CITY OF CAPE TOWN
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CITY OF CAPE TOWN

4TH GENERATION INTEGRATED WASTE MANAGEMENT PLAN/ WASTE SECTOR 2022/23-2026/27

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ACRONYMS

ADC	Alternative Daily Cover
AWT	Alternative Waste Treatment
BBC	Buy-Back Centre
CCT	City of Cape Town
CID	City Improvement District
CP	Coastal Park Landfill
CRR	Capital Replacement Reserve
DEFF	National Department of Environment, Forestry, and Fisheries
DEA&DP	Department of Environmental Affairs and Development Planning
EFF	External Financing Fund
EfW	Energy from Waste
EIA	Environmental Impact Assessment
EMT	Executive Management Team
EOAM	Economic Opportunities and Asset Management
EPWP	Expanded Public Works Programme
GHG	Greenhouse Gas
IDP	Integrated Development Plan
IPWIS	Integrated Pollutant and Waste Information System
IS&T	Information services and technology
IWMF	Integrated Waste Management Facility
IWMP	Integrated Waste Management Plan
IWMS	Integrated Waste Management System
MBT	Mechanical Biological Treatment
MFMA	Municipal Finance Management Act,
MRF	Materials Recovery Facility
MSA	Municipal Systems Act
MSDF	Municipal Spatial Development Framework
MSW	Municipal Solid Waste
MiTS	Micro Transfer Station
MTIFF	Medium Term Infrastructure Investment Framework
NDP	National Development Plan
NEMA	National Environmental Management Act
NEMWA	National Environmental Management Waste Act, 2008 (Act No.59 of 2008)
NWMS	National Waste Management Strategy
O&M	Operations and Maintenance
OCC	Operational Control Centre
RTS	Refuse Transfer Station
RUL	Remaining Useful Life
S@S	Separation at Source
SA	South Africa
SCM	Supply Chain Management
SDF	Spatial Development Framework
SDG	Sustainable Development Goals
SLA	Service Level Agreement
SMME	Small, Medium and Micro-Enterprises
SMF	Strategic Management Framework
UWM	Urban Waste Management
USDG	Urban Settlements Development Grant
TOD	Transit Oriented Development

VHK Vissershok Landfill

GLOSSARY OF TERMS

Terms	Definitions
Airspace	The volume of space on a landfill site, calculated in Cubic metres (M3)
Beat	The scheduled work to be performed by one bin-lifting refuse compacting vehicle with one driver and crew one day in one or more geographical zone/s. It is identified by a unique alphanumeric code representing the Area, District, and Beat and, where applicable additional information such as trade waste. It can be depicted by one or more polygon on a map covering either a portion of one suburb or a whole or several whole suburbs or any other combination thereof.
Buy back Centre	Centre where people sell recyclables material they have collected. Recycling companies buy recyclables material from the buyback centre and pay only for the material they can use.
Cleansing	Means the process of cleaning and removing unwanted substances, such as dirt, infectious agents, and other impurities, from an object or environment. In the context of waste management, it includes; litter picking, removal of dead animals, street sweeping, clearing of illegally disposed waste; and street cleaning which involves the use of water and disinfectants. The activities undertaken by the Cleansing Branch of City of Cape Town's Solid Waste Management Department.
Decommission	In relation to waste treatment, waste transfer or waste disposal facilities, means the planning for and management, and remediation of the closure of a facility that is in operation or that no longer operates.
Disposal	Means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into or any land.
Domestic Waste	Means waste excluding hazardous waste that emanates from premises used wholly or mainly for residential, educational, sport or recreational purposes.
Drop off facility	Means facilities provided by the City in strategic locations around the City of Cape town to facilitate waste minimisation through the separation of recyclables material, garden refuse. It can also be used as temporary transition points for waste.

Food Waste	means discarded food (organic fraction) generated from residential, industrial and commercial food processes
Formal Households	Means a developed residential property where individual erven were approved in terms of Town planning legislation
General Waste	Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes— (a) domestic waste; (b) building and demolition waste; (c) business waste: and (d) inert waste;
Green/Garden waste (also referred to as Clean Garden Waste)	Means organic waste, which emanates from gardening or landscaping activities at Residential Properties, business or industrial properties, which includes but is limited to grass cutting, leaves and branches, and includes any biodegradable material and includes such waste emanating from Residential Properties and business properties, but excludes waste products of animal origin.
Hazardous waste	Means waste that may, by circumstances of the production, use, quantity, concentration or inherent physical, chemical or toxicological characteristics, therefore, have a significant adverse effect on the environment, or the health of a person or other living organisms. Such waste has a high risk rating of 1 and 2 and may not be disposed-of at CCT landfills. An example is health care risk waste.
Informal Settlement Collections	The standard service level for informal settlements dwellings is a once-a-week, bagged door-door waste collection service provided to indigent families. In this category, each informal household will be provided weekly with Council refuse bags, of a size, number and design determined by the City.
Integrated waste management facility	In the context of this report, an Integrated Waste Management Facility is infrastructure that serves to intercept waste before disposal by retrieving materials for processing, re-use and recycling and is typically integrated with a refuse transfer station.
Landfill	A modern engineered way to dispose of waste into the ground and still protect the environment. As the landfill is built, the base of the cell is lined with a protective layer and materials are installed to monitor and collect leachate and gas emissions. As waste is deposited over the liner, it is compacted with heavy machinery in an effort to get the maximum amount of waste in an area. At the end of the day, the waste is covered with soil or special fabric cover (unless specifically exempted by state regulators.) Once the lined area is completely full, it is covered with an engineer-designed cap. Regulations mandate the periodic testing of groundwater, leachate levels and gas

	emissions
Lift	The planned collection of waste from a formal wheelie bin.
Material Recovery Facility (MRF)	Synonymous with Drop-offs in this report and is included here to align with the terminology in the Transfer Stations. There are two classes (levels) of Micro Waste Transfer Stations, namely minor and major. The distinction between the two is based on the size of the station and the type of processing that takes place there.
Mini Material Recovery Facility (Mini-MRF)	A small centre, located at Drop-offs, for the reception and transfer of materials recovered from the waste stream for recycling.
Municipal Solid Waste	Waste generated from residential and non-industrial commercial sources. It includes predominantly household waste (domestic waste) with sometimes the addition of commercial waste collected by a municipality within a given area. It includes both solid and semi-solid wastes and generally excludes industrial hazardous waste.
Organic Waste	Means waste of biological origin which can be broken down, in a reasonable amount of time, into its base compounds by micro-organisms and other living things
Recovery	Means the controlled extraction of material or the retrieval of energy from waste to produce a product.
Recycle	Means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material;
Refuse Transfer Station	A facility where waste is temporarily stored and ideally sorted before it is transported more economically to other recycling centres or landfills.
Re-Use	To utilise the whole, a portion of a specific part of any substance, material or object from the waste stream (again) for a similar or different purpose without changing the form or properties of such substance, material or object.
Sector Plan	Means a plan that will contain the information that is required by this document, where by strategy and plans are stated and translated into implementation plans.
Service Point	The specific location at which a solid waste service is rendered, such as the location of a lift.

Waste	"Waste" means any substance, whether or not that substance can be reduced, re-used, recycled and recovered— (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; 30 (b) which the generator has no further use of for the purposes of production; (c) that must be treated or disposed of; or (d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but— (i) a by-product is not considered waste; and 35 (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste;
Waste characterisation	A process of analysing waste streams and their composition and quantities (tonnes) considering, seasonality, calorific value, and volume; may distinguish between different settlement structures (urban, peri-urban, and rural).
Waste Management Facility	Means a place, infrastructure, structure or containment of any kind wherein, upon or at which a waste management activity takes place and includes a waste transfer station, container yard, landfill site, incinerator, drop-off site, a recycling or a composting facility.
Waste Minimisation	Means the avoidance of the amount and toxicity of waste that is generated and, in the event, where the waste is generated, the reduction of the amount and toxicity of waste that is disposed of.
Waste Treatment Facility	Means any site that is used to accumulate waste for the purpose of storage, recovery, treatment, reprocessing, recycling or sorting of the waste.

CHAPTER 1

1. INTRODUCTION

The Sector Plan (Integrated Waste Management Plan) is developed to fulfil the directorate's legislative mandate, to align with the City's strategic objectives in terms of the new term of office IDP and to enable integrated planning with other programmes and services of the City.

The Waste Management Sector Plan or Integrated Waste Management (IWM) Plan of the Urban Waste Management (UWM) Directorate of the City of Cape Town consists of operational and support strategies, as well as a schedule of projects and activities. The aim of the IWM Plan is to give effect to the directorate's strategies of waste minimisation, provision of sustainable and affordable services and compliance with the goals of the National Waste Management Strategy and the objectives of the National Environmental Management Waste Act 59 of 2008.

The City recognizes that waste generation occurs in different instances. Waste is generated through the activities of people, business or industrial entities; in this case, there is space to regulate and to control the generation of waste. In the case of natural disasters, accidents or other natural process waste is also generated, but in these instances, it becomes more complex to implement the same control mechanisms.

The waste generated in Cape Town by private citizens, tourists, visitors, commerce and industry has resulted in a net growth in the volume of waste. The City does not have unlimited landfill airspace. There is a need to divert waste from landfill to ensure that landfill airspace is not depleted sooner than necessary. Given the City's burgeoning population and ongoing increase in the volumes of waste disposed of, the City could in future face an environmental and health crisis.

The City acknowledges its responsibilities to reduce, minimize and dispose waste in an environmentally acceptable manner in order to reduce its impact on the environment and save landfill airspace and approved an Integrated Waste Management policy to articulate bold measures to achieve these objectives, protect the environment, and offer progressive, sustainable options for integrated waste management.

Furthermore, waste must be managed through various processes that will ensure a safe, healthy and a sustainable environment to ensure that the right of individuals as enshrined in section 24 of the Constitution is protected. Fulfilment of this right requires that all stakeholders must accept co-responsibility for minimizing waste impacts optimally, to ensure environmental sustainability.

CHAPTER 2

2. DESCRIPTION OF THE GEOGRAPHICAL AREA, GEO-PHYSICAL AND GEO-HYDROLOGICAL CONDITIONS

The City of Cape Town Metropolitan Municipality (CCT), a Category A municipality, is situated in the southern peninsula of the Western Cape Province and covers an area of approximately 2,445 km². The CCT is neighboured by the West Coast District to the north, Cape Winelands District to the east and Overberg District to the Southeast.

The area consists of varying topography, which includes flat plains, hills and mountains. High mountains are located fairly close to the sea; e.g. Table Mountain which exceeds 1 000 m in elevation. Other high mountains on the perimeter include the Hottentots-Holland, Helderberg, Stellenbosch, Jonkershoek, Franschhoek, Wemmershoek, Du Toits, Paarl, Slanghoek, Limiet and Elandskloof mountains. These mountains form an eastern perimeter of mountains around the CCT. A major portion of the CCT consists of the area known as the Cape Flats, which has an elevation of between 20 and 45 m above sea level.

Cape Town is located within the Cape Floristic Region, which is geographically the smallest of the world's six floral kingdoms, but supports the highest density of plant species. Cape Town supports 2 500 indigenous plant species of which 190 are endemic (species that are found nowhere else in the world), thus within the Cape Floristic Region it is considered an area of particularly high floral diversity (or a local "hotspot" within a global "hotspot"). This floral diversity relates to the steep environmental gradients, including altitudinal, geological and rainfall gradients; that have combined to create a large number of different habitats. Six national vegetation types are found only within the City Of Cape Town's borders, and of these, five are classified as "Endangered" or "Critically Endangered". These vegetation types support species that are unique to Cape Town and many of these are under threat from extinction, due to habitat destruction and the impact of invasive alien species.

The city is located in a highly sensitive and vulnerable ecosystem and is recognised as a global biodiversity hotspot, meaning that it is highly threatened. The City is also fortunate to have the Table Mountain National park within its boundary. The City's environment is one of its strongest assets - driving tourism and attracting people and investment into the city's economy. Growing resource consumption, pollution (air, water, and waste) and the protection of the city's biodiversity are key issues that must be addressed.

Climate

Cape Town has a Mediterranean-type climate with well-defined seasons. Cape Town has a mean annual rainfall of 515mm/annum and an average temperature of 16.7°C. The area has moderately wet winters and dry, warm summers. In the winter months, May through August, cold fronts sweep across the Atlantic and bombard Cape Town with rain and the north-west gales. The winters are cool with an average minimum

temperature of about 7° C. Most of the rainfall occurs in winter, but due to the topography, the rainfall varies quite dramatically. In the valleys and coastal plains it averages 500mm per year, while in the mountainous areas it can average as much as 1500mm a year.

The meteorological depressions that typically bring rain to this area during winter move past to the south of the area (and the land mass) during summer; resulting in long dry spells.

Geo-hydrology

Cape Town has a footprint of over 300km coastline. The rivers in the CCT are relatively small. Some rivers worth mentioning are the Salt-, the Dieppe-, the Black-, the East-, Quills-, Moderate- and Lorenz rivers. The rivers, which are utilised as water sources, lie mostly outside of the CCT. These are the tributaries to the Berg River namely the Wolwekloof and Banhoek tributaries, Sonderend-, Palmiet-, Klein Berg- and Leeu rivers. Of these, the Berg River that flows in a northerly and later westerly direction is by far the largest.

The major dams that supplies the CCT are situated outside (except for the Steenbras Upper and the Steenbras Lower Dams) the mountainous eastern perimeter of the area:

- The Theewaterskloof dam near Villiersdorp is the major water source of the CCT and forms part of a large inter-basin water transfer scheme that regulates the flow from the Sonderend-, Berg- and Eerste rivers.
- The Voëlvlei dam is the furthest north near Gouda and relies on diversion works in the Klein Berg, Leeu and 24 Rivers for its water supply.
- The Wemmershoek dam is situated in the mountains near Franschhoek and is supplied from various small rivers in the Wemmershoek Mountains (e.g. Tierkloof- and Olifants rivers).
- The Steenbras Upper dam and Steenbras Lower dam are situated in the Hottentots-Holland mountain range near Gordon's Bay, and serve a dual purpose of providing an upper reservoir for the Steenbras Pumped Storage Scheme and for supplying water for domestic/industrial use.
- The Berg River Dam is located in the upper reaches of the Berg River near Franschhoek.
- Other smaller dams include the dams on Table Mountain (Woodhead, Hely Hutchinson, De Villiers, Victoria and Alexandra) which are used to supply water to the southern suburbs and the Peninsula, and the dams at Simons Town (Kleinplaats and Lewis Gay) which provide water to the Peninsula.

The CCT is the economic hub and capital of the province as well as the legislative capital of South Africa, where the national parliament and many government offices are located. Being the oldest City in South Africa, it is affectionately known as 'The Mother City'.

CHAPTER 3

3. DEMOGRAPHICS

Population Projections for Cape Town from 2017 to 2040

Cape Town currently has the second-largest population of all cities in South Africa, with an estimated 4.756 million residents in 2022. The city has seen steady population growth over the years, albeit at a slowing annual growth rate: decreasing from an average annual growth rate of 2.3% from 2003-2012 to 2.1% from 2013-2022. In 2022, Cape Town is estimated to make up 66% of the population in the Western Cape.

The table below shows a summary of the population projections for Cape Town (CCT, 2018) and each of the four service delivery areas (SDA).

Table 1: Population projections 2018

Year	Cape Town	SDA: North	SDA: East	SDA: Central	SDA: South
2016	**4,004,983**	**946,172**	**1,040,530**	**1,018,544**	**999,737**
2017	4,087,318	964,007	1,064,298	1,038,943	1,020,070
2018	4,169,427	981,675	1,088,049	1,059,357	1,040,346
2019	4,251,227	999,149	1,111,772	1,079,760	1,060,546
2020	4,332,656	1,016,418	1,135,460	1,100,131	1,080,647
2021	4,413,593	1,033,454	1,159,072	1,120,445	1,100,622
2022	4,494,004	1,050,236	1,182,613	1,140,693	1,120,462
2023	4,573,925	1,066,751	1,206,108	1,160,883	1,140,183
2024	4,653,398	1,083,014	1,229,575	1,181,013	1,159,796
2025	4,732,476	1,099,067	1,253,027	1,201,076	1,179,307
2026	4,811,070	1,114,906	1,276,430	1,221,046	1,198,688
2027	4,889,156	1,130,527	1,299,786	1,240,913	1,217,930
2028	4,966,761	1,145,939	1,323,105	1,260,673	1,237,045
2029	5,043,910	1,161,153	1,346,387	1,280,319	1,256,051
2030	5,120,572	1,176,183	1,369,619	1,299,830	1,274,940
2031	5,196,580	1,191,002	1,392,758	1,319,159	1,293,661
2032	5,271,867	1,205,603	1,415,777	1,338,295	1,312,192
2033	5,346,400	1,219,990	1,438,641	1,357,235	1,330,533
2034	5,420,203	1,234,179	1,461,342	1,375,985	1,348,696
2035	5,493,219	1,248,166	1,483,858	1,394,524	1,366,670
2036	5,565,281	1,261,915	1,506,152	1,412,803	1,384,412
2037	5,636,363	1,275,432	1,528,203	1,430,818	1,401,910
2038	5,706,433	1,288,715	1,549,977	1,448,577	1,419,163
2039	5,775,484	1,301,768	1,571,462	1,466,085	1,436,170
2040	**5,843,462**	**1,314,576**	**1,59,2637**	**1,483,328**	**1,452,921**

Projected population figures for Cape Town and its four area-based service delivery areas were produced for the years 2017 to 2040. The results show that the population of Cape Town as a whole is expected to grow from approximately 4.00 million individuals in 2016 to approximately 5.84 million individuals in 2040, which represents an average annual increase in the population of 1.59% and of approximately 1.84 million individuals over the whole period.

It should be noted that the total estimated population according to the CCT Land Use Model (LUM) 2040 (completed in August 2020) is somewhat higher than the official CCT Population Projection estimate. The LUM population estimate of 6.085 million population by 2040[1] is useful in conjunction with the official population projections, and can be used, in the interim, as a range pending the 2022 Census update.

The rate of growth in the population of Cape Town and its four service delivery areas differ considerably as mortality, fertility and migration rates differ across the areas. See Table 2 for the annual growth rates for Cape Town and each of the service delivery areas (CCT, 2018).

Table 2 : Annual growth rates

Year	Cape Town	SDA: North	SDA: East	SDA: Central	SDA: South
2017	2.1%	1.9%	2.3%	2.0%	2.0%
2018	2.0%	1.8%	2.2%	2.0%	2.0%
2019	2.0%	1.8%	2.2%	1.9%	1.9%
2020	1.9%	1.7%	2.1%	1.9%	1.9%
2021	1.9%	1.7%	2.1%	1.8%	1.8%
2022	1.8%	1.6%	2.0%	1.8%	1.8%
2023	1.8%	1.6%	2.0%	1.8%	1.8%
2024	1.7%	1.5%	1.9%	1.7%	1.7%
2025	1.7%	1.5%	1.9%	1.7%	1.7%
2026	1.7%	1.4%	1.9%	1.7%	1.6%
2027	1.6%	1.4%	1.8%	1.6%	1.6%
2028	1.6%	1.4%	1.8%	1.6%	1.6%
2029	1.6%	1.3%	1.8%	1.6%	1.5%
2030	1.5%	1.3%	1.7%	1.5%	1.5%
2031	1.5%	1.3%	1.7%	1.5%	1.5%
2032	1.4%	1.2%	1.7%	1.5%	1.4%
2033	1.4%	1.2%	1.6%	1.4%	1.4%
2034	1.4%	1.2%	1.6%	1.4%	1.4%
2035	1.3%	1.1%	1.5%	1.3%	1.3%
2036	1.3%	1.1%	1.5%	1.3%	1.3%
2037	1.3%	1.1%	1.5%	1.3%	1.3%
2038	1.2%	1.0%	1.4%	1.2%	1.2%
2039	1.2%	1.0%	1.4%	1.2%	1.2%
2040	1.2%	1.0%	1.3%	1.2%	1.2%

Age profile

Figure 2: indicates how the age profile of Cape Town is projected to change over time, showing the age profile in 2016 and the projected age profiles for 2020, 2030 and 2040.

[1] Nevertheless, it should be noted that the LUM is a dwelling unit projection model, and not a population projection model, such as the City's Population Model (known as CPOP1) which is based on traditional and tested population projection methodologies.

From the population pyramids, it can be seen that Cape Town population is expected to experience significant aging over the next two decades.

Figure 1: Age profile (CCT, 2018)

Cape Town population projection pyramids, (CCT, 2018)

According to the 2016 Community Survey, 6.24% of Cape Town population was aged 65 years and older in 2016 and this percentage is expected to increase to 12.00% by 2040. For those younger than 15 years, the percentage of the total population is expected to decrease from 26.02% in 2016 to 19.84% in 2040. Although the percentage of the population younger than 15 years is decreasing, the number of individuals in this age group is expected to increase by about 117 000 between 2016 and 2040

Spatial Module

Projections for sub-metropolitan regions face methodological challenges not commonly encountered at the level of urban systems. Demographic processes at sub-system scale are not only influenced by historical trends and household characteristics, but also spatial dynamics such as land availability and constraints, rates of informal settlement and backyarding growth and overcrowding.

A spatial module has been included in the linear population projection model. This spatial adjustment module allows the re-apportion of projected citywide growth to sub-metropolitan catchments based on annual residential capacities per SDA as derived from inter-related spatial assumptions and policy decisions.

Population and household indicators

As at 2016, City of Cape Town had a population of 4 004 793 which amounted to 1 264 849 households.

Table 3 : Cape Town population figures (2016 Community Survey, Statistics South Africa)

Issue	**Number**
Population	4004793
Households	1264849
Average Household Size	3.17

These households are living in different **housing circumstances.** The housing circumstances of households as at 2016 show that some 17.6% of households lived in informal dwellings, compared to 81.6% in formal dwellings. However, the General Household Survey (GHS) from Stats SA estimated an increasing percentage (18.3% on average over 2019-2021)[2] of households in Cape Town reporting that they reside in informal dwellings[3]

Table 4: Cape Town dwelling type statistics (2016 Community Survey, Statistics South Africa

Dwelling Type	**Number**	**Percentage**
Formal Dwelling	1 032 497	81.6%
Informal structure in backyard	77 634	6.1%
Informal structure NOT in backyard	145 286	11.5%
Other (includes traditional, caravan and tent)	9 229	0.8%
Unknown	203	0%
Total	**1 264 849**	**100%**

[2] An average is used as the sample size for the 2020 and 2021 GHS was smaller than in previous years, and could impact on the statistical findings. The smaller sample size was due to the pandemic, where survey field work was a challenge.

[3] More information on this possible trend is expected to be available during 2023 after the 2022 Census.

Household income and housing opportunities

On average over the three-year period from 2019 to 2021, some 24% of households earned R3 500 or less per month, while some 56% of households in Cape Town had an income of R10 000 or less per month and 17% had a monthly income between R10 001 and R22 000. This means that some 73% of Cape Town residents are earning R22 000 and less per month. At the other end of the spectrum, 27% of households had an income of R22 001 and above per month.

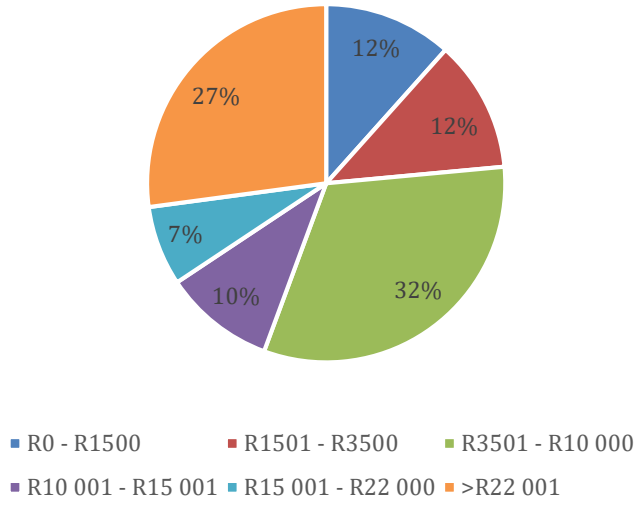

Figure 2: Percentage distribution of Cape Town monthly household income, in Rands (average 2019, 2020 and 2021) from the General Household Survey, Statistics South Africa

Employment and economic profile

Economic output in the Western Cape and Cape Town recovered to pre-Covid-19 output levels (i.e. 2019 Q4) in 2022. At the sectoral level, agriculture; finance and business services; community and personal services; transport and communication; and general government continued performance above pre-Covid-19 levels into Q3 2023. The pandemic in 2020 resulted in the worst recession in Cape Town and the 'recovery' has been hindered by the war in Europe and subsequent global challenges, such as supply chain constraints and rising inflation. Local challenges include constrained electricity supply, bottlenecks in the logistics sector and high interest rates. Notwithstanding these challenges, there are pockets of innovation including Cape Town's finance, real estate, technology and BPO sectors as well as firms in the food value chain. Cape Town plays a significant role in the regional economy, making up 71.9% of the Western Cape GDP, and 10% of national GDP in 2022.

The city generated a gross geographic product of around R659.8 billion in 2022 and is the third largest urban economy in South Africa (see Figure 3 below). Cape Town's diverse, services sector dominates, making up 77.7% of the economy.

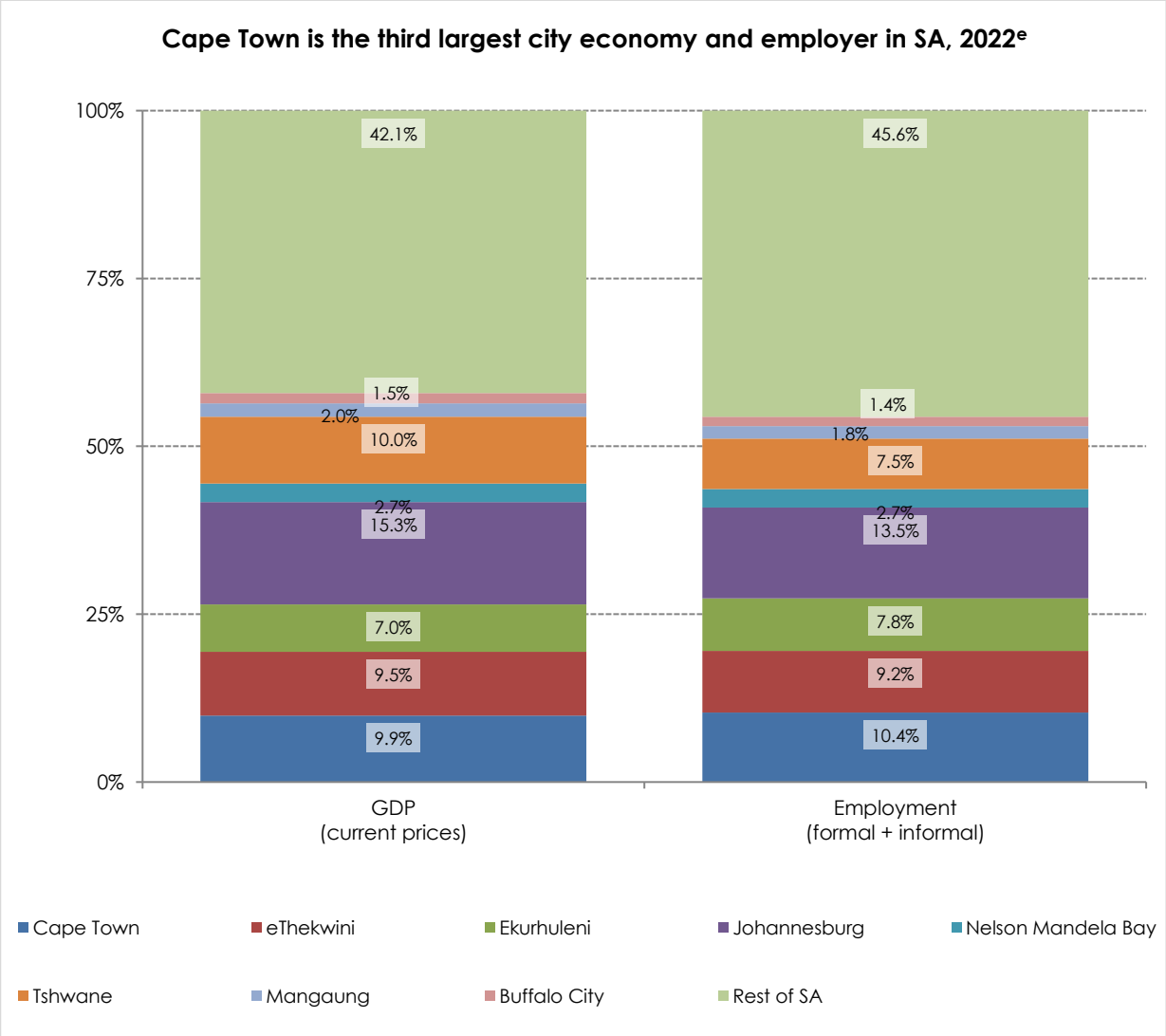

Figure 3 : A comparison of Cape Town GDP with other cities 2022 (Source: South Africa Regional eXplorer, S&P Global, January 2024)

Economic growth at both a national and city level has not managed to keep pace with population growth. The situation deteriorated in 2020 due to the impact of Covid-19 and the government's response to it. Gross domestic product (GDP) per capita, which had been on a negative trajectory over the past 7 years, declined to R100 513 in 2020 (constant 2015 prices). Since then, GDP per capita has grown to R104 857 in 2022.

Cape Town, like South Africa, is strongly impacted by developments in the global economy. In 2020, due to the Covid-19 pandemic and its associated restrictions, the Cape Town economy contracted by 5,8%. Rebound growth in 2021 reached 4.1%, and in 2022 was 2.9%, while estimated growth for 2023 is expected to remain sluggish at 0.8%.

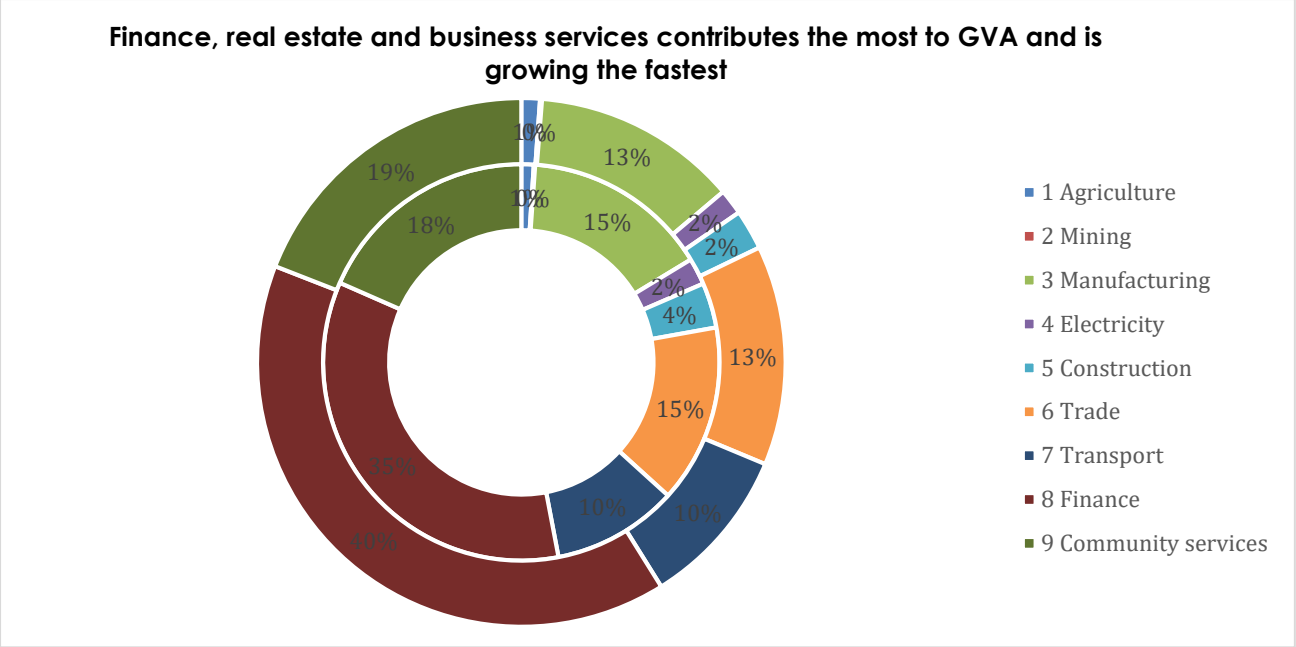

Figure 4: CT Sectoral GVA share, 2013 (inner) and 2022 (outer)[4]

While some sectors experienced a declining share of Gross Value Added (GVA) from 2013-2022, their GVA values may still have increased, but not at the rate of sectors where the share increased. The retail, wholesale trade and accommodation sector for example grew by over R1 billion in GVA, but its share of total Cape Town GVA declined by 1.1 percentage points, to 13.4%. The full recovery of international visitor arrivals in 2023, after the Covid-19 shock, is likely to bolster this sector going forward. The largest increase in GVA share over the period was for finance, real estate and business services, increasing by 5,2 percentage points, with the primary driver being the real estate sector.

In 2013, the finance, real estate and business services led in GVA contribution (34,6%), while employment was driven by the trade and hospitality sector (22,2%). However by 2022, both GVA and employment were led by finance, real estate and business services contributing 39,8% and 24,1%, respectively. The disparity in their contribution to GVA as compared to employment highlights the sector's relatively low labour intensity. The notable change in ranking for the top employment contributor from trade and hospitality in 2013, to finance, real estate and business services in 2022, reflects shifts within the economy after experiencing setbacks like the drought and the Covid-19 pandemic.

Employment and skills

Cape Town's broad unemployment rate (including the non-searching) reached its highest recording in the second quarter of 2022 (31,3%) since 2008[5] as a result of the pandemic. Since then, the broad unemployment rate has been on a decreasing trend indicating that Cape Town's labour market is recovering from the delayed trough. Despite the shocks, Cape Town's broad unemployment rate has remained the lowest

[4] *Source: South Africa Regional eXplorer, 2023; Statistics South Africa, 2023*

5 The start of the Quarterly Labour Force Survey in 2008

rate among metros. Cape Town's unemployment rate is expected to improve further in 2023 and 2024 as labour intensive industries related to tourism fully recover.

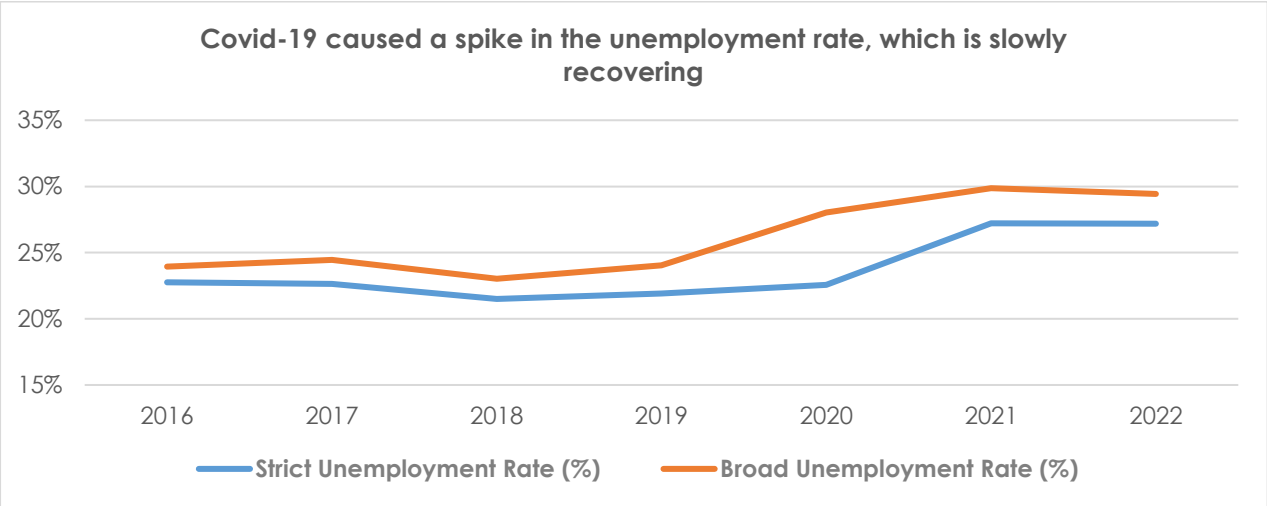

Figure 5: Unemployment rates for Cape Town, 2016-2022[6]

In 2022, 1.53 million individuals in Cape Town were employed, 571 100 were unemployed but searching, and another 24 663 were discouraged job seekers. The narrow youth (15-24yrs) unemployment rate decreased to 54,2% in 2022, from 56. % in 2021. While this remains lower than the youth unemployment rate for the country, it is still notably higher than in other developing countries. Of particular concern are the youth, aged 15-24 years, who are not in education, employment and training (NEET) of which there were 30,6% in 2022.

The Male contribution to employment (an average of 55%) consistently outweighs the female employment contribution (an average of 45%). The gap decreased significantly from 12,9% in 2021 to 5,4% in 2022, the lowest gender gap to date.

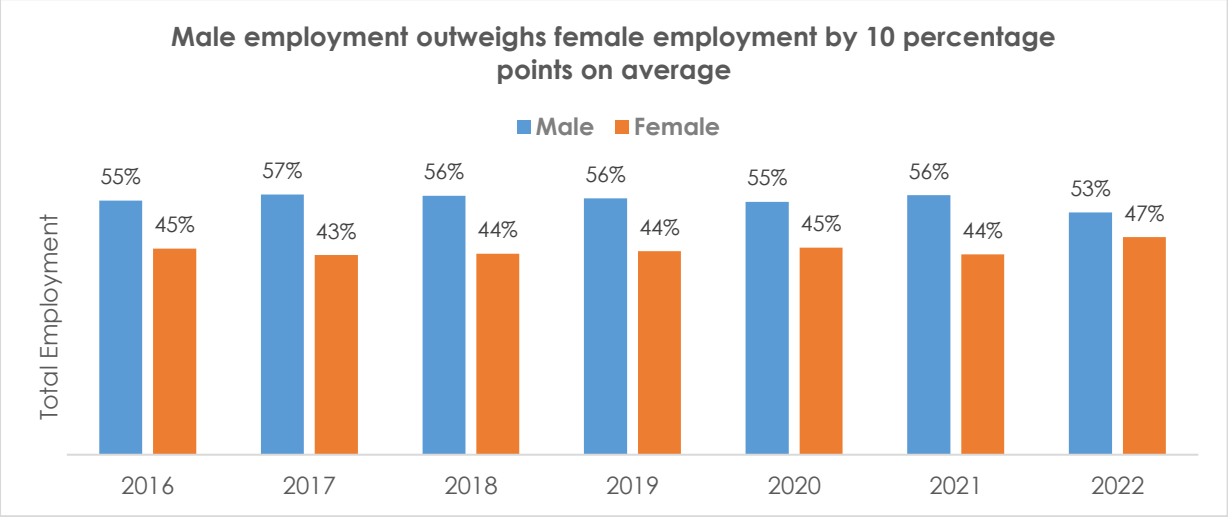

Figure 6: Employment Gender Gap in Cape Town, 2016-2022[7]

6 Source: Quarterly Labour Force Survey 2016-2022, Stats SA. 2021 is an average of quarter 1 to quarter.

7 Source: Quarterly Labour Force Survey 2016-2022, Stats SA.

Informal employment contributes around 11% to total employment in Cape Town. The post Covid-19 recovery in 2022 saw informal employment rise to 169 695 individuals from 146 214 individuals in 2021. Employment in this category still remains below pre-Covid levels. Structural unemployment trends are also likely to persist as the demand for labour in the higher-skilled tertiary sectors and the supply of labour in the lower-skilled categories of the labour market are mismatched.

