.

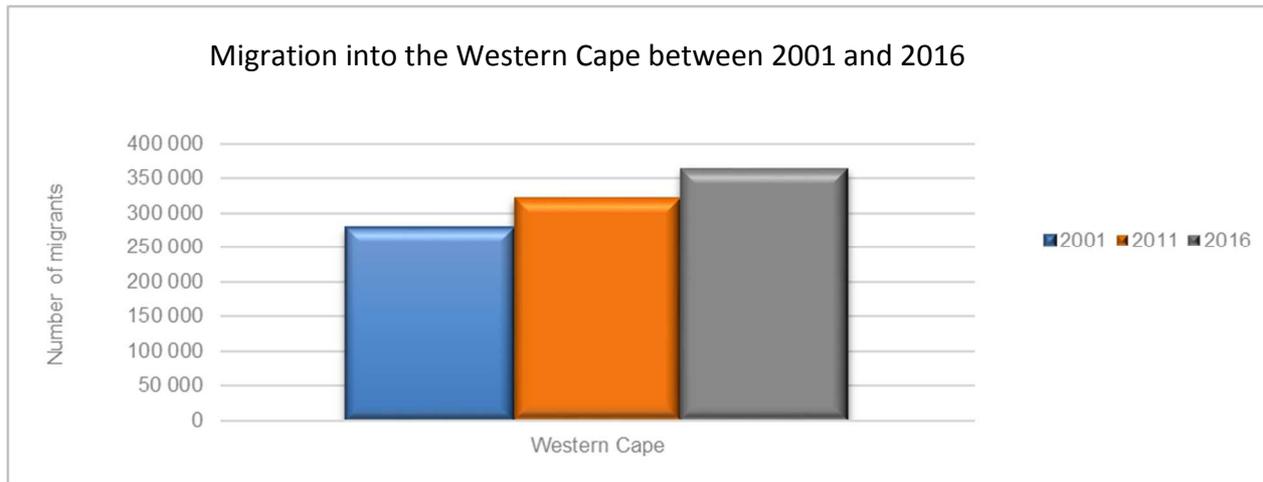


Figure 2-2: Migration into the Western Cape between 2001 and 2016

Source: StatsSA, 2013; CS, 2016

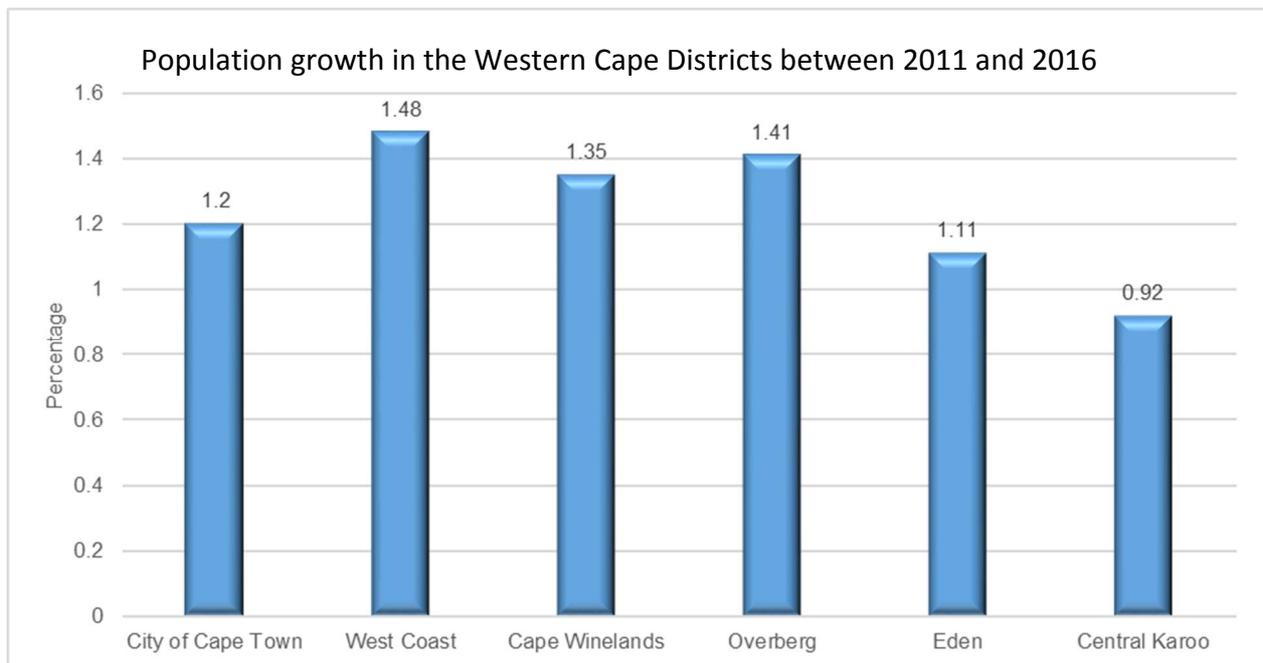


Figure 2-3: Population growth in the Western Cape Districts between 2011 and 2016

Source: StatsSA CS, 2016

2.2 Growing human settlements

Expanding human settlements pose one of the biggest environmental challenges in the Western Cape. As population increases, so too does the demand for housing, infrastructure and services, which increases the impact on the environment.

In 2011, 90.0% of the Western Cape population was living in urban areas¹. The authorities' capacity to provide and manage basic service infrastructure in urban areas is



¹ Although the Western Cape Provincial Spatial Development Framework classifies settlements into five categories based on population size, the same classification system is not used in the SoEOR. Rather, more general terms (i.e. urban and rural) are used at the authors' discretion.

already overextended (African Centre for Cities and Western Cape Department of Human Settlements, 2017). In addition, the legacy of segregated settlement patterns, inequality, poor health and unemployment further compromise the capacity of the environment to assimilate consequent effects of urbanisation. This is compounded by the fact that ecosystem services remain an important source of livelihoods in the Western Cape.

Segregated spatial patterns have consigned the poor to the urban fringes, with limited economic opportunities, and access to services. This pattern persists, with housing delivery at or beyond the urban edge aggravating unsustainable urban sprawl. The Western Cape Government (WCG) is attempting to move towards sustainable and resilient human settlements in the Western Cape, although implementation remains a significant challenge (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

3 STATE

The state of human settlements in the Western Cape is measured by settlement indicators and how they have changed over time.

3.1 Housing demand and delivery

Housing is a key indicator and a significant driver of urban sprawl in South Africa and the Western Cape. Availability of appropriate housing is a key issue in the Western Cape, owing to increased demand driven by population growth and immigration. In the Western Cape, households requiring housing typically register (applications) on municipal Housing Demand Databases, consolidated by the Provincial Department of Human Settlements. In 2015, 496 726 households were registered. It is estimated that in 2040, the Western Cape population will reach 8.1 million, which equates to 2.6 million households; consequently the province will have to provide an additional 35 000 units per annum (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

Tracked **indicators** of status of **Human Settlements**:

- *Housing demand and delivery;*
- *Access to basic services;*
- *Access to transport; and*
- *Open space provision.*

3.1.1 Housing type

There are 1 933 876 households in the Western Cape (StatsSA Community Survey, 2016), with an average household size of 3.2, marginally below the national average. The 2011 census recorded an average household size of 3.6 for the Western Cape, suggesting that family units are reducing



in size, and implying a higher demand for houses (since there are fewer people per unit). There are many housing types in the Western Cape: the majority (82.4%) are classified as formal; 16.6% as informal; and fewer than 0.1% classified as traditional dwellings. About 6.0% of formal accommodation is deemed to be overcrowded.

In 2015, an estimated 384 000 households were living in inadequate conditions in the province.

“Inadequate conditions” include overcrowded formal accommodation, informal settlements and backyard dwellings (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

Table 3-1: Housing types in Western Cape municipalities (as a percentage) (2017)

Settlements category of largest town	District Municipality	Local Municipality	Formal owned	Over-crowding	Informal settlement	Backyard rental	Traditional	Other
Metropolitan Municipality	CCT	Cape Town	78	5	13	7	0	0
Regional Centre (>70 000 pop): Very high & high Growth Potential (GP)	Eden	George	84	6	7	7	1	1
	Cape Winelands	Drakenstein	85	7	6	8	0	1
	Cape Winelands	Stellenbosch	75	4	17	6	1	1
	Eden	Mossel Bay	86	8	7	5	1	1
	Cape Winelands	Breede River	78	6	15	5	1	1
Regional Centre (>70 000 pop):Medium GP	Eden	Oudtshoorn	89	8	6	5	0	0
Primary Regional Services Centre (RSC) Swartland(20 000 - 70 000): Very high & high GP	Eden	Knysna	74	3	18	6	1	1
	West Coast	Swartland	91	10	2	6	0	1
	Overberg	Theewaterskloof	80	7	11	5	0	0
	West Coast	Saldanha Bay	82	6	11	5	2	2
	Overberg	Overstrand	80	6	9	8	1	1
Primary RSC (20 000 - 70 000): Medium GP	Cape Winelands	Witzenberg	86	7	6	4	1	1
	Overberg	Swellendam	88	7	6	4	1	1
Primary RSC) (20 000 - 70 000): Low GP	Central Karoo	Beaufort West	98	4	1	1	0	0
Secondary RSC (5 000 - 20 000): High GP	West Coast	Bergrivier	93	8	1	3	1	2
	Eden	Hessequa	94	5	2	2	1	1
	Eden	Bitou	72	7	15	9	1	3
Secondary RSC (5 000 - 20 000): Medium growth potential	Cape Winelands	Langeberg	91	10	2	6	0	1
	Overberg	Cape Agulhas	85	2	11	2	1	1
Secondary RSC (5 000 - 20 000): Very low and low GP	West Coast	Matzikama	85	2	11	2	1	1
	West Coast	Cederberg	87	5	8	3	1	1
	Eden	Kannaland	96	14	1	1	1	1
Rural settlement able to support social services (1 000 - 5 000): Very low and low growth potential	Central Karoo	Prince Albert	93	7	3	2	1	1
	Central Karoo	Laingsburg	96	5	0	1	1	2

Source: African Centre for Cities and Western Cape Department of Human Settlements, 2017

An analysis by the African Centre for Cities and Western Cape Department of Human Settlements (2017) revealed that:

- Informal settlements are most prevalent in municipalities with larger urban settlements and elevated growth potential;
- Backyard dwellings are prevalent only in the CCT's older townships and municipalities with larger urban settlements and high growth potential; and
- Overcrowding is evident in all municipalities but to a greater degree in those with medium-sized settlements and with medium to high growth potential, e.g. in a number of the larger coastal hubs (Cape Town, Knysna and Stellenbosch), and interior economic hubs.

