



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD



INFRASTRUCTURE REPORT

December 2023

Making progress possible. Together.



DRAFTERS AND CONTENT DEVELOPERS

DIRECTOR POLICY AND STRATEGY

Hugh Cole

STRATEGIC PLANNING BRANCH

Lucille Janssens

Cayley Green

Marnus Botha

Thokozani Zulu

CONTENTS

PREFACE 04

Foreword from the Executive Mayor	04
Message from the City Manager	05
Abbreviations	07
Executive summary	08
Introduction	11
Capital expenditure framework	12

STATUS UPDATE OF BULK INFRASTRUCTURE PIPELINE 15

Energy 16

Generation	18
Distribution	20
Conclusion	20

Urban Waste Management 22

Landfill	25
Refuse transfer stations and drop-offs	26
Conclusion	26

Water and Sanitation 28

The New Water Programme, Master Planning and the Adaptable Programme	30
Bulkwater	32
Wastewater treatment works (WWTW)	33
Wastewater sludge treatment	35
Sewer pump stations	36
Stormwater	38
Conclusion	40

Human Settlements 42

Sector plan review	43
--------------------------	----

Urban Mobility 46

New outer year projects	48
Roads	50
Conclusion	51

Electronic document navigation

- Entries on the contents page link to the relevant page.
- Click the page number at the bottom of each page to return to the contents page.

CLIMATE RESILIENCE 52

Recommendations	56
-----------------------	----

LOCATION-BASED ANALYSIS: MAITLAND 58

Introduction	59
Contextual analysis	60
Bulk infrastructure analysis	64

Urban Waste Management 65

Current state	65
Future state	65

Energy 65

Current state	65
Future state	65

Urban Mobility 66

Current state	66
Future state	67

Water and Sanitation 69

Current state	69
Future state	70

Conclusion	71
Key outcomes and way forward	72

ANNEXURES 74

Annexure A: Energy	76
Annexure B: Urban Waste Management	79
Annexure C: Water and Sanitation	80
Annexure D: Human Settlements	85
Annexure E: Urban Mobility	87
Annexure F: Resilience	88
Annexure G: Maitland	91

FOREWORD FROM THE EXECUTIVE MAYOR



Our mission of building a City of Hope for all Capetonians grows more important and more urgent every day, as many other parts of South Africa slide backwards into neglect and decay. What we are working to achieve in Cape Town

will not only deliver more dignified living conditions and economic opportunities for our city's residents for decades to come, it will also signal to South Africans elsewhere what is possible. It will demonstrate that no one has to accept decline as an inevitable outcome in South Africa.

Adding to this urgency is the projected population trend in Cape Town as confirmed towards the end of 2023 in the Census report. We are now a metro of almost 5 million people and we're about to overtake Johannesburg as the most populous metro in the country. As our reputation as a city of opportunity and excellence grows, so too does the number of people who choose to make a life for themselves and their families here. But rather than be daunted by the pressures of urbanisation and semigration, we have chosen to meet these challenges head-on by future-proofing our city through investment in its infrastructure.

The work detailed in this second Infrastructure Report is the clearest possible indication of our ambitions to gear Cape Town for this fast-changing future. It is also an honest and transparent summary of our progress to date on our ten-year capital portfolio. You will see that several energy generation projects have been added since our first report came out a year ago, and that our planned capital expenditure in Water and Sanitation has increased significantly thanks to an increase in pipe replacement and pump station upgrade projects.

These annual reports also offer us the opportunity to rectify any gaps we may have come across.

Improvements since the last report include a full review of the Human Settlements Sector Plan, which will form the basis on which projects for the outer years of the portfolio will be developed. We have also added significantly to the outer years of the Urban Mobility capital pipeline since last year.

However, the fiscal pressures under which we must deliver on this pipeline continue to grow as funding from National Treasury is squeezed more and more. These pressures are forcing us into very difficult spending decisions while still trying to accelerate our infrastructure build programme. Sometimes this means prioritising areas of greatest need, particularly in the bulk water section of the portfolio.

One new addition to the report which I am excited about is the location-based analysis of Maitland. This analysis will help ensure that our planned bulk service provision is sufficient to meet future demand – something that is of critical importance to investors. As an area well-placed and targeted for investment, Maitland was an obvious choice as the first location for this kind of analysis.

We've also added a specific analysis of the City's climate resilience. With our drought planning already at an advanced stage, we are determined to protect Cape Town against all other future shocks too, such as flooding and heatwaves. While we still have some work to do in this regard, the inclusion of a climate resilience analysis in this report clearly signals our intent.

What this reports shows, above all else, is a city heading in the right direction. A city that refuses to accept that South Africa only has a reverse gear. We are a city that is building, expanding and preparing for the future. And in doing so, we are showing what is possible throughout the country.

A handwritten signature in black ink, appearing to read 'Geordin Hill-Lewis'.

Geordin Hill-Lewis
Executive Mayor

MESSAGE FROM THE CITY MANAGER



The second annual Infrastructure Report is a transparent evaluation of the City of Cape Town's infrastructure plans in our five bulk infrastructure sectors. This demonstrates that, despite significant challenges, we are

moving forward in terms of infrastructure delivery. This progress would not have been possible without the extensive efforts from the vast number of officials across various sectors of the City over the last year – this progress is testament to their hard work, for which I thank them.

The development of long-term infrastructure plans is crucial for any well-functioning municipality, but plans are one thing – ensuring that they are fit-for-purpose and aligned to the current and future needs of the City are another. That is why this work is so important, not only does this analysis help us to identify potential gaps, backlogs, changing circumstances, new demands and risk exposures, but it will also increasingly assist us in identifying opportunities for greater efficiencies and collaborations at the implementation level. Many lessons have been learnt and with continual improvement this will ultimately serve to accelerate service delivery and infrastructure provision which are key enablers of economic growth in our local economy.

This year's report has also expanded into two critical areas of analysis, our first location-based assessment of infrastructure provision to the Maitland area and our first thematic analysis of the climate resilience of the City. The Maitland example is very insightful and paves the way for similar location-based analysis of other areas to inform future reports. The climate analysis sought to answer this key question: "Is the 10 year portfolio adequately preparing the City to deal with key climate change shocks?" The outcomes show that currently there are

a total of 1 436 resilience projects within the 10-year capital portfolio contributing to climate resilience, with a value of approximately R55.5 billion. Further, approximately 40% of the City's planned infrastructure projects in the portfolio contribute to strengthening its ability to respond to climatic shock events. However, drought emerges from the analysis as the only shock which has been fully assessed, as it is well-articulated at a strategic level and has been mainstreamed in terms of implementation responses. This means that we have much work to do to achieve the same level of infrastructure planning and development for other shocks and we are working on energy sustainability. This and other areas will be a point of focus going forward.

We are gathering significant momentum with our infrastructure ambitions and as we continue to navigate the sometimes tough waters of local government service delivery we remain committed to continuous innovation, accountability, openness and transparency. We believe in infrastructure-led growth and so the investments we are making are crucial to growing the local economy, spearheading service delivery, caring for our residents and creating jobs. We also hope that various local and international stakeholders who read this report will see many opportunities to partner with us in achieving our vision of a City of Hope for all.

Lungelo Mbandazayo
City Manager



ABBREVIATIONS

AGT	Athlone gas turbine
AIP	alien invasive plant
BBF	biosolids beneficiation facilities
BESS	battery energy storage systems
BWAS	Bulk Water Augmentation Scheme
CBD	central business district
CID	city improvement district
DFA	development focus area
DSDF	District Spatial Development Framework
IPP	independent power producer
IPTN	Integrated Public Transport Network
km/h	kilometres per hour
kV	kilovolt
LAP	local area plan
LSDF	Local Spatial Development Framework
LUM	Land Use Model
MBT	mechanical biological treatment
Mℓ	megalitres
Mℓ/d	megalitres per day
MPP	Mayoral Priority Programme
MS	main substation
MVA	megavolt amperes
MW	megawatt
NMT	non-motorised transport
PPP	public-private partnership
PRASA	Passenger Rail Agency of South Africa
PS	pump station
PV	photovoltaic
RGT	Roggebaai gas turbine
RTS	refuse transfer station
SAP PPM	project preparation management system
SHPS	Steenbras hydro pumped storage
WTP	water treatment plant
WWTW	wastewater treatment works

EXECUTIVE SUMMARY

The City of Cape Town remains committed to enhancing infrastructure planning, preparation and delivery to stimulate economic growth and reduce poverty. This commitment to infrastructure is focused on refurbishment, upgrades and new infrastructure builds across all sectors to ensure that backlogs are addressed and that new, sufficient capacity is created to provide for and enable future growth in Cape Town.

The 2023 Infrastructure Report is the second report of its kind. This report builds on the first report by remaining focused on an evaluation of the City's bulk infrastructure across the five directorates of Energy, Urban Waste Management, Water and Sanitation, Human Settlements and Urban Mobility. In so doing, the report aims to answer three main questions:

1. Are the critical projects identified across all five sectors in last year's report on track?
2. Have there been any significant new developments or new risk areas in the City's bulk infrastructure pipeline?
3. Have any of the key challenges in Cape Town's bulk infrastructure sectors been resolved since last year's report?

The findings of this report indicate that there have been some positive developments in the portfolio over the last year. The majority of critical projects identified in the first report are on track but some key risk areas remain.

This report highlights that:

- Several new energy generation projects have entered the portfolio in the last year, which are either in the tendering or feasibility stage.
- Challenges regarding landfill space remain a challenge for Urban Waste Management.

Additional cells have been completed at Coastal Park landfill, which will provide some airspace capacity increase, but these cannot move into operation until the national Department of Water and Sanitation provides approval for landfill activities at these cells. Similar delays will potentially also be experienced at Vissershok landfill once the cells currently under development reach completion.

- The purchase and development of a regional landfill site should be a critical priority for the Urban Waste Management directorate going forward. The project has currently reverted to feasibility, with a site for development yet to be determined.
- Similarly, refuse transfer and drop off is another area of challenge for Urban Waste Management. With the exception of Swartklip, there are no current projects

Critical projects are projects that have been identified in an infrastructure report as needed to address current or future capacity shortfalls.



The term **bulk infrastructure** refers to the public infrastructure by means of which water, sewerage, waste and electricity services are provided and managed. This includes infrastructure involved in generation, collection, storage, purification, conveyancing and disposal, as the case may be, and which is connected to the reticulation system that, in turn, distributes services to or from end users (City customers).

for additional refuse transfer stations (RTSs) or drop-off facilities that are targeted for completion before 2028. This means that there will be a five-year period during which no additional disposal and drop-off capacity will be added citywide, which is a concern. While the City is currently meeting demand, the population, and therefore demand, will grow over this five-year period and the goal of decreasing the service radius from 7 km to 3 km will also not be achieved until then.

- There has been a significant increase in the planned capital expenditure over the 10-year portfolio in Water and Sanitation. This is largely driven by increased pipe replacement and pump station-related projects aimed at reducing the frequency, duration and impact of sewer spills.
- Projects to diversify Cape Town's water supply remain on track.
- Due to budget constraints, projects in the bulk water section of the portfolio are being prioritised to target areas of greatest need first.
- Wastewater sludge treatment remains an area of significant concern, with further delays having been experienced in the development of the first biosolids beneficiation facility.
- Stormwater master planning remains a priority but has not progressed since last year's report due to ongoing budget constraints.
- A full review of the Human Settlements Sector Plan has commenced. This aims to address the gaps identified in last year's report and will form the basis on which projects for the outer years of the portfolio will be developed.
- There have been significant additions to the outer years of the Urban Mobility capital pipeline since last year, a number of which relate to improved public transport.

As the City matures the strategic long-term planning of its infrastructure portfolio, the development of additional analytical capabilities and methodologies will enable the organisation to ask different types of questions of its planned infrastructure investments over a long-term planning horizon.

This report seeks to answer two additional questions:

1. **Is the 10-year portfolio adequately preparing the City to deal with key climate change shocks?**
2. **Does (i) an important local area (in this case Maitland) have adequate infrastructure for current demand, and does (ii) the infrastructure portfolio enable this local area to meet its full potential in the future?**

The analysis finds that the answer to the first question is that approximately 40% of the City's planned infrastructure projects in the portfolio contribute to strengthening its ability to respond to climatic shock events in the future. However, while infrastructure responses have been developed to prepare the City for higher frequency and intensity of drought shocks, such planning is less developed for the other four climate shocks that the City is expected to experience in the future.

The analysis finds that the answer to the second question is that there are sufficient projects in the pipeline to address current and future expected capacity constraints relating to solid waste, electricity infrastructure, transport infrastructure, and bulk water and sewer systems in the Maitland area. However, there are flooding and stormwater concerns in the northwestern portion of Maitland, affecting the Maitland Metro precinct, which require the development of an Urban Stormwater Management Plan for Maitland. There is also ageing water reticulation infrastructure in the area that requires a full assessment of the water reticulation network to be conducted in order to inform future infrastructure interventions.



INTRODUCTION

The City's 2023 Infrastructure Report is the second report of this nature and builds on the foundation set by the 2022 inaugural report released in February 2023. Both reports focus on the City's bulk infrastructure across the five directorates of Energy, Urban Waste Management, Water and Sanitation, Human Settlements and Urban Mobility.¹

The first report sought to answer three main questions:

1. Is the City's bulk infrastructure master planning in these five sectors adequate?
2. Does the City's bulk infrastructure pipeline in these five sectors meet current and future demand?
3. If the answer to question 2 is 'no', are there projects in the pipeline that will address any shortfalls?

In its second iteration, the 2023 Infrastructure Report includes the following:

- An update on the bulk infrastructure¹ pipeline of projects assessed in the first report, highlighting critical progressions or challenges experienced in the year under review.
- A first 'thematic-based' assessment of the resilience of the 10-year capital portfolio to climate shocks.
- A first 'location-based' assessment of bulk infrastructure in Maitland.

The 2023 Infrastructure Report provides an analysis based on data extracted from the City's project preparation management system (SAP PPM) as at 23 May 2023 and the latest sector plans.² It therefore provides an analysis of projects that are in various stages of development that can be implemented depending on budget availability.

TABLE 1: REPORT AND SAP PPM DATA DATES

Report date	SAP PPM data
December 2022	4 May 2022
December 2023	23 May 2023

This report aims to provide an update of critical projects identified in the 2022 Infrastructure Report. An analysis of project progress, status, as well as anticipated completion is provided below and maps of projects currently in progress are presented.

Across all the bulk infrastructure portfolios, positive developments have been identified since last year's report, many of which are direct responses to recommendations made in the first infrastructure report. In some cases, projects have not progressed as planned, and the reasons for these delays are detailed and further recommendations are made.

The publication of this report underscores the City's commitment to boost its productivity and competitiveness through the provision of high-quality infrastructure. It also demonstrates the City's commitment to openness and transparency.

¹ The 2022 report was limited to the evaluation of the City's bulk infrastructure across the five directorates of Energy, Urban Waste Management, Water and Sanitation, Human Settlements and Urban Mobility. The analysis was based on data extracted from the City's project preparation management system (SAP PPM) as at 4 May 2022.

² Sector plans are documents that contain a sector's strategy and planning, which are translated into implementation plans. They are intended to provide capital and operational planning for the major infrastructure sectors over 20 years and are updated annually.

CAPITAL EXPENDITURE FRAMEWORK

It is both a legislative requirement³ and a strategic imperative of the City of Cape Town that infrastructure investment should facilitate spatial transformation by supporting the City's spatial strategy as articulated in its Municipal Spatial Development Framework (MSDF).

While the focus of this second Infrastructure Report remains the five bulk sectors covered in the first report, this section aims to provide high-level insight into the City's overall capital budget, with specific analysis of the spatial alignment of the new projects that have been funded each year.

The capital budget⁴ is funded from the following major funding sources for the 2022/23 financial year:⁵

The capital programme of the City reflects that 70% (or just over R5,2 billion) of the capital programme was allocated to infrastructure assets in the 2022/23 financial year, while the remaining 30% was allocated to other asset categories. Infrastructure asset investment by the City is typically related to upgrading, rehabilitation and refurbishment, and new infrastructure. Of the R5,2 billion allocated to infrastructure assets, the largest contributor to the spending was the Water and Sanitation Directorate (R2,2 billion in 2022/23), followed by Urban Mobility (R955 million in 2022/23) and Energy (R915,7 million in 2022/23).

FIGURE 1: CAPITAL BUDGET FUNDING SOURCES

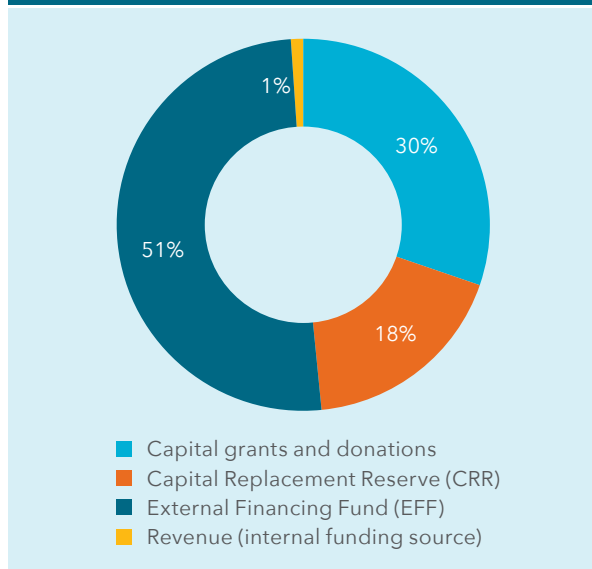
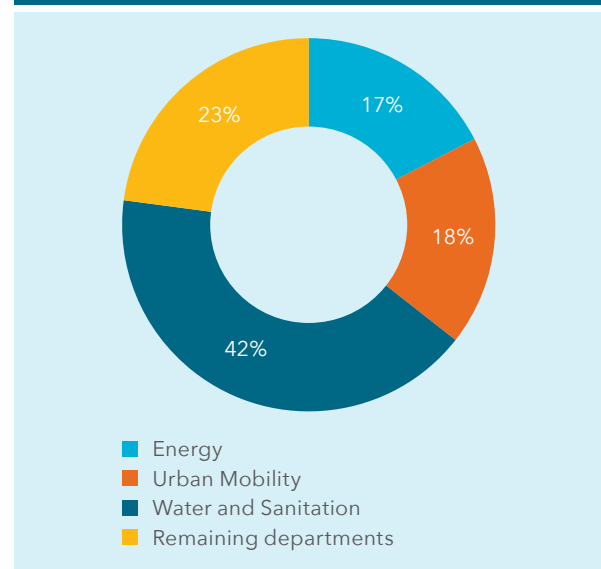


FIGURE 2: LARGEST SPENDING CONTRIBUTOR BY DIRECTORATE 2022/23



³ Section 21(n) of the Spatial Planning and Land Use Management Act 16 of 2013.

⁴ City of Cape Town: 2022/23-2024/25 Budget.

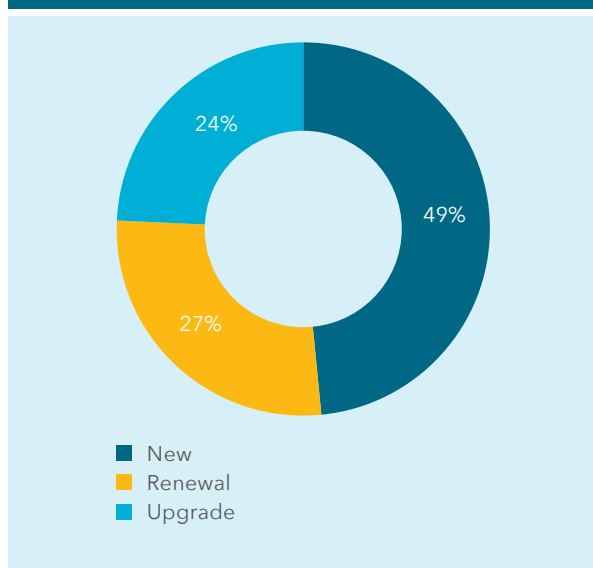
⁵ External Financing Fund: External, long-term loans are used to finance the outlay of capital assets funded by the External Financing Fund (EFF). The EFF is one of the largest sources of funding for infrastructure investments by the City.

Grants and donations: The City receives a number of intergovernmental transfers from national and provincial government in the form of conditional grants. These are particularly important to fund infrastructure in the human settlements and urban mobility sectors, although the lack of certainty regarding future grants makes long-term planning in these sectors challenging.

Capital replacement reserve: The City maintains a dedicated reserve of funding for the replacement of capital assets. At present, the majority of capital replacement reserve funding is committed to the Energy (49%) and Urban Mobility (34%) directorates.

Importantly, the City invested nearly three quarters of its capital allocation in the expansion of capacity, either through the construction and implementation of new assets or through the upgrade of existing assets to increase capacity (and sometimes also lifespan).

FIGURE 3: CATEGORIES OF CAPITAL ALLOCATION



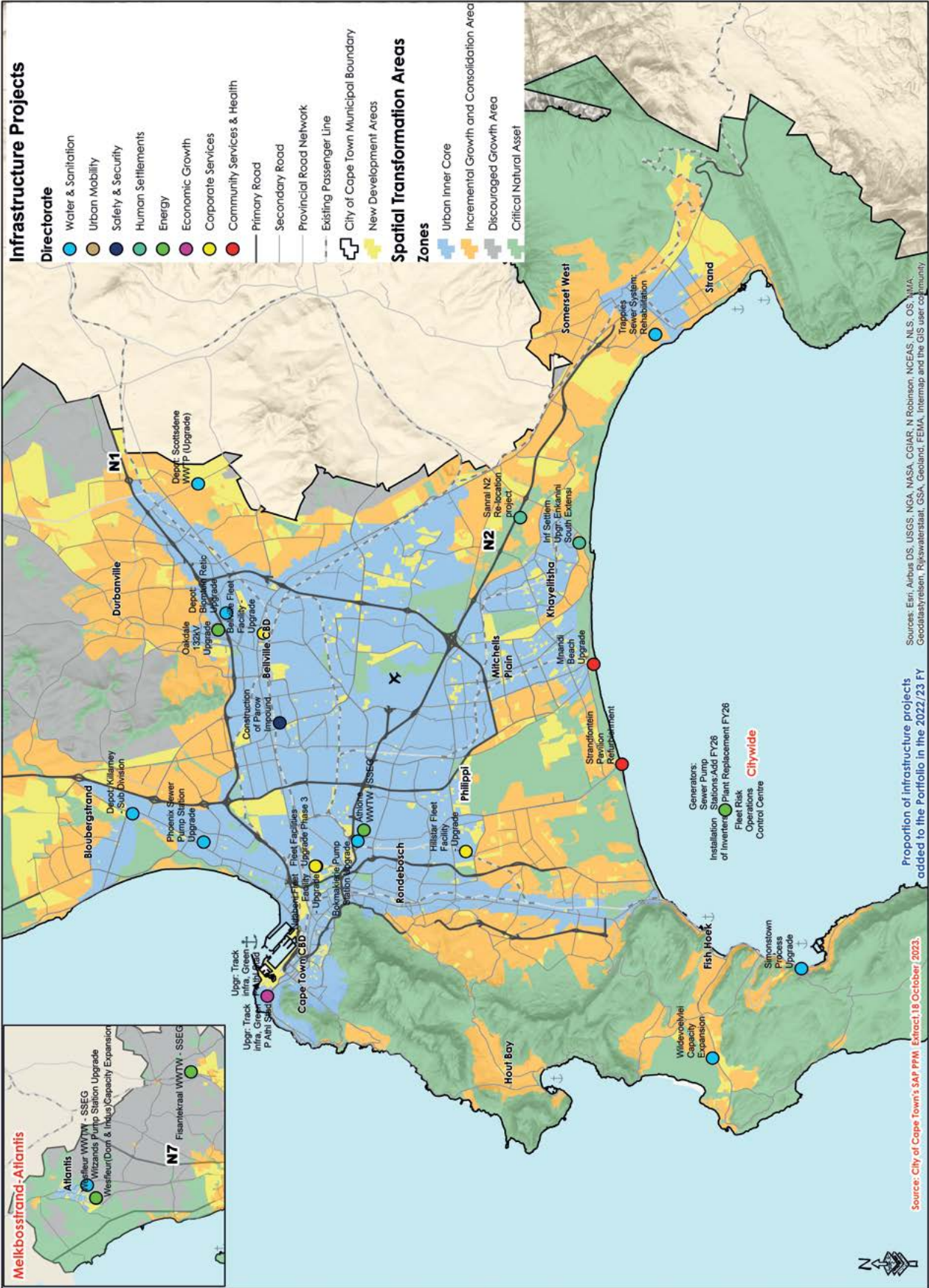
The City is committed to ensuring that its capital investment in infrastructure supports the long-term spatial vision of the City, as articulated in the MSDF. The City's MSDF is built on three foundational strategies:

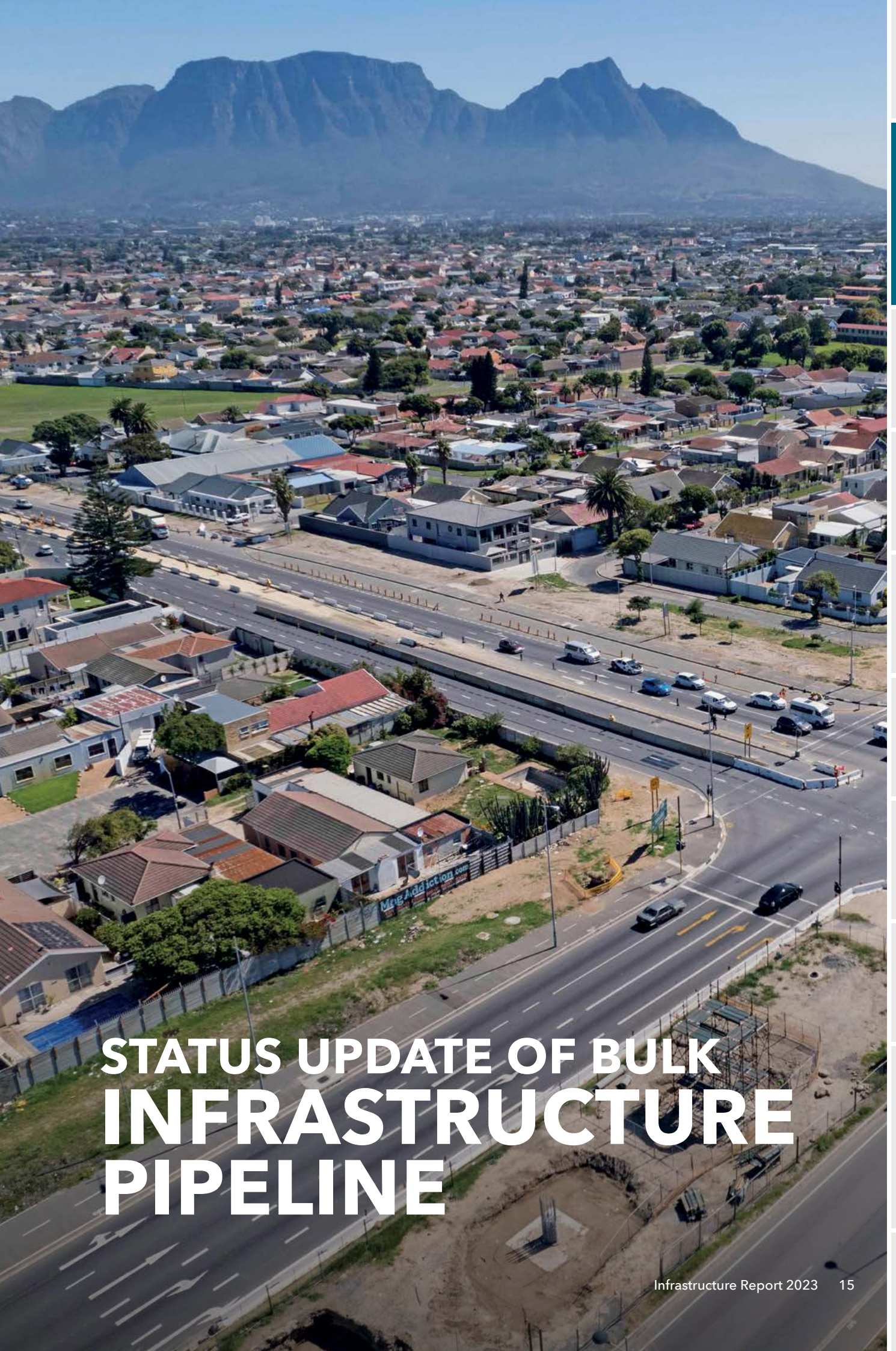
1. Plan for economic growth and improve access to economic opportunities.
2. Manage urban growth, and create a balance between urban development, food security and environmental protection.
3. Build an inclusive, integrated, vibrant and healthy city.

The MSDF seeks to achieve these strategic objectives by prioritising 'inward city growth'. Thus the MSDF informs where, when and how appropriate land use development can be facilitated. Figure 4 on the following page provides a snapshot of new projects from the 2022/23 financial year capital portfolio, overlaid on the MSDF spatial transformation areas (STAs), where these new projects are location-specific. This map represents just over 30% of the new projects added to the long-term capital pipeline in the 2022/23 financial year. The remaining 70% of the new capital projects added in the 2022/23 financial year are seen as citywide and do not have specific geographical location data. These include routine water network upgrades or system equipment replacements. While not included in the figure below, it is worth noting that these citywide projects have undergone multiple assessments to ensure alignment with the strategic and spatial priorities of the City.

As demonstrated in figure 4, projects added to the portfolio in the 2022/23 financial year are well aligned to the spatial priorities of the City. The majority of projects reflected are located within the area denoted as the urban inner core, while the remaining projects are located in the incremental growth and consolidation areas or new development areas. There are no projects in the discouraged growth areas, and where a project's location is in the critical natural asset STA, these are with the intention to ensure that the City protects, enhances and extends access to these areas, as per the MSDF.

**FIGURE 4: LOCATION OF PROJECTS ADDED TO THE PORTFOLIO
IN THE 2022/23 FINANCIAL YEAR**





STATUS UPDATE OF BULK INFRASTRUCTURE PIPELINE



ENERGY

The Energy Directorate's bulk infrastructure integrated portfolio has seen an increase in capital expenditure planned in the outer years of the 10-year portfolio since the 2022 report. This is due to the inclusion of new projects largely dedicated to the rehabilitation and refurbishment of current energy assets.