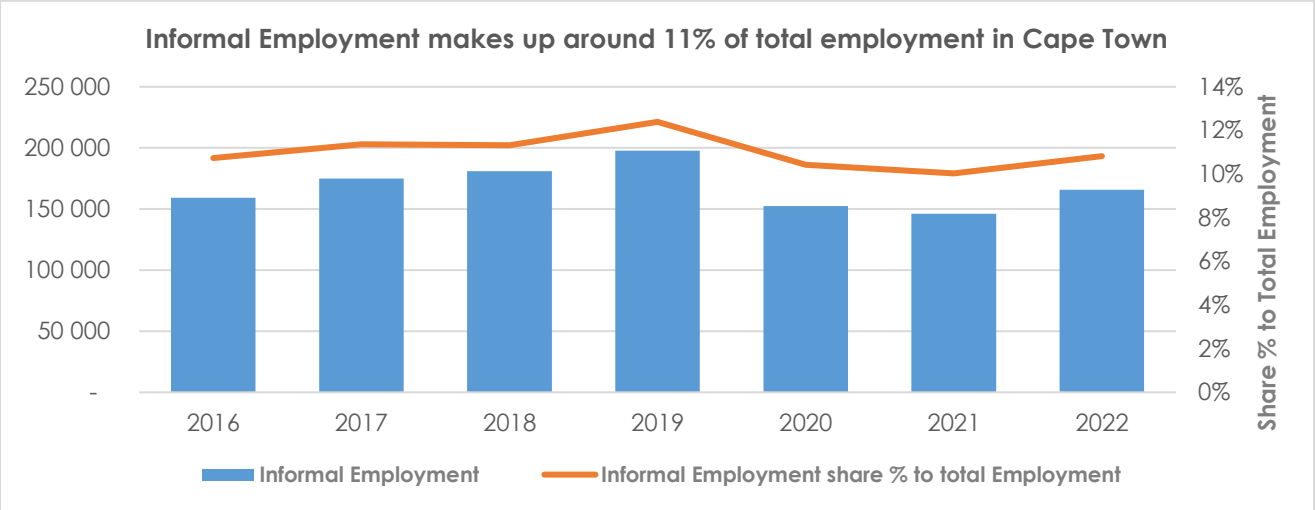

Figure 7: Informal sector employment in Cape Town, 2016-2022[8]

Projected trends

The tables below from the LUM 2040 project the number of new dwelling units projected to be developed across formal and informal sectors between 2020 and 2040. The City's projections suggest that 53% of new dwelling units developed between 2020 and 2040 will be informal, which amounts to an approximate 334 242 new informal dwellings over this period. Informal dwellings are broken into main dwellings (26.5% of all new dwellings), additional dwellings (19.7%), and multi-residential informal boarding house units (6.8%).

In comparison, a projected 47% of new dwellings units will be formal, amounting to an approximate 296 026 new dwellings over the period 2020 and 2040. Formal dwellings are broken into main dwellings (33% of all new dwellings), and additional dwellings (14%). This information suggests that the City needs to be proactively planning for informality – which has impacts in terms of land availability, provision of basic services, security of tenure, and other regulatory responses.

8 Source: Quarterly Labour Force Survey 2016-2022, Stats SA. 2021 is an average of quarter 1 to quarter.

Table 5: Distribution of projected 2020 – 2040 dwelling unit growth across dwelling type

Market/Year		% of Total du at 2040	Estimated number of new dwelling units - Growth only	
			Total	Ave du/p.a. 2020 - 2040
All dwelling types	Formal main dwelling (Baseline Flat line Projections 2020 – 2040)	33.0%	208 053	9 907
	Additional dwelling formal	14.0%	87 973	4 189
	Informal main dwelling	26.5%	167 298	7 967
	Additional dwelling informal	19.7%	124 081	5 909
	Multi-residential informal boarding house unit	6.8%	42 863	2 041
	Grand Total	**100%**	**630 268**	**30 013**

Source: City of Cape Town, Policy and Strategy Department, Research Branch, **Projected Inputs to Support the City's future Land Use Model 2040 for Metropolitan Spatial Planning,** August 2020

CHAPTER 4

4. STRATEGIC INTENT

Long Term Strategic Plans

4.1 Strategic Statements / Intent

The Urban Waste Directorate has identified seven main strategic intents related to its operations.

Table 6: UWM Strategic Intent Statements

Strategic Intent	Objectives	Work streams
1. Build an efficient, effective, future-focused and sustainable Solid Waste Service	● Drive necessary changes in the sector through continuous improvement ● Develop an agile workforce with requisite skills for a wider range of business processes ● Develop a resource and costing model that reflects the realities of a changing business ● Ensure our customers receive reliable and high-quality services that help them contribute to achieving city-wide waste sector goals	● Waste Collections (Formal and informal) ● Cleansing ● Disposal
2. Prepare for intensification and densification of the spatial form of the city. 3. Improve access to quality and reliable basic services	● Expand the footprint of drop-off facilities to be closer to a greater number of customers ● Improve location and capacity of transfer stations ● Deliver appropriate waste containment options ● Provide effective and efficient waste services to informal and formal households.	● Waste Collections ● (Formal and informal) ● Cleansing

Strategic Intent	Objectives	Work streams
4. Extend the life of the existing landfill space to 2040 5. Develop a new regional facility	● Increase existing landfill space ● Invest in stimulating resource beneficiation ● Accelerate waste avoidance ● Develop a regional facility with 35 years of airspace	● Disposal ● Waste beneficiation ● Circular Economy
6. Improve infrastructure and asset management, and increase redundancies	● Enhance and deliver proactive maintenance ● Invest in asset protection ● Ensure spare capacity for times of disruption	● Waste facilities and fleet ● Disposal
7. Invest in the city's efforts to mitigate climate change and minimise the health impacts of waste management.	● Maximise the opportunities to reduce green-house gases from waste streams and activities ● Ensure the protection of human and environmental health	● Waste facilities and fleet ● Disposal ● Education and awareness ● Waste minimisation

Vision

The long-term vision for the Cape Town Waste Management sector is:

- to improve access to basic services for residents to as close to 100% as possible within the constraints of available funds and unplanned growth
- to develop multiple integrated initiatives that will reduce waste and the associated
- impacts substantially as well as contribute to and support economic development
- to generate other sources of funding for integrated waste management through Public-Private Partnerships within the Cape Town municipal area
- to improve the income generated by the Council's waste services
- to optimise the utilisation of the Council's resources and capital and
- to regulate waste and the associated services that will ensure sustainability and prevent impact or harm to people and the environment.

4.2 Development Strategies | Strategic Framework

The long-term vision for the City of Cape Town's waste management services, is to integrate waste management services in such a way that they are able to not only provide basic services, but to augment economic activity and minimise the effects of waste on human and environmental health.

- Responsibility to reduce, minimize and dispose waste in an environmentally acceptable manner in order to reduce its impact on the environment and save landfill airspace. The environmental benefits of decreasing waste streams are obvious but can also be researched further and used to help inform the long-term (20-year) view and sector plan. The following figure provides a perspective on the most preferable to least preferable way of dealing with waste.

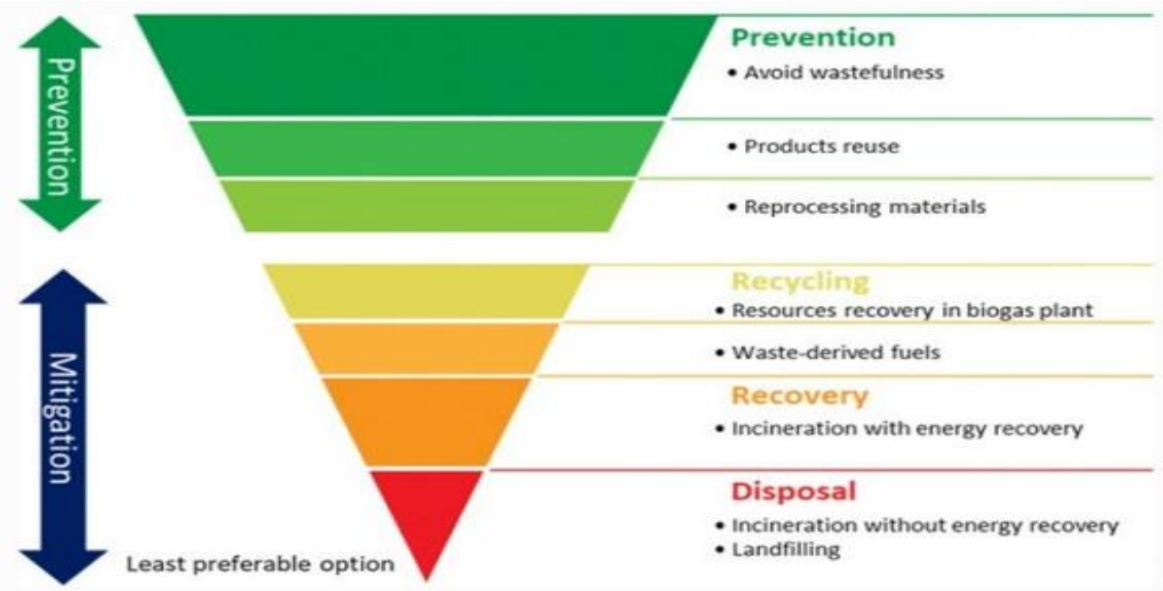

Figure 8: Preferable way of dealing with waste

- Engage stakeholders where necessary, as waste minimisation and recycling activities are not limited to the City's jurisdiction but involve the processing and manufacturing sectors on a local and national scale.
- Waste minimisation cross cuts throughout the City's Urban Waste Management Branches and is integrated.
- Extending the life of the existing landfill space to 2040 and investing in the city's efforts to mitigate climate change and minimise the health impacts of waste management are the two strategic intents that cut across the entire Urban Waste Management Directorate and link with activities required by other City departments and external stakeholders.
- Invest in stimulating resource beneficiation.
- Accelerate waste avoidance.
- Maximise the opportunities to reduce greenhouse gases from waste streams and activities. (Note: stimulating organic waste beneficiation or avoidance (above) automatically achieves this goal as it avoids methane produced from landfilling organics).

Key principles underpinning the Strategic Framework:

- The "circular economy" approach for long-lasting design of products, maintenance, and reuse, remanufacturing, and closed recycling loops.

- The "cradle-to-cradle" approach in viewing materials as nutrients for the same or new cycles.
- "Waste avoidance, or prevention before waste generation" above other waste management options.
- "Separation at source, streaming and diversion" makes provision for waste streams to be separated where possible.
- "Producer responsibility" to influence product design, ability and responsibility to reduce the toxicity and waste generated.
- The 80/20 (Pareto) approach to prioritise waste avoidance and diversion systems to optimise the return on effort and expenditure.

The diagram below highlights the circular economy

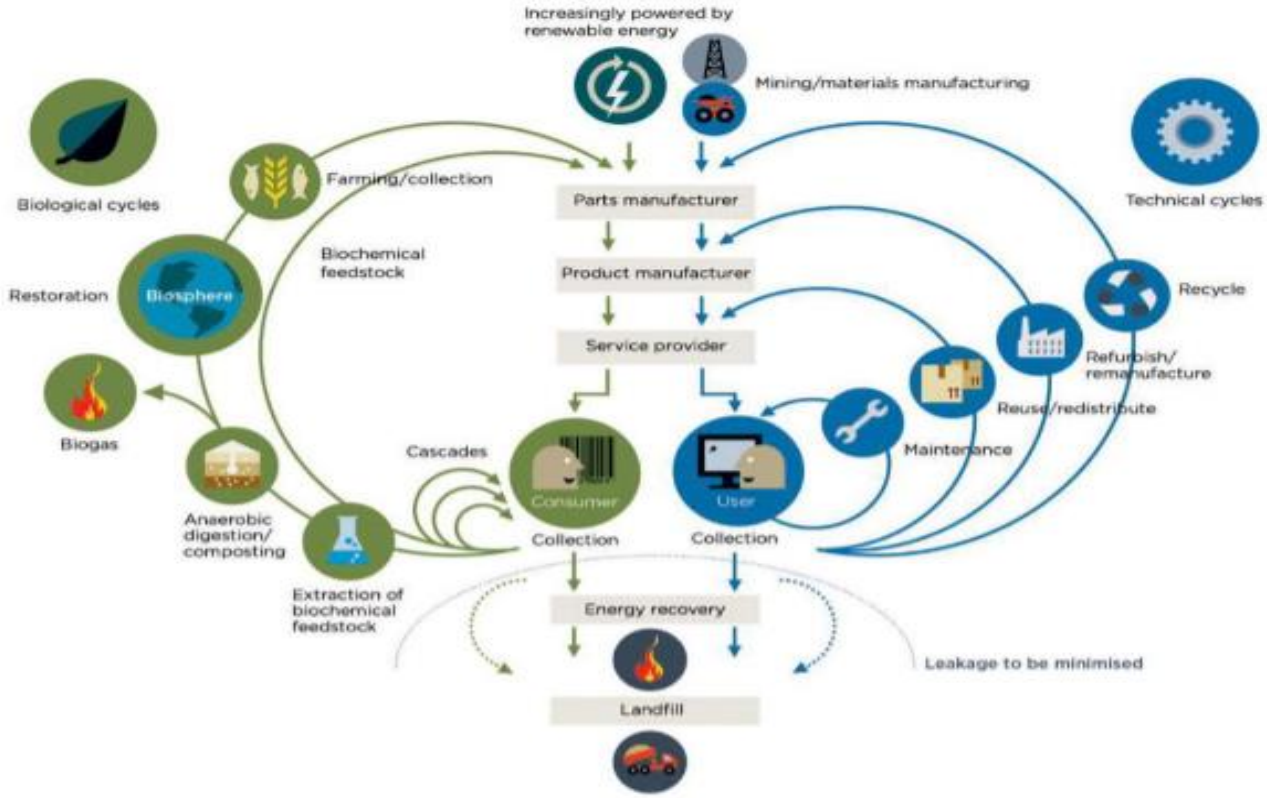

Figure 9: Butterfly Diagram of the Circular Economy - Source: Ellen MacArthur Foundation

4.3 Strategic Deliverables

Urban Waste Directorate identified eleven (11) strategic deliverables that needs to occur in order to meet the vision, strategic intent, objectives and legislative requirements.

1. Aim to meet NWMS targets through the development of a Waste Strategy and implement aggressive waste minimisation/diversion as follows:
   - 40% waste diverted from landfill by 2025;
   - 55% waste diverted from landfill by 2030;
   - >70% waste diverted from landfill by 2035.

2. Accelerate infrastructure development and regulatory amendments to fast-track diversion by:
    - Developing a funding strategy to fund diversion infrastructure and operating expenditure for waste minimisation and diversion from landfill.
    - Considering alternate funding sources to implement the legislative changes impacting City's Urban Waste Management service.
    - Developing a fully integrated activity-based costing (ABC) in place to determine the true cost of a service or what the cost drivers of the services are.
    - Revisiting the funding and tariff model in collaboration with Corporate Finance to address the high levels of cross subsidisation among the various functions and across the municipality.
    - Creating a balance in capital expenditure based on strategic demand prioritisation.
3. Aim to meet Provincial IWMP organic waste diversion targets of:
    - 50% diversion of organic waste from landfill by 2022 (short term/immediate target).
    - 100% diversion of organic waste from landfill by 2027 (5 year target).
4. Develop infrastructure (Material Recovery Facilities) for at source sorted waste streams. (Mini-MRF's at larger drop-offs or free standing MRF's).
5. Develop and implement a city Cleanliness Index in collaboration with other City directorates.
6. Finalise policy for servicing backyarders and accelerate the rollout of weekly refuse collection services to backyarders.
7. Collaborate with City directorates/departments and external stakeholders in the development and implementation of a Circular Economy Action Plan (cross cutting intervention throughout the City). Ensure aggressive communication and marketing campaigns:
    - to champion circular economy;
    - to effect behaviour change; and
    - to achieve waste avoidance behaviour change in Cape Town.
8. Develop UWM capacity, resources, technology and infrastructure to meet growth, the changing environment and legislative imperatives.
9. Provide infrastructure to mitigate unlawful occupation of land:
    - closed landfills and facilities;
    - Historical landfills (abandoned):
10. To manage greenhouse emissions from the City's waste management activities and facilities.
11. To research and consider innovative solutions for waste management.

4.4 Resilience Factors

Key resilience challenges related to UWM operations are summarised in the table below.

Table 7: Key Resilience Challenges

Main resilience factors	Related factors (if relevant)	Comments and questions
Policy & regulatory uncertainty	Compliance with national legislative requirements puts a burden on the City and ratepayers.	Local government realities not fully considered by national government. Some waste-related targets are aspirational and not fully realizable; unfunded mandates; This is about obtaining the right balance between what government must do and what the private sector / households must do.
Rapid urbanisation	Subsequent increase in waste production / Informal settlements	Population is expected to grow at around 1.7% per annum. The Directorate needs to plan for the eventuality - when the expected growth is exceeded.
Informal settlements & backyards / Densification of human settlements	Illegal land occupation / Traffic congestion	Different business models for densely populated areas (including informal settlements) needs to be explored
Rapidly declining landfill space	Increase in waste production / regional inefficiencies / policy & regulatory uncertainty	At current waste generation rate, landfill airspace is projected to run out by 2036; extensive diversion measures and extending landfill foot print are the only measures that can effectively increase landfill airspace. The inclusion of a new landfill on all future scenarios of waste management is crucial.
Weak resource economy	Increase in waste production / Ineffective separation at source	The global market for recyclables / re-use has collapsed in recent past; no significant local / regional market for resources; investment in operations / infrastructure for alternative pathways other than landfilling comes with risk if insignificant market.
Poverty & inequality / Unemployment / Insecure municipal finances	Economic crisis / Crime & violence	These factors impact revenue raising ability; Poverty levels affect the number of non-paying customers; While unemployment moves within a narrow band

4.5 IDP Alignment: New Term of Office

The Sector Plan / IWM Plan aligns with National and Provincial plans and policies. It also aligns with the City's Integrated Development Plan (IDP), endorsing the priorities, foundations and objectives for the new term of office as depicted in the table below

Table 8: IDP Alignment: New Term of Office

STRATEGIC INTENT AND OBJECTIVES	CITY - IDP	PROVINCIAL/ NATIONAL GOALS
Build an efficient, effective, future-focused and sustainable waste utility • Drive necessary changes in the sector through continuous improvement • Develop an agile workforce with requisite skills for a wider range of business processes • Develop a resource and costing model that reflects the realities of a changing business • Ensure our customers and stakeholders receive reliable and high quality services that help them contribute to achieving city-wide waste sector goals	4. Well-managed and modernised infrastructure to support economic growth 4.1 Utility business model programme 4.1.B. Solid Waste – Business model reform Initiative (Waste Strategy)	**WCIWMP** **Goal 2:** Improved integrated waste management planning and implementation for efficient waste services and infrastructure, **Goal 4:** Improved compliance with environmental regulatory framework **National Waste Management Strategy 2020** **Pillar 2**: Effective and sustainable waste services **Pillar 3**: Compliance, enforcement and awareness
Prepare for intensification and densification of the spatial form of the city. • Expand the footprint of drop-off facilities to be closer to a greater number of customers • Improve location and capacity of transfer stations	2. Improved access to quality and reliable basic services 2.1 Mainstreaming basic service delivery to informal settlements and backyard dwellings programme 2.1.C. Informal settlements waste collection project 2.1.F Backyard dwelling service support project (private properties)	**WCIWMP** **Goal 2:** Improved integrated waste management planning and implementation for efficient waste services and infrastructure, **National Waste Management Strategy 2020** **Pillar 2**: effective and sustainable waste services

• Deliver appropriate waste containment options **Improve access** **to quality and reliable** **basic services**	4.7 Promoting cleanliness and addressing illegal dumping 4.7.A. Area cleaning project 4.7.B. Public awareness and partnerships initiative 4.7.C. Illegal dumping monitoring and enforcement initiative	
Extend the life of the existing landfill space to 2040 • Increase existing landfill space • Invest in stimulating resource beneficiation • Accelerate waste avoidance **Develop a new regional facility** • Invest in a new regional facility	4.5 Excellence in waste service delivery programme 4.5.A. Landfill management project 4.6 Waste minimisation and recycling programme	**WCIWMP** **Goal 2:** Improved integrated waste management planning and implementation for efficient waste services and infrastructure **Goal 3:** Effective and efficient utilisation of resources **National Waste Management Strategy 2020** **Pillar 1**: Waste minimisation
Improve infrastructure and asset management, and increase redundancies • Enhance and deliver proactive maintenance Internal Technical services • Invest in asset protection • Ensure spare capacity for times of disruption	4. Well-managed and modernised infrastructure to support economic growth 4.2 Infrastructure planning and delivery programme 4.5 Excellence in waste service delivery programme 4.5.B. Waste collection efficiency project	**National Waste Management Strategy 2020** **Pillar 1**: Waste minimisation **Pillar 2**: Effective and sustainable waste services **Pillar 3**: Compliance, enforcement and awareness **WCIWMP** Improved integrated waste management planning and implementation for efficient waste services and infrastructure, **Goal 4:** Improved compliance with environmental regulatory framework

Invest in the city's efforts to mitigate climate change and minimise the health impacts of waste management. • Maximise the opportunities to reduce green-house gases from waste streams and activities • Ensure the protection of human and environmental health all branches	4.6 Waste minimisation and recycling programme 4.6.A. Integrated waste management facilities initiative 4.6.B. Waste minimisation for a circular economy initiative	**WCIWMP** **Goal 1:** Strengthened education, capacity and advocacy towards Integrated Waste Management **Goal 3:** Effective and efficient utilisation of resources **National Waste Management Strategy 2020** **Pillar 1:** Waste Minimisation **NDP 2030 : Objectives** Achieve the peak, plateau and decline trajectory for greenhouse gas emissions, with peak being reached by 2025 Absolute reduction in the total volume of waste disposed to landfill each year. Supporting action point 33 to stimulate renewable energy and waste recycling

Urban Waste Integrated Waste Management Policy and Bylaw.

Furthermore, the principles, service levels and standards for waste management are contained in the City's IWM policy. The overarching policy objectives are:

- to ensure basic waste management services to all residents,
- to reduce waste that is landfilled,
- to conserve resources and the environment,
- to clear illegally disposed waste, and
- to reduce the impacts of waste on the health, well-being and environment.

The service levels and payment of waste management services is in accordance with the tariff information contained in the City's Tariff Schedule, which is reviewed and adopted by Council at the same time as the Integrated Development Plan (IDP) and the IWM Plan.

City's IWM By-law, for the regulation of waste management activities, is aligned with National imperatives (NWMS), and was adopted by Council (resolution C15/03/09), and promulgated in August 2009. This is the first comprehensive waste management by-law

aligned to the objectives of the National Waste Act. The by-law was subsequently amended to align with administrative, legal and juristic requirements in 2010 and the most recent amendment and promulgation was in June 2016.

City Strategies and Policies

The UWM role in, and ability to contribute towards, key CCT strategies and plans such as the MSDF, Resilience Strategy and others is summarised as follows

The UWM Sector Plan adopts and endorses the corporate strategies and plans, such as:

City of Cape Town Municipal Spatial Development Framework
• It supports and informs our waste management investment decisions where it affects the spatial form of the City. • It reflects the spatial vision of the City. • It allows for integrated planning and design for waste infrastructure to ensure our ability to provide basic services.

Draft Energy Strategy
The City is considering a number of options to use energy from waste. These include waste/sewerage to methane gas, waste-to-energy, and co-generation. The recovery of landfill, organic waste and wastewater treatment plant methane is of added significance given that methane is a major contributor to the carbon emissions from City-owned facilities.

Economic Growth Strategy
Enterprise and investment, catalytic sectors for funding and business support for waste projects.

Climate change Strategy
Energy and climate change. Implementation of projects / measures for the mitigation of climate change because of waste on the environment. The City will aim to reduce Cape Town's carbon footprint in order to contribute to the global reduction of greenhouse gas emissions and make the local economy more competitive. This will be done through the implementation of a range of carbon emission reduction projects in line with the aims of the Energy 2040 goals. The City will aim to further enable the re-use or recycling of waste materials into economic resources, at the same time reducing waste to landfill, and contributing to a resource-efficient economy by continuing to implement various waste minimisation and recycling projects across the city.

Waste and the Circular Economy: Recovering and deriving value from Cape Town's waste stream is a key element in the shift towards a circular economy, with multiple co-benefits with respect to cleanliness of the city, and reduced littering and illegal dumping. Improved resource efficiency through material recycling, reduced waste, and diversion of organic waste from landfill to productive uses will be combined to reduce greenhouse gas emissions. In order to address this challenge, the City commits to working towards achieving the following goals within this strategic focus area:

- Goal 22: Develop and implement a sustainable waste management strategy that is financially feasible, and maximises material efficiency by prioritising waste avoidance, reduction, treatment and recycling in line with provincial targets
- Goal 23: Reduce organic waste disposal to landfill by 50% by 2030 and 100% by 2050 through better waste separation, treatment and utilisation
- Goal 24: Increase diversion of recyclables from disposal to landfill by 40% by 2030 and 85% by 2050 through improved collection, waste separation, and providing support to informal workers
- Goal 25: Reduce the climate and environmental impact of disposal facilities by increasing landfill gas collection efficiency, treatment and utilisation

Comprehensive integrated Transport Plan
Planning for efficient transportation of waste through road and rail. Management of waste generated during road constructions.

Environmental Strategy
This aligns with the NEMA principle of ensuring that waste generation is minimised or managed in a manner that does not pollute the environment. In addition to the provision of basic services, recycling services are widely available, large scale composting of garden waste is in place, and waste diversion is optimised.

Water Strategy
Stormwater management and wastewater treatment has a direct impact on the management of waste e.g. disposal of sewage sludge, river and canal management and cleaning.

Integrated Human Settlements Sector Plan
The provision of integrated waste management services to settlements through identification of suitable waste service mechanisms and development of waste infrastructure.

Resilience Strategy
Planning for waste services to include existing shocks and stress that impacts the service. This include climate change, rapid urbanisation, rapidly declining landfill space and weak resource economy

CHAPTER 5

5. PUBLIC PARTICIPATION

The public participation process for the 4th generation IWMP was conducted in terms of section 17 of the Local Government: Municipal Systems Act, Act 32 of 2000. In alignment with the prescribed legislation, the stakeholder engagement process for draft 4th generation IWMP was implemented as follows;

1. Collaboration Platform

The City of Cape Town launched an online collaboration platform, where residents can share ideas about specific challenges the City is facing.

The public was requested to join the platform by registering using these steps on their digital device (mobile phone; tablet or desktop):

- Enter this link into your Internet browser: https://www.capetown.gov.za/ideas
- Register on the platform using your email address;
- Create your profile by providing a username and password (you can submit input anonymously);

After successfully registering, members were able to navigate to the topic: Comment on the City's draft 2022-2027 water and waste sector plans and submit feedback on these draft plans.

2. Have your say

Comments, input or recommendations were submitted on these plans from

- E-mail: wsw.plans@capetown.gov.za
- Online: www.capetown.gov.za/haveyoursay
- Post: Service Integration Office, Water & Waste Services Directorate, 9th Floor, 2-Bay, Tower Block, Civic Centre, 12 Hertzog Boulevard, Foreshore, Cape Town, 8001 for attention David Paulse
- Hand: At your nearest Sub council Office

3. The draft IWM Plan was also advertised in the regional and local community newspapers (Argus, Burger and all community newspapers). capetown.gov.za/Media-and-news/Have your say on draft water services and waste management sector plans

4. Key stakeholders were notified via email to submit their comments and inputs.

CHAPTER 6

6. LEGISLATIVE REQUIREMENT AND BACKGROUND TO CCT WASTE SECTOR PLAN

6.1 National, provincial and by-law analysis

Legislation, government policy, national strategies and protocols, and the City's institutional and regulatory framework have a direct bearing on the sustainable, affordable and equitable provision of waste services in Cape Town. This includes, but is not restricted to the following:

- Constitution of the Republic of South Africa, 1996; Chapter 2 Bill of Rights and Schedule 5B, and MSA provisions requiring local government to ensure provision of waste management services.
- Constitution, s.24: The right of everyone to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
  The NEMA principles are cornerstones to the development of the Specific Environmental Management Acts. In the Waste space, the service is underpinned by the following principle: that waste is avoided or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;

- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) as amended and related regulations. Some of which includes;
  - EPR regulation - Producers to take responsibility for their products beyond the consumer stage.
    - "The-polluter-pays" principle and responsibility of waste generators.
  - Waste Information Regulations
    - To regulate the collection of data and information.
- Norms and Standards
  - Norms and Standard for storage of waste
  - Norms and standard for sorting, shredding, grinding, crushing, screening or baling of general waste
  - Norms and standard for treatment of organic waste
  - Norms and standard for organic waste compost
  - Norms and standard for disposal of waste to landfill
- Policies
  - National Policy in Thermal Treatment of General and Hazardous Waste (2009)
  - National Policy for the Provision of Basic Refuse Removal Services to Indigent Households (2011)

- The National Waste Management Strategy (2020) (NWMS) - The NWMS defines two key components to ensuring waste minimisation, which are also key drivers for the above circular economy, as follows:
    - Waste prevention (or waste avoidance) – avoiding the generation of waste and avoiding its toxicity;

Waste as a resource (or waste beneficiation) - Beneficiating waste through re-use, recycling, treatment and recovery to reduce the amount and the toxicity of waste disposed of.

NWMS ambitious targets are:

Table 8: National Waste Management Strategy goal

GOAL	SA: SHORT TERM TARGET (2025)	SA: MEDIUM TERM TARGET (2030)	SA: LONG TERM TARGET (2035)
Prevent waste, and where waste cannot be prevented, **ensure that the following targeted percentages of waste is diverted from landfill,** leading to zero waste going to landfill in future.	**40%** of waste diverted from landfill	**55%** of waste diverted from landfill	More than **70%** of waste diverted from landfill

- Legislation, which regulates the development and operation of waste facilities, includes;
    - Environment Conservation Act, 1989 (Act No. 73 of 1989)- Section 20
    - National Water Act, 1998 (Act No. 36 of 1998)
    - National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

- Legislation which regulates special waste streams;
    - Hazardous Substances Act, 1973 (Act No. 15 of 1973) and Regulations
    - National Health Act, 2003 (Act No. 61 of 2003)

- Legislation related to establishment, functions and mandate of local government.
    - Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000)
    - Defines basic municipal service as meaning "a municipal service that is necessary to ensure an acceptable and reasonable quality of life and, if not provided, would endanger public health or safety or the environment
    - Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998)
    - Local Government: Municipal Finance Management Act, 2003 (Act No. 56 of 2003)

- Other supporting legislation includes the following;
    - National Road Traffic Act, 1996 (Act No. 93 of 1996), for transportation of waste by road

- Second-Hand Goods Act, 2009 (Act No. 6 of 2009), reuse, recycling of used goods to combat theft
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Regulations

Provincial legislation and policies

- Western Cape Health Care Waste Management Act, 2007 (Act No. 7 of 2007) includes responsibilities regarding health care waste management
- Hazardous Waste Management Plan (DEA&DP) (2006)
- Western Cape 2nd generation Integrated Waste Management Plan (2017)
- Provincial Waste Information System
- OneCape2040 (2013)
- Western Cape Government: Western Cape Green Economy Strategy Framework (2013)
- Western Cape Provincial Spatial Development Framework (SDF)

City By-laws and policies

- Integrated Waste Management By-law, 2009, as amended
- Environmental Health By-law, 2003
- Streets, Public Places and the Prevention of Noise Nuisances By-law, 2007
- Air Quality Management By-law, 2016
- Treated Effluent By-law, 2010 as amended
- Wastewater and Industrial Effluent By-law, 2013
- Environmental Management Strategy
- Economic Growth Strategy
- EPWP Policy
- Air Quality Management Policy
- Asset Management Policy
- Supply Chain Management Policy

CHAPTER 7

7. COMPLIANCE AND ENFORCEMENT

Compliance Audits

The monitoring systems used by the Urban Waste Directorate are governed by various legislation. The table below depicts audit requirements for the City's waste facilities and their compliance status.

Table 9: Audit requirements for waste facilities

Facility	Internal Audit Frequency Requirements	Internal Audit Average Percentage compliance with audit requirements (2023)	External Audit Frequency Requirements	External Audit Average Percentage compliance with audit requirements (2023)
ACTIVE SITES LANDFILL SITES				
Bellville South LFS	Bi-annual (twice a year)	88.49%	annually	87.06%
Coastal Park LFS	Quarterly	87.06%	annually	85.72%
Vissershok LFS	Monthly (11 months covered)	94.05%	quarterly	90.60%
	CLOSED SITES			
Atlantis LFS	quarterly	97.84%	annually	100%
Brackenfell LFS	quarterly	88.68%	annually	97.69%
Faure LFS	quarterly	89.86%	annually	92.97%
Gordon's Bay LFS	quarterly	89.59%	bi-annually	98.86%
Kraaifontein LFS	quarterly	79.31%	annually	92.00%
Swartklip LFS	quarterly	94.42%	annually	93.33%
Table View LFS	quarterly	91.37%	bi-annually	88.46% (May)
Waterkloof LFS	quarterly	95.9%	annually	94.23%
	HISTORIC SITES			
Fish Hoek LFS	bi- annually	91.94%	annually	92.74%
Macassar LFS	quarterly	95.25%	annually	97.14%
Mamre LFS	quarterly	96.77%	bi- annually	88.85% (May)

Noordhoek LFS	quarterly	97.55%	annually	96.53%
Ocean View LFS	quarterly	90.07%	annually	97.78%
Radnor LFS	quarterly	99.32%	annually	100%
Sarepta LFS	Three times a year, conducted in January, July and November	87.89%	annually	100%
Simonstown LFS	quarterly	88.17%	annually	93.50%
Strand LFS	quarterly	99.3%	annually	97.78%
Witsand LFS	bi-annually	99.25%	biennially	97.78
	TRANSFER STATIONS			
Athlone RTS	quarterly	92.99%	annually	97.14%
Bellville RTS (Tygerberg IWMF)	quarterly	93.85%	bi-annually	90.34%
Kraaifontein IWMF	quarterly	89.78%	annually	90.07%
Swartklip RTS	quarterly	94.99%	annually	94.67%
DROP-OFFS				
Atlantis	quarterly	95.35%	biennially	94,62%
Killarney	quarterly	81.82%	biennially	95,77%
Welgelegen	quarterly	92.5%	biennially	92,56%
De Grendel	quarterly	82.05%	biennially	90,38%
Kensington	quarterly	84.72%	biennially	95,19%
Tygerdal	quarterly	95.35%	biennially	92,38%
Gordons Bay	quarterly	96.43%	biennially	94,03%
Delft	quarterly	93.42%	biennially	85,13%
Belhar	quarterly	95.23%	biennially	80,58%
Ravensmead	quarterly	93.42%	biennially	92,38%
Prince George Drive	quarterly	77.78%	biennially	Site commissioned June 2021

Wynberg	quarterly	95.24%	biennially	87,95%
Retreat	quarterly	76.47%	biennially	83,69%
Mitchells Plain	quarterly	83.78%	biennially	94,48%
Schaapkraal	quarterly	87.5%	biennially	82,92%
Induland	quarterly	73.8%	biennially	92,54%
Sea-Point	quarterly	94.44%	biennially	94,38%
Woodstock	quarterly	95.0%	biennially	86,86%
Kommetjie	quarterly	87.84%	biennially	93,54%
Simons Town	quarterly	94.05%	biennially	95,69%
Hout Bay	quarterly	95.86%	biennially	94,23%

CHAPTER 8

8. WASTE GENERATION AND COMPOSITION

Waste Quantities

The summarised waste quantities received at CCT Disposal Facilities over the past 6 financial years are presented in **Table 10**. The data distinguishes between waste landfilled and waste diverted for other uses. Builders' rubble and sand is typically stockpiled for use in temporary haul roads, daily cover and intermediate cover on slopes. Garden greens are chipped and beneficiated (typically to produce compost).

Table 10: Waste Managed by CCT

CITY OF CAPE TOWN **WASTE STATISTICS**	**Total 18/19**	**Total 19/20**	**Total 20/21**	**Total 21/22**	**Total 22/23**
Waste Entering Disposal Facilities over Weighbridge	**Tons**	**Tons**	**Tons**	**Tons**	**Tons**
General Waste	1 115 961	1 006 892	1 061 488	1 117 064	1 120 031
Hazardous Waste	7 588	3 376	10 822	4 024	6 546
Total Incoming General + Haz Waste Landfilled	**1 123 550**	**1 010 269**	**1 072 310**	**1 121 088**	**1 126 576**
Builders rubble entering landfill sites to be chipped	414 406	235 691	370 024	434 411	416 430
Garden Greens entering Landfill sites to be chipped	5 792	12 511	30 986	17 778	8 737
Total Incoming Waste sent for Builders Rubble Stockpile or Garden Greens Chipping	**420 198**	**248 202**	**401 010**	**452 189**	**425 167**
Total Incoming Waste (Tons)	**1 543 748**	**1 258 471**	**1 473 320**	**1 573 277**	**1 551 744**

Total Waste Diverted from Landfill	**380 608**	**186 968**	**216 454**	**362 371**	**317 493**
Total Waste Managed	**1 671 874**	**1 315 929**	**1 535 243**	**1 695 776**	**1 656 650**
% Waste Minimisation (based on Council activities and disposal sites)	**22.77%**	**14.21%**	**14.10%**	**21.37%**	**19.16%**

The waste data analysis found the following:

- The mass of general waste disposed to landfill at all CCT facilities in the past 6 financial years has remained consistent, with an annual average over this period of 1.15 million tonnes.
- 73% of waste received at landfill was Municipal Solid Waste (MSW) (2019), with 20% being inert.
- Based on household waste characterisation (2018), MSW comprises 35% recyclables by mass and 29% organic waste by mass (important for impact of future diversion scenarios).

Other waste streams generated within the City

Agricultural waste

Agricultural land is generally serviced by the private sector as per the integrated management principles and standards of the CCTs Integrated Waste Management Policy.

Sewage sludge

This IWM Policy excludes waste originating from sanitation systems, for which there are separate National and City policies, but makes provision for the disposal of treated sewage sludge's of an acceptable quality that will minimise the impact on the environment, as determined by separate guidelines from time-to-time.

Waste Tyre

The current waste tyre management system as provided for in the Waste Tyres Regulations (2017), enforced by DFFE is regrettable, after many years, still not curbing the ongoing illegal dumping of tyres. The City of Cape Town, as a responsible local authority, continue to collect illegally disposed tyres. Failing to do so, we have experienced, attract further dumping, which not only result in unpleasant visual cleansing nuisances, but also cause both fire and environmental risks. The waste tyre is prohibited from being landfilled like any other general waste as promulgated in the NEM:WA, National Norms and Standard for disposal of waste to Landfill Chapter 2, Section 5 (i) (o) and (p).

Currently the City is compelled to store these collected waste tyres at City drop-off sites, but only as a temporary measure. The Waste Tyre Regulations of 2017, promulgated on 29 September 2017, is clear on the management of waste tyres and the roles of relevant stakeholders in the value chain.

Household hazardous Waste

The NWMS target is to decrease landfilling of HHHW by 10% by 2024. HHHW is a relatively small waste stream and although there are varying levels of net benefits between municipalities. City of Cape Town has developed two drop-off facilities that are dedicated to HHHW.

Health care risk waste

Specialized waste collection and related services and infrastructure for industrial and hazardous waste are currently not provided by the City of Cape Town, but by private accredited waste service providers due to specialized facilities and infrastructure requirements not normally provided or maintained by the City.

These services aim at industrial and health care service sectors (including veterinary services) that generate hazardous waste of various categories, which requires special handling, transport and treatment before disposal. Industries have the responsibility to contract with an accredited service provider for the management of these waste streams.

CHAPTER 9

9. WASTE AVOIDANCE, REDUCTION AND RECYCLING

Approximately 20% of waste in the system was diverted from landfill in **2022/23.** Builder's rubble accounted for 64% of this diversion followed by greens (30%) and Think Twice (Include drop off and City Initiatives) (6%).

Table 11: Waste Diversion

CITY OF CAPE TOWN WASTE STATISTICS	**Total 17/18**	**Total 18/19**	**Total 19/20**	**Total 20/21**	**Total 21/22**	**Total 22/23**
Waste Minimisation Programmes	Tons	Tons	Tons	Tons	Tons	
Bellville South Compost	9782	1971	333	742	0	0
Drop-off Facilities (Recyclables)	5 812	5 752	4 754	5 977	5 565	5 500
Athlone Refuse Transfer Station (Recyclables - Dirty MRF)		0	0	0	0	0
Builders Rubble reused	316 809	246 689	116 999	123 545	222 094	203 849
Chipping of Garden Greens at Drop-off Facilities	97 875	69 849	16 509	11 780	52 596	53 132
Chipping of Garden Greens Disposal Facilities	59 409	35 647	28 314	41 297	51 940	41 959
Sea/Green/Mouille Point Three Anchor Bay (Think Twice)	1 922	1 611	1 262	1 739	1 698	1 708
Atlantic Area (Think Twice)	2 607	2 678	1 281	3 905	4 129	2 254
Helderberg Area (Think Twice)	0	0	0	0	3 728	2 672
Kraaifontein IWMF (Think Twice)	16 021	14 601	15 735	25 007	18 250	4 532
Deep South Area (Think Twice)	1 388	1 497	1 657	2 284	2 196	1 704

CITY OF CAPE TOWN WASTE STATISTICS	Total 17/18	Total 18/19	Total 19/20	Total 20/21	Total 21/22	Total 22/23
City Paper Project	158	132	90	84	50	73
Damaged Refuse Bins (Recycled plastic)	118	183	35	93	126	163
Total Waste Diverted from Landfill	**511 901**	**380 608**	**186 968**	**216 454**	**362 371**	**317 547**
Total Waste Managed	**2 640 830**	**1 671 874**[9]	**1 315 929**	**1 535 243**	**1 695 776**	**1 656 704**
% Waste Minimisation (based on Council activities and disposal sites)	**19.38%**	**22.77%**	**14.21%**	**14.10%**	**21.37%**	**19.17%**

Table 12: Summarises projected waste diversion volume targets for the CCT

Formal sector waste Streams	2020	2025	2030
Municipal landfill	1175916 t	1515932 t	1626720 t
Municipal diversion	371660 t	866506 t	1287194 t
Greens	20787 t	179621 t	232323 t
Recyclables	26181 t	74548 t	74548 t
Builders rubble	143545 t	419431 t	695318 t
Wastewater Sludge	151147 t	192906 t	285005 t

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Kraaifontein took a dip when the bi-weekly collection was introduced. It is picking up since July2023. We are currently at 12000+ for Kraaifontein.