Table 3-1 (Western Cape Treasury, 2016) indicates the number of informal houses per district. Compared to national figures, housing types in the Western Cape are marginally better, with the lowest proportion of people living in informal dwellings. However, it appears that the number of households living in informal dwellings continues to increase in the CCT, primarily because population growth in CCT exceeds housing delivery rates (African Centre for Cities and Western Cape Department of Human Settlements, 2017). This is exacerbated by shrinking household sizes, with young, single migrants and adult children who do not qualify for housing subsidies, or are not generally prioritised, establishing homes in informal dwellings in informal settlements and backyards (Anthony Hazell, Pers. Comm. September 2017).

Table 3-2: Number of informal settlements per type and district

	Households in shacks not in backyard	Proportion of all households	Households in shacks in backyards	Proportion of all households
City of Cape Town	143 823	13%	74 957	7%
Cape Winelands	19 815	19%	11 836	6%
Eden	14 068	9%	9 522	6%
Overberg	7 506	10%	4 048	5%
West Coast	6 272	6%	4 744	4%
Central Karoo	183	1%	174	1%
Total	191 667	12%	105 281	6%

3.1.2 Housing Delivery

A significant 13.20% of people in the Western Cape indicated that the greatest challenge in the province is inadequate housing (StatsSA CS, 2016). As of July 2017, a total of 535 802 households in the province had registered their demand for housing (refer to Figure 3-1 below). Almost 60% of registered demand is accounted for in the CCT. The actual need for housing could be much greater when considering households who have not registered their housing need with the relevant municipality (WCG, 2017b).

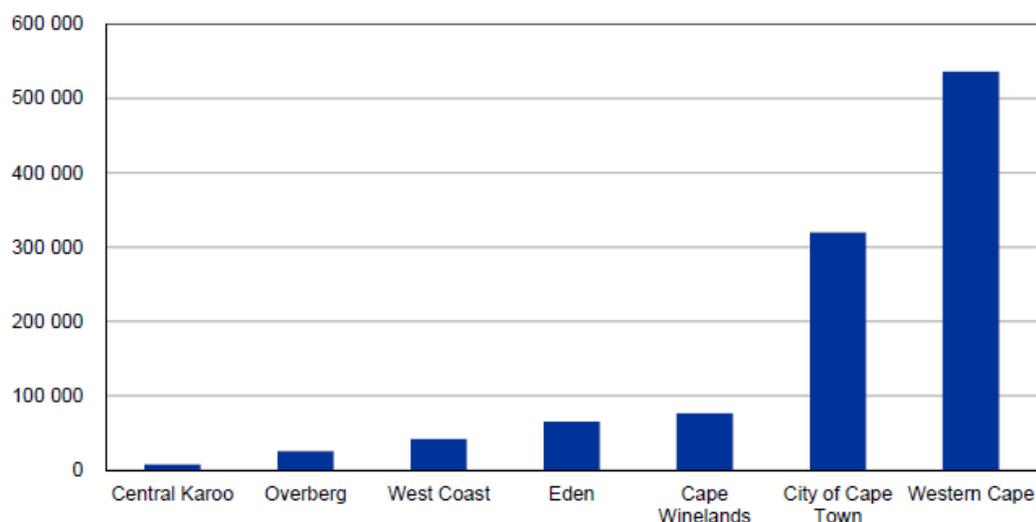


Figure 3-1: Registered housing demand in the Western Cape per district

Source: WCG, 2017b

3.1.3 Housing demand

Housing 'demand' in the Western Cape is recorded through the Housing Demand Databases. Demand for housing type directly relates to the households' ability and willingness to pay, invariably determined by income, family size, housing design preference and access to finance (i.e. bonds). Of those living in inadequate conditions in the Western Cape Province:

- 135 000 households (8%) earn less than R 800 a month;
- 178 000 (11%) earn R 801 - R3 500 a month;
- 55 000 (3%) earn R3 501 - R7 500 a month; and
- 16 000 (1%) earn R7 501 - R15 000.

Remaining households with inadequate housing earn above R 15 000 a month (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

Although the budget allocated to housing in the Western Cape continues to increase, the annual delivery of units is declining, with indicators suggesting a notable decrease between 2010/11 and 2013/14. Reasons cited for failure to meet housing demand include increased construction costs, community unrest (especially in CCT), cost overruns, inflation and increases in delivery standards (Living Cape, 2017). On average, 23 000 housing opportunities are delivered annually across all subsidy programmes in the Province. At this rate it would take in excess of 16 years to eliminate the 529 181 backlog, placing further pressure on those responsible for housing delivery (African Centre for Cities and Western Cape Department of Human Settlements, 2017).

The number of households that received housing subsidies and grants increased to 7.0% in the Western Cape between 2002 and 2013 (National General Household Survey, 2013). Only the Free State (17.1%) awarded more grants than the Western Cape. Furthermore, between 2009 and 2013, 64 489 houses were built in the Western Cape, while 42 936 sites were fitted with services (National General Household Survey, 2013). During this period, the CCT built 34 881 houses and installed services at 16 614 sites (StatsSA, 2013).

Figure 3-2 (DTPW, 2014) shows the distribution of housing projects and informal settlements in the province. The majority are in the CCT, with other notable projects in Saldanha Bay, George, Knysna and Plettenberg Bay. Informal settlements are also prevalent in these areas, as the demand for housing in these economic hubs continues to grow.

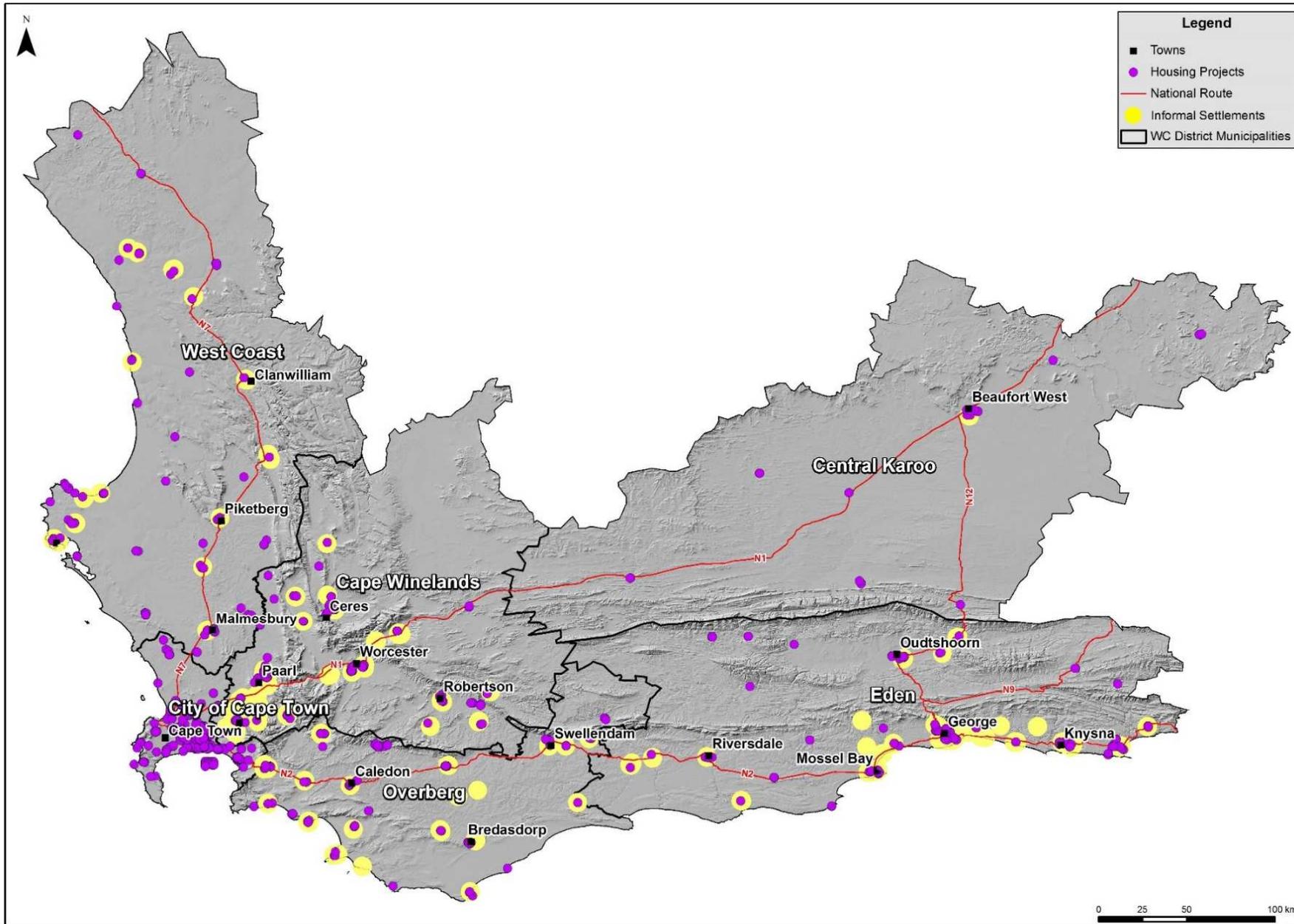


Figure 3-2: Spatial distribution of housing projects in the Western Cape

3.2 Access to basic services

The ability to access basic services indicates the quality of living conditions and human settlements. Poor access to basic services infers an increased demand for natural resources and an increased impact on the natural environment - pollution and contamination of water, soil and air; loss of biodiversity and high-potential land; and the unsustainable use of resources.