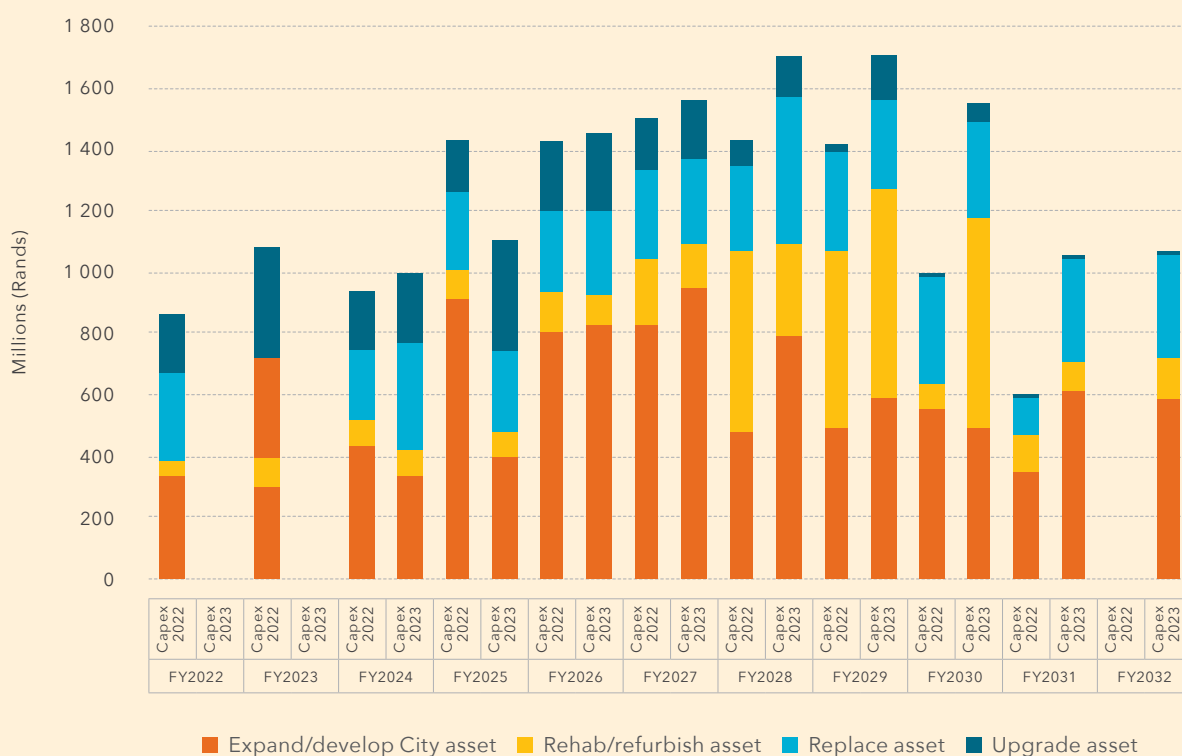
Since the 2022 report, the following trends have remained consistent:

- The majority of capital expenditure remains

committed to the expansion and development of assets.

- Rehabilitation and refurbishment of assets increase steadily over the next 10 years, peaking in 2028 and 2029.
- The City's planned infrastructure projects in Energy over the next 10 years respond to anticipated over-firm⁶ distribution network concerns and accommodate energy-efficiency measures to support energy security.

FIGURE 5: ENERGY SECTOR'S BULK CAPITAL EXPENDITURE BY TECHNICAL CATEGORY OVER THE 10-YEAR PERIOD FROM 2022 TO 2032 (AS EXTRACTED FROM SAP PPM ON 23 MAY 2023)



⁶ The state of electrical infrastructure is determined by a network reliability index of firm vs. non-firm vs. over-firm capacity. Firm capacity indicates the network ability to withstand an N-1 fault condition, meaning that it is capable of experiencing an outage of a single network component without causing losses in electricity supply. This should not be confused with the total installed transformer capacity at the MS. Over-firm capacity means the demand peak (in MVA) for the preceding year exceeded the firm network capacity.

Increased planned capital and operational commitments have also been noted in the Energy portfolio in line with the 'Energy Security for Economic Growth' Mayoral Priority Programme (MPP).

While last year's report noted that this programme would have a critical impact on the future of the City's electricity infrastructure, very few projects had been initiated at the time of the data extraction for last year's report.

Since then, several significant initiatives have commenced and are progressing within the portfolio. These are summarised in the following sections.

The Executive Mayor and City Manager have identified five **Mayoral Priority Programmes** to which additional resources have been allocated to ensure that progress is made during the current term of office. These five areas are broadly sanitation and inland water quality, energy security, land release for affordable housing, safety, and ease of doing business.

GENERATION

Current generation assets comprise the Steenbras hydro pumped storage (SHPS) scheme and two small gas turbines, Roggebaai gas turbine (RGT) and Athlone gas turbine (AGT), which are usually only run in emergencies. The SHPS is currently used to shield City-supplied customers from up to two stages of load-shedding. As was noted in the 2022 report, the City has projects in the pipeline to refurbish and maintain current generation assets that all remain on track – see annexure A:1 for details.

A number of new generation projects have entered the portfolio since last year's report. These supply-side interventions emanate from the MPP and aim to deliver on the City's commitment to deliver a range of solutions, both City and privately owned, which will protect the City from four stages of load-shedding. These projects are summarised in table 2 below. It should be noted that some of these assets will not be owned, or maintained, by the City. Private power producers will build, run and maintain some of the assets, and the City will utilise the power generated (subject to affordability and tender specifications) from these to purchase power that would otherwise have been purchased from Eskom. Some of these projects will thus fall within the operational budget expenditure category.

TABLE 2: DETAILS OF NEW GENERATION PROJECTS

Programme	Status	Power expected	Target date for first power	Ownership
Embedded independent power producers (IPPs)	Tender issued to market in February 2022	Up to 200 MW	2026	Private
Dispatchable ⁷ IPP	Tender issued to market in April 2023	Up to 500 MW	2027 ⁸	Private
Battery energy storage systems (BESS)	Feasibility	<5 MW	2025	Pilot facility = City future facilities = possibly private
Atlantis photovoltaic (PV)	Tender process under way	7 MW	2025	City
Paardevelei PV and BESS	Feasibility	Up to 60 MW	2027	City, private or public-private partnership (PPP) – TBC following feasibility

⁷ Dispatchable power refers to the output of an electrical power plant that can be turned on or off to deliver power as needed.

⁸ This target date is based on the sector plan. It should be noted that the MPP for Energy has set a more ambitious target of the end of the term of office (some point in 2026). Every effort is being made to bring this programme online by the more ambitious target date.

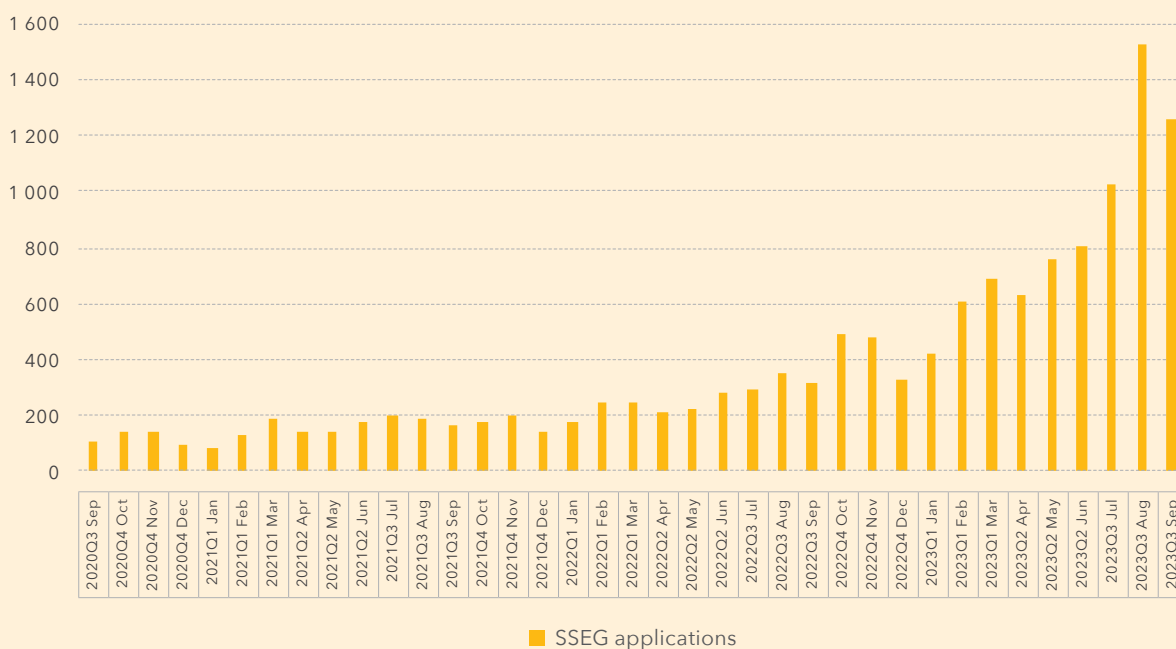
It is worth noting that alongside these supply-side interventions, the City is also pursuing a range of demand-side interventions. These are not covered in detail in this report as they are operational and not capital in nature. The following projects are currently in progress and will lead to decreased demand for energy and strain on the City's energy infrastructure network:

- **The Power Heroes programme** – an initiative to contract with residential and small commercial customers through a third-party aggregator for voluntary energy reductions at specific times, which will entail automated remote switching off of power-intensive devices during load-shedding and/or peak periods.
- **The cash-for-power programme** – aims to incentivise the installation of grid-tied solar PV systems and will pay customers (who are net generators that produce more than what they consume) to feed excess power generated into the City grid.
- **Wheeling** – the financial transaction representing the transportation of third-party electrical energy (kWh) to a third-party customer via the distribution/transmission network.

- **Energy-efficiency projects** – a programme targeting the retrofitting of inefficient lighting and HVAC systems, as well as the installation of SSEG, at City-owned facilities.

Finally, it is also worth noting that, in the past 18 months, Cape Town has seen a significant uptake in households and businesses installing grid-tied solar PV systems. This is and will continue to result in decreased demand for electricity from the grid. As of 30 September 2023, the City had, in total,⁹ more than 3 998 grid-tied residential systems commissioned and 606 grid-tied commercial and industrial systems commissioned. This equates to a total installed and commissioned grid-tied capacity of 116,7 megavolt amperes (MVA). A total of 7 692 new applications were received so far in 2023, as of 30 September 2023. This uptake in applications is expected, given the increase in load-shedding experienced, as well as the 1 October 2023 deadline set for the implementation of new SSEG requirements aimed at streamlining the application and authorisation process.

FIGURE 6: MONTHLY SSEG APPLICATIONS, RESIDENTIAL AND COMMERCIAL, SEPTEMBER 2020 TO SEPTEMBER 2023



⁹ This total is the overall total of registered and approved SSEG applications.

DISTRIBUTION

The City's distribution network is supplied from the national grid via 37 points of delivery. Where network infrastructure constraints are identified, new infrastructure is required to create additional distribution capacity. These projects are driven by customer demand and are normally reactive in nature. Projects are initiated as and when customer applications or large new developments require it. New connections are accommodated on existing infrastructure, provided technically sound networks exist. It should be noted that the continued theft and vandalism of City infrastructure are having a negative impact on network constraints and pose a significant challenge at present. During the 2022/23 financial year, 912 incidents of vandalism totalling an estimated R17 million were recorded, with photographic evidence.

Another component of the portfolio are end-of-lifecycle projects, which are subject to a condition-based assessment of the equipment in order to determine the

correct time of project initiation and potential extended useful life. The response is one of the following:

- Refurbishment and replacement of the capital asset; or
- Improvement and expansion of the capital asset.

In the latter, the intention of these projects is to increase operating capacity of existing assets, either by adding another cable/conductor, upgrading existing power transformers with larger transformers (typically in 50 MVA units), or establishing new switching stations to consolidate intake points or supply from a higher voltage level.

There have been a few updates on City-owned distribution projects identified as backlogs in last year's report, as well as updates from Eskom on plans to upgrade their main substations, which are detailed in annexures A2 - A5.

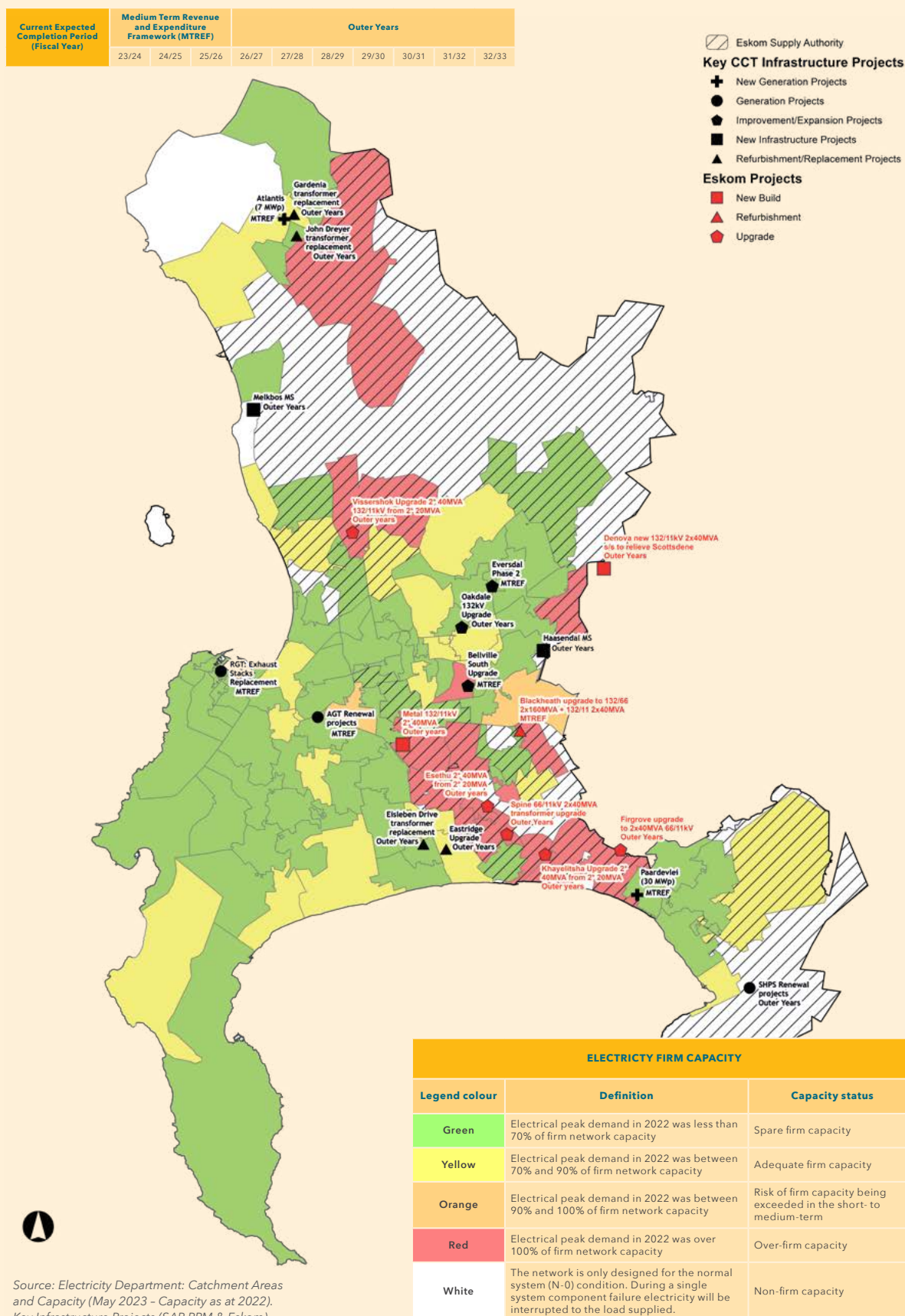


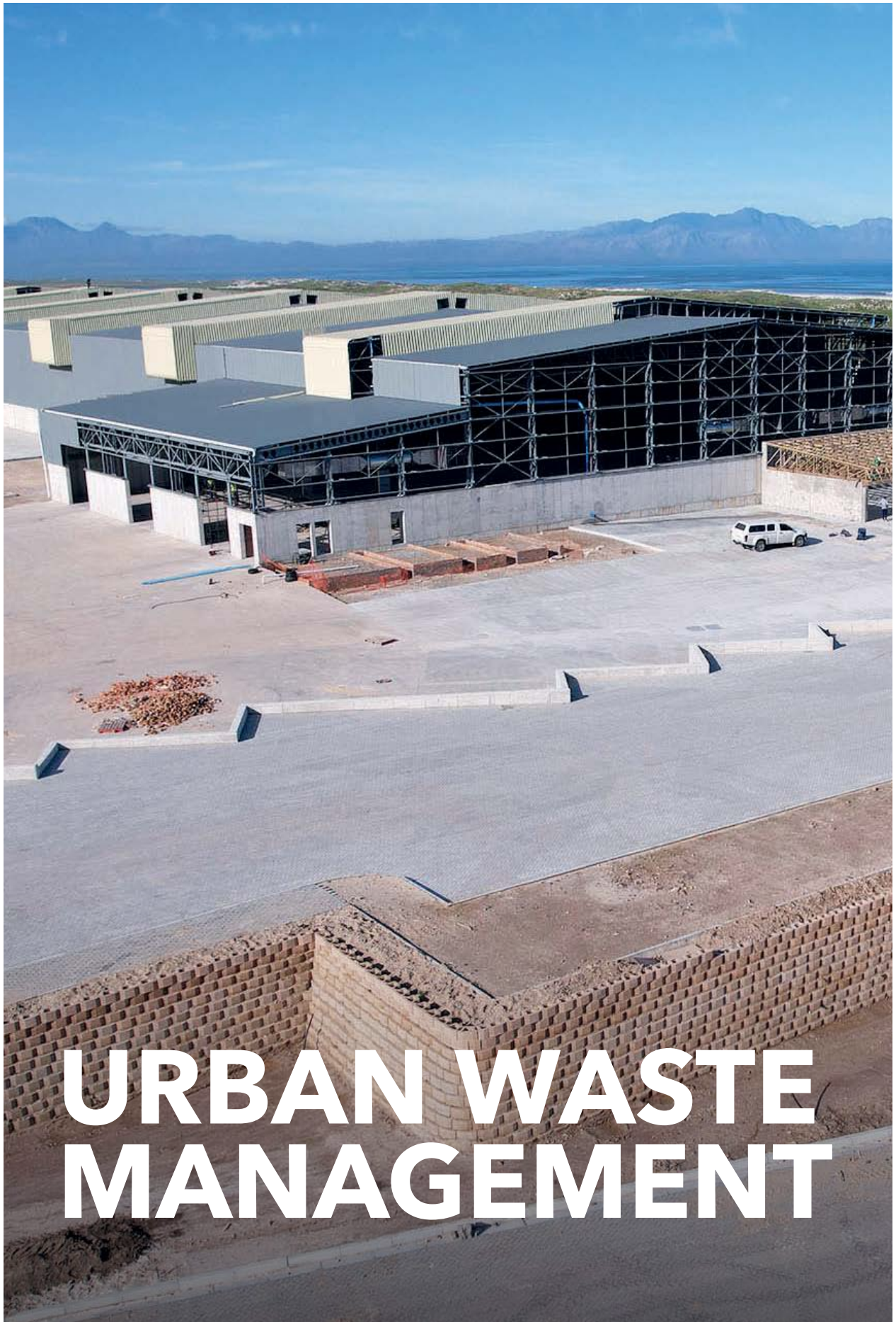
CONCLUSION

In the past year, the Energy portfolio has seen an increase in projects of the portfolio in the outer years. Minor changes in distribution network projects have also occurred in response to changes in development trends.

Aside from this, the remainder of the Energy bulk capital infrastructure portfolio remains largely consistent, and no new backlogs or risk areas have been identified.

FIGURE 7: ENERGY CAPACITY AND CAPITAL PROJECTS, INCLUDING ESKOM





URBAN WASTE MANAGEMENT

The Urban Waste Management Directorate's integrated portfolio has changed significantly since last year. This has been driven by a significant increase in both expansion and upgrade projects for drop-off facilities and RTSs.

That said, the following trends have remained consistent:

- The majority (98%) of the capital expenditure relates to the expansion and upgrade of assets. This is largely due to the capital requirements of landfill projects.

FIGURE 8: URBAN WASTE MANAGEMENT SECTOR'S BULK CAPITAL EXPENDITURE BY TECHNICAL CATEGORY OVER THE 10-YEAR PERIOD FROM 2022 TO 2032 (AS EXTRACTED FROM SAP PPM ON 23 MAY 2023)

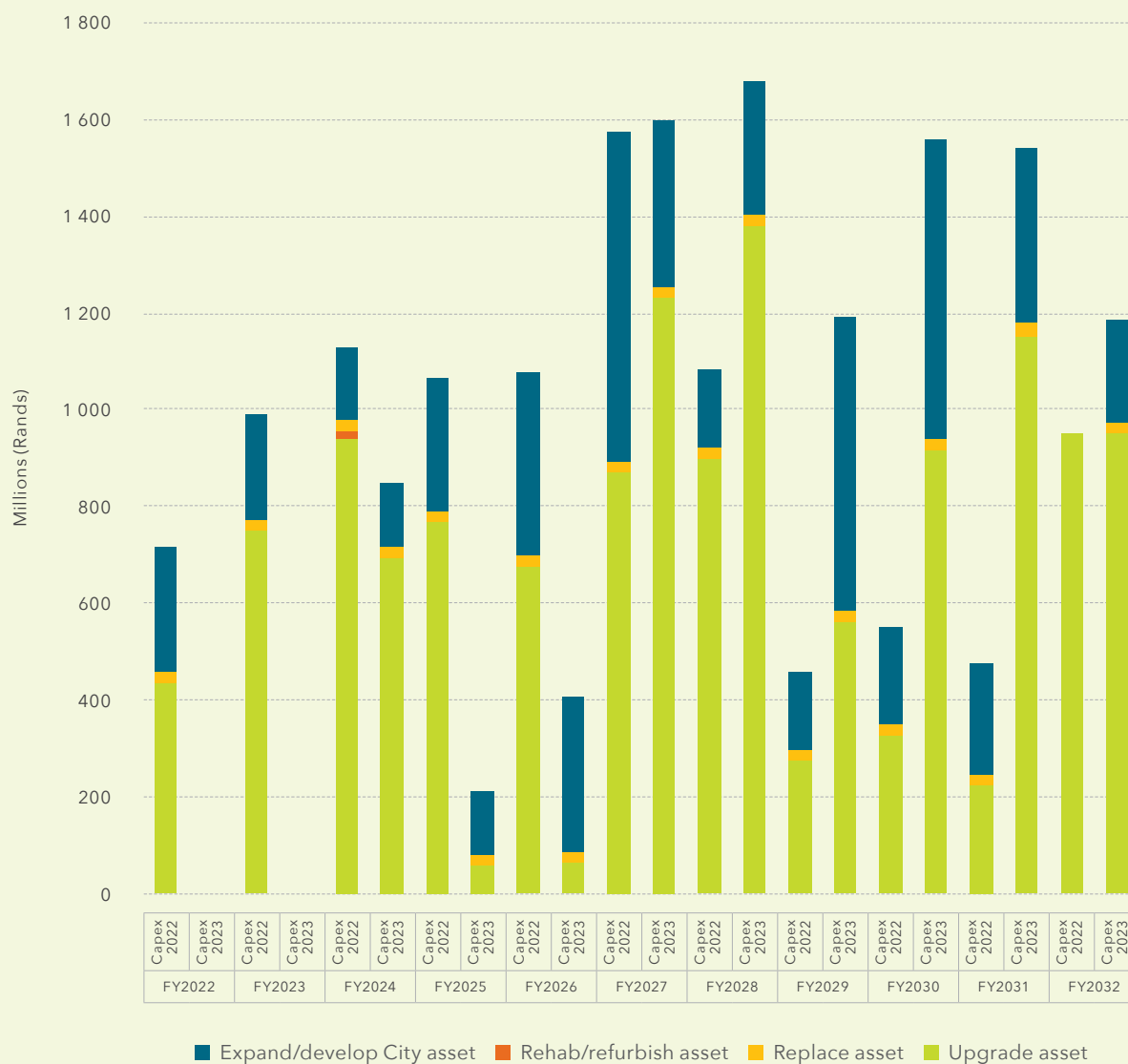
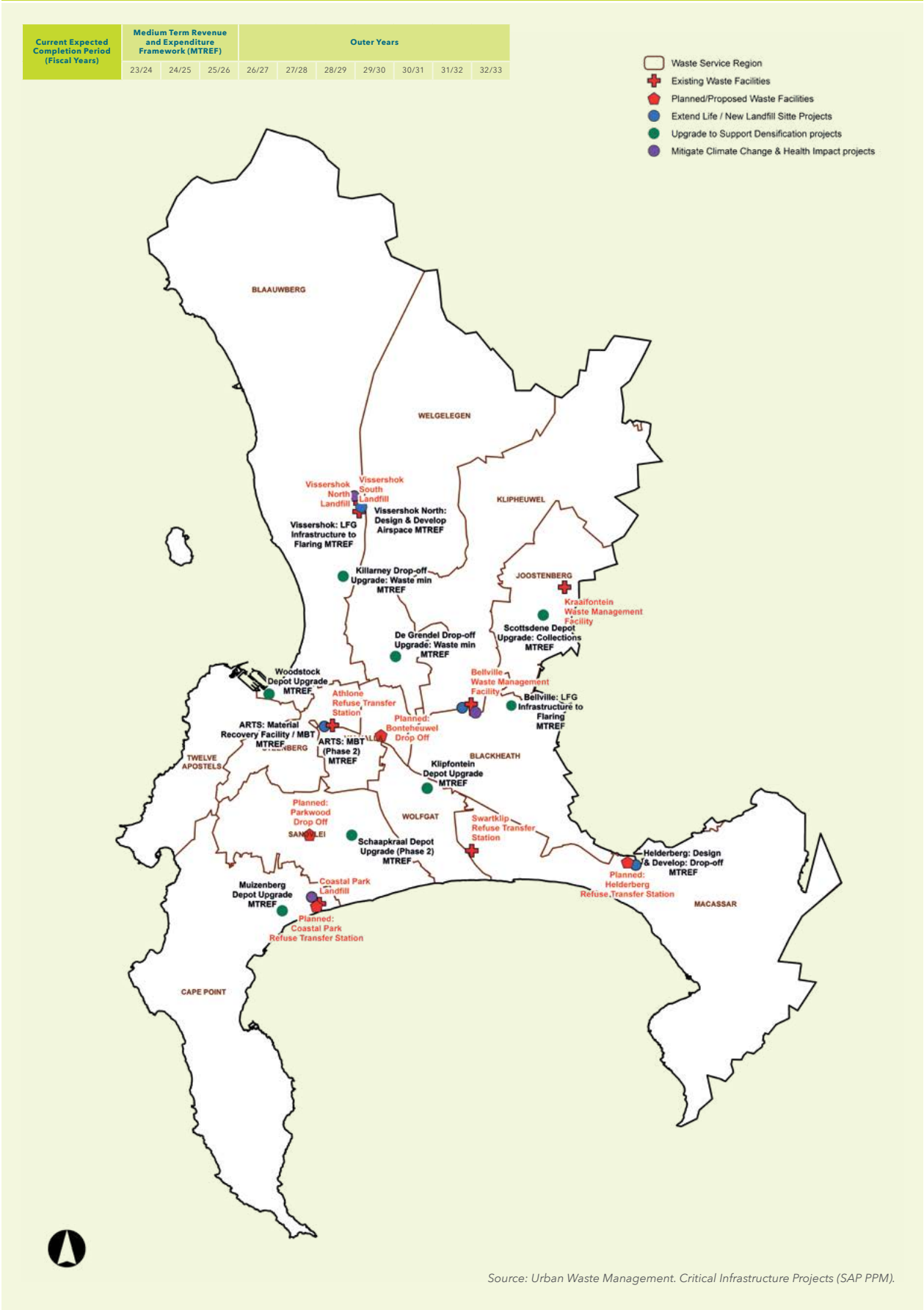


FIGURE 9: URBAN WASTE MANAGEMENT'S EXISTING AND PLANNED CAPITAL PROJECTS



Source: Urban Waste Management. Critical Infrastructure Projects (SAP PPM).

LANDFILL

The City operates two landfill sites, namely Coastal Park and Vissershok. Coastal Park has four years of remaining capacity; thereafter, all waste will have to be transported to Vissershok, which will be under increased pressure.

Last year's report noted the intention of the directorate to extend the Vissershok airspace availability between 2037 and 2040. This will be achieved through baseline waste reduction and through the expansion of Vissershok to the north, which will ensure that there is sufficient capacity to manage the increase in pressure until a new regional landfill is developed.

The City has projects in the pipeline for both Coastal Park and Vissershok to address current backlogs as detailed in annexure B:1.

Coastal Park landfill site

Additional cell development has been completed for Coastal Park; however, landfilling cannot take place until approval to commence activities has been received from the commenting authority, i.e. the national Department of Water and Sanitation. There is currently a lack of guidelines in terms of expected or required timelines for such commenting review, and it is therefore unclear when the City will receive this authorisation in order to begin operation of the new cells.

With the Coastal Park landfill site running out of airspace, the planned Coastal Park refuse transfer station (RTS) will allow waste to still be disposed of at this site before being transported to Vissershok in order to reduce haulage costs and optimise collection routes. The original plan was to develop both an RTS and an organic reduction facility on the same site in order to process organic waste closer to source of origin and divert it from landfill. However, this project has been delayed due to procurement challenges associated with the appointment of professional service

providers. There are also a number of outstanding technical challenges regarding the full strategy for organic waste collection and separation. As a result, a phased approach has been taken that will first focus on the completion of the RTS with the construction of the organic reduction facility thereafter. The directorate intends to thus still be able to complete the RTS within the remaining four years of Coastal Park's lifespan. In addition, the Coastal Park material recovery facility is currently under construction.

Vissershok landfill site

The long-term banked airspace at Vissershok has declined due to operational usage, prompting the directorate to apply for additional airspace. The Vissershok South site development is in progress, with two new piggy-back cells currently under construction. However, as with Coastal Park, once the cells have been constructed, authorisation from the national Department of Water and Sanitation will be required prior to landfilling activities, which could result in delays.

Regional landfill site

The City has for numerous years been in the process of pursuing the establishment of a new regional landfill site. This need has become more urgent as the lifespan of Coastal Park nears conclusion. However, several challenges have been experienced with regard to stakeholder appeals to the Environmental Impact Assessment process and a Record of Decision issued on 16 July 2007 by the provincial Department of Environmental Affairs and Development Planning. Appeals and litigation ensued and the matter remains unresolved to date. As a result, the land acquisition for a new regional landfill site has been delayed and the directorate has had to initiate a new process, which is currently in the feasibility stage, for the identification of a new site for development. This is a significant concern, as the targeted date for purchase of land is 2026 - the year before Coastal Park reaches the end of its lifespan. This will result in significant additional pressure being placed on the Vissershok landfill. This project is a critical priority for the City going forward.

