2020

Asset Management Plan

Stormwater Management Infrastructure

City of
Norwood
Payneham
& St Peters

Document Control		2020 ASSET MANAGEMENT PLAN – STORMWATER MANAGEMENT INFRASTRUCTURE			
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1	December 2020	Draft for Community Consultation	SD	PM	PP
2	January 2021	Final – Council Meeting 18 January 2021	SD	PM	PP

Contents

1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Asset Management Plan

Asset management planning is a comprehensive process ensuring the delivery of services from infrastructure is financially sustainable.

This Asset Management Plan (AMP) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The AMP defines the services to be provided, how the services are provided and what funds are required over the ten (10) year planning period. The AMP will link to the Council's Long-Term Financial Plan (LTFP) which typically considers a ten (10) year planning period.

This AMP covers the City's Stormwater Management Infrastructure Network.

1.2 Asset Description

The City's Stormwater Management Infrastructure Network comprises:

- stormwater drainage infrastructure (inclusive of pits, pipes, culverts, open channels, outlets and pumps);
- pedestrian and vehicular bridges; and
- Aquifer Recharge Storage (ASR) infrastructure (inclusive of bores, pits, pipes, pumps, control systems and bio-filtration beds).

The Stormwater Management Infrastructure Network has a significant total renewal value estimated at $126,866,864.

1.3 Levels of Service

The Council's present funding levels are sufficient to continue to provide existing services at current service levels in the medium term.

The main service consequences of the Planned Budget expenditure are:

- assets are replaced accordingly with respect to condition and intended useful life; and
- assets complying with the relevant standards and guidelines.

1.4 Future Demand

The main demands for new services are created by:

- increased runoff from historic development within catchments;
- increased runoff from increased rainfall intensity as a result of a changing climate; and
- stormwater quality enhancements prior to discharging of stormwater.

These demands will be approached using a combination of managing existing assets, upgrading existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures, including:

- monitoring of asset condition;
- undertaking community expectation surveys; and
- monitoring the impacts of climate change and increased urban development.

1.5 Life-Cycle Management Plan

1.5.1 What does it Cost?

The forecast life-cycle costs necessary to provide the services covered by this AMP includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AMP may be prepared for a range of time periods, it typically informs a long-term financial planning period of ten (10) years. Therefore, a summary

output from the AMP is the forecast of ten (10) year total outlays, which for the Stormwater Management Infrastructure Network is estimated as $32,102,100 or $3,210,210 on average per year.