CHAPTER 10

10. STATE OF ASSESSMENT

This Chapter provides an overview of the State of assessment for urban waste functions namely; Collections, Cleansing, Disposal, Drop –offs and Engineering &Asset Management (EAM).

10.1 Backlogs

Urban Waste Management backlogs are categorised as follows;

Investment Backlog:

This is experienced in the Disposal and Waste minimisation space where the development of waste infrastructure was delayed.

Development of Waste infrastructure

Significant delays were experienced with the authorisation of current landfill projects. This relates to the commenting authority who is the National Department of Water and Sanitation. For any design approvals, this needs to be factored into the planning phase since there is no legislative timeframe that can assist to guide and allocate time to this process. Land reservation for City land is another process that the directorate will consider in the early stages of the project life cycle. This in particular has affected project implementation timelines of most of the drop off facilities that were planned for the next 10 years as per the table below.

Table 13: list of investment and replacement backlog

Item	Item Description	Type pf Backlog	Original start	Delayed start	Reason for Backlog	Reason for project
CPX.0010025	CPTS: Transfer Station New	Investment Backlog	2022	2024	With the delay in the construction of the Coastal Park Material recovery Facility on the same site, this project has been phased out.	With the Coastal Park Landfill site running out of airspace the Transfer station will allow for waste to still be disposed at this site and be transported to Vissershok landfill site
CPX.0007920	Vissershok North: Design and develop Airspace	Investment Backlog	2023	2024	Significant delays with the approval of Vissershok designs by the National Department of Water and Sanitation.	Increase landfill airspace to meet the demand.

CPX.000 3136	Purchase of Land Regional Landfill	Investment Backlog	2025	2026	Land still to be identified and procured. Feasibility study underway.	Secure long term landfill airspace.
CPX.000 3137	Dev of the Regional Landfill Site	Investment Backlog	2023	2027	Land still to be identified and procured. Feasibility study underway.	Secure long term landfill airspace.
CPX.001 1068	ARTS: MBT (Phase 2)	Investment Backlog	2027	2028	PRA - Fail/Not Supported	organic waste reduction facility which serves to divert and process organic waste closer to the source of origin
CPX.001 4676	Drop-off Facilities: New Bothasig	Investment Backlog	2027	2028	PRA - Fail/Not Supported – land reservation	Waste diversion closer to source of origin - households
CPX.001 4679	Drop-off Facilities: New Khayelitsha	Investment Backlog	2027	2028	PRA - Fail/Not Supported- land reservation	Waste diversion closer to source of origin - households
CPX.001 4649	Drop-off Facilities: Sea Point Upgrading	Investment Backlog	2027	2028	PRA - Fail/Not Supported	Waste diversion closer to source of origin - households
CPX.001 0023	HTS: Material Recovery Facility New	Investment Backlog	2027	2028	PRA - Fail/Not Supported	Waste diversion closer to source of origin
CPX.001 4719	Major Upgr of Facilities - Vaalfontein	Investment Backlog	2027	2028	PRA - Fail/Not Supported	Increase space for additional resources as per increasing demand
CPX.001 4654	VHS: LFG Infr - Beneficiation (Phase 2)	Investment Backlog	2027	2028	PRA - Fail/Not Supported	Extract Methane gas for flaring/ beneficiation

Replacement Backlog:

Fleet replacement

The availability and phasing of old and unreliable fleet has direct impact on timeous rendering of services which cause backlog and increasing number of C3 notifications received by the directorate.

Service Delivery Backlog:

Provision of informal refuse collection and cleansing services

Backlogs in this context is defined as increased littering, dumping and waste accumulation that routine and scheduled waste services cannot resolve within the stipulated time as per approved service standards.

This is represented and quantified by the number of C3 complaints as outlined in the table below.

Table 14: Number of C3 complaints received

Complaint Type	FY18-19	FY19-20	FY20-21	FY21-22	FY22-23	FY23-24 As @ NOV 23	Average %
Illegal Dumping	58.4	64.5	65.5	61.3	67.5	67.8	**64.2**
Street Sweeping	22.9	21.6	18.4	18.7	21.2	18.9	**20.3**
Litter Bins Not Serviced	3.6	3.5	3.7	3.2	3.2	3.6	**3.5**
Litter Bins Required	3.1	2.6	2.6	2.9	2.3	2.6	**2.7**
Animal Carcass Removal	2.7	1.8	2	6.8	1.5	1.1	**2.7**
Informal Settlements-Dumping	1.4	1.5	2.7	2.3	0.5	1.4	**1.6**
Illegal Dumping Offenders	2.7	1.2	0.8	1.2	1.2	1.1	**1.4**
Request for "No Dumping" Signboard	1.2	0.9	0.6	0.7	0.6	0.5	**0.8**
Beach Cleaning	0.7	0.6	0.7	0.9	1.1	0.9	**0.8**
Informal Settlements-No Refuse Collect	0.2	0.5	0.6	0.5	0.1	0.9	**0.5**
Informal Settlements-Ship cont. overflow	0.5	0.4	0.3	0.5	0.3	0.5	**0.4**
Informal Settlements-Fire Debris Removal	0.2	0.3	0.3	0.3	0.2	0.4	**0.3**
General Staff Complaints	0.2	0.2	1.8	0.1	0.1	0	**0.4**
Dumping on Parks/Public Open Spaces	0.1	0.1	0	0	0	0	**0**
Informal Settlements-No Bags Received	0	0.1	0.1	0.6	0.1	0.2	**0.2**
Special Waste	0.1	0.1	0	0	0	0	**0**
EPIC Solid Waste	0.1	0	0	0	0	0	**0**
Unhealthy/Unhygienic Conditions	0	0	0	0	0	0	**0**
Branch Removal (Fallen/Broken)	0	0	0	0	0	0	**0**
Dumping in/on Stormwater Infrastructure	0.1	0	0	0	0	0	**0**

The current situation results in environmental degradation due to excessive illegal dumping and contributes to high percentage expenditure on actions focussed on eradicating these challenges.

The availability of fleet coupled with the phasing out of old and unreliable fleet as well as the appointment of contracted services directly impacted on timeous rendering of services. This is the main resulted in an increased number of C3 notification received by the department.

The Directorate is in the process of reviewing the current waste collection model for informal settlements; the findings will be incorporated in the Waste Strategy.

10.2 Capacity and constraints

The table below depicts the existing capacity as determined by the consumption rate and demand. Depots undergo beat reviews annually, in collaboration with the GIS unit. These reviews may result in new beats being established, or existing beats expanding or changing. Factors that influence these decisions include: changes in density and population growth, beat proximity to depot, number of lifts. Required capacity is unknown at this stage. An investigation is currently underway to review current beats and determine additional capacity required, to be concluded by March 2024. Findings and related action items will be included in the next review of the sector plan.

The table below provides an overview of the available capacity within the directorate to provide waste services.

Table 15: Current capacity for waste services

SECTION	FUNCTION	CURRENT CAPACITY
Collections	Refuse collection	158 RELs Team collects 1000 – 1200 bins per day (beat) - 825 000 service points weekly
Cleansing	Litter Picking Street Cleaning Servicing of Informal Settlements Clearing of illegal dumping	Vehicles - 582
Disposal	Disposal Sites	Available airspace estimated to 14 years for the 2 disposal facilities
	Transfer Stations	Four Transfer Stations across the City. Utilisation lower than design capacity
Waste Markets	Drop offs	28 Drop offs – at 7km radius for the entire City, with the exception of Somerset West area where the facility was decommissioned in the previous years.

Cleansing

The Cleansing Branch constitutes the largest number of personnel directly employed by the City as well as number of personnel appointed indirectly or directly via short-term projects. At present, the branch constitutes 1,628 permanent personnel, which are further supplemented by approximately 4,800 temporary personnel for short-term projects annually. The supplementing staffing is sourced through the Expanded Public Works Programme. The current human resources of the Cleansing Branch require a review in order to align it with the changing times and growth in services provision needs throughout the City.

Disposal

- The four RTS operational targets are currently lower than design capacities. Athlone in particular due to the constraint of the rail transport not being available.
- Although there are no capacity constraints at RTS plant availability is a challenge. Blue plant tender has addressed mechanical plant maintenance. Procurement of new containers as well as installing additional lines to increase capacity at RTS's is required. Since this is being created by downtime due to load shedding and traffic bottle necks which are unpredictable. Increased capacity will therefore need to be supported with additional capital programmes.
- The two operating landfill sites has a combined remaining airspace of 14 years. Capacity constraints at the landfill sites being reached in 2026 for Coastal Park and Vissershok in 2036 based on base case. In terms of operations, both operational landfills have adequate plant and equipment available for operations, however, equipment and fleet breakdowns impact operational efficiency. Both operational landfills are generally satisfactorily compacted and covered.

Drop-off facilities

- The City's Drop off facilities are placed at 7km radius and caters for the whole City of Cape Town except for Somerset West where the Drop off was decommissioned. There has since been a strategic decision to reduce the 7km radius to 3 km. As a result some of the areas falls outside the 3km radius especially informal areas.

- To meet these demands, a tailored strategy and model for developing drop-offs in informal areas need to be developed based on the types of waste generated, and waste collection and sorting processes. There is also a low proportion of drop-off sites in the formal low-income areas.

- This approach will address the lack of standards and disparities in the planning and development of Drop-off facilities. Figure 10 depicts the existing and planned drop-offs at 7km and 3km respectively.

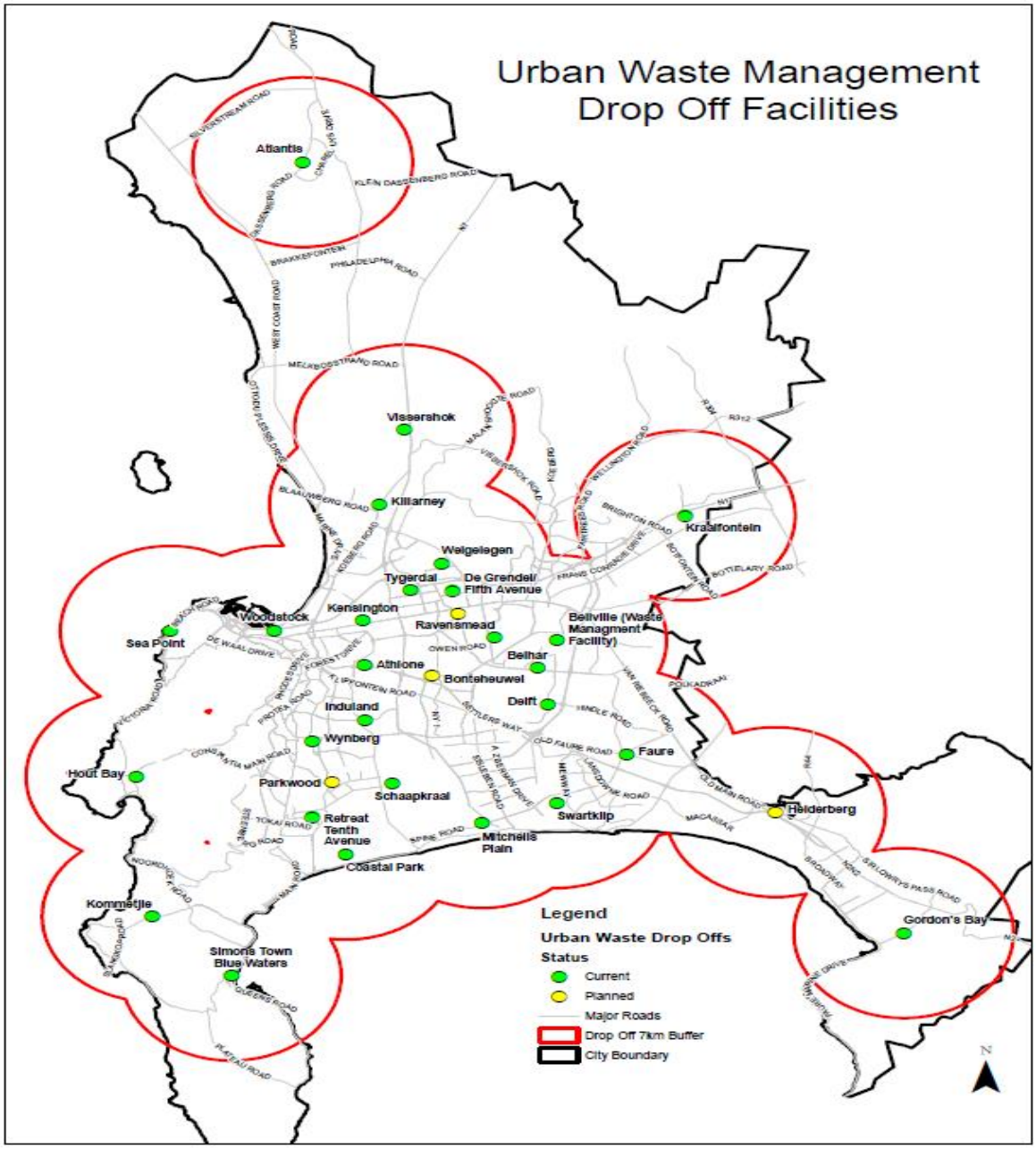


Figure 10: Drop-off facilities

Constraints

- Densification

  Growth of the city and the impact of narrow roads and problematic turning circles renders certain areas within the City inaccessible for waste collection, resulting in illegal dumping. Inadequate waste containers exacerbate the situation.

- Servicing of Backyarders

  The Directorate is still to determine the appropriate model for servicing backyarders. In terms of the IWM Policy, it is not mandatory for property owners to provide

additional bins to their tenants, this result in the City not being able to recover the full cost of servicing backyarders.

- Haulage of waste by road.

  Access to rail is not currently available thus creating bottlenecks and additional costs to waste Services. Movement and transportation of waste between transfer stations and customers and final disposal sites is not a viable option considering the geography of the CCT service area in relation to the location of the landfills (over 30km). Waste Services incur significant costs in transporting waste between the network of transfer stations and the Vissershok South and North Landfills. As much of the growth in the CCT is taking place in the east, future logistical costs are likely to increase.

- Aging plant and equipment

  There are plans in place to replace RTS equipment such as crane rails and compaction lines.

- Leachate treatment plant operationalisation

  The operation of the leachate treatment plant at Vissershok will be reviewed in order to improve efficiencies.

- Depleted landfill airspace

  The acquisition of land for the development of the regional waste facility remains a challenge.

- Lack of skills

  The current lack of skills within UWM to deal with alternative technologies for waste disposal is addressed in the HR Plan.

10.3 Consumption and demand analysis

The mass of waste landfilled in the past six years has remained relatively stable, averaging at approximately 1.15 million tonnes per annum. While population trends (growth and socio-economic levels) are the main predictors of waste generation trends over time, the many pathways that waste may travel through the system before ending up at landfill means that the amount of waste disposed is dependent on many more variables, not just population characteristics.

There is an airspace challenge at the two (2) landfill sites with Coastal Park expected to reach capacity in 2026 and Vissershok Landfill to reach capacity in 2036. The various interventions on waste minimisation will have an effect of extending the life of these sites, as well as operational improvements through monitoring of various parameters.

Airspace consumption

The following airspace consumption information reports on the volume of airspace consumed within the period between surveys, which are undertaken monthly, as well as a lifespan projection (without accounting for waste growth and / or diversion initiatives).

Vissershok

Table 16: Vissershok Landfill airspace consumption

Vissershok Landfill - Topographical Survey					
Date of current survey (latest)		09/01/2024			
Date of previous survey		01/12/2023			
Period between surveys		39		Calendar days	
Airspace Consumption*					
For Period between two surveys stated above		77 822		m3	
Daily average**	1 995	m3/day	Monthly average	60 860	m3/month
Consumption equates to a 11.3 % increase compared with iPWIS1 average for 2022					
Disposal Overfill					
Above Permissible 90m Elevation (WML)		0		m3	
Remaining Airspace					
South: Interim Landfill Profile (excl. Triangle)***		± 4 700 000		m3	
South: Final Landfill Profile (incl. Triangle)***		± 10 900 000		m3	
North: Cells 1-4 (High-level Model)***		± 2 500 000		m3	
North: Final Landfill Profile (GRAP Analysis, 2019) ***		± 12 200 000		m3	

- Average daily airspace consumption is **1 995 m3/day** at the working face, which equates to a monthly consumption rate of approximately **60 860 m3/month**.
- **CCT** had disposed **50 225 m3** and **28 070 m3** waste on the New Wedge Cell (RTS Disposal) and Cell 5 (RELs and others) respectively.

The assessment of disposal rates and airspace consumption at VLS has been complicated in recent months due to the construction of the piggyback on site.

Coastal Park

Table 17: Coastal Park Landfill Airspace consumption

Coastal Park Landfill - Topographical Survey			
Date of current survey (latest)		09/01/2024	
Date of previous survey		09/12/2023	
Period between surveys	39		Calendar days
Airspace Consumption*			
For Period	47 758		m3

Daily average**	1 224	m3/day	Monthly average	37 349	m3/month
Consumption equates to a 12 % decrease compared with the iPWIS1 average for 2022					
Disposal Overfill					
Above Permissible 45m Elevation (WML)		± 233 150		m3	
Above Final Landfill Profile		± 534 700		m3	
Remaining Airspace					
Final Landfill Profile***		± 1 900 000		m3	
Excluding Cell 1B (Dome Only)***		± -250 000		m3	

- Average daily airspace consumption is **1 224 m3/day** at the working face, which equates to a monthly consumption rate of approximately **37 349 m3/month**

Remaining useful life estimates

This section is based on a deterministic model to project the remaining useful life based on Raw Weighbridge Data, iPWIS data and airspace consumption rates, with the latter calculated from comparing the topographical surveys to the final airspace.

The deterministic model considers all consumption rate data to establish low and high thresholds in order to present life estimates as envelopes. Note the low threshold is based on the survey data presented, with the high threshold based on the raw weighbridge data. It is evident that the iPWIS data falls within this envelope.

The City remodelled the deterministic model to assess the correlation of the various consumption rates and how it impacts the model, as well as updated the remaining airspace for the scenarios. As discussed, to determine the time envelope within which the site is expected to reach capacity, five (5) scenarios were modelled.

The results of the modelled scenarios are presented in **Tables 18.** It should be noted that the modelled scenarios do not consider the impact of potential future waste diversion projects. Coastal Park Landfill has limited remaining airspace and is projected to reach capacity within the next three years, and by implication, all waste will be disposed at Vissershok in the future.

Vissershok

Table 18: Vissershok modelled scenario and projected capacity

Scenario	**Projected Capacity Date**	
	Low Threshold	**High Threshold**
1. Immediate Case VLS South Interim Profile & CPLS Full Profile @ 3% waste growth	Mar-29	Dec-27
2. Intermediate Case VLS South Interim Profile, VLS North (Cells 1-4) & CPLS Full Profile @ 3% waste growth	Dec-30	May-29
3. Unlikely Case Frankdale Rd remains- VLS South Interim Profile,	Jan-37	Apr-34

VLS North Full Profile & CPLS Full Profile @ 3% waste growth		
4. Future Case VLS Full Profile & CPLS Full Profile @ 3% waste growth	Jul-40	Mar-37
5. Diversion Case VLS Full Profile & CPLS Full Profile @ 0% waste growth	Mar-45	Feb-40

The 'remaining useful life envelope' for VLS at 3% waste growth is estimated to be depleted in 3.8 years and 16 years. Considering the high threshold cases, the following scenarios are presented.

- In the immediate case, VLS South interim will deplete its airspace December 2027
- In the intermediate case, VLS South interim and cell 1-4 on VLS North available, the landfill will deplete it's airspace in May 2029,
- In the unlikely case, VLS South interim and VLS North full profile, the landfill will deplete its airspace in April 3034.
- In the future case, VLS full profile, the landfill will deplete its airspace in March 2036.
- In the diversion case, VLS full profile, the landfill will deplete its airspace in February 2040.

Coastal Park

Table 19: Coastal Park modelled scenario and projected capacity date

Scenario	**Projected Capacity Date**	
	Low Threshold	**High Thresold**
1.Best case Full CPLS profile@0% waste growth	Aug-27	Jul-26
2. Likely case Full CPLS profile @3% waste growth	Jun-27	June-26

The 'remaining useful life envelope' for CPLS at 0% and 3% waste growth is estimated between 2 and 3.5 Years.

It is unlikely that the best case will be realised, i.e. that waste disposal quantities will remain flat given the high population growth currently experienced in the City and the historic growth trends evident at CPLS. This scenario has therefore been disregarded. Wide scale waste diversion and extension of the landfill height are the only viable options that will extend CPLS's useful life significantly.

Cleansing

Cleansing's level of service is determined by the current available resources comprising of vehicles and staff. Apart from internal factors comprising staff shortages and the downtime on vehicles, there are external factors attributed to the growth in population size as well as the developments of new informal settlements and suburbs, which place continual increasing demands on Cleansing's services and the Branch's available resources.

An analysis of the C3 complaints received for the past five financial years indicate that approximately 64 percent of all complaints received are attributed to illegal dumping. The trends, as illustrated in **Table 14**, above indicate the increasing demand on cleansing services, which is expected to increase with the increasing population growth and increasing influx of people moving to the City.

It is however a challenge in assessing the demand for Illegal dumping Services apart from setting a target of eradication of the illegal dumping activities within the City.

The current cleansing services demand is in relation to a need to improve Cleansing Services at informal settlements. The level of services at the informal settlements and townships need to be improved drastically in the short and long term.

Collections

The collection of MSW requires 240L wheelie bins. In order to be effective, this requires reliable refuse compactor vehicles and bin lifters to ensure the City renders uninterrupted refuse services.

It should be noted that one service point does not necessarily translate to one household i.e. one service point can have more than one household and more than one bin.

For the purpose of this review, the following assumption will be made for resource planning.

- One household = one service point.

This will then determine the required additional capacity to meet the demand.

- Each refuse compactor on average services 1044 households per day (beat)
- Currently a total of 158 vehicles are required to service 825000 collection points on a weekly basis (i.e. approximately 5000 households serviced by one truck on a weekly basis).
- With the estimated growth of 630 000 additional household by 2040 based on LUM, additional 120 vehicles will be required to provide the waste collection service as per the current service level as depicted in **Table 20** below.

Table 20: Current vs required Collections capacity

Current capacity 2024		**Required capacity by 2040**	
Number of HH/service point	Number of vehicles	Number of HH/service point	Number of vehicles
825 000 Service points weekly.	158	1 455 000	278

Drop-offs

Urban Waste Management has 28 drop-off facilities throughout the City. Drop-offs are classified as major and minor drop-off sites. There is a total of 9 major facilities and 12 minor facilities as well as seven facilities managed by the disposal department situated within the landfill sites, classification is based on the capacity to accommodate waste. The Drop offs in their current form do meet the capacity and demand requirements. The reduction of the 7km radius to 3 km creates a demand for additional drop offs to be developed.

As mentioned above there are 28 drop off sites within the City and there is a demand for drop off sites to be closer to residents remains a priority, especially so in the low income and informal areas.

The planned upgrades over the next 10 years will address the capacity issue in its design by increasing the footprint of drop-offs where possible. The intention is to move towards the development of minor drop-offs across the city with a focus on informal areas. The current 10-year capital plan for new sites include the development of drop-offs In Khayelitsha.

10.4 Quality of service

The quality of Waste Services is measured through SDBIPs, environmental audits and the ability to meet service standards. **Table 20** Provides an overview of performance indicators for the past financial year. The Directorate could not meet targets for formal beats receiving refuse collection service on scheduled day. This has a direct impact on the Service standards KPI which was also not met. This contributes towards increased illegal dumping i.e. if bins are not collected as scheduled. Some of the reasons behind this is unavailability of vehicles due to breakdowns. The Capital project pipeline includes the procurement of additional vehicles to replace the aging fleet.

The number of C3 notifications received over a period was used to measure the quality of Service for Cleansing.

Table 21: Key Performance Indicators

KPI	Baseline 2021/2022	Annual Target 30 June 2023	Target Q4	Actual Q4 30 Jun 2023
Adherence to service standards (%)	New	90%	90%	88.76%
Informal Settlements receiving waste removal and area cleaning services (%)(NKPI)	99.79%	99%	99%	99.78%
Service requests for refuse non-collection resolved within 3 days (%).	New	96%	96%	52.22%
"Formal Beats receiving a refuse collection service on scheduled day (%)	New	99%	99%	97.36%
Percentage of waste diverted from landfill sites through council waste minimisation initiatives	13.90%	14.9%	14.9%	19.16%
Percentage of recognised informal settlements receiving integrated waste handling services	99.79%	99%	99%	99.78%
Percentage of scheduled waste collection service users reporting non-collection	New	75%	75%	0.02%
Percentage Drop-offs facilities open to the public	new	99%	99%	99%
Number of clean-up programmes implemented with residents	new	58	58	58

Cleansing

The standard service level for informal settlements dwellings is aligned with the Council's Indigent Policy. This is a once-a-week, bagged door-door waste collection service provided to indigent families. In this category, each informal household will be provided weekly with Council refuse bags, of a size, number and design determined by the City. The service offered is an integrated area cleaning and refuse collection service provided through external contractors.

Disposal

RTS operations are monitored using KPIs, such as weighbridge flows, plant availability and breakdowns.

Landfill sites are subjected to internal and external audits. This includes the monitoring and reporting for water quality, landfill gas, leachate, availability of cover material, co-disposal ratio, compaction ratio ,slope stability and other nuisance management. Environmental auditing against waste management licences should be 90-100%, refer to **Table 9** for frequency and recent audit results .

Closed / historical landfill sites undergoes internal/external environmental auditing and any other reporting requirements as determined (including GRAP 19 - provision for rehabilitation of landfill sites).

10.5 Access

Collections

Collections service, in its current form, is 100% accessible to all formal properties with the same level of service provision. Waste collection from informal settlements is provided through private contractors, it is a door-to-door service where every household is provided with a bag. There are at present 462 informal settlements comprising 270 693 dwellings in total which receive a waste service through the Cleansing Branch's appointed service providers. One informal settlement is inaccessible.

There is an assessment currently undertaken to quantify the number of containers in all areas that cannot be accessed by a compactor truck as specified on the tender due to poor road infrastructure. This will necessitate relooking at the vehicle specifications and exploring other collection methods. The directorate is reviewing the waste collection model for informal settlements.

Cleansing

Access is dependent on an array of circumstances. Including community uprisings and poor road infrastructure among others.

Cleansing Services is currently accessible to all communities with applicable standards of cleanliness levels; it is however a concern that illegal dumping occurs in some of the formal settlements and frequently in the informal settlements. This is mainly because the density of population and space that affects the smooth movement of the vehicles affects collection of waste in informal settlements. Blue refuse bags are currently being utilised.

Drop-offs

Collections and Drop Offs branch has a total of twenty one (21) drop off sites and the disposal branch seven (7) spread across the urban (formal) parts of Cape Town. They are within a 7km radius. This 7km radius is not always adequate in terms of bringing drop off sites closer to the community and therefore we are investigating how we can expand drop off and build on an inclusive model for the urban (formal), informal and low-income areas of Cape Town.

Currently all areas within the City falls within the 7km radius for Drop offs except Somerset West where the facility was closed. There are plans in place to construct a new facility. The following figures illustrates the 7km and proposed 3km radius for Drop offs.

Disposal

The Waste Transfer Stations are servicing internal clients and therefore accessibility cannot be measured towards the Public.

The current operating landfill sides, Coastal Park and Vissershok are accessible to internal and external clients. This can be further improved by ensuring that weighbridge are well maintained and functional at all times.

10.6 Risks

Service delivery and Asset risks

The inability of the directorate to deliver on its mandate poses a huge risk for the City. This risks mostly relates to the operations within the directorate. Most of the contributing factors for this risks relates to increasing demand due to growth, safety of personnel, aging fleet, vandalism and availability of resources. The situation is exacerbated by dependency on other directorates for the provision of security and other support functions,

Compliance risk

In the past few months the Directorate was subjected to several litigation matters regarding the appointment of service providers. This action has resulted in service delivery backlogs as reported in the previous section. This has subsequently led to section 28(4) of the National Environmental Management Act, 1998 directives issued against the City. Implementation plans have since been developed and implemented over short to medium term. Some of these actions are briefly discussed in the operational programmes section of this document. **Table 21** below presents risk ratings and mitigation measures for the identified risks within the directorate.

Table 22: Urban Waste Directorate risk rating and control measures

RISK	Existing Control Measure	Control Effectiveness	Residual Rating			Action Plan
			RI	RL	RR	
Bureaucracy – Long lead times (procure to receipt turn-a round)	Adhere to delegations and sub delegations	70%	0	10	90	Directorate to establish mechanisms to ensure that SCM processes and establishment of contracts within directorate receive on-going attention and not be unduly delayed.
	Implementation of and adherence to legislation and regulations related to SCM	60%				
	Utilisation of Contract Management Unit (CMU) and Legal Services (LS) legal support with regards to the establish contracts with suppliers	60%				
Constraints in servicing Informal settlement due to growth	Participate in the Integrated Waste management work group, coordinated by Human Settlements	50%	0	10	90	Waste Collection model for informal settlements under review. (level of service, containment options)
Constraints to providing services to backyarders (people living on private property) - no mechanism available	Participation in the Integrated Human Settlement space (dependence on corporate decision making re- funding of backyarders)	50%				Waste collection model for waste collection under review – beat review, payment of additional bins
Dependencies on other directorates on SCM, IS&T,	Monthly forum meetings relating to centralising project phased in approach by Corporate Fleet Management	50%	0	10	90	Mitigated by existing controls in collaboration with other City role players.

HR and Corporate Fleet	Monthly HR Forum meetings as wells as engagement via HR working group	80%				
	Reliance on internal innovation (in-house HR, IT, Planning & Finance Support)	90%				
	Training and development for UWM staff on SCM processes	70%				
	Utilisation of and adherence to HR Processes	60%				
	Participation in monthly forum meetings relating to fleet centralising project (Phased in approach by Corporate Fleet Management)	50%				
	Participation in the annual and Mid-year budget process	60%				
Illegal dumping	Complaints to 107, dispatched to field staff via Control Room	70%	0	10	90	Mitigated through existing controls & in collaboration with other city stakeholders (E.g. wrt the revision of the 107 Illegal
	Participate in the Integrated Waste management work group, coordinated by Human Settlements	50%				
	Weekly monitoring and reporting on Mayoral Program relating to the upscaling of litter cleansing activities along major highways, main arterials and in public spaces.	60%				

	Liaison with Informal Settlements (working group) regarding service offering required	50%				
Impact of loadshedding on infrastructure and service delivery	Established CCT BCM Standard Operating Procedures	20%	0	10	90	Mitigated by existing controls
Increasing unlawful land occupation/ land grabs/ occupation of land in buffer areas	Monitoring of land to best of ability to ensure timely reporting of ULOs to facilitate response within 14 days	50%				Mitigated existing controls (monitoring closed and historical sites)
	Provision of basic waste services to ULOs	50%				Lobby for additional funding to clean up after ULO people and keep city clean.
Increasing carbon footprint and adverse impact on Climate Change	Monitoring and reporting of the implementation of waste focussed area deliverables on the City's annual climate change action plan implementation report	50%	0	10	90	Risks and contributing factor relating to climate changes is monitored and mitigated in more detail on the Environmental Transversal Risk Register and UWM contributions are contained
Staff and / or public injuries / fatalities	Reliance on Safety & Security alerts regarding hotspots and volatile areas	50%	0	10	90	Mitigated by existing controls & in collaboration with Safety & Security and the Transversal Safety Risk Register
	Withdrawal of staff from volatile areas/situations	30%				
	Escalation of staff safety issues for consideration during the updating of the Staff Safety Transversal Risk Register	40%				

	Reliance on Law Enforcement (slow reaction time)	30%				
	Security measures / alarm system	40%				
	Employment of Safety & Security Law Enforcement Officers on landfill sites	60%				
Vandalism of infrastructure	Reliance on loss control unit & implementation of the loss control processes		09	10	90	Mitigated by existing controls & in collaboration with Safety & Security and the Transversal Safety Risk Register
	Submission of reports to Mayoral Committee on losses					
Exposures of the City to significant fines and prosecution/jail time		50%	9	10	90	Mitigated by existing controls

10.7 Dependencies (Internal and External)

Some of the dependencies identified in the risk register are further detailed in this section. In addition, other dependencies relates to the regulation of waste services by responsible authorities and collaboration with other role players in the waste sector.

Table 23: Internal and external dependencies

INTERNAL DEPENDENCIES		
CITY DIRECTORATES		
DEPARTMENT/SECTION	**ROLE**	**INFLUENCE ON WASTE SERVICES**
Fleet Management	Centralisation of Fleet	Centralisation of specialised fleet could lead to service delivery disruptions.
IS&T Services	Maintenance of IT equipment and systems	Waste systems such as weighbridge, accreditation, iPWIS
Safety and Security	Provision of security Services	Dependencies on the provision of security services which is mostly inadequate to protect waste infrastructure and personnel against security threats
Finance	Financial planning and governance	Regulates procurement of goods and services
Water and Sanitation • Waste Water • Catchment Stormwater and River Management (CSRM)	Management of sewage sludge and maintenance of storm water systems	Sewage sludge contributes towards the organic waste diversion targets. Collaboration in the cleaning of catchment areas.
Human settlement	Integrated Human Settlement planning	Planning for waste services in line with HS Sector Plan
Spatial Planning and Environment • BDM • Urban Planning and Design	Spatial and development planning	Planning for waste infrastructure - MSDF/ DSDF/LSDF Waste management Plans - DAMS
EXTERNAL DEPENDENCIES		
PROVINCIAL DEPARTMENTS		
DEADP	Approval and Endorsement of Waste Sector Plans	Required in terms of NEMWA 59 of 2008

	Authorisation of waste facilities- Drop offs/ Transfer Stations	Delays due to lengthy authorization processes Substantial capital investment as a result of license review
	Auditing of Waste management facilities	Section 24 (8) Directives for non-compliance which attracts huge rehabilitation costs and or penalties
	Setting of waste diversion targets	Requires substantial Capital investment in infrastructure development- organic waste diversion
	Monitor overall compliance with environmental legislation	Section 24 (8) Directives for non-compliance which attracts huge rehabilitation costs and or penalties
NATIONAL DEPARTMENTS		
DFFE Water and Sanitations	Authorisation for waste facilities –landfill sites	Delays due to lengthy authorization processes
	Setting of Waste diversion targets	Requires substantial Capital investment in infrastructure development- organic waste diversion
Department of Public Works	EPWP	Job creation opportunities
National treasury	Financial planning and governance	Allocation of grant funding and governance
PRIVATE SECTOR		
PROS	Implementation of EPR plans in collaboration with the City	Cost for waste diversion projects to be shared with PROs
Business	Suppliers of goods and services	Provides waste services on behalf of the City. Failure to meet contractual obligations – service disruptions.

10.8 End-of-life cycle projects

Landfill sites projects that are discussed in this section. Other Waste Facilities such as Transfer Stations, Drop-offs and MRFs do not have a predetermined lifespan and continue to operate for many years if well maintained. When Coastal Park closes there is an end use plan with concomitant monitoring requirements. The plan is to be revisited given the focus to unlock

land for uses such as solar, wind, RTS, drop-off sites and as an MRF. Depending on budgets, a closed landfill can be retained and maintained for waste diversion and possibly energy generation.

Historic and Closed Landfill sites

The City has a number of historic and closed landfill sites that are currently being rehabilitated in terms of closure permits requirements. Most of the facilities are still within the rehabilitation period of 10 - 30 years and as a result, no end-use plans have been determined yet. Given the condition of the land, the establishment of permanent structures on closed sites is not permitted. In most cases the end use of these facilities is 'public open space' for recreational activities.

Historical Landfill sites

The City has ten (10) historical sites spread across the City.

These are facilities that are no longer operational (may not have been licensed). These facilities are monitored in line with permit conditions but are not capped in accordance with engineering standards.

Closed Landfill sites

The City has Seven (07) closed facilities spread across the City. These facilities are undergoing rehabilitation and capped in accordance with engineering standards.

Table 24: List of closed landfill sites

CLOSED LANDFILL SITES	Atlantis	Brackenfell	Faure	Gordons Bay	Swartklip	Table view	Kraaifontein
Permit / Waste license no	19/2/5/1/A1/2/ WL0062/12	B33/2/720/211 /S/P203	12/11/4/P2	E13/2/10/1-A3/193-DWLT404/10/10	E13/2/10/1-A6/257-0001/09	12/9/11/P122	E13/12/10/1-A4/269-0008/10
Permit / Licence date issued	10-Mar-14	24-Oct-95	14-Sept-2007	06-Apr-10	06-May-10	02-Jun-09	04-Jul-11
Permit / Licence expiry date	10-Mar-24	No expiry day	No expiry date	01-Jan-30	06-May-30	No expiry date	04-Jul-21
Nature/Status of permit / waste licence : Active / Closed Historic	Closed Landfill	Closed Landfill	Closed Landfill	Closed Landfill	Closed Landfill	Closed Landfill	Closed Landfill
ERF number	CA3-3-, CA1183 & 81-2756	ERF 2981	ERF 1905, Blue Downs, District of Oostenberg	ERF 3512	ERF 113181	ERF 10627, 10628 and 10093 of Milnerton	Portions 43 and 45 of farm no. 725
Land Use	Residential Public open space Agricultural	Utility	Residential Public open Space	Public Open Space	Utility	unknown	Utility
Ownership	Owner1 & 2:PGWC, Owner 3: CCT	CMC: Brackenfell Substructure	Provincial Government Western Cape	City of Cape Town	City of Cape Town	unknown	City of Cape Town

Table 25: list of historic landfill sites

11 HISTORIC SITES	Fish Hoek	Noordhoek	Mamre	Macassar	Ocean View	Radnor	Sarepta	Strand	Simons Town	Witsand
Licence/Permit reference #.	19/2/5/1/A-6/97/WL0039/14.	19/2/5/1/A6/57/WL0041/14	19/2/5/1/A1/2/WL0066/14.	19/2/5/1/A3/39/WL0042/14	19/2/5/1/A6/58/WL0037/14	19/2/5/1/A8/98/WL0036/14	19/2/5/1/A5/43/WL0043/14	19/2/5/1/A3/20/WL0044/14	19/2/5/1/A6/79/WL0038/14	19/2/5/1/A6/70/WL0045/14
Date of Issue	29-Sep-14	10 December 2014.	11-Nov-14	10-Dec-14	11-Nov-14	09-Dec-14	07-Nov-14	29-Aug-14	10 December 2014	11-Nov-14
Date of expiry	29 September 2024.	10 December 2024.	11 November 2024.	10-Dec-24	11 November 2024	7 November 2024	9 February 2025	29 September 2024.	10 December 2024.	11 November 2024.
Location of site	Just north of the Silvergate Sports Fields and adjacent to the CCT Fish Hoek Roads Depot	Noordhoek Main Road entrance, adjacent to Lake Michelle, Noordhoe	Remainder of farm No. 971, Groenekloof, Cape Town	Junction of Kramat Road and Macassar Road to the north of the Eerste River	Oceanview residential area, accessible from Cedarber and Buffalo roads.	Southern part of the Parow Industria Industrial Area, Cape Town	Located in the Sarepta residential area of Kuils River on parts of seven separate erven along the western bank of a canalised section of the Kuils River.	Located at the eastern edge of the Mansfield residential area, Gordon's Bay.	Located on the lower slope of the mountains at the end of Dido Valley above the coastline between Glencairn and Simons Town.	Located in the Southern part of the Farm Sweet Water and accessible from the Lighthouse Road, Witsand Beach

ERF number	Erf 8924	Cape Farm No. 933 and Erf no. 3823	Farm 971 Groenekoof.	ERF 5321.	Erf 2558	Cape Farm 515 Erven 523, 524-RE, 525,526,1990 and 10373,	Ervenno. 12783-RE and 12789-RE	ERF No. 4103 and 3512	ERF No 420	Portion of the Farm Sweet Water No. 978, Witsand Beach
Internal audit frequency	Bi-annually	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
External audit frequency	Yearly	Annually	Annually	Yearly	Annually	Yearly	Annually	Yearly	Yearly	Annually
Land Use	Community	Public open space	Public open space	Public open Space	Public open Space	Various,	Public open space	Public open space	Unknown	agricultural
Ownership	City of Cape Town	City of Cape Town	Gemmenskap V Mamre	City of Cape Town	City of Cape Town	City of Cape Town	City of Cape Town	City of Cape Town	City of Cape Town	City of Cape Town

CHAPTER 11

11. FUTURE SCENARIO

The UWM directorate has developed a view on Cape Town 2040 that it is planning for. This view has been developed through strategic forecasting, scenario planning, or other suitable methodologies.