TABLE 3: PROJECTS RELATING TO THE DEVELOPMENT OF A REGIONAL LANDFILL

Project name	Project status 2023	Planned start	Planned finish
Purchase of Land Regional Landfill Project	Feasibility	2024	2025
Purchase of Land Regional Waste Management Facility	Scoping	2026	2027
Development of the Regional Landfill Site - Waste Management Licence Application	Scoping	2015	2024
Development of the Regional Landfill Site	Scoping	2023	2027

REFUSE TRANSFER STATIONS AND DROP-OFFS

The City manages a number of refuse transfer stations (RTSs) and, despite there being sufficient RTSs across the city to divert waste, the frequent breakdown of transfer station equipment results in operational targets regularly being missed. The transfer stations that continue to experience frequent breakdowns are detailed in annexure B:2.

In order to address the challenges, these transfer stations will be undergoing upgrades and regular maintenance of equipment. In addition, the City has initiated the development of two new transfer stations at Coastal Park and in the Helderberg district to increase overall capacity.

The Athlone RTS project is aimed at both an upgrade of the existing facility and the development of an integrated waste management facility in order to reduce the volume of waste going to landfill. The project will therefore include the provision of formal recycling, chipping of garden waste and mechanical biological treatment processing for the extraction of organic waste. Due to constraints with the size of the site, the inclusion of informal recycling will only be considered in phase 2 of the project.

A key policy change noted in last year's report was the City's intention to reduce the service radius of drop-off sites from 7 km to 3 km in the short to medium term. Since then, there has been an increase in bulk projects in the portfolio, starting from the 2025/26 financial year to 2035, for the provision of additional drop-off facilities. See annexure B:3 for further details.

However, with the exception of Swartklip equipment upgrades, none of the current projects planned for additional RTSs or drop-off facilities are targeted for completion before 2028. This is a concern, as there will be a five-year period during which no additional disposal and drop-off capacity will be added citywide. While the City is currently meeting demand, the population, and therefore demand, will grow over this five-year period and the goal of decreasing the service radius from 7 km to 3 km will also not be achieved until then.

Last year's report noted that the Informal Settlement Waste Management Strategy should be completed as a matter of urgency. This strategy development process is nearing completion and is currently targeted for the end of June 2024. The directorate is also in the process of reviewing its informal settlement waste collection model. This is intended to meet the increasing demand for waste services in informal areas, as well as incorporate waste minimisation initiatives.

Finally, the inability of the City to access the rail network to transfer waste to and from RTSs remains a significant challenge, which inhibits the operational efficiency and financial sustainability of metropolitan solid waste management.

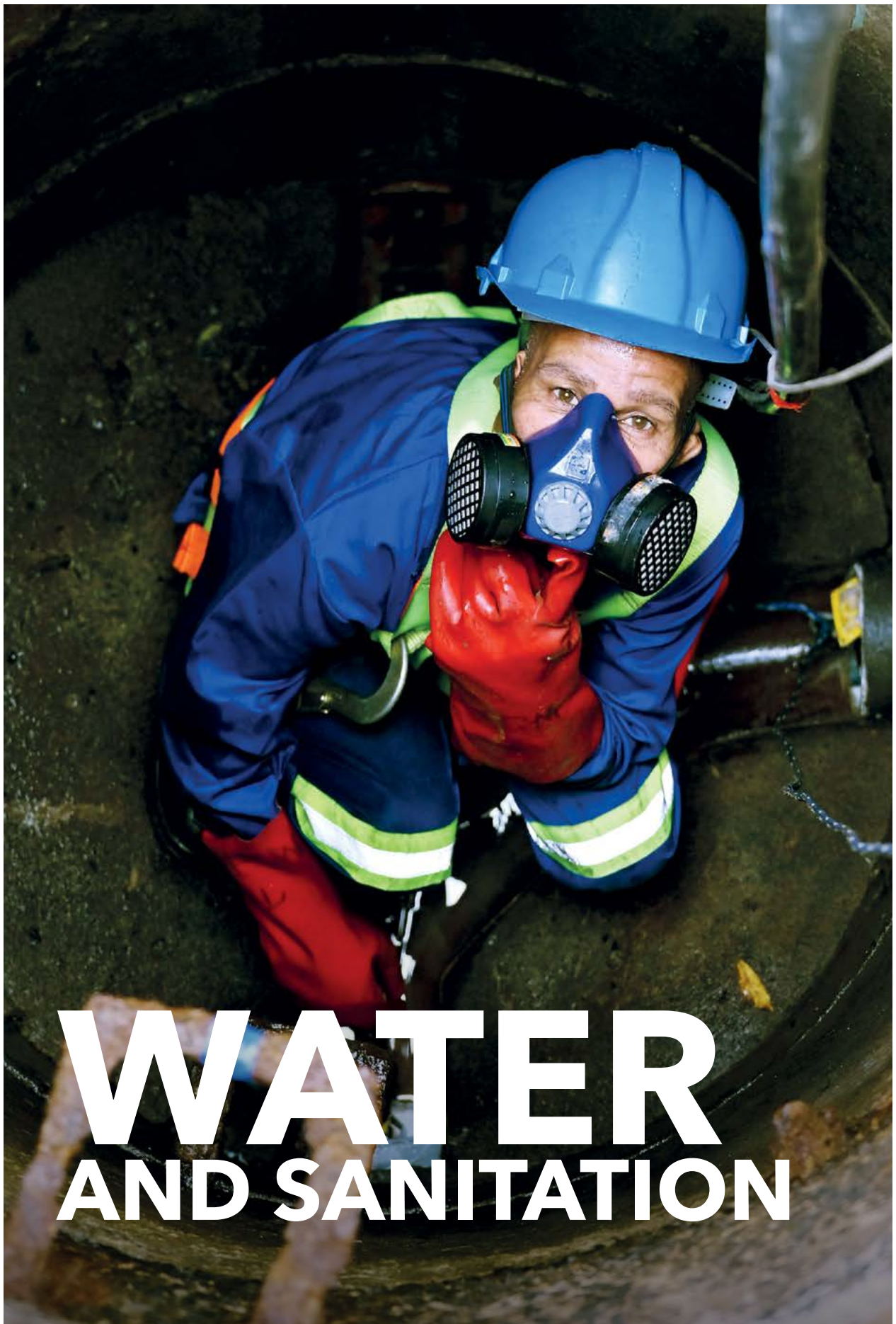
CONCLUSION

The imminent closure of Coastal Park is a significant, ongoing risk to the City. The purchase and development of a regional landfill site thus remains a critical priority for the City going forward.

While additional cells have been completed at Coastal Park, which will provide some airspace capacity increase, these cannot move into operation until the national Department of Water and Sanitation provides approval for landfill activities at these cells. Similar delays will potentially also be experienced at Vissershok once the cells currently under way reach completion. The City will therefore advocate for the speedy resolution of this regulatory matter with national government.

While several new projects have been added to the portfolio, which will address the change in radius of drop-off facilities in the medium term with the exception of Swartklip, there are no current projects for additional RTSs or drop-off facilities targeted for completion before 2028. This is a concern, as a growing population with increasing demand will have to be serviced with no additional capacity over the next five years.



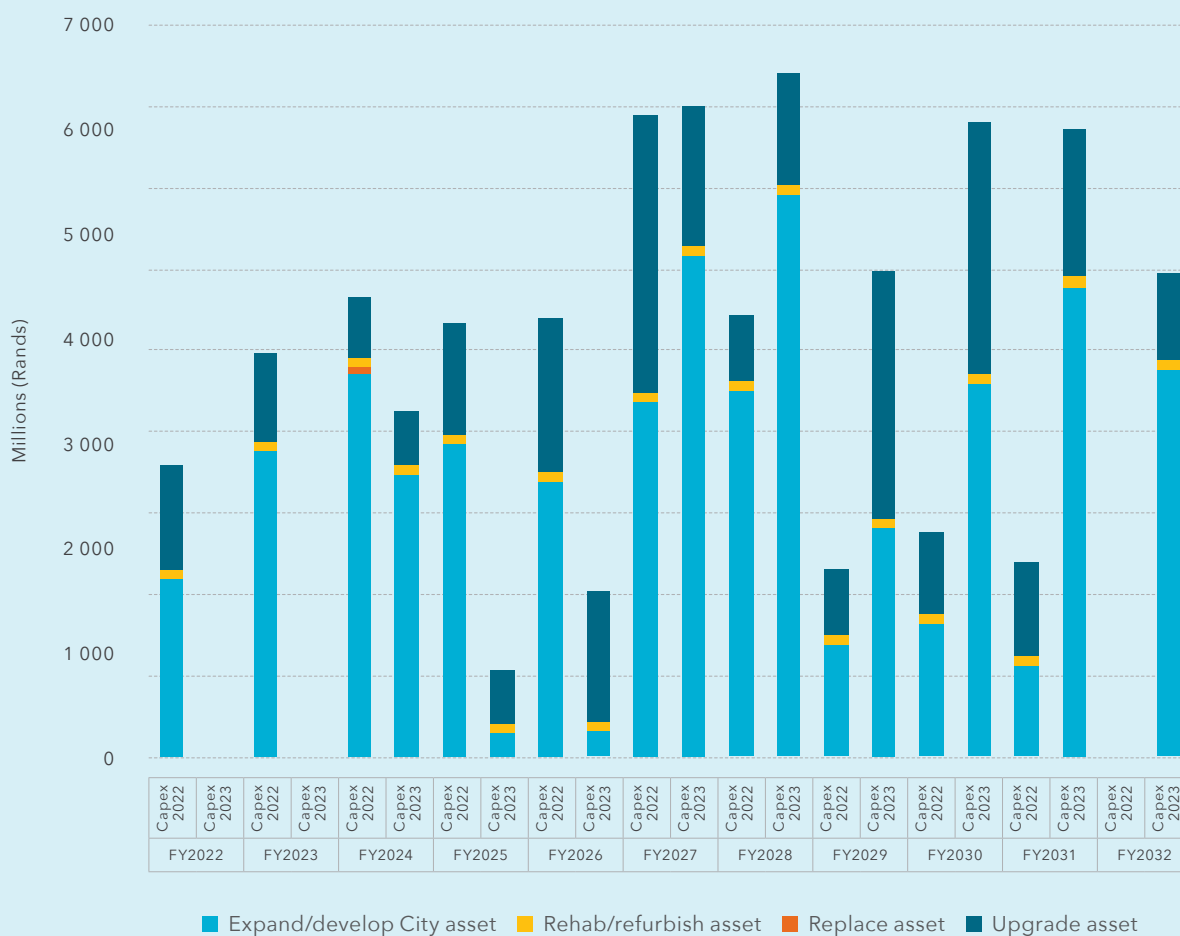


The Water and Sanitation Directorate's bulk infrastructure integrated portfolio has seen a significant increase in planned capital expenditure over the 10-year portfolio since last year's report. This is largely driven by increased pipe replacement and pump station-related projects aimed at reducing the frequency, duration and impact of sewer spills.

Since the 2022 report, the following trends have remained fairly consistent:

- Capital expenditure grows consistently to 2026, dropping annually thereafter.
- The majority of capital commitments relate to new and upgrade capital projects.
- Bulk water capital projects account for the majority of the directorate's capital commitments, followed by wastewater.

FIGURE 10: WATER AND SANITATION SECTOR'S BULK CAPITAL EXPENDITURE BY TECHNICAL CATEGORY OVER THE 10-YEAR PERIOD FROM 2022 TO 2032 (AS EXTRACTED FROM SAP PPM ON 23 MAY 2023)



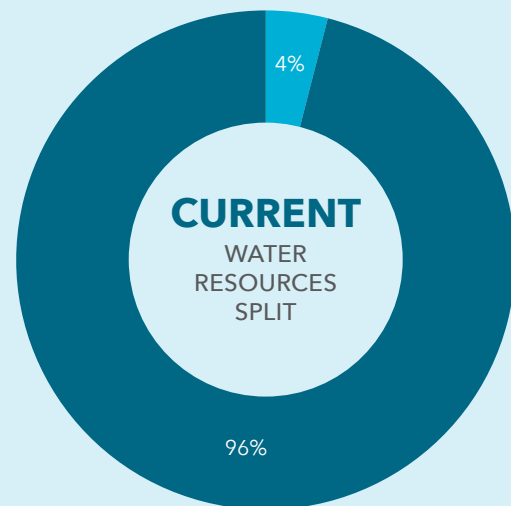
THE NEW WATER PROGRAMME, MASTER PLANNING AND THE ADAPTABLE PROGRAMME

In the 2022 report, it was noted that the Water and Sanitation Directorate was conducting a review of the approach to implementing the New Water Programme, primarily to confirm that the programme is still aligned to the City's current investment priorities and risk tolerance (in light of climate change, population growth and financial sustainability), and secondarily to assess the impact on affordability, given current fiscal constraints. This review has been postponed until the outcome of a review of the Western Cape Water Supply System is concluded by national government.¹⁰ The outcome of this review, which is currently under way, will help to calculate growth in water demand to determine requirements for new water projects beyond 2030, since the New Water Programme only caters for the demand up to 2030. Once the outcome of the review is final, the review of the New Water Programme can commence. Until then, the City remains committed to the current plan and is on track to deliver 300 million litres of water per day by the end of the 2029/30 financial year.

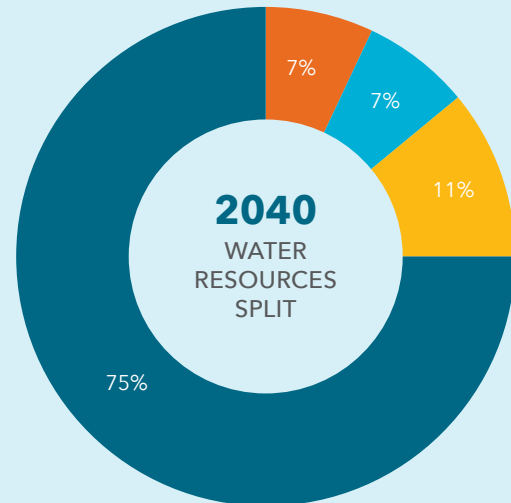
Another aspect of future planning, which is also dependent on the outcome of this review as it relates to the calculation of growth in water demand beyond 2030, is the current constraints at the City's water treatment plants (WTPs). As was detailed in last year's report (see annexure C:1), five WTPs currently have no surplus capacity during peak demand. The Voëlvelei and Wemmershoek WTPs cannot shut down for extended periods of time. The Blackheath and Faure WTPs are fed via the Riviersonderend tunnel system, which, in the event of the tunnel failing or being out of operation for extended periods, would mean that the City would lose approximately 40% to 50% of its water treatment capacity.

The New Water Strategy (informed by the New Water Programme) sets out the City's alternative water source projects up to 2030 and states that, by 2040, the City aims to diversify its water sources away from surface water schemes by 25% by introducing desalination, groundwater extraction and reuse. Currently, 96% of the City's water resources are from surface water, with 4% from groundwater, whereas future water augmentation schemes will decrease surface water reliance to 75%, with 11% coming from desalination, 7% from groundwater and 7% from reuse.

FIGURE 11: HOW CAPE TOWN'S WATER SUPPLY SYSTEM WILL CHANGE



■ Groundwater
■ Surface water



■ Desalination
■ Groundwater
■ Reuse
■ Surface water

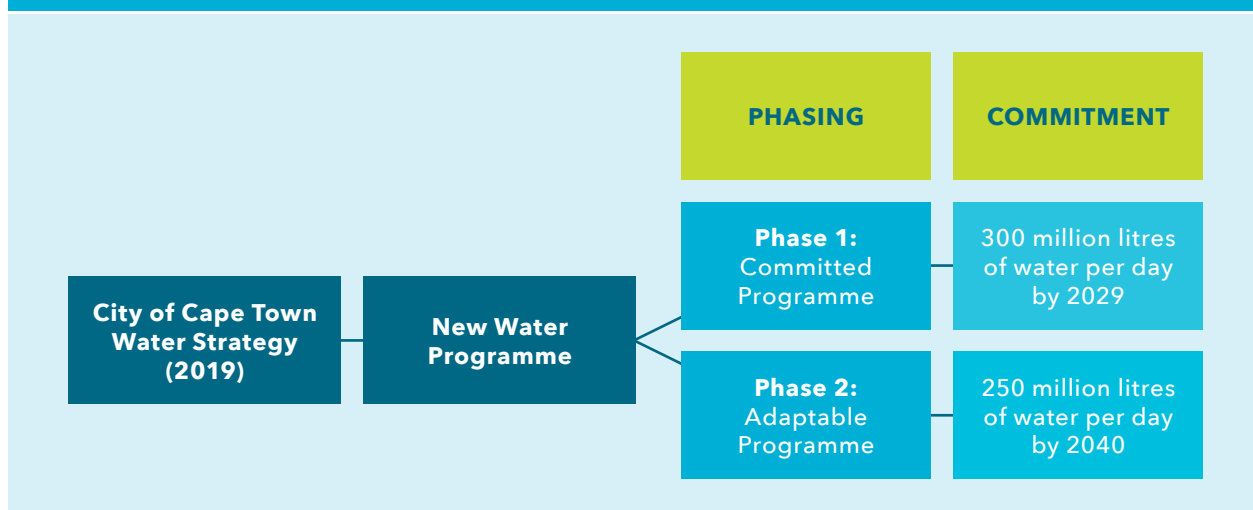
Source: City of Cape Town Water Strategy, 2019.

¹⁰ The City is responsible for the reticulation, treatment and provision of water to residents of Cape Town, while national government, through the Department of Water and Sanitation, is responsible for bulk water supply and infrastructure. Cape Town is part of the Western Cape water Supply System, which gets its water from six major rain-fed dams.

Alongside these reviews, the directorate has initiated the 'Adaptable Programme'. The purpose of this programme is to plan for the capital pipeline beyond 2030 to meet anticipated future need, but for which an immediate implementation decision is not required. Preliminary work on these projects, such as securing and permitting sites and preparing designs and bid documents, will be undertaken in advance so that the City can implement the projects more swiftly

if necessary. However, these projects are not yet reflected in the City's portfolio management system and are therefore not reflected in the portfolio shown in figure 10 of this report. This needs to be urgently addressed in order to support long-term planning and decision-making. However, the current status and possible capacity of the schemes currently envisaged under the Adaptable Programme are detailed in annexure C:2.

FIGURE 12: WHERE THE ADAPTABLE PROGRAMME FITS WITHIN THE OVERALL WATER STRATEGY



BULK WATER

In the context of budget constraints and the need to keep tariffs affordable, the City is prioritising wastewater over bulk water to address wastewater treatment backlogs that impact on development in the city.

In light of this, the Bulk Water Department is currently reviewing the growing demand across the city and is reprioritising projects within the portfolio to address areas of greatest need and highest demand first, while postponing certain projects in the portfolio due to budget constraints. Annexures C3 - C:5 provide an update on current projects in the pipeline, noting where projects have been postponed in the portfolio.

Desalination

As a result of the complexity and financial commitments required for a desalination project, since the publication of the 2022 report, the City has entered into discussions with National Treasury (NT) around the possible establishment of a public-private partnership. This would enable a co-funding model for the project. While these discussions are ongoing, the first desalination plant phase 1 (70 Mℓ/d) remains on track to be completed in 2030.

Further desalination projects will be investigated as part of the Adaptable Programme for potential implementation in the later years of 2035 to 2040 to meet future water demand, subject to financial modelling and availability.

Reservoirs

Since the 2022 report, both the Spes Bona and Contermanskloof reservoirs have been completed. The Steenbras Reservoir infrastructure is also currently undergoing a re-evaluation process under the 2022-2024 Master Plan. This re-evaluation has prompted new, further infrastructure interventions (which are presently being assessed) for both the Helderberg Scheme and Steenbras Reservoir.

Parts of Helderberg are high lying and require pump stations in series to get water to the high-point-serving reservoirs. While there is sufficient storage capacity (48 hours), the pump stations cannot switch on as required during prolonged power outages (as was experienced in 2023 due to load-shedding), resulting in reservoir filling problems. This risk has been addressed through the installation of generators at four critical pump stations.

As was detailed in last year's report, the Brakkloof Reservoir is supplied by a single distribution pipeline. In the event of a prolonged water outage due to required repairs, it will not have sufficient storage to secure supply for the duration of repair. Since then, a feasibility study was conducted and a decision was made to construct a 20 Mℓ reservoir in proximity to Brakkloof to address the single distribution pipeline risk. This project is now expected to enter the design stage.

A number of additional reservoirs are included in the capital project pipeline, some of which respond to existing capacity constraints and some of which will provide storage capacity for new water produced through either the Bulk Water Augmentation Scheme (BWAS) or the New Water Programme.

COMPLETED CONTERMANSKLOOF RESERVOIR



WASTEWATER TREATMENT WORKS (WWTW)

WWTW upgrade projects can comprise a capacity upgrade or a treatment process upgrade, or both. All WWTW upgrade projects are implemented to improve or maintain treated effluent quality and ensure sufficient treatment capacity for future population growth.

Annexure C:6 provides an update on the project preparation status of the various projects that are currently in the capital portfolio to address capacity constraints at WWTWs identified in last year's report as over- or near-capacity. Of these projects, Zandvliet and Potsdam experienced initial delays, which have affected project implementation and completion. That said, both are now progressing. Zandvliet phase 1

(20 Mℓ/d) will be completed in early 2024, while phase 2 is currently scheduled to start in the 2027/28 financial year and end by 2034/35 (a postponement on the original timeline due to budget constraints).

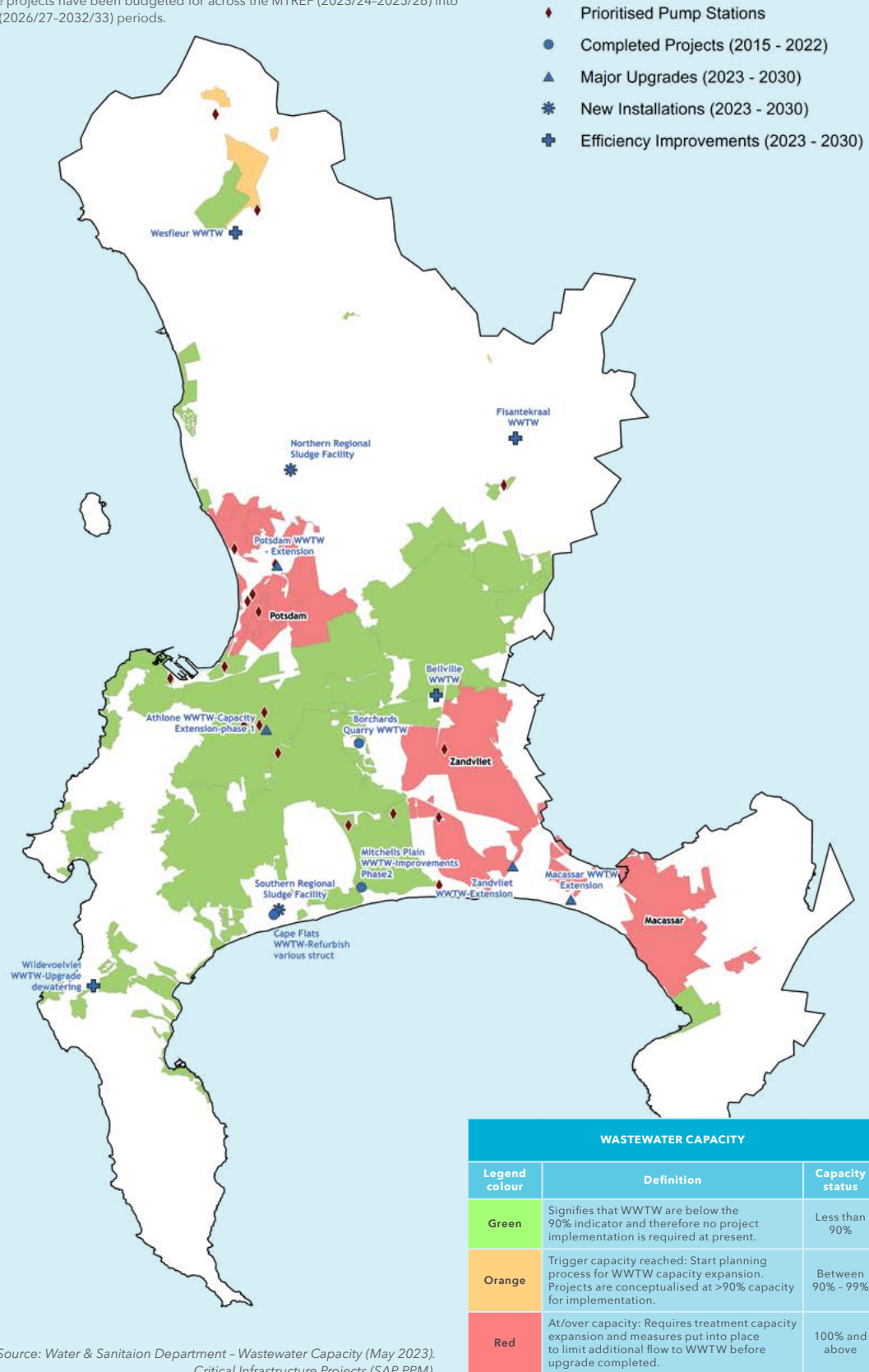
For Zandvliet, 72 Mℓ/d capacity was projected to be reached in 2013,¹¹ and an upgrade to 90 Mℓ/d had already kicked off in 2010. However, by 2011, Zandvliet had reached its 72 Mℓ/d flow capacity. The Zandvliet catchment is the fastest growing catchment in the city, thus phase 2 will need to be commissioned shortly after phase 1. Potsdam is currently on track for completion (infrastructure handover/commissioning) by the end of the 2026 financial year, assuming that there are no unforeseen delays. The remaining six projects are on track and are expected to be implemented as envisaged.



¹¹ GLS W&S Master Plan 2011/15.

FIGURE 13: WASTEWATER CAPACITY AND CAPITAL PROJECTS

Water & Sanitation infrastructure generally have a project lifecycle of between 7-10 years and therefore, these projects have been budgeted for across the MTREF (2023/24-2025/26) into the Outer Year (2026/27-2032/33) periods.



WASTEWATER SLUDGE TREATMENT

Since 2010, the City has pursued a regional approach to sludge treatment and disposal. The 2010 Sludge Strategy made provision for three regional sludge facilities or biosolids beneficiation facilities (BBFs), one in the south (located at Cape Flats WWTW), one in the north (located at a greenfield site) and one in the east (located at Zandvliet WWTW). As was detailed in the 2022 report, these projects have for various reasons suffered from significant delays and none of these facilities have been completed to date.

Since last year's report, budget constraints have led to further delays with a decision being taken to split the southern BBF project into two phases. The project is currently in design phase that is nearing completion, but the commencement of construction has also had to be pushed out further to accommodate Potsdam and Macassar WWTW projects from a budgetary point of view. Phase 1 of the southern BBF project is currently scheduled for commissioning in the 2028/29 financial year and phase 2 commissioning for the 2030/31 financial year. This means that the City will be non-compliant with the 2027 deadline¹² for diverting all primary sludge from landfill. The northern BBF has also been further delayed since the last report.

TABLE 4: UPDATE ON BBF PROJECTS

2022 Project list	2023 Project list	Planned finish	Comments
Southern BBF (at Cape Flats WWTW)	Cape Flats WWTW – Biosolids phase 1	2024/25	Decision taken to split the project into two phases due to budget constraints.
	Cape Flats WWTW – Biosolids phase 2	2032/33	
Northern BBF (at greenfield site)	Northern BBF (at a new greenfield site)	2036/37	Impasse over land sale: Land price agreement not reached with private owner. New site is required. Project has been further delayed.
Eastern BBF (at Zandvliet WWTW)	Eastern BBF (at Zandvliet WWTW)	2037/38	No change

Work is also currently under way to consolidate previous studies and review the regionalised approach to ensure it is still the optimal way forward regarding wastewater sludge treatment and disposal, taking changes in legislation, technology and the local and global economy into account. The outcome of this

investigation may impact the Sludge Strategy going forward, particularly regarding sizing and location of the second and third BBF. Finally, the City is also investigating the feasibility of following a PPP for BBF developments into the future.

¹² National legislation, effective from 2019, prohibits the disposal of liquid to landfills, with organic diversion from landfill partially prohibited by 2023 and totally prohibited by 2027.

SEWER PUMP STATIONS

The City's sewer network consists of a combination of gravity, pump stations and rising mains. The guidance for capacity expansion is the sewer master plan, which is based on the latest long-term Land Use Model (LUM 2040).¹³ The sewer master plan sets out various cases for the upgrade of insufficient pump stations. Since last year's report, budgetary provision has also now been made for generators, given the constraints currently being experienced as a result of load-shedding.

In addition, as was noted in last year's report, 163 sewer pump stations have thus far been assessed as part of the MPP rapid pump station condition assessment. This identified a list of 25 pump stations that were experiencing critical constraints and gave rise to a rolling list of 20 pump stations that will be upgraded into the future. The eight listed below are currently included on the major projects list with a dedicated budget. These pump stations are predominantly in the scoping phase. Since last year's report, one project, Retreat pump station, has been completed and is in the commission and close-out phase.

TABLE 5: SEWER PUMP STATION MAJOR PROJECTS

2022 Project list	Capacity	Project status 2023	Planned finish
Rietvlei	Insufficient capacity	Scoping	2026
Table View East		Scoping	2029
Raapenberg		Scoping	2027
Langa		Scoping	2027
River Road		Scoping	2028
Koeberg		Scoping	2026
Sanddrift East		Scoping	2026
Retreat		Commission and close-out	Completed
General provision ¹⁴		Execution	2023-2031



Marine outfalls

An investigation titled "Marine Outfalls: Investigation into alternatives for land-based treatment in new or existing land-based WWTW" is currently under way. This investigation will present and shortlist scenarios and options for the future of the City's existing three marine outfalls that can subsequently be taken forward to feasibility.