The Western Cape continues to perform best in terms of delivery of basic services in South Africa (StatsSA CS, 2016).

3.2.1 Access to potable water

The Constitution affords every citizen the right to basic water provision. Access to clean water is critical to ensure an individual's health, safety and well-being. As such, the WGC provides a quantum of free water (and electricity), especially for poor communities. Worryingly, access to potable (piped) water has decreased in the Western Cape from 99.1% in 2011 to 96.5% in 2016 (Western Cape Treasury, 2016), although the province still has the highest proportion of households with access to piped water inside dwellings. A comprehensive breakdown of access to potable water in the Western Cape is provided in Table 3-3.

Table 3-3: Comparative access to water per household, 2011 and 2016

Area	2011				2016			
	Access to piped water		No access to piped water		Access to piped water		No access to piped water	
Western Cape	1 619 763	99.1%	14 237	0.9%	1 914 055	96.5%	19 821	3.5%
City of Cape Town	1 061 354	99.4%	7 219	0.6%	1 229 695	97.2%	35 154	2.8%
West Coast	105 710	98.9%	1 071	1.0%	121 247	93.4%	8 614	6.6%
Cape Winelands	196 603	99.2%	1 662	0.8%	225 934	95.7%	10 072	4.3%
Overberg	76 609	99.2%	586	0.8%	88 176	96.0%	3 658	4.0%
Eden	160 523	97.8%	3 587	2.2%	180 498	95.3%	8 847	4.7%
Central Karoo	18 963	99.4%	112	0.6%	20 805	94.7%	1 175	5.3%

Source: Western Cape Treasury, 2016

Currently, 35 154 households in the CCT do not have access to piped water, relying on alternative water sources. This figure has increased since the 2011 Census, and is replicated in other districts (StatsSA CS, 2016). The increase is mainly attributable to rapid population growth and possibly differing sampling methodologies. Maintenance of infrastructure has been hampered by chronic underinvestment, and a large proportion of existing infrastructure is reaching (or has reached) capacity (Western Cape Infrastructure Framework, 2013).

3.2.2 Quality of drinking water (Blue Drop)

The Blue Drop Certification Programme, which was introduced by the then Department of Water Affairs and Forestry in 2008, has become the standard for drinking water quality in South Africa. It serves as a regulatory certification measure to ensure continual improvement in South Africa's drinking water and the capacity of those who manage it. (DWS, 2014).

The average Blue Drop score for the Western Cape decreased from 94.0% in 2011 to 89.0% in 2014, i.e. poorer overall sustained water quality. Notably, 25 water service authorities lost their Blue Drop

status and only four recorded “improved” performance. The CCT received the highest Blue Drop score in the province in 2014 (95.86%). The Western Cape is the second best performing province behind Gauteng. Table 3-4 presents all municipal Blue Drop scores, with the performance based on comparison of 2012 and 2014 scores. Note that water quality compliance rates published by CCT indicates over 99% compliance of their drinking water with South African National Standard 241:2015 over the past year. This information is not included in the table below as similar, comparable information is not available for all Districts (CCT, 2018). This information has, however, informed the performance trend for CCT.

Table 3-4: Municipal Blue Drop scores from 2010 to 2014

Area	Water Service Authorities (Local Municipalities)	2010	2011	2012	2014	Performance Trend
Western Cape		92.45	94.0	94.2	89.0	Deteriorating
CCT	City of Cape Town	98.20	97.61	98.14	95.86	Improving ²
West Coast	Bergvrievier	62.70	85.20	92.15	63.79	Deteriorating
	Cederberg	60.00	51.05	80.39	39.96	Deteriorating
	Matzikama	30.10	32.98	70.29	48.64	Deteriorating
	Saldanha Bay	80.80	87.69	95.40	69.38	Deteriorating
	Swartland	68.60	92.89	95.24	74.26	Deteriorating
Cape Winelands	Breede Valley	74.00	85.93	89.02	89.16	Improving
	Drakenstein	91.70	95.72	96.26	72.14	Deteriorating
	Langeberg	0.00	32.39	51.62	72.30	Improving
	Stellenbosch	94.90	95.74	95.56	80.12	Deteriorating
	Witzenberg	93.30	97.56	97.63	95.77	Deteriorating
Overberg	Cape Agulhas	78.60	73.01	86.64	69.48	Deteriorating
	Overstrand	71.60	90.56	96.82	90.79	Deteriorating
	Swellendam	67.30	80.50	85.16	57.25	Deteriorating
	Theewaterskloof	49.00	75.41	71.50	64.18	Deteriorating
Eden	Bitou	97.70	96.12	97.74	90.43	Deteriorating
	George	96.90	96.26	97.41	82.77	Deteriorating
	Hessequa	46.20	14.10	35.59	55.18	Improving
	Kannaland	19.40	22.05	28.47	31.66	Improving
	Knysna	75.20	89.76	92.00	61.62	Deteriorating
	Mossel Bay	84.50	95.27	95.68	78.76	Deteriorating
	Oudtshoorn	44.80	36.88	64.58	51.29	Deteriorating
Central Karoo	Beaufort West	83.80	92.01	94.91	89.52	Deteriorating
	Laingsburg	63.90	80.54	71.16	26.06	Deteriorating
	Prince Albert	55.00	70.72	70.09	34.18	Deteriorating

Source: DWS, 2014

Blue Drop Certification will become increasingly difficult to attain in the Western Cape as water shortages begin to impact on the province’s ability to provide drinking water. Other factors, which will exacerbate delivery of potable water, include inadequate maintenance of water service infrastructure and shortcomings at operations level.

² Taking into account more recent data collected by CCT (2017)

3.2.3 Quality of treated wastewater (Green Drop)

The purpose of the Green Drop Certification Programme is to safeguard the quality and delivery of sustainable wastewater treatment services. The certification process is based on a well-developed risk and incentive based system. The programme provides a good indication of the level of service provided by wastewater treatment works and ensures compliance with standards that safeguard human and ecological health and well-being.

The Western Cape achieved an 84.2% Green Drop Score³ in 2013 (83.10% in 2011), the best performing province in the country. This indicates good compliance, corroborated by the lowest risk score of 57.7%. A breakdown of Green Drop Scores were not available at local municipal level, and as such, the Cumulative Risk Ratio performances for local municipalities is provided in Table 3-5. Cumulative Risk Ratio forms part of the overall Green Drop Score, with low percentages indicating low risk rates and thus, good performance. The Beaufort West, Bitou, Witzenberg and Overstrand water service providers received the best overall risk positions (lowest scores), and Beaufort West, Bitou, Hessequa, Bergriver and Drakenstein received the best progress in terms of risk abatement (based on comparison of 2013 and 2014 scores).

Table 3-5: Municipal Green Drop Cumulative Risk ratios from 2011 to 2014

Area	Water Service Authorities (Local Municipalities)	2011	2012	2013	2014	Performance Trend
Western Cape		61.1	51.5	52.5	57.7	Deteriorating
CCT	City of Cape Town	49.0	55.9	47.3	49.3	Deteriorating
West Coast	Bergriver	54.1	60.0	62.4	55.3	Improving
	Cederberg	59.8	83.3	73.1	75.6	Deteriorating
	Matzikama	52.9	56.7	57.4	74.5	Deteriorating
	Saldanha Bay	47.1	84.9	44.5	58.0	Deteriorating
	Swartland	47.2	67.3	55.6	64.4	Deteriorating
Cape Winelands	Breede Valley	47.4	58.7	45.3	63.0	Deteriorating
	Drakenstein	47.1	65.3	60.3	56.1	Improving
	Langeberg	56.5	67.8	50.6	64.5	Deteriorating
	Stellenbosch	62.4	80.0	83.2	79.5	Improving
	Witzenberg	42.6	43.1	35.6	38.5	Deteriorating
Overberg	Cape Agulhas	48.5	79.2	55.9	72.1	Deteriorating
	Overstrand	38.5	39.2	37.3	41.1	Deteriorating
	Swellendam	63.5	70.0	52.9	75.3	Deteriorating
	Theewaterskloof	56.3	61.9	49.6	49.6	Stable
Eden	Bitou	20.2	22.0	29.0	20.2	Improving
	George	34.8	39.3	37.7	49.2	Deteriorating
	Hessequa	60.6	71.1	62.9	51.8	Improving
	Kannaland	60.8	72.2	74.5	78.4	Deteriorating

³ Green Drop scores are given per individual wastewater system within the municipal area for Process control, maintenance and management skills; Wastewater quality monitoring; Credibility of wastewater sampling and analysis; Submission of wastewater quality results; Wastewater quality compliance; Management of wastewater quality failures; Storm-water and water demand management; By-laws; Capacity and facility to reticulate and treat wastewater; Publication of wastewater quality performance; Wastewater asset management.

Area	Water Service Authorities (Local Municipalities)	2011	2012	2013	2014	Performance Trend
	Knysna	55.0	48.4	40.8	47.3	Deteriorating
	Mossel Bay	43.0	39.4	45.6	47.7	Deteriorating
	Oudtshoorn	56.5	65.8	52.1	57.6	Deteriorating
Central Karoo	Beaufort West	29.4	50.0	60.3	36.8	Improving
	Laingsburg	70.6	77.8	58.8	88.2	Deteriorating
	Prince Albert	56.9	57.4	41.2	76.5	Deteriorating

Source: DWS, 2013/14

3.2.4 Sanitation

The percentage of households with access to sanitation (flush/chemical toilets) in the Western Cape has improved from 90.5% in 2011 to 94.6% in 2016 (StatsSA CS, 2016), largely attributed to the effective roll-out of the Access to Basic Service (ABS) programme. This programme facilitated improved access to water through installation of communal taps in all informal settlements in the Western Cape over the past few years.

Table 3-6 illustrates that the number of households using other⁴ sanitation facilities has declined in every district. The biggest improvements have been in the West Coast (29 % increase in the number of flush/chemical toilets), Eden (27% increase) and Overberg (27% increase).