Purpose:

- To show that alternative futures have been considered:
- To build the capacity of the sector to understand key drivers and the degrees of uncertainty in each
- To understand trends that present risks or opportunities to the sector
- To clarify triggers and how these will impact on programmes, projects or operating models
- To develop a sector plan that is responsive to these trends and triggers, and resilient in the face of different future scenarios
- To make explicit the assumptions and aspirations on which the sector plan is built

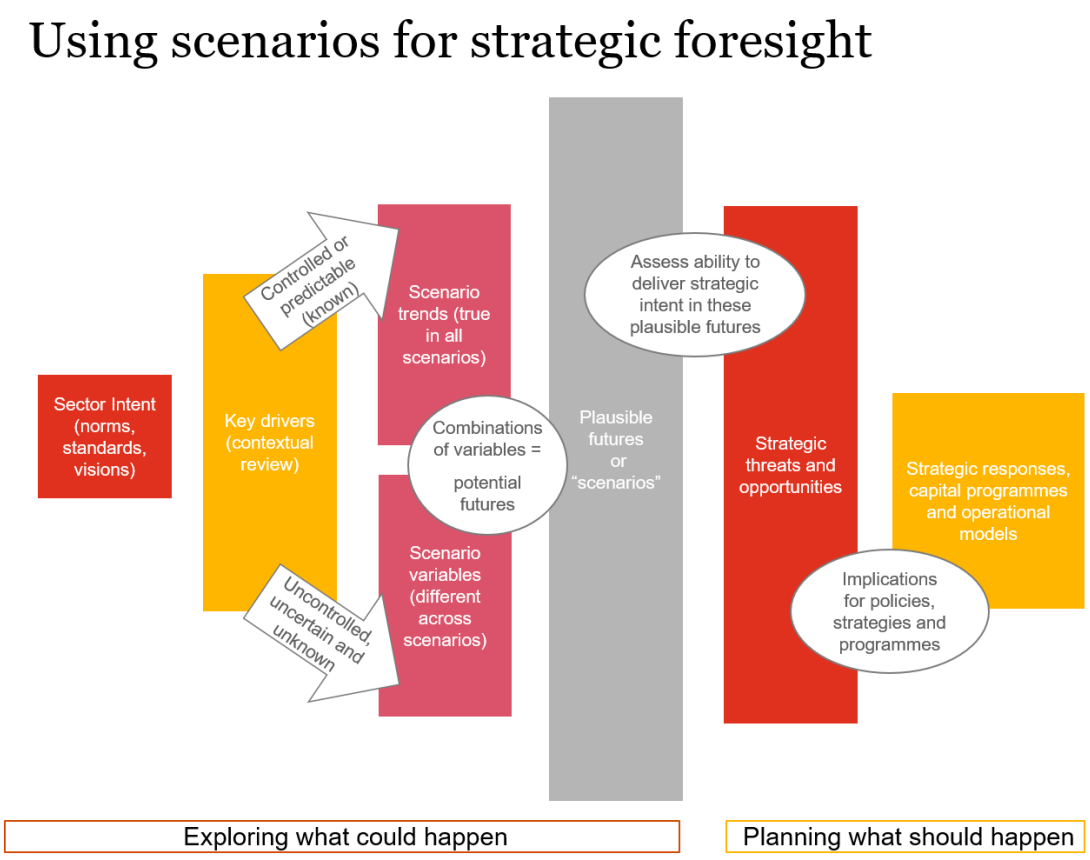


Figure 11: Strategic Foresighting Process

Two possible future visions to frame practical opportunities, risks and boundaries, and to inform recommendations have been developed.

As a point of departure for both future visions, the key strategic intent is for waste to be diverted from landfill. Indeed, the Waste Act (59 of 2008) includes in its preamble:

- "sustainable development requires that the generation of waste is avoided, or where it cannot be avoided, that it is reduced, re-used, recycled or recovered and only as a last resort treated and safely disposed of; and
- The minimisation of pollution and the use of natural resources through vigorous control, cleaner technologies, cleaner production and consumption practices, and waste minimisation are key to ensuring that the environment is protected from the impact of waste".

There are also several drivers specific to the CCT context, not least, that landfill airspace is a scarce resource and costs to develop future airspace will increase. Furthermore, new landfills will be developed further from generation points, inevitably leading to increased system logistics costs as compared to the current system. There are also environmental, climate change and resource management drivers for diversion from landfill, the mitigation of which are being mandated by legislation. While the two proposed potential future visions are similar in objective and will have comparable diversion targets, the mechanism by which waste is diverted differs in each.

'**Future Vision 1**' considers a future where most Urban Waste is diverted as close to the source of its generation as possible and makes use of both decentralised and centralised facilities (including drop-offs) to maximise diverted organic and packaging waste.

'**Future Vision 2**' contemplates a future where packaging waste is separated at source, collected and sorted at large MRFs. Small scale diversion occurs at selected drop-offs. In this vision, organic waste is extracted from the mixed waste stream at IWMF's (i.e. centralised facilities) after collection and is separated through a mechanical-biological type process. Large-scale treatment plants convert organics to energy. Residual waste from the MBT process is packaged as refuse derived fuel.

The characteristics of each of these visions is briefly described below.

- **Future vision 1 Intervening at source (upstream of Collections)**

Existing and planned large scale centralised MRFs will be the primary means of extracting packaging waste from the system, but wide scale diversion will also be supported by decentralised mini-MRFs located at drop-offs. These will support small business development by providing opportunities for SMME is to provide local separate collection of recyclables. The larger MRF operators (established firms) would provide business support and bring the benefits of economies of scale to small operators (for example when procuring vehicles, spares, tyres etc.) and in turn the

larger MRF operators would secure recycled material in a form of quasi value chain finance.

Organic waste could follow a similar model to that of packaging waste, with small operators based at drop-offs separately collecting organic waste within defined catchments. The clean organics could be treated at the drop-offs in small, decentralised in-vessel composters (or similar) or sold as clean organic feedstock to private off-takers. Large-scale clean organic waste treatment facilities (supported by separate collection services) could be located at IWMF's, though it is anticipated that there will be strong market demand for clean organics that may obviate the need for CCT developed facilities.

In this future, the City's collection system changes materially as there is a significantly reduced mass of waste that will be collected because of source separated organics and packaging wastes. The CCT Collections Branch remains the driver of diversion in the system, playing a central role in driving and managing this system, but is less involved in the actual collection and beneficiation activities for the diverted waste streams. **Figure 19** is a proposed diagrammatic illustration of future vision 1.

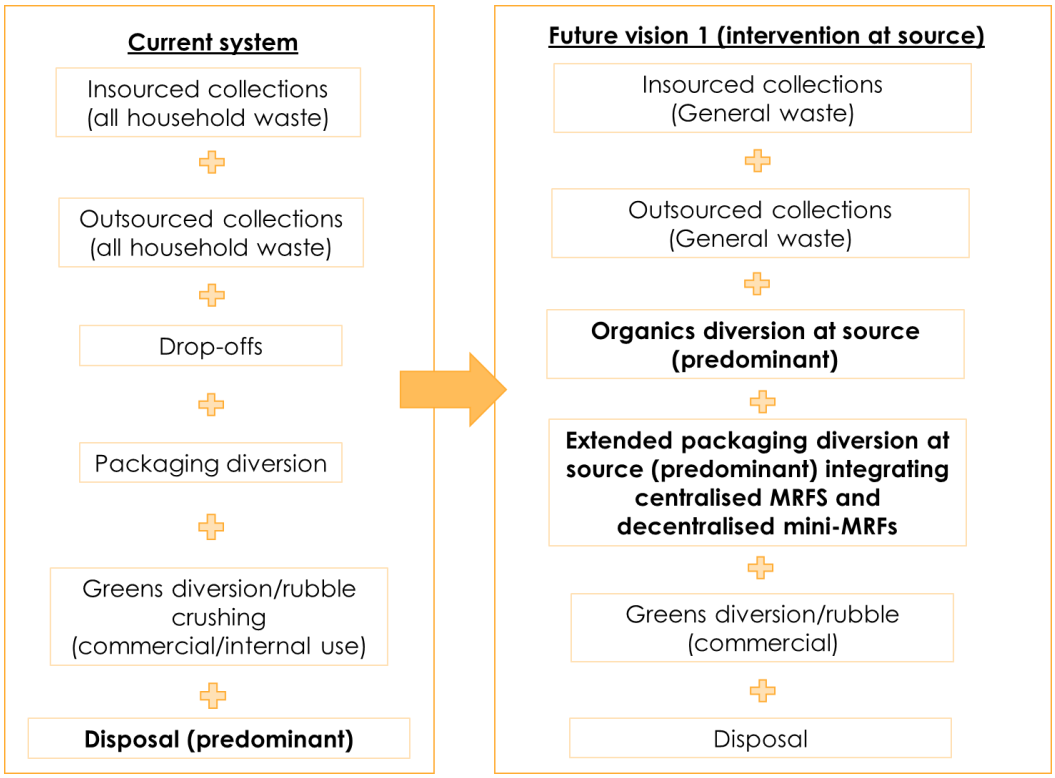


Figure 12: Future vision 1 - Intervention at source and integrated centralised and decentralised diversion

- **Scenario 2 Intervening at end-of-pipe (downstream of Collections)**

This vision is characterised by an increased rollout of separate collection of packaging waste, principally linked to large scale MRFs located at IWMFs. Small scale recycling

will be supported at drop-offs (mini-MRFs) but will not necessarily form part of the centralised diversion infrastructure.

The current Collections system (insourced and outsourced) will continue to collect the wet waste fraction (i.e. that remaining after packaging has been separated at source) and will deliver it to large-scale centralised treatment infrastructure typically located at IWMFs. The organic fraction will therefore be extracted after collection. The organics so extracted will be of less value and would likely require significant capital investment by the City in ensuring there is use for the final product.

In this future the City's collection, system only nominally changes (due to the reduced mass of waste that will be collected because of increased packaging diversion. The CCT plays a central role in diversion and beneficiation of organics.

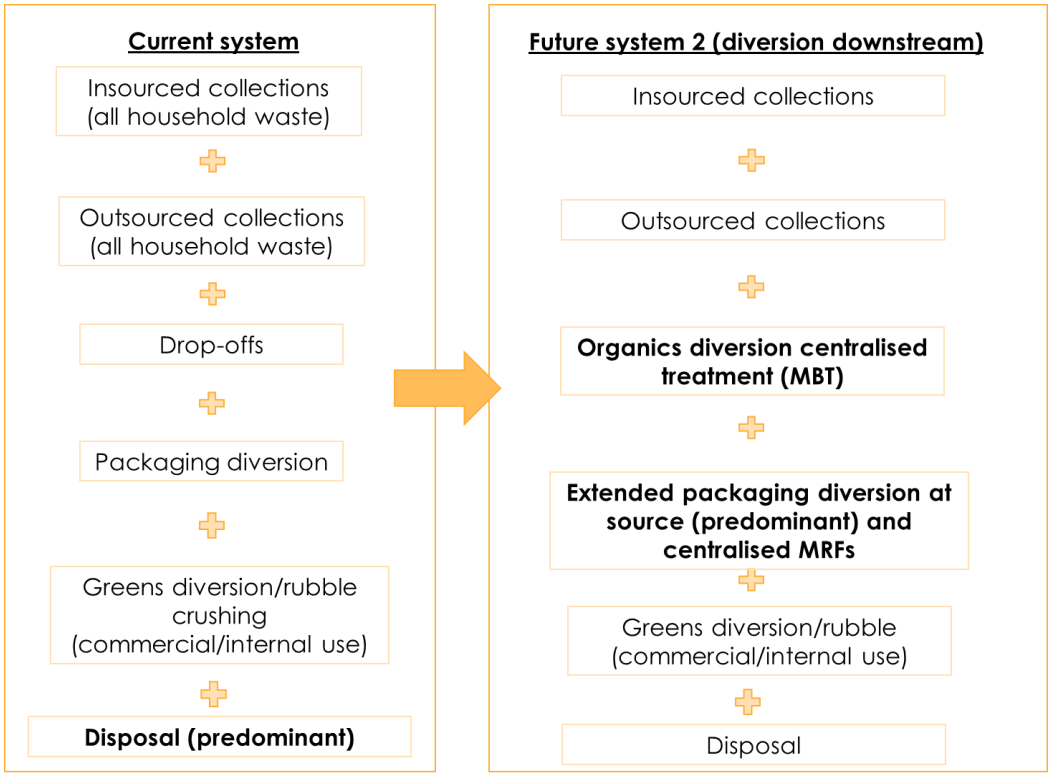


Figure 13: Future vision 2 – Centralised diversion infrastructure and downstream diversion of organic waste

Indicative costs for alternative waste treatment options

The following indicative costs for alternative waste treatment option graphic provides a useful comparison and range of capital and operational costs of alternative waste treatment options compared to a "do nothing" scenario and is part of the Urban Waste foresight.

Figure 14: Indicative costs for alternative costs for various waste treatment technologies

Cleansing Strategic Foresight

Cleansing aim is to address the deterioration of cleanliness in the City and a number of scenarios to respond to the issues that affect our services and the branch response is to focus on the current as well as the desired state.

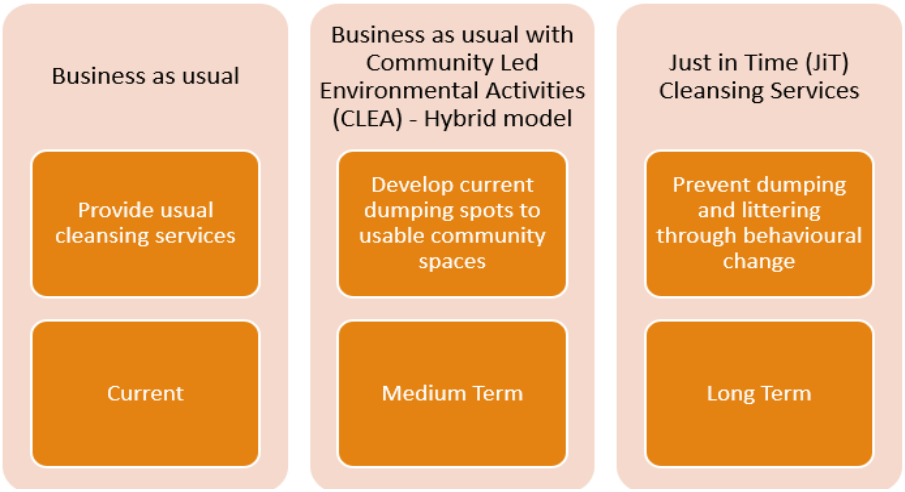


Figure 15: Cleansing Future State

The desired strategic position of Urban Waste Management Cleansing is ultimate provision of world class cleansing services for our clients, partners and stakeholders through the following mechanism. This is underpinned on the bedrock of human capital of excellence at all levels.

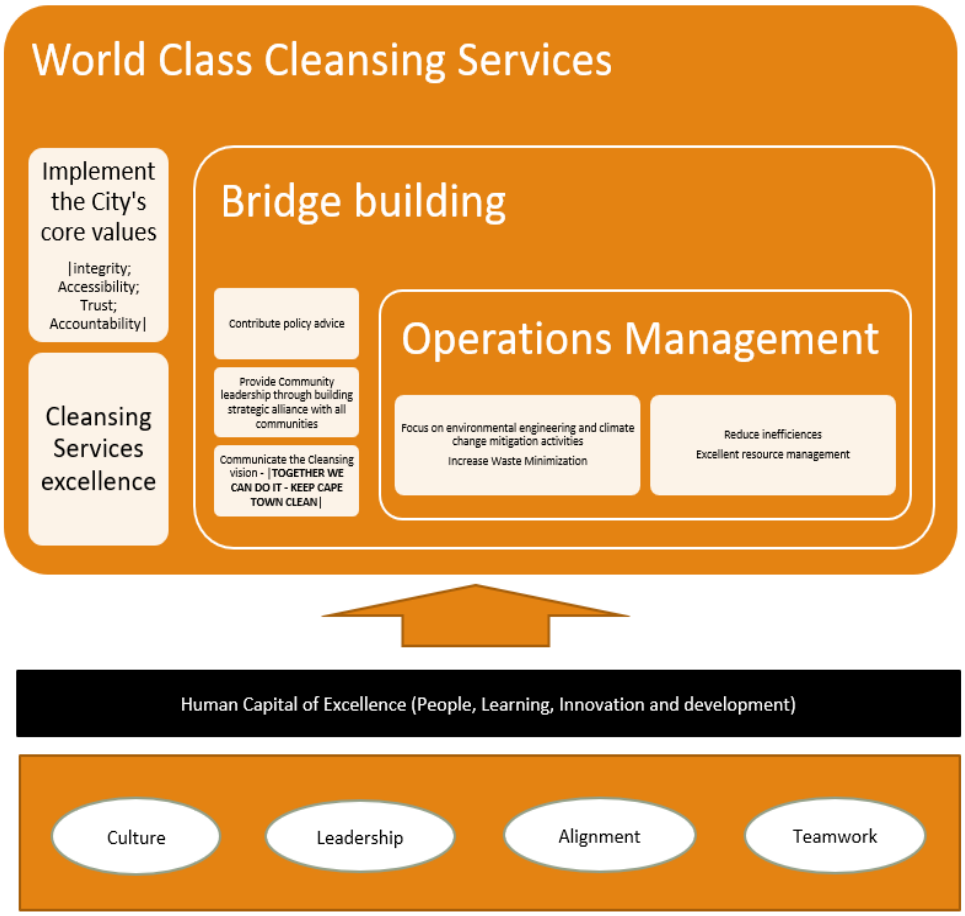


Figure 16: Cleansing Operation Excellence

Disposal Strategic Foresight

Disposal's key objective is to ensure sustainability. This is achieved by:

- Ensuring sustainable waste disposal practice and prioritisation of best practice for landfilling.
- Developing and sustaining integrated approach to provide the required waste disposal services and beneficiation of targeted waste streams.
- Prioritising airspace savings and improving utilisation of available airspace through operational improvements.
- Developing improved capacity and ensuring continuity of services through the establishment of infrastructure for additional or improvement of existing facilities.
- Integrating waste management approach to be further rolled out to facilities where an urgent need exits – organic waste diversion focus.

- Supporting the inclusion of community recycling where diversion of waste can be targeted.
- Possible partnership to be explored (for e.g. with Sishen trains utilising the return trip).

To do this an integrated approach assessing the current states and interventions required in getting to the future perspective and opportunities were identified in and is illustrated in the diagram below.

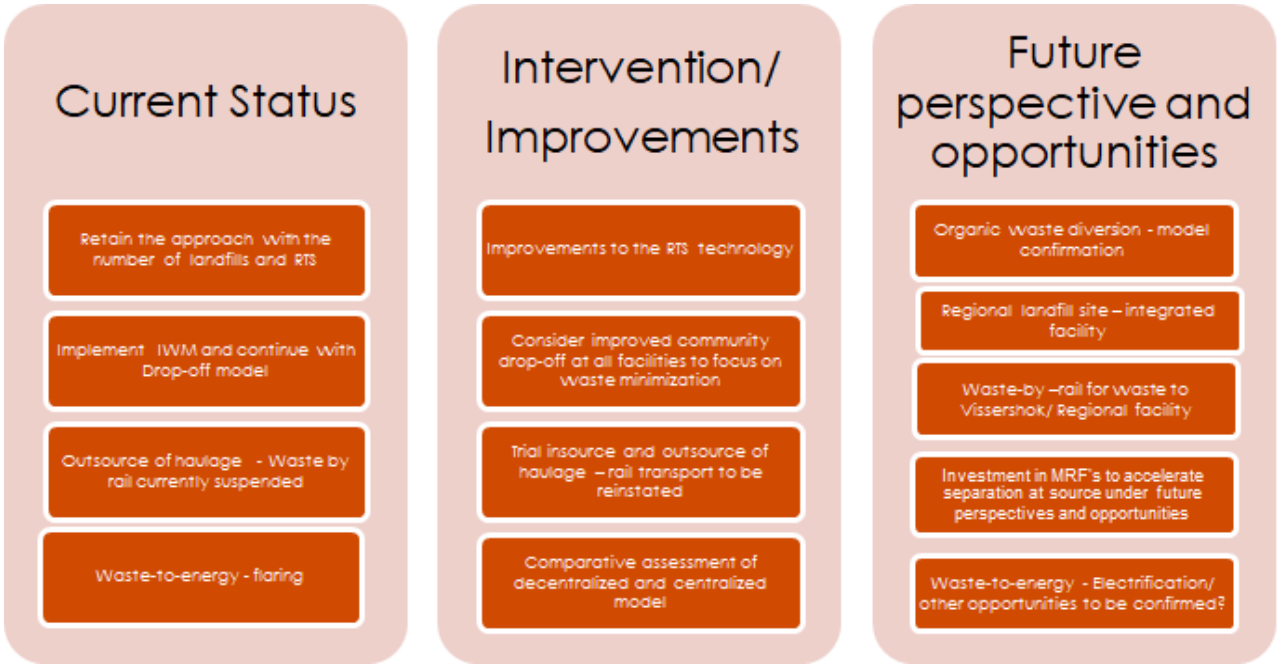


Figure 17 : Disposal Future state

Urban Waste Operations

Due to topographical factors, most waste generated in the City must be "double handed" as it is not taken from source to disposal, but discharges via drop off sites (Micro transfer stations) and refuse transfer stations.

The generations and collection of waste and its final discharge via the transfer stations and drop-off stations gives rise to additional costs, but is a necessity to optimise management operations. Various operational scenarios have been developed to

support this. The interaction is represented in the schematic diagram below.

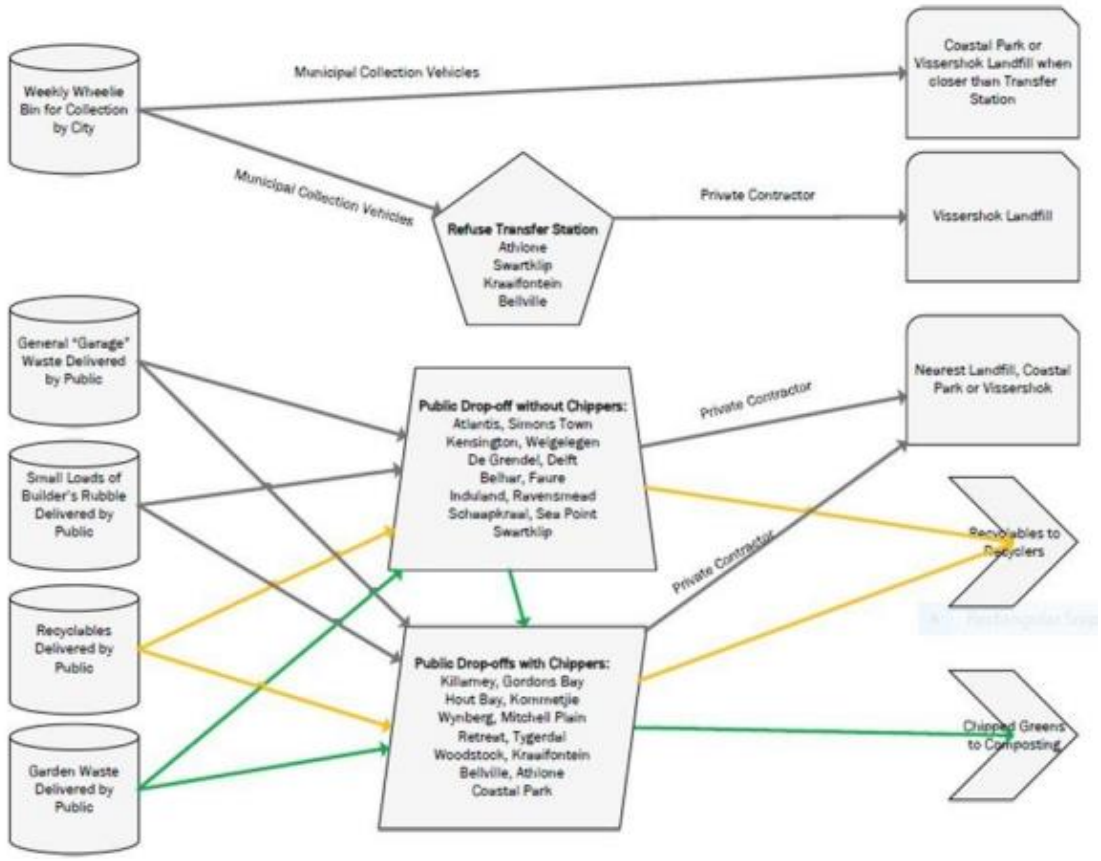


Figure 18 : Urban Waste Operations Schematic

The above diagram is an illustration of the current business as usual scenario that consists of:

- A facility where waste is temporarily stored and ideally sorted before it is transported more economically to other recycling centres or landfills.
- Residential waste minimisations and logistics optimisation initiatives such as the introduction of the Drop-offs has had and will continue to impact on waste minimisation and diversion of green waste and recyclable material away from the two landfills at Coastal Park and Vissershok.
- Green Waste is being chipped at by the Public Drop-offs. These sites are equipped with Chippers, or alternatively where Chippers are not available, transported to the nearest site equipped with an operating chipper. Private Contractors are chipping the green waste at a cost per cubic metre and transporting the chipped green waste material from all the sites to composting facilities at no additional cost to the City for transportation, however, there is a cost to the city associated with chipping is inclusive of transport cost.
- Operators who extracts economic value from this material collect recyclable materials being dropped at the drop-off facilities. This collection happens at no cost to the City.
- Builder's rubble is chipped and used where possible by the roads department otherwise, it is transported to the nearest landfill being Vissershok or Coastal Park.
- General waste eventually is transported to the landfill sites of Vissershok or Coastal Park.

Airspace Strategic Foresight

A number of interventions to extend the remaining life of the airspace stocks in the City have been explored. The range of interventions available have been characterised into three groups:

- **Operational** – these interventions can be implemented by the Disposal branch and are aimed at improving landfill practices such that airspace is used more efficiently. They are distinct from those operational interventions that improve business efficiency. The key objectives of the interventions are to improve operational planning, processing, and compaction of waste such that the full available airspace is utilised, which together with a waste body of optimal density will maximise landfill life. These interventions are described in **Table 25.**

- **Strategic** – these interventions have the potential for greatest impact on airspace longevity. Some of these interventions including upstream waste diversion are not within the mandate of the Disposal Branch and may require wide scale system upstream changes (Directorate level) to realise the airspace benefits. They have the potential to significantly increase the airspace stocks in the CCT or will have a material effect on the rate at which airspace is consumed. They are referred to as strategic as they need both longer planning and implementation timeframes and will have medium to long-term impact. These interventions also require detailed supporting studies to inform their feasibility and cost of implementation e.g. wide scale diversion and Landfill mining. (Refer to **Table 26**).

- **Advanced** – these are interventions that are typically capital intensive and would require a fundamental change in how landfills are managed from waste acceptance, handling through to disposal. They are perceived as high cost and operationally complex and they are not common in the South African context.. The costs of such interventions should be weighed up against the savings in other parts of the waste management system. In a future where the waste character received at landfill is likely to change, particularly where organic fractions are banned, future landfill operations may be better suited to these types of interventions e.g. Pre-processing and pre-compaction of waste (Refer to **Table 27**).

The interventions are discussed in the following sections and are presented in an interventions impact matrix.

Operational interventions to improve airspace usage are distinct from those operational interventions that improve business efficiency. In the context of this report, the key objectives of the interventions are to improve operational planning, processing, and compaction of waste such that the full available airspace is utilised, which together with a waste body of optimal density will maximise landfill life.

Table 26: Identified operational interventions and potential impact on airspace consumption

1. Maximising landfill settlement			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Landfills settle over time due to biodegradation (conversion of organic matter to landfill gas and leachate) & consolidation (due to an increasing vertical mass of waste). ● By actively planning site operations temporally, the landfill operator can strategically fill parts of the site that are then allowed to lay fallow until settlement has taken place. Waste is then only placed in these areas once a planned 'settlement' window has been reached. ● If this actively planned filling is not possible, an alternative would be to fill the site beyond the licensed height in anticipation of future settlement. ● Stockpile management could also play a part in accelerating	This is a **passive intervention** insofar as there is no material monetary investment or daily operational changes required.	● A detailed filling plan would need to be produced, which may need to be procured externally. ● Additional surveys required to actively monitor effectiveness of filling plan ● Buy-in to the plan by operational staff will be necessary to ensure full benefits achieved. ● Regulatory approval may be required to temporarily exceed maximum permitted height. ● When filling above the licensed height the operator will have to rely on assumed settlement rate. These rates vary for different landfills and therefore the final height achieved is unlikely to be optimal. Actively planning and measuring consolidation would lead to more optimal outcomes. ● Stockpile 'micro-management'	● Costs to implement are low – requires a master filling plan that would need updating annually (may need to be outsourced, though combined with interpretation of airspace consumed, which is being done already). ● Active management of the filling plan by site staff and supported by senior staff. ● Impact on RUL expected to be relatively small but given the low cost to implement is likely to pass a cost benefit test.

consolidation.		may be an additional operational burden.	
2. Maximise available airspace and reduce cost of closure – slope management			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Often landfill slopes are graded by eye by machine operators. While this is generally adequate for intermediate slopes, final slopes must not exceed maximum grades as set out in the end-use plan. They should also not be flatter than that set out in the end-use plan as the full available will not be utilised.	**Passive intervention** that will ensure full use of all available airspace. Will also minimise the extent of earthworks required upon closure when slopes closely match the end-use plan.	● A final, optimised end-use plan that extracts maximum airspace within the allowed ● Regulatory constraints will need to be developed. This should comprise final levels, final slope grades and toe coordinates. ● Will require active management of plant operators to ensure slope grades as set out on site are adhered to ● Would require regular installation of batter boards by surveyor ● Requires more regular surveys to assess slope grades. Corrective action can be taken earlier if slopes grades are not optimal.	● The cost to develop the plan would be low given that it already exists. May require optimisation by evaluating various terrain models in conjunction with slope stability assessments ● Monitoring of final side slope grades for compliance with the plan is also a low-cost intervention, and indeed, it is understood that the CCT does ad hoc monitoring of slope grades. ● The net impact on RUL is likely to be low, but relative to the cost of implementation will probably pass a cost-benefit test. Indeed, the opportunity cost of not actively monitoring adherence to end-use plans and final slope grades may be very high at time

			of closure due to extensive remedial works to shape the site to acceptable grades.
3. Maximise available airspace and reduce cost of closure – slope management using alternative daily cover (ADC)/temporary cover			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Alternative daily covers (ADC) used in lieu of the Standard 150mm soil cover. They are typically placed over the working face at the end of the day and removed before disposal operations continue the next day Typically, a geotextile is laid over the waste and ballasted down. The following day, operational staff roll-back the geotextile from the area that will then receive that days-worth of waste and then re-use that geotextile (recovered at the end of day).	● **Active intervention** ● ADC saves valuable airspace. The Minimum Requirements advises adding 25% to annual airspace consumption estimates when estimating RUL to account for cover usage ● Some ADC's are reusable and are therefore a cost-effective alternative to soil (especially if cover has to be purchased) ● Could potentially reduce perched leachate when reusable ADC replaces soil cover with low permeability (such as clay) ● May reduce odours emanating from the working face (if ADC is impermeable)	● Requires a change in operations – removing the ADC before filling starts in the morning and placing it back on the site following cessation of filling ● Daily operations would need to be carefully sequenced and the working face kept as small as possible ● Waste in fallow areas would still need to be covered (i.e. plant will still be needed for this) ● Disposable, impermeable ADC that are left in place each day could create perched leachate layers.	● The investment cost would depend on the type of ADC and the requirements for placing and removing it daily. The real cost is likely to be borne by the additional operational burden ● Given the potential airspace, saving of 25% the impact is theoretically significant. While this full benefit will not be realised since fallow areas of the landfill would still need covered, there is a case for trialling ADC to evaluate the costs and benefits.

	as compared soil.		
4. Proactive cover management			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Ensuring that the minimum amount of cover is used while remaining compliant with WML conditions. This would entail proactive monitoring of the amount of cover used daily and then adjusting operations to reduce usage by as much as possible.	● **Passive intervention** ● Reduces airspace consumed by inert material ● Optimises cover material usage (especially where this is in short supply and/or needs to be imported).	● Additional monitoring required (measuring / tallying loads/day) ● May require operational intervention to optimise the working face dimensions to minimise cover area (for example deeper lifts) ● Training/experimenting with optimal placement of cover material delivered to the working face prior to spreading to ensure even spread of material across working face.	● There is little direct investment cost involved in this intervention. A formal short-term pilot could be run to ascertain the optimal loads of cover needed each day as well as the optimal placement of the cover prior to spreading. ● The impact would depend on the current cover material usage practices. By running the pilot, the data on usage will be known and the opportunity for improvement. ● The very low investment costs as compared to potential impact would certainly pass a cost benefit assessment.

5. Optimal use of plant to maximise compaction (and reduce operational costs)			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Purposefully organising the working face operations to optimise compaction effort by using each unit of plant for its intended purpose ● Dumped waste (from rucks) should be spread in thin layers to ensure full compaction depth. ● Landfill compactors are purpose-built machines that should ideally compact waste on relatively flat surfaces/benches and working faces not exceeding 1:4. They are also not meant for dozing waste. The compactor blade is meant to spread waste before the wheels shred and compact the loose waste into a denser matrix	● Passive intervention ● Professionalising the working face operations ● More effective compaction ● Using machines for their intended purpose lowers operating costs (fuel and maintenance particularly) ● Using compactors for compacting only (as opposed to dozing waste) will ensure it spends more time doing what it was designed for ● An ordered working face improves on site health and safety conditions.	● Planning & demonstrating the 'organised working face' concept for operational staff will be required ● Training on proper use of machines ● Acceptance of change by experienced landfill operators – changing the mindset from 'this is how we've always done it' ● Will require active monitoring of working face operations to ensure the strategy.	● Improvements in compaction may be in the order of 10% depending on existing compaction effectiveness ● RUL impact relatively small but there may be significant ancillary benefits (operational cost savings, ordered, safer working environment) ● Essentially a good practice intervention with very low investment costs (training) and will pass a cost-benefit test.

● Minimum 4 passes of landfill compactor over same area of waste and following a logical pattern to ensure full coverage of the working face ● Bulldozers are not effective at compacting waste (the tracks being designed to spread load and maximise traction) and should be used to complement the landfill compactor by pushing and spreading waste stockpiles across and/or down the working face while the compactor runs parallel to the slope.			

Strategic interventions refer to those actions that have the potential to significantly increase the airspace stocks in the CCT or will have a material effect on the rate at which airspace is consumed. They are referred to as strategic as they need both longer planning and implementation timeframes and will have medium to long-term impact. These interventions also require detailed supporting studies to inform their feasibility and cost of implementation. Strategic system interventions (upstream waste diversion for example) will likely be driven at a Departmental level (as opposed to branch level) as there are significant implications across the entire waste management chain if implemented.

Table 27 : Identified strategic interventions and potential impact on airspace stocks

1. Increasing the licensed height of existing landfills			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Vertical extension of the landfill by amending the licensed height. Where no basal liner exists a "piggyback approach", where a new liner system is installed over existing waste, may be considered.	● **Passive intervention** ● Develops a large additional volume of airspace in short time span ● Effectively reduces the unit costs of landfill cell infrastructure (basal lining system) ● Low historic cost and land already 'contaminated' ● Avoids additional economic and environmental costs of a new landfill. ● Most significantly it avoids the added logistics costs as it is likely that new landfills will be located further away from the City	● Inexpensive intervention but trade-offs include visual impacts and public acceptance ● Function of other steps such as applying for a waste license amendment, informed by engineering studies including a visual impact assessment and stability analysis ● May discourage implementation of waste diversion projects especially in the absence of other regulatory drivers for diversion of waste ● May not be technically feasible (stability) ● May not be practically feasible (topographic limitations)	● Relatively low investment cost (environmental impact studies and engineering assessments) for high impact in terms of extending airspace especially when considering the avoided costs of developing new infrastructure (be it landfill or alternative treatment facilities) ● Investment cost would increase where piggyback liners are required, but would still be more cost-effective than a new site

2. Wide scale diversion of waste from landfill			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Diversion of waste from landfill to treatment or beneficiation infrastructure (public and private). This reduces the amount of waste to landfill. Diversion could be achieved through extensive separation at source and beneficiation of clean materials. Another approach is downstream interception of waste fractions from mixed waste, which may be mechanically separated into components and beneficiated and/or used to generate products of treatment (biogas for example). Other options include thermal treatment with/without energy recovery. The residual waste from these treatment processes that would need to be landfilled is a small fraction of the initial volume. The main fractions targeted for diversion should be related to	● **Active and full system intervention** ● Wide scale diversion of waste will have a significant positive impact on landfill RUL ● Diversion of organics would reduce environmental nuisance and risk (gas and leachate emissions would be diminished) ● Promotes a circular approach to materials management ● Stimulates uptake markets and hence contributes to GDP ● Diversion often requires labour intensive activities (separate collection, sorting and separating recyclables) and so creates employment opportunities, especially for SMMEs ● Possible to better integrate communities into the waste	● Active intervention and whole system change ● The NWMS (2020) sets targets for diversion of waste from landfill with a mainly packaging focus. The DEA&DP have amended the CCT's WMLs, which now include clauses that direct the City to eliminate organic wastes from entering landfill by 2027. ● GNR 636 requires 25% diversion (from a 2013 baseline at a particular landfill) of garden waste from landfill within 5 years (by 2018) and 50% diversion by 2023. ● Implementing diversion programmes is not within the mandate of the Disposal Branch and must be done at a system level	● Effective implementation of diversion will extend the RUL of landfills. ● Organic waste diversion is likely to have a strong impact initially on airspace consumption but a relatively small impact in the long term (as organic waste degrades in the landfill) as the landfill settles due to biological processes ● Recyclable waste diversion will have high impact given its relatively low density ● The investment for diversion and stimulation of offtake markets is likely to be high and would require a significant change to the current system. A waste diversion strategy that considers separation at source vs. downstream extraction of materials and centralised vs decentralised treatment solutions will need

market demand and are typically organic waste (food and garden green waste) and packaging waste ('recyclable waste'). Waste avoidance, minimisation and recycling are at the top of the waste hierarchy and underpin waste policy, legislation and regulation in South Africa.	management system than a linear 'collect-transport-dispose' system	● Scale of diversion is contingent on effectiveness of separation at source and the value chain of specialized waste processing activities ● Requires broad household and business participation supported by continuous awareness and behaviour change campaigns ● Formalised diversion programmes may negatively impact informal waste diversion activities ● Large-scale diversion will impact revenues from disposal while operational costs may not reduce at the same pace initially. Full cost accounting will need to be done at a system level rather than cost centre level	to be developed to inform a cost-benefit assessment. This study would need to take into account whole of system costs and benefits

3. Landfill mining			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
The process of extraction and restoration of landfill sites during which buried solid waste is excavated and treated for resource recovery (Interwaste, 2019)	● Alleviate space and local pollution concerns, thereby potentially extending the life of the landfill due to volume reductions ● Recovery of various resources: soil reclamation, potential waste-to-energy production and supply of new source material for declining supplies (particularly metals frequently found in electronic products) (MIT, 2016).	● Cost is directly related to size of the landfill as soil excavation, screening, testing and deposition account for 80% of the total cost of landfill mining (MIT, 2016). ● Presence of hazardous waste is an additional cost factor, requiring toxicity characteristic leaching procedures (TCLP) to ensure safe reclamation. ● Regulations would need to be in place to for landfill reclamation (e.g. permits) ● Current limited uptake of rare earth reclamation is a challenge ● Incentives (such as renewable energy credit / support) to promote energy production ● Storage of reclaimed materials can	● Positive impact on airspace stocks may be high but so too will be the costs. Unless there is a specific market demand for recovered materials (e.g. incinerators or cement kilns for combustible fractions) then this intervention is unlikely to pass a cost-benefit test. Material outputs and their anticipated marketability constitute a key issue of any landfill mining scenario (Krook, et al., 2019) ● Gas extraction infrastructure would be lost if landfill mining was pursued (already large investments by CCT) ● The foresight to consider landfill mining in the future when landfilling today may reap dividends. There may be an opportunity to landfill in a manner that allows simple recovery of

		affect usefulness (MIT, 2016)	materials once markets are established at a later date – i.e. to use landfills as a store of value for low cost mining in the future. ● Note: UNLIKELY TO BE FEASIBLE FOR THE FORESEEABLE FUTURE and currently will only be explored as a last resort as not deemed cost effective

Advanced interventions are those that are typically capital intensive and would require a fundamental change in how landfills are managed from waste acceptance, handling through to disposal. These interventions are not common in waste management, as they are perceived as high cost and operationally complex. In a future where the waste character received at landfill is likely to change, particularly where organic fractions are banned, future landfill operations may be better suited to these types.