1.6 Financial Summary

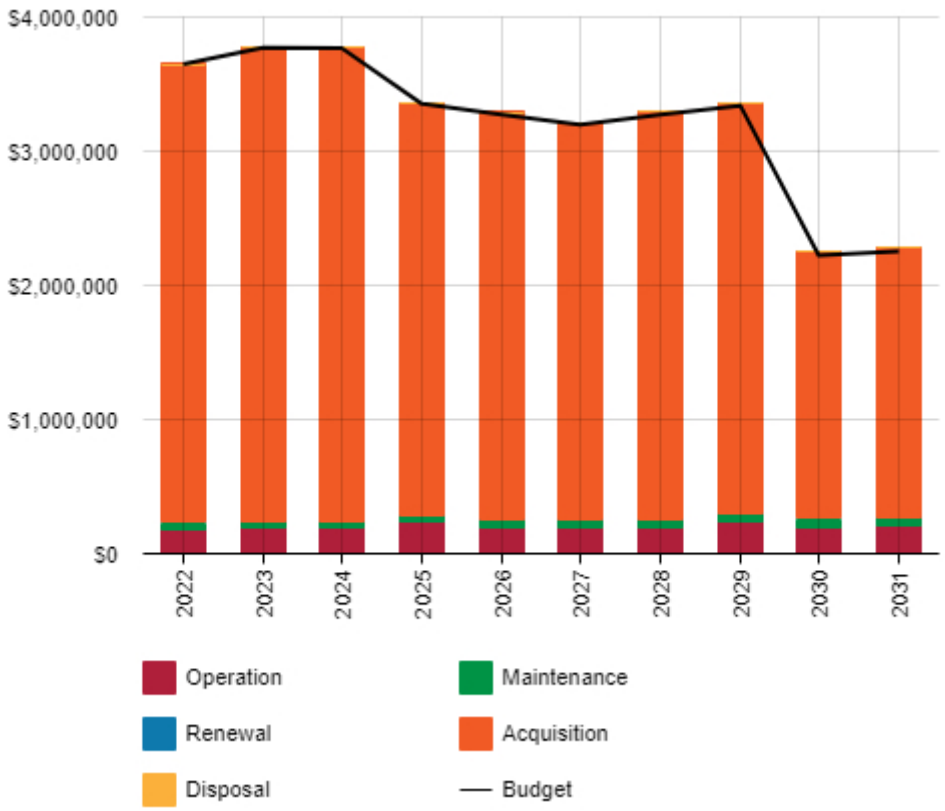
1.6.1 What the Council will do

Estimated available funding for the ten (10) year period is $32,102,100 (or $3,210,210 on average per year) as set out in the LTFP. This is 100% of the cost to sustain the current level of service at the lowest life-cycle cost.

The reality is that only what is funded in the LTFP can be provided. The informed decision making depends on the AMP emphasising the consequences of Planned Budgets on the service levels which are provided and the associated risks.

The anticipated Planned Budget for the City's Stormwater Management Infrastructure Network results in a shortfall of $0 average per year of the forecast life-cycle costs required to provide services in the AMP compared with the Planned Budget currently included in the LTFP. This is shown in Figure 1.6.1.

Figure 1.6.1: FORECAST LIFE-CYCLE COSTS AND PLANNED BUDGETS



All figure values are shown in current (2020) dollars.

The Council plans to undertake the following in respect to the existing Stormwater Management Infrastructure Network:

- operation, maintenance, renewal and upgrade of Stormwater Management Infrastructure assets to meet service levels set by in annual budgets; and
- major projects within the ten (10) year planning period which consists of upgrading the level of flood protection within catchments to provide the defined level of service through an integrated stormwater

management approach. This includes opportunities for stormwater reuse and water sensitive urban design (WSUD) initiatives wherever possible within the project budget.

1.6.2 What the Council cannot do

The Council currently allocates sufficient funding to sustain the Stormwater Management Infrastructure Network at the proposed standard. Any operations and maintenance budget requirements derived from new stormwater reuse or WSUD infrastructure have not been allowed for, as the potential new infrastructure and operations and maintenance which are required are unknown at this stage and will only be determined during the design of the renewal projects. As this information becomes available the AMP will be updated to reflect the changes.

1.6.3 Managing the Risks

The Council's current budget levels are sufficient to continue to manage risks in the medium term.

The main risk consequences are:

- frequency of flood events increasing due to increasing stormwater runoff;
- stormwater of poor quality entering the receiving waters and wider environment; and
- community expectations are not met.

The Council will endeavour to manage these risks within the available funding allocation by:

- reacting to potential flood events with temporary mitigation measures;
- maintaining the frequency of footpath "blowing and street sweeping" to remove gross pollutants from catchments; and
- prioritising acquisition projects.

1.7 Asset Management Practices

The Council's systems to manage assets include:

- the Council's financial system; and
- the Council's asset management system.

Assets requiring renewal/replacement are identified from either the Asset Register Method or the Alternative Method. These methods are part of the Life-Cycle Model.

If Asset Register data is used to forecast the renewal costs, this is done using the acquisition year and the useful life.

Alternatively, an estimate of renewal life-cycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

The Asset Register Method was used to forecast the renewal life-cycle costs for this AMP.

1.8 Monitoring and Improvement Program

The next steps resulting from this AMP to improve asset management practices are:

- prioritising acquisition expenditure;
- establishing a formal condition rating process and GIS data storage system;
- reviewing opportunities for stormwater reuse and WSUD;
- reviewing resilience of critical infrastructure; and
- reviewing adaptive technologies to prolong the life of assets.