Table 3-6: Comparative access to sanitation per household, 2011 and 2016)

District	2011				2016			
	Flush/chemical toilets		Other		Flush/chemical toilets		Other	
CCT	976 177	91%	92 396	9%	1 193 110	94%	71 739	6%
West Coast	93 459	88%	13 322	12%	120 155	93%	9 706	7%
Cape Winelands	181 418	92%	16 848	8%	228 650	97%	7 356	3%
Overberg	69 274	90%	7 922	10%	87 910	96%	3 925	4%
Eden	140 751	86%	23 359	14%	178 646	94%	10 700	6%
Central Karoo	17 075	90%	2 001	10%	21 345	97%	635	3%

Source: Stats SA Census, 2011; StatsSA CS, 2016; WCG, 2016

Chemical and flush toilets are the most common form of sanitation at district level. No districts have more than 5% of households without access to sanitation (WCG, 2016).

Although access to sanitation has greatly increased over the last five years, more needs to be done to improve access. Those without access to flush/chemical toilets should be prioritized: the use of ecological, pit and bucket toilets is damaging to the environment, polluting both ground and surface water systems. This affects the health and social well-being of those relying on these water resources.

Access to flush toilets should also be improved, because chemical toilets provide a lower standard of service at greater (long term) cost, with greater environmental risks owing to inadequate maintenance. A study investigating implementation of sanitation in informal settlements in Cape Town revealed that, due to the inability to eradicate the bucket system nationwide, DWAF (2008) accepted the continued use of un-sewered toilets as 'temporary'

⁴ Other sanitation facilities refer to bucket, pit latrine and ecological toilets

options. In addition, chemical toilets are difficult and costly to maintain, and present a number of health and environmental hazards as residents dispose of their waste in sensitive areas (e.g. wetlands) (Taing, 2015).

3.2.5 Refuse removal

Refuse is removed by the local authority at least once a week in the majority of households in all six of the provincial districts. The provision of refuse removal services has steadily increased across the districts (Stats SA Census, 2011; StatsSA CS, 2016), with a consequent small decrease in burning and communal or private refuse dumps. However, there are still numerous illegal dumping sites, areas where refuse is burnt and unlicensed waste sites, which adversely affect both human and environmental health. Additional details in this regard are provided in the Waste Management Chapter.

Figure 3-3 depicts the level of domestic waste collection services in district municipalities. Municipal waste removal services increased in all of the district municipalities between 2001 and 2015, with the West Coast and Central Karoo districts achieving 99.8% and 100%, respectively (Provincial Treasury, 2015). In the CCT, the percentage remained stable at 94% between 2001 and 2011, with no data available for 2015 (DEA&DP, 2017). The DEA&DP Integrated Waste Management Plan (IWMP) noted that refuse removal services provided by local municipalities could be improved.

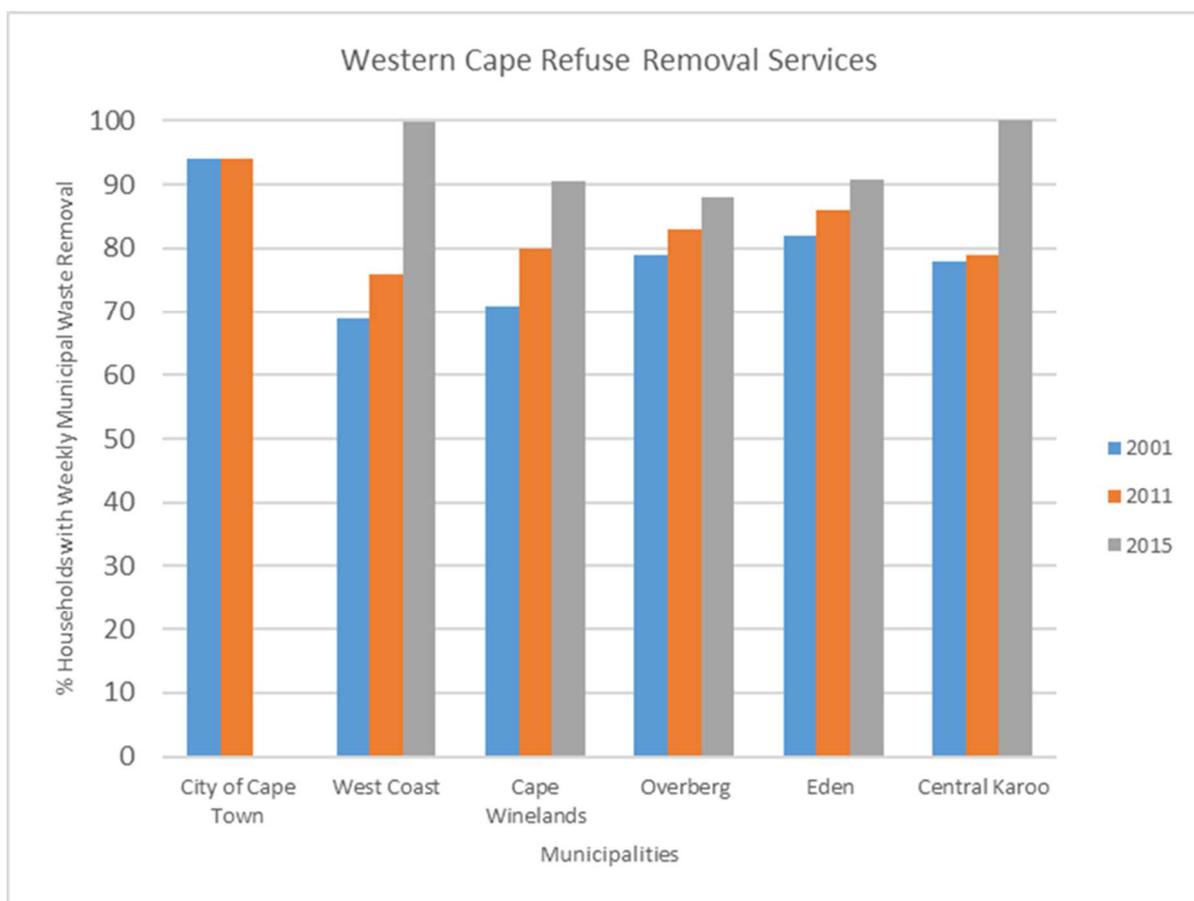


Figure 3-3: Refuse removal services as of June 2015

Source: StatsSA, 2012, DEA&DP, 2017

3.2.6 Access to electricity

Access to electricity is critical for modern economies, but is also important for safety, warmth, washing, cooking and a number of other everyday requirements.

In 2016, 96.5% of Western Cape households had direct access (connections) to electricity, up from 93.6% in 2011. (Stats SA Census, 2001/2011; StatsSA CS, 2016; WCG, 2016).

Table 3-7: Proportion of population with access to electricity in the Western Cape 2016

Area	2001	2011	2016
Western Cape	88.1%	93.6%	96.5%
City of Cape Town	88.8%	94.0%	97.2%
West Coast	88.1%	94.4%	93.8%
Cape Winelands	88.5%	92.8%	94.1%
Overberg	83.9%	91.2%	93.9%
Eden	85.6%	91.1%	95.6%
Central Karoo	83.9%	89.4%	95.1%

Source: Stats SA Census, 2001/2011; StatsSA CS, 2016; WCG, 2016

High connection costs continue to hinder progress specifically in rural and urban-fringe settlements (de Wet, 2017). Some households resort to dangerous illegal connections (most common in urban areas). Part of the electrification drive in the province needs to focus on sustainable, renewable energy options, such as solar energy.

3.3 Access to transportation

Access to transport is an important factor in the viability and long-term sustainability of human settlements. Transportation is the second highest energy consumer after the industrial sector, contributing to unsustainable use of non-renewable (fossil fuel) resources and high carbon dioxide emissions (DEA&DP, 2013). This is compounded by the inefficient structure of towns in the province, based on the apartheid-style planning, which removed the poor and settled them on the periphery of towns, far from employment opportunities and amenities.

The Western Cape has a well-established transport system and access routes compared to the rest of the country (DEA&DP, 2013) (see Figure 3-4 (DTPW, 2014)). In addition to the national and provincial roads in the Western Cape, numerous arterial and secondary roads connect the province internally and to other provinces. Cape Town International Airport serves as the international air travel hub for the province, but is supported by numerous smaller airports and airstrips.

While road infrastructure in the province is fairly well developed, operating public transport is not cost effective due to the spatial structure of our cities and towns (monocentric towns with strong daily in and out flows). Strong spatial strategies are required to support transport services (e.g. transit-oriented development). This situation has been catered for the by the minibus taxi industry, resulting in a service which can be sub-optimal, and is on-demand (i.e. offers no services on non-viable routes and at non-viable times). There is a recognition that this service needs to be integrated into the institutionalised integrated transport system (Nicky Sasman, pers.comm January 2018).