Table 28: Identified advanced interventions and potential impact on airspace consumption

1. Pre-processing of waste on site			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Pre-processing of waste refers to the process of shredding or pulverising waste into smaller fractions such that is it more conducive to compaction.	● Shredded and compacted waste theoretically creates a more homogenised waste mix that is easier to handle and compact at landfill.	● Waste should be screened (to removed large fractions unsuitable for shredding) ● Ideally most of the organic fraction should be extracted ● Space for offloading, screening, shredding, stockpiling	● Modern landfill compactors are designed to pulverise and shred mixed wastes while compacting rendering pre-pulverisation somewhat unneeded ● Shredding of waste will add costs to landfill operations as waste would be double handled. ● The capital investment required for pre-processing equipment will likely not provide the

			airspace benefit relative to cost of implementation / operation ● unlikely to be a cost-effective intervention
2. Pre-compacting of residual waste			
DESCRIPTION	**CLASSIFICATION**	**REQUIREMENTS FOR IMPLEMENTATION**	**IMPORTANT CONSIDERATIONS**
Similar to above, in that waste is pre-processed, but with the processed waste then also being compacted (typically into bales), tied and possibly wrapped for transport and placement in a bale fill. Pre-compacting for landfill refers specifically to the compression of waste into a block (bale) that is secured by plastic or wire strapping (PWM Waste Systems, 2018). Compression by bailing into blocks can happen post-weighbridge at transfer station or post-weighbridge at landfill.	● By pre-compacting and securing the waste in a bale, the density is retained when placed in the final storage location or landfill. This in contrast to waste from RTSs, which is pre-compacted into bins to maximise payloads. ● Once the compacted waste is ejected at the landfill, the waste increases in density again. ● Bales may be easier to store and more efficiently handled for transport. Bales do not require specialised waste handling equipment for manoeuvring or placement. ● Bales can be transported via existing modes (flatbed trailers for example)	● Upstream diversion of organics and high value packaging waste. ● Residual waste material to be screened of residual organics and waste shredded ● Space for offloading, screening, shredding, baling and storage of bales ● Bale handling equipment	● A baled system is best suited to a dry residual waste stream where organics have been removed. ● Baled residual waste could represent a store of value for future landfill mining. ● Wet waste bales do not retain their structural integrity and may collapse during transport and placement. ● Moving to a baling system requires an overhaul of the current waste handling equipment and infrastructure (e.g. supply and installation of bailing machines). This will change the way landfills are operated and will require significant reinvestment in waste management equipment at transfer facilities and landfills. ● Bailing may be difficult to use on existing landfills if there is a requirement for dedicated cells (DFFE, 2015). ● Leachate generation quantities at landfill are unknown and impact on gas generation likely to be negative (DFFE, 2015) ● Operating costs may be high (DFFE, 2015),

			especially considering new capital investments that would be required to change to this system ● Pre-compaction of unprocessed waste does not change the characteristics of the waste and it will have the same impact on the environment as un-compacted waste (CIWM, 2020) ● Note: This is not a preferred option as significant challenges were experienced in the past due to operational complexity and specialised equipment requirements and the operations at ARTS was abandoned.

CHAPTER 12

12. PROJECT PIPELINE

The management of pipeline of projects to ensure successful delivery of services is critical. To this end, the following measures are in place within UWM:

- A business plan indicative of programmes to be rolled out in furtherance of the overarching strategy.
- A PMO section has been established to deal with project and contract management, which interfaces with project managers within the respective Branches of UWM.
- A demand plan agreed to with Supply Chain Management showing timelines to ensure contracts are in place as and when required.
- Technical experts that participate in the development of specifications and the evaluation of bids, though the number may not be commensurate with the need.
- Monthly engagements with the Chief Financial Officer to monitor performance against the demand plan and identifying areas requiring focused attention.
- Comprehensive repository of all procurement contracts, including financial performance on contracts, which helps in identifying recurring or repeatable tenders that are up for renewal.

12.1 Major/bulk infrastructure projects

The major capital infrastructure identified programmes have been split into the operational units.

Disposal

- Regional facility – licensing, land alienation and development – land acquisition
- Transfer Station development (2 sites - Helderberg and Coastal Park)
- Development of Material Recovery Facilities
- Complete LFG Infrastructure to flaring/energy
- Development of Organic waste mechanical separation plants
- Develop Drop-off facilities
- Transfer Station development;
    - Coastal Park RTS
    - Helderberg RTS
- Airspace development;
    - Vissershok
- Regional Landfill (procurement of land, licensing, land alienation and development).

Cleansing, Collections and drop offs

Development and upgrading of drop-offs and depots to improve waste diversion and enhance services delivery

CAPEX projects in excess of R10m are depicted in **Tables 28- 30** below. The tables further categorises these capital projects in accordance with the following criteria;

- New projects/replacement
- Refurbishment; and
- Improvement/expansion.

Table 29: New projects

item	Item Description	Type	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Colm1
CPX.0007923	Coastal Park:LFG Infrastructure to Flaring	DGR	Gate Missed	Execution	87 233 035	88 907 606	24 480 373	45 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	-	FY24
CPX.0007916	Vissershok:LFG Infrastructure to Flaring	DGR	Gate Missed	Execution	104 443 660	104 443 660	1 555 120	49 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	5 000 000	4 000 000	5 000 000	FY24
CPX.0023131	Drop-off Facilities: New Bellville	DGR	Gate On Track	Scoping	-	-	-	49 591 297	-	-	-	-	-	-	-	42 871 777	5 279 622	1 439 898	FY31
CPX.0023132	Drop-off Facilities: New MitchellsPlain2	DGR	Gate On Track	Scoping	-	-	-	49 591 297	-	-	-	-	-	-	-	42 871 777	5 279 622	1 439 898	FY31
CPX.0023133	Drop-off Facilities: New 11	DGR	Gate On Track	Scoping	-	-	-	52 755 354	-	-	-	-	-	-	-	-	47 158 954	5 596 400	FY32
CPX.0023134	Drop-off Facilities: New 12	DGR	Gate On Track	Scoping	-	-	-	52 755 354	-	-	-	-	-	-	-	-	47 158 954	5 596 400	FY32
CPX.0007908	Helderberg:Design and develop (drop-off)	DGR	Gate Missed	Detailed Design	74 744 799	74 750 989	4 600 000	67 457 455	-	-	-	6 230 973	53 127 491	8 098 991	-	-	-	-	FY27
CPX.0011087	VHS: LFG Infrastructure - Beneficiation	DGR	Date Missed	Detailed Design	73 832 875	73 832 876	-	71 928 087	155 114	-	-	899 100	47 868 599	23 005 274	-	-	-	-	FY24
CPX.0014654	VHS: LFG Infr - Beneficiation (Phase 2)	DGR	Gate On Track	Scoping	76 000 000	76 000 000	-	76 000 000	-	-	-	2 000 000	2 000 000	30 000 000	42 000 000	-	-	-	FY27
CPX.0033111	Waste Minimisation FY28	N/A	Not Applicable	Scoping	56 000 000	56 000 000	-	84 500 000	-	-	-	-	84 500 000	-	-	-	-	-	FY28
CPX.0014676	Drop-off Facilities: New Bothasig	DGR	Gate On Track	Scoping	98 638 502	98 638 502	-	98 638 502	-	-	-	24 200 000	3 721 925	1 015 071	47 144 273	22 218 877	338 356	-	FY27
CPX.0014677	Drop-off Facilities: New Durbanville	DGR	Gate On Track	Scoping	98 638 502	98 638 502	-	98 638 502	-	-	-	24 200 000	3 721 925	1 015 071	47 144 273	22 218 877	338 356	-	FY27
CPX.0003136	Purchase of Land Regional Landfill	N/A	Not Applicable	Feasibility	100 000 000	100 000 000	-	100 000 000	-	-	-	100 000 000	-	-	-	-	-	-	FY27
CPX.0014679	Drop-off Facilities: New Khayelitsha	DGR	Gate On Track	Scoping	105 524 813	105 524 813	-	105 524 813	-	-	-	26 620 000	3 945 241	1 075 975	35 184 375	38 340 564	358 658	-	FY27

CPX.0014678	Drop-off Facilities: New Macassar	DGR	Gate On Track	Scoping	105 524 813	105 524 813	-	105 524 813	-	-	-	-	26 620 000	3 945 241	1 075 975	35 184 375	38 340 564	358 658	FY28
CPX.0023130	Drop-off Facilities: New MitchellsPlain1	DGR	Gate On Track	Scoping	-	118 891 991	-	108 403 183	-	-	-	-	-	-	38 974 342	4 980 776	1 358 394	63 089 671	FY30
CPX.0023129	Drop-off Facilities: New Simonstown/Sth	DGR	Gate On Track	Scoping	-	118 891 991	-	108 403 183	-	-	-	-	-	-	38 974 342	4 980 776	1 358 394	63 089 671	FY30
CPX.0014680	Drop-off Facilities: New Kuilsriver	DGR	Gate On Track	Scoping	112 921 101	112 921 101	-	112 921 101	-	-	-	-	29 282 000	4 181 955	1 140 534	52 971 305	24 965 130	380 177	FY28
CPX.0014681	Drop-off Facilities: New Westbank	DGR	Gate On Track	Scoping	112 921 101	112 921 101	-	112 921 101	-	-	-	-	29 282 000	4 181 955	1 140 534	52 971 305	24 965 130	380 177	FY28
CPX.0014655	VHS: LFG Infr - Beneficiation (Phase 3)	DGR	Gate On Track	Scoping	123 287 024	123 287 024	-	123 287 024	-	-	-	-	-	2 279 249	46 024 040	74 983 735	-	-	FY29
CPX.0007920	Vissershok North:Design and develop Airs	CGR	Gate Missed	Execution	166 357 212	148 518 250	156 832	127 924 876	121 388 024	6 536 852	-	-	-	-	-	-	-	-	FY24
CPX.0007910	Coastal Park:Design and develop (MRF)	CGR	Gate On Track	Execution	458 392 258	465 597 749	5 000 000	200 196 321	199 696 321	500 000	-	-	-	-	-	-	-	-	FY24
CPX.0010023	HTS: Material Recovery Facility New	CGR	Gate On Track	Scoping	209 080 000	209 080 000	-	209 080 000	-	-	-	18 850 000	141 542 500	48 687 500	-	-	-	-	FY27
CPX.0010025	CPTS: Transfer Station New	CGR	Gate On Track	Conceptual Design	212 875 000	212 875 000	-	212 875 000	-	5 925 000	6 379 743	134 706 454	65 863 803	-	-	-	-	-	FY25
CPX.0023109	Vissershok North:Design&Dev Airs(Phase2)	CGR	Gate On Track	Scoping	275 000 000	275 000 000	-	275 000 000	-	-	-	15 000 000	2 291 663	95 628 001	127 503 996	32 076 340	2 500 000	-	FY27
CPX.0003137	Dev of the Regional Landfill Site	CGR	Gate On Track	Scoping	280 000 000	280 000 000	-	280 000 000	-	-	-	-	5 000 000	15 000 000	10 000 000	20 000 000	170 000 000	60 000 000	FY28
CPX.0007847	ARTS:Material Recovery Facility / MBT	CGR	Gate On Track	Conceptual Design	329 793 080	329 793 080	364 509	327 947 787	7 163 861	4 916 193	10 112 517	180 278 217	124 666 999	810 000	-	-	-	-	FY24
CPX.0011068	ARTS: MBT (Phase 2)	CGR	Date Missed	Scoping	521 750 000	521 750 000	-	421 750 000	-	-	-	15 937 500	141 652 271	31 385 539	13 091 909	121 265 255	97 300 481	1 117 045	FY27

Table 30: Replacement

Item	Item Description	Type	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Column1
CPX.0015116	Plant: Replacement FY25	N/A	Not Applicable	Scoping	30 000 000	30 000 000	-	30 000 000	-	30 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0015117	Plant: Replacement FY26	N/A	Not Applicable	Scoping	30 000 000	30 000 000	-	30 000 000	-	-	30 000 000	-	-	-	-	-	-	-	FY26
CPX.0015118	Plant: Replacement FY27	N/A	Not Applicable	Scoping	30 000 000	30 000 000	-	30 000 000	-	-	-	30 000 000	-	-	-	-	-	-	FY27
CPX.0015119	Plant: Replacement FY28	N/A	Not Applicable	Scoping	30 000 000	30 000 000	-	30 000 000	-	-	-	-	30 000 000	-	-	-	-	-	FY28
CPX.0015120	Plant: Replacement FY29	N/A	Not Applicable	Scoping	-	28 000 000	-	30 000 000	-	-	-	-	-	30 000 000	-	-	-	-	FY29
CPX.0023066	Plant: Replacement FY31	N/A	Not Applicable	Scoping	-	-	-	30 000 000	-	-	-	-	-	-	-	30 000 000	-	-	FY31
CPX.0015127	Plant: Replacement FY30	N/A	Not Applicable	Scoping	-	28 000 000	-	30 000 000	-	-	-	-	-	-	30 000 000	-	-	-	FY30
CPX.0023071	Plant: Replacement FY32	N/A	Not Applicable	Scoping	-	-	-	30 000 000	-	-	-	-	-	-	-	-	30 000 000	-	FY32
CPX.0023046	Plant: Replacement FY33	N/A	Not Applicable	Scoping	-	-	-	30 000 000	-	-	-	-	-	-	-	-	-	30 000 000	FY33
CPX.0015035	Plant: Replacement FY24	N/A	Not Applicable	Execution	30 000 000	75 000 000	-	75 000 000	75 000 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0015126	Vehicles: Replacement FY29	N/A	Not Applicable	Scoping	-	112 000 000	-	130 000 000	-	-	-	-	-	130 000 000	-	-	-	-	FY29
CPX.0023067	Vehicles: Replacement FY31	N/A	Not Applicable	Scoping	-	-	-	130 000 000	-	-	-	-	-	-	-	130 000 000	-	-	FY31

CPX.0015099	Vehicles: Replacement FY30	N/A	Not Applicable	Scoping	-	112 000 000	-	130 000 000	-	-	-	-	-	-	130 000 000	-	-	-	FY30
CPX.0023072	Vehicles: Replacement FY32	N/A	Not Applicable	Scoping	-	-	-	130 000 000	-	-	-	-	-	-	-	-	130 000 000	-	FY32
CPX.0023047	Vehicles: Replacement FY33	N/A	Not Applicable	Scoping	-	-	-	130 000 000	-	-	-	-	-	-	-	-	-	130 000 000	FY33
CPX.0015122	Vehicles: Replacement FY25	N/A	Not Applicable	Scoping	150 000 000	150 000 000	-	150 000 000	-	150 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0015123	Vehicles: Replacement FY26	N/A	Not Applicable	Scoping	150 000 000	150 000 000	-	150 000 000	-	-	150 000 000	-	-	-	-	-	-	-	FY26
CPX.0015124	Vehicles: Replacement FY27	N/A	Not Applicable	Scoping	150 000 000	150 000 000	-	150 000 000	-	-	-	150 000 000	-	-	-	-	-	-	FY27
CPX.0015125	Vehicles: Replacement FY28	N/A	Not Applicable	Scoping	130 000 000	130 000 000	-	150 000 000	-	-	-	-	150 000 000	-	-	-	-	-	FY28
CPX.0015121	Vehicles: Replacement FY24	N/A	Not Applicable	Screen	250 000 000	224 000 000	-	230 713 401	230 713 401	-	-	-	-	-	-	-	-	-	FY24

Table 31: improvement /Expansion enhancement

Item	Item Description	Type	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Colmn1
CPX.0019450	Minor Upgrading Works: Building FY25	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	10 000 000	-	10 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0019470	Minor Upgrading Works: Building FY26	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	10 000 000	-	-	10 000 000	-	-	-	-	-	-	-	FY26

CPX.0019483	Minor Upgrading Works: Building FY27	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	10 000 000	-	-	-	10 000 000	-	-	-	-	-	-	FY27
CPX.0019446	Minor Upgrading Works: Electrical FY24	N/A	Not Applicable	Scoping	11 000 000	11 000 000	-	11 000 000	11 000 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0019455	Minor Upgrading Works: Electrical FY25	N/A	Not Applicable	Scoping	11 000 000	11 000 000	-	13 000 000	-	13 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0019456	Minor Upgrading Works: Civil FY25	N/A	Not Applicable	Scoping	20 000 000	20 000 000	-	20 000 000	-	20 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0019458	Minor Upgrading Works: Fencing FY25	N/A	Not Applicable	Scoping	20 000 000	20 000 000	-	20 000 000	-	20 000 000	-	-	-	-	-	-	-	-	FY25
CPX.0019445	Minor Upgrading Works: Fencing FY24	N/A	Not Applicable	Detailed Design	20 000 000	20 000 000	-	20 000 000	20 000 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0019463	Minor Upgrading Works: Civil FY26	N/A	Not Applicable	Scoping	2 000 000	2 000 000	-	20 000 000	-	-	20 000 000	-	-	-	-	-	-	-	FY26
CPX.0019482	Minor Upgrading Works: Fencing FY26	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	20 000 000	-	-	20 000 000	-	-	-	-	-	-	-	FY26
CPX.0019485	Minor Upgrading Works: Civil FY27	N/A	Not Applicable	Scoping	2 000 000	2 000 000	-	20 000 000	-	-	-	20 000 000	-	-	-	-	-	-	FY27
CPX.0014625	Minor Upgrading Works: Civil FY24	N/A	Not Applicable	Detailed Design	20 045 988	20 000 000	-	20 045 988	20 045 988	-	-	-	-	-	-	-	-	-	FY24
CPX.0014689	Transfer Station Gantry	DGR	Date Missed	Scoping	23 334 091	23 334 091	-	23 334 091	-	-	-	-	-	-	23 334 091	-	-	-	FY30

	Crane Replacem																	
CPX.0014790	Scottsdene Depot Upgrade - Collections	DGR	Gate Missed	Detailed Design	24 379 090	24 436 908	962 394	23 520 000	100 000	100 000	20 000	23 300 000	-	-	-	-	-	-	FY24
CPX.0014696	Landfill Site Gantry Crane Replacement	DGR	Date Missed	Scoping	26 457 130	26 457 130	-	26 457 130	-	-	-	-	-	-	26 457 130	-	-	-	FY30
CPX.0014647	Drop-off Facilities: Schaapkraal Upgrade	DGR	Gate On Track	Scoping	32 500 000	32 500 000	-	31 613 637	-	-	738 637	369 318	19 457 792	10 900 163	147 727	-	-	-	FY26
CPX.0014646	Drop-off Facilities: Belhar Upgrade	DGR	Gate On Track	Scoping	32 500 000	32 500 000	-	32 500 000	-	-	-	626 658	1 344 319	23 548 909	6 980 114	-	-	-	FY27
CPX.0010028	KWMF: Material Recovery Facility Refurb.	DGR	Not Applicable	Scoping	42 547 386	42 547 386	-	42 547 386	-	1 523 003	855 299	6 994 210	33 174 874	-	-	-	-	-	FY25
CPX.0016348	De Grendel Drop-off Upgrade Waste Min	DGR	Gate Missed	Detailed Design	57 363 471	57 363 471	627 067	45 460 743	165 455	118 296	40 346 329	4 830 663	-	-	-	-	-	-	FY24
CPX.0014648	Drop-off Facilities: Welgelegen Upgrade	DGR	Gate On Track	Scoping	48 415 992	48 415 992	-	47 095 554	-	-	-	1 100 360	495 168	22 801 101	22 698 925	-	-	-	FY27
CPX.0014719	Major Upgr of Facilities - Vaalfontein	DGR	Gate On Track	Scoping	47 342 888	47 342 888	-	47 342 888	-	-	-	2 603 859	710 144	39 578 653	4 450 232	-	-	-	FY27
CPX.0014718	Major Upgr of Facilities - Wynberg	DGR	Gate On Track	Scoping	47 342 888	47 342 888	-	47 342 888	-	-	-	2 603 859	710 144	39 578 653	4 450 232	-	-	-	FY27
CPX.0023137	Drop-off Facilities: Upgrading 7	DGR	Gate On Track	Scoping	-	32 500 000	-	47 996 289	-	-	-	-	-	-	-	1 178 582	2 528 314	44 289 393	FY31
CPX.0023138	Drop-off Facilities: Upgrading 8	DGR	Gate On Track	Scoping	-	32 500 000	-	47 996 289	-	-	-	-	-	-	-	1 178 582	2 528 314	44 289 393	FY31
CPX.0014649	Drop-off Facilities: Sea	DGR	Gate On Track	Scoping	48 415 992	48 415 992	-	48 415 992	-	-	-	933 547	2 002 662	35 081 347	10 398 436	-	-	-	FY27

	Point Upgrading																	
CPX.0023120	Major Upgr of Facilities 7	DGR	Gate On Track	Scoping	50 183 461	50 183 461	-	50 183 461	-	-	-	-	2 760 091	752 752	41 953 372	4 717 246	-	-	FY28
CPX.0023121	Major Upgr of Facilities 8	DGR	Gate On Track	Scoping	50 183 461	50 183 461	-	50 183 461	-	-	-	-	2 760 091	752 752	41 953 372	4 717 246	-	-	FY28
CPX.0014675	Major Upgr of Facilities - Maitland	DGR	Gate Missed	Detailed Design	52 299 296	52 821 714	-	52 299 296	720 876	253 265	478 776	964 246	14 865 242	34 864 219	152 672	-	-	-	FY24
CPX.0014837	Construction of Workshop - Vissershok	DGR	Gate Missed	Detailed Design	47 014 314	47 085 685	947 142	53 196 970	-	1 095 085	1 048 682	14 942 218	35 912 586	198 399	-	-	-	-	FY25
CPX.0023123	Major Upgr of Facilities 10	DGR	Gate On Track	Scoping	-	-	-	54 150 990	-	-	-	-	-	-	-	3 287 312	896 540	49 967 138	FY31
CPX.0023122	Major Upgr of Facilities 9	DGR	Gate On Track	Scoping	-	-	-	54 150 990	-	-	-	-	-	-	-	3 287 312	896 540	49 967 138	FY31
CPX.0014650	Drop-off Facilities: Kommetjie Upgrade	DGR	Gate On Track	Scoping	32 500 000	57 664 221	-	57 664 221	-	-	-	-	-	-	1 111 870	2 385 202	41 782 446	12 384 703	FY30
CPX.0014651	Drop-off Facilities: Wynberg Upgrade	DGR	Gate On Track	Scoping	32 500 000	57 664 221	-	57 664 221	-	-	-	-	-	-	1 111 870	2 385 202	41 782 446	12 384 703	FY30
CPX.0015242	Killarney Drop-off Upgrade Waste Min	DGR	Gate On Track	Detailed Design	62 355 595	61 836 031	-	59 964 237	659 897	60 710	55 705 305	3 538 325	-	-	-	-	-	-	FY24
CPX.0014720	Major Upgr of Facilities - Goodwood	CGR	Date Missed	Scoping	133 300 604	133 300 604	-	133 300 604	-	-	-	486 312	1 702 092	1 979 982	1 721 392	122 756 128	486 312	4 168 386	FY27
CPX.0011066	Woodstock Depot Upgrade	CGR	Gate Missed	Detailed Design	164 690 647	164 690 647	-	160 700 000	-	90 000	50 000	51 150 000	54 450 000	54 450 000	510 000	-	-	-	FY25
CPX.0010026	BTS:Material Recovery Facility / MBT	CGR	Gate On Track	Scoping	183 600 000	183 600 000	-	183 600 000	-	-	-	-	8 050 454	32 703 656	119 596 167	22 415 178	834 545	-	FY28

12.2 Minor projects

The CAPEX projects less than R10m are depicted in **Tables 31-33** below.

Table 32: New projects

Item	Item Description	Type	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Col umn1
CPX.0014149	Mechanical Equipment: Additional FY24	**N/A**	Not Applicable	**Scoping**	250 000	250 000	-	**250 000**	250 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0031027	Waste Minimisation FY24	**N/A**	Not Applicable	**Scoping**	5 360 000	47 600 000	-	**5 360 000**	5 360 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0014184	Construction of CBRF - Fisantekraal D/O	**N/A**	Not Applicable	**Conceptual Design**	6 296 940	6 296 962	407 595	**5 889 367**	216 748	123 857	2 485 574	3 063 188	-	-	-	-	-	-	FY24
CPX.0007926	Bellville:LFG Infrastructure to Flaring	**DGR**	**Gate Missed**	**Execution**	40 706 347	40 714 069	24 438 297	**7 920 000**	720 000	720 000	1 440 000	720 000	720 000	720 000	720 000	720 000	720 000	720 000	FY24

Table 33: Improvement/expansion

Item	Item Description	Type	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Col umn1
CPX.0014170	Major Upgrade of Landfill Sites FY24	N/A	Not Applicable	Scoping	694 691	-	-	694 691	694 691	-	-	-	-	-	-	-	-	-	FY24
CPX.0014694	Vissershok Leachgate Plant - VLFS Refurb	N/A	Not Applicable	Execution	5 000 688	12 895 035	4 098 997	971 885	866 481	105 404	-	-	-	-	-	-	-	-	FY24
CPX.0019489	Minor Upgrading Works: Civil FY28	N/A	Not Applicable	Scoping	2 000 000	2 000 000	-	2 000 000	-	-	-	-	2 000 000	-	-	-	-	-	FY28

CPX.0019494	Minor Upgrading Works: Civil FY29	N/A	Not Applicable	Scoping	2 000 000	2 000 000	-	2 000 000	-	-	-	-	-	2 000 000	-	-	-	-	FY29
CPX.0023057	Minor Upgrading Works: Civil FY31	N/A	Not Applicable	Scoping	-	-	-	2 000 000	-	-	-	-	-	-	-	2 000 000	-	-	FY31
CPX.0014830	Minor Upgrading Works: Civil FY30	N/A	Not Applicable	Scoping	-	2 000 000	-	2 000 000	-	-	-	-	-	-	2 000 000	-	-	-	FY30
CPX.0023074	Minor Upgrading Works: Civil FY32	N/A	Not Applicable	Scoping	-	-	-	2 000 000	-	-	-	-	-	-	-	-	2 000 000	-	FY32
CPX.0023049	Minor Upgrading Works: Civil FY33	N/A	Not Applicable	Scoping	-	-	-	2 000 000	-	-	-	-	-	-	-	-	-	2 000 000	FY33
CPX.0019487	Minor Upgrading Works: Electrical FY27	N/A	Not Applicable	Scoping	3 000 000	3 000 000	-	3 000 000	-	-	-	3 000 000	-	-	-	-	-	-	FY27
CPX.0019490	Minor Upgrading Works: Electrical FY28	N/A	Not Applicable	Scoping	3 000 000	3 000 000	-	3 000 000	-	-	-	-	3 000 000	-	-	-	-	-	FY28
CPX.0019495	Minor Upgrading Works: Electrical FY29	N/A	Not Applicable	Scoping	3 000 000	3 000 000	-	3 000 000	-	-	-	-	-	3 000 000	-	-	-	-	FY29
CPX.0023058	Minor Upgrading Works: Electrical FY31	N/A	Not Applicable	Scoping	-	-	-	3 000 000	-	-	-	-	-	-	-	3 000 000	-	-	FY31

CPX.0014942	Minor Upgrading Works: Electrical FY30	N/A	Not Applicable	Scoping	-	3 000 000	-	3 000 000	-	-	-	-	-	-	3 000 000	-	-	-	FY30
CPX.0023075	Minor Upgrading Works: Electrical FY32	N/A	Not Applicable	Scoping	-	-	-	3 000 000	-	-	-	-	-	-	-	-	3 000 000	-	FY32
CPX.0023090	Minor Upgrading Works: Electrical FY33	N/A	Not Applicable	Scoping	-	-	-	3 000 000	-	-	-	-	-	-	-	-	-	3 000 000	FY33
CPX.0014721	Major Upgr of Facilities - Melton Rose	DGR	Gate On Track	Scoping	-	37 500 000	-	3 693 624	-	-	-	-	-	-	-	-	-	3 693 624	FY33
CPX.0014791	Major Upgr of Facilities 6	DGR	Gate On Track	Scoping	37 500 000	37 500 000	-	3 693 624	-	-	-	-	-	-	-	-	-	3 693 624	FY33
CPX.0014688	KWMF Weighbridge Infrastr-Upgrade	N/A	Not Applicable	Detailed Design	4 141 157	4 149 542	109 542	3 900 000	-	3 900 000	-	-	-	-	-	-	-	-	FY25
CPX.0023140	Drop-off Facilities: Upgrading 10	DGR	Gate On Track	Scoping	-	32 500 000	-	3 929 310	-	-	-	-	-	-	-	-	1 249 297	2 680 013	FY32
CPX.0023139	Drop-off Facilities: Upgrading 9	DGR	Gate On Track	Scoping	-	32 500 000	-	3 929 310	-	-	-	-	-	-	-	-	1 249 297	2 680 013	FY32
CPX.0019444	Minor Upgrading Works: Building FY24	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	4 000 000	-	-	-	-	-	-	-	-	-	FY24
CPX.0019486	Minor Upgrading Works: Fencing FY27	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	-	-	-	4 000 000	-	-	-	-	-	-	FY27

CPX.0019488	Minor Upgrading Works: Building FY28	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	-	-	-	-	4 000 000	-	-	-	-	-	FY28
CPX.0019493	Minor Upgrading Works: Fencing FY28	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	-	-	-	-	4 000 000	-	-	-	-	-	FY28
CPX.0019492	Minor Upgrading Works: Building FY29	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	-	-	-	-	-	4 000 000	-	-	-	-	FY29
CPX.0019496	Minor Upgrading Works: Fencing FY29	N/A	Not Applicable	Scoping	4 000 000	4 000 000	-	4 000 000	-	-	-	-	-	4 000 000	-	-	-	-	FY29
CPX.0023056	Minor Upgrading Works: Building FY31	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	4 000 000	-	-	FY31
CPX.0023059	Minor Upgrading Works: Fencing FY31	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	4 000 000	-	-	FY31
CPX.0014841	Minor Upgrading Works: Building FY30	N/A	Not Applicable	Scoping	-	4 000 000	-	4 000 000	-	-	-	-	-	-	4 000 000	-	-	-	FY30
CPX.0014842	Minor Upgrading Works: Fencing FY30	N/A	Not Applicable	Scoping	-	4 000 000	-	4 000 000	-	-	-	-	-	-	4 000 000	-	-	-	FY30
CPX.0023073	Minor Upgrading Works: Building FY32	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	-	4 000 000	-	FY32

CPX.0023076	Minor Upgrading Works: Fencing FY32	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	-	4 000 000	-	FY32
CPX.0023048	Minor Upgrading Works: Building FY33	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	-	-	4 000 000	FY33
CPX.0023091	Minor Upgrading Works: Fencing FY33	N/A	Not Applicable	Scoping	-	-	-	4 000 000	-	-	-	-	-	-	-	-	-	4 000 000	FY33
CPX.0019476	Minor Upgrading Works: Electrical FY26	N/A	Not Applicable	Scoping	3 000 000	3 000 000	-	5 000 000	-	-	5 000 000	-	-	-	-	-	-	-	FY26
CPX.0023108	Schaapkraal Depot Upgrade (Phase 2)	DGR	Date Missed	Scoping	7 817 653	7 817 653	-	7 817 653	232 923	3 816 020	3 768 710	-	-	-	-	-	-	-	FY24
CPX.0014672	Muizenberg Depot Upgrade	N/A	Not Applicable	Detailed Design	8 594 438	8 594 438	1 230 226	7 979 371	7 979 371	-	-	-	-	-	-	-	-	-	FY24
CPX.0023107	Kuils River Depot Upgrade (Phase 2)	DGR	Date Missed	Scoping	9 178 816	9 178 816	-	9 178 816	-	566 658	8 612 158	-	-	-	-	-	-	-	FY25

Table 34: Operating projects

Item	Item Description	Status	Current Phase PPM	Approved TPC	Proposed Draft TPC	Actuals to Date	Total LP	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	Column1
CPX.0021329	IT Printing Equipment Replacement: FY33	Not Applicable	Scoping	-	-	-	550 000	-	-	-	-	-	-	-	-	-	550 000	FY33
CPX.0019433	Furniture: Replacement - Rates FY28	Not Applicable	Scoping	-	525 000	-	600 000	-	-	-	-	600 000	-	-	-	-	-	FY28
CPX.0019436	Office Furniture: Replacem: Rates FY29	Not Applicable	Scoping	-	525 000	-	600 000	-	-	-	-	-	600 000	-	-	-	-	FY29
CPX.0021262	Office Furniture: Replacem: Rates FY30	Not Applicable	Scoping	-	525 000	-	600 000	-	-	-	-	-	-	600 000	-	-	-	FY30
CPX.0023062	Office Furniture Replacement: Rates FY31	Not Applicable	Scoping	-	-	-	650 000	-	-	-	-	-	-	-	650 000	-	-	FY31
CPX.0021263	Office Furniture Replacement: Rates FY32	Not Applicable	Scoping	-	-	-	650 000	-	-	-	-	-	-	-	-	650 000	-	FY32
CPX.0021264	Office Furniture Replacement: Rates FY33	Not Applicable	Scoping	-	-	-	650 000	-	-	-	-	-	-	-	-	-	650 000	FY33
CPX.0019439	IT Computer Equipment Replacement: FY24	Not Applicable	Execution	1 750 000	1 750 000	-	1 761 888	1 761 888	-	-	-	-	-	-	-	-	-	FY24
CPX.0014534	Shipping Containers: Replacement FY25	Not Applicable	Scoping	2 500 000	2 500 000	-	2 500 000	-	2 500 000	-	-	-	-	-	-	-	-	FY25
CPX.0014535	Shipping Containers: Replacement FY26	Not Applicable	Scoping	2 500 000	2 500 000	-	2 500 000	-	-	2 500 000	-	-	-	-	-	-	-	FY26

CPX.0014616	Shipping Containers: Replacement FY27	Not Applicable	Scoping	2 500 000	2 500 000	-	2 500 000	-	-	-	2 500 000	-	-	-	-	-	-	FY27
CPX.0014617	Shipping Containers: Replacement FY28	Not Applicable	Scoping	2 500 000	2 500 000	-	2 500 000	-	-	-	-	2 500 000	-	-	-	-	-	FY28
CPX.0014618	Shipping Containers: Replacement FY29	Not Applicable	Scoping	-	1 000 000	-	2 500 000	-	-	-	-	-	2 500 000	-	-	-	-	FY29
CPX.0014620	Shipping Containers: Replacement FY31	Not Applicable	Scoping	-	-	-	2 500 000	-	-	-	-	-	-	-	2 500 000	-	-	FY31
CPX.0014619	Shipping Containers: Replacement FY30	Not Applicable	Scoping	-	1 000 000	-	2 500 000	-	-	-	-	-	-	2 500 000	-	-	-	FY30
CPX.0014621	Shipping Containers: Replacement FY32	Not Applicable	Scoping	-	-	-	2 500 000	-	-	-	-	-	-	-	-	2 500 000	-	FY32
CPX.0014622	Shipping Containers: Replacement FY33	Not Applicable	Scoping	-	-	-	2 500 000	-	-	-	-	-	-	-	-	-	2 500 000	FY33
CPX.0014150	Shipping Containers: Replacement FY24	Not Applicable	Scoping	1 000 000	1 000 000	-	3 319 479	3 319 479	-	-	-	-	-	-	-	-	-	FY24
CPX.0019448	IT Computer Equipment Replacement: FY25	Not Applicable	Scoping	5 687 500	5 687 500	-	5 687 500	-	5 687 500	-	-	-	-	-	-	-	-	FY25
CPX.0019452	IT Computer Equipment Replacement: FY26	Not Applicable	Scoping	7 000 000	5 687 500	-	5 687 500	-	-	5 687 500	-	-	-	-	-	-	-	FY26

CPX.0019460	IT Computer Equipment Replacement: FY27	Not Applicable	Scoping	7 000 000	5 687 500	-	5 687 500	-	-	-	5 687 500	-	-	-	-	-	-	FY27
CPX.0019478	IT Computer Equipment Replacement: FY28	Not Applicable	Scoping	-	7 000 000	-	5 687 500	-	-	-	-	5 687 500	-	-	-	-	-	FY28
CPX.0019480	IT Computer Equipment Replacement: FY29	Not Applicable	Scoping	-	7 000 000	-	5 687 500	-	-	-	-	-	5 687 500	-	-	-	-	FY29
CPX.0023068	IT Computer Equipment Replacement: FY31	Not Applicable	Scoping	-	-	-	5 687 500	-	-	-	-	-	-	-	5 687 500	-	-	FY31
CPX.0021272	IT Computer Equipment Replacement: FY30	Not Applicable	Scoping	-	7 000 000	-	5 687 500	-	-	-	-	-	-	5 687 500	-	-	-	FY30
CPX.0021273	IT Computer Equipment Replacement: FY32	Not Applicable	Scoping	-	-	-	5 687 500	-	-	-	-	-	-	-	-	5 687 500	-	FY32
CPX.0021274	IT Computer Equipment Replacement: FY33	Not Applicable	Scoping	-	-	-	7 000 000	-	-	-	-	-	-	-	-	-	7 000 000	FY33

12.3 Projects in support of other Sector pipelines

UWM projects align with the following IDP initiatives for informal settlement and Backyard support.

2. Improved access to quality and reliable basic services.

2.1 Mainstreaming basic service delivery to informal settlements and backyard dwellings programme.

2.2. Informal settlements waste collection project.

2.3. Backyard dwelling service support project.

12.4 Intergovernmental project support

Urban Waste Services are not a prerequisite to the provision of other infrastructure Services because it is demand driven.

CHAPTER 13

13. TRIGGERS

This section describes the trigger framework for Capital Projects within the Urban Waste Directorate. It describes the reasons behind the initiation of current directorate projects, which ranges from legislative requirements to service demand.

In conducting project prioritisation, Projects were scored against the following matrix.

a) **Land Acquisition**
This entails the availability of land i.e. reservation, zoning, procurement for project development. Projects in the more advanced stage of acquiring land were scored higher on the matrix.

b) **Licencing Requirement (legal)**
Compliance with legislative requirements in terms of environmental authorisations.

c) **Locality (based on formal/informal) 1 formal 10 informal**
Projects in informal / densely populated areas attracted more points than projects in urban areas. This is meant to enhance waste management services and promote equity in densely populated areas.

d) **Supports Organic waste diversion/Potential**
Most waste facilities has a built in capacity to accept organic waste . In order to meet organic waste diversion targets, projects which have potential to attract more organic waste than others attracted a higher score.

e) **Support Dry Recyclable (diversion from landfill**)
This is still in line with legislative requirements . The directorate has adopted 28% target for waste diversion in the 2023/24, with with adjustments for the outer years. Projects with high potential for waste diversion obtained more points than those which do not. Specific focus on areas with existing waste minimisation programmes in place.

f) **Supports Job creation**
Directly linked to the waste diversion is the element of job creation. Drop offs with high recyclables materials have a potential to support local economic development and create job opportunities.

g) **Project Dependencies/ Risks**
Projects were assessed for risk based on their locality, likelihood of risk, and impact.

The following tables depicts the prioritised projects for Disposal and Drop offs as supported by the project pipeline. The four (04) prioritised projects for each category are highlighted below.

Table 35: Scoring of Drop offs

Items	Khayelitsha Drop -off (New)	Bothasig (New)	Belhar (Upgrade)	Durbanville (New)	Kuilsriver (New)	Macassar (New)	WesBank (New)	Mitchell's Plain (New)	Simons Town (New)
CPX Number	**CPX.0014679-F1**	**CPX.0014676-F1**	**CPX.0014646-F1**	**CPX.0014677-F1**	**CPX.0014680-F1**	**CPX.0014678-F1**	**CPX.0014681-F1**	**CPX.0023130-F1**	**CPX.0023129-F1**
Measurement Indicator									
Approved Budget	10	10	10	10	10	10	10	10	10
Land Acquisition	5	5	1	5	10	5	5	5	5
Licencing Requirement (legal)	1	1	5	1	1	1	1	1	1
Locality (based on formal/informal) 1 formal 10 informal	6	1	1	1	1	1	6	5	1
Supports Organic waste diversion/Potential	10	10	10	10	10	10	10	10	10
Support Dry Recyclable (diversion from landfill)	10	10	10	10	10	10	10	10	10
Supports Job creation	5	5	5	5	5	5	5	5	5
Project Dependencies/ Risks	5	5	5	5	5	5	5	5	5
Subtotal	52	47	47	47	52	47	52	51	47
Weighting Priority: 1-2 Low; 3-5 Medium; 6-10 HIgh	8	5	5	6	6	6	5	5	5
Grand Total	**416**	**235**	**235**	**282**	**312**	**282**	**260**	**255**	**235**

Table 36: Scoring for Disposal projects

	Low	Med	High	CP - Piggy back cell	CP MRF	CP RTS	CP Organic Diversion	VLS expansion	ARTS modernisation	BRTS upgrade and MBT (BCP organic waste facility)	CP Increase in height (very new and still to be approved.	Upgrade of KWMF	CP LFG	VLS LFG	Gantry Crane Project	Mining of closed Landfills	Upgrade of RTS	OWF - Decentralised model (Very new)	Regional Facility
Project				CPX.0007924	CPX.0007910	CPX.0010025	various	CPX.0007920	CPX.0007847	CPX.0010026	New	CPX.0010028	CPX.0011067	CPX.0014654 CPX.0014655	CPX.0014696	In planning	various	In planning	CPX.0003136 CPX.0003137
Measurement Indicator	#1	#5	#10																
Approved Budget				10	10	10	10	10	10	7	1	10	10	10	7	1	5	5	5
Land Acquisition				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5
Licencing Requirement (legal)				1	1	1	1	1	5	5	8	1	1	1	5	5	5	5	10
Locality (based on formal/informal) 1 formal 10 informal				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Supports Organic waste diversion/Potential				5	5	5	5	5	10	10	5	10	1	1	5	5	10	10	10
Support Dry Recyclable (diversion from landfill)				1	10	5	1	1	10	10	1	10	5	5	5	5	10	5	10
Supports Job creation				1	10	5	5	5	5	10	5	10	1	1	1	1	5	5	10

Project Dependencies / Risks				**1**	**1**	**10**	**10**	**1**	**10**	**5**	**5**	**1**	**1**	**1**	**1**	**10**	**5**	**5**	**10**
Subtotal				**21**	**39**	**38**	**34**	**25**	**52**	**49**	**27**	**44**	**21**	**21**	**26**	**29**	**42**	**37**	**61**
Weighting Priority: 1-2 Low; 3-5 Medium; 6-10 HIgh				**6**	**8**	**10**	**8**	**8**	**6**	**10**	**10**	**5**	**4**	**4**	**6**	**4**	**8**	**8**	**10**
Grand Total				**126**	**312**	**380**	**272**	**200**	**312**	**490**	**270**	**220**	**84**	**84**	**156**	**116**	**336**	**296**	**610**

13.1 Land requirements

13.1.1 Land availability assessment

The actual land needed for the development of the new regional facility still needs to be identified. Feasibility to identify suitable land will be conducted in the 2024- 2025 financial year.