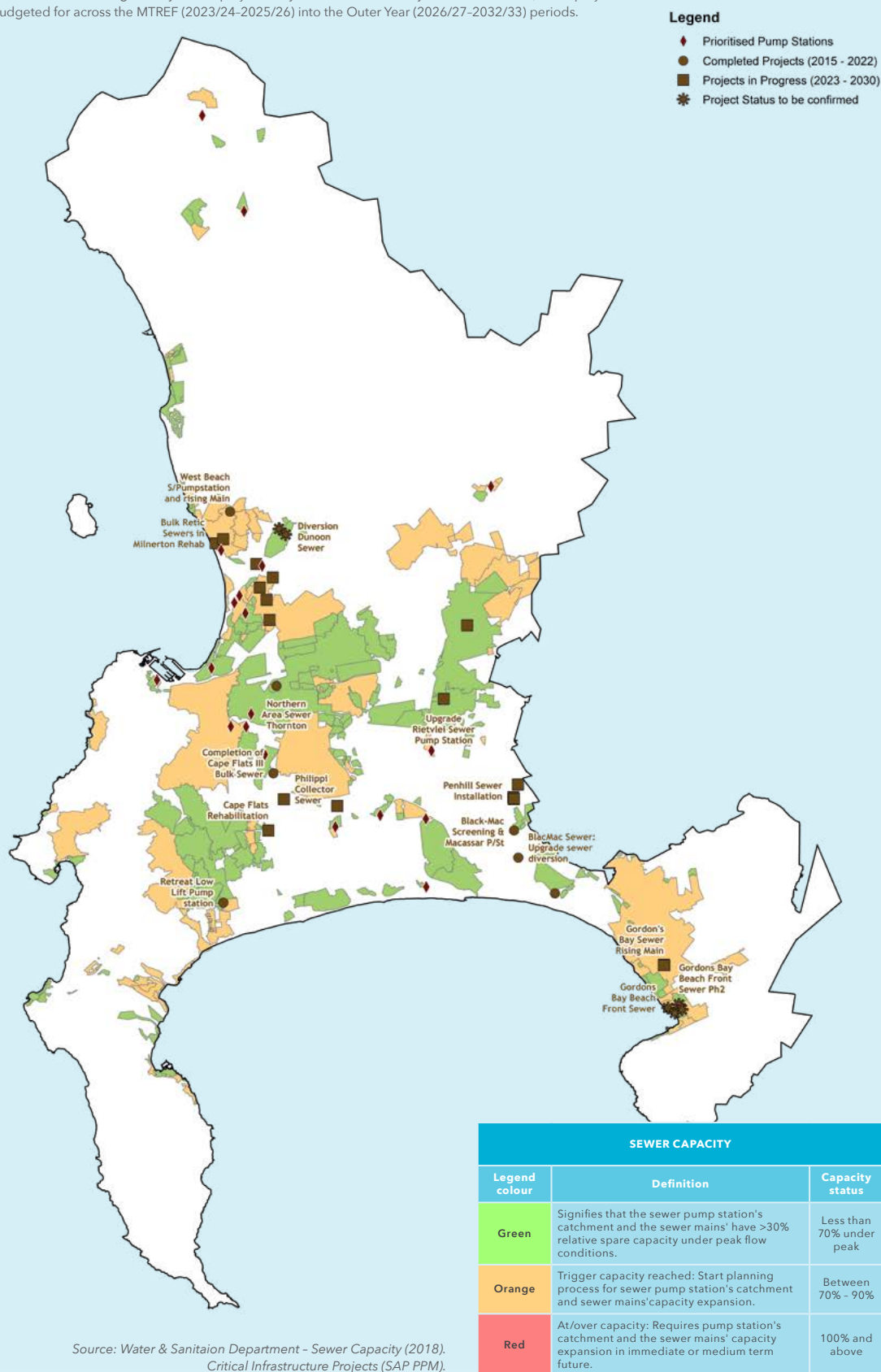
In the interim, there is currently no provision for any process or capacity upgrades nor for conversion to land-based treatment for any of the three marine outfalls in the next decade. Neither of the three outfalls are expected to reach capacity within that period and no decisions have yet been taken regarding technology changes.

¹³ The LUM 2040 is a Land Use Model, with a 2020 baseline, that provides an estimated scenario of residential and non-residential land use distributions for 2040.

¹⁴ This includes: Melville Road PS, Section 10 PS, Tokai PS, Clifton Road PS, Simon's Town No 1 PS, Fish Hoek PS, Sacks Circle PS, Fisantekraal 2 PS, Ascot PS, Lupin Crescent PS, West Beach PS, Diep River PS, Northpine PS, Camps Bay outfall PS, and Wingfield A PS.

FIGURE 14: SEWER CAPACITY AND CAPITAL PROJECTS

Water & Sanitation infrastructure generally have a project lifecycle of between 7-10 years and therefore, these projects have been budgeted for across the MTREF (2023/24-2025/26) into the Outer Year (2026/27-2032/33) periods.





STORMWATER

The 2022 report identified a concern that the City does not currently have a full set of stormwater master plans for each catchment area, and that the process to develop them has a long lead time. An additional challenge, which has since been identified, is the lack of capacity in the domestic market to provide the necessary technical resources to do the volume of master planning work that would be required in a shortened timeframe.

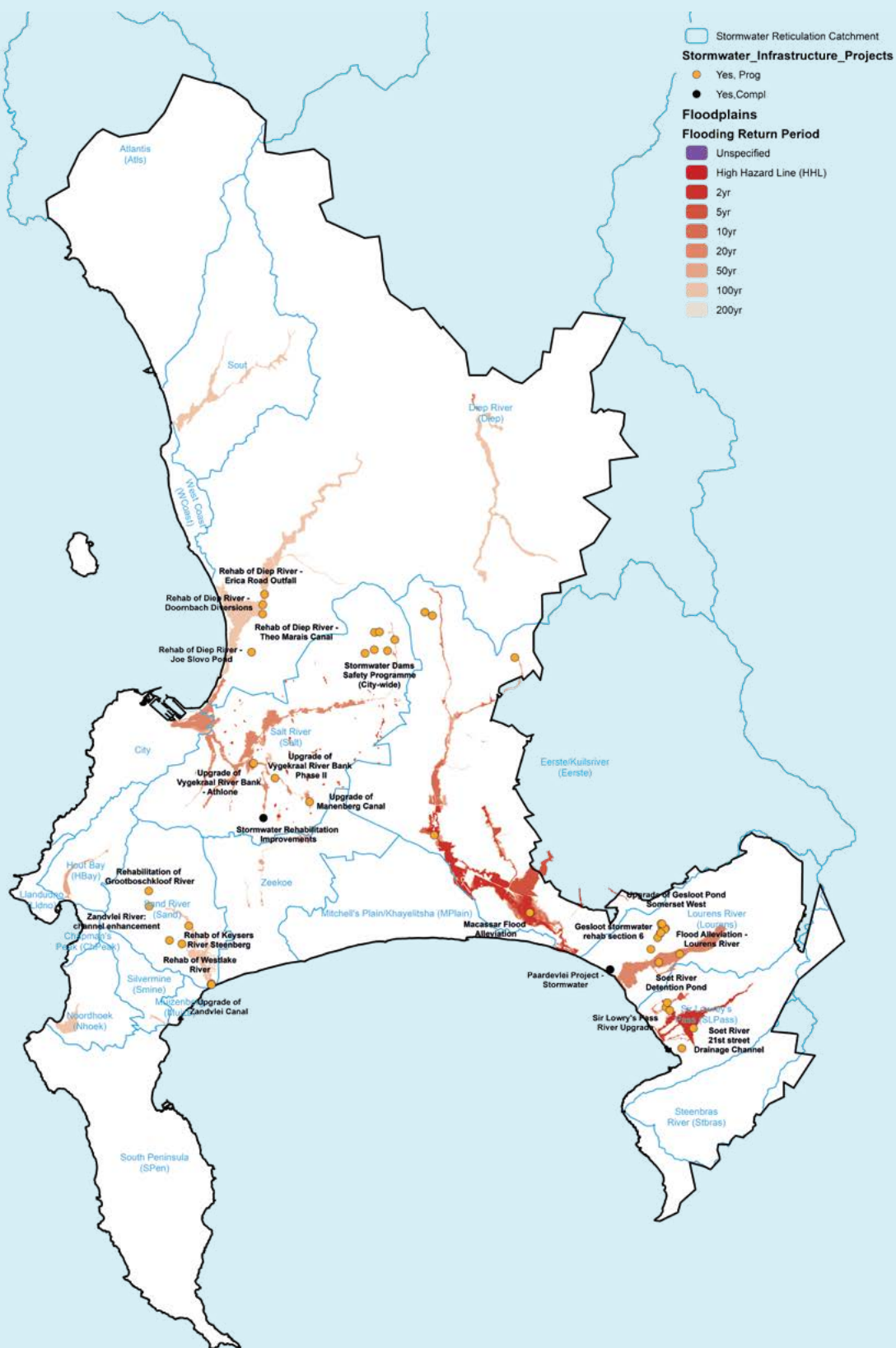
While the City has determined flood levels and the associated floodlines for 1:100-year flood events, these floodlines are out of date and need to be reassessed as part of the master planning process. In addition, due to climate change, it is likely that events that were previously 1:100-year events are now occurring with more intensity,¹⁵ requiring additional modelling.

While last year's report focused on stormwater master planning and the backlogs in this regard, and mentioned that there were projects in the 10-year portfolio relating to flood management and pollution abatement (these are also shown on the map in last year's report), no further assessment was provided due to a lack of detail in the sector plan at the time. Since then, updates to the sector plan have enabled a more detailed assessment, which is presented below.

This report provides an analysis of current backlogs in the stormwater system, with annexure C:7 providing a list of current capital projects that respond to these. However, it should be noted that this analysis only covers known backlogs. A comprehensive list of backlogs can only be established once there is a full set of stormwater master plans for all catchments in the city. In the absence of this, the City is prioritising the implementation of projects to address known backlogs.

¹⁵ As per the IPCC AR6.

FIGURE 15: STORMWATER CAPITAL PROJECTS



Source: Water & Sanitation Department - Stormwater. Critical Infrastructure Projects (SAP PPM).

New or replacement projects

The Diep River catchment currently has two priority projects, namely Doornbach and Theo Marais Canal. Doornbach is a project that will use diversion structures,¹⁶ separators¹⁷ and gravity mains¹⁸ to divert greywater within the stormwater system to the sewer system at the Potsdam WWTW, which will ultimately improve the water quality of the Diep River. The Theo Marais Canal aims to improve the water quality of Milnerton Lagoon.

The Lourens River flood alleviation project entails the design and construction of a bypass channel around the Somerset West central business district (CBD), which will protect the CBD and vulnerable residential areas and communities along the river corridor in the instance of a 1:100-year flood event.

The Macassar flood alleviation project will upgrade the Macassar River corridor, bordered by Baden Powell Drive to the west and the N2 to the north. The project is vital to secure the safe conveyance of water of up to a 1:100-year flood event, and should alleviate seasonal flooding in the areas of Kramat, Sandvlei and Macassar.

Refurbishment projects

The Vygekraal project will cover the repair and stabilisation of the riverbanks of the Vygekraal River between Vanguard Drive and Statia Heights, while also creating a river corridor through Nantes Park.

The citywide stormwater dams¹⁹ project is a safety upgrade of stormwater dams across the city, from category I to category II stormwater dams. The project will implement the recommendations of the recent dam safety evaluations and the work will rehabilitate various elements of the stormwater dams, including spillways, embankments and outlet channels. In addition, the work will provide some water quality improvement in the city's waterways.

Infrastructure expansion projects

The Diep River Erica Road outfall project aims to improve water quality in the Diep River and Milnerton Lagoon.

The Geelsloot project (which is the system on Avenue Irene where it joins the underground system) has several subprojects that will occur over several years. The channel runs adjacent to several homes and often overflows, which leads to flooded properties, especially in winter. These subprojects have an estimated completion date of December 2027.

The Sir Lowry's Pass River upgrade will secure the safe conveyance of water up to a 1:100-year flood event through the Firlands agricultural area. It will also ensure the safe conveyance of water in a 1:50-year flood event in the existing development areas in Gordon's Bay.

The Soet River upgrade project will cover the upgrading of the existing stormwater drainage channels, a detention pond, and pipe upgrade in order to mitigate flooding and reduce pollution.

CONCLUSION

In the past year, the Water and Sanitation bulk infrastructure capital portfolio has increased significantly, largely in response to a push to decrease the frequency and severity of sewer spills.

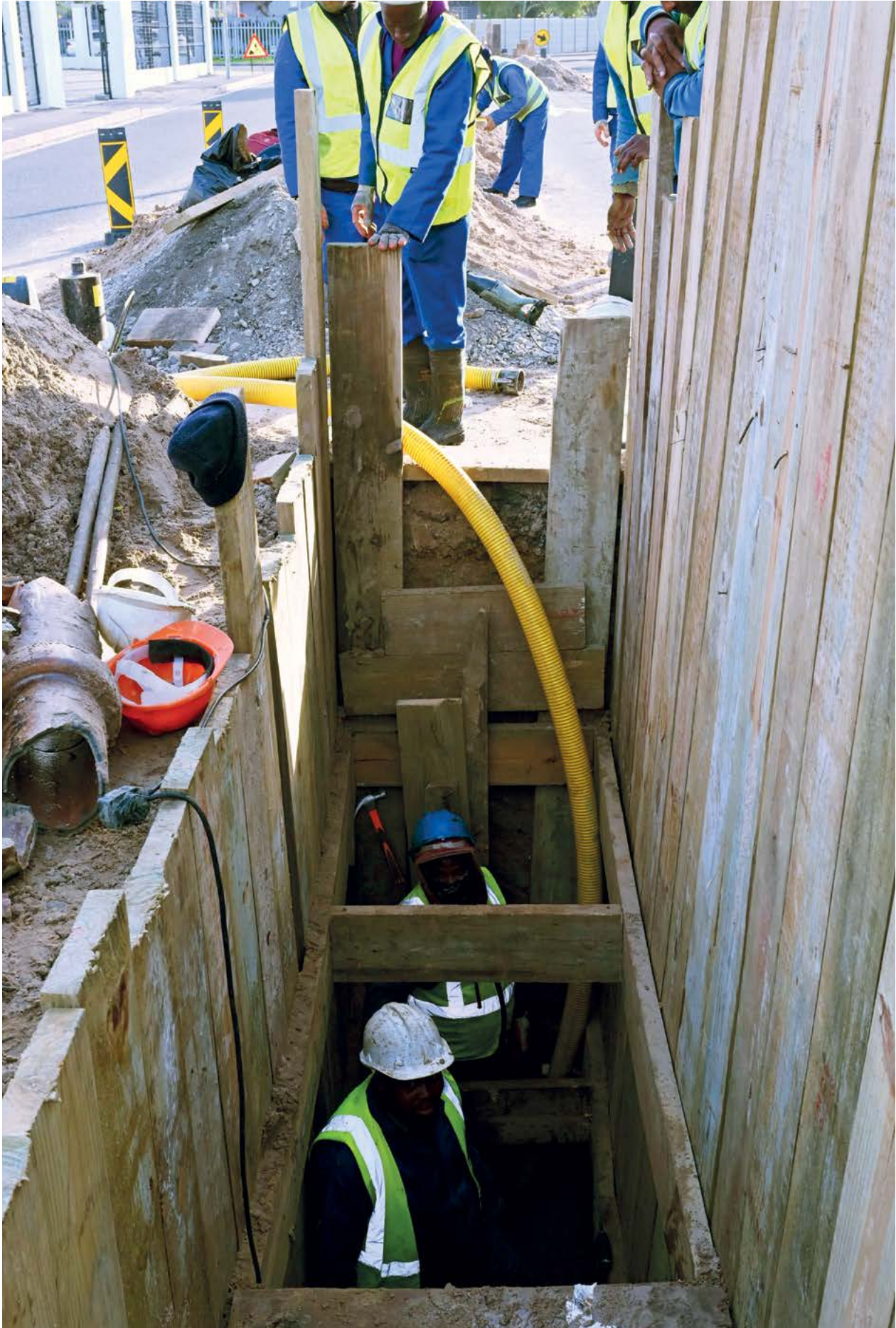
While much of the existing portfolio remains on track, a few delays and reprioritisations have been seen in the bulk water project portfolio and in the waste sludge treatment facility projects. The lack of stormwater master planning remains a concern, although this will hopefully be mitigated if the current funding application succeeds in the next year.

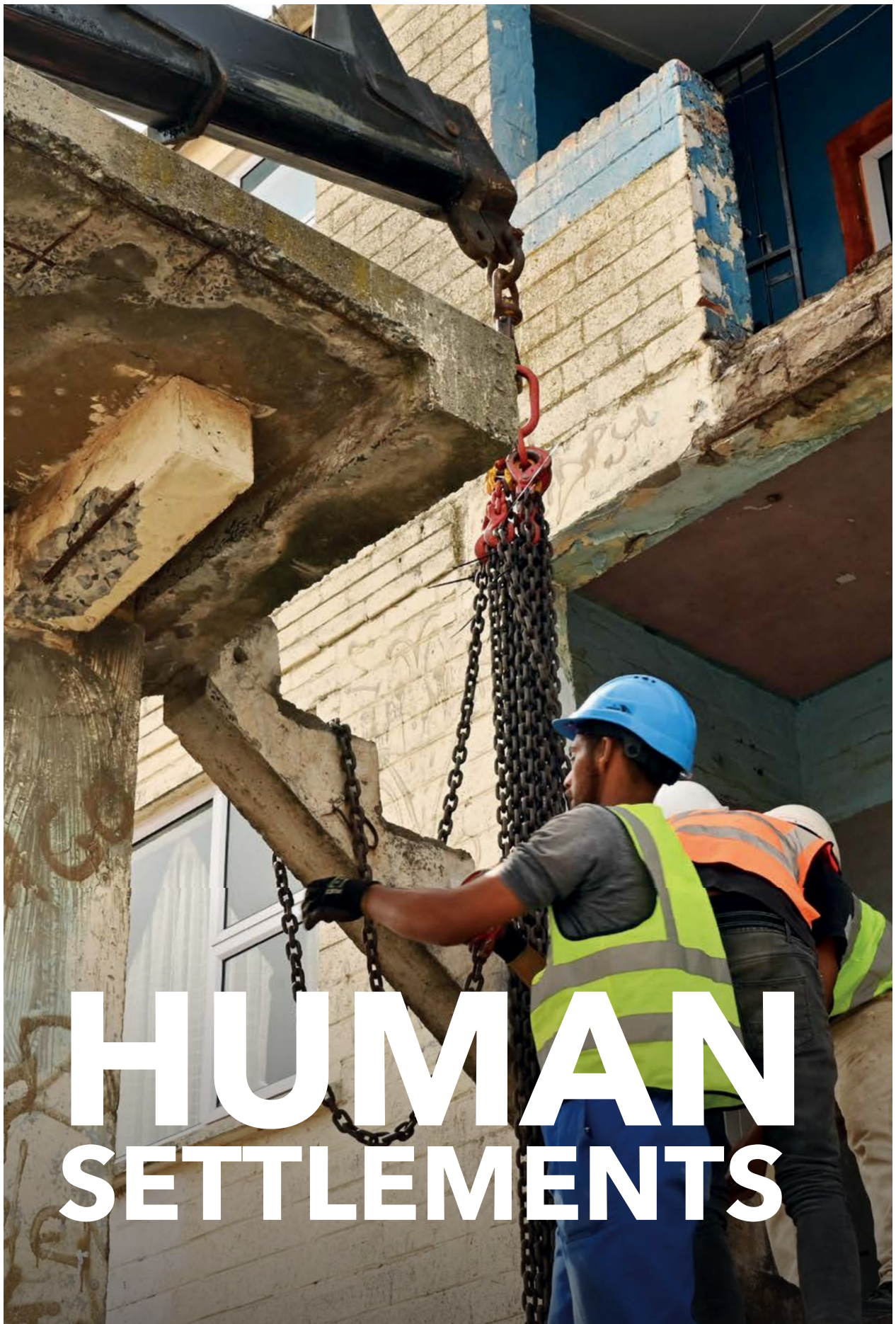
¹⁶ Diversion structures are temporary ridges or excavated channels (or combination) constructed to divert concentrated and sheet surface water, and possibly subsurface water, from or around areas under construction or development, to sites where it can be used or disposed of.

¹⁷ Separators are underground devices designed to remove floatable debris (e.g. leaves, trash, oil, etc.) and to remove suspended solids from stormwater runoff by sedimentation.

¹⁸ Gravity mains are a network of underground pipes that use gravity to move raw wastewater to a regional wastewater treatment plant. The wastewater can consist of blackwater, greywater and stormwater.

¹⁹ Stormwater dams are a type of infrastructure that provides the benefits to flood attenuation and water resources. They are used for the storage of water resulting from natural precipitation and/or the accumulation thereof, which includes groundwater and spring water ordinarily conveyed by the stormwater system, as well as seawater within estuaries.





HUMAN SETTLEMENTS

SECTOR PLAN REVIEW

The 2022 report was very clear that:

- at current supply levels, housing supply does not meet housing demand in Cape Town; and
- despite a clear demand for housing, there is a significant drop-off in human settlements projects (top structures) in the outer years of the portfolio.

While both points remain true, the full review of the Human Settlements Sector Plan has now commenced. This review aims to address the gaps identified in last year's report and will form the basis on which projects for the outer years will be developed.

Specifically, the review aims to:

- identify scenarios for future housing demand (2040) broken down by:
 - geographic location
 - household income levels

- outline housing typologies that can respond to this demand (private, delivered by government, or in partnership between government and private)
- review the land pipeline
- review current and emerging project planning methodologies
- identify land to meet demand (based on land identification criteria)
- include an analysis of underutilised City assets
- develop initial costing and analysis of the above information in order to determine the best scenario

Since last year's report, several changes have been made in the capital portfolio, as reflected in figure 16 on the following page. Planned projects for the outer years have decreased (although it is acknowledged that this will likely change significantly following the sector plan review) and there has been a noticeable increase in projects in the pipeline for the medium term until the end of 2026. In addition, the below table provides an update on progress made through the land release for affordable housing MPP in the last year.

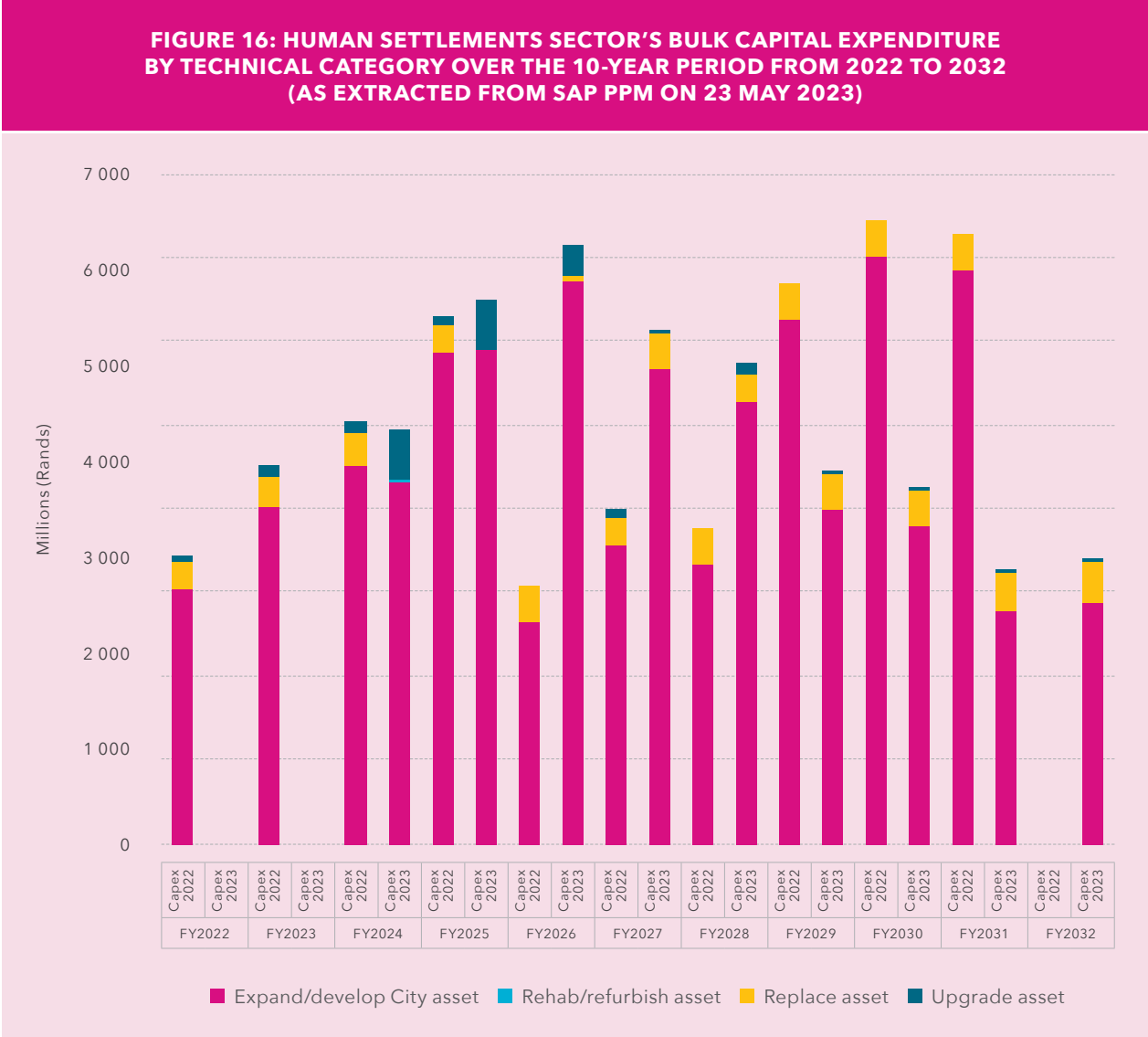
TABLE 6: PROGRESS UPDATE ON LAND RELEASE MPP

Number	Land parcel	Development type	Final award date	Social housing yield	Total yield
1	Salt River Market	Mixed	July 2022	216	1 000
2	Parow sub-precinct 1	Social housing	October 2023	343	343
3	Parow sub-precinct 2	Social housing	September 2023	180	180
4	Pickwick Street	Mixed	October 2023	840	1 800
Total housing opportunities created				1 579	3 323

Projects in the pipeline for the medium term include various housing projects, informal settlement and backyarder upgrades or infills, and hostel and Council housing rehabilitation and refurbishment projects.

Planned rehabilitation and refurbishment projects for 2023/24 for City rental housing units are listed in annexure D:1.

In addition, since last year’s report, there has been a policy shift by the national Department of Human Settlements²⁰ regarding the current grant funding model. National government will no longer be funding BNG (breaking new ground) housing²¹ and will instead focus grant funding allocations towards the upgrading of informal settlements. This shift will make it difficult to develop housing at greater densities.

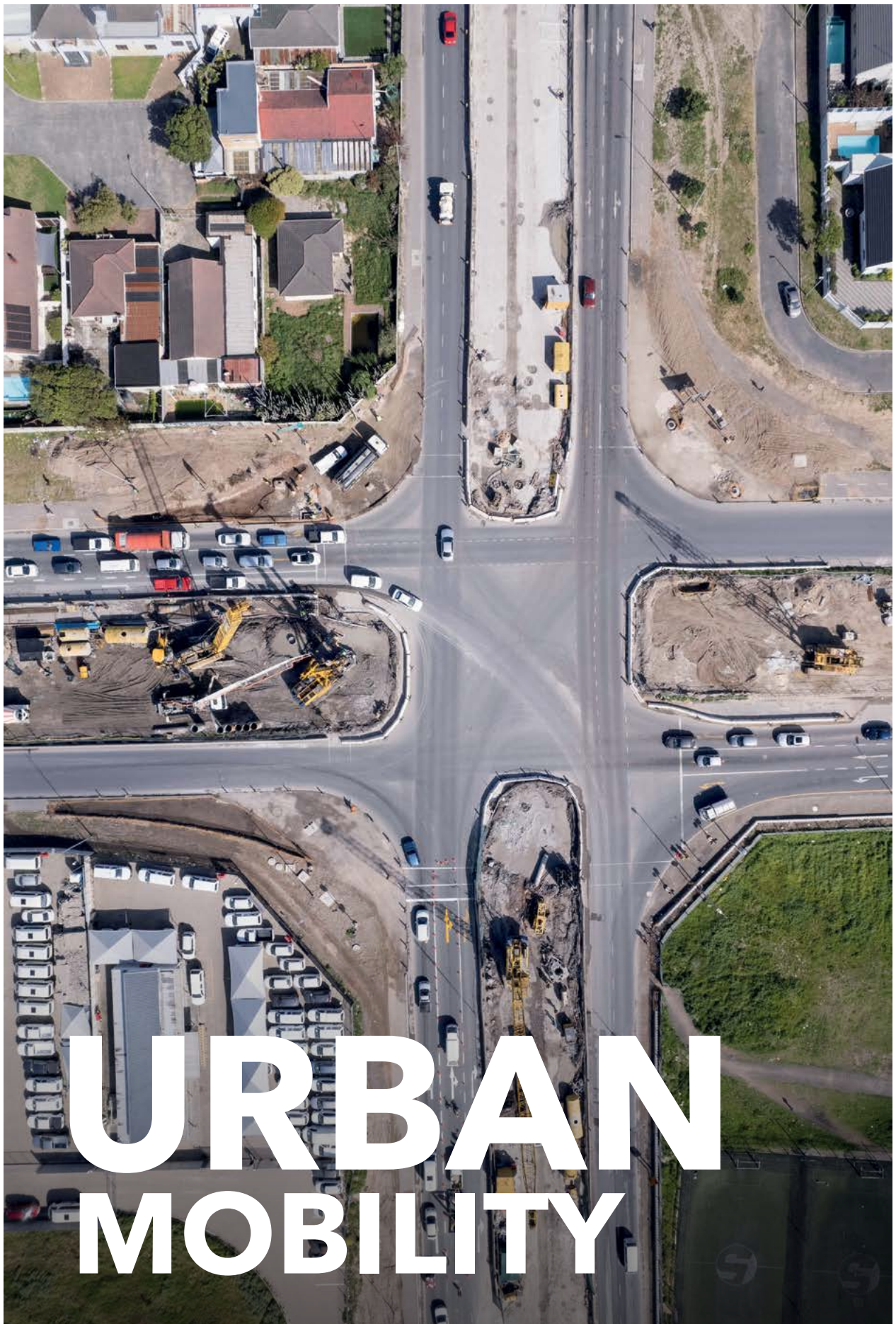


The updated sector plan will be completed by the end of the 2024/25 financial year. It is thus anticipated that at

the time of the 2025 Infrastructure Report, the challenges identified to date will be addressed.

²⁰ Draft White Paper for Housing and Human Settlements, 2023.
²¹ With the exception of housing for military veterans.

