2020
Stormwater
Asset Management Plan

CITY OF
TEA TREE GULLY
Naturally Better

Asset management plans (AMPs) are used to guide the planning, construction, maintenance and operation of our infrastructure.

These plans are key components of our Long-Term Financial Plan and include detailed information about each asset and define which services will be provided, how they will be provided and what funding is required to cost-effectively deliver them over a 10-year period.

For more information call 8397 7444 or visit cttg.sa.gov.au/amp

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Introduction

The City of Tea Tree Gully's stormwater assets provide valuable services that are part of our community's everyday life. They have been established over a long period of time and must be properly maintained and developed to ensure continued community benefit.

City of Tea Tree Gully's stormwater network plays an important role in flood mitigation, reducing water pollution and retaining water resources for the City.

Stormwater drains and structures primary purpose is to direct stormwater away from the water table into creeks but also includes waste interception devices which heavily reduce pollution in natural water courses and waterways.

Creeks and wetlands play an important part in retaining water resources while also maintaining and enhancing the natural environment and serve as an important public amenity for the local community. Stormwater harvested through wetlands and dams contribute to Council's aquifer recharge scheme where stormwater is treated and injected into underground aquifers. This water is then used to irrigate parks and sporting fields, reducing demand on mains water.

This asset management plan is used to guide the planning, construction, maintenance and operation of Council's stormwater infrastructure.

It details our approach to managing our stormwater assets, future demand and risk, and our compliance with regulatory requirements. It also identifies the estimated capital expenditure necessary to provide stormwater infrastructure and associated services to the community over a 10-year period.

Our goal in managing our stormwater assets is to meet the required service levels in the most cost-effective manner for present and future customers. This means timing infrastructure renewals before unplanned maintenance costs become excessive, but not so soon that assets are

renewed before it is really needed.

Our stormwater assets include pits, pipes, culverts, gross pollutant traps, inspection points and wetlands. The total current replacement cost of these assets is about $188.5 million.

Approximately $930,000 is required each year to maintain, operate and renew our stormwater infrastructure assets in accordance with our current service levels.

Actual annual expenditure will vary from year to year as we acquire more assets, build new assets and undertake major renewal works.

The asset management plan should be read in conjunction with Council's key strategic management, planning and policy documents, including our Asset Management Policy, Long Term Financial Plan and Annual Business Plan and Budget.

Collectively, these plans support the achievement of our vision for our City – *A thriving community that enjoys a quality lifestyle that values its people and natural environment*.

The Stormwater Asset Management Plan is reviewed annually, with a full update completed every four years.

We incorporate community feedback into our asset management plans through information provided via our annual community survey, the review of common customer requests and formal community engagement.

Visit cttg.sa.gov.au/amp to view all of our asset management plans.

Stormwater profile

Asset quantity

480 km
Stormwater pipes

12
Gross pollutant traps

18,600
Stormwater pits

36
Wetlands

$188.5 million
Asset replacement cost

- Stormwater pipes – $127.36 million
- Stormwater pits – $57.89 million
- Wetlands/dams – $3.25 million

Service levels

The current stormwater asset service levels are driven by Council's strategic plan and vision for the City, legislative requirements and community research.

Service level drivers

Community insight

Our annual Community Survey along with customer request data allows us to understand resident satisfaction with our asset management program and provides guidance for continuous improvement.

While suggested improvements may not directly relate to the maintenance or renewal of an asset, they can influence the use of an asset, which can impact its serviceable life.

Strategic and organisational goals

Our vision for a thriving community with a quality lifestyle that values its people and natural environment is the foundation of our strategic and organisational goals.

Council's Strategic Plan 2025[1] articulates the vision and aspirations for our community, and details objectives for these aspirations. The objectives listed below are linked directly to the Stormwater Asset Management Plan.

Community

- People feel a sense of belonging, inclusion and connection with places, spaces and the community.

Environment

- Environmentally valuable places and sites that are flourishing and well cared for.
- A community that is protected from public and environmental health risks.
- We are resilient to climate change and equipped to manage the impact of extreme weather events.

Places

- Infrastructure and community facilities are fit for purpose, constructed using sustainable practices and well maintained.

Leadership

- Planning considers current and future community needs.
- Decision making is informed, based on evidence, and is consistent.
- Major strategic decisions are made after considering the views of our community.

Legislative requirements

There are many legislative requirements relating to the management of stormwater assets. These include:

- *Local Government Act 1999*
- *Environment Protection Act 1993*
- *Environmental Protection (Water Quality) Policy 2015*
- *Water Resources Act 2012*
- *WSA 05-2013 – Conduit Inspection Reporting Code of Australia*
- *Australian Standards*
- *Work Health & Safety Act 2012 (South Australia)*
- *South Australian Public Health Act 2011*
- *Australian National Committee of Large Dams (ANCOLD) Guidelines on Consequence Category for Dams 2012*
- *Australian National Committee of Large Dams (ANCOLD) Guidelines on Risk Assessment 2003*
- *Australian National Committee of Large Dams (ANCOLD) Guidelines on Dam Safety Management*