The following table depicts the status of land identified/ required for pipeline projects

Land reservation process not finalised for most Drop offs. Due to this, the implementation dates shifted to the outer years.

Table 37: Land Availability Assessment

NEW INFRASTRUCTURE PLANNED									
Facility name	**Location GPS Coordinates (where applicable)**	**Alignment with MSDF (Y/N)**	**City land Reservation status**	**Acquisition plan identifying correct area to purchase**	**Environmental Authorisation**	**Current land use**	**Change of land use required**	**Land acquisition budgeted for**	**Planned Project start date**
Bellville complex (transfer station and compost plan) Regional landfill site	Bellville South Industrial	Yes	Yes required from water and sanitation	n/a	Waste licence	Utility	To be determine	n/a	2027
	To be identified	Yes	n/a	Yes	Waste licence	Unknown-pending identification of land	unknown	yes	2028
Bellville drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown-pending identification of land	unknown	n/a	Not confirmed
Bothasig drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be	Unknown-pending identification of land	unknown	n/a	Not confirmed

					required when the construction is completed				
Durbanville drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown-pending identification of land	unknown	n/a	Not confirmed
Khayelitsha drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown-pending identification of land	unknown	n/a	Not confirmed
Macassar drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017	Unknown-pending identification of land	unknown	n/a	Not confirmed

					will be required when the construction is completed				
Kuilsriver drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown- pending identification of land	unknown	n/a	Not confirmed
Mitchell's Plain 1 & 2 drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown- pending identification of land	unknown	n/a	Not confirmed
Simons' Town drop-off	To be finalised	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be	Unknown- pending identification of land	unknown	n/a	Not confirmed

					required when the construction is completed				
Wesbank drop-off	To be identified	Yes	Not started	n/a	NWMA: Norms and Standards for sorting shedding grinding and baling 2017 will be required when the construction is completed	Unknown-pending identification of land	unknown	n/a	Not confirmed
Mitchell's Plain minidrop-off	Judo Street Public Space,Eastridge,Mitchell's Plain.	Yes	In process	n/a	Duty of care to be registered	Open space 2	Yes	n/a	01.03.2024
	Zither Street,Steenberg&Symphony Avenue	Yes	In process	n/a	Duty of care to be registered	Open space 2	Yes	n/a	01.03.2024
Scottsdene mini drop-off	Eoan Avenue(next to VGK Scottsdene)	Yes	In process	n/a	Duty of care to be registered	Single Residential 1	Yes	n/a	01.03.2024
Joe-slovo mini drop-off	Democracy Park-Cnr Atlas Drive&Democracy Way	Yes	In process	n/a	Duty of care to be registered	Open space 2 (Court Order : 1780/2021)	Yes	n/a	01.03.2024

Kuilsriver mini drop-off	Cnr 35 th Avenue&Old Stellenbosch Road	Yes	In process	n/a	Duty of care to be registered	Open space 2	Yes	n/a	01.03.2024
Delft mini drop-off	Leiden Ave,open space between Koonap&Mkuze Str	Yes	In process	n/a	Duty of care to be registered	Community 2 Regional	Yes	n/a	01.03.2024
Philip mini drop-off	Tokwana street at Better life close to the graveyard	Yes	In process	n/a	Duty of care to be registered	Community 1 Local	Yes	n/a	01.03.2024
	Green belt behind erf 60148, 4 Zelani Mkhonza Street	Yes	In process	n/a	Duty of care to be registered	Community 2 Regional / 102	Yes	n/a	01.03.2024

13.1.2 Land procurement

Disposal facilities

The Regional facility has yet to be procured and the cost is estimated at t R300 million. The feasibility study is underway to identify suitable land for the facility. The project will also need to include an extensive EIA assessment.

Depots

The cleansing branch will require additional land for the development of new depots. Currently the Parow depot of Area Central is experiencing significant space constraints and there is a need to source land for the development of a new Cleansing depot to replace the Parow facility. It is anticipated that land being considered is registered to the City of Cape Town so it will not require any procurement.

Land for depots and drop offs should be identified at the conceptualisation stage of the township development, as it is done with recreational spaces, parks, church lands etc. This will enable the directorate to have pockets of land identified for possible use as depot. This will be influenced by the operational strategic model adopted by the directorate (i.e. insource or outsource). This should be driven by the principle of the spatial development framework where all factors that influence the sustainability and efficiencies to services are being considered. A resource determination (i.e. land for depots) prior to approval should be standard which will be activated by the size of the development. Factors that will influence that will be densification, type of development (i.e. single residents' v/s block of flats and or estates and business mix).

Drop-offs

City land is considered for the development of drop offs and mini drop offs, no procurement of land is required.

CHAPTER 14

14. OPERATING MODEL

This section outlines and analyses the sources and elements required for the successful operations of the Urban Waste Management business.

14.1 Operating areas/ Service delivery areas

Operating areas

Table 37 summarises the facilities excluding depots operated by Urban Waste Management, the area, type of facility and expansion possibilities are where budgets are being allocated in the next 10 years for expansion, upgrades and new facilities

Table 38: Urban Waste Management operating facilities.

NUMBER ON THE MAP	NAME	TYPE	STATUS	POINT_X	POINT_Y	Expansion Possibility
1	Bonteheuwel	Drop-off	Planned	18.56239992	-33.95686312	Space Avail
2	Athlone	Drop-off	Current	18.51580704	-33.94868313	MBT, MRF,RTS upgrade
3	Vissershok	Drop-off	Current	18.54441487	-33.77392690	Expansion / LFG
4	Kraaifontein	Drop-off	Current	18.73735336	-33.83822942	MRF refurbishment
7	Ravensmead	Drop-off	Current	18.60548196	-33.92853668	No Space
9	Schaapkraal	Drop-off	Current	18.53468705	-34.03684712	Space Avail
12	Sea Point	Drop-off	Current	18.38202588	-33.92600201	Cannot expand
13	Coastal Park	Drop-off	Current	18.50186827	-34.08820555	New RTS, MRF, LFG
14	Welgelegen	Drop-off	Current	18.56939017	-33.87317476	Space Avail
15	De Grendel/ Fifth Avenue	Drop-off	Current	18.57673749	-33.89366815	Space Avail
16	Simons Town Blue Waters	Drop-off	Current	18.42258213	-34.17921176	Space Avail
17	Belhar	Drop-off	Current	18.63521319	-33.95144472	Space Avail

18	Delft	Drop-off	Current	18.64214181	-33.97812537	Space Avail
19	Tygerdal	Drop-off	Current	18.54794112	-33.89337671	To close
20	Atlantis	Drop-off	Current	18.47566317	-33.57481990	Space Avail
22	Faure	Drop-off	Current	18.69650783	-34.01566076	Space Avail
23	Kensington	Drop-off	Current	18.51493062	-33.91567367	No Space
24	Beaconvale	Drop-off	Planned	18.58090395	-33.91100005	Space Avail
25	Helderberg	Drop-off	Planned	18.80124904	-34.05712280	Proposed new LF, MRF Drop off
26	Parkwood	Drop-off	Planned	18.49316108	-34.03599120	Space Avail
27	Killarney	Drop-off	Current	18.52682412	-33.82928956	Space Avail
28	Kommetjie	Drop-off	Current	18.36822597	-34.13492881	Space Avail
29	Gordon's Bay	Drop-off	Current	18.88723690	-34.14889776	Space Avail
30	Hout Bay	Drop-off	Current	18.35785961	-34.03109002	No Space
31	Woodstock	Drop-off	Current	18.45083682	-33.92235981	Space Avail
32	Wynberg	Drop-off	Current	18.47991524	-34.00533214	No Space
33	Retreat Tenth Avenue	Drop-off	Current	18.47947796	-34.06127375	Space Avail
34	Swartklip	Drop-off	Current	18.65188943	-34.05190108	Space Avail
35	Induland	Drop-off	Current	18.51624842	-33.98945584	Space Avail
36	Mitchells Plain	Drop-off	Current	18.59625803	-34.06647068	Space Avail
38	Bellville Waste Management Facility Drop-off	Drop-off	Current	18.64828363	-33.92882041	LFG to flaring
39	Kraaifontein	Landfill	Closed	18.70640794	-33.82150128	MRF refurbishment
44	Atlantis	Landfill	Proposed	18.48302892	-33.64762452	Proposed
45	Kalbaskraal	Landfill	Proposed	18.65349595	-33.63620370	Proposed
46	Coastal Park	Landfill	Current	18.50248054	-34.09113946	Current

47	Bellville	Landfill	Closed	18.65326833	-33.93885996	LFG to flaring
48	Vissershok South	Landfill	Current	18.54232455	-33.77768699	Expansion / LFG
49	Kraaifontein	Waste Management Facility	Current	18.74035859	-67.77275198	MRF refurbishment
51	Swartklip	Refuse Transfer Station	Current	18.64915111	-34.04927222	Current
52	Athlone	Refuse Transfer Station	Current	18.51609631	-33.95201280	Current
53	Vissershok North	Landfill	Current	18.54319288	-33.77094685	Expansion / LFG
54	Coastal Park	Refuse Transfer Station	Planned	18.49956742	-34.09310730	New RTS, MRF, LFG
55	Helderberg	Refuse Transfer Station	Planned	18.79640686	-34.05724864	Planned
56	Bellville	Waste Management Facility	Current	18.64901180	-33.93200045	LFG to flaring
57	Vissershok North Leachate Plant	Leachate Plant	Current	18.53761461	-33.78058441	Expansion / LFG

These facilities are further categorised in terms of operational, function and service area as depicted in the figures below.

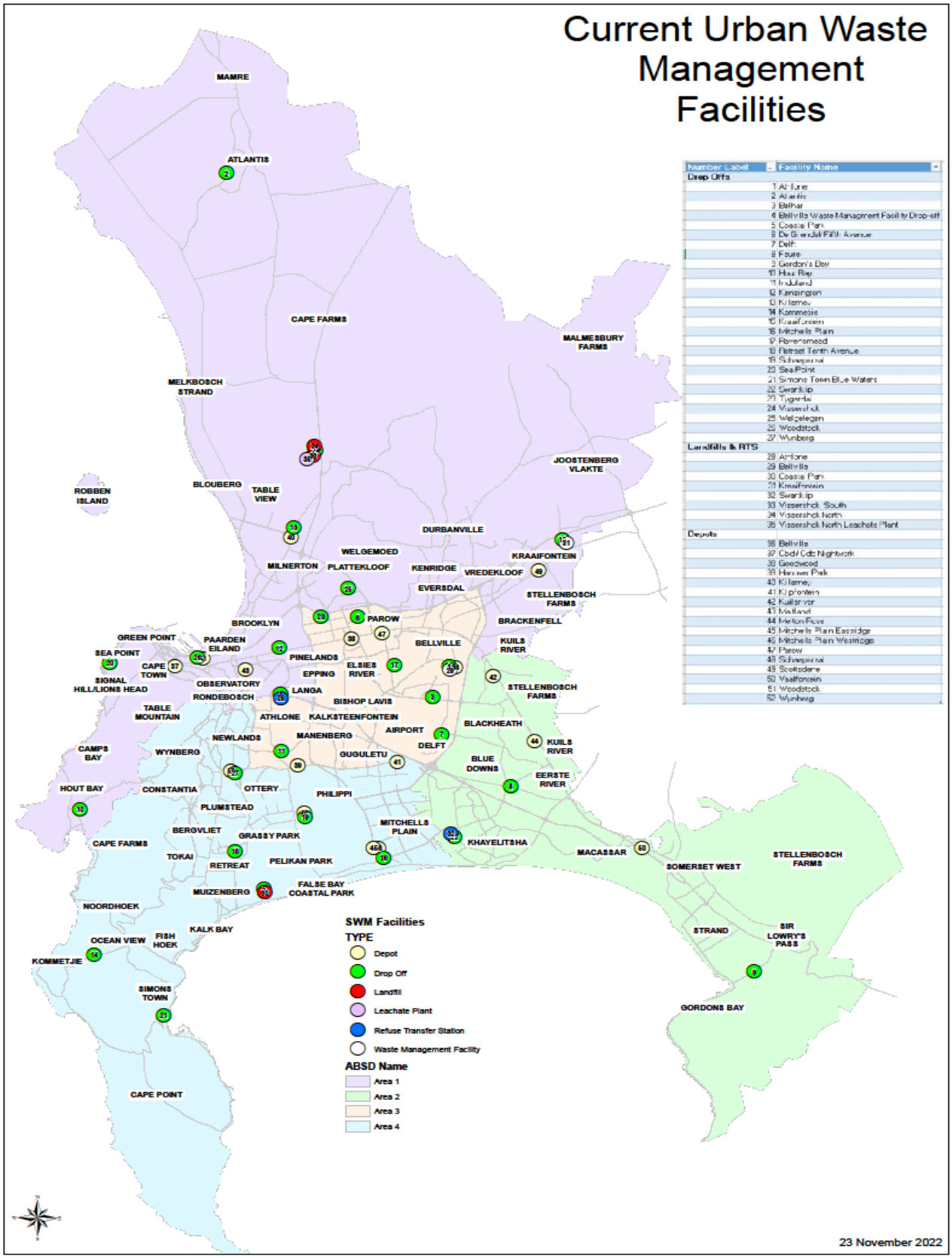


Figure 19: The location of the facilities that are within UWM

Collections and cleansing

Collections and Cleansing main household operations are classified into two main categories, which are formal and informal households and respond to the ever-growing needs of the city.

Collections branch Facilities

The Collections Branch has divided the City into four (4) service areas (see **Figure 20**) with roughly equal numbers of weekly lifts. The four service areas are Atlantic, Impuma, Tierberg and Two Oceans. Each service area is further divided into districts covering various suburbs receiving the refuse collection service. Collection beats in turn cover a portion of one suburb; a whole suburb; or more than one suburb. Each district is serviced out of at least one depot. Depots assist one another when operations are affected due to breakdowns or labour issues. When a depot requests assistance from another depot to complete a beat, a truck (with its staff complement) is sent to complete the beat.

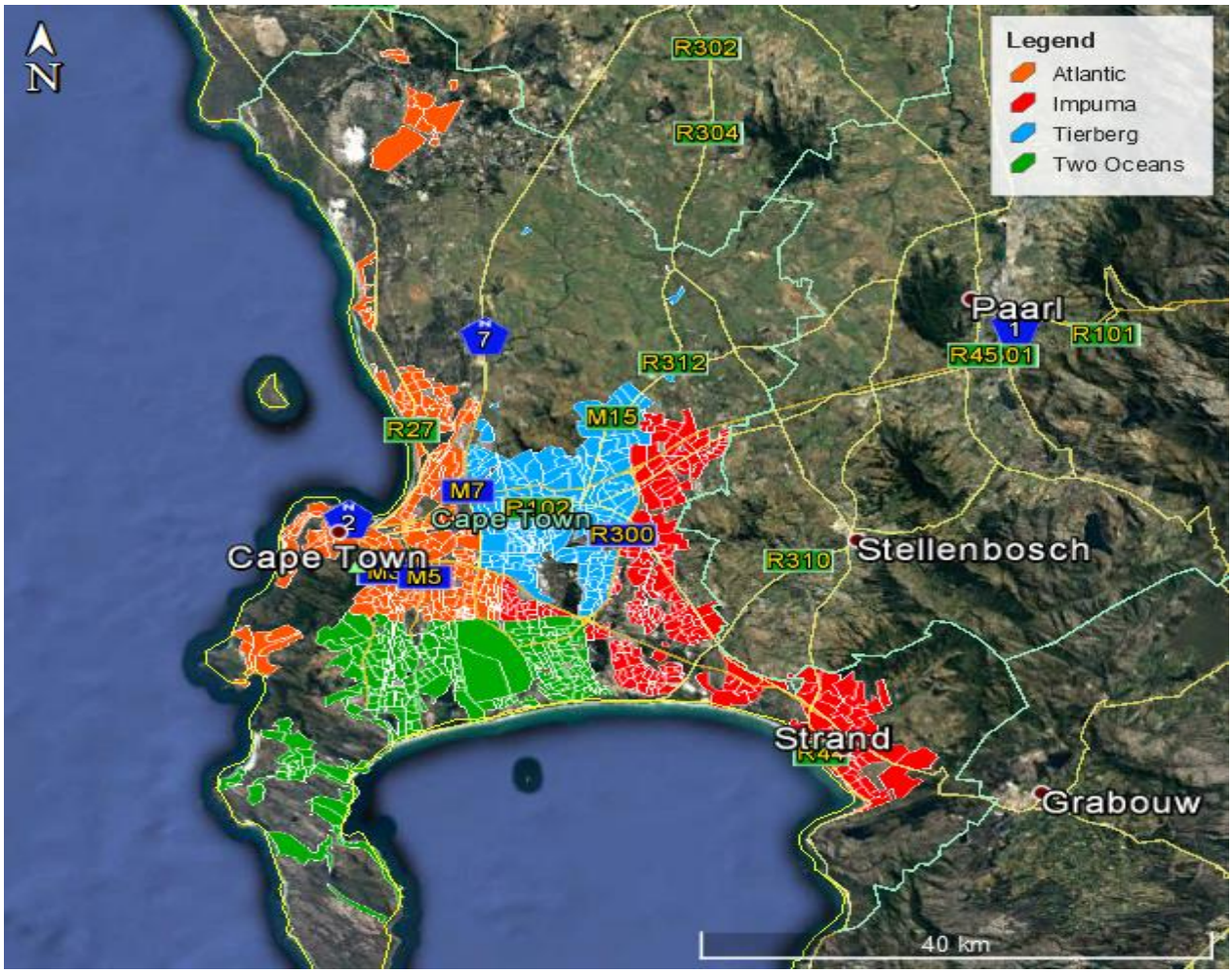


Figure 20: Collections Branch Service Areas

Formal collections

All formal residential properties (as defined in the CCT Tariff Policy) receive a collection service from the City. All formal households, including backyard dwellings where practicable, are provided with a 240L wheelie bin for all general waste. Households receive the kerbside waste collection service once a week, which is defined as the standard (basic) service level. The Collections Branch makes use of contractors to deliver the service to approximately 25% of customers.

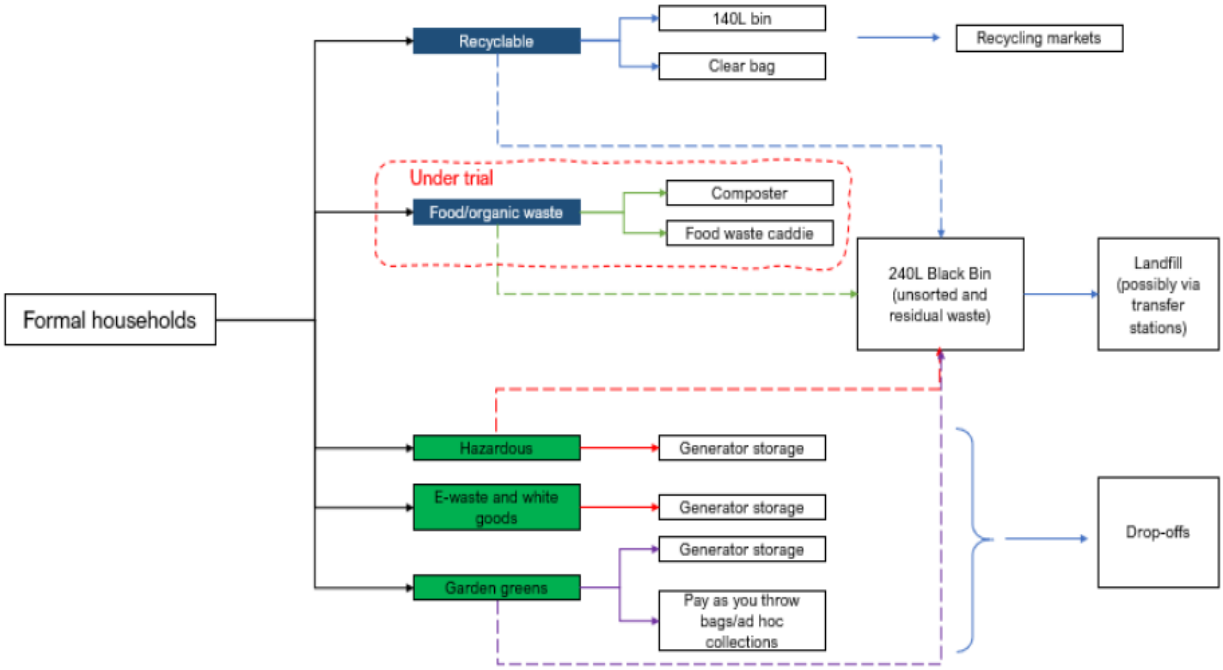


Figure 21: Collections formal household process

Informal collections

The standard service level for informal settlements is a once-a-week, bagged door-to-door waste collection service, provided by external service providers contracted by the Cleansing Branch. Each informal household is provided with blue refuse bags each week, of a size, number and design determined by the City. In addition to the refuse bag collection service, the Cleansing Branch provides communal bins/skips and "shipping containers" in informal areas as part of an integrated area cleaning and refuse collection service.

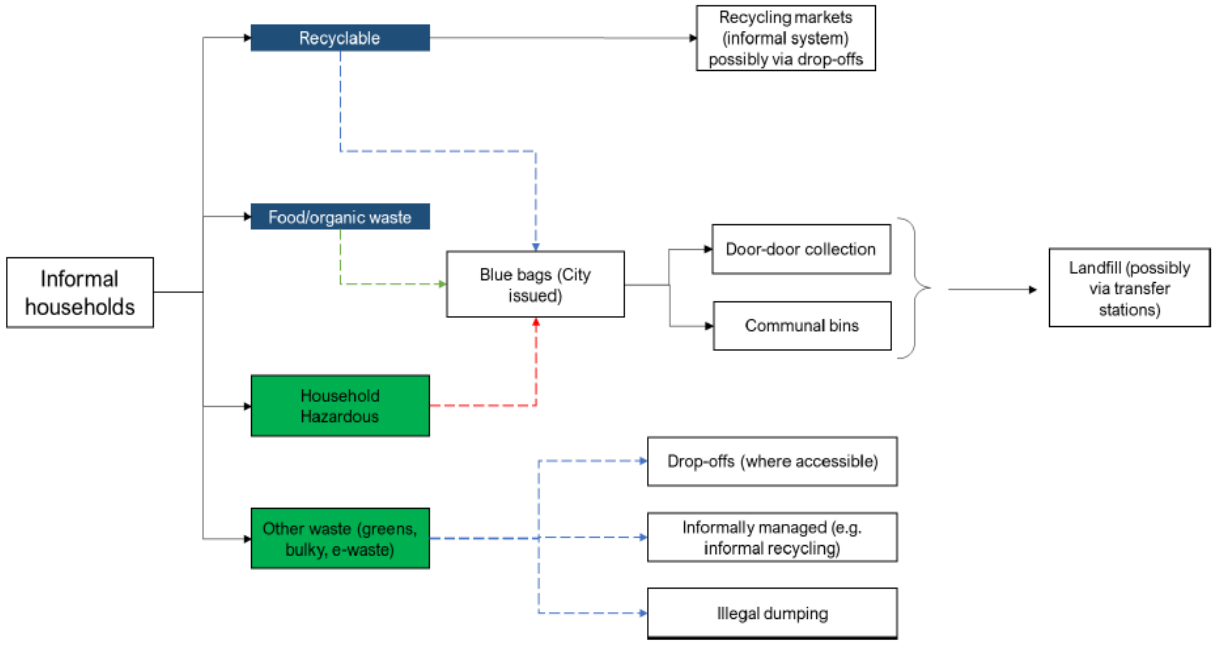


Figure 22: Cleansing informal household process

Drop-offs

The purpose of Drop-offs is to provide a self-service to residents for the disposal of bulky general waste and other waste streams such as garden refuse, builders' rubble and recyclables.

Some drop-offs also accept "garage waste", but only Athlone and Bellville drop-off facilities accept household hazardous waste.

Sorting of waste (into the various streams accepted at each drop-off) prior to arrival at a drop-off aids in the efficient operation of the facility. The public is therefore encouraged to do this beforehand, or upon arrival with assistance from drop-off staff. Vehicle and/or trailer capacity may not exceed 1.5 tonnes and a maximum of three loads per day per vehicle is allowed. The drop-offs' model focuses on enabling waste beneficiation through diversion of waste from landfill. The City contracts services from the private sector for chipping of green waste (and hauling to a composting facility), sorting and separation of recyclable waste and haulage of residual waste (not able to be beneficiated by the previous contractors) to landfill.

Presently there is a 7km radius coverage standard for waste drop-off facilities throughout the City, however the strategy is to change the coverage to a 3km radius as there is a demand for drop offs to be closer to communities, with prioritisation in low income and informal areas. Improving the coverage would require additional drop-offs to be implemented in areas such as Philippi, Mitchells Plain, Khayelitsha, Bellville and Durbanville.

Disposal branch facilities

Approximately 60% of waste is managed in the Athlone, Bellville and Swartklip catchment areas. These areas form part of the City's Urban Inner Core, where land use intensification (e.g. TOD) or diversification will be prioritised. The areas comprise of many informal settlement and low-income areas. MRFs, additional drop off facilities, buy back centres, partnerships with Buy-Back Centres (BBC)/private recycling collection companies and other waste minimisation initiatives may be required in these areas to accommodate anticipated waste growth due to land use densification and consequent increase in population in these areas. The waste management areas and the estimated waste managed in these areas are shown in diagram below.

Disposals

The key disposal points in the City and associated flow of waste goes through three RTS and one IWMF facilities or go directly to the two landfill sites as shown in **Figure 23**. Vissershok landfill receives less waste directly (over its weighbridge) as compared to Coastal Park, but more waste is disposed of at Vissershok as all RTS waste is transported to Vissershok, which has the appropriate infrastructure and systems to manage the RTS containers.

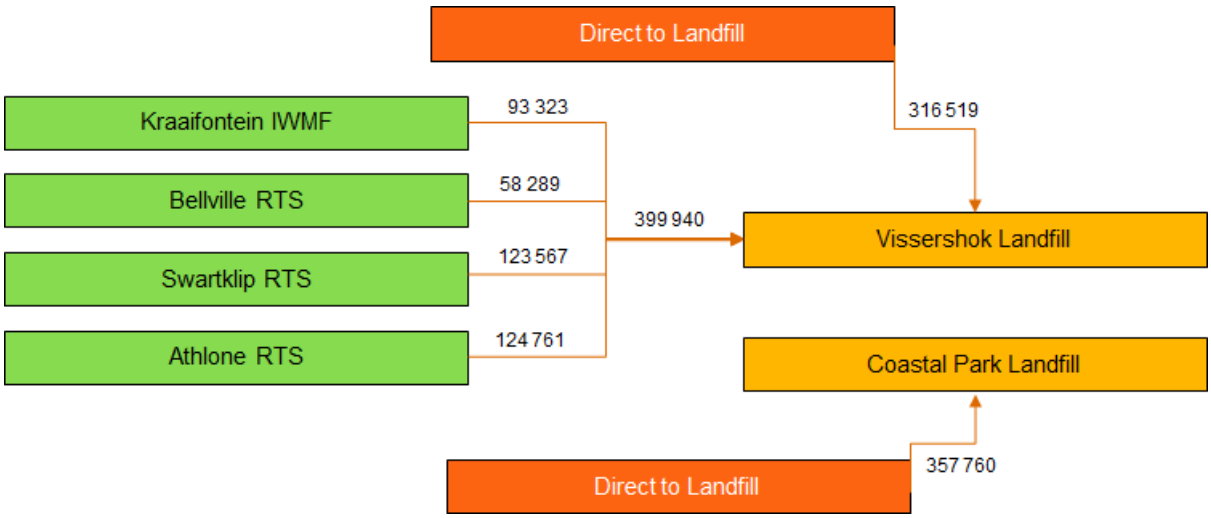


Figure 23: **Waste flows through the City's physical infrastructure 2018/19 financial year**

Urban Waste has an airspace challenge at the two-landfill sites with Coastal Park expected to reach capacity in 2026 and Vissershok Landfill to reach capacity in 2036. This scenario is based on CPK YOY ~ 10% growth airspace consumption growth and waste diversion measures. The interventions proposed by collections and drop offs and waste minimisation will have an effect of extending the life of these sites.

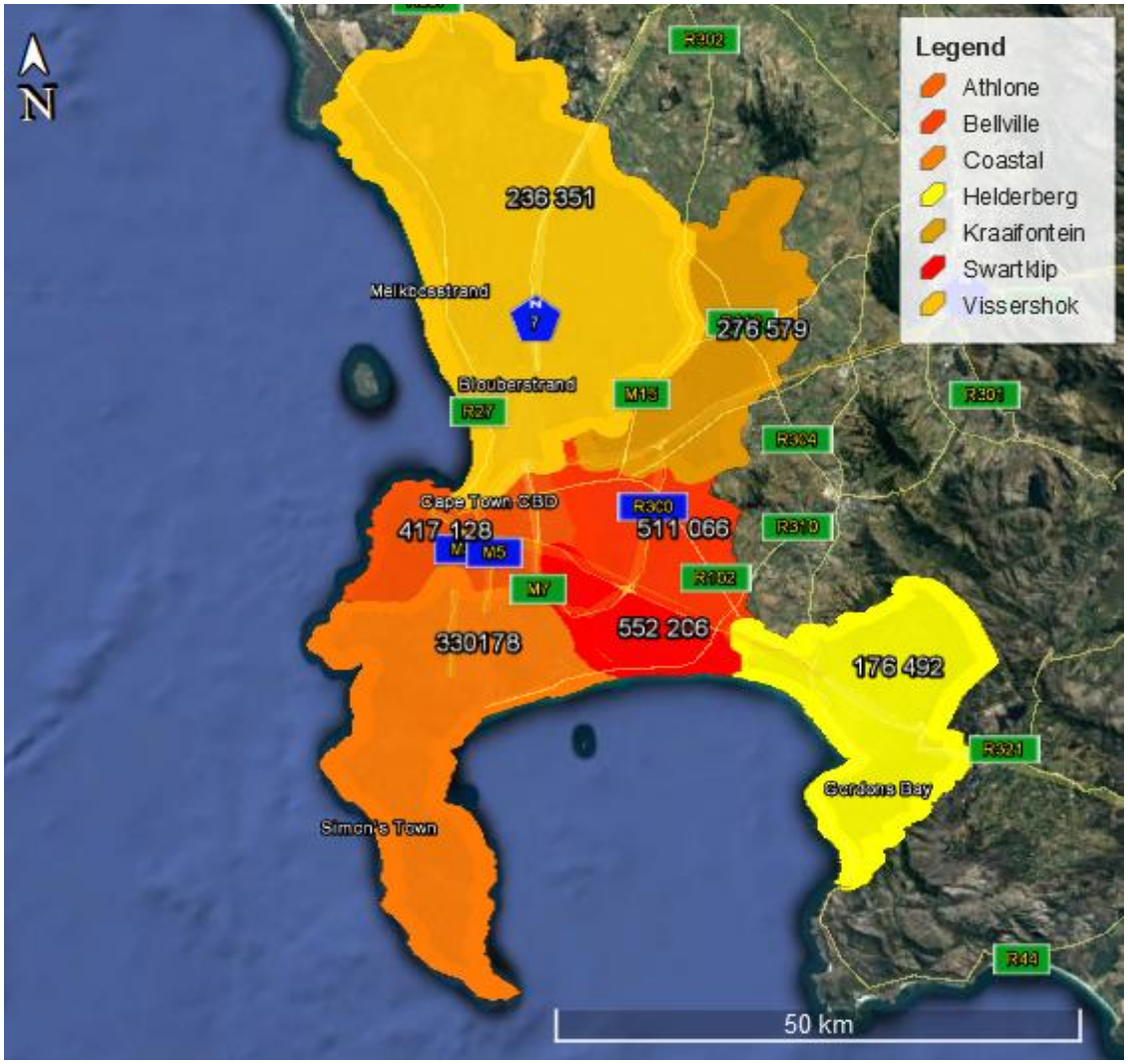


Figure 24 : Waste Management Areas

There are currently four Macro Refuse Transfer Stations (RTS);

- Athlone Refuse Transfer Station,
- Swartklip Refuse Transfer Station,
- Kraaifontein Waste Management Facility and
- Bellville Refuse Transfer Station

Another macro waste transfer station is planned for Helderberg and some integrated waste management functions are being planned for the existing Athlone facility.

The City currently has two landfill sites. One at Vissershok and one at Coastal Park. The last mentioned is approaching the end of its capacity. This facility will be replaced with a transfer facility and MRF similar to the KWMF set up.

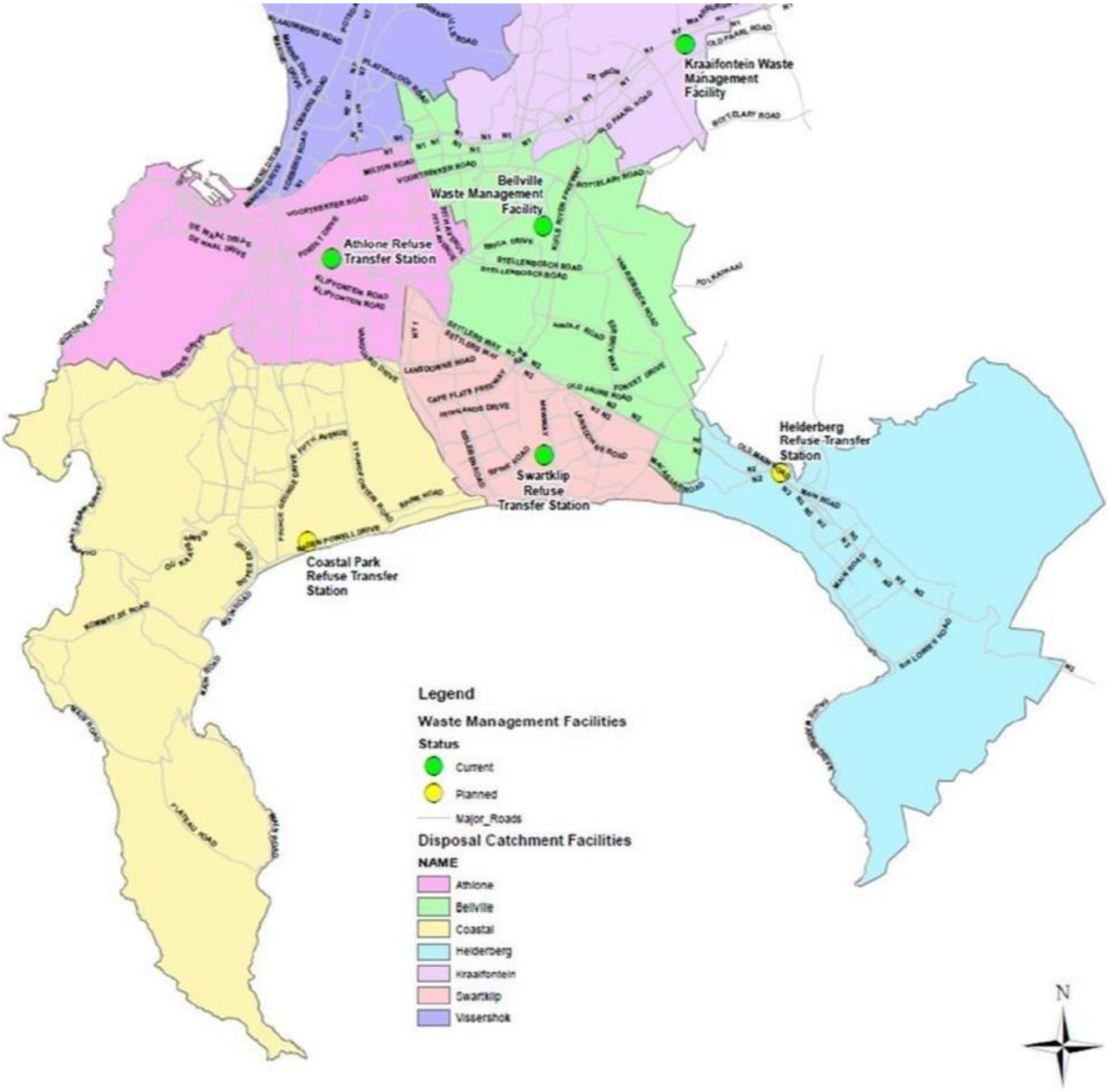


Figure 25: Catchment areas for the respective Transfer Stations in the City

Figure 26: Distribution of cleansing facilities across the city

Drop off facilities and Micro Waste Transfer Stations are used synonymously and are classified into two classes (levels) namely minor and major. Macro Transfer Stations (RTS) is a large facility where waste is compacted before going to landfill. The distinction between the two is based on the size of the station and the type of processing that takes place.

Waste Minimisation

Separate collection of recyclables

The city also provides a separate recyclable collection service to 22% of the formal households "Think Twice" separation at source (S@S) programme as part of its waste diversion strategy. Private contractors collect co-mingled recyclable waste on a weekly basis. The City traditionally provided clear plastic bags to households that receive the service but now issue 140L "green lid" bins to households in new service areas. The City has started the process of converting the collection frequency from weekly to fortnightly (currently more than 100 000 households receive a fortnightly collection service), as per Strategic Deliverable 8, in response to trials indicating that fortnightly collection will be more cost effective.

Informal collection of recyclables

Swop shop

Although a separate collection of recyclables is not currently offered in informal areas, the City's Swop Shop Trailer, which was trialled in 2020, now services various informal areas weekly, resulting in a tangible incentive for communities to sort their recyclable waste. Residents swop their recyclable waste for vouchers, to be redeemed for items in the City's custom branded swop shop (pictures available). The swop shop is currently operational in Harare, Delft, Imizamo Yethu and Nomzamo, with plans to construct additional trailers and expand the service to additional areas.

Organic waste separation by/from fruit and vegetable traders

Following various trials, the separate collection of organic waste from fruit and vegetable traders is being expanded, both in various PTI/Trading areas, namely Bellville, Wynberg, Mitchellsplain, Cape Town and Epping, as well as as Langa. Ongoing collection of tonnage and consting data is strengthening the business model to further expand this service.

The following are key cross cutting functions and activities for Urban Waste Directorate. A waste minimisation action plan, bringing together roles and responsibility from all role-players in urban waste management, is being developed.

Waste Minimisation

NWMS waste diversion targets

- Increase the roll-out of "think Twice" dry waste collection services to 180 000 households in the next 5 years - the Coastal Park Materials Recovery Facility is being constructed (to be completed in 2024), which should facilitate the expansion of this service to approximately 100 000 additional service points, some of which are blocks of flats. In addition, the above Woodstock and Prince George Drive catchment areas should facilitate an additional 15 000 households. The kraaifontein catchment will also be expanded.
- Make use of both decentralised and centralised facilities (including drop-offs) to maximise diverted organics and packaging waste. Various trials are being undertaken to understand different business models for organic waste diversion, as well as comparative costing. This will inform the business models to be adopted. Packaging waste sorting is already done at both

MRFs and Drop-offs, and this will be expanded.

- Maximise green waste diversion, chipping, composting and or processing
- Maximise builder's rubble crushing and reuse (departmentally or externally)
- To in collaboration with City departments and external stakeholders develop and implement a Circular Economy Action Plan (cross cutting intervention in the City) and ensure aggressive communication and marketing campaigns to champion circular economy to effect behaviour change to achieve waste avoidance behaviour change in Cape Town - This action is pending a corporate City decision to move forward with such a cross cutting CE Action Plan. Such a decision has not yet materialised.