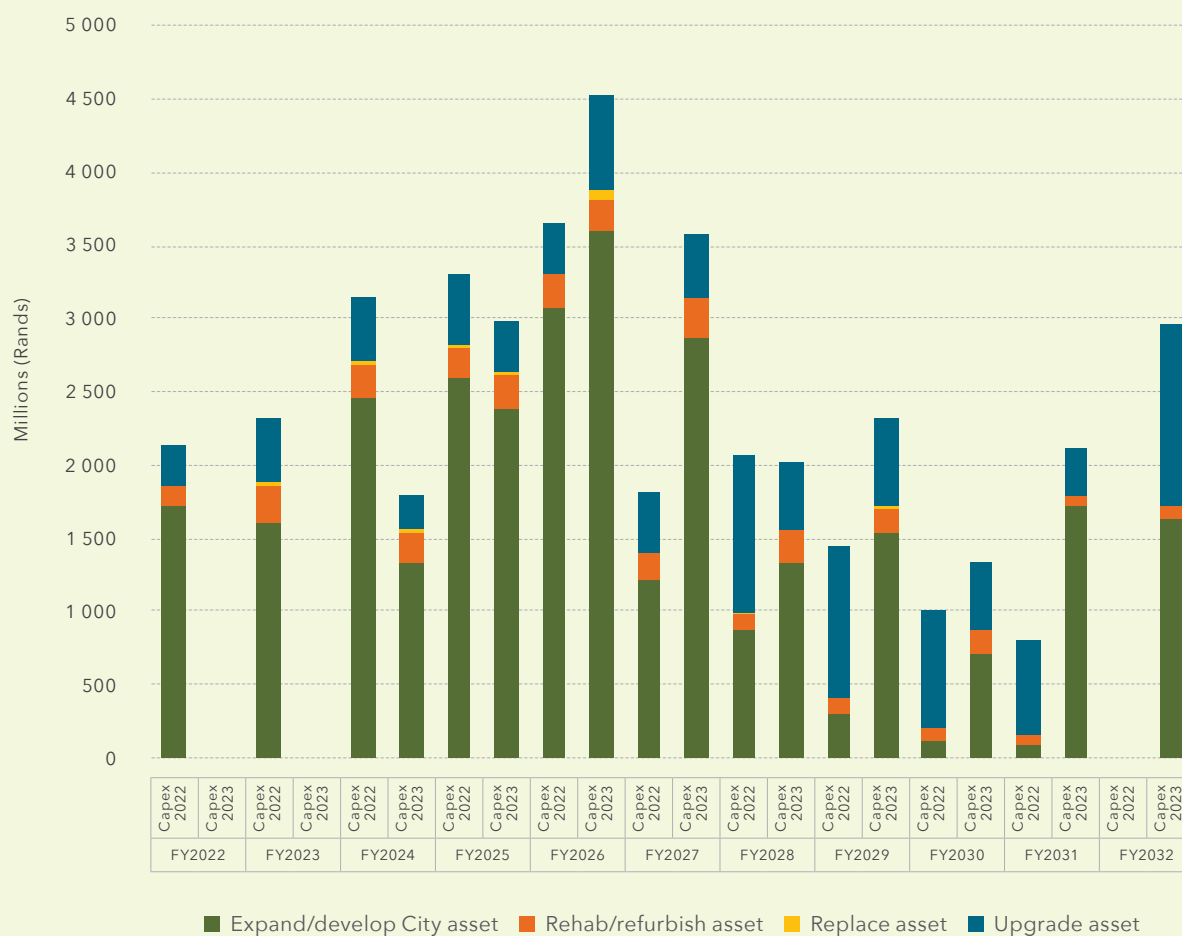




Urban Mobility's bulk infrastructure integrated portfolio has changed significantly since the 2022 Infrastructure Report. In the 2022 portfolio, planned expenditure increased steadily up to the 2026 financial year and subsequently decreased substantially from the 2027 financial year onwards, noting a particular drop in the Expand/Develop City Asset category following the completion of capital projects related to MyCiTi phase 2A in 2027, with no further new public transport planned thereafter.

Since the publication of the 2022 Infrastructure Report, significant progress has been made to increase the number of capital projects planned for the outer years. Specifically, a number of new projects are now reflected in the portfolio in the outer years (see table 7 on the following page) relating to the improved public transport programme, which has resulted in significant growth in the planned capital expenditure between the 2027 and 2031 financial years, driven largely by increases in the Expand/Develop City Asset category.

FIGURE 17: URBAN MOBILITY SECTOR'S BULK CAPITAL EXPENDITURE BY TECHNICAL CATEGORY OVER THE 10-YEAR PERIOD FROM 2022 TO 2032 (AS EXTRACTED FROM SAP PPM ON 23 MAY 2023)



NEW OUTER YEAR PROJECTS

These changes have been possible as a result of the finalisation of the Comprehensive Integrated Transport Plan 2023-2028, which was adopted by Council in May 2023. Further changes to the portfolio are expected

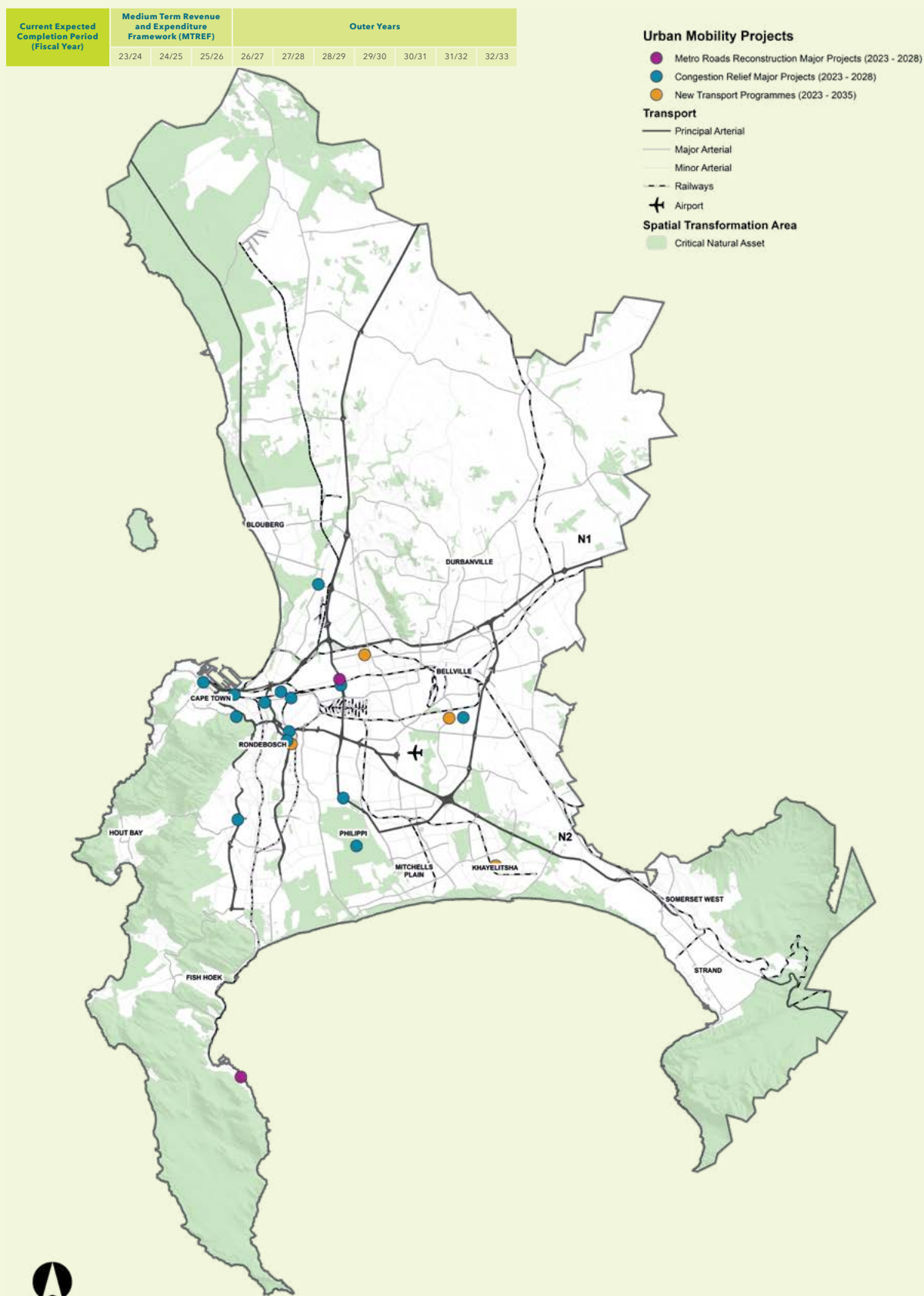
in the next year as the Urban Mobility Sector Plan is currently under comprehensive review, in parallel to the review of the City's Integrated Public Transport Network (IPTN) plan, which is targeted for completion by 2025. The focus of these newly added programmes is improving access to, and the experience of, public transport in the city.

TABLE 7: NEWLY CAPTURED URBAN MOBILITY PROGRAMMES

Programme name	Project preparation status 2023	Typology	Planned finish
Khayelitsha – Century City corridor	Scoping	New	2035
Symphony Way corridor	Scoping	New	2035
Klipfontein corridor	Scoping	New	2035
PT Priority Measures Programme	Scoping	New	2035
PT Stop and Shelter Programme	Scoping	New	2035
TMC expansion – phases 2B & 3	Scoping	New	2035



FIGURE 18: URBAN MOBILITY'S NEW PROJECTS, CONGESTION RELIEF MAJOR PROJECTS AND METRO ROADS RECONSTRUCTION PROGRAMME MAJOR PROJECTS



Source: Urban Mobility (2023). Critical Infrastructure Projects (SAP PPM).

The Khayelitsha–Century City, Symphony Way and Klipfontein corridors are the next planned major public transport corridors, after the completion of MyCiTi Phase 2A (Claremont/Wynberg to Khayelitsha/Mitchells Plain). At this stage, the projects have been captured in the City's PPM system as bus rapid transport (BRT) corridors, although the exact modality of these corridors is still to be determined and may change subject to the expected demand for these corridors, which is currently being defined and assessed as part of project preparation, informed by the City's IPTN modelling. Speed of movement for high-occupancy public transport will be the priority.

The Public Transport (PT) Priority Measures Programme is a collection of 20 projects across Cape Town that will provide priority interventions along the City's road network to improve public transport speeds through dedicated lanes, intersection optimisation, and grade separation for public transport modes such as Golden Arrow buses, minibuses and other high-occupancy vehicles.

The PT Priority Measures Programme will be supported by the PT Stop and Shelter Programme, which will invest in embayments, bus shelters, signage and other infrastructure interventions to improve the overall quality, safety and experience of all public transport passengers across the various public transport modes.

In addition, the City will invest in expanding the Transport Management Centre (including the Transport Management System)²² through phases 2B and 3 to manage, operate and optimise a continually growing transport network citywide.

Further detailed information related to these programmes will follow in subsequent iterations of the infrastructure report as these programmes move through their project preparation stages.

Following the recommendations of the 2022 report, Urban Mobility has also begun the development of a project prioritisation framework to inform future infrastructure implementation decisions and trade-offs that will be reflected in the next iteration of its sector plan.

ROADS

Congestion Relief Programme

The Congestion Relief Programme is a response to the City's commitment to reducing the time residents spend in traffic every day through targeted road capacity improvements, and interventions that reduce the need to travel at all or during peak times of day.

The 2022 report noted 14 major projects, six of which relate to new infrastructure builds, while the remaining eight are expansions of existing infrastructure. The programme also consists of 23 minor projects (14 expansion projects and nine new projects) resulting in a total R5,8 billion capital commitment over the 10-year portfolio. A comprehensive list of all the major congestion relief projects and their related project statuses are found in annexure E:2.

Since the 2022 report, there have been no additional major road projects added to the portfolio; however, a number of minor road projects have been added.

Metro Roads Reconstruction Programme

The Metro Roads Reconstruction Programme, the details of which are summarised in the following table, involves the identification of the overall maintenance and rehabilitation needs for the road network.

²² The Transport Management System is the technology used for processing big data related to transport and enables improved real-time responses to incidents on the arterial network, as well as improved planning and design of traffic signal timing.


TABLE 8: DETAILS OF METRO ROADS RECONSTRUCTION PROGRAMME

	Maintenance projects	Refurbishment projects
Type	Minor projects	Major projects
Requirements	Projects that require resurfacing, patching and minor base repairs	Projects that require rehabilitation, which includes a full repair to extend the life of the road pavement structure
Fund	Operating budget	Capital budget

There are two major projects associated with the Metro Roads Reconstruction Programme, as shown in annexure E:3. Since last year's report, both projects have advanced to the scoping stage. The Jakes Gerwel project is expected to be completed by 2026, while the completion of the Simon's Town main road rehabilitation has been postponed to 2028.

CONCLUSION

In the past year, the Urban Mobility bulk infrastructure capital portfolio has increased significantly, as projects have now been brought into the portfolio in the outer years relating to the next three major transport corridors: the Khayelitsha-Century City, Symphony Way and Klipfontein corridors. These new projects have a total estimated value of R21 billion, on top of the R26 billion already in the portfolio. The remainder of the portfolio appears largely on track.



CLIMATE RESILIENCE

The IDP commits the City to building a resilient city, which means a city that sustainably meets its resource needs, develops infrastructure that responds to climate change and is able to withstand disaster events. In light of the current and future impacts of climate change, an analysis has recently been concluded on the climate resilience of the 10-year capital portfolio to such impacts. The outcomes of this analysis have shown that approximately 40% of the City's planned infrastructure projects in the portfolio contribute to strengthening its ability to respond to climatic shock events in the future.

This work was built off an initial analysis conducted by the Future Planning and Resilience (FPR) Directorate²³ regarding climate resilience through infrastructure (see annexure F:1 for further details) of the three-year portfolio in 2022 (2021/22-2024/25), which indicated that:

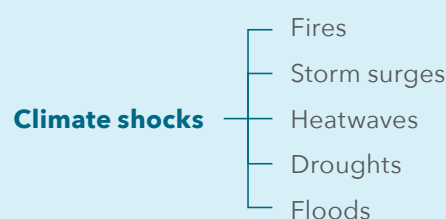
- there were 378 capital projects totalling approximately R24,8 billion contributing to climate resilience outcomes; and
- there was a significant underrepresentation of the climate resilience outcome of projects when tagging done by project managers was considered alone (i.e. FPR analysis found projects that contributed to climate resilience outcomes that were not tagged as such by project managers).

This analysis was valuable not only in assessing the three-year portfolio, but also in establishing a base methodology²⁴ by which this type of assessment could be replicated and extended by the City.

Resilience through infrastructure means the resilience is provided to the city or parts of the city (in contrast to resilience of infrastructure, which means interventions that make the infrastructure itself resilient to shocks/stresses during construction and post-construction).

At present, the plausible climate change shocks (see figure 19 below) that Cape Town may face in the future are well known and have been identified through the City's Hazard Vulnerability and Risk Assessment. However, in only one instance (drought) has the shock been assessed, well articulated at a strategic level, and mainstreamed in terms of implementation responses. Significant work is needed to achieve the same level of infrastructure planning and development for the other shocks.

FIGURE 19: IDENTIFIED CLIMATIC SHOCKS FOR CAPE TOWN



Learning from this initial work, the City has developed a plan (see annexure F:2 for full details) to improve hazard planning in order to prepare the infrastructure portfolio appropriately over time.

The next identified step in this plan was to extend the portfolio analysis tagging methodology to the City's full 10-year capital portfolio. In so doing,²⁵ the City sought to answer two key questions:

1. What projects currently exist in our portfolio that may contribute to building resilience against future climate shock events?
2. Is the City planning sufficiently for more frequent and higher-impact (more disastrous) climate shocks?

The results of this analysis indicated the following:

- Currently, there are a total of 1 436 projects contributing to climate resilience, with a value of approximately R55,5 billion, within the 10-year capital portfolio.

²³ This project was funded through UK PACT.

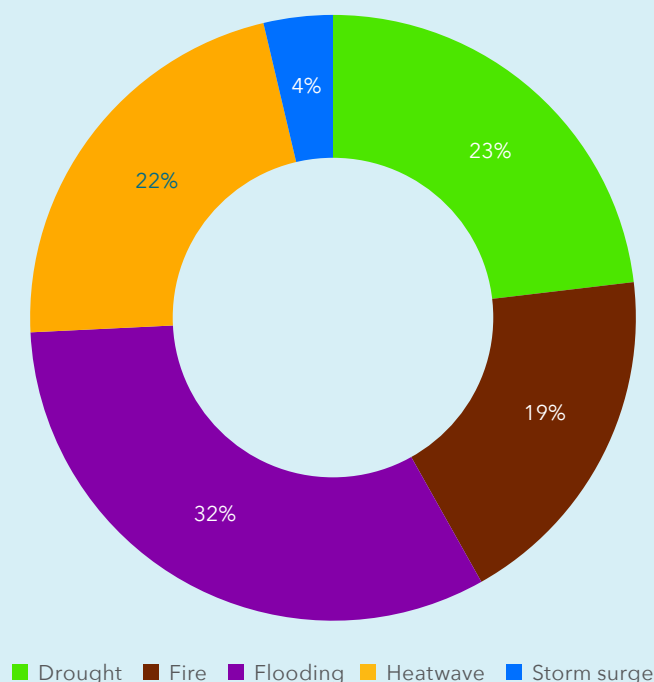
²⁴ For full details of the tagging methodology, please see <https://greencape.co.za/lessons-learnt-from-the-city-of-cape-towns-capital-portfolio-resilience-assessment/>.

²⁵ In applying the methodology, it should be noted that a few amendments were made, as certain terminology anomalies were identified in a review of the initial analysis.

- As with the three-year portfolio, there was a significant underrepresentation of the climate resilience of projects when tagging done by project managers was considered alone (see annexure F:3 for a graphical representation).

Figure 20 below illustrates the number of resilience projects in the 10-year capital portfolio per climate shock, while figure 21 shows the spatial locations of those projects that can be depicted as such (noting that several projects in the portfolio are citywide and therefore cannot be spatialised).

FIGURE 20: PERCENTAGE OF RESILIENCE PROJECTS IN THE 10-YEAR CAPITAL PORTFOLIO PER CLIMATE SHOCK (AS EXTRACTED FROM SAP PPM ON 1 FEBRUARY 2023)



In attempting to provide initial answers to the two key questions, this further analysis concluded that:

1. the City potentially has a significant number of planned interventions that will make a contribution to improving resilience against future climatic shock events; and
2. the City's planning is well developed for the drought hazard in terms of planning for higher frequency and intensity, but the same is less clear for the other four climatic shocks of heatwaves, storm surges, flooding and fires.

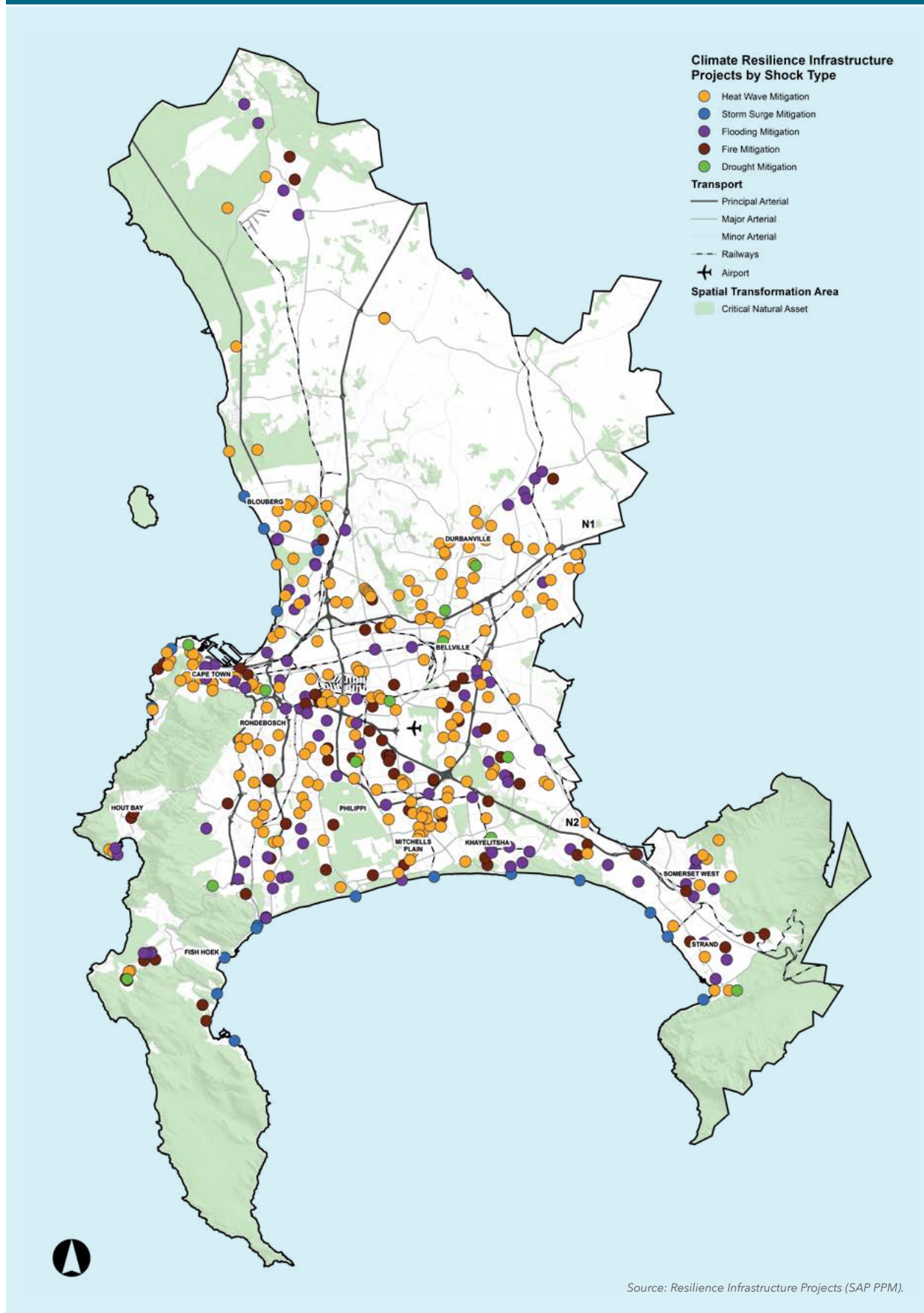
Importantly, the City has embarked on a process of embedding climate resilience analysis and planning

into its infrastructure planning processes. As resilience planning and analysis capabilities in the City mature, the answer to these key questions will become more apparent.

The City has also recently conducted a high-level analysis of the 2023/24–2025/26 capital budget to assess which programmes or projects respond to climate change (considering mitigation and adaption).²⁶ National Treasury is also in the process of setting up a climate budget tagging process and the City is currently involved in the consultations regarding this project. The integration of climate tagging on PPM will support a streamlined approach to climate budget tagging in the future.

²⁶ City of Cape Town – 2023/24 to 2025/26 Budget (31 May 2023) https://resource.capetown.gov.za/documentcentre/Documents/Financial%20documents/Budget_2023-24_AnnexureA.pdf

FIGURE 21: LOCATION OF CLIMATE RESILIENCE INFRASTRUCTURE PROJECTS BY SHOCK TYPE



RECOMMENDATIONS

The extension of the climate resilience assessment methodology to the full 10-year capital portfolio has shown that approximately 40% of the City's planned infrastructure projects in the portfolio contribute to strengthening its ability to respond to climatic shock events in the future. These are well developed to prepare the City for higher frequency and intensity of drought shocks, but such planning is less clear for the other four climate shocks that the City is expected to experience in the future.

This assessment has provided the next step in the City's plan to improve hazard planning in order to appropriately prepare the infrastructure portfolio. The question which now needs to be further interrogated is whether or not this planning is sufficient.

As such:

- The City will continue with such analysis on a periodic basis while also working to refine this methodology to a project characteristics level.
- The City will improve the accuracy of tagging of projects at the point of loading them onto the project portfolio management system.
- Where projects are indicated to be contributors to climate resilience through the tagging exercise, further interrogation of resilience benefits should be assessed during project preparation in order to ensure that resilience benefit is realised in project delivery.
- The City will update the sector plan guidelines to provide for resilience considerations at the inception point of infrastructure portfolio planning – specifically to identify which shocks and stresses the sector plan needs to be responsive to.
- Given recent significant flooding events in the City of Cape Town geographical area, and the impact these events have had both on a community and citywide level, it is recommended that the 'flooding' shock be prioritised for further in-depth review and planning, noting that this work is highly budget-dependent, as detailed in the previous section of this report.

Finally, in considering the outcomes of this analysis, it should be kept in mind that capital projects can and should be used to support the attainment of resilience outcomes against the likely climate shocks faced by the City, but how that infrastructure is used and maintained will be crucial to realising the desired outcomes.





LOCATION-BASED ANALYSIS: **MAITLAND**



INTRODUCTION

The purpose of this section is to provide a high-level analysis of bulk infrastructure provision in Maitland by examining four bulk sectors: urban waste, water and sanitation, energy, and urban mobility. This section aims to answer two main questions:

1. Does the Maitland area have sufficient infrastructure capacity to allow optimal/full potential development?
2. If the answer to question 1 is 'no', are there projects in the pipeline that will address any shortfalls?

The status of each sector is assessed relative to current demand and future population projections for the area in order to determine whether there are a sufficient number of bulk infrastructure projects in the pipeline to enable the development of Maitland. An assessment of service request data was also conducted for the Maitland study area²⁷ for the four bulk services over three years from 2020 to 2022 (see annexure G:4 for full details). While many of the issues that arise through this analysis are operational in nature, where bulk infrastructure concerns arose, these are highlighted in the relevant sections below.

The analysis of this section is especially important, given the strategic importance of Maitland from a development point of view, and given that the City is currently considering mechanisms such as heritage exemptions and incentive overlays, which will unlock further development in Maitland.

Maitland has been selected for this first location-based infrastructure analysis, as it is in the urban development zone (UDZ)²⁸ and is one of the few suburbs within an 8 km radius of the Cape Town CBD, where there are still many opportunities for development and investments, and where property prices are still at relatively affordable levels. In addition, Maitland has existing affordable housing, with the potential to develop more well-located affordable housing. Given its location and various other factors, Maitland is seen as a strategic site for major redevelopment and has been designated as a development focus area (DFA).

Maitland has also been designated as a prioritised local area,²⁹ as it maintains a strong/strategic role within the continued functioning of the city, due to its accessibility

and proximity to markets and concentrations of skilled workers. The last local area plan (LAP) for Maitland was created in 1992 and is therefore outdated in terms of spatial trends, as well as the City's spatial objectives. The City is in the process of drafting a new Local Spatial Development Framework (LSDF) for Maitland.

It should be noted that the analysis in this report does not serve as an LAP or LSDF, but rather as a tool to assess and inform bulk infrastructure requirements in Maitland into the future in order to support future development. It should also be noted that the take-up of development rights was not assessed as part of this analysis and existing rights and future incentives will be considered as part of the LSDF process.

The **C3 service request system**, established in 2007, is a system through which citizens can log service requests or make complaints to the municipality through SMS, email, online (via web application), and telephone calls on issues relating to service delivery. Issues such as faulty streetlights, blocked drains and potholes can be logged as service requests to the central call centre, which informs the relevant department to resolve that complaint; the complaint is tracked from the point when the issue is logged until the point when it is resolved.

The **development focus areas (DFAs)** are a refinement of the urban inner core to areas of 'development focus' or priority, i.e. DFAs for the period of the district plan (10-year cycle). The DFAs are targeted for urban restructuring and planning to focus on the short- to medium-term projects that have the highest potential spatial transformative impact with dedicated budget, planning, or investment to facilitate development. Investment in DFAs focuses on maintaining and improving public services that are required to unlock public- and private-sector-driven residential and economic development potential.

A **prioritised local area (PLA)** is a focal point for spatially targeted interventions and catalytic projects. The intention of these is to create a critical mass of public investment interventions aimed at leveraging private-sector investment in a spatially targeted manner.

²⁷ The service requests were extracted according to the study area boundary and therefore do not reflect service requests for Maitland as a whole.

²⁸ The UDZ is a tax incentive administered by SARS and aims to encourage private-sector-led residential and commercial development in inner-city areas with developed public transport facilities.

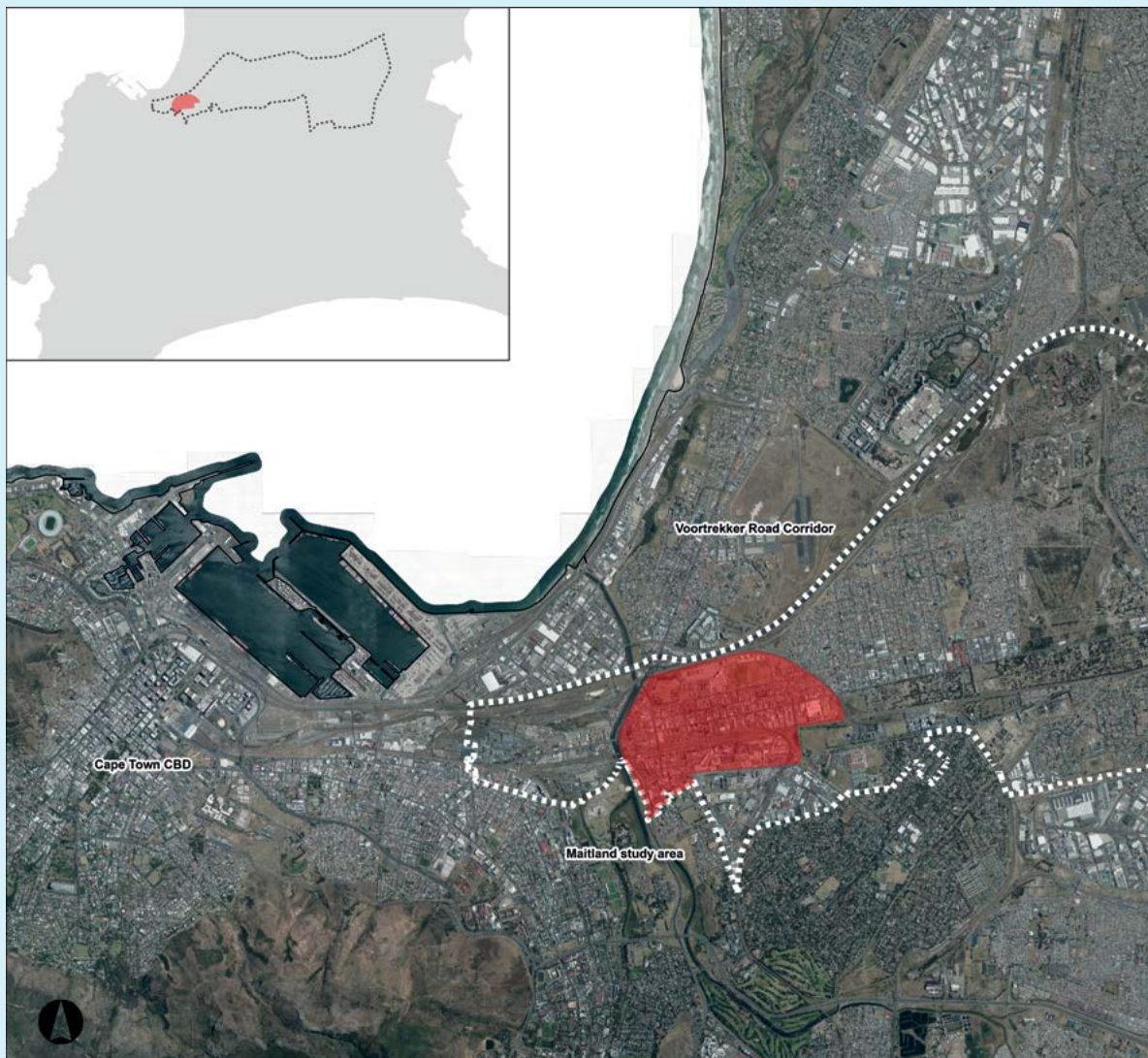
²⁹ As defined in the scope of works of the Voortrekker Road Corridor Integration Zone Strategy and Investment Plan.