2.0 INTRODUCTION

2.1 Background

This AMP communicates the requirements for the sustainable delivery of services through the management of assets, compliance with regulatory requirements and required funding to provide the appropriate levels of service over the long-term planning period.

This AMP is to be read in conjunction with the following key planning documents:

- *CityPlan 2030*: *Shaping Our Future*
- Long Term Financial Plan
- Annual Business Plan
- Flood Mapping and Management Strategy
- Asset Management Policy (2019)
- Community Surveys
- Resilient East - Regional Climate Change Adaptation Plan
- Resilient East - Climate Projections Report

The Council has a strong focus on asset management, with continuous improvements during the revision of the AMP. Integration of renewal and upgrade planning is undergoing continuous improvement to ensure the minimum required investment provides the greatest value outcomes.

The infrastructure assets covered by this AMP include stormwater drainage, re-use and water quality assets. For a detailed summary of the assets covered in this AMP refer to Table 5.1.1 in Section 5.

The infrastructure assets included in this AMP have a total replacement value of $126,866,864.

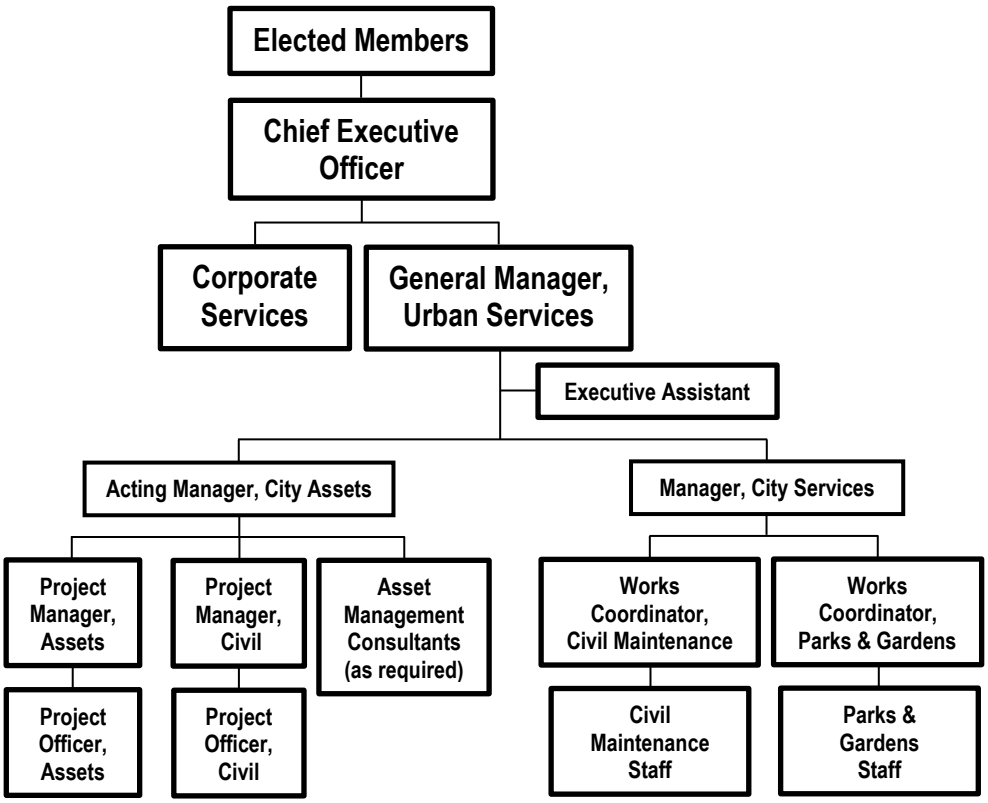
Key stakeholders in the preparation and implementation of this AMP are shown in Table 2.1.