[1] Strategic Plan 2025 - cttg.sa.gov.au/strategicplan

- *Australian National Committee of Large Dams (ANCOLD) Guidelines on the Environmental Management of Dams 2001*
- *Australian National Committee of Large Dams (ANCOLD) Regulation and Practice for the Environmental Management of Dams in Australia 2014.*
- *Australian National Committee of Large Dams (ANCOLD Guidelines for geotechnical Investigation of Dams 2020*
- *Australian and New Zealand Environmental and Conservation Council (ANZECC) Water Quality Guidelines.*
- *Guidelines for managing risk in recreational water NHMRC 2008.*
- *Landscape Bill SA - Department of Environment and Water*

Service level performance

The performance of our assets are measured in two ways:

Customer service levels

How the customer receives or experiences the service. The measures used in this asset management plan are quality, function and safety.

Technical service levels

What we do to deliver the service.

The current stormwater asset service levels are driven by Council's strategic plan and vision for the City, legislative requirements, community research and resources available within the current Long-Term Financial Plan.

These service levels will be used to:
- Clarify the level of service customers expect
- Identify the work required to meet these service levels

- Identify the costs and benefits of the services offered
- Enable Council and customers to analyse the quality, function and safety of stormwater assets based on the existing service levels
- Determine the impact (primarily financial) of increasing or decreasing the service levels.

Technical service levels

Supporting the customer service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Operations** – the regular activities to provide services (e.g. street sweeping, pits and pipes cleaning etc.)

- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. side entry pit lid replacement, lid frame repair)

- **Renewal** – the activities that return the service capability of an asset up to that which it had originally (e.g. replacement of unserviceable pits and pipes)

- **Upgrade/New** – the activities to provide a higher level of service (e.g. larger volume pits or pipes) or a new service that did not exist previously (e.g. a new stormwater system to mitigate flooding issues).

Service and asset managers plan, implement and control technical service levels to influence the customer service levels.

Customer service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Quality *How good is the service, including its condition and quality*	Minimise localised flooding and overflow through private properties	Customer request regarding flooding	Measured through Customer Request Management system 13 – 2016 51 – 2017 28 – 2018 40 – 2019	Reduction in customer requests over time e.g. < 40 by end of 2020.
	Reduce pollution of water ways and creeks	Volume of water material intercepted by waste interceptors, street sweeping and from side entry pit cleaning activities	6,000 cubic metres of material removed from the water table, side entry pits and waste interceptors	Removal of 6,000 cubic metres of material
Function *How suitable is the service for its intended purpose*	Ensure stormwater system meets community expectations by effectively draining away stormwater	Customer request regarding flooding	Measured through Customer Request Management system 13 – 2016 51 – 2017 28 – 2018 40 – 2019	Reduction in customer requests over time e.g. < 40 by end of 2020.
Safety *How safe is the asset for users of the service*	Minimise property damage from flood waters	Insurance claims received per annum	4 claims in 2018 4 claims in 2019	Reduction of claims by 2020

Technical service levels

Performance measure	Service level	Performance measure process	Current performance	Performance target
Operations				
Stormwater pipes	Condition assessments in accordance with WSA05 2008 standards to inform maintenance requirements and renewal program candidates.	Number of customer requests regarding maintenance per annum.	0.5% of total pipe network is condition assessed each year based on reactive requirements. Current annual expenditure: $40,000.	Proactive and reactive inspection to target minimum 2.5% of network per year which is equivalent to approximately 12 km per year (480km of stormwater pipes). Estimated cost: $100,000 per year.
Blockages	Proactive/reactive high-pressure cleaning of pipelines using hydrojet equipment. Proactive/reactive sump and pit cleaning program. Street sweeping of water table to reduce the amount of debris entering stormwater network.	Reduction in flooding and pipe failures created by blocked pipelines. Reduction in flooding and pit failures created by blocked pits. Completion of annual street sweeping program.	Programmed proactive stormwater infrastructure cleaning program. Current annual expenditure: $100,000.	Programmed proactive cleaning in addition to reactive cleaning. Estimated cost: $120,000 per year.
Maintenance				
Pipes, channels and structures (side entry pits, gross pollutant traps)	Urgent repairs (minor in nature) to ensure continued suitable functionality of assets.	Customer requests (maintenance) of unserviceable assets. Number of infrastructure failures per annum.	Reactive maintenance within budget allocation. Side entry pits (frame and lid replacements) repairs completed by internal staff. Gross pollutant trap nets replacements by internal staff.	To address high risk reactive maintenance requirements within 12 months.

Performance measure	Service level	Performance measure process	Current performance	Performance target
Renewals				
Pipes, channels and structures (side entry pits, gross pollutant traps)	To provide serviceable assets in the most efficient and cost-effective manner.	Ongoing three year renewal/upgrade or rehabilitation program for assets that score a condition greater than 3 (poor or very poor condition).	50% of condition 4 and 5 assets addressed from 2017 CCTV inspection. Primarily reactive renewal identified from customer requests.	Rehabilitation and capital renewal/ upgrade program that addresses defects within 12 months to maintain assets at acceptable service levels.
Upgrade/renewal				
Pipes, channels and structures (side entry pits, gross pollutant traps)	To provide service in accordance with the following design standards: 5-year ARI (Average Recurrence Interval) for residential (standard pits and pipes). 10-year ARI for industrial. 100-year ARI for watercourses. Ensure stormwater system has appropriate design capacity.	Number of properties experiencing flooding (customer requests). Number of properties experiencing inundation events.	Reactive upgrades based on customer request (flooding). <10 per year No property affected more than twice in 5 years.	Acquire detailed designs and undertake proactive upgrades based on capacity requirements and flood mitigation. <10 per year No property affected more than twice in 5 years.