CONTEXTUAL ANALYSIS

The Maitland study area (displayed in figure 22) can be found north of Pinelands, south of Brooklyn, east of Salt River, and to the west of Kensington. It is situated along

the Voortrekker Road corridor and is favourably located in relation to investment and development potential due to its proximity to the Cape Town CBD.

FIGURE 22: LOCALITY OF MAITLAND

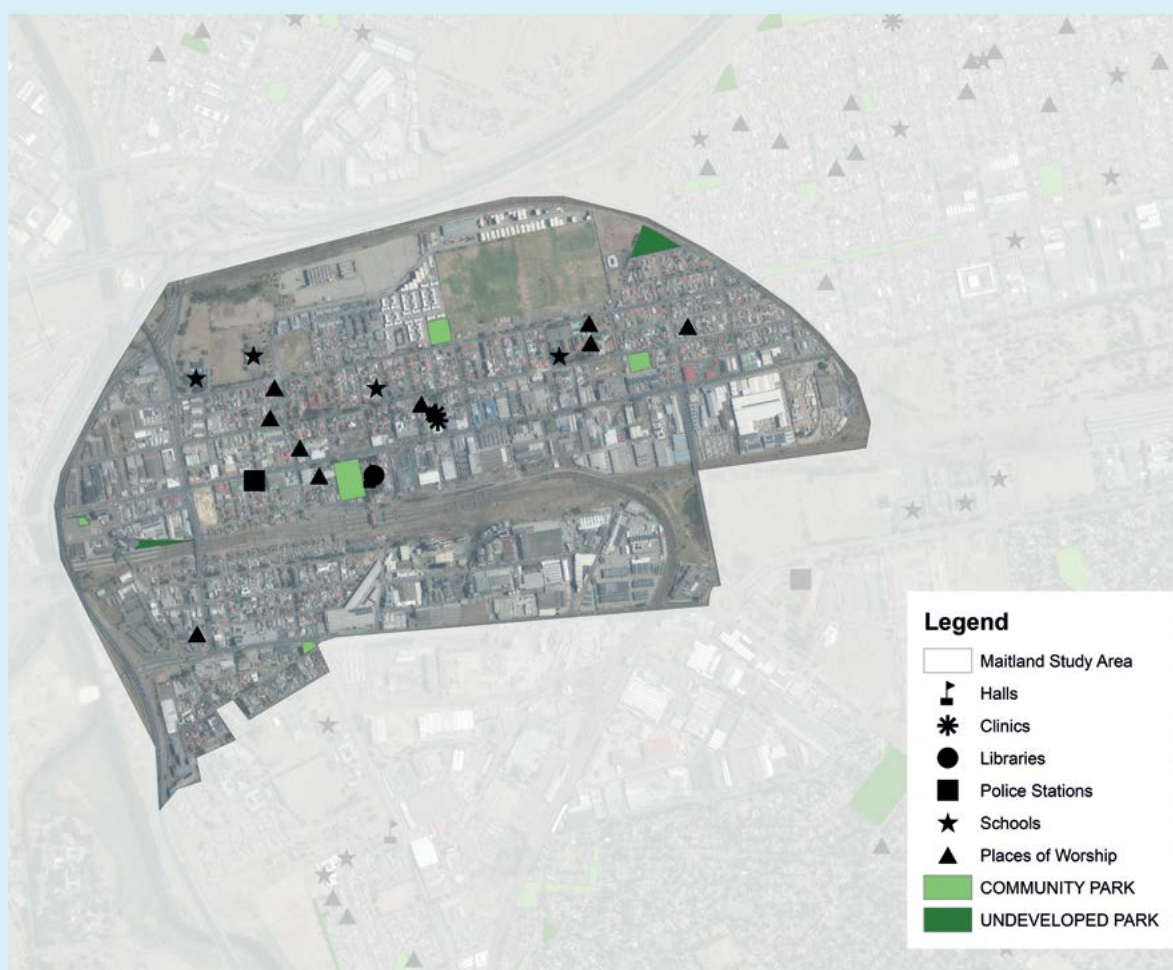


According to Statistics South Africa, the population of Maitland stood at 7 986 in 2011.³⁰ By the end of 2021, the population was estimated³¹ to be 13 683, a 40% increase over 10 years and 6% higher than previous estimates.³²

The western side of Maitland is bound by the Black and Liesbeek rivers, which pose potential future threats of flooding that are further discussed below.

Maitland has a shortage of open space. According to the Council for Scientific and Industrial Research standards for public facilities, 0,5 ha of open space is required per 1 000 people. At present, three to four additional public open spaces or parks are required to adequately service the current population of the area. This is especially critical for the southern portion of Maitland, which is only served by Berkley Road Park.

FIGURE 23: OPEN SPACE AND FACILITIES IN MAITLAND



³⁰ Stats SA Census 2011 (https://resource.capetown.gov.za/documentcentre/Documents/Maps%20and%20statistics/2011_Census_CT_Suburb_Maitland_Profile.pdf).

³¹ Estimate makes use of the official 2011 Census data as a base and was derived using an area overlay method, and adjusted using available data sources.

³² Previous growth estimations by the Density Syndicate (2014) projected that by 2032 there would be 12 898 people in Maitland.

Maitland has sufficient public facilities and there is a growing number of light industrial buildings being repurposed and converted into social facilities (such as churches and galleries). There is a significant portion of publicly owned land in Maitland; however, this is predominantly owned by Transnet, the Passenger Rail Agency of South Africa (PRASA), National Government, and the Western Cape Government. Of the 80 ha of publicly owned land, approximately 49 ha belong to the aforementioned entities, consisting of partially developed land.

The area of Maitland consists of 844 residential erven, 23 blocks of flats, 126 business/commercial erven, and 225 industrial erven. As such, the predominant built fabric in Maitland consists of formal residential housing. Residential erven in Maitland have densified over time, with the following noted:

- Properties along Voortrekker Road are mixed-use in nature. Commercial and business activity is also located along this activity road, as well as on the western edge of the study area.

- The northern and southern portions of the study area are dominated by residential, with the eastern edge predominantly single residential.
- The area also accommodates a range of industrial activities, including service industries, retail wholesaling, and warehousing. Heavy industrial activities are not present in the study area.
- The zoning of Maitland provides sufficient allowance for development at higher densities.
- Small-scale rental units have increased in the area in the past decade (see figure 24 below).
- The area has seen an increase in social housing, such as Maitland Mews (which has been a joint venture between the City, provincial government, and the Social Housing Institution)³³ and is part of a bigger precinct development called Maitland Metro (see figure 25 on the following page), which will deliver more than 50 000 m² of mixed-use development bulk and more than 1 200 new units over the next eight years. The status of these projects is detailed in figure 25.
- An informal settlement has developed in the area on land earmarked for a community development centre.

FIGURE 24: SMALL-SCALE RENTAL UNITS IN MAITLAND (ESSEX STREET AND SUFFOLK STREET) 2009-2023



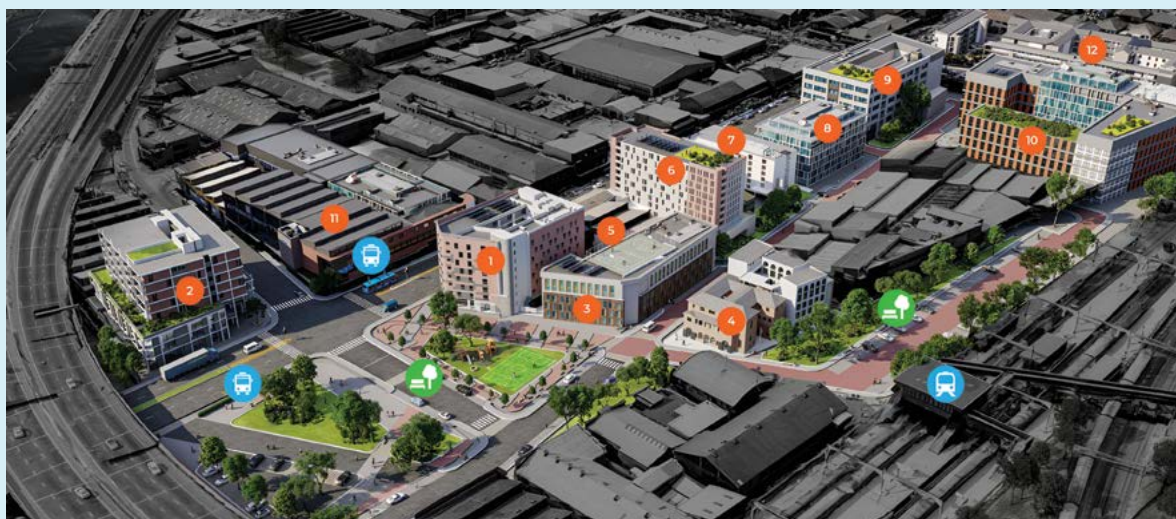
2009



2023

³³ Madulammoho Housing Association is the social housing institution that collaborated with government to develop and manage Maitland Mews.

FIGURE 25: MAITLAND METRO PRECINCT



MAITLAND METRO BUILDING STATUS

Completed	1, 7, 11, 12
In progress	3, 4, 6
To be developed	2, 5, 8, 9, 10

It is evident that Maitland, which was once considered industrial, is transforming into a mixed-use urban hub. As Cape Town's population continues to grow, Maitland is becoming increasingly more desirable for more

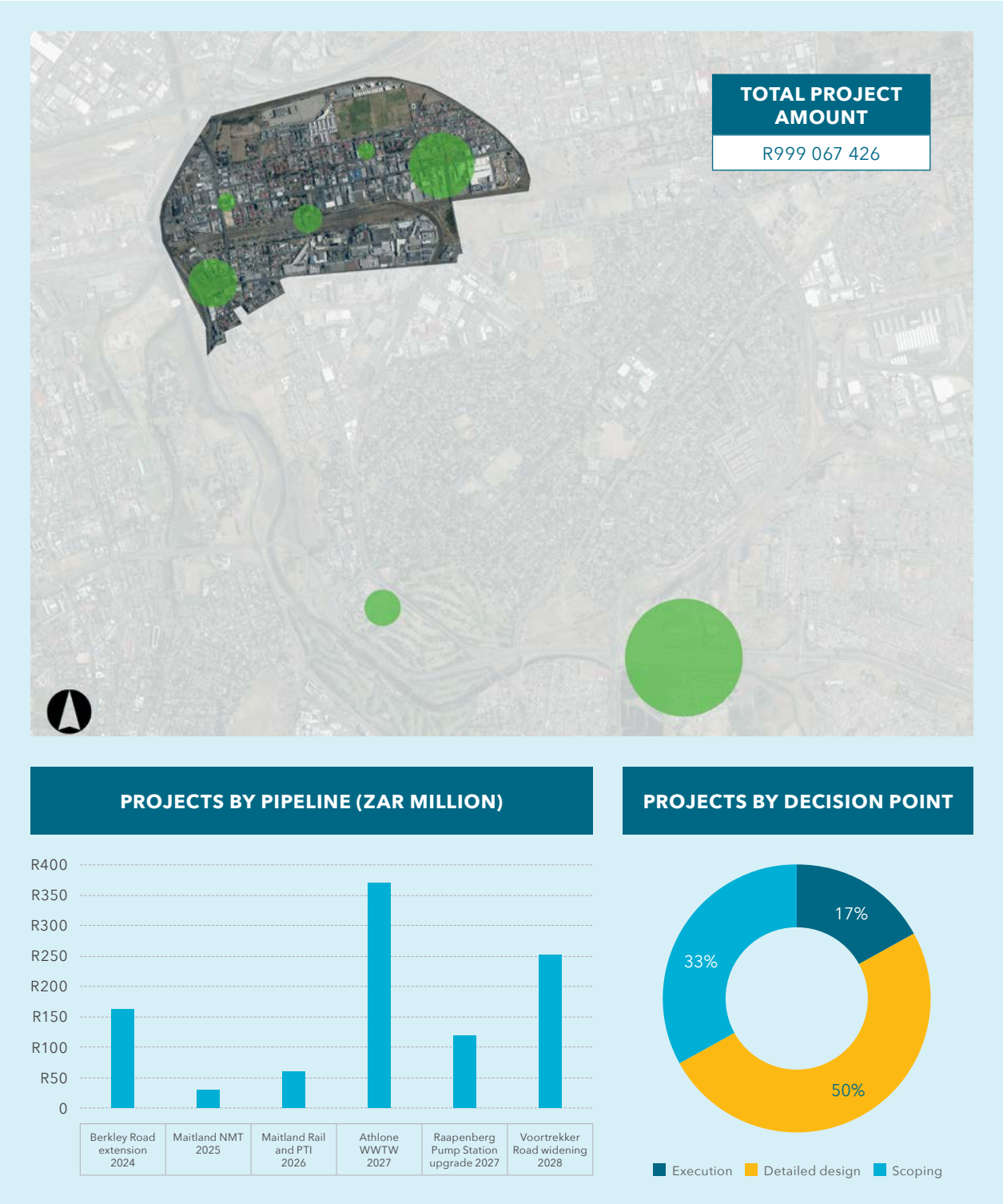
people, creating the need to ensure that the City is planning to provide sufficient bulk infrastructure to enable continued development in the area into the future.

BULK INFRASTRUCTURE ANALYSIS

The following section assesses the bulk infrastructure conditions across four bulk sectors and makes recommendations for strengthening infrastructure delivery in each case.

To unlock future development, key capital investments (summarised in figure 26 below) have been identified across the sectors as a result of this analysis. These projects consist of citywide priority projects that affect Maitland and district priority projects identified in the Table Bay District Plan.

FIGURE 26: MAITLAND PRIORITY PROJECT PIPELINE



URBAN WASTE MANAGEMENT

CURRENT STATE

Waste generated in Maitland is managed by the Athlone RTS. The 2022 Infrastructure Report noted that the Athlone RTS faces two challenges at present, namely inaccessibility to rail and infrastructure breakdowns.

The refuse truck depot in Maitland serves the residents of Maitland as well as surrounding areas such as Paarden Eiland, Pinelands, Kensington and parts of Epping. The depot in Maitland needs an upgrade due to ageing infrastructure.

Maitland residents have access to two drop-off facilities within a 3 km radius, being Kensington and Woodstock, both of which have sufficient operating capacity at present.

FUTURE STATE

Based on the current upgrades and projects in the capital pipeline, there is sufficient capacity to accommodate an increase in population in Maitland and address capacity shortfalls.

As is noted in annexure B:2, the Athlone RTS is currently on target for an upgrade, which will include the construction of a material recovery facility to be completed in 2028. This will provide sufficient accommodation for expected future increased population numbers in the area.

The Maitland refuse truck depot is also on track for an upgrade, which is targeted for completion in 2027. Both the Woodstock and Kensington drop-offs have carrying capacities of 1,5 tons, which are assessed at this time as being sufficient to accommodate a future population increase.

ENERGY

CURRENT STATE

Maitland is part of service delivery area 1, in Area North, and is contained within the Mowbray service area. The bulk power in Maitland is provided by Maitland main substation (MS), which supplies load north and south of the N1. The Maitland MS is currently loaded to 74% of its firm capacity. This has been an improvement since the 2019/20 financial year where, through load shifts to neighbouring main substations, the City managed to reduce the load from 94% to 74%. At present, Maitland MS has sufficient capacity to accommodate additional dwelling densities, as well as new developments.

However, it should be noted that 'lack of power' (no power) is the most reported C3 service request, accounting for 47% of all energy service requests for the Maitland area (see annexure G:4 for further details). The Energy Directorate has attributed these requests to vandalism, which as noted previously in this report is an

ongoing challenge, resulting in a disruption of and an increase in the cost of electricity services.

FUTURE STATE

Based on current projections, the Maitland MS will be over firm capacity by 2040.³⁴ To accommodate this expected future growth, two new switching stations and main substations, Liesbeek and Oude Molen, are in the capital pipeline to supply the load south of the N1, planned for completion in 2031 and 2036, respectively. These two new 50 MVA substations will allow for an additional 76 MVA firm capacity in the area south of the N1. It should, however, be noted that these are not tagged as priority projects and are therefore subject to future budget availability. In addition, significant spare capacity is noted on the neighbouring footprints – Observatory (17 MVA), Kensington (11 MVA), Epping (50 MVA), and Broad Road (9 MVA), which the Energy directorate will endeavour to use before large capital commitment to create new infrastructure.

³⁴ The Land Use Model (LUM) 2040 has been used to determine future energy requirements.

CURRENT STATE

Maitland is located close to the Cape Town CBD, airport and harbour, and has multidirectional accessibility. It has good road-based transport accessibility with Voortrekker Road providing east-west access and Koeberg Road providing north-south access. Both Golden Arrow and MyCiTi operate routes with direct access to Maitland. The area enjoys favourable coverage by public transport parking zones, which enable reduced off-street parking provision in all land uses within demarcated areas, thus supporting public transport through enabling increased development intensity, development viability, and lower private vehicle trip generation.

It is also served by the Koeberg and Maitland railway stations, which provide access to the central line and the northern line, although the central line was non-operational between 2019 and early 2023. While operations resumed in March 2023, as at 1 November 2023, the central line was still not travelling to Cape Town CBD; instead, commuters were required to disembark at Maitland station to connect to the CBD via other means.

There are currently no dedicated non-motorised transport (NMT) routes in the area (e.g. bike paths and pavements). High pedestrian activity is experienced along train station precincts and along Voortrekker Road, Berkley Road, Upper Camp Road, Station Road, Koeberg Road, and Royal Road. There are safety concerns along these routes, especially around the train station precincts, where pedestrians are regularly subject to petty theft. A pedestrian link from Ysterplaat Station to Maitland was noted as a requirement by residents during 2022 public engagements³⁵ and, more recently, during LSDF public engagements. In the absence of such a link, pedestrians regularly cross major roads to reach their destinations, which is a serious safety concern.

Maitland experiences congestion during morning and evening peak hours³⁶ along Berkley, Koeberg and Voortrekker roads.³⁷ Voortrekker is the most congested, with particular congestion found at the corner of Koeberg Road and Voortrekker Road. Congestion report data revealed that speed limits in this area are 70 km/h; yet, during peak traffic, average speeds are between 20–40 km/h. The data also revealed that driving a distance of 10 km on Voortrekker Road generally takes between 17 and 20 minutes when congestion is at its worst. Similarly, during peak hours Berkley Road (an 80 km/h road) has average speeds of 30–50 km/h. Extending Prestige Drive to the north towards Ysterplaat and Berkley Road towards Observatory could potentially alleviate pressures experienced on Voortrekker Road and Koeberg Road by providing alternative access routes. In addition, dedicated bus lanes for MyCiTi and Golden Arrow, and intersection optimisation would not only alleviate congestion pressures, but improve the overall quality and experience of public transport passengers.

Road maintenance issues consisting of potholes and road and walkway/pavement defects are the most reported C3 service requests for the area, accounting for 38% of all transport service requests (see annexure G:4 for further details). While the number of requests in the category have gradually declined (decreased by 17% in the last year), the ongoing stormwater challenges being experienced in the area (see further details below) will continue to have a negative impact on the conditions of the road network. The second- and third-most reported requests are blockages (pipes/canals/drains/manholes) and manhole cover/gully grid replacements, at 19% and 16% respectively.

³⁵ DSDf Table Bay Public Participation Transcripts, 2022.

³⁶ Morning peak periods from 06:00 to 09:00 and evening peak periods from 16:00 to 19:00.

³⁷ Data for the month of October 2022 were extracted from TomTom as a proxy.

FUTURE STATE

Major road-based projects³⁸ currently in the pipeline for Maitland include the expansion and extension of Berkley Road and the upgrade and widening of Voortrekker Road.

The expansion of Berkley Road entails dualling the road, together with the provision of cycle lanes, public transport stops, adequate sidewalks and upgrades and signalisation to the M5 interchange. This project will alleviate congestion by improving both link and

intersection capacity. The extension of Berkley Road from the M5 to Liesbeek Parkway, which is currently being constructed by the developers of the River Club, will complete an important missing link in the road network that will alleviate congestion while also supporting the redevelopment of the Two Rivers Urban Park. The City-driven dualling of Berkley Road is in the detail design phase and is expected to be completed in 2027.

FIGURE 27: BERKLEY ROAD DUALLING

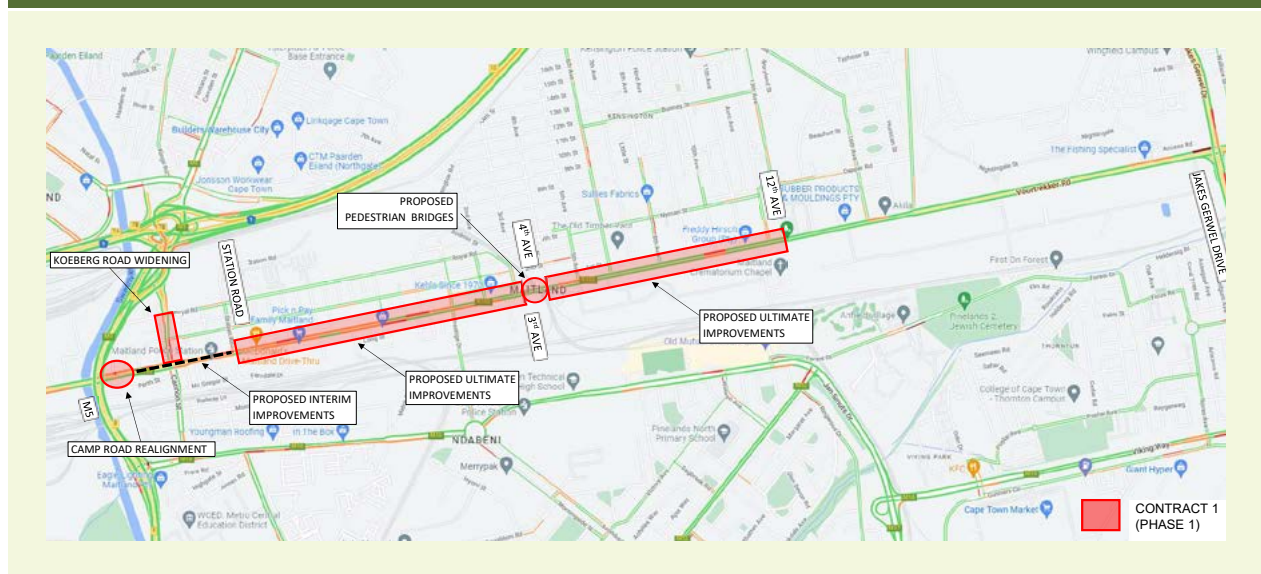


³⁸ 2017 Council-published Congestion Management Programme for Cape Town.

The Voortrekker Road expansion project comprises the widening of Koeberg Road between Voortrekker Road and Royal Road, as well as the dualling of Voortrekker Road between Station Road in Maitland and 12th Avenue in Kensington (see figure 28). This project is targeted for completion in the 2026/27 financial year.

Minor road-based projects consist of the extension of Prestige Drive, which extends from Voortrekker Road northwards to the N1, creating a new N1/Prestige Drive interchange. This project is in the scoping phase and implementation is anticipated for 2038.

FIGURE 28: VOORTREKKER ROAD UPGRADE PHASE 1: EXTENT OF WORKS DIAGRAM (CITY OF CAPE TOWN, MAY 2022)



A new MyCiTi station is planned in Maitland as part of MyCiTi phase 1. The bus station will be located adjacent to the Maitland rail station and existing minibus taxi facility on Ferndale Drive and will be accompanied by several road and traffic management changes to improve traffic flow and transport integration in the area. This project is in the detailed design phase and construction is to commence in July 2024, with the MyCiTi station becoming operational by mid-2026.

The City has plans in place³⁹ for NMT improvements along major roads in the Kensington, Fackretton and Maitland areas (see annexure G:6), which will connect Maitland to Observatory and Kensington via direct NMT links. However, nothing is yet noted in the project pipeline to address the need (noted from the LSDF engagements) for a pedestrian link between the Ysterplaat Station and Maitland.

³⁹ <https://www.capetown.gov.za/City-Connect/Have-your-say/Issues-open-for-public-comment/proposed-nmt-infrastructure-in-maitland>.

WATER AND SANITATION

CURRENT STATE

Maitland, part of bulk water service region 1 (north), is supplied by an existing main running from the Steenbras Dam. This main currently has available capacity and the area has sufficient supply. However, the distribution systems in Maitland are over 40 years old and most of the existing water services are located within road reserves. Further investigations are required to assess the water reticulation network in this area given the age of the system.

There are six sewage pump stations within Maitland, one of which is installed with a generator. These all drain to the Raapenberg pump station from where the wastewater is pumped to the Athlone WWTW. While the Athlone WWTW currently has sufficient capacity (as a result of the completion of phase 1 of its three-phase upgrades), the receiving pump station, Raapenberg, currently has insufficient capacity, and upgrading is required to accommodate future developments in the area. The pump station appears to be managing with the current load. The major upgrade will include the upgrading of the pump setup, sand traps, screens, sump, and rising mains (currently two rising mains). The Royal Road pump station is operating at near capacity and is also prone to breakdowns, although no upgrades are currently noted in the pipeline for this pump station.

As seen in annexure G:4, the most logged C3 service request relating to water is 'blocked or overflowing sewer'. A significant contributor to these, and related public concern,⁴⁰ were issues stemming from the Royal Road pump station, which experienced repeated failure due to blockages in 2021. This was further exacerbated by load-shedding. The pump station has since been equipped with a generator, and the requests have decreased to similar ranges seen in 2020.

In public participation regarding the Table Bay District Spatial Development Framework (DSDF) earlier this year, concerns were raised by members of the public regarding other pump stations in the area, such as the Beach Road pump station that was experiencing regular breakdowns. These breakdowns were the result

of overloading and vandalism and resulted in the City having to use mobile pumps to keep sewage flowing. The upgrade of the Beach Road pump station has since been completed, which should resolve these issues.

The northwestern portion of Maitland is located within the 1:10- to 1:100-year flood plain and has been identified as a high hazard zone as seen in figure 29. There is currently no stormwater master plan for the Salt River catchment area within which the study area falls.

According to City policy, a **floodplain** is defined as the area susceptible to inundation by the 1:100-year flood, and the high hazard zone within a floodplain is determined by the velocity and depth of flow. Other characteristics related to the high hazard zone include the inability to wade or have vehicular access and compromised stability of structures and walls.

Furthermore, within the Maitland city improvement district (CID) boundary there are several 'flood areas' that are affected by heavy rains, namely:

- Camp Road
- Voortrekker Road and Beach Road
- Coronation Road and Beach Road
- Upper Camp Road Bridge
- Williams, Long and Norway Street intersection/area

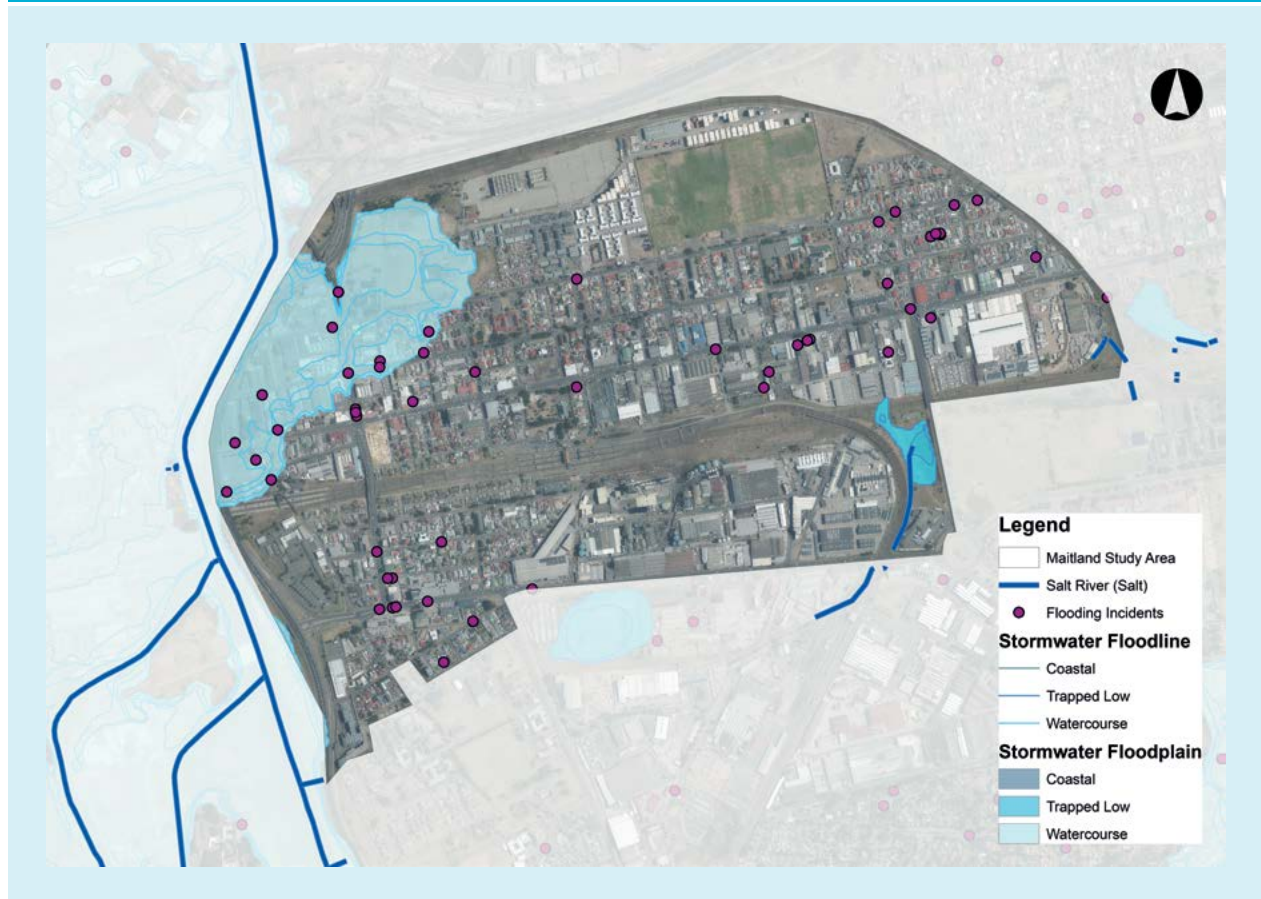
These challenges are particularly severe in the Koeberg precinct where flooding frequently impacts the vehicles and the success of the businesses in the area, and also has the potential to impact some of the buildings in the area.