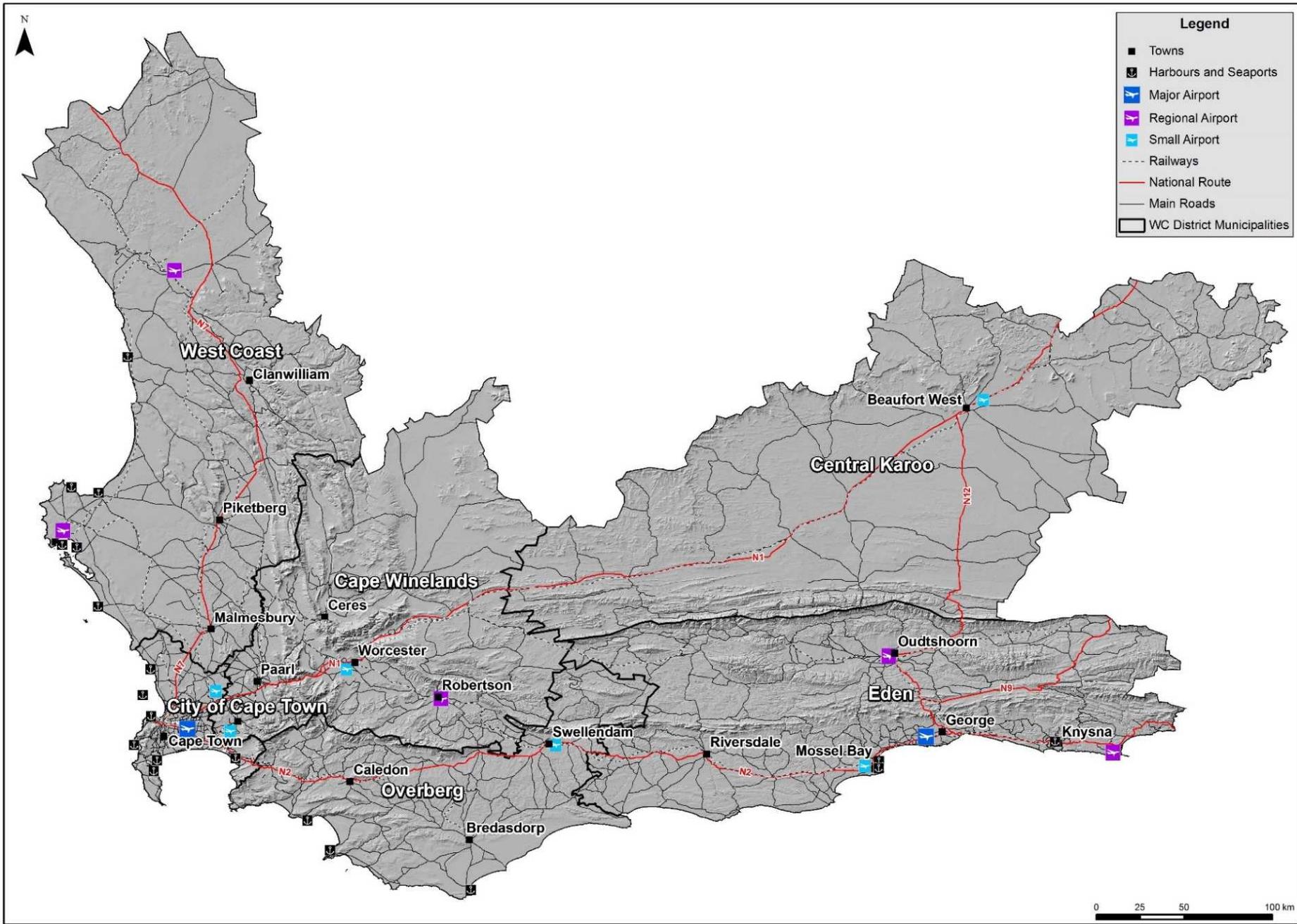


Figure 3-4: Transportation networks in the Western Cape

The Western Cape Province has invested considerably in improving its transport services to ensure access to fast, reliable and sustainable transport. The following transport priorities have been identified in the Provincial Land Transport Framework (2011/12 – 2015/16):

- Fully integrated Rapid Public Transport Networks in the higher-order urban regions of the province to promote access to opportunity, equity, sustainability, safety and multi modal integration;
- Fully integrated Public Transport Networks in the rural regions of the province, providing regular, affordable public transport linking major towns to their rural hinterlands and services;
- A safe public transport system, including policing both on public transport and road ways to enable the ease of movement for those who may wish to walk or cycle;
- A well-maintained road network, focusing on strategic roads offering economic and developmental potential for the province. Roads will be maintained in the most cost-effective and efficient manner;
- A sustainable, efficient high speed rail long distance public and freight transport network, connecting the Western Cape to the rest of South Africa and Africa to allow the efficient movement of people and freight;
- An efficient international airport linking the rest of the world to the choice gateway of the African continent: with Cape Town International Airport as the best run and most efficient airport on the continent;
- Ports and associated logistics systems that are well developed, well maintained, highly efficient and meet international standards;
- A transport system (both public and private) that is resilient to peak oil, with an aggressive energy transition plan to move away from non-renewable energy sources, towards renewable energy which supports the new electricity-based transport system; and
- A transport system that is fully integrated with land use.

One of the goals of the Western Cape Government is to provide an efficient, accessible and integrated multimodal public transport system managed by capacitated and equipped municipal authorities. The WCG allocates substantial funding towards the multimodal public transport system with rail as the backbone (DTPW, 2011). The objectives were to obtain a 13% modal shift from private to public transport into Cape Town's CBD by 2014 and increase the number of commuter rail train sets to 117 by 2016. Investment in new train sets was expected to be around R4 billion (DTPW, 2011).

The most and least utilised transport modes in the Western Cape are summarised in Figure 3-5 (StatsSA, 2014).

The Provincial Spatial Development Framework (2014) recognises transport as a basic need, but there are barriers to providing this service, including:

- High costs of public and private transport;
- Absence of public transport in low income/low density areas; and
- Location of settlements far from economic/social centres.

In many cases commuters are forced to make use of more than one mode of transport per journey, increasing commuting costs, and highlighting the need for integration between various modes of transport in the province. Greater integration between services is required, which will require changes to government arrangements (which are currently split between the provincial and local governments).

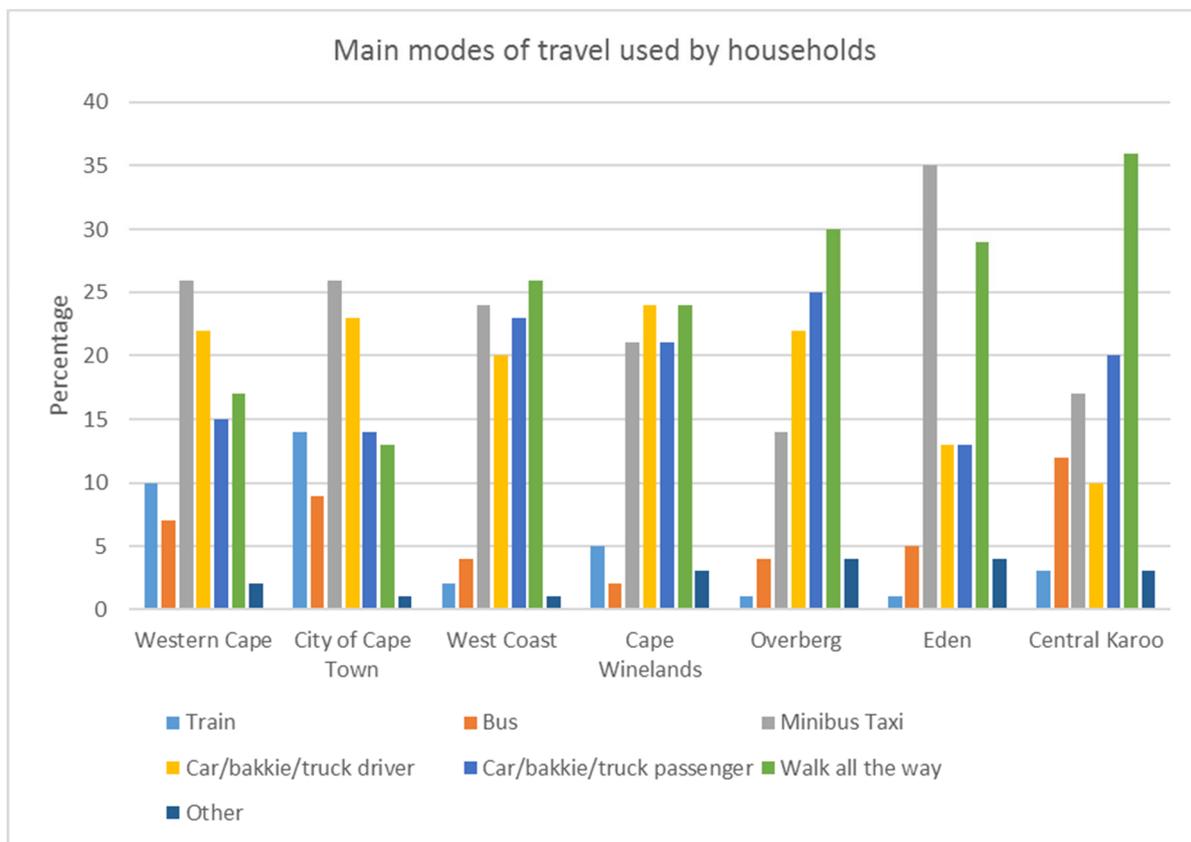


Figure 3-5: Main modes of travel usually used by households, by district municipality⁵

3.3.1 Integrated Rapid Transport

In the Western Cape, Integrated Rapid Transport (IRT) systems are being rolled out in CCT in phases, which seek to integrate all modal options into a coherent package for the customer. Among the modes to be integrated are: rail services, quality bus services, minibus taxis, feeder bus services, pedestrian and bicycle access, metered taxis, and park-and-ride facilities.

3.3.2 Rail transport

Trains are the bulk carrier and the more affordable form of public transport in the province, although there has been a recent, but persistent drop in use of this mode of transport, primarily due to inefficiency and safety concerns (Tristan Görgens, Pers. comm, September 2017). Recent accurate data on train use is however not available.

Metrorail Western Cape operates 702 trains per weekday, 360 trains on Saturdays and 230 trains on Sundays, across six local municipalities, viz. the CCT, Drakenstein, Stellenbosch, Breede Valley, Swartland and Helderberg sub-council area (Wiggill, 2016).

Some key areas within the CCT have no train service, notably Blue Downs, the Atlantic suburbs and Tableview (Metrorail Western Cape, 2012). The former will be served by the proposed Blue Downs railway line, while the latter is served by Cape Town's Bus Rapid Transit (BRT) System, as discussed in section 3.3.3. Safety concerns, especially during off peak times, and unreliable service (partially attributed to cable theft) pose challenges to commuters making use of rail services.

⁵ Provincial subsidies on bus services through the Division of Revenue Act gives them a pricing advantage over the minibus taxi industry which is not subsidised.