Table 2.1: KEY STAKEHOLDERS IN THE AMP

Key Stakeholder	Role in AMP
Elected Members	Represent needs of community/shareholders, allocate resources to meet planning objectives in providing services while managing risks and ensure services are sustainable.
Chief Executive Officer	Endorse the development of the AMP and provide resources required to complete the task.
General Manager, Urban Services and Acting Manager, City Assets	Set high level priorities for asset management development and support the implementation of actions resulting from this AMP.
Corporate Services	Development of supporting policies such as capitalisations and depreciation. Provision of GIS applications and support.
Asset Management Consultants	Preparation of asset sustainability and financial reports incorporating asset depreciation in compliance with current accounting standards. Host and consolidate asset register including updating valuations, capitalisations and disposals. Provide support for development of the AMP and the implementation of effective asset management principles. Independently endorse asset revaluation methodology.
Project Manager, Assets	Responsible for the overall development of the AMP. Coordinate input of other stakeholder into the AMP. Manage the periodic collection of asset condition data.
City Assets	Assist the Project Manager, Assets in the development of the AMP.
City Services	Provide local knowledge level of detail on the Stormwater Management Infrastructure Network. Describe the maintenance standards deployed and the ability to meet the technical and Citizen Levels of Service.
External Parties	Local Residents; Local Businesses; Utilities; Developers; and Federal and State Governments.

The Council's organisational structure for service delivery of infrastructure assets is detailed in Figure 2.1.

Figure 2.1: ORGANISATIONAL STRUCTURE



2.2 Goals and Objectives of Asset Ownership

The Council's goal in the management of infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost-effective manner for present and future consumers. The key elements of infrastructure asset management are:

- providing a defined level of service and monitoring performance;
- managing the impact of growth through demand management and infrastructure investment;
- taking a life-cycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service;
- identifying, assessing and appropriately controlling risks; and
- linking to the LTFP which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

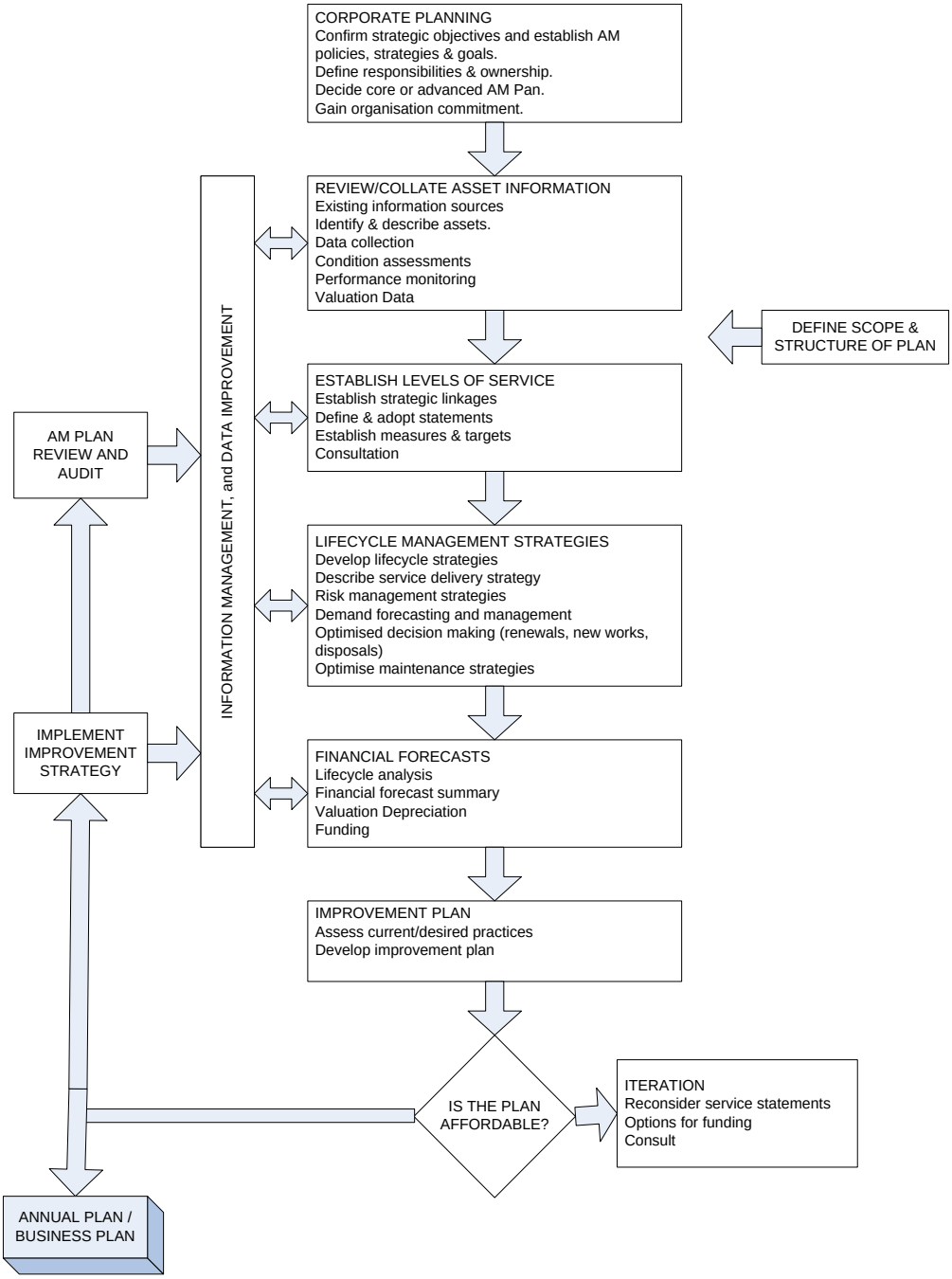
- **levels of service** – specifies the services and levels of service to be provided;
- **future demand** – how this will impact on future service delivery and how this is to be met;
- **life-cycle management** – how to manage its existing and future assets to provide defined levels of service;
- **financial summary** – what funds are required to provide the defined services;
- **asset management practices** – how the Council manages the provision of the services;
- **monitoring** – how the AMP will be monitored to ensure objectives are met; and
- **asset management improvement plan** – how the Council increases asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 [1]; and
- International Organisation for Standardisation (ISO) 55000[2].