⁴⁰ <https://www.news24.com/news24/community-newspaper/peoples-post/sewage-overflow-problem-persists-20210906>.

At present, there is no Urban Stormwater Management Plan⁴¹ for Maitland. Such a plan is urgently needed to address these challenges and mitigate negative development impacts through the development

of onsite stormwater retention, such as through a multifunctional stormwater detention and attenuation pond, as well as further investigations for complementary flooding mitigation mechanisms.

FIGURE 29: FLOODPLAIN AND FLOODING INCIDENTS IN MAITLAND



FUTURE STATE

The Water and Sanitation Directorate is currently in the process of assessing the state of the reticulation network pipes across the city and has embarked on an accelerated pipe replacement programme to address this ageing infrastructure. The City replaced 55 164 m of pipes in the last financial year, a 34% increase from the previous year.

The Raapenberg pump station was included in the 'rapid pump station condition assessment' conducted in 2020 and is part of the priority pump station list that will be upgraded in the near future. The project is in the scoping phase and is expected to be completed

by 2027. The completion of this project is critical to unlocking development in the area.

There is currently no work under way to develop an Urban Stormwater Management Plan for Maitland and, as a result, no projects exist in the capital pipeline to address the stormwater run-off challenges that currently cause regular localised flooding in the area. While such a plan should ideally follow on from a catchment stormwater master plan, given the current delays being experienced in citywide stormwater master planning development, this plan should proceed and should then be updated further once the stormwater master plan for the Salt River catchment is completed.

⁴¹ In line with the City's Management of Urban Stormwater Impacts Policy (2009).

CONCLUSION

The purpose of this section was to provide a high-level analysis of bulk infrastructure provision in Maitland by examining four bulk sectors: urban waste, water and sanitation, energy, and urban mobility with the aim of answering two main questions:

- 1. Does the Maitland area have sufficient infrastructure capacity to allow optimal/full potential development?

- 2. If the answer to question 1 is ‘no’, are there projects in the pipeline that will address any shortfalls?

This assessment shows that there are sufficient projects in the pipeline to address current and future expected capacity constraints relating to solid waste, electricity infrastructure, transport infrastructure, and bulk water and sewer systems in the Maitland area.

However, three areas of concern have emerged, summarised in table 9 below.

TABLE 9: AREAS OF CONCERN IN MAITLAND		
Concern	Required action	Sector
Flooding and stormwater concerns in the northwestern portion of Maitland, affecting Maitland Metro precinct	Development of an attenuation or detention pond for the northwestern portion of Maitland.	Water and Sanitation
Ageing water reticulation infrastructure	Assessment of the water reticulation network in this area, given the age of the system.	Water and Sanitation
Inadequate public open space	Provision of more quality public open spaces as per the CSIR guidelines.	Community Services and Health



KEY OUTCOMES AND WAY FORWARD

The 2023 Infrastructure Report is the second report of its kind. This report has built on the first report by remaining focused on an evaluation of the City's bulk infrastructure across the five directorates of Energy, Urban Waste Management, Water and Sanitation, Human Settlements and Urban Mobility.

KEY OUTCOMES

A large portion of projects in the portfolio across the sectors remain on track and some positive developments have been noted in Energy, and in Water and Sanitation.

Long-term capital pipeline deficiencies

Last year's report identified specific concerns in both the Human Settlements and Urban Mobility sectors regarding deficits in their long-term capital pipelines.

The full review of the Human Settlements Sector Plan has now commenced, which is a positive development. The aim of this is to develop a long-term capital pipeline that closes the gap between supply and demand in housing.

This work is critically important and must remain a top priority to deliver. The outcomes of this work will be an important informant of future capital spend. A significant number of projects have now been developed for the outer years of the Urban Mobility capital pipeline. This was a previous area of deficit. These new projects largely relate to improved public transport.

Landfill capacity

Concern was raised in last year's report about the urgent need to develop a regional landfill. Since then, the directorate has had to start the process anew, with the project now in feasibility once more, and with no land having been identified for the regional landfill site at present. This project is a critical priority for the City.

In the meantime, there are several additional cell developments under way at both Coastal Park and Vissershok. However, once completed, new cells require approval from the national Department of Water and Sanitation before landfill operations

can commence. Cells at Coastal Park have been completed but are currently awaiting such authorisation and there is no certainty about how long this authorisation process could take. Vissershok will face the same challenge once the cells currently in development are completed.

Wastewater sludge

A delay in the completion of a biosolids beneficiation facility (the first of three planned facilities) was noted in last year's report. Since then there has been a further delay due to budget constraints as well as a decision to review the approach to sludge treatment overall. The overall strategy for delivering this infrastructure is being reviewed, as are PPPs as an avenue for future delivery.

Stormwater master planning

Stormwater master planning remains a priority but has not progressed since last year's report due to ongoing budget constraints. Linked to this, flooding has been identified as a priority climate shock that the City is not currently sufficiently prepared for. There is an urgent need through the stormwater master planning process to update the City's floodlines, as well as to prepare for an extreme flooding scenario, such as a 1:200-year flood event.

Climate resilience

The first thematic infrastructure analysis of the climate resilience of the City's capital portfolio was included in this report. This showed that approximately 40% of the City's planned infrastructure projects in the 10-year capital portfolio contribute to strengthening its ability to respond to climatic shock events in the future. These are well developed to prepare the City for the higher frequency and intensity of drought shocks, but such planning is less clear for the other four climate shocks that the City is expected to experience in the future.

Maitland

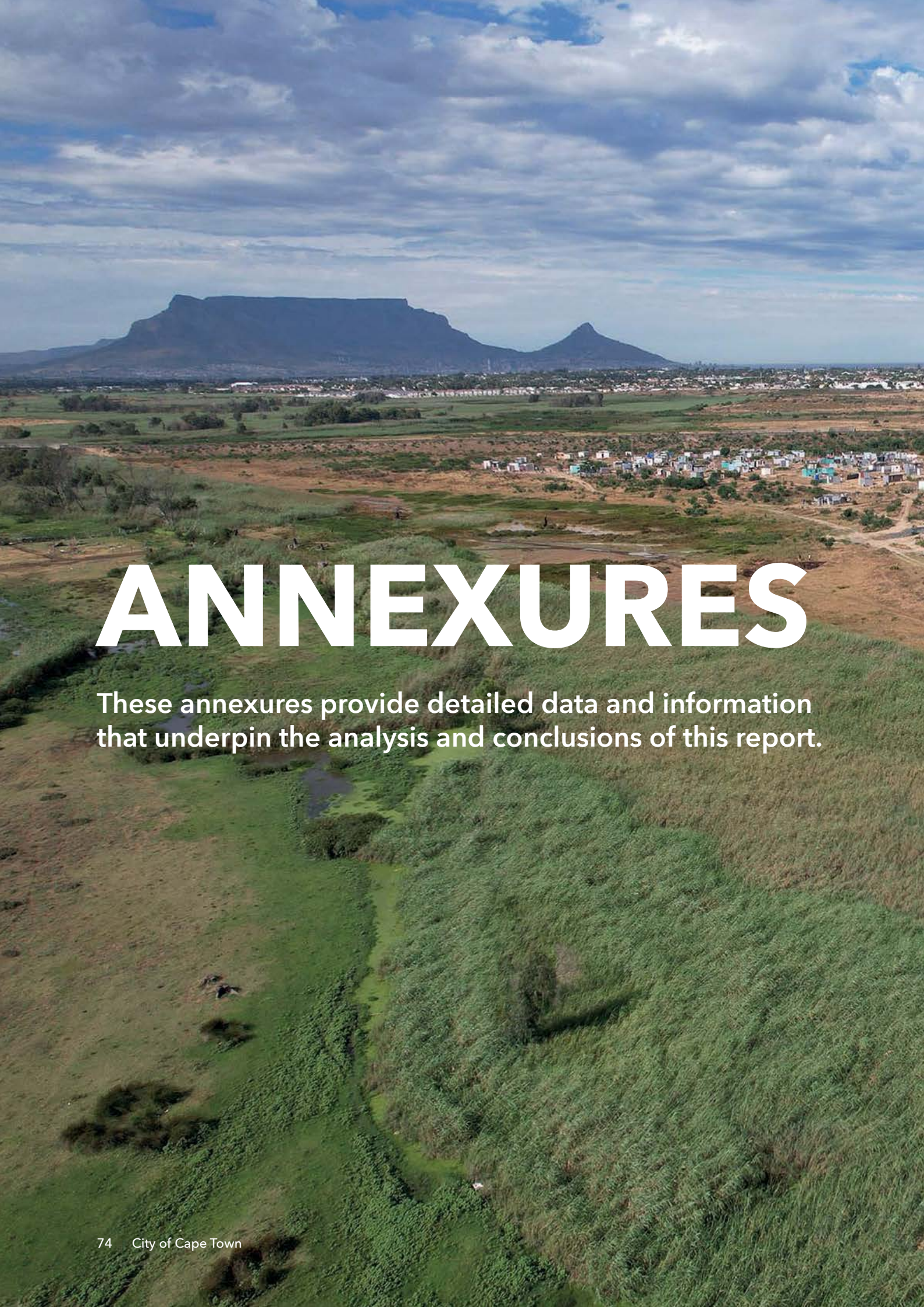
A location-based analysis was also conducted of the Maitland area. The outcome of this analysis revealed that there are sufficient projects in the

pipeline to address current and future expected capacity constraints relating to solid waste, electricity infrastructure, transport infrastructure, and bulk water and sewer systems in the Maitland area. However, there are flooding and stormwater concerns in the northwestern portion of Maitland, affecting the Maitland Metro precinct, which require the development of an Urban Stormwater Management Plan for Maitland. In addition, ageing water reticulation infrastructure in the area requires a full assessment of the water reticulation network to be conducted to inform future infrastructure interventions.

WAY FORWARD

The City of Cape Town remains committed to enhancing infrastructure planning, preparation and delivery in order to stimulate growth and support inclusive economic development. This report will continue to develop, with future iterations planning to expand analysis beyond the five bulk infrastructure sectors that have thus far been assessed, and aims to dive deeper into specific pressure points within the overall capital portfolio. The next iteration will also explore new and innovative ways of presenting the insights of this analysis with the aim of moving to a more interactive format in future, while remaining committed to continued transparency.





ANNEXURES

These annexures provide detailed data and information that underpin the analysis and conclusions of this report.



ANNEXURE A: ENERGY

Annexure A:1 Status of programmes for City of Cape Town generation assets

Infrastructure name and type	Capacity/potential capacity	Project name	Project status 2022	Project status 2023	Targeted completion
SHPS: City-owned generation asset	180 MW	Steenbras: Transformer replacement	Detailed design	Detailed design	2025
		Steenbras: Concrete ASR remediation	Scoping	Scoping	2031
		Steenbras: Refurbishment of main plant	Feasibility	Feasibility	2031
		Steenbras: SPS crane refurbishment	Detailed design	Detailed design	2024
Roggebaai gas turbine: City-owned generation asset	36 MW	RGT: Exhaust stacks replacement	Detailed design	Detailed design	2024
AGT: City-owned generation asset	36 MW	AGT: Refurbishment of the main plant	Scoping	Scoping	2030
		AGT: Fire suppression	Execution	Execution	2023
City-initiated embedded generation	7 MW	Atlantis (PV) – City-owned generation asset	Detailed design	Detailed design	2025
	20–60 MW	Somerset West (Paardevelei) (PV) – ownership of asset TBC	Scoping	Feasibility	Between 2026 and 2030
	200 MW	IPPs – privately owned	N/A	Stage 2 of tender in process	2026
Dispatchable IPP programme	500 MW	IPPs – privately owned	N/A	Tender issued	2027 ⁴²
Battery energy storage systems pilot: City-owned	TBC – feasibility currently under way	Battery energy storage systems	N/A	Scoping	2027

⁴² This target date is based on the sector plan. But the Mayors Priority Programme for Energy has set a more ambitious target of the end of the term of office (some point in 2026). Every effort is being made to bring this programme online by the more ambitious target date.

Annexure A:2 State of main substation over firm capacity (City- and Eskom-owned)

CITY-OWNED				
Infrastructure name	Infrastructure type	Percentage of firm capacity 2021	Percentage of firm capacity 2022	Indicator
Mfuleni and Garden Cities	Main substation	104	115	Over firm
Bellville South	Transformer	95	100	Over firm

ESKOM-OWNED				
Infrastructure name	Infrastructure type	Percentage of firm capacity 2021	Percentage of firm capacity 2022	Indicator
Scottsdene	Main substation	172	172	Over firm
Spine		146	146	Over firm
Blackheath		140	128	Over firm
Khayelitsha		116	116	Over firm
Firgrove		116	117	Over firm
Mpilo*		114	60*	Firm
Esethu		114	117	Over firm
Vissershok		112	112	Over firm
Delft		106	106	Over firm
Airport		102	105	Over firm
Dassenberg		96	108	Over firm

* Mpilo substation was upgraded to 2 x 40 MVA, 66/11 kV substations.

Annexure A:3 Eskom's plans to address over-firm loading at their main substations

Substation	Project to address non-firm loading	Timeframe
Scottsdene	Denova 132/11 kV 2 x 40 MVA	Next three financial years
Spine	Spine 66/11 kV 2 x 40 MVA transformer upgrade from 2 x 20 MVA	Outer years
Blackheath	Blackheath upgrade to 132/66 kV 2 x 160 MVA + 132/11 kV 2 x 40 MVA from 2 x 20 MVA	Next three financial years
Khayelitsha	Khayelitsha upgrade to 2 x 40 MVA from 2 x 20 MVA	Outer years
Firgrove	Firgrove upgrade to 2 x 40 MVA 66/11 kV from 2 x 20 MVA	Outer years
Esethu	Esethu upgrade to 2 x 40 MVA from 2 x 20 MVA	Outer years
Vissershok	Vissershok upgrade to 2 x 40 MVA 132/11 kV from 2 x 20 MVA	Outer years
Delft	Solution to be considered in next NDP review cycle (2024)	TBC
Airport	Metal 2 x 40 MVA 132/11 kV	Outer years
Dassenberg	Solution to be considered in next NDP review cycle (2024)	TBC

Annexure A:4 City of Cape Town areas supplied by electrical infrastructure expected to be over-firm capacity by 2030

Infrastructure name	Description	Project status 2022/23	Planned finish
Melkbos/West Coast intake	Melkbos new main substation	Scoping	2030
Morgen Gronde main substation	Haasendal main substation	Scoping	2030
Big Bay main substation	Big Bay main substation	N/A*	N/A*

* Note that the trigger for upgrades is development. In the case of the Big Bay main substation, the levels of development currently being experienced have not yet triggered the need for an upgrade project to commence.

Annexure A:5 City of Cape Town power transformers that will reach theoretical end-of-life in the next 10 years⁴³

Infrastructure (number of transformers)	Project description	Transformer age	Project type	Project status 2022/23	Planned finish
Bellville South (3)	Bellville South main substation upgrade	64, 59, 50	Improvement and expansion	Execution	2024
Doordakraal (2)	Oakdale 132 kV upgrade	46	Improvement and expansion	Scoping	2028
Eversdal (1)	Eversdal substation upgrade – phase 2	46	Improvement and expansion	Execution	2023
Gardenia (2)	Gardenia transformer upgrade	46	Refurbishment and replacement	Scoping	2028
John Dreyer (1)	John Dreyer transformer upgrade	46	Refurbishment and replacement	Scoping	2028
Eisleben Drive (2)	Eisleben Drive MS transformer upgrade	46	Refurbishment and replacement	Scoping	2028
Eastridge (2)	Eastridge main substation upgrade	41	Refurbishment and replacement	Scoping	2034
Midlands (1)*	N/A	46	N/A	N/A	N/A
Spine Road (2)*	N/A	43	N/A	N/A	N/A
Sampson (2)*	N/A	42	N/A	N/A	N/A
Jan Smuts (2)**	N/A	42	N/A	N/A	N/A

* Sampson, Spine Road and Midlands do not yet have active projects linked to them, since the transformers are still subject to a condition assessment, which will determine when in future years upgrade projects should be brought online.

** Only one of the Jan Smuts transformers is currently 42 years old. The second Jan Smuts transformer will only reach its theoretical end-of-life in 2037. The plan is to replace both transformers in 2035, which falls outside the current 10 years under review.

⁴³ The state of electrical infrastructure is determined by a network reliability index of firm vs. non-firm vs. over-firm capacity. Firm capacity indicates the network ability to withstand an N-1 fault condition, meaning that it is capable of experiencing an outage of a single network component without causing losses in electricity supply. This should not be confused with the total installed transformer capacity at the main substation. Over-firm capacity means the demand peak (in MVA) for the preceding year exceeded the firm network capacity.

ANNEXURE B: URBAN WASTE MANAGEMENT

Annexure B:1 State of the City of Cape Town's landfills

Infrastructure name	Expected full capacity	Planned project description	Status previous report	Project status 2022/23	Planned finish
Coastal Park	2027	Coastal Park: Airspace design and development	Execution	Execution	2023
		Coastal Park: Landfill gas infrastructure – beneficiation	Execution	Execution	2023
		Coastal Park: Landfill gas infrastructure to flaring	Execution	Execution	2032
Vissershok	2039	Vissershok North: Design and develop airspace	Execution	Execution	2025
		Vissershok: Leachate plant – VLFS refurbishment	Execution	Execution	2023

Annexure B:2 State of the City of Cape Town's refuse transfer stations

Infrastructure name	Expected full capacity	Planned project description	Status previous report	Project status 2022/23	Planned finish
Athlone	Infrastructure breakdowns and lack of accessibility to rail	Athlone RTS: Material recovery facility/mechanical biological treatment (MBT)	Conceptual design	Conceptual design	2028
Kraaifontein	Infrastructure breakdowns	Kraaifontein waste management facility: Material recovery facility refurbishment	Scoping	Scoping	2028
Swartklip		Major upgrade of transfer station	Execution	Execution	2023
Bellville		Bellville transfer station: Material recovery facility/ MBT	Scoping	Scoping	2031

Annexure B:3 New drop-off facilities

New drop-off facilities	Project preparation stage	Planned finish
Mitchells Plain 2	Scoping	2035
Westbank	Scoping	2031
Bothasig	Scoping	2032
Mitchells Plain 1	Scoping	2035
Simon's Town/South	Scoping	2035
Durbanville	Scoping	2032
Macassar	Scoping	2032
Khayelitsha	Scoping	2032
Kuils River	Scoping	2031
Bellville	Scoping	2035

ANNEXURE C: WATER AND SANITATION

Annexure C:1 The state of the City of Cape Town's water treatment plants

Infrastructure name	Infrastructure type	Design capacity	Operational capacity	Peak demand	Surplus capacity
		Mℓ/d			
Wemmershoek	Water treatment plant	270	210	270	0
Constantia Nek		3	3	3	0
Brooklands		5	4	5	0
Witzands		14	6	14	0
Albion Spring		4	3	4	0
Silwerstroom		3	3	2,7	0,3
Faure (hillside to the north of Faure)		500	400	351	49
Voëlvlei		273	160	198	38
Steenbras		150	110	130	20
Kloofnek		18	18	5,2	12,8
Blackheath		420	360	400	40

Annexure C:2 Current status and possible capacity of schemes being investigated under the Adaptable Programme

Description	2023 master plan update	Capacity (Mℓ/d)	Comments
Lourens River diversion	2039	54	Anticipated that study will be completed by end of 2023
Michell's Pass	2036	65	Study commenced and anticipated completion by mid-2024
Raising of Steenbras Lower	2042	63	City commenced discussions with national Department of Water and Sanitation to determine best way forward regarding initiation of prefeasibility study on raising Steenbras Lower Dam.
New Water Schemes (reuse)	2040	>100	Study anticipated for completion by end of 2023
Atlantis Aquifer phase 3	2045	13	Prefeasibility study under way
Faure New Water Scheme phase 2 (70-100 Mℓ/d)	2036	30	Part of the Faure New Water Scheme Feasibility Study
Desalination phase 2 (West Coast)	2040	>150	Prefeasibility study under way. City considered two sites at feasibility level: Port Industrial Park site and site at Atlantis. City commissioned study to consider desalination site close to Melkbos. Anticipated that study will be completed by end of 2024.
Alien invasive plant (AIP) clearance (total of six priority catchments)	To be confirmed once more detailed information becomes available		
Management of the WCWSS			
Water Conservation/ Demand Management			
Total (excluding AIP clearance)		>510,0	

Annexure C:3 Updated status on bulk water projects in the City's Bulk Water Augmentation Scheme

Current project	Status previous report	Project status 2023	Planned finish
BWAS-C5&C8 - Land Acquisition/Servitudes	N/A (new)	Benefits review	2039
BWAS-C6&C7 - Land Acquisition/Servitudes	N/A (new)	Benefits review	2039
BWAS: Servitudes (C2&C4)	Conceptual design	Conceptual design	2029
BWAS-C5-D&CS - Spes Bona - VV PRV & Flow Cntrl	N/A (new)	Benefits review	2038
BWAS-C5-C-VV-GG Phase 2: Pump station	N/A (new)	Scoping	2038
BWAS-C5-D&CS-VV-GG Phase 2: Pump station	N/A (new)	Benefits review	2038
BWAS-C7-C-VV-GG Phase 3: SBR-GG Pipeline 13,3 km	Scoping	Scoping	2032
BWAS: Phase 3: SBR-GG Pipeline-13 km C7-D&CS-VV-GG	Feasibility	Feasibility	2032
BWAS: Phase 3: SBR-GG Pipeline-13 km C7-EIA-VV-GG	Conceptual design	Conceptual design	2026
BWAS: Phase 2: Spes Bona Res (300 Mℓ) C6-C-VV-GG	Conceptual design	Conceptual design	2031
BWAS: Phase 2: Spes Bona Res (300 Mℓ) C6-D&CS-VV-GG	Conceptual design	Conceptual design	2029
BWAS: Muldersvlei water treatment plant (WTP)-SBR Pipeline-13 km C4-C	Conceptual design	Conceptual design	2031
BWAS: Muldersvlei WTP-SBR Pipeline-13 km C4-D&CS	Conceptual design	Conceptual design	2031
BWAS-C2-C - Raw Water Pipeline-Muldersvlei WTP	Scoping	Scoping	2031
BWAS-C3-C - Muldersvlei WTP (500 Mℓ/d)	Scoping	Scoping	2031
BWAS: Muldersvlei WTP 500 Mℓ/d C3-D&CS	Conceptual design	Conceptual design	2034
BWAS: Muldersvlei Reservoir & Pipeline	Screening	Detailed design	2027
Bulk Water Augmentation Scheme	Detailed design	Detailed design	2031

Annexure C:4 Updated status on bulk water projects in the New Water Programme

Current project	Status previous report	Project status 2023	Planned finish
Table Mountain Group Aquifer: pre-treatment	Scoping	Detailed design	2036
Table Mountain Group Aquifer: Groenlandberg	Scoping	Detailed design	2036
Table Mountain Group Aquifer: Nuweberg	Scoping	Detailed design	2036
Table Mountain Group Aquifer: Steenbras	Execution	Execution	2024
Cape Flats Aquifer: Mitchells Plain	Scoping	Scoping	2027
Cape Flats Aquifer: Strandfontein northeast	Scoping	Conceptual design	2026
Cape Flats Aquifer: Hanover Park & Philippi	Scoping	Execution	2027
Cape Flats Aquifer: Strandfontein west	Execution	Execution	2024
Additional resources desalination reclaim	N/A (new)	Scoping	2024
Desalination permanent site	Conceptual design	Feasibility	2025
Zandvliet/Faure plant reuse (70 Mℓ)	Detailed design	Detailed design	2030
Desalination location 1	Feasibility	Feasibility	2030
Cape Flats Aquifer recharge	Execution	Execution	2026
Atlantis Aquifer	Execution	Execution	2027
Cape Flats Aquifer	Execution	Execution	2028
Desalination	N/A (new)	Conceptual design	2026
Additional resources desalination reclaim	Feasibility	Scoping	2035

Annexure C:5 Updated status on other major bulk water projects

Current project	Typology	Status previous report	Project status 2023	Planned finish
N1-Wemmershoek pipeline relocation	Bulk water pipeline	N/A (new)	Scoping	2029
Contermanskloof Reservoir	Contermanskloof Reservoir	Execution	Commission and close-out	2023
Bulk water generators: Additional FY24	Generators: Additional - bulk water	N/A (new)	Scoping	2024
Helderberg/Faure Scheme	Helderberg/Faure Bulk Water Scheme	Conceptual design	Scoping	2033
Steenbras Reservoir - construction	Steenbras Reservoir	Benefits review	Benefits review	2025
Steenbras Reservoir		Feasibility	Scoping	2032

Annexure C:6 Update of WWTW projects

Wastewater treatment works	Capacity	Project status 2021/22	Project status 2022/23	Planned finish
Zandvliet – primary treatment and sludge	Over capacity	Execution	Execution	2024
Zandvliet – capacity expansion		Scoping	Scoping	2027
Klipheuwel WWTW		Scoping	Conceptual design	2038
Macassar WWTW – extension ⁴⁴		Scoping	Conceptual design	2029
Potsdam WWTW – extension		Scoping	Detailed design	2029
Mitchells Plain WWTW	Near capacity		Scoping	2027
Athlone – capacity extension		Scoping	Detailed design	2032
Wesfleur – capacity expansion			Scoping	2031

Annexure C:7 Current stormwater projects

Current project	Typology	Project status 2022/23	Planned finish
Diep River – Doornbach diversions	New/replacement project	Scoping	2026
Rehab of Diep River – Theo Marais Canal		Conceptual design	2027
Flood alleviation – Lourens River		Detailed design	2025
Flood alleviation – Lourens River phase II		Conceptual design	2030
Macassar flood alleviation		Conceptual design	2028
Upgrade Vygekraal River bank – Athlone	Refurbishments	Detailed design	2024
Upgrade Vygekraal River banks – phase II		Scoping	2026
Stormwater dams: Safety upgrade (citywide)		Screening	2027
Geelsloot projects	Infrastructure expansion	Conceptual design	2026
Sir Lowry's Pass River upgrade		Execution	2027
Soet River 21st Street drainage channel		Scoping	2030
Soet River construction detention pond		Scoping	2030
Soet River detention pond		Conceptual design	2028
Rehab of Diep River – Erica Road outfall		Conceptual design	2025

⁴⁴ Note that the Macassar upgrade will address the capacity constraints currently experienced at both the Macassar and Gordon's Bay WWTW.