Future demand

Population growth, social and technology changes can impact community demand for services. This section looks at these trends and examines the strategies required to address them.

Demand drivers

Drivers affecting demand include:

- Population change
- Climate change
- Economic factors
- Seasonal factors
- Environmental awareness.

Demand forecasts

Population growth and infill development

The City of Tea Tree Gully's population is forecasted to grow to 101,648 by 2030 (in 2016 – the last census year – the population was 99,153). Long-term, this rise in population may result in a higher capacity placed upon stormwater assets, which may shorten the useful life of our assets and increase maintenance costs.

Infill development (where two or three dwellings are built on an existing allotment) has occurred at a significant rate within the last 10 years. This activity is primarily happening in the central east, Modbury, Modbury North, and Holden Hill zones, which were originally developed in the 1960s and 1970s.

There is a direct correlation that increasing infill development leads to increasing impermeable surfaces, which contribute to the demand on the stormwater network and downstream water courses.

Council have controls in place, through the Residential Stormwater Detention Policy, to manage stormwater discharged from new developments by requiring the installation of detention tanks to reduce the demand on the stormwater network in peak storm events.

Climate change

The effects of climate change on stormwater management are not the most understood within the industry. However, climate change modelling undertaken by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) predicts:

- A medium confidence that there will be a decrease in winter and spring rainfall, but an increase in the frequency of high intensity rainfall - this means that there may be areas of the existing stormwater network that may require upgrades to prevent localised flooding
- A high confidence that there will be an increase in drought conditions and evapotranspiration rates (atmospheric moisture demand), impacts on biodiversity along creeks and waterways, damage to riparian zones increasing the risk of bank erosion
- A high confidence of harsher fire weather.

In response to climate change, Council have an ongoing monitoring program that assess the performance of the stormwater network to identify areas of concern and develop strategies to manage demand on the network.

It is acknowledged that there is more work that needs to be undertaken in this area to provide long-term sustainable management of stormwater and water resources in the City. This will be discussed more in the plan, improve, monitoring section of this asset management plan.

Environmental awareness

The growing social awareness around environmental management has had a significant impact on stormwater management both from customer expectation and legislative requirements.

The River Torrens is a highly valued asset by the wider Adelaide community. As such, the Adelaide and Mount Lofty Ranges Natural Resources Management Board (AMLRNRMB) commissioned a review of the existing management of the River Torrens in 2019, with the view to introduce new legislation that will facilitate a new governance structure for managing the River Torrens.

The proposed governance structure will likely impact Council's existing service levels along the River Torrens and potentially increase expenditure to better manage the River Torrens catchment.

Economic factors

Rate capping, if it were to occur, also has the potential to affect the way City of Tea Tree Gully delivers services to the community. If there is a funding shortfall to manage existing assets to the agreed levels or service, the level of service will likely need to decrease. A shortfall could also result in the inability to provide new assets or upgrades desired by the community.

Demand management plan

Demand for new services will be met through the management of existing assets, the upgrade and renewal of assets, the provision of new assets and demand management practices.

Asset types	Demand driver	Demand management plan
Stormwater runoff from infill development within the City	Design capacities of stormwater network exceeded	Continue to implement Council's stormwater detention policy for new developments. Update stormwater network hydraulic modelling to assist with decision making and producing the necessary information for undertaking network design.
Increased stormwater contamination as a result of infill development	Breach of EPA policy, impact on waterways used by the public	Implement stormwater quality objectives for new developments. Look for opportunities for water-sensitive urban design in new developments and Council streetscapes and reserves.

Asset programs to meet demand

Growth

Urban development in the City of Tea Tree Gully has reached the boundary of the Hills Face Zone. With most of the urban area now fully developed, large developments are unlikely to occur. This reduces the likelihood of the need to extend our stormwater network and stormwater assets being handed over to Council to manage.

Lifecycle management

This section outlines asset performance and condition information, and uses asset management principles to develop broad strategies and specific work programs to achieve the agreed service levels.