Passenger train routes are largely confined to the CCT, however the City of Cape Town, 2017: Comprehensive Integrated Transport Plan 2018-2023 shows that the current rail service is in crisis in Cape Town. The transport system in Cape Town is highly dependent on rail as its backbone, but the serious decline in service has forced many passengers onto the road network, leading to gridlock during the peak periods. The National Rail Policy Green Paper of 2015 proposed that municipalities should take over the operational subsidies and enter into service level agreements with the Passenger Rail Agency of South Africa (PRASA). Subsequently, a National Rail Policy Draft White Paper was released in June 2017. The draft White Paper acknowledges that around the world, urban rail generally has always been a local government function. The draft White Paper sets out a route map for the full assignment of the urban rail function to municipalities commencing with the enactment of the National Rail Policy in 2019 and the completion of such assignments by 2025. While the CCT acknowledges this approach, it is currently considering, as part of its Commuter Rail Plan, whether other strategies are necessary in order to address the current rail crisis in Cape Town.



The CCT cannot deliver integrated, intermodal and interoperable transport in Cape Town without an effective rail component. Furthermore, rail is not just the backbone of the transport system but also of Cape Town's spatial form. In response to the rail crisis, and within the context of achieving integrated transport, the CCT has developed a draft business plan for its approach to rail (CCT, 2017a).

3.3.3 Bus services

Buses are the third most used form of public transport in the province after minibus taxis. Buses are less able to access rural areas in the province (Statistics South Africa and Department of Transport, 2014). While the province still subsidises conventional bus services, national funding has shifted to bus rapid transport systems, which can be implemented on the basis of an integrated transport plan. Cape Town and George have succeeded in doing this, although this has not had a significant impact on shifting modal choice away from private motor vehicle use and national funding to BRT systems is now being reduced (Nicky Sasman, pers. comm. January 2018).

The first phase of Cape Town's BRT System, the My CiTi bus service, was launched in the CCT in 2011 with an extensive route network in the Cape Town CBD and extending from the CBD along major routes to Khayelitsha, Mitchells Plain, Atlantis, Camps Bay and Hout Bay, Tableview and Melkbosstrand and Century City. The second phase will provide a more extensive service to the southeast parts of the city, including Mitchells Plain and Khayelitsha, to destinations across the peninsula (Spatial Planning and Urban Design Department, 2016). The third phase will include Bellville, Delft, the rest of the northern suburbs and Stellenbosch, and the fourth phase will include the Greater Helderberg area (Spatial Planning and Urban Design Department, 2016). The rollout plan for further phases will be revised in 2019 and may be less ambitious.

3.3.4 Minibus taxi services

Minibus taxis remain the most utilised form of transport among Western Cape households (51.4%), specifically in the CCT, Eden, and Cape Winelands Districts, where they are the dominant means of transport (National Household Travel Survey: Western Cape Profile, 2014). However, minibus

taxis still account for the most transport accidents and are considered unsafe, largely due to roadworthiness concerns and reckless driving.

The nature of the minibus taxi industry differs for each municipality due to differences in population densities, economic activity and geographical location. The minibus taxi service is more focused on passenger trips to work or school in dense areas and also targets shopping and health destinations during off-peak periods. In low density areas, people usually make use of non-motorised transport, and where minibus taxis are utilised, they are more likely to provide a door-to-door service to passengers. The minibus taxi service is the dominant mode of public transport and provides commuter and long distance services. However, during off-peak periods the minibus taxi ranks are underutilized. The tariff charged, fare collection and routes serviced are not structured and change often. Minibus taxis operate predominantly within urban centres, where they contribute to the majority of passenger movements throughout the week (Department of Transport and Public Works, 2011).

Regulation of minibus taxi operators is improving. The Provincial Regulatory Entity (PRE) in the DTPW is responsible for issuing Operating Licences and/or permits to all modes of public transport, including minibus taxis, however the CCT has applied for this function to be devolved to the City.

Overtrading of minibus taxi routes is probably one of the main reasons for the instability in the industry. Overtrading has rendered large parts of the industry economically unsustainable, resulting in a fleet of ageing and un-roadworthy minibuses and has led to fierce competition for passengers forcing operators to annex other more lucrative routes (TCT, 2014). The situation is aggravated by illegal operators, believed to account for 49% of all operators, abetted by inefficient law enforcement and failure to appoint the Transport Appeals Tribunal (TCT, 2014).

Restructuring of transport systems in the Western Cape is inhibited because the minibus taxi industry is not sufficiently structured or formalised to enter into tendered or negotiated contracts (TCT, 2014).

3.3.5 Non-Motorised Transport

Non-Motorised Transport includes all forms of movement that are not propelled by battery and or fuel combustion driven mechanisms, for example walking, cycling as well as those pushing and pulling carts, prams, wheelbarrows, trolleys, animal drawn carts and wheelchairs. Historically, NMT has not received the attention it deserves in the province, although this is changing. NMT is the most flexible mode of transport and the importance of catering for and integrating NMT with all other modes of transport cannot be overemphasized.

While local governments are increasingly catering for NMT use, this is usually reactive (e.g. providing pathways along well-used tracks and roadways). The formal recognition of major roads as important pedestrian routes could enable safety measures to be put in place for NMT users, especially at night.

3.3.6 Sea transport

Two deep-water harbours (Cape Town and Saldanha) are key to the economy, offering transport and economic opportunities, which attract job seekers and promote economic growth and development.

A number of small vessel harbours along the coast service the fishing, tourism and recreational sectors. However, the increasing maintenance and capital funding constraints for these small harbours is a challenge (CCT, 2017b).

3.4 Open space provision

Open spaces are important features of sustainable human settlements, and their functions include:

- Recreational parks;
- Hosting of music and art festivals, civic and state events;
- Reduction of visual impact in urban areas;
- Provision of buffers along roads;
- Acting as ecological corridors; and
- Acting as sites for agriculture and conservation of fauna and flora (DEA&DP, 2013).

Healthy natural ecosystems support not only biodiversity, but deliver numerous ecosystem services. These often serve as natural open spaces and as such, are essential components of sustainable development and human settlements, and contribute to community upliftment and quality of life, as well as ecological processes. In addition, they can potentially serve as sites for microeconomic economic activities, including subsistence livelihoods and cultural activities.

The Western Cape Provincial Spatial Development Framework (PSDF) indicates that there is insufficient open space in Western Cape settlements and that where open space is provided, often the design does not facilitate the intended use or spaces are underutilized because of inadequate maintenance and safety concerns.

There is poor data regarding open spaces (and protected and conservation areas) in the province outside of the CCT. Open space in the metropolitan area is poorly maintained and insufficient to support the expanding urban population, while in many instances, open spaces are used for other unplanned activities. Appropriately, used open spaces provide employment opportunities and urban upliftment, both of which can decrease human settlements' reliance and impacts on the environment.

Open spaces are particularly important in the urban context, where many people live in overcrowded conditions with few open spaces. This densification and dearth of open spaces in the province (as recorded by the 2014 PSDF), jeopardises efforts to create fluid and sustainable human settlements, noting that the lack of public open spaces is believed to stimulate crime and social ills.

4 IMPACTS

Considering the state of human settlements and the pressures that they are facing, this section discusses the impacts confronted by the Western Cape environment.

4.1 Changes in human living conditions

The Western Cape aims to deliver more sustainable and adequately serviced human settlements and improved living conditions. This includes improvements to informal housing in the form of serviced sites and sustainable, affordable housing solutions (The Housing Development Agency, 2013).

The *Better Living Challenge* is a five-year joint initiative between the WCG and the Cape Craft and Design Institute. It comprises a series of challenges that aim to foster design innovations to improve living conditions of low-income communities in the Western Cape. The *Better Living Challenge 1* (from 2014 – 2016) focused on innovative home improvement products. The *Better Living Challenge 2* (2016 – 2019) is exploring ways of supporting upgrading of homes, by understanding users' needs, co-creating solutions, and bringing together people from diverse disciplines to find new ways of tackling the housing issue (The Better Living Challenge, 2017).

The *Better Living Challenge* indicates that aspects critical to improving human living conditions in the province are:

- Land ownership, user rights and policy reform;
- Accessible, user-friendly information, networking, capacity building and skills development in informal settlement upgrading planning, process and practice; and
- Affordable, accessible finance for procurement, upgrading and home maintenance.

4.2 Pollution and waste

Inappropriately managed waste contaminates and degrades the environment, affecting health, wellbeing and productivity. Vulnerable communities are the most likely to suffer the impacts of



pollution and waste, with air and water quality often most degraded in informal settlements (DEA, 2011).

Large, growing informal settlements in the Western Cape, with poor living conditions and inadequate basic services, are similarly affected, leading to unsustainable land use practices and degradation (Tizora *et al.*, 2016). Without access to basic services such as piped water and refuse removal, communities become wholly reliant on natural systems and ecosystem services to access these needs. Illegal

dumping, burning of waste and excessive harvesting and burning of wood for fuel are examples of activities degrading the environment and reducing air and water quality (DEA&DP, 2013). Informal settlements located near the coast, rivers, estuaries, wetlands and open spaces are even more likely to pollute and contaminate natural systems. In some instances, ecosystems have been degraded to a point where they are no longer functional nor provide ecosystem services.

4.3 Increased resource use and consumption

Human settlements place significant pressure on natural resources, mainly because the ecological footprint of human settlements extends far beyond their formal delineated boundaries (DEA&DP, 2013), and persist over many generations. This is particularly true of the Western Cape's water resources, which are critically strained by the current extended drought, coupled with growing human settlements and the associated demand for (potable) water. Water resources in the Western Cape are threatened by both climate change and excessive domestic and commercial consumption. Without proper water management measures and monitoring, the resource will continue to be depleted and water scarcity will continue to affect human settlements, particularly those in vulnerable areas and with poor access to piped water (Tizora *et al.*, 2016).

Natural resource use includes the "abstraction of fresh water for domestic and agricultural purposes, generation of electricity, deforestation for timber products, and agricultural over-use of soils. These kinds of over-exploitation take place at regional and sometimes global scales, as these resources are often supplied from places that are geographically remote from the area where the demand exists" (DEAT, 2007).

The impacts of the expansion of human settlements on other resources associated with changes in land use (deforestation, agriculture, etc.) are discussed in the Land Chapter.