ANNEXURE D: HUMAN SETTLEMENTS

Annexure D:1 Human Settlement capital expenditure plans for FY2023/24 relating to rehabilitation and refurbishment of the City's public rental housing

Project type	Scope	Location	Overall status	Planned finish
Plumbing	Relocate internal sewer stack to exterior at four-storey flats	Uitsig - eight blocks (four-storey)	Construction	2024
Plumbing	Relocate internal stack pipes to external and replace sanitaryware	Oyster Court (three-storey)	Procurement	2024
Electrical upgrades	Upgrading of electrical infrastructure	Adriaanse, Ravensmead Uitsig, Leonsdale	Procurement	2024
Electrical upgrades	Upgrading of electrical infrastructure	Milnerton - Albow Gardens	Procurement	2024
Electrical upgrades	Upgrading of electrical infrastructure	Hanover Park (additional)	Procurement	2024
Electrical upgrades	Upgrading of electrical infrastructure	Hanover Park (additional)	Procurement	2024
CRU electrical upgrades	Upgrading of electrical infrastructure	Hanover Park	Procurement	2025
Roofing	Replacement of existing asbestos roof coverings	Avon Place, Trinity Place, Springbok Place, Chestnut Place	Procurement	2024
Window replacements	Replacement of steel window frames	Albow Gardens - blocks A, B, C	Procurement	2024
Window replacements	Replacement of steel window frames	Kewtown (one block)	Procurement	2024
Window replacements	Replacement of steel window frames	Kewtown (11 blocks)	Procurement	2024
Window replacements	Replacement of steel window frames	Lavender Hill	Procurement	2024
Window replacements	Replacement of steel window frames	Macassar	Procurement	2024
Security fencing	Installation of 2,4-metre-high, heavy-duty precast concrete walls	Kewtown	Procurement	2024

Project type	Scope	Location	Overall status	Planned finish
Security fencing	Installation of 2,4-metre-high, heavy-duty precast concrete walls	Hanover Park	On hold	2025
Security fencing	Installation of 2,4-metre-high, heavy-duty precast concrete walls	Mitchells Plain housing office	Procurement	2024
Staircases	Replacement of walkways at CRUs	Protea Park	Construction	2024
Staircases	Replacement of walkways at CRUs	Crow Court, Robinvale, Atlantis	Procurement	2024
Staircases	Replacement of staircases	Ocean View	Procurement	2024
Staircases	Replacement of staircases	Lavender Hill	Procurement	2024
Roofing	Replacement of existing asbestos roof coverings	Lwandle, Nyanga	Procurement	2024
Roofing	Replacement of existing asbestos roof coverings	Mitchells Plain, Lavender Hill	Procurement	2024

ANNEXURE E: URBAN MOBILITY

Annexure E:1 New projects added to the bulk infrastructure integrated portfolio outer years

Programme name	Project preparation status 2023	Typology	Planned finish
Khayelitsha – Century City Corridor	Scoping	New	2035
Symphony Way Corridor	Scoping	New	2035
Klipfontein Corridor	Scoping	New	2035
Public Transport Priority Measures Programme	Scoping	New	2035
Public Transport Stop & Shelter Programme	Scoping	New	2035
TMC Expansion – Phases 2B & 3	Scoping	New	2035

Annexure E:2 Congestion relief major projects

Current project	Typology	Project preparation status 2022	Project preparation status 2023	Planned finish
Voortrekker Road widening between Salt River Canal and Prestige Drive, and Cannon Street widening between Royal Road and Voortrekker Road	Expansion	Scoping	Scoping	2026/27
Foreshore Freeway: Linking Eastern and Western Boulevard	Expansion	Scoping	Scoping	2027/28
Berkley Road (M5 to Prestige Drive) and Jan Smuts Drive (Prestige Drive to Oude Molen Tech High School)	Expansion	Scoping	Scoping	2027/28
M3 Corridor: Extra inbound lane	Expansion	Scoping	Scoping	2027/28
Church Street widening between Albert Road and FW de Klerk Boulevard	Expansion	Scoping	Scoping	2032/33
Jakes Gerwel (Vanguard Drive) (M7) upgrade to freeway between N1 and N2	Expansion	Scoping	Scoping	2034/35
N2 widening between hospital bend and Jan Smuts Drive (M17)	Expansion	Scoping	Scoping	2034/35
Kromboom Parkway widening between Kromboom Road to N2	Expansion	Scoping	Scoping	2038/39
Erica Drive extension across R300 to Belhar Main Road	New	Scoping	Scoping	2024/25
Berkley Road extension and dualling M5 to Liesbeek Parkway	New	Scoping	Scoping	2029/30
Constantia-Main Road Realignment Scheme: M3 to Main Road	New	Scoping	Scoping	2033/34
Blaauwberg Road extension from Koeberg Road to N7 interchange and to Tygerberg Valley Road (excluding Western Cape Government bridge and intersection)	New	Scoping	Scoping	2032/33
Sheffield Road East extension from Jakes Gerwel (M7) to Ottery Road	New	Scoping	Scoping	2035/36
R300 South extension to Prince George Drive (M5)	New	Scoping	Scoping	2039/40

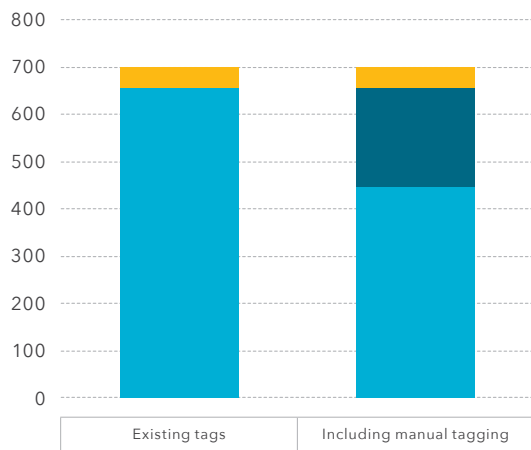
Annexure E:3 Metro Roads Reconstruction Programme major projects

Current project	Typology	Project status 2022	Project status 2023	Planned finish
Jakes Gerwel Drive between Frans Conradie Drive and Viking Way	Rehabilitation	Scoping	Detailed design	2025
Main Road Simon's Town/St George Street Road/Queens Road/McFarlane Road from Dido Valley Road to Rocklands Road	Rehabilitation	Scoping	Scoping	2028

ANNEXURE F: RESILIENCE

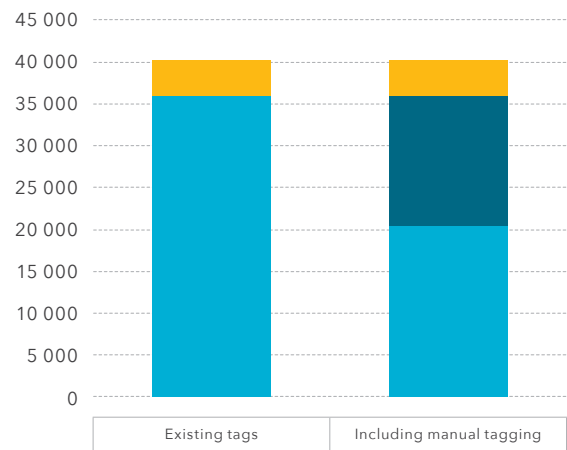
Annexure F:1 Number and value of infrastructure projects that contribute to building resilience to climate shocks within the three-year (January 2022-June 2025) capital portfolio as at 26 January 2022

NUMBER OF PROJECTS



- No resilience against climate shocks
- Climate shock resilience (manual tag)
- Climate shock resilience (tagged)

VALUE OF PROJECTS (ZAR MILLION)

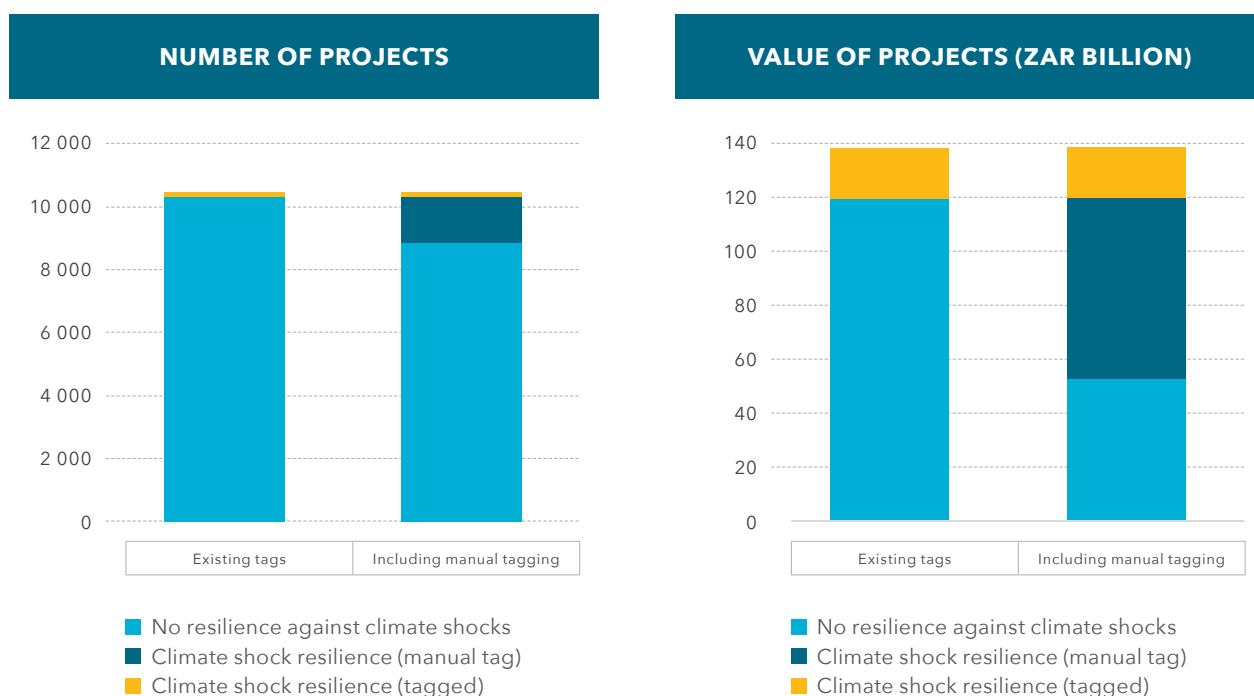


- No resilience against climate shocks
- Climate shock resilience (manual tag)
- Climate shock resilience (tagged)

Annexure F:2 Maturity process timeline

	2022	2023	2024	2025	
Impact / Intervention logic	Drought well developed, other shocks not.	Determine level of resilience required against each shock (factoring risk and vulnerability), and interventions needed to achieve this (focus on one new shock per year)			Measurable level of resilience against each shock
		Risk analyses per shock: enable prioritisation of infrastructure			
Scope	3 year portfolio, resilience through infrastructure	Include 10 year analysis (1-3 year; 4-10 year)		Incorporate co-dependencies / system level interactions (AMIA tool)	
Extent	Citywide vs community	Citywide interventions or geo-tag overlay to vulnerability maps for spatially specific interventions;			
Metrics	CAPEX & number of projects per shock / dept.	Develop indicators per intervention.	Develop impact targets per intervention (based on impact / intervention logic)	Composite indicators per shock (relative impact of interventions)	
Analytics	Per shock / per directorate	Analysis of y/y trends by department / aggregated by shock			
		Identify gaps and reasons for gaps; inform strategic decisions on addressing underdevelopment of resilience against particular shocks in the portfolio			

Annexure F:3 Number and value of infrastructure projects that contribute to building resilience to climate shocks within the 10-year capital portfolio as at 1 February 2023



Annexure F:4 Number and value of resilience projects in the 10-year portfolio per climate shock

Climate shocks	Number of candidate projects	Potential total 10-year budget
Drought	332	22 162 063 859
Fire	269	6 740 634 792
Flooding	465	25 473 219 937
Heatwave	317	361 117 472
Storm surge	53	783 672 780
Grand total	1 436	55 520 708 840

Annexure F:5 Number and value of resilience projects per directorate in the 10-year portfolio

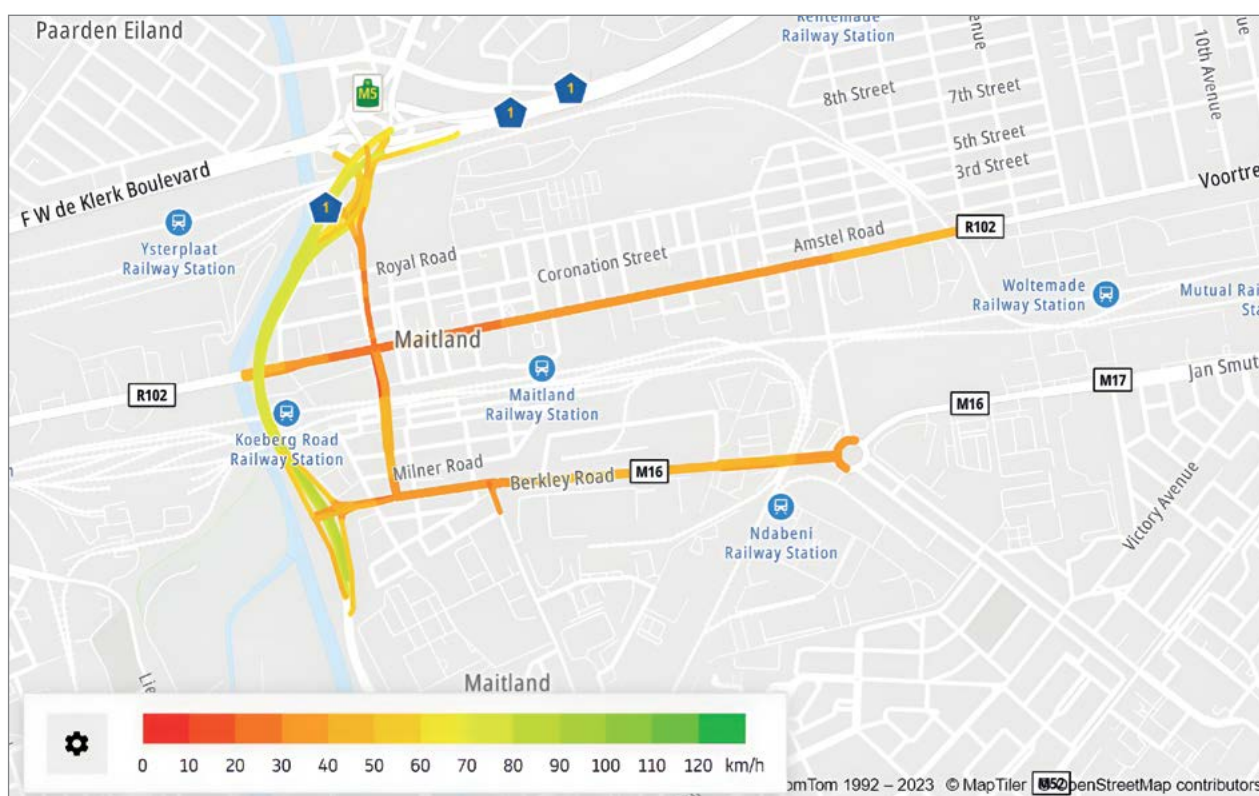
Directorates	Drought	Fire	Flooding	Heatwave	Storm surge	Total projects	Potential 10-year budget
Community Services and Health	34	15	48	258	4	359	980 640 531
Corporate Services		18	4	6		28	31 007 000
Economic Growth			1	1		2	8 600 000
Energy		22				22	155 919 260
Finance		1		2		3	35 000 000
Human Settlements	50	115	119	37		321	8 596 418 083
Safety and Security		41				41	252 943 116
Spatial Planning and Environment	2		6	13	49	70	805 116 016
Urban Mobility			119			119	587 572 736
Urban Waste Management		57	27			84	3 222 772 060
Water and Sanitation	246		141			387	40 844 720 038
Grand total	332	269	465	317	53	1 436	55 520 708 840

ANNEXURE G: MAITLAND

Annexure G:1 Population trends for Maitland 2011-2021

	2011	2021 estimate	Growth (2011-2021)
Maitland	9 782	13 683	39,88%
Cape Town	3 740 025	4 413 593	18,01%

Annexure G:2 Congestion in Maitland for October 2022 morning (06:00-09:00) and evening (16:00-19:00) peak periods

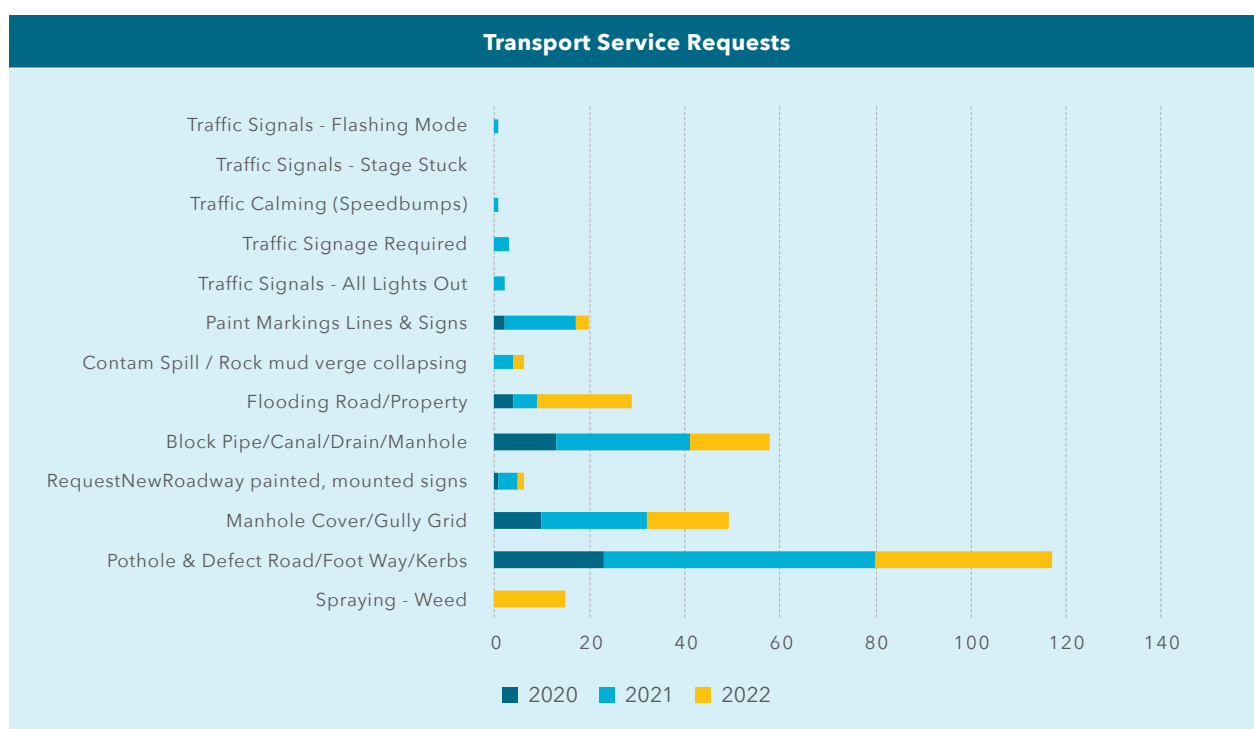
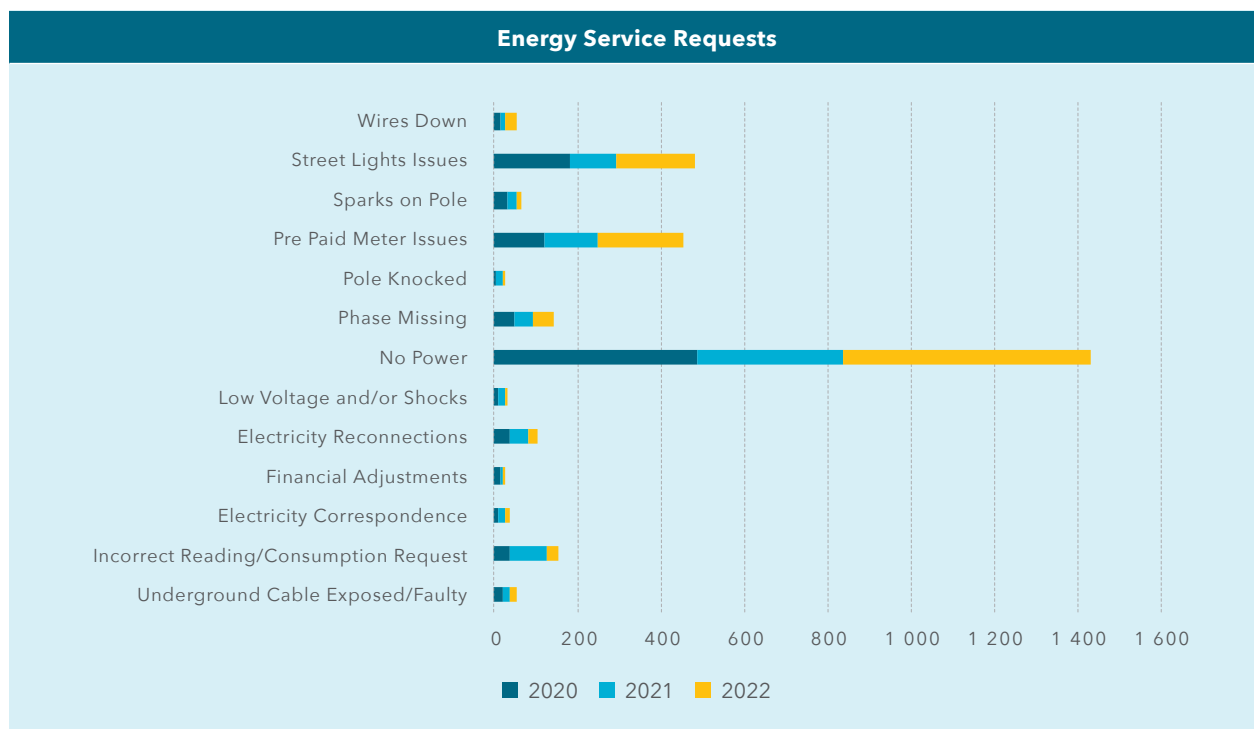


Annexure G:3 Priority projects in Maitland⁴⁵

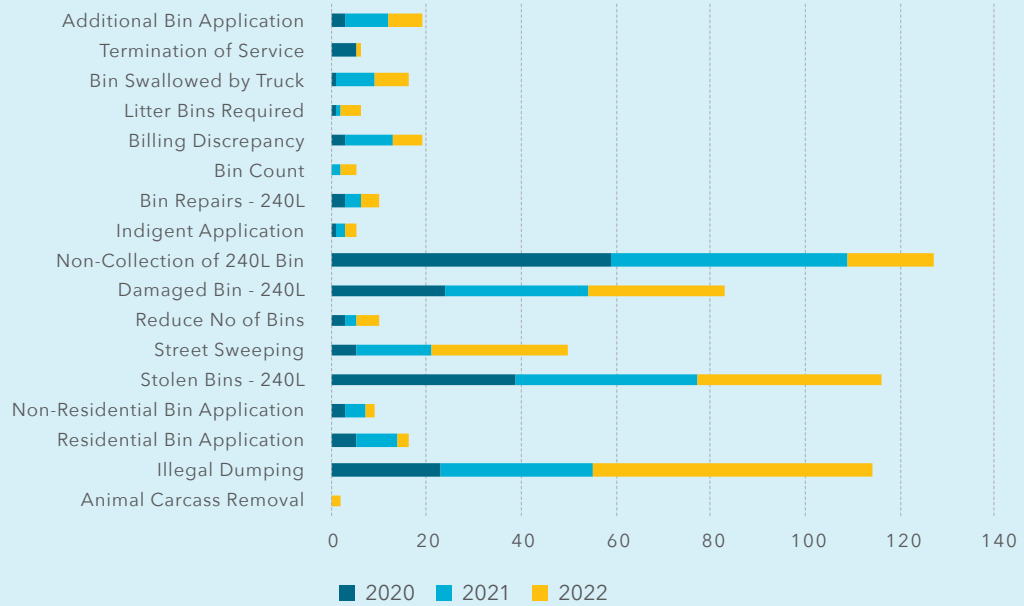
Project	Priority	Sector	Project description	Stage and planned finish
Berkley Road extension	District	Urban Mobility	A proposed extension that connects Berkley Road with Malta Road/Albert Road (Lower Main Road) as part of an inter-district development route. The route plays a vital role in supporting the increase in development intensity envisaged in the suburbs east of the Black River. This is currently being implemented and is supported in the short term.	Execution 2024
Voortrekker Road widening between Salt River Canal and Prestige Drive, and Cannon Street widening between Royal Road and Voortrekker Road	Citywide		The Voortrekker Road expansion project comprises the dualling of Voortrekker Road and the widening of Koeberg Road. This project will increase the link capacity and alleviate congestion.	Detailed design 2028
Maitland rail and public transport interchange	District		The Northern Corridor Modernisation Study has identified Maitland as needing upgrades to bring these facilities up to PRASA's 2014 identified norms and standards for rail facilities. Improvements are encouraged to facilitate mode integration, universal access, park and ride, among other necessary changes.	Detailed design 2026
Maitland NMT	District		Investment in NMT infrastructure has been identified as a priority in Maitland, with attention being paid to improving NMT infrastructure in the Voortrekker Road environment and focusing on alignment with more intense residential development in the area.	Detailed design 2025
Athlone WWTW	Citywide	Water and Sanitation	The expansion of the Athlone WWTW is a strategic priority infrastructure programme currently in the early stages of implementation. This is necessitated by the demand on WWTW due to the continued and planned intensification of development in the catchment for this treatment works.	Scoping 2027
Raapenberg pump station upgrade	Citywide		The Raapenberg pump station currently operates at insufficient capacity and requires an upgrade. The pump station is to be upgraded as part of the priority pump station programme.	Scoping 2027

⁴⁵ Extracted from the Table Bay District Plan Technical Report (2022) and Infrastructure Report (2022).

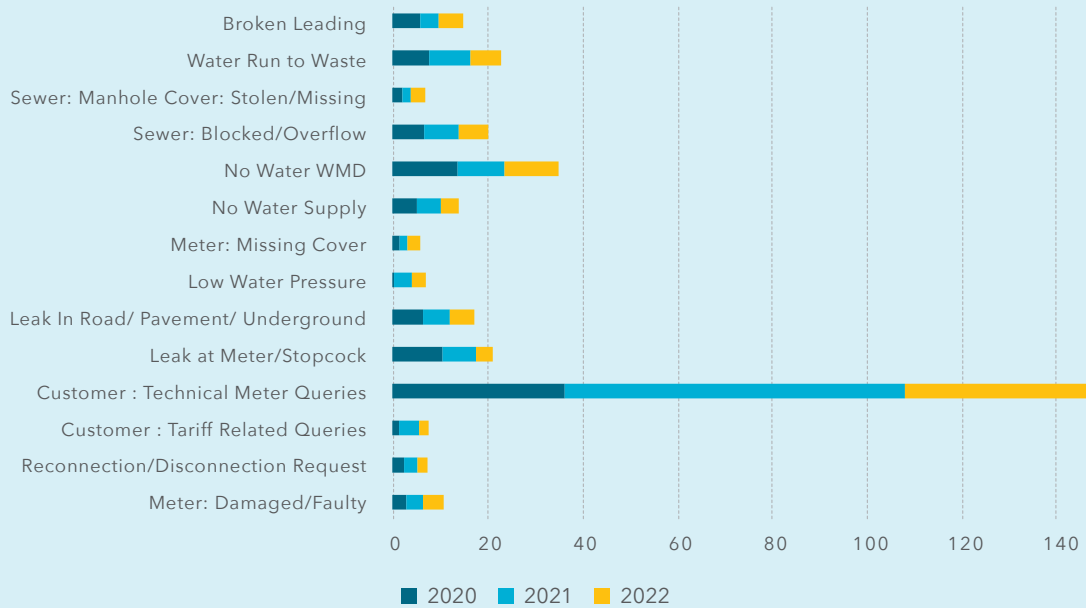
Annexure G:4 Summaries of C3 notification requests across bulk sectors for Maitland



Solid Waste Service Requests



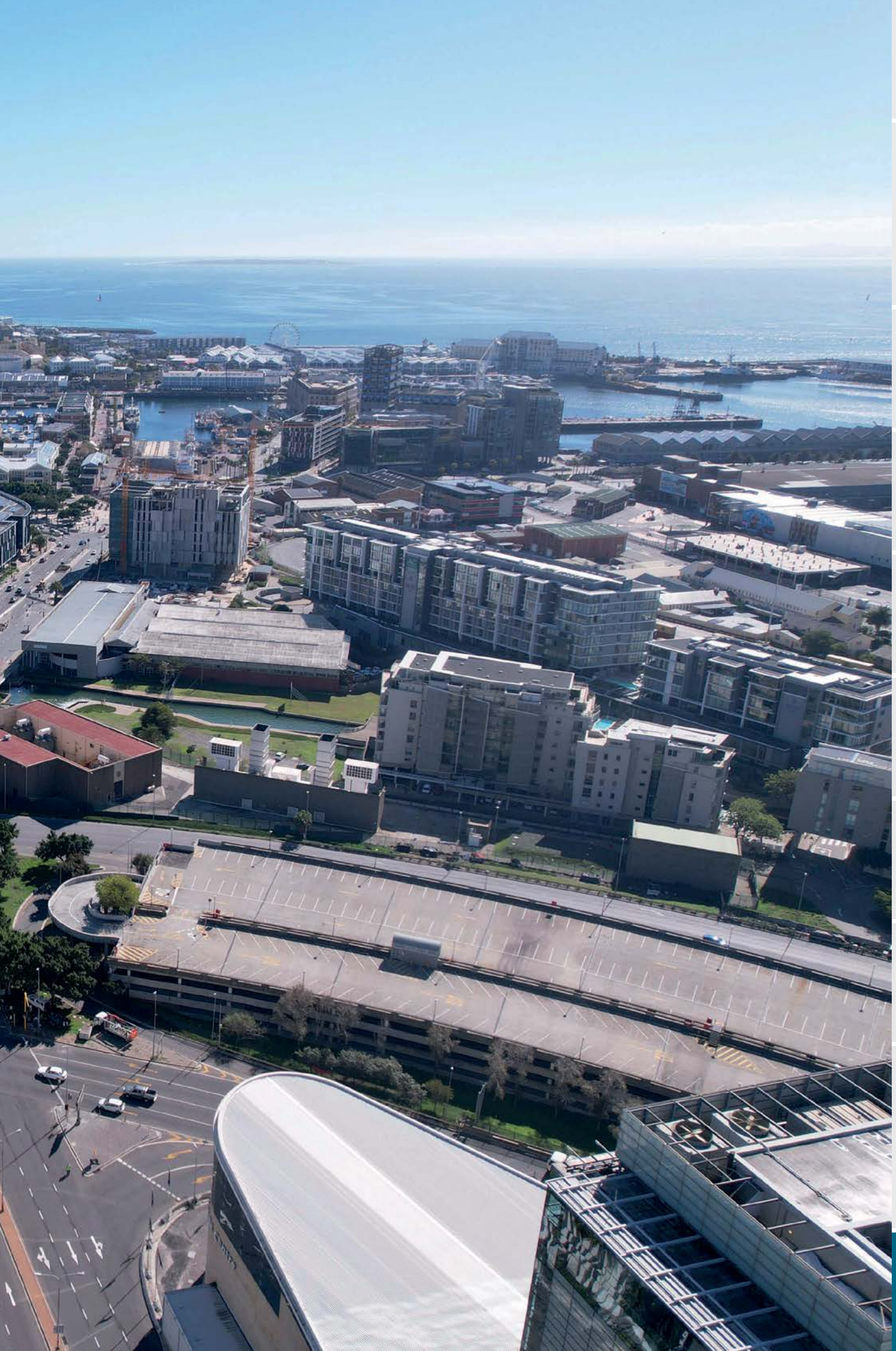
Water and Sanitation Service Requests



Annexure G:5 NMT in Kensington, Factreton and Maitland

	Walking lane improvements	Bicycle routes
NMT improvements in Kensington, Factreton and Maitland	- 12th Avenue from Voortrekker Road to Acre Road - Dapper Road from Berkley Road to Raapenberg Road - Sunderland Street from 16th Avenue to 7th Avenue - 10th Avenue from Nyman Street to Sky Steelworks - 13th Avenue from Dapper Road to Maryland Street - Bunney Street from Maryland Street to 6th Avenue - Station Road from Royal Road to Ferndale Drive - Royal Road from Koeberg Road to Bodmin Street - 4th Street from 2nd Avenue to 6th Avenue - 6th Avenue from Voortrekker Road to Acre Road - Factreton Avenue from Sunderland Street to Lugmag Avenue - Lugmag Avenue from Factreton Avenue to Acre Road - 16th Avenue from Voortrekker Road to Factreton Avenue	- Maitland Public Library - Factreton Clinic - First National Rangers Saint Agnes FC - Maitland Gardens - Maitland Square - Kensington Centre - Koeberg Primary School - Maitland Primary School - Holy Cross High School - Wingfield Primary School - HJ Kronenberg Primary School - Kenmere Primary School - Windermere Primary School - Windermere High School - Kensington High School - Factreton Primary School - Sunderland Primary School - WD Hendricks Primary School - Maitland High School











CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Making progress possible. Together.