The assets covered by this plan include:

- Stormwater pipes
- Stormwater pits
  (side entry pits, junction boxes)
- Culverts and channels
- Gross pollutant traps
- Wetlands

**Asset age profile by decade
(% based on asset cost)**

- 1960 - 5.7%
- 1970 - 25.3%
- 1980 - 31.2%
- 1990 - 28.9%
- 2000 - 6.8%
- 2010 - 2.1%
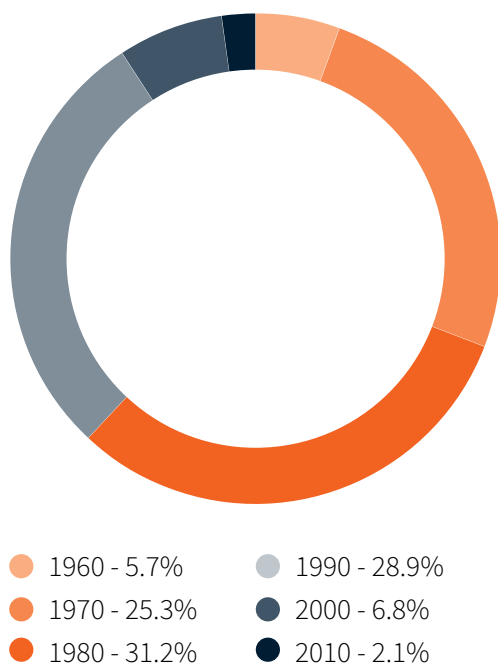
Asset capacity and performance

To achieve the desired service levels we have developed a set of guiding principles, which take into account a variety of factors such as usage, location and environment.

Asset condition assessment

As part of routine maintenance, condition assessment is conducted on underground infrastructure through camera inspections, visual inspections and engineering assessments. This is to ensure the asset is achieving its desired functionality whilst also ensuring no risk to surrounding infrastructure through structural defects. Examples of defects include: joint movement in pipes resulting in sinkholes and cracking, or tree root intrusion in pipes resulting in blockages.

Hydraulic modelling

This is not available to Council at present, however it is in the improvement plan for the future. Hydraulic modelling will provide Council with a greater understanding of stormwater capacity requirements within the city, which can be used to inform future capital works in collaboration with existing condition information.

Stormwater design standards

All new stormwater infrastructure conforms to the industry design standards as outlined in the technical service levels section of the asset management plan. Stormwater infrastructure is designed to cater for the majority of minor events (5-year ARI for residential). Designing

to cater for more significant rain events would require significant budget as material and construction costs increase proportionally. Roads are designed to allow for holding of stormwater during more significant rain events (100-year ARI) when underground infrastructure is at capacity.

Water quality

Water quality is monitored in accordance with EPA standards, with regular water quality testing conducted at various points along the City's watercourses. Water quality testing enables Council to identify and address point sources of pollution along water courses. Council also operates multiple dams which aid in the improvement of water quality through the removal of suspended solids. In addition, water sensitive urban design is incorporated into infrastructure designs which incorporate the use of natural filtration, plants and other landscaping to remove water pollutants.

Asset condition

The regular collection of condition data allows us to make informed decisions and mitigate risk when formulating forward capital works programs. Asset condition is usually determined through field observations of defect parameters.

Asset conditions are measured using a 1-5 rating system where 1 relates to an asset that is 'as new' and 5 relates to an asset that is at the end of its useful life.

Condition grading

1. Very good
New or like new, only planned maintenance required.

2. Good
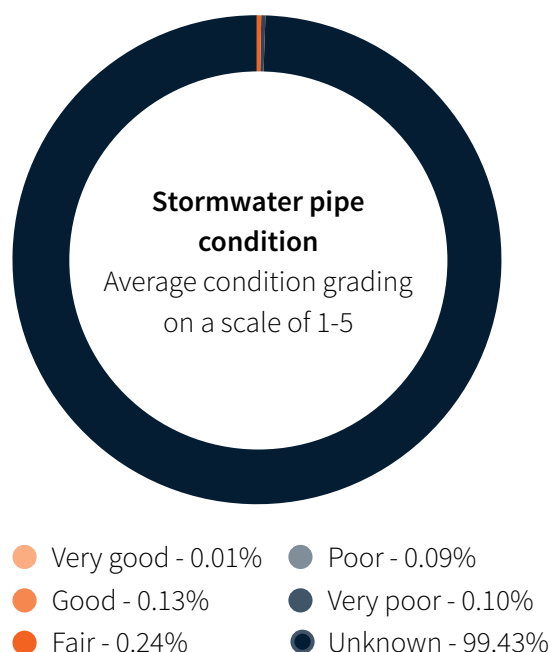Minor maintenance required, plus planned maintenance.
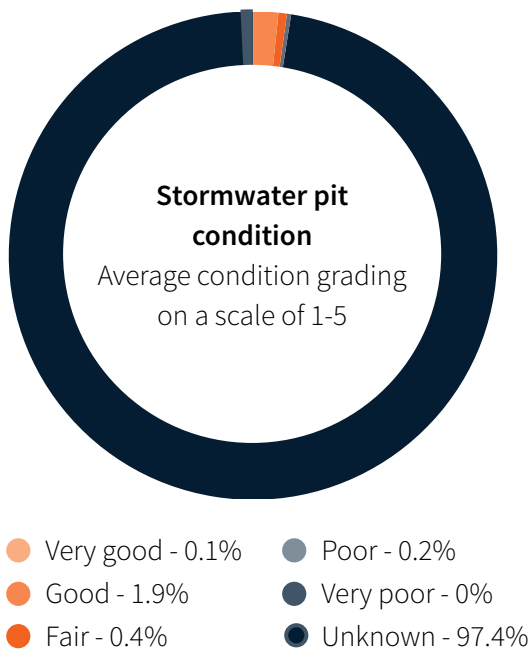
3. Fair
Significant maintenance required.