Waste pickers / SMME's / Job creation and PRO Engagement/Partnership in terms of new Extended Producer Responsibility Regulations

- Amend UWM regulatory instruments to allow unrestricted, but regulated access to certain waste streams
- As required by the National Waste Management Strategy and Extended Producer Responsibility Regulations, engage and partner with various stakeholders in terms of new business models for separation at source of packaging waste, including the Producer Responsibility Organisations, and the formal and informal recycling industry (including waste pickers), to integrate separation at source systems.

Climate change / circular economy

- Implement the strategy of accelerated accreditation of waste service providers to meet the NWMS waste diversion targets
- Increase the roll-out of "think Twice" dry waste collection services to 180 000 households in the next 5 years
- Make use of both decentralised and centralised facilities (including drop-offs) to maximise diverted organics and packaging waste.
- Maximise green waste diversion, chipping, composting and or processing
- Maximise builder's rubble crushing and reuse (departmentally or externally)

- To collaborate with City departments and external stakeholders develop and implement a Circular Economy Action Plan (cross cutting intervention in the City) and ensure aggressive communication and marketing campaigns to champion circular economy to effect behaviour change to achieve waste avoidance behaviour change in Cape Town

Waste pickers / SMME's / Job creation

- Amend SWM regulatory instruments to allow unrestricted, but regulated access to certain waste streams

Public Awareness and Education

It was realised that we need various approaches/ interventions that are tailor to the real time issues and in particular those communities in question. On the other hand, time has also shown that the current state of the City, the cleanliness, people's ownership, responsibility toward their own environment has taken a back seat, being not important and also not critical as dire issues such as housing, having food on the table and having a job are more essential than waste.

Therefore bringing the culture of ownership, responsibility, pride and care back to our immediate environment- our communities; our society will require more sustainable integrated waste management approach.

Operational Programmes include the following:

- Overall litter and illegal dumping awareness and avoidance.
- Encourage people participation in the use of solid waste services and infrastructure with the purpose to avoid illegal dumping.
- Create awareness on other recovery infrastructure resources available to encourage waste avoidance with the emphasis on the landfill lifespan available.
- Create indirect benefits through capacity building waste training such as community's entrepreneurship seeing waste as an opportunity.
- Using repetitive messaging to change behaviour and instil compliance.
    - Leverage from digital and traditional means to communicate about waste that will support waste avoidance and waste minimisation.
    - The use of data and research for waste awareness and education programmes using the theoretical process to underpin the Public Awareness and Education practices.
    - To foster and to continue building relations with various stakeholders as a base to build effective approaches to waste avoidance, waste minimisation, Compliance and to use environmental partnerships as an approach for environmental improvements.

Engineering Asset Management (EAM)

Table 39 : Technical services strategic response

Strategic Response	Description	Benefit
All information on digital Enterprise Asset Management (EAM) system (currently SAP)	All information, including: ● Master data ● Transactional data ● Usage data ● Decommissioning data Creating a "digital twin" in the Enterprise Asset Management (EAM) system (currently SAP) in order to accurately track and manage the lifecycle of assets.	All asset information and history are located at a central point. This makes analysis and management of the asset lifecycle easier as well as storing information that can impact future decision-making.
Customised Asset Care Plans for each equipment category.	Customised Asset Care Plans for each equipment category based on working environment and conditions. All Asset Care Plans to be programmed in the Enterprise Asset Management (EAM) system (currently SAP) to read and trigger work orders based on usage data fed into the system.	By customising the Asset Care Plans to our conditions and working environment, we ensure that we get the optimum working life from the equipment. By having all Asset Care Plans on SAP we ensure that the plans are executed and it will also assist in future budget planning for repairs and maintenance.
Building in-house capacity to take over the Asset Care Centre from Consultants	Appointing resources permanently that will take over all tasks related to the Asset Care Centre service that has been executed by Pragma.	Building in-house capacity and capabilities will ensure that gains made during consultancy is carried forward and Asset Management becomes a focus-area in SWM.
Holding long lead-time / critical spares	Keeping a minimum stock of long lead-time and/or critical spare parts for assets in stores.	By holding long lead-time / critical spares, the downtime of assets are reduced (better availability).

Operator Asset Care programmes	Involving Operators as the first line of Asset Care and Maintenance.	Involving the operators in the Asset Care programmes as the first line, we ensure that our assets are properly maintained, but it also assists in ensuring that the asset is properly operated. In turn, a reduction in breakdowns (better availability & reliability) should occur. This has a direct financial and operational impact.
Term tenders for maintenance of equipment	Ensure that term tenders are in place for all types of repairs and maintenance for all asset categories. Consider Section 33 tenders to enable implementation and feasibility of Public Private Partnership (PPP) workshops.	Tenders are the preferred procurement method and will alleviate current procurement challenges experienced. It would also ensure that Vendors buy into and are held accountable to a standard contract.

14.2 Support functions

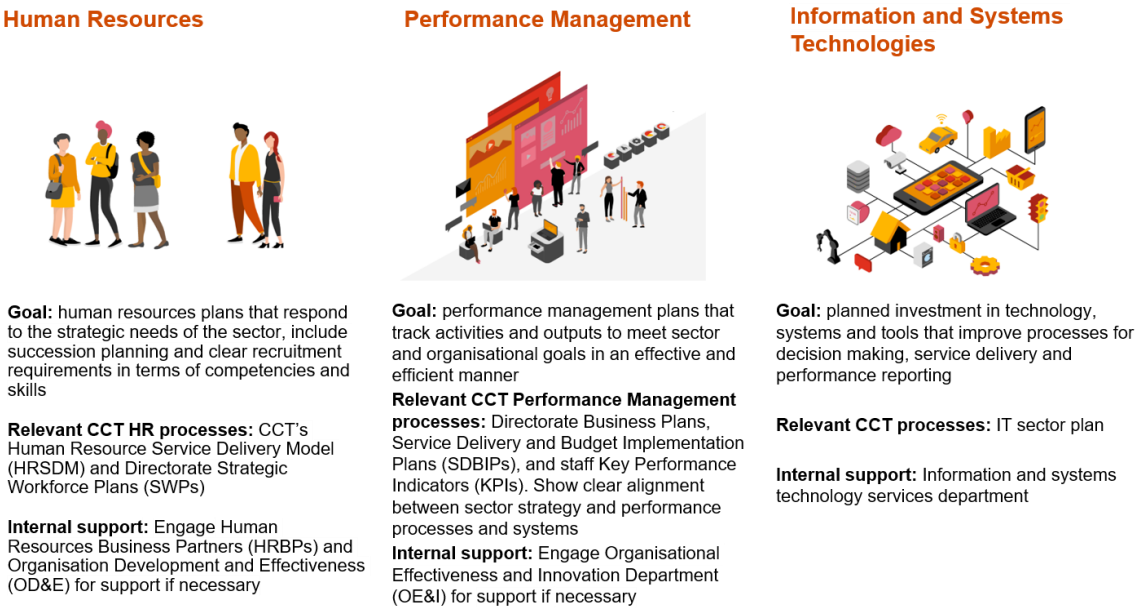


Figure 27: Summary of Core Operations Information Requirements

14.2.1 Human Resource plan

Introduction and high level strategic linkages

The CCT Urban Waste Management HR Plan find its mandate in the agreed strategic intent of "*Build an efficient, effective, future-focused and sustainable waste utility - Develop an agile workforce with requisite skills for a wider range of business processes*".

As such it needs to reflect a Human Resources / Organisational Development response in support of -

(i) Giving effect to and aligning to the organisational strategic objectives (as detailed in the Integrated Development Plan and related documents and plans)
(ii) Executing its constitutional, legislative and statutory mandates,
(iii) Realising the approved departmental strategic intents, and
(iv) Addressing the service delivery operational realities.

The core purpose of waste management is often defined as "reducing and eliminating adverse impacts of waste materials on human health and the environment, to support economic development and superior quality of life". The achievement of this purpose is both vital to and enmeshed in the CCT strategies and initiatives to establish the City as "a destination of choice" and "a forward looking globally competitive business city", where the state of cleanliness and aesthetic appeal is of utmost importance. Accordingly, the strategic significance of Waste Management is evident in its direct linkage to the majority of the City's Integrated Development Plan (IDP) priorities, objectives and Programmes as discussed in (4.5)

In similar vein, the Local Government Municipal Systems Act defines a "basic municipal services" as meaning "a municipal service that is necessary to ensure an acceptable and reasonable quality of life and, if not provided, would endanger public health or safety or the environment.

The "essential" nature of Urban Waste Management is echoed in that in terms of Government Gazette No. 18276 of 12 September 1997 (Department of Labour Notice No.1216), specifically clause 2(e), the Essential Services Committee declared "the collection and disposal of refuse at a disposal site" as designated, and in terms of clause 2(f)), "the collection of refuse left unattended for 14 days or longer including domestic refuse and refuse on public roads and open spaces" as essential. The essential nature of Urban Waste Management Services significantly affects the organisation of human resources and execution of the Urban Waste Management mandate, especially during disasters and labour or service interruptions.

(i) Operational realities, representing service delivery constraints, have been identified through a series of Workforce Planning Workshops, discussions and engagements and will be expanded on in discussing the directorate's human capacity needs.

As-is analysis

A combination of engineering, scientific, professional, technical, management and core operational skills are harnessed towards ensuring that a clean and healthy environment is sustained and protected for the benefit of future generations.

The UWM Directorate is currently organised (as at January 2024) into 4 departments;

- Waste Services
- Public Empowerment & Development
- Integrated Planning & Waste Strategy and
- Finance & Capital Implementation.

The departments are supported by the Shared Services component consisting of 3 (three) units; Directorate Support Services, Project Management Office and Human Resources Business Partner. The high level organizational structure is illustrated in the figure 28 below.

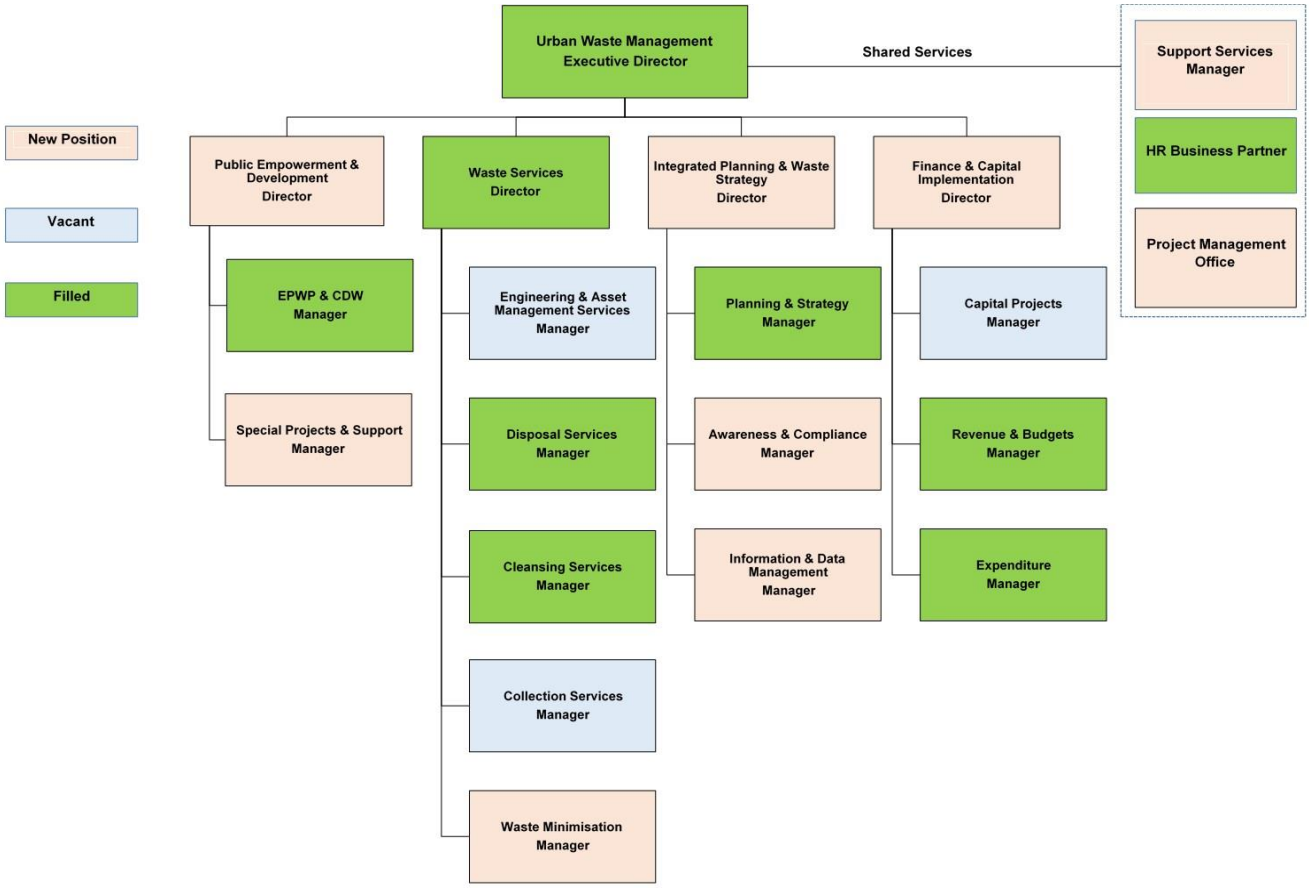


Figure 28: Urban Waste Management organogram

Vacancy Analysis

As at December 2023, the UWM directorate had 3348 filled positions and 267 vacant positions translating to a vacancy rate of 7.30%. Thus achieving the vacancy performance target of 10% as vacancies in the organization need to be managed and must not exceed 10%. The staff turnover is sitting at 5.53%. At the end of December 2023, directorate had 71 terminations. Number of appointed staff as at December 2023 (3348) per business unit.

Table 40: Permanent staff establishment

DIRECTORATE	NUMBER OF STAFF
Executive Director: UWM	2
Finance and Capital Implementation	39
HR Business Partner	9
Integrated Planning	74
Project Management Office	2
Public Empowerment & Development	33
Support Services	2
Waste Services	3187
GRAND TOTAL	**3348**

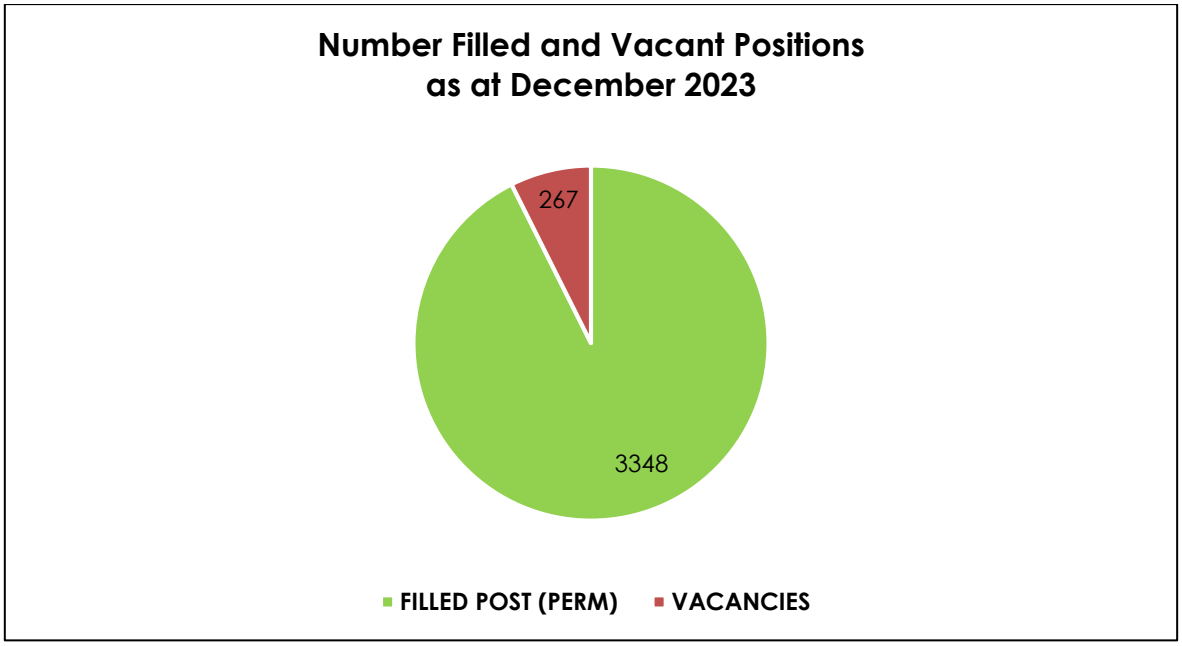


Figure 29: Number of filled and vacant positions

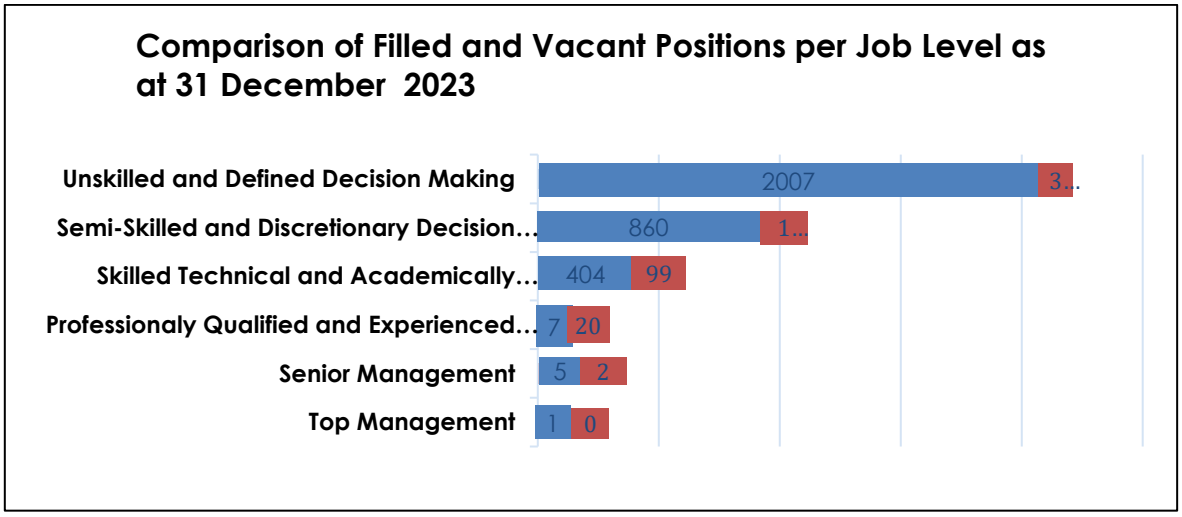


Figure 30: Comparison of filled and vacant positions per job level

Human capacity needs & constraints

Misalliance between staff resources and service demands

- Over the last 4 to 5 years, the total staff number of the current Waste Services department (and its forerunner SWM department) has remained relatively constant around +/- 3100 (excluding components currently linked to other departments within the new UWM directorate). Over the same period service demands, service points, expansion of the client base (due

to a myriad of factors including urbanisation, population, growth, new residential developments). The appropriate resourcing in combination with innovations and alternate methodologies requires implementation and would be justifiable in the context of the City strategic objective of "mainstreaming basic service delivery to informal settlements".

- This evident misalliance of human resource capacity with service demands led to an over reliance on temporary relief in the form of Expended Public Work Program resources and Temporary Employment Service (Labour Broker) staff. The numbers of these temporary resources point to a need to staff the department appropriately. Whilst especially the Cleansing and Collections branches are exploring innovations and alternatives, the need for additional resources seems to remain a reality.

- The Cleansing branch petitioned a work-study and determination of required resources to be conducted, to inform the efficient resourcing of the branch. Over reliance on temporary employment services does pose a risk to the Directorate and City. It also threatens the stability of the directorate in terms of skills and knowledge. Also comes with a cost of constantly training new staff members. In addition, the heavy reliance on Labour Broker staff needs to be reduced or phased out, in line with the City's resolve to this end and the inherent risk of not utilising Labour Broker resources for ad-hoc, justifiable, temporary purposes.

Organisational structure & alignment considerations

During the initial stages of the development of the Sector Plan, it was reiterated that the future structure of the directorate should be "fit for purpose". In addition, that it should adhere to the Corporate People Management Strategy principles of "Agility/Flexibility". To an extent, the requirement of "fit for purpose" has been supported through the establishment of the new Urban Waste Management directorate, with the objective of elevating and prioritising "basic services". This led to the split of the Water & Waste Directorate, with Water & Sanitation becoming a stand-alone directorate and Urban Waste Management and the Corporate EPWP & CDW department joining to form the Urban Waste Management directorate. Fit for purpose and "agility/flexibility" however require a people and resource response to business challenges, developments and constraints:

- In this regard, it has been motivated that the Waste Services will be entering a build phase, where there will be a strong reliance on engineering, contract management, project management and capital implementation skills requirements. Whilst a number of staff members with engineering qualifications are employed in the Capital Projects unit, the numbers are small and not in line with the significant number of capital implementation

projects that these staff members need to manage, leading to the limited critical staff resources being overburdened.

- The 2020 Sector plan requirement, that "Capital Implementation" needs to be prioritised, resourced and elevated institutionally, has been addressed through the closer alignment between Capital Projects and Finance & Commercial as well as the establishment of a new Project Management Office as part of the Shared Services component in the UWM directorate.
- Data analysis and information management has been accepted as critical in the strategic approach to the directorate, going forward and the need for relevant components to be integrated and ideally positioned structurally/institutionally to the benefit of the whole department has been confirmed. An organisational realignment exploration of especially the GIS/MIS, IT and OCC (Operations Command Centre) components has been formalised (in line with the objectives of the 2020 Sector plan) with the findings implemented and the appropriate structural positioning of these units concluded.
- Waste to energy initiatives (including Landfill Gas Harvesting) have been initiated and are almost exclusively dependent on external skills acquired via either outsourced arrangements and/or consultant support. The newly (2020) approved National Waste Management Strategy however guide that, firstly, municipal services should shift from focusing exclusively on collection and disposal of waste, to separation at source and waste beneficiation. Secondly, that technical capacity and innovation for beneficiation of waste (including Waste-to-Energy) be increased. As this seems to develop into an accepted municipal competency, there is a requirement to develop the inherent scientific skills within the department, to enable self-sufficiency in the medium to long term.
- Rapid Developments in the waste management sector and dictates in the National Waste Management Strategy (2020) necessitate the expansion of the department's Waste Minimisation mandate, approach and ideal organisational arrangement to cater for best-practice emerging Waste management trends and realities, including the institutionalisation of "Waste markets", "Creating a secondary resource economy", prudently increasing access to municipal infrastructure, giving effect to circular economy principles and initiatives and developing and structurally accommodating the knowledge, skills and competencies inherent to "liaison with industry" and "liaison with community stakeholders". The prioritisation and elevation of Waste Minimisation has been addressed through the establishment of "Waste Minimisation" as a stand-alone branch (with Waste Markets as one component) and closely aligned and positioned to the Waste Operation functionalities
- The strategies that are focusing on waste avoidance will rely significantly on achieving behaviour and attitude changes in stakeholders, including industry and community stakeholders. The development and acquisition of advanced communication, facilitation and interpersonal skills as part of

core waste management competencies are fast becoming a priority. The National Waste Management strategy accordingly advocates the need for "Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping, coupled with "compliance promotion and awareness" (clarified as being separate from "compliance and enforcement").

Emerging themes from strategic workforce plan engagements:

- Perfecting the balance between insourcing and outsourcing of service:
    - Mechanical Workshops and Maintenance (whilst to an extent impacted by announced/intended Corporate centralisation of Fleet and Workshops);
    - Gas-flaring at Landfill Sites;
    - Security Services
    - Fleet Management and Transport Logistics
- Safety of Staff in Operational Areas
- Customer requirements: All hours Service Culture requiring the extension of normal operational hours and necessitating the establishment of shift systems and formalised work schedule arrangements, to be consulted with trade unions and phased in.
- Working transversally with other City departments
- Leadership and Supervisory Skills
- Expanding Service Areas & Failing Contractors
- Traffic Congestion and Rail Services decay
- Flexible Work Arrangements (De Loitte 2018 survey – direct correlation between 1) diversity and loyalty and 2) flexibility and organisational commitment)
- Work on Public Holidays and Overtime Complications
- HR Strategic, Operational and Transactional aspects per HR Functional Areas
- City values, culture, work environment and staff morale are more and more impacting a business' ability to attract and retain key talent, and hence the business' ability to be competitive or deliver services at a high level. In this context, the periodic employee survey's requires prioritised attention and the emerging themes will be addressed.
- The feedback from Corporate Employee Wellness and ICAS (Employee Wellness Service Providers) points to Mental Health red flags increasing. Once again directly linked to how employees experience the context and culture in the directorate.

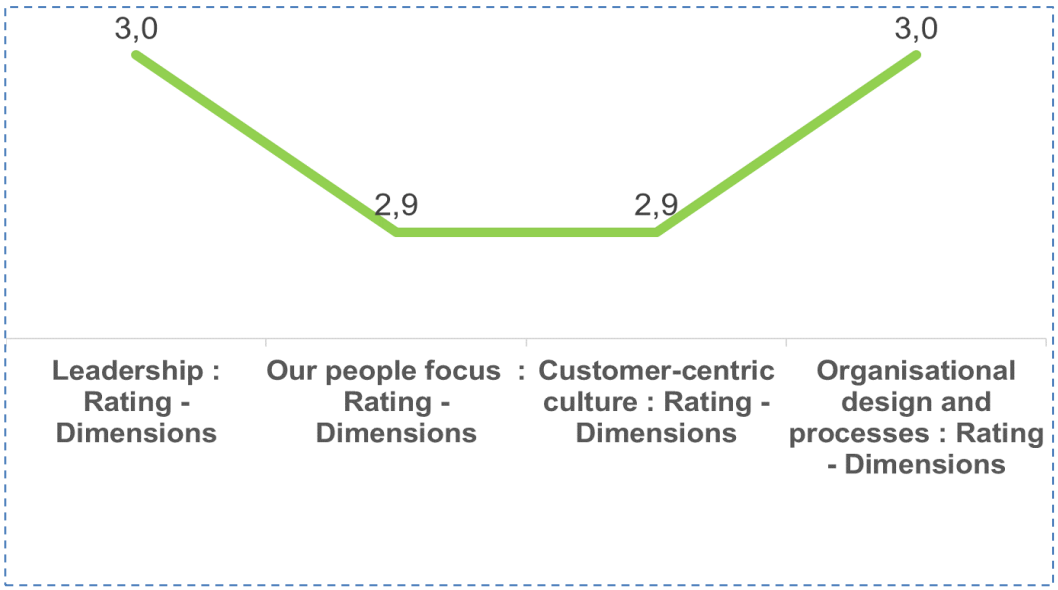


Figure 31: Average Score of Attributes

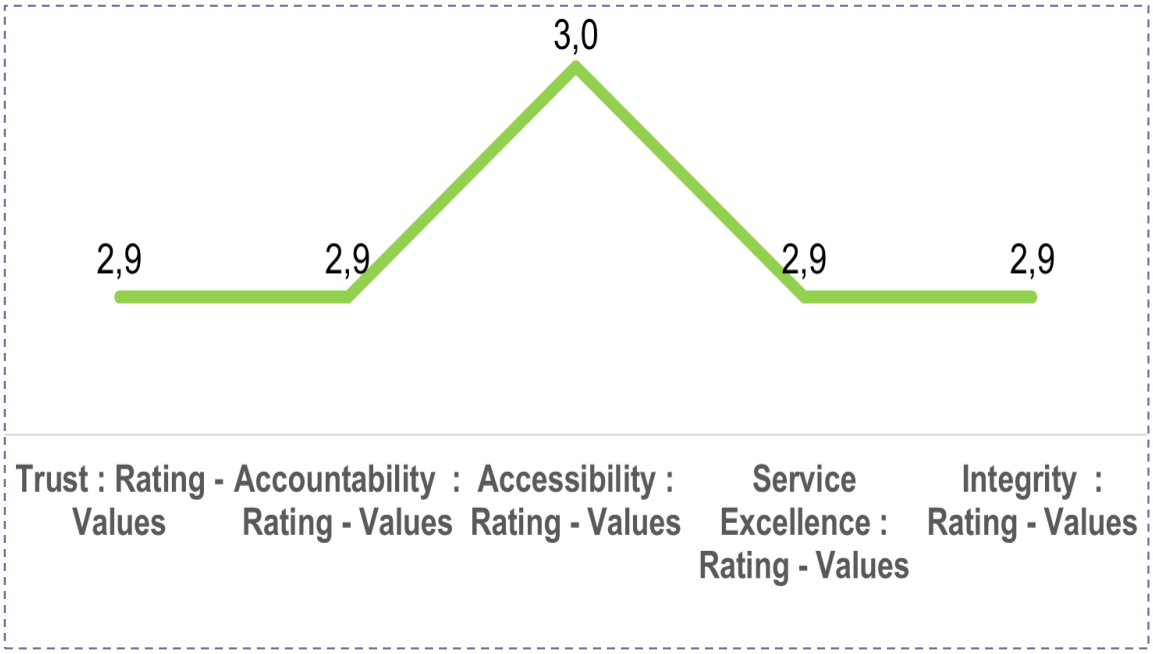
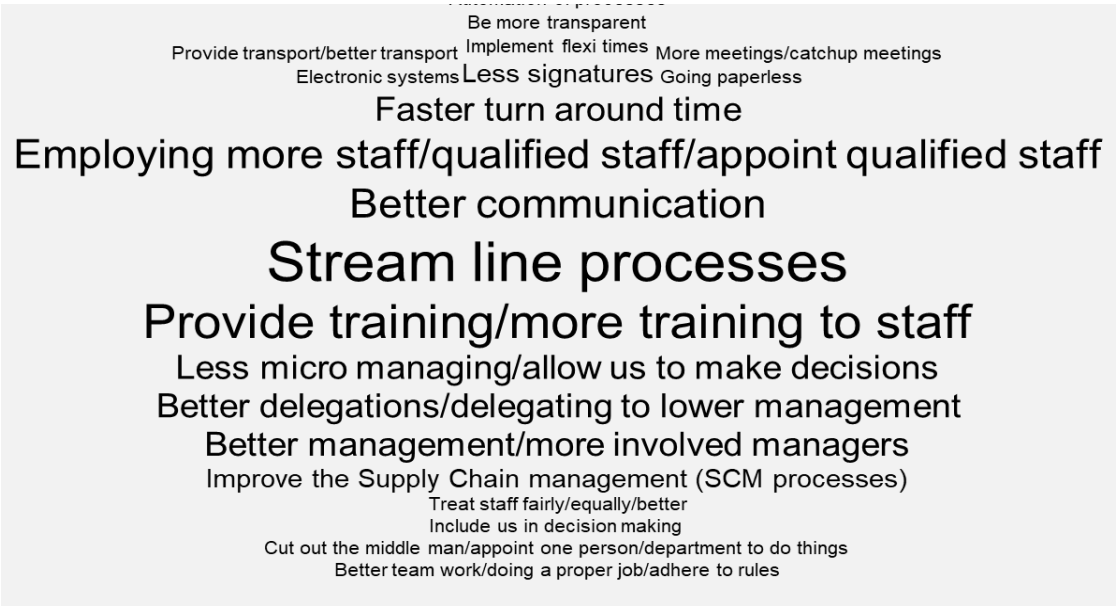


Figure 32: Average Score of Values

Considered "Red-Tape" by Employees:

Advice from Employees:



UWM People Strategy Objectives (subject to validation) to be driven:

Training

1. Target engineering, scientific and professional skills identified through the SWP and Sector Planning Processes as critical to realising the directorate strategy;

2. Continue the shift to Waste Management Core training, with critical and scarce skills being prioritised.
3. Entrenching technical literacy as a priority at all post levels;
4. Embedding Mentoring & Coaching as the norm within Urban Waste Management;
5. *Integrating* ETD as part of normal business, empowering supervisors to lead (through train-the-trainer initiatives), insourcing critical training components and embedding Learning Organisation guidelines within UWM department;
6. Ensure equitable coverage of all post levels in training opportunity distribution as per previous directives.
7. Approval of Bursary opportunities in line with UWM core business and critical need
8. Implementation of T14-and- above Personal Development Plans (PDP's) and Integration with TNA's
9. Implementation of T5-T13 PDP's and Integration with PDP's in conjunction with GIS, IT, BI units;
10. Emerging Waste Management Training in Line with 2020 National Waste Management Strategy requirements;
11. Investigate, report and draft a management plan linked to future certification requirements for Disposal Services staff;
12. The importance and strategic significance of professional exposure and networking via (amongst others) Waste Management related workshops, seminars and conferences be reflected in strategy and lobbied at Corporate.
13. ECSA path to PrTech and PrEng Registration/Certification be consolidated and formalised in support of strategic skills development, professionalization of Waste Management Services and Retention of critical Staff;
14. The current significant investment in Adult Education & Training (AET), representing a national and organisational priority, be continued;
15. Leadership capabilities and relevant Practical Supervision to represent a priority inclusion in WSP.

Recruitment and Selection

1. Review and update fast-tracking mechanisms for Recruitment & Selection and the "Filling of Vacancies" action plan;
2. Formalise the agreed alternate staffing mechanisms for Drivers;
3. Resource and Investigate alternatives to the utilisation of Labour Brokers (considering various union and national drives to limit or outlaw use);
4. Enhance the quality of appointments through the promotion and implementation of Fit-for-purpose best practice methodologies;
5. Introduce a service level agreement between corporate HR and HRBP office on filling of vacancies

6. Focus on reducing the vacancy age by monitoring and reducing the vacancy time to fill rate

Labour Relations

1. Formalise an integrated strategy to (1) enhance supervisors' practical skills in handling labour-related matters and (2) reduce the number of disciplinary finding reversals.
2. Track and Monitor the initiation and conclusion of disciplinary matters to ensure that they are resolved in time.

Individual Performance Management

1. Link T14-and-above IPM deliverables to key UWM and SDBIP focus areas, Set appropriate targets, and align competency data.
2. Fine-tune T10-T13 IPM implementation and prepare for roll out to all other job categories
3. Commence implementation of fit-for-purpose best practice methodologies
4. Training and planning of IPM roll out for Non PC users

SDBIP-related HR objectives

1. Develop an integrated Absenteeism Management Plan,
2. Develop an integrated Overtime Management Plan, consult with UWM Management Team and implement major aspects.
3. Monitor and ensure full compliance with OHS agreement.
4. Align existing Succession Plan framework with Corporate Succession Plan and finalise specific plans for the priority critical & scarce positions

Reward and Recognition

1. Formulation and Implementation of a UWM Reward and Recognition Action Plan (and progress towards continuous recognition)
2. Raise awareness as well as identify & implement initiatives to actively support the values, norms and behavioural standards contained in the Municipal Systems Act, Employment Equity Act, Code of Conduct and CoGTA guidelines.
3. Improve staff engagement as a measure of Staff Motivation / productivity by addressing the Pulse Survey indicators and also (a) "Treat employees as most important asset", (b) "Assign right number of people to get job done", (c) "Provide process for feedback and ideas", (d) "Ask for ideas", (e) "Public recognition" and (f) "Communicate considering feelings".
4. Support the attraction and retention of staff by addressing key staff retention benchmark indicators (including lack of autonomy & respect,

lack of professional development program, lack of recognition, health problems and job burnout, poor leadership and management relationships, transportation expenses, challenging job roles, desire to pursue new/different career).

5. Continuously Conduct exit interviews with staff in critical and scarce positions and address staff retention aspects identified.
6. Continued roll-out of the Employee Wellness projects including HIV/Aids, Tuberculosis, Substance Abuse, Stress Management and Life Skills for lower occupational levels.

Equity and Diversity

1. Monitor the compliance with EE targets; manage areas of over and under representation, special focus on representivity of women in management level and persons with disabilities at all level positions.
2. Implementing measures removing equity barriers and discriminatory practices (including nepotism, favouritism and unfair discrimination in HR processes and the work environment).
3. Address sexual harassment and reported gender intolerance/discrimination especially amongst operational staff.

14.2.2 Performance management

The following key legal and other guidelines govern the Urban Waste Management Department, namely:

- Section 20 (1) Operations or Operations-to-Closure Permits in terms of the Environment Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management: Waste Management Act, Act 58 of 2009 (NEMWA)
- Record of Decision in terms of section 21, 22 and 26 as well as listed activity (No 8) in terms of the EIA regulations promulgated in terms of the Environment Conservation Act, 1989 (Act 73 of 1989)
- Amendments by DWAF to the section 20 (1) Permit in terms of the Environmental Conservation Act, 1989 (Act 73 of 1989)
- Status Quo Reporting in the quarterly external audit by Naude Associates
- In-house standards
- Special projects such as the HG air disposal study requested by the Morningside
- Residents Monitoring Committee
- Other studies or guidelines may occur from time to time.

Waste management facilities operated by the CCT are monitored for the following:

- Waste types, waste volumes/mass

- Groundwater quality and management (except for ARTS), groundwater trends, leachate quality and management, surface water quality and management
- Biogas monitoring, air analysis (where required)
- Health of workers, reporting of incidents, annual figures to DWAF
- Continuation of first aid training and stock, continuation of fire register upkeep, stock and usage of personal protective clothing
- Management of contractors employing salvage workers (where required), other compliance requirements in the said permit and RoD, construction and engineering operations in the DWAF approved permit, monitoring of FFS audit compliances by the ROSE Foundation and other parameters when required.

14.2.3 Action on Culture surveys

Develop an action plan to address areas of improvement in line with latest city pulse survey results. Engage employees in order to improve the participation rate in the culture survey.

Table 41: Latest city pulse survey results

Lowest rated attributes according to the Pulse survey	
Dimension Statement	**Score**
The City of Cape Town provides sufficient flexibility to help employees balance the demands of work and personal life.	**3.1**
My line manager regularly provides me with feedback about my performance	**3.0**
Policies are applied in the same way to all staff	**3.0**

The following SDBIP-related HR Objectives have been identified.

- Develop an integrated Absenteeism Management Plan with the aim of increasing staff availability in the directorate
- Develop an integrated Overtime Management Plan, to reduce overtime expenditure and health and safety risks associated with excessive overtime.
- Monitor and ensure full compliance with the OHS agreement.
- Compile and Finalise the directorates strategic workforce plan in line with service delivery priorities.
- Align existing Succession Plan framework with Corporate Succession Plan and finalise specific plans for the priority critical & scarce positions

- Develop an intergrated plan for training, absorption and retention of critical skills in the directorate
- Link T14-and-above IPM deliverables to key waste management focus areas, set appropriate targets, and align competency data.
- Complete preparations for IPM roll out at all levels
- Commence implementation of fit-for-purpose best practice methodologies.

14.3 Systems and Data

The UWM Data and IT management unit focussing on:

- Geographic Information Services – spatial enablement and integration of business information through spatial applications.
- Business Information Services – manage the development of integrated information platforms cross cutting SWM departments, other City departments and external stakeholders.
- Knowledge Management Services – development of platforms to improve data accessibility and sharing of information within the department.
- Statistical and Compliance Reporting – manage reporting to different stakeholders as per legislative requirements.
- Project Management – manage the development of systems/applications to improve data management.
- Technology procurement - manage the procurement of hardware and services through Corporate IS&T department bulk tenders.

The unit's key performance areas and indicators are associated with:

- Development and implementation of Urban Waste Management Information Services (statistical, business, operational and spatial);
- Development, implementation and maintenance of Urban Waste Geographic Information Services;
- Development and implementation of Urban Waste Knowledge Management Methodologies;
- Establishment of effective reporting structures and lines on Urban Waste Directorate's strategic and operational information;
- Enablement of UWM departments to take ownership of their data, by managing the development of systems, processes, standard operating procedures and integration to improve monitoring of service delivering, the reporting there of, and support future scenario planning.
- The procurement, management and maintenance of:
    - Hardware and software procurement
    - Maintenance of IT infrastructure
    - Development of IT systems based on business requirements
    - Project management of IT related programs

- Development of standards, processes and guidelines for the UWM department
- Development of databases based on business requirements
- Maintenance of the departments weighbridge hardware, database and reporting
- Research on new technologies
- CCTV management
- SCADA management

The overall data maturity of UWM is inconsistent, with the existence of pockets of excellence, while other parts have very low levels of data maturity. This presents a challenge in terms of the availability and usefulness of data for decision-making as when good and bad quality data is used together, the result may be based on the lowest denominator making it unreliable. There is an urgent need to enhance UWM's data maturity levels in order to support UWM to become a data and evidence-led organisation. The UWM straddles levels 1 & 2 on the Data Maturity Progression Model as defined in the TDA Data Management Strategy.

UWM has developed a data and information framework in support of the City's Data Strategy, supported by an operational plan containing the deliverables to be implemented over the next 5 years. The framework has the following application:

- Applies to all explicit data and information unless specified otherwise.
- Applies to all permanent and non-permanent employees of the City.
- Applies to all UWM branches.
- Strategic information – broad based and mixture of information gathered from both internal and external sources.
- Tactical information – mostly internal information with fewer external sources being used.
- Operational information based on tactical information.
- Unstructured information.