4.4 Biodiversity loss and compromised ecosystem services

As discussed in more detail in the Biodiversity Chapter of the SoEOR, biodiversity delivers valuable long-term services to people, such as clean water for drinking, irrigation and industrial use; fishing grounds; grazing land; pollination of crops and natural vegetation; soil formation; clean air; climate regulation; tourism opportunities; flood attenuation and disaster risk reduction. Biodiversity fundamentally sustains life and underpins many aspects of human well-being and socio-economic development.

Most drivers of biodiversity loss in the Western Cape are anthropogenic. These include the transformation of natural areas for agriculture, plantations and horticulture as well as human settlements, infrastructure and services. Rapid development has occurred in coastal areas, characterised by unique natural landscapes and biodiversity, which all underpin the tourism sector (DEA&DP, 2013), the growth of which has contributed to the gradual degradation of biodiversity in the province. Similarly, growing human settlements which use the natural environment for ecosystem services and livelihoods, compound impacts on biodiversity.

Education and understanding of the fundamental role that ecosystems play in natural systems and within communities is not well understood or prioritised by residents of the Western Cape, and capacity building in this sense would promote better usage of finite ecosystem services within those communities that rely on them.

5 RESPONSES

5.1 Mitigation and adaptation

The urgent requirement by government is to reduce and mitigate destructive environmental resource use and unsustainable consumption patterns associated with growing human settlements, while addressing the social and economic requirements for housing, infrastructure and services. As such, the government has made a commitment to a “*Better Living Model*” and sustainable sanitation for all. The *Better Living Model* seeks to decrease the spatial and socio-economic divide by identifying well-located land on which to develop mixed-income, multi-use neighbourhoods. The flagship project is a 22 ha site of the former Conradie Hospital in Pinelands (*Better Living Model*, 2017). Projects like this address the current spatial conundrum faced by the province: people need formal housing; however, most housing is on the urban fringes, increasing transportation costs to and from economic nodes.

Sustainable sanitation for all addresses inequitable and insufficient sanitation, particularly in informal settlements (WCG, 2012). The approach seeks to include a bottom up and top down approach to the supply of sanitation, whereby co-responsibility and co-accountability is adopted between government, communities and households. A review of urban sanitation in South Africa found that waterborne sewage is the most sustainable solution, and resulted in a marginal increase in



water use for a significant increase in service level. The increased water use could be mitigated through decentralised treatment and re-use (Paladh, Graham and Kaplan, 2017).

The PSDF is the primary tool to address spatial inefficiencies and inequalities relating to human settlements in the Western Cape. However, other legislation, policies and tools also address human settlements and their impact on the receiving environment, as listed in Annexure A.

5.1.1 Provincial Strategic Goal 4: Enable a resilient, sustainable, quality and inclusive living environment

Through *Provincial Strategic Goal 4*, the Western Cape Government acknowledges that developing sustainable human settlements is essential to social unity and the reduction of poverty in the province. This requires specific responses to maintain ecosystem health, optimise resource-use efficiencies and promote sustainable waste management. By committing to maintaining a better quality of life for the inhabitants of the Western Cape, the government seeks to ensure the sustainable use of natural resources. Ultimately, Provincial Strategic Goal 4 seeks to enable improvements in Western Cape settlement development and functionality. One of the important drivers of the goal is the Western Cape Sustainable Water Management Plan, which was developed in 2012. The plan emphasises improved governance of water utilisation, technology and innovation (WCG, 2014).

5.2 Sustainable human settlements

The establishment of sustainable human settlements is necessary if the Western Cape is to keep up with the demand for subsidised housing and the delivery of basic services. Demand is fast exceeding supply, fueling growth of large informal settlements. Financial and personnel resource limitations make it difficult for the province to meet demand and, as such, a sustainable solution to human settlements is proving evasive (PDG, 2015).

Since the previous SoEOR (2013), a number of responses have been developed and applied with varying levels of success. A significant driver is the private sector's move towards the green economy and the greening of their businesses and investments. This has extended to the government's response, largely through the introduction of national policies (such as the National Greening Strategy) and provincial strategies, including the Western Cape Green Economy Strategy Framework and PSDF, which explicitly address sustainability, the green economy and green infrastructure. Some responses include:

- The Living Cape: Human Settlement Framework (2017), the focus of which is to improve the quantity and quality of human settlements, as holistic open spaces, in urban areas. The framework aims to facilitate this by ensuring a common understanding and shared vision for human settlements across all sectors in the province, articulating key proposals for integrated human settlements and defining and prioritizing clear and implementable human settlement actions using an area-based/neighbourhood framework;
- The Western Cape Informal Settlement Strategic Framework (2016), developed in recognition that a paradigm shift on informal settlements in the Western Cape is required. The Framework provides guidance to provincial and local municipal departments in developing a coherent programmatic, sector-wide approach to informal settlements (Department of Human Settlements, 2016);
- The IRT system in the CCT, while improving public transport networks in and around the CCT, has proved a costly exercise and continues to face operational sustainability challenges, which are being addressed through integrated transportation planning in the province. In particular, urban nodes are encouraging NMT through pedestrian and bicycle lanes (TCT, 2014);

- Transit-oriented development (TOD) and the BRT system are seen as a means to bringing fragmented settlements closer together, redressing spatial inequalities. Although this is regarded as an expensive intervention in the CCT, expansion of the TOD beyond the CCT is being contemplated;
- The Free Basic Alternative Energy Policy developed by the (former) Department of Minerals and Energy was initiated in the Western Cape in 2003 to provide poor households with alternative energy, largely from solar power. The policy has had mixed results and, like much of service delivery in the province, a slow roll-out (WCG, 2013);
- There has been a mass response to green buildings and technology, which is largely being led by the CCT and businesses located in the Cape Town CBD. A sustainability criterion has been incorporated into the City's Project Approval Process, encouraging a move towards more resilient and sustainable housing developments (WCG, 2013; WCG, 2017a); and
- Numerous opportunities for waste-to-energy generation, industrial symbiosis and recycling initiatives have arisen in recent years. Recycling is a particularly strong response in the province, with many recycling stations and employment opportunities arising (Cloete, 2017).

5.3 Challenges

5.3.1 More efficient and effective land use

Land suitably located for human settlements is scarce and increasingly expensive to secure (Department of Human Settlements, 2010). Continued urbanisation will require the government to focus on the effective utilisation of land when developing human settlements. The Spatial Planning and Land Use Management White Paper identified the need for government to re-examine settlement planning, to facilitate densification and the integration of settlements into infrastructure and socio-economic systems that support their development, such as public transport and social services (South African Government, 2017). In the Western Cape, this has been addressed through the development of the Living Cape Human Settlements Framework.

There is a policy gap at lower household income level, and a simplification and integration of the policy options available to low income households is recommended. This tier of housing seekers will continue to grow, and an understanding of the circumstances these households face, the level of contribution they can make and the type of housing support they need is required. As such, renewed focus on rent-to-buy and rent options in the development of human settlements in the province is necessary (PDG, 2015).

5.3.2 Cross sector partnership building

Government is unable to continue as the chief provider of low-income housing and basic services. Effective partnerships with private and non-governmental sectors, communities and households should be investigated to address increasing future demand (Institute for Security Studies & International Futures at the Pardee Centre, 2017). Contributions by households will help to alleviate financing and maintenance challenges faced by the Western Cape Government in the roll-out of its current low-income housing model.

However, the shift from the starter house model to higher-specification houses is a warning sign that household contributions are not guaranteed and that the government will need an explicit policy initiative to encourage households to invest. Building these partnerships will require bold policy interventions and clear communication regarding the roles of all stakeholders to deliver sustainable, integrated human settlements (Institute for Security Studies & International Futures at the Pardee Centre, 2017).

5.3.3 Integration of government departments

Housing and service delivery need to be addressed through the collective effort of the Western Cape Government departments and local municipalities (Institute for Security Studies & International Futures at the Pardee Centre, 2017). The demand for housing, for example, is linked to the demand for education and employment. Human settlements, therefore, cannot be seen as detached from these factors, warranting an integrated approach to human settlement planning in the province. Such collaboration will become critically important as population and demand for housing and services continues to grow. The 2017 Living Cape Human Settlements Framework aims to ensure a common understanding and shared vision for human settlements across all sectors in the province.

6 CONCLUSION

OUTLOOK: STABLE

The role that human settlements play in environmental change is significant and sustainable approaches to development and maintenance of human settlements in the Western Cape are critical for the health and wellbeing of communities and natural systems. Numerous pressures, including population growth, unsustainable consumption and the growth of human settlements, are prevalent in the province.

Projected population growth, paired with the housing and basic service delivery requirements for settlements are increasing pollution and waste, transforming productive land and deleteriously affecting ecologically sensitive areas and biodiversity.

Legislation governing human settlements is outdated, but is being addressed in the form of the Green Paper on Human Settlements and revision of the National Housing Code. This will include improvement in legislation governing the planning, design and development of settlements, in a sustainable and integrated manner (DHS, 2015). The Living Cape: Human Settlement Framework (2017) and the Western Cape Informal Settlement Strategic Framework (2016) are two key policy responses aimed at improving the quality of human settlements.

Integrated planning has not been fully effected in the Western Cape, hampering planning and delivery of sustainable human settlements. Integrated planning and a better understanding of mandates and responsibilities across municipal departments will expedite identification of strategic priorities and better coordination of resources (WCG, 2014).

While the Western Cape Province is considered the best performer in the country in terms of overall service delivery, continued delivery remains challenging, particularly for housing where increased demand, notably in urban centres, far outweighs supply (Western Cape Treasury, 2016). At national, provincial and local municipal level, insufficient resources are allocated to housing and urban development schemes aimed at improving living conditions for the urban poor. National spending on housing has declined to R 108.3 billion (National Treasury republic of South Africa, 2017), highlighting that constraints to the timeous and effective delivery of housing and services needs to be addressed.