4. Poor
Significant renewal/rehabilitation required.

5. Very poor
End of useful life, and/or beyond rehabilitation.

Stormwater pipe condition
Average condition grading on a scale of 1-5

- Very good - 0.01%
- Good - 0.13%
- Fair - 0.24%
- Poor - 0.09%
- Very poor - 0.10%
- Unknown - 99.43%

Stormwater pit condition
Average condition grading on a scale of 1-5

- ● Very good - 0.1%
- ● Good - 1.9%
- ● Fair - 0.4%
- ● Poor - 0.2%
- ● Very poor - 0%
- ● Unknown - 97.4%

Planned maintenance

Planned maintenance relates to repair work that arises from proactive activities such as inspections and condition assessments, where actioning repair work is then prioritised, scheduled and reviewed against previous maintenance history.

While future operations and maintenance expenditure is forecast to trend in line with previous years' spend and budgets, footpath maintenance is decreasing and road operational costs are increasing.

Previous operational and maintenance expenditure

Operations and maintenance plan

To improve the functionality of our stormwater assets, we regularly undertake operational activities such as pits and pipes cleaning, camera inspections (CCTV) and condition assessments. While this work will not change the condition of the asset, it will help prolong its useful life.

We also undertake regular maintenance work including side entry pit frame repairs, lid replacements and patch repairs over small sections of damage assets. This work will improve the condition and functionality of the asset necessary to keep them operational.

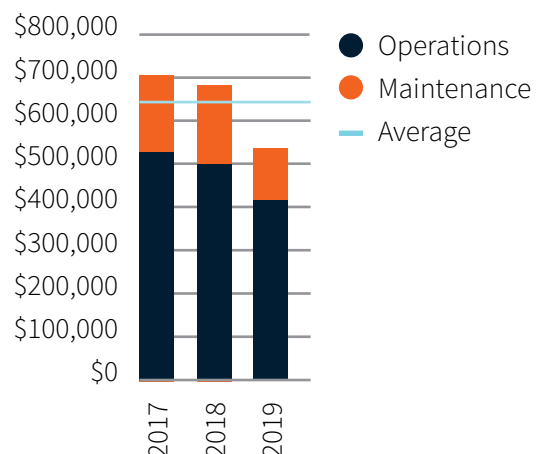Maintenance works are classified as planned and reactive:

Reactive maintenance

Reactive maintenance is undertaken in response to customer requests or when assets fail and need immediate repair.

Renewal plan

Renewal is the process of restoring an existing asset to its original service potential. This does not usually increase the functionality or usability of the asset.

Assets requiring renewal or replacement are identified using the following methods:

- **Aged-based approach**
  Using acquisition year and useful life to determine the renewal year.
- **Condition-based approach**
  Using condition predictive modelling systems.
- **Manual-based approach**
  Using a combination of visual inspections and maintenance history to determine the remaining useful life of the asset.

Renewal plan methods by asset type

Type of asset	Renewal/Replacement method
Stormwater pipes	Condition-based and aged-based
Stormwater pits	Condition-based and aged-based
Gross pollutant traps	Aged-based and manual-based
Wetlands/dams	Aged-based

Renewal prioritisation drivers

Asset renewal and replacement is typically undertaken in accordance with two major community expectations in mind:

Reliability
The asset can reliably deliver the service it was constructed to do so (e.g. renewing a pipe so that water is properly drained and minimising its effect on other assets such as footpaths, roads, properties etc.)

Quality
The asset is of sufficient quality to meet community service levels (e.g. able to drain stormwater away efficiently).

Renewal prioritisation

The renewal of an existing asset is prioritised using the following criteria:

- **Risk**
  The consequence of asset failure is high.
- **Consumer usage**
  The asset is highly used and the subsequent impact on users would be greatest.
- **High cost asset**
  Total value represents the greatest net value to the organisation.
- **Age profile**
  The asset is close to the end of its useful life.
- **Maintenance**
  The asset has high operational or maintenance costs.
- **Community expectations**
  Asset renewal would provide better service levels.

Future renewal and replacement expenditure summary

Projected future renewal and replacement expenditures are show in the below graph.

Projected capital renewal and replacement expenditure

● Capital renewals
● Unplanned renewals
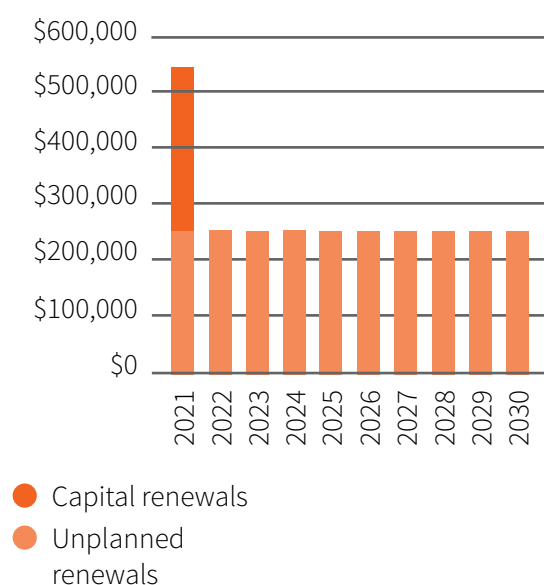
The projected capital expenditure shows a slight peak in year one, where assets that are in poor to very poor condition require renewal. As stormwater assets have long useful lives, there is a minimal effect on required renewal expenditure over a 10-year planning period.