The data management plan will amongst other things give a clear direction on how to manage data and information within UWM and facilitate the identification of clear roles and responsibilities within line departments, and also for the departments to take ownership of their information and data (data custodianship/ stewardship). All branches within UWM are obliged to give effect to the City Data Management Strategy. Hence the Urban Waste Management Team (UWMT) established the working team to coordinate and facilitate the Implementation plan. The working team will provide oversight and direction for the strategic management and sharing of data and information within UWM.

14.4 Operational Programmes

Operating impact of new proposed projects over the next 5 financial years for waste management facilities over the next 10 years

Table 41 depicts a list of projects that were budgeted for operating impact when looking at the long-term financial plan. The existing sites already have operating budgets, so no additional funding is required

Table 42: Operating impact of CAPEX projects

Project Description	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
ARTS: Material Recovery Facility / MBT	-	-	-	-	12 224 520
Coastal Park:Design and develop (MRF)	-	10 584 000	7 386 750	2 976 750	-
Construction of CBRF - Fisantekraal D/O	-	2 650 979	979 020	-	-
Construction of Workshop - Vissershok	-	-	10 000 000	-	-
De Grendel Drop-off Upgrade Waste Min	3 871 449	2 823 450	-	4 452 166	3 246 968
Killarney Drop-off Upgrade Waste Min	-	-	-	-	4 645 739
New Prince George Drop-off	7 883 794	3 696 000	-	-	-
Grand Total	**11 755 243**	**19 754 429**	**18 365 770**	**7 428 916**	**20 117 226**

Operating programmes per service area

The main operational programmes within Urban Waste are linked to three main functions namely, Collection, Cleansing & Disposal.

Cleansing Programmes

The Cleansing branch has a number of operational programmes that require top-up services during specific periods, and these have been identified as;

- The **Winter Preparedness Programme** which encompasses an increased top-up cleaning service in leafy and sandy areas to avoid stormwater blockages and flooding and covers the period from May to the end of September of the same year.

- The **Festive Season Programme** entails an increased top-up cleaning service for beaches, scenic routes and business areas and covers the period from October to the end of April of the following year.

- The winter and Festive Programmes are in the process of being integrated into one single service, namely the Provision of Waste Management Cleansing Services for Annual Seasonal Programmes, which will be implemented from 01 July.

- Additional operational projects and programmes include the **Mayoral Clean-Up Campaign**, **Ward allocation projects** as well as the **Mayor's Visible Service Acceleration (MVSA) Programme**

- The Rapid Response Programme for FY23/24 has again received funding from National Treasury to the amount of R51 million rand to assist in upscaling and delivering public employment. The aim is to eradicate the scourge of illegal dumping with specific focus on behavioural change and provision of alternatives to residents.

Waste minimisation Programmes

- Provide infrastructure for both separation at-source and end-of-stream interventions. This will support small business development by providing opportunities for SMMEs.

- Investigate and increase collection at source services (organic waste, packaging waste recyclables), through a combination of commercial contracts, business initiatives (EPR), entrepreneurs, waste pickers and SMME's
  (Pilot Projects).

Compliance and enforcement of IWM Bylaw

- Accelerate the accreditation of waste service providers to compel the private sector to report waste diversion figures. UWM cannot reach the NWMS waste diversion targets without private sector diversion.
- The EPWP Auxiliary By Law Enforcement project
    - Recruit unemployed youth and train them as peace officer's before deploying them into the field.
    - The project started in 2022 recruited approximately 90 unemployed youth between 2022-2024.

14.5 Institutional

Institutional Arrangements

Touchpoints between the Urban Waste sector plan and other sector plans

- The MSDF and City Population growth projections as a general service demand planning tool.
- Human Settlements Policy, recorded trends in Informal Settlement growth, and informal establishment of informal settlement areas.
- Strategic and resilience planning supported by management information, operational data, statistical analyses, trends and demand assessments.
- Technology changes, change management, organisational review, and skills development.

CHAPTER 15

15. ASSET MANAGEMENT

i. Urban Waste fixed assets,

The table below provides a summary of all Urban Waste Management fixed assets (Land and buildings). An estimated R 1 Billion, 236 Million is the book value of the Urban Waste Management Directorate's fixed assets. Despite the varying remaining useful lives of the various asset classes, it is worth noting that all three landfills collectively have remaining airspace of fourteen years. Detailed description of assets detailing asset location, Current value, financial value and other related information is attached as an annexure to this report.

Table 43: Urban Waste fixed assets

Remaining useful life/ Category	No of Assets	Acquis.val.	Accum.dep.	Book val.
CARPORTS	**7**	**1 640 018.27**	**- 92 573.17**	**1 547 445.10**
45-50	7	1 640 018.27	- 92 573.17	1 547 445.10
DROP-OFFS/ TIP SITES	**20**	**240 098 189.42**	**- 23 235 289.36**	**216 862 900.06**
10-14	7	79 153 302.82	- 11 308 269.18	67 845 033.64
15-19	3	2 093 500.76	- 519 858.66	1 573 642.10
20-24	3	51 468 983.92	- 5 833 840.79	45 635 143.13
25-29	6	21 373 051.09	- 2 706 342.37	18 666 708.72
30-34	1	86 009 350.83	- 2 866 978.36	83 142 372.47
DROP-OFFS/ TIP SITES - DISPOSAL	**4**	**74 111 224.29**	**- 54 651 191.14**	**19 460 033.15**
0-4	1	60 333 917.68	- 51 352 884.72	8 981 032.96
10-14	1	897 915.50	- 538 749.32	359 166.18
15-19	1	163 600.00	- 68 884.20	94 715.80
20-24	1	12 715 791.11	- 2 690 672.90	10 025 118.21
LANDFILLS	**3**	**1 006 417 107.83**	**- 610 179 454.77**	**396 237 653.06**
0-4	3	1 006 417 107.83	- 610 179 454.77	396 237 653.06
OFFICES	**52**	**30 235 231.94**	**- 7 091 115.44**	**23 144 116.50**
10-14	1	146 532.88	- 83 035.31	63 497.57
25-29	14	3 257 216.32	- 2 180 861.81	1 076 354.51
30-34	26	3 873 871.53	- 1 962 513.39	1 911 358.14
35-39	9	14 259 680.34	- 2 140 287.53	12 119 392.81
40-44	1	238 190.86	- 47 638.20	190 552.66
45-50	1	8 459 740.01	- 676 779.20	7 782 960.81
OPEN LAND/ERF	**4**	**5 536 598.55**	**-**	**5 536 598.55**
0-4	4	5 536 598.55	-	5 536 598.55

OTHER WASTE FACILITIES	**13**	**476 844 490.47**	**- 155 012 932.65**	**321 831 557.82**
5-9	1	2 143.94	- 1 616.70	527.24
10-14	6	20 098 144.87	- 8 685 796.99	11 412 347.88
15-19	4	217 153 192.95	- 86 442 636.29	130 710 556.66
20-24	2	239 591 008.71	- 59 882 882.67	179 708 126.04
STORE ROOM	**4**	**4 715 545.60**	**- 741 024.48**	**3 974 521.12**
25-29	2	422 891.99	- 287 734.01	135 157.98
40-44	1	376 948.08	- 60 311.68	316 636.40
45-50	1	3 915 705.53	- 392 978.79	3 522 726.74
WORKSHOPS/DEPOTS	**30**	**268 204 921.08**	**- 39 377 211.58**	**228 827 709.50**
15-19	1	5 301 654.49	- 1 861 105.08	3 440 549.41
25-29	4	32 707 237.35	- 13 124 909.68	19 582 327.67
30-34	7	18 334 150.73	- 11 055 171.43	7 278 979.30
35-39	6	96 816 320.74	- 6 016 946.58	90 799 374.16
40-44	5	56 689 484.53	- 3 837 194.99	52 852 289.54
45-50	7	58 356 073.24	- 3 481 883.82	54 874 189.42
OTHER ASSETS		**49 882 008.92**	**- 31 269 632.40**	**18 612 376.52**
(blank)		49 882 008.92	- 31 269 632.40	18 612 376.52
Grand Total	**137**	**2 157 685 336.37**	**- 921 650 424.99**	**1 236 034 911.38**

ii. Plant and equipment (including vehicles):

A summary of fleet and equipment is indicated below. Detailed information of all plant and equipment is detailed in the annexure attached to this report. The yellow plant & equipment, as well as the yellow vehicles, are presented in this section. The Directorate owns approximately 1300 pieces of plant and equipment (including vehicles), valued at more than R643 million. It is estimated that more than 50% of refuse collectors for waste collection have a remaining useful life of less than one year.

Table 44: Plant and equipment

Remaining useful life/ Category	No of Assets	Acquis.val.	Accum.dep.	Book val.
LANDFILL COMPACTOR	**14**	**81 784 326.36**	**- 45 074 650.58**	**36 709 675.78**
0-1	4	17 427 672.40	- 16 809 292.40	618 380.00
2-3	3	11 209 500.00	- 10 371 321.05	838 178.95
6-7	2	14 656 921.49	- 7 879 284.36	6 777 637.13
8-9	4	30 037 989.47	- 9 329 899.19	20 708 090.28
12-13	1	8 452 243.00	- 684 853.58	7 767 389.42
LOCOMOTIVE	**1**	**2 750 000.00**	**- 1 650 321.63**	**1 099 678.37**
6-7	1	2 750 000.00	- 1 650 321.63	1 099 678.37
OTHER - Trucks	**135**	**88 205 668.85**	**- 57 581 187.30**	**30 624 481.55**
0-1	57	34 024 309.77	- 29 923 951.69	4 100 358.08

2-3	34	25 489 541.00	- 18 565 729.11	6 923 811.89
4-5	20	10 676 553.07	- 5 651 403.88	5 025 149.19
8-9	9	6 561 636.70	- 2 055 327.52	4 506 309.18
10-11	5	3 453 762.20	- 764 951.15	2 688 811.05
12-13	10	7 999 866.11	- 619 823.95	7 380 042.16
OTHER - Vehicles	**516**	**128 478 111.36**	**- 79 219 071.35**	**49 259 040.01**
0-1	259	45 417 857.34	- 38 188 367.34	7 229 490.00
2-3	88	22 453 518.41	- 15 203 180.26	7 250 338.15
4-5	119	43 718 229.98	- 21 886 344.10	21 831 885.88
6-7	46	16 888 505.63	- 3 941 179.65	12 947 325.98
8-9	4	-	-	-
REFUSE COLLECTOR	**172**	**182 403 172.81**	**- 70 330 484.86**	**112 072 687.95**
0-1	67	31 990 310.09	- 24 826 294.42	7 164 015.67
2-3	22	17 102 444.05	- 12 443 281.33	4 659 162.72
4-5	25	25 635 585.43	- 16 537 707.79	9 097 877.64
6-7	3	10 693 023.00	- 4 144 009.20	6 549 013.80
8-9	4	4 409 374.08	- 1 509 984.54	2 899 389.54
10-11	19	27 944 942.86	- 5 570 836.05	22 374 106.81
12-13	32	64 627 493.30	- 5 298 371.53	59 329 121.77
REFUSE COMPACTOR	**311**	**675 186 136.70**	**- 412 341 672.89**	**262 844 463.81**
0-1	167	295 470 957.71	- 267 688 872.09	27 782 085.62
2-3	7	13 563 459.00	- 11 634 763.01	1 928 695.99
4-5	35	93 006 403.84	- 59 303 835.61	33 702 568.23
6-7	36	97 203 477.00	- 41 470 751.20	55 732 725.80
8-9	4	13 245 549.00	- 5 135 398.13	8 110 150.87
10-11	39	103 145 211.03	- 20 152 651.78	82 992 559.25
12-13	23	59 551 079.12	- 6 955 401.07	52 595 678.05
SWEEPER	**48**	**76 861 309.41**	**- 43 187 393.00**	**33 673 916.41**
0-1	10	5 177 472.50	- 4 306 522.50	870 950.00
2-3	11	9 114 440.00	- 6 774 928.56	2 339 511.44
4-5	12	30 862 670.59	- 19 153 938.32	11 708 732.27
6-7	4	18 639 732.00	- 9 620 108.20	9 019 623.80
8-9	8	10 228 646.32	- 2 914 337.41	7 314 308.91
10-11	3	2 838 348.00	- 417 558.01	2 420 789.99
YELLOW PLANT	**103**	**215 252 648.77**	**- 98 078 639.35**	**117 174 009.42**
0-1	14	11 661 459.88	- 10 772 129.88	889 330.00
2-3	8	13 777 800.00	- 12 283 928.09	1 493 871.91
4-5	21	31 669 001.35	- 21 931 076.55	9 737 924.80
6-7	18	53 519 031.03	- 30 294 148.28	23 224 882.75
8-9	6	9 011 652.16	- 3 754 785.88	5 256 866.28
10-11	21	53 159 103.09	- 12 435 992.35	40 723 110.74
12-13	5	16 253 480.54	- 4 310 591.12	11 942 889.42
14-15	10	26 201 120.72	- 2 295 987.20	23 905 133.52
Grand Total	**1300**	**1 450 921 374.26**	**- 807 463 420.96**	**643 457 953.30**

CHAPTER 16

16. FINANCIAL MODEL

This section of the Sector Plan demonstrates the financial model associated with the delivery of UWM services.

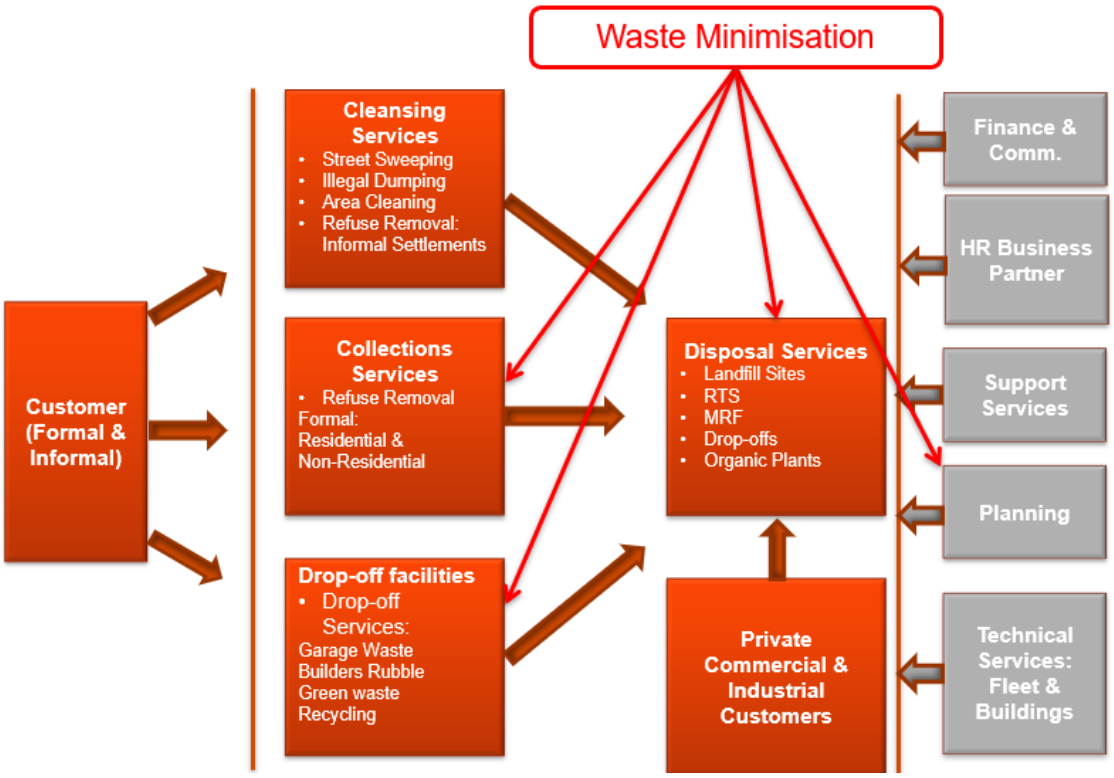


Figure 33: The Urban Waste Management value chain

The above Urban Waste Management value chain is incorporated into the decision-making and into the directorate's budget structures

Though in its complete whole it is deemed to be a trading service by National Treasury, Waste Management has a funding model that sets it apart from most, if not all, Directorates in the City in that it is funded from both tariffs (Collections and Disposal) while the remainder of the business is funded from Property Rates. The services provided by Waste Services fall into the following categories:

- *Public good* – maintenance of clean beaches and the operating of drop-off facilities where people can take excess waste not suitable to go into the 240-litre wheelie bin, which are available to the end-user free of charge.
- *Private good* – a benefit that is attributable to the end-user and therefore attracts a service charge based on consumption e.g. the number of 240-litre wheelie bins on site or tons of waste disposed of.

Funding for waste management services comes from a combination of:

- Cost-reflective tariffs - the businesses of both Collections and Disposal (the latter previously partially relied on co-funding from Property Rates) are fully funded from income or revenue derived from tariffs.
- Equitable share – the national government acknowledges the inability of indigent households to pay for basic municipal services and partly contributes to the coffers of municipalities to make up for the shortfall in revenue. The equitable share allocated to Waste Services is inadequate to cover the social package (sliding scale) offered by the City to its indigent households in formal residential areas. The difference is covered by the Collections Tariff.
- Free basic services – households living in Informal Settlements receive free basic services that are partly funded from the equitable share and the Property Rates. However, as a result of pressure on the Rates Account, there is a drive over the next two to three financial years to have it wholly funded from Tariffs.
- Infrastructure Grants (e.g. USDG) - although Urban Waste Management has not been a beneficiary in the last decade or so, national government takes cognizance of the ideal position of local government to the provision of services and accordingly allocates conditional grants to municipalities largely for infrastructure projects that will impact poorer households.
- Property Rates – of the operational Branches Drop-offs and Cleansing are funded from Property rates while the cost of all the support Branches is fully absorbed by the Operational Branches, namely Cleansing, Collections & Drop-offs as well as Disposal.
- Fleet - though Engineering Asset Management is a support Branch, its Fleet Section (the custodian of the Department's plant & vehicles) operates as a business and therefore its operational costs (licensing fees, tyres, repairs & maintenance and overheads) are fully recovered from its fleet & equipment rental "paid" by the end user.
- Alternative funding – though not particularly explored by the Directorate, there are other sources of funding external to the government sphere that are available to municipalities, but these often come with onerous conditions, which must be clearly understood before entering into any agreement.
- The drop-offs linked to Collections were previously funded from Tariffs but are now classified as a Rates-funded service. However, due to ongoing under-funding these drop-offs have over the years assumed a dual funding in that the activities associated with waste minimisation (chipping of garden greens and collection of dry recyclables), for instance, are funded from Tariffs, as explained below.
- For the Rates-funded services there is no modelling of tariffs as growth parameters are dependent on what the Property Rates can afford in total for all such services, as assessed by Corporate Finance, which is usually not enough to adequately respond to demand for services.

TARIFFS

- **Consumptive refuse collection tariff** – contrary to what is suggested in the National Pricing Strategy for Waste Management, the refuse collection in the City is not based on actual quantity of waste generated, but is rather based on the number of waste receptacles (240-litre wheelie bin) issued. There is a logic behind the decision otherwise some customers may end up paying for waste that is not theirs as some might be inclined to deposit their waste in neighbours' bins.
- **Waste minimisation** – the Department presently has a universal refuse collection tariff for domestic clients applicable to all users regardless of whether one receives separate collection of dry recyclables or not. The intention to introduce a tariff that is not zero-rated has previously been tabled at the Budget Steering Committee with no objection, except emphasis on the need to first take it through a rigorous public participation process. An area of sensitivity has been modelling such a tariff in such a way that it is not viewed as punitive (an added cost to the end-user), but as an incentive to encourage participation.
- **Landfill Sites versus Transfer Stations** – the City previously had a transfer station tariff separate and lower than a landfill tariff. This was in an effort to encourage waste disposal clients to take their waste directly to the transfer station to facilitate beneficiation. However, the two tariffs were subsequently equalised, though there is now growing sentiment to revisit that position.
- **Tariff interconnectivity** – the provision of bulk infrastructure, namely transfer stations and material recovery facilities for the handling and further processing of waste as well as licensed landfills with engineered cells for the safe disposal of waste attracts a huge cost and therefore generally higher tariffs. However, those opting for the refuse collection service of the City only see the refuse collection tariff on their municipal accounts, which (though inclusive of waste disposal fees) we try to keep affordable.
- **Waste Disposal Surcharge** – a punitive tariff for waste emanating from outside of the municipal boundary of the City in order to protect the interests of the people of Cape Town. Although distance could be a deterrent, it must be highlighted that the said tariff is very difficult to administer as a number of service providers render services across municipal boundary and are unlikely to declare the origin of the waste to avoid a surcharge.

Table 45: Rebates based on residential property values

2022/23 Financial year			2023/24 Financial Year	
Residential Property Values	**No. of Customers**	**% Rebate**	**Residential Property Values**	**No. of Customers**

R1 - R300,000	162,905	100%	R1 - R450,000	192,217
R300,001 - R350,000	31,732	50%	R450,001 - R500,000	22,165
R350,001 - R500,000	65,028	25%	R500,001 - R650,000	52,648

Please note that the value of the rebate excludes households living in Informal Settlements.

The rebate categories above reflect the social package available to indigent households based on the value of the property (for the first 240-litre wheelie bin). Further rebate on refuse collection is based on joint monthly household income, as depicted below.

Table 46: Adjusted rebate categories based on household income

Monthly Household Income	% Rebate (2022/23)	% Rebate (2023/24)
Less than R4,500	100%	100%
R4,501 - R6000	95%	
R6,001 - R7,500	90%	

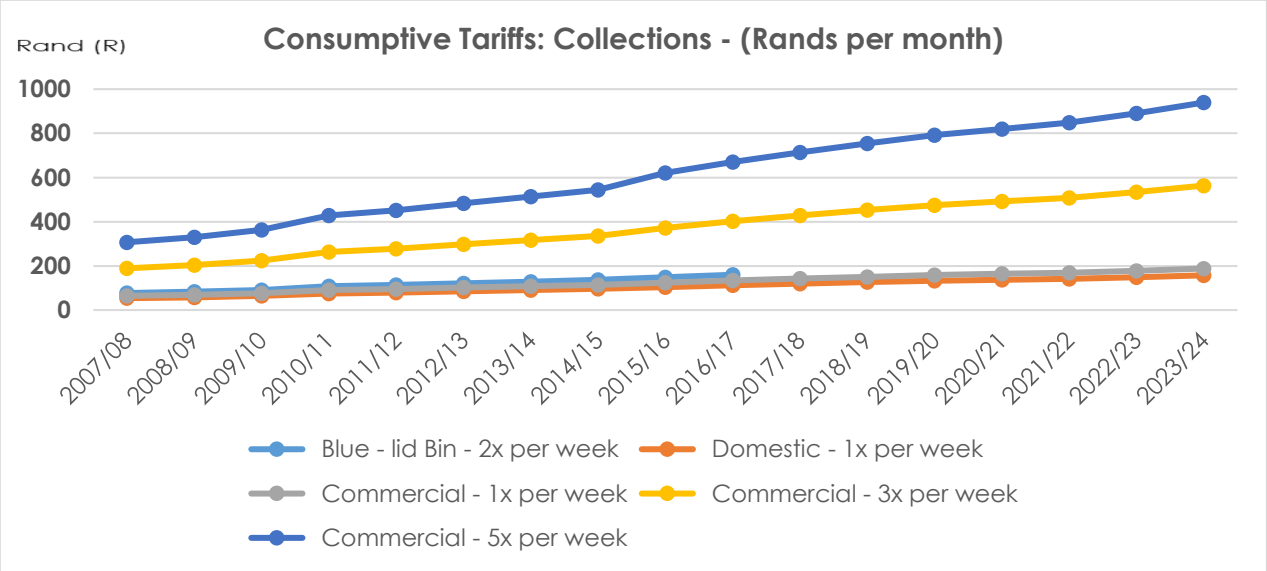


Figure 34: Refuse Collection Tariffs: 2007/08 – 2023/24

The inference that can be drawn from the graph above is that:

- The once per week domestic and commercial tariffs differ only marginally.
- An increase of approximately 3 times for most of the domestic tariffs between 2007/08 and 2023/24.
- The discontinuation of the twice per week service as it was not economical as the number of customers was small and far in between.
- Widening gap between the once per week versus thrice per week and the thrice per week versus five times per week services.

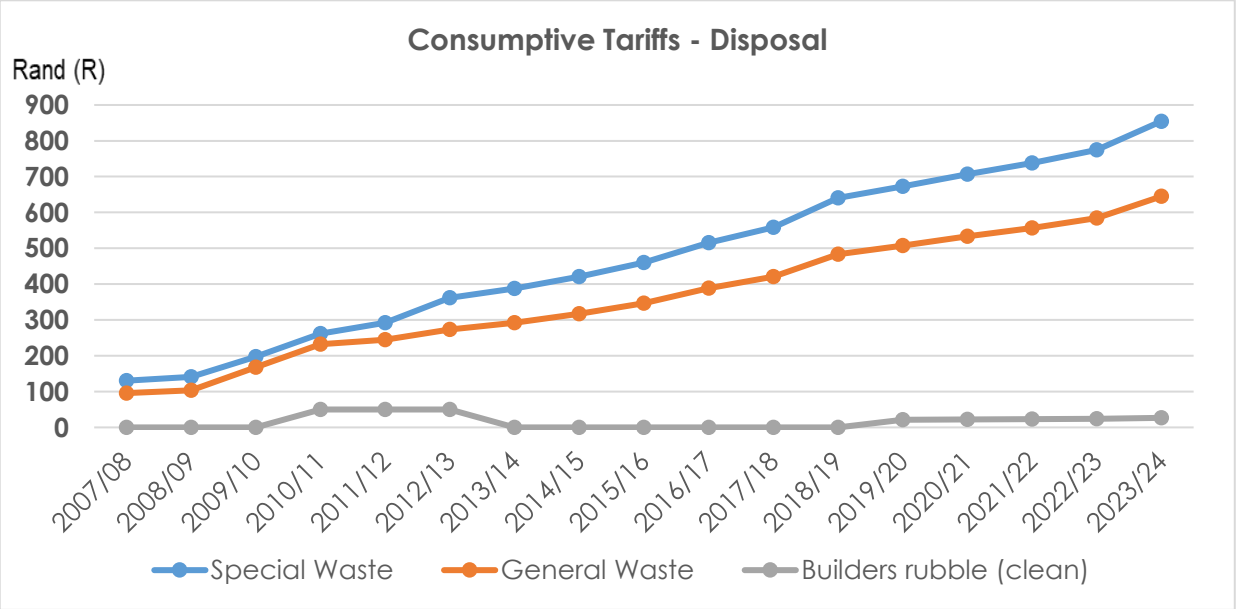


Figure 35: Waste disposal tariffs between 2007/08 and 2023/24

The following deductions can be made from the foregoing graph:

- The General Waste and Special Waste tariffs increase fivefold between 2007/08 and 2023/24.
- Widening gap between the General Waste and Special Waste tariffs over the years.
- Introduction of a Demolition Waste or Builders' Rubble Tariff for three years between 2010/11 and 2012/13, which was discontinued for six financial years before being reintroduced in 2019/20 though at less than 50% of the earlier nominal tariff.

16.1 REVENUE MANAGEMENT

Section 15 of the MFMA expressly mentions that a municipality may, unless stated otherwise, incur expenditure only

(a) In terms of an approved budget; and
(b) Within the limits of the amounts appropriated for the different votes in an approved budget.

The above statement further emphasises the fact that budgets must be fully funded and therefore makes no room for deficit budgets.

Table 47: Planned Income for Urban Waste Management for 2023/24

Revenue Item	**Budget (Full Year)**
Refuse Charges	1 673 987 436
Availability	14 738 469
Interest Earned on Arrears	36 195 552
Indigent Relief : Refuse	432 625 799-
Primary Income (Cash)	**1 292 295 658**
Refuse Removal	164 652 066
Grants and Subsidies : Equitable Share	353 860 525
Other	1 237 899
Total Income - Collections	**1 812 046 148**
Disposal Coupon Fees	159 736 618
Special Waste Fees	7 749 342
Builders' Rubble	627 760
Primary Income (Cash)	**168 113 720**
Bulk Refuse	531 040 605
Dumping Cost	35 750 509
Development Contribution	18 732 989
Other	34 559 419
Total Income - Disposal	**788 197 242**
Rates Contribution to UWM	1 976 239 540
Grants and Subsidies : Conditional	148 976 195
Grants and Subsidies : Equitable Share	157 791 080
Profit on Sale of Assets	4 502 900
Contributions Received by R&G	94 230 773
Other	2 287 115
Total Income - Rates	**2 384 027 603**
Grand Total	**4 984 270 994**

Accordingly, in terms of Table 46 above 48% of the operating costs of the Directorate are funded from Property Rates and the remainder is funded from tariffs associated with Collections and Disposal. In terms of the latest billing data domestic customers make up more than 85% of the revenue for Collections while business, which have the option to engage the services of the City or alternatively procure the services of another accredited service provider, contribute only approximately 10% of the Branch's total revenue. Disposal on the other hand has Cleansing and Collections (excluding contractors) as their biggest clients and are responsible for approximately 70% of the Branch's revenue, which does not involve the exchange of cash (internal transaction). The two Branches have a joint

income in excess of R2bn in the 2020/21 financial year, which is significant to have its overall management prioritised. Some of the things that come to mind will be:

- Work on complete integration of systems, adequately mitigate all risk exposure and consider the centralisation of revenue oriented functions to enhance effectiveness and accountability.
- Move past periodically reporting on performance to introducing strong financial oversight.

A healthy collection ratio for Collections (Disposal is on prepaid for its external customers) is at the heart of a fully funded budget based on realistically anticipated revenue. There is a direct relationship between the collection ratio and the economic climate. The financial year 2022/23 had seen a collection ratio of 92%, which has been sustained in the first 5 months of the 2023/24 financial year, which informs the expenditure budget.

Table 48: Collection ratio – latter part of 2023/24

Description	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23
Balance Brought Forward	**808 968 801**	**812 719 273**	**820 819 392**	**769 464 643**	**778 800 042**	**784 928 014**
B/C/O	**812 719 273**	**820 819 392**	**769 464 643**	**778 800 042**	**784 928 014**	**789 985 630**
Billed	156 246 517	167 672 696	169 757 808	174 982 322	173 621 991	168 614 269
Internal	11 672 415	13 714 985	13 713 165	11 401 649	14 597 959	14 028 417
Write Off	7 767 883	799 130	61 041 308	1 557 678	3 750 147	1 805 744
Credit	156 400 578	172 488 432	173 784 414	175 490 894	178 341 831	175 779 326
Monthly Payment Ratio	**93.14%**	**95.09%**	**94.72%**	**94.16%**	**94.75%**	**96.24%**
6 Months Credit	931 381 015	954 469 373	984 102 939	1 000 050 382	1 028 073 377	1 032 285 474
6 Months Invoiced + VAT	1 010 946 814	1 023 108 304	1 045 705 003	1 065 173 589	1 084 077 951	1 090 024 192
6 Months - Payment Ratio	**92.13%**	**93.29%**	**94.11%**	**93.89%**	**94.83%**	**94.70%**
12 Months (Year) Credit	1 861 722 474	1 877 987 658	1 898 880 395	1 923 489 704	1 943 527 369	1 959 962 037
12 Months (Year) Invoiced + VAT	2 020 624 420	2 034 109 165	2 054 503 427	2 072 496 357	2 088 927 680	2 100 373 289
12 Months - Payment Ratio	**92.14%**	**92.32%**	**92.43%**	**92.81%**	**93.04%**	**93.31%**

16.2 COSTING

The Accounting & Financial Management Section has developed a costing model initially premised on Collections and carefully identifies the activities that consume resources (cost drivers) such as employee-related costs, contracted services, fleet & equipment rental, disposal costs. Acknowledging that there are nuances in Cleansing and Disposal, the conversation has now been formally extended to these Branches as it is imperative that the model be developed further to encapsulate these sections of the waste management business.

With assumptions made in respect of growth in client base and/or number of bins serviced, waste generation patterns, consumer price index etc., the model can and has been adapted to build in other capabilities, including the modelling of tariffs over a much longer time horizon. It is important to emphasise the following about the model, which does not

- ✓ Address issues of operational efficiency around the utilisation of resources e.g. fleet
- ✓ Take away the need for technical input from experts on engineering and other type projects

16.3 OPERATING BUDGET

Operating Budget – at least R1bn or a quarter of the budget is collectively for;

- Refuse collection contracts
- Think Twice (separation of waste at source) contracts
- Chipping of garden greens
- Haulage of waste from drop-offs/transfer stations to landfills
- Maintenance of plant/vehicles/machinery

Table 49: High level breakdown of the operating budget for UWM 2023/24

Expenditure Item	**Budget (Full Year)**
Employee Related Cost	1 446 939 719
Contracted Services	1 122 260 324
Debt Impairment	98 536 422
Repair & Maintenance (Primary)	190 127 043
Repair & Maintenance (Secondary)	42 144 270
Depreciation & Asset Impairment	223 022 458
Finance Charges	14 701 386
Bulk Charges	531 040 605
Activity Based Recoveries	7 611 631
Support Charges	402 428 778
Other expenditure	905 458 358
Total Expenditure	**4 984 270 994**

16.4 FINANCIAL GAPS

- Still to be determined is whether a Transfer Station should be charged at a higher rate per ton than that of a Landfill site as it has the huge cost of haulage.
- What Form of Waste Minimisation tariffs will be introduced and whether they will have some form of incentive?

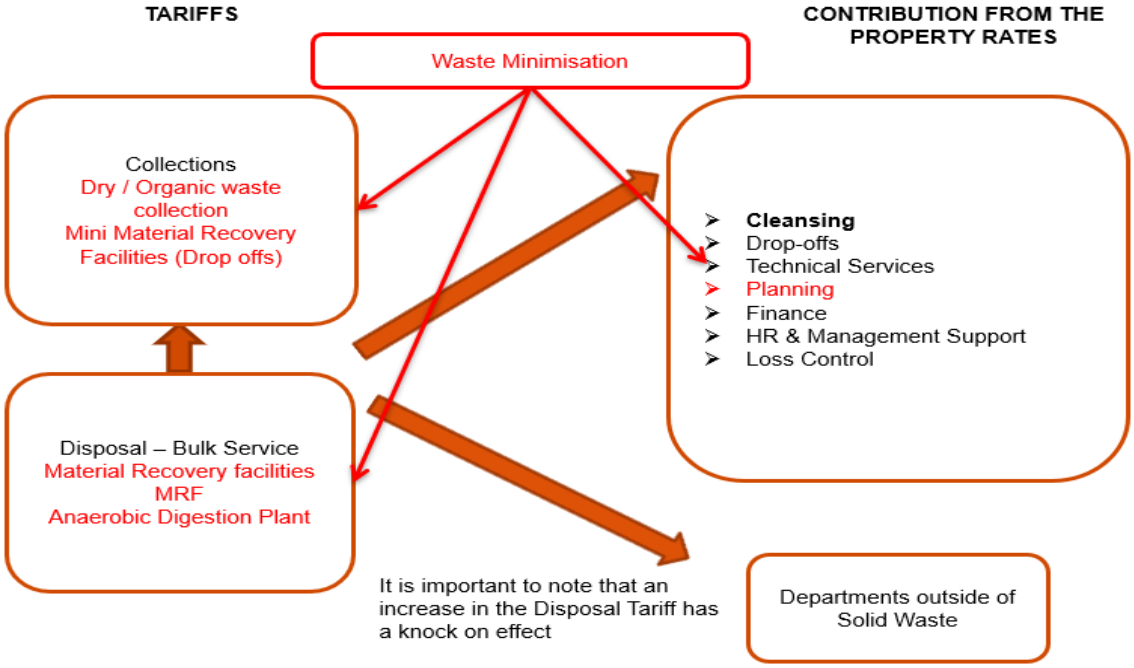


Figure 36: Urban Waste Management services budget structure

Drop off site funding is both tariff and rates funded as noted in diagram below.

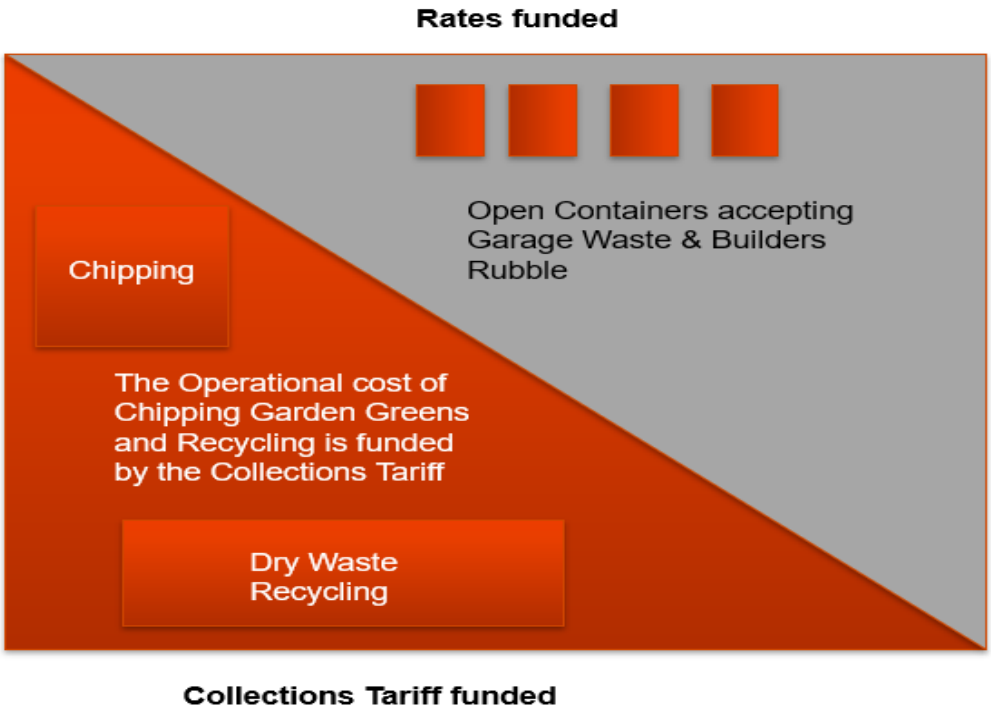


Figure 37: Drop off funding dual funding

Consequently, it is evident that the Directorate will have to consider the following propositions:

- Drop-offs – the current cross-subsidisation arrangement needs to be formalised and possibly thresholds be established.
- Cleansing (funded from Property Rates) picks up waste dumped illegally a sizeable fraction of which is waste that should have gone into a wheelie bin that ordinarily would have been serviced by Collections (Tariff funded). A clear basis exists for cross-subsidisation of Cleansing services from Tariffs, subject to transparency.
- In an effort to bridge the divide between Tariffs and Rates, there is a need for an investigation on a project-based approach to providing services in areas with specific peculiarities (mix of formal and informal plus high backyarder presence) such as Dunoon and Joe Slovo (Milnerton) where the demarcation of services is impractical. The plan will further unpack the various interventions
- We are looking into reinstating the CRR funding for assets with a shorter lifespan such as Fleet and IT equipment. Even though budgeting for CRR is seen as budgeting for a surplus. In our view, the impact of taking up loans from an Interest on Loan perspective is on an annual basis quite costly.

CHAPTER 17

17. STAKEHOLDERS

For the purposes of this section, there will be a distinction between:

a) Stakeholders that must be identified for the purposes of the sector plan development and review process, and

b) Identification of stakeholders as part of an on-going stakeholder management / communications plan or strategy/policy/SOP as part of day-to-day management of the service delivery or the specific function.

Both preceding sections identifies categories of stakeholders in terms of:

- Legislative requirements;
- Minimum requirements (a National or Provincial Department that may have concurrent or higher powers);
- Key role-players of the different spheres of government (National and provincial Departments);
- Key organisations/associations/NGO's etc. at a municipal level;
- Customers/consumers (may also have customer segmentation if customers have different needs);
- Internal department that may have dependencies or which may be affected by the planning and implementation of planned services/maintenance/upgrades. Most of the dependencies listed in **Table 37** are part of the UWM stakeholders as depicted below

The objective, different approaches and point in time at which communications/ engagement must happen must be designed in relation to the specific category.

The Stakeholder base for Waste Management Services rendered is vast and includes various actors such as:

Table 50: Stakeholder base

Internal: Urban Waste Stakeholders	City Directorates	External Stakeholders
• Waste Collections • Cleansing & By-law enforcement • Disposal • Human Resources • Commerce and Finance • Technical Services • Planning: All Internal sections	• Environmental health • Environmental Management - (Environmental Planning and Sustainability) • Water and Sanitation directorate • Communications- media and marketing • Transport (Planning) • Metro Police • Social development • Human Settlements • Sub councils and Councillors • Energy (climate change and sustainable energy) • Recreation and Parks • IS&T • Finance	• Residential – a combination of formal and informal communities, lower, middle and upper • Commerce and Industry (esp the waste industry, PROs) • Schools, places of learning and other institutions (e.g. churches, old age homes, etc.) • Special Interest Groups – Partnerships (NGO's and CBO's) including Green Cape • Tourism and Events • Provincial and National Government) including Department of Environmental Affairs and Development Planning (DEADP) DFFE, Water and Sanitation, DST, DTI, DoE and DMR

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Head Integrated Waste Strategy and Policy

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