The challenge in the Western Cape is to reduce the impact of human settlements on the natural environment while still meeting basic socio-economic requirements. Promulgation of supplementary legislation guiding sustainable development of human settlements may not be the most viable response, but rather better implementation and enforcement of existing provisions or changes to policy and service delivery models. Nevertheless, national and provincial policies, plans and strategies do address housing and the promotion of sustainable human settlements. The successful implementation and expansion of these, supported by appropriate monitoring and evaluation, is necessary to improve quality and sustainable human settlements. However, it is

important to note that many national regulations and policies encourage unsustainable human settlements and urban sprawl, and inhibit sustainable and innovative local solutions.

In the Western Cape, human settlements have an overall stable outlook. While there has been an increase in the total number of households provided with basic services, continued population growth in the province ensures that demand exceeds supply. Consequently, the proportion of households receiving basic services and housing has decreased in some instances. In addition, there has been a general decline in blue drop and green drop scores across most local municipalities, indicative of declining drinking water quality and wastewater treatment.

Innovative design and technology are important mechanisms to achieve the right balance between socio-economic needs and environmental well-being. Also, more efficient and effective land use is required, supported by a more integrated, cross-sectoral approach.

Table 6-1 provides an overview of the key pressures, impacts, challenges, progress and recommended critical areas for action.

Table 6-2 presents the anticipated changes or outlook for the future of human settlements, based on the findings in this chapter.

Table 6-1: Overview of key human settlements aspects

Aspect	Summary of key points
Pressures	<ul style="list-style-type: none"> • In-migration and urbanisation • Growing human settlements
Impacts	<ul style="list-style-type: none"> • Changes in human living conditions • Pollution and waste • Increased resource use and consumption • Biodiversity loss and compromised ecosystem services
Challenges	<ul style="list-style-type: none"> • Outdated national legislation • Need for integrated planning • Lagging rate of delivery
Progress	<ul style="list-style-type: none"> • Progress in building sustainable human settlements • Increased delivery of electricity and sanitation • Key policy responses including Living Cape: Human Settlement Framework (2017) and the Western Cape Informal Settlement Strategic Framework (2016)
Critical areas for action	<ul style="list-style-type: none"> • Addressing the housing backlog through innovative, sustainable solutions • Research and implementation of innovative water supply solutions for a water scarce province

Table 6-2: Summary of the outlook for human settlements in the Western Cape

Indicator	Quantification	Target/Desired State	Trend
Housing	<ul style="list-style-type: none"> • Informal dwellings constituted 16.6% of households in 2015 (18.2% in 2011) • Housing backlog: 529 181 in 2017 (409 827 in 2011) 	<p>Increasing the % of population with access to formal housing</p> <p>Moving from providing houses to providing sustainable human settlements, with services such as sanitation, electricity and infrastructure.</p> <p>Moving from the State as the main provider of housing to the State as enabler of housing provision through partnerships with other entities, such as the private sector.</p>	<p>Declining</p> 
Access to basic services	<ul style="list-style-type: none"> • Piped water: 96.5% in 2016 (99.1% in 2011) • Electricity: 96.5% in 2016 (93.6% in 2011) • Sanitation: 94.6% in 2016 (90.5% in 2011) • Refuse removal: percentage not available for 2016 (91.7% in 2011), figures however confirm access has increased 	<p>Providing basic services to all households</p>	<p>Improving</p> 
Access to transportation	<ul style="list-style-type: none"> • WC still has better developed transport infrastructure compared to much of SA • Cost constraints and a shortage of bus routes, however, persist • Some still walking long distances to work/place of education • Poor transport service for low-income communities in rural areas 	<p>Access to affordable public transport to all communities</p>	<p>No change</p> 
Open space provision	<ul style="list-style-type: none"> • Challenges to progress and provision including legacy issues relating to segregated land distribution and access • Lack of updated data on existing open space status 	<p>Access to open spaces for both urban and rural population, (including parks, cemeteries, cultural areas etc.)</p>	<p>Insufficient Data</p> 

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Annexure A

Table A1: Summary of policy, tools and legislation

Responses	Year	Description	Purpose
National Responses	2000	Millennium Development Goals	Eight goals with measurable targets and clear deadlines for improving the lives of the world's poorest people
	2015	Sustainable Development Goals (SDGs)	The SDGs are a new, universal set of goals, targets and indicators that UN member states will be expected to use to frame their agendas and political policies over the next 15 years.
	2016	New Urban Agenda (UN Habitat III)	The New Urban Agenda is the outcome document agreed upon at the Habitat III cities conference in Quito, Ecuador, in October 2016. It will guide the efforts around urbanization of a wide range of actors — nation states, city and regional leaders, international development funders, United Nations programmes and civil society — for the next 20 years.
	1996	The Constitution of South Africa	The supreme law of the country of South Africa. It provides the legal foundation for the existence of the republic, sets out the rights and duties of its citizens, and defines the structure of the government.
	1997	National Housing Act 107 of 1997	This Act recognises the Constitutional right to adequate housing access and clarifies the State's response to this right by setting out the legislative basis for the sustainable development of housing.
	1998	National Environmental Management Act 107 of 1998	To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.
	1999	National Heritage Resources Act 25 of 1999	To introduce an integrated and interactive system for the management of national heritage resources.
	2000	Municipal Systems Act 32 of 2000	To provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities.
	2004	Breaking New Ground - A comprehensive plan for the development of sustainable human settlements	A framework by the National Department of Housing for the implementation of housing policy and programs, aiming to eradicate or upgrade all informal settlements by 2014
	2007	National Rural Transport Strategy	Aimed at developing balanced and sustainable rural transport systems by supporting local infrastructure and services.
	2008	Draft National Framework for Sustainable Development	To enunciate South Africa's national vision for sustainable development and indicate strategic interventions to re-orientate South Africa's development path in a more sustainable direction.
	2008	Draft South African Inclusionary Housing Policy	Primarily intended to promote greater social inclusion/integration and to break with the highly segregated processes of built environment creation in South Africa.
	2009	National Land Transport Act 5 of 2009	Regulates the transformation and restructuring of the national land transport system.

	2010	New Growth Path	Aimed at enhancing growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years.
	2011	National Outcome 8 for Human Settlements	Promote sustainable human settlements and an improved quality of household life.
	2011	National Strategy for Sustainable Development	Enhancing systems for integrated planning and implementation, Sustaining our ecosystems and using natural resources efficiently, Towards a green economy, Building sustainable communities and Responding effectively to climate change
	2012	National Development Plan – Vision for 2030	The plan aims to reduce inequality by 2030
	2013	Spatial Planning and Land Use Management Act 16 of 2013	The law gives the Department of Rural Development and Land Reform the power to pass Regulations in terms of SPLUMA to provide additional detail on how the law should be implemented. It also provides the legislative basis for realising the spatial principles of the National Development Plan.
	2015	Integrated Urban Development Framework (IUDF)	The IUDF seeks to foster a shared understanding across government and society about how best to manage urbanisation and achieve the goals of economic development, job creation and improved living conditions for the people of South Africa.
Provincial responses	2007	Western Cape Provincial Growth and Development Strategy	Sets out the Western Cape Government's vision and strategic priorities
	2007	Western Cape Sustainable Human Settlement Strategy - The Road Map to Dignified Communities	Serves as a guide in putting to work various Policy Frameworks devised by the Western Cape Provincial Government as part of its obligation to provide communities with sustainable human settlements to live in.
	2012	Access to Basic Services Programme	To rapidly improve access to basic services and goods
	2012	Western Cape Housing Demand database	Online system to monitor and register housing demand in Western Cape
	2012	Affordable Housing Programme	Assist low income households (with a combined income of R 3 501 – R 15 000) to access adequate funding for housing needs
	2012	Rural mobility projects	Support the improvement of rural access and mobility
	2012	Bus Rapid Transport System	Bus-based public transport system designed to improve capacity and reliability relative to a conventional bus system.
	2012	One Cape 2040 Vision	Stimulate a transition towards a more inclusive and resilient economic future for the Western Cape region.
	2013	Western Cape Growth Potential Study	Determined the growth potential and socio-economic needs of settlements in the Western Cape outside of the Cape Town metropolitan area
	2013	Western Cape Infrastructure Framework	Aligns all infrastructure to the province's strategic agenda and vision.
	2014	Western Cape Provincial Spatial Development Framework (PSDF)	Coordinates, integrates and aligns provincial plans and development strategies with policies of National Government; the plans, policies and development strategies

			of provincial departments; and the plans, policies and development strategies of municipalities.
	2014	Western Cape Land Use Planning Act 3 of 2014	To consolidate legislation in the Province pertaining to provincial planning, regional planning and development, urban and rural development, regulation, support and monitoring of municipal planning and regulation of public places and municipal roads arising from subdivisions.
	2015	Western Cape Green Economy Strategy Framework	To make the Western Cape the lowest carbon province and leading green economic hub of the African continent.
	2016	Western Cape Informal Settlement Strategic Framework	Provides guidance to provincial and local municipal departments in developing a coherent programmatic, sector-wide approach to informal settlements.
	2017	Living Cape Human Settlement Framework	To ensure the development of sustainable integrated human settlements in the Western Cape. To ensure creation of human settlements that allow residents to access social and economic opportunities close to where they live.
	2017	Green Procurement Policy Guidelines for state-subsidised housing	The aim of green procurement in state-subsidised human settlements is therefore: improved sustainable use of resources, increased ecological resilience, and to enable sustainable livelihoods.
Local municipality responses		Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs)	IDP: an overall framework for development to co-ordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area. SDF: serves to give spatial direction to the IDP, and provide a common spatial agenda for diverse sector plans.
		Service Delivery and Budget Implementation Plan (SDBIP) 2016/2017	The SDBIP gives effect to the IDP and the budget of the municipality. It is an expression of the objectives of the City in quantifiable outcomes that will be implemented by the administration for the financial period. It includes the service delivery targets and performance indicators for each quarter, linked to the performance agreements of senior management.
		Housing/Human Settlement Plans	Various
		Integrated Transport Plan	Assigns the Province and its transport authorities the mandate for the transport network and everything that moves on it.
		Built Environment Performance Plan	Articulates a municipality's investment rationale and institutional arrangements to address spatial and sectoral integration (only relevant to the CCT).

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