An amount of $250,000 per year is required for unplanned renewals where asset failure occurs that could not be predicted. It is demanding to visually assess all underground assets in a timely manner to determine the condition to predict asset failure. Poor construction methods or expansive soils can contribute to an underground asset like stormwater pipes not reaching its useful life potential.

The budgeted expenditure (from the long-term financial plan) is approximately $2.35 million per year. $1.45 million of this is from annual

depreciation of stormwater assets, however, this does not closely relate to the amount required for capital renewals. As a majority of the stormwater network was constructed in the 1970s through to 1990s, assets are only 30 to 50 years old, and from an age approach, still have a medium-to-long remaining useful life.

Renewal expenditure

Expenditure type	Cost over 10 years
Capital renewals	$313,083
Unplanned renewals	$2,500,000
Total	**$2,813,083**

Assets identified for renewal and/or replacement may be deferred in capital works programs if the cost is not able to be funded. This can be the case when there is a backlog of assets to be renewed, higher priority projects are required for other assets classes, or upgrade/new works have been committed based on consumer preferences, e.g. strategic projects.

Deferring the renewal of an asset may not impact its short-term performance. If work is deferred for a prolonged period of time the cost of renewal may increase as the asset deteriorates, which could lead to potential environmental and safety issues.

Creation/Acquisition/Upgrade plan

New works are those that create a new asset that did not previously exist, or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. These potential additional assets are considered in the Future Demand section of this asset management plan.

As detailed in the Future Demand section, new assets and upgrade/expansion of existing assets are identified in various sources such as community or Elected Member requests, proposals identified from strategic plans or partnerships with other organisations. Project proposals are investigated to verify the need and to develop a preliminary budget estimate. Project proposals that are approved are ranked by priority and available funds and scheduled in future works programs.

Asset disposal plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. For stormwater assets, City of Tea Tree Gully has no proposal to decommission any services.

Risk management

Effective risk management is integral to all aspects of Council business including how infrastructure assets risks are identified and managed.

Identify risks

What can happen?

When and why?

How and why?

Analyse & evaluate risks

Consequence

Likelihood

Level of risk

Evaluate

Treat risks

Identify controls

Assess controls

Implement controls

The risk assessment process which is aligned to the Risk Management Standard ISO 31000:2018 – Guidelines provides the logical approach for the identification, assessment and management of risks in order to protect Council's assets and to minimise risks to the community.

Once risks have been assessed and rated, for the most significant risks (those rated as high or extreme), treatment options must be considered and implemented. Risks identified as moderate or low are monitored and reviewed to determine if circumstances change.

The following risk management principles have been applied to our stormwater infrastructure assets:

- Integration of risk management in all decision making and business processes
- Applying a systematic and structured approach to manage risks
- A tailored risk management approach to suit the context

- Applying an evidence-based approach in assessing and mitigating risks
- Determining the Council's risk tolerance
- Applying a transparent and inclusive approach in the management of risks
- Applying risk management practices to continuously improve City of Tea Tree Gully's operations.

Risk identification

For stormwater assets, risks can be identified from a number of sources:

- Minor operational routine inspections
- Major condition/defect inspections
- Customer requests
- History of performance
- Stakeholder advice.

Risk analysis

The City of Tea Tree Gully uses a risk assessment matrix (as pictured below) that is designed to define the level of risk by combining the consequence and the likelihood to arrive at a risk rating.

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost certain
Critical	High	High	Extreme	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Medium	Medium	Medium	High	High
Minor	Low	Low	Medium	Medium	Medium
Insignificant	Low	Low	Low	Low	Low

Risk treatment

All risks that have been assessed as having an 'Extreme' or 'High' risk rating require the implementation of mitigation strategies and/or risk treatment options (controls). The residual risk rating and treatment cost post implementation of treatment/controls is shown in the table on the next page.

Critical risks and treatment strategies

Note – The residual risk is the risk remaining after the selected risk treatment plan is operational.

Service or asset at risk	What can happen	Risk rating	Risk treatment strategies/control	Residual risk *	Treatment costs
Stormwater drainage network	Localised flooding and inefficient management of stormwater due to infrastructure blockages.	High	Preventative maintenance of side entry pits. Reactive pipe clearing using high pressure water jet.	Medium	$120,000 per year
Stormwater drainage network	Poor understanding of stormwater drainage network assets – can result in: • Multiple asset failures • Poor financial forecast/budgeting • Flooding • Incorrectly designed assets.	High	1. Implement condition assessment program of stormwater structures and pipes 2. Hydraulic modelling and hydraulic assessment of stormwater catchments 3. Complete catchment wide risk assessment 4. Implement an ongoing rehabilitation program for repair and maintenance of stormwater assets.	High	Condition assessment program $80,000 per year. Development of hydraulic model and hydraulic assessment of stormwater catchments $100,000 per year over 3 years.