A road map for preparing an AMP is shown in Figure 2.2.

Figure 2.2: ROAD MAP FOR PREPARING AN AMP



Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11

[1] Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2| 13
[2] ISO 55000 Overview, principles and terminology

3.0 LEVELS OF SERVICE

3.1 Community Research and Expectations

The Council conducts Community Surveys at regular intervals to establish how the Council is performing in a number of key indicators. Community Surveys have been conducted in 2009, 2011, 2013 and 2017, with the most recent survey undertaken in 2019. The survey uses a 5-point scale to determine satisfaction, with 1 being very dissatisfied, 5 being very satisfied and a 'don't know' response. The mean score is derived from the five-point satisfaction scale. Table 3.1 summarises the results from the Council's Community Surveys.

Table 3.1: COMMUNITY SATISFACTION SURVEY LEVELS

Performance Measure	Satisfaction Level				
	2019	2017	2013	2011	2009
Overall Infrastructure Satisfaction	3.8	3.8	4.0	4.0	3.6
Overall Environmental Satisfaction	3.4	3.7	3.9	4.0	3.7
Enhancing the Natural Environment	3.7	3.8	3.8	3.9	3.5
Managing Watercourses	3.4	3.6	3.6	3.6	3.2
Water, Management & Use	3.4	3.7	3.5	3.6	3.1
Undertaking Environmental Initiatives	3.4	3.5	3.2	3.2	3.0
Responding to Climate Change	3.0	N/A	N/A	N/A	N/A

3.2 Strategic and Corporate Goals

This AMP has been prepared in accordance with the Council's Vision, Mission, Goals and Objectives as set out in *CityPlan 2030: Shaping our Future*.

The Council's Vision is:

'A City which values its heritage, cultural diversity, sense of place and natural environment.

A progressive City which is prosperous, sustainable and socially