Watercourses (Dry Creek, Cobbler Creek etc.)	Increased flow rates in creeks resulting in bank failure and flooding.	High	Residential Stormwater Detention Policy. Monitoring creek flows during storm events. Hydraulic assessment of creeks and waterways.	High	Staff time
Watercourses (Dry Creek, Cobbler Creek etc.)	Overgrown reeds choking natural waterways resulting in flooding in adjacent areas.	High	Maintenance of 3 major sites per annum.	High	Estimated cost for reed removal and maintenance per annum: $40,000
Detention Basins/ Wetlands/ Dams	Increase risk of blue green algae events due to sediment and high nutrient loads: damage to environment and loss of public amenity, public health risk from blue green algae toxins, odour issues. Increase risk of dam stratification due to build up of sludge and organic material at the bottom of the dam, which promotes blue green algae events.	High	De-silting of wetlands, basins and dams. Develop and implement silt management strategy for Council wetlands and dams.	High	Development of silt management strategy $40,000.

Dam breach	Breach of Wynn Vale Dam wall causing damage and loss downstream of the dam.	Extreme	Undertake dam safety audit in accordance with ANCOLD guidelines. Consider recommendations from the dam audit and develop options to reduce the risk to the community. Undertake dam surveillance in accordance with ANCOLD guidelines. Where possible, install telemetry to remote monitoring capability.	High	Dam safety audit $110,000 Telemetry $10,000 Dam surveillance $10,000

Financial summary

This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan.

Asset valuations

The value of our stormwater assets as at 30 June 2019 are shown below.

Asset type	Current replacement cost	Depreciated replacement cost	Accumulated depreciation	Depreciation expense
Stormwater drains	$127,364,497	$15,778,249	$111,586,247	$1,061,092
Stormwater pits	$57,881,230	$1,067,990	$56,813,239	$374,798
Wetland/Dams	$3,250,670	$124,065	$3,126,604	$17,745

Financial projections

This plan sets out the projected operations, maintenance and capital renewal expenditure required to provide the agreed service levels to the community over a 10-year period in a sustainable manner and informs our Long-Term Financial Plan.

The projected operations, maintenance and capital renewal expenditure required over the 10-year planning period is $930,000 on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is $2.35 million on average per year, which funds the projected required expenditure.

Asset renewal funding ratio

The asset renewal funding ratio indicates that over the next 10 years of forecasting, we expect to have 100% of the funds required for the optimal renewal and replacement of assets.

Knowing the extent and timing of any required increase in expenditure and knowing the service level consequences if funding is not available will assist in providing services in a financially sustainable manner.

Projected operating and capital expenditure
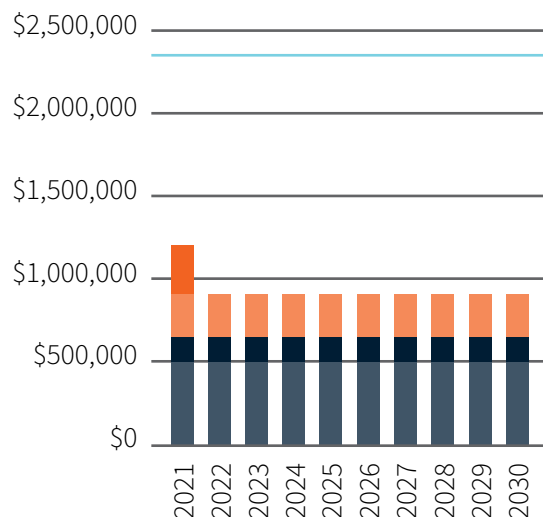
Legend:
- ● Capital renewals
- ● Unplanned renewals
- ● Maintenance
- ● Operational
- — Budgeted expenditure (LTFP)

A key tool in financial forecasting will be modelling the predictive behaviour of assets. Testing and verifying the intervention variables will determine if an increase in funding is required, or whether the serviceability of assets is decreased due to the budget allocation from the Long-Term Financial Plan.

Key assumptions made in financial forecasts

Key assumptions made in this asset management plan are as follows:

- Asset values are based on valuations data performed by APV Valuers and Asset Management.
- The required renewal expenditure assumes that the community is content with the current levels of service across the entire asset class. Should these levels of service be refined through future community consultation, it could have a significant impact on the intervention levels used and funding required.
- The Long-Term Financial Plan is grouped by asset type, and is based upon the depreciation expense values.
- Replacement works will be valued based on actual costs of work, e.g. predictive modelling of roads determines the treatment cost input into the modelling software, and not the current replacement cost.
- The assumed useful lives of assets will be achieved.
- All assets with the same construction/material type will deteriorate at the same rate regardless of locational or environmental considerations.
- It is understood that the Long-Term Financial Plan funding values are subject to change year upon year based upon expenditure in other sections of Council, not just asset management related expenditure.

Forecast reliability and confidence

The expenditure and valuation projections in this plan are based on best available data. The estimated confidence level of this data is considered to be reliable (level B), using the five level scale below.

A. Highly reliable

Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%.

B. Reliable

Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%.

C. Uncertain

Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete (up to 50% is extrapolated data) and estimated to be accurate ± 25%.

D. Very uncertain

Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%.

E. Unknown

None or very little data held.

Plan improvement & monitoring

The figures within this plan will be reviewed annually as part of our Long-Term Financial Plan review process and will be amended to recognise any changes in service levels, valuations, conditions and/or resources available to provide those services.

Status of asset management practices

Accounting and financial systems

We use Civica Authority to manage our financial information. This system is used in conjunction with our asset management information system, Assetic Cloud.

Financial transactions are processed using Assetic Cloud against asset components, which update financial depreciation values as the transactions are performed.

Accounting standards and regulations

The Australian Accounting Standards provide the benchmark against which we report on asset accounting.

Asset management systems

We use Assetic Cloud to manage our asset information. This system integrates with our GIS system and our Customer Request Management system.

Assetic Cloud is managed through modules including asset register, accounting, valuations and assessments

Our asset register contains important asset information such as material, construction date, and hierarchy, which is used to develop this asset management plan and to forecast the renewal of our assets.

Improvement plan

The asset management improvement plan generated from this asset management plan is shown on the next page.

Monitoring and review procedures

The Stormwater Asset Management Plan will be reviewed annually, during the annual business plan and budget process, to ensure it reflects:

- Current service levels
- Actual asset values
- Projected operations, maintenance, capital renewal and replacement
- Capital upgrade/new and asset disposal expenditures
- Projected expenditure values incorporated into the Long-Term Financial Plan
- Any changes to the available resources and the resultant service levels.

The Plan has a life of four years and is due for full revision and updating within two years of each Council election.

Performance measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required projected expenditure identified in the asset management plan are incorporated into the Long-Term Financial Plan.
- The degree to which the works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the asset management plan.

- The degree to which the existing and projected service levels and service consequences risks and residual risks are incorporated into the Strategic Plan and associated strategic management.

Asset management improvement plan

	Task	Responsibility	Resources required	Timeline
1	Complete catchment wide risk assessment of stormwater network.	Water Resources	Internal staff. Operating expense $20,000	Within 24 months
2	Undertake condition assessment of stormwater assets and implement a three-year rolling rehabilitation program and capital works program.	Water Resources	CCTV inspections $80,000 per year Software - InfoAsset Planner/Manager ESRI and AMS.	Ongoing
3	Undertake data collection for hydraulic modelling as part of routine maintenance – confirmation of asset information such as invert levels, pipe material, pipe size and volume. Stage 1 – Modbury precinct Stage 2 – Modbury North Stage 3 – Wynn Vale Stage 4 – Ridgehaven Stage 5 – Surrey Downs	Water Resources	Surveying equipment Software - InfoAsset Planner/Manager. Infoworks ICM, ESRI and AMS. Internal resources	Stage 1- 12 months Stage 2 & 3 - 24 months Stage 4 - 36 months
4	Update register of blockages and inspections against pipes electronically using asset management software to inform proactive cleaning/inspection program.	Water operations (drainage maintenance)	Data collection equipment – asset management system.	Within 24 months
5	Update floodplain mapping for Dry Creek.	Civil assets & water operations	Project manager (internal). Engineering consultant (external). Additional budget required: Estimated $200,000-$500,000	Within 36 months

6	1. Stormwater Management Plan – Dry Creek. 2. Endorsed by Stormwater Management Authority (SMA) 3. *Local Government Act 1999* legislative requirements	Civil Assets & Water Operations. City of Salisbury, City of Port Adelaide Enfield (optional).	Project manager (internal). Engineering consultant (external). Additional budget: estimated $250,000	Within 12 months
7	Cobber Creek Dam flood risk modelling • To develop a consequence category in accordance with ANCOLD guideline	Civil Assets & Water Operations. City of Salisbury Council (Drainage Team).	Project manager (internal). Additional budget required.	Ongoing
8	Structural review of Council's stormwater infrastructure (dam walls, culverts etc.) to develop and implement a framework for risk management e.g Wynn Vale Dam audit	Civil Assets & Water Operations	Project manager (internal). Engineering consultant (external). Additional budget required.	June 2022
9	Desilting of creeks, wetlands and dams • Desilting of Druminor wetland included for consideration with the Dry Creek Corridor Concept Plan Develop a Silt Management Strategy	Water Operations	Project manager (internal). Consultant (external). Additional budget required: estimated costs $400,000 per site.	Ongoing Silt Management Strategy by December 2021
10	Waste management - Develop a framework (project initiation) to develop a waste interception strategy to reduce water pollution of waterways	Civil Assets, Water Operations	Project manager (internal).	June 2023

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- Demand Analysis – DPTI, https://www.dpti.sa.gov.au/__data/assets/pdf_file/0012/418899/Demand_Analysis.pdf

CITY OF
TEA TREE GULLY
Naturally Better

571 Montague Road, Modbury 5092
PO Box 571, Modbury 5092
cttg.sa.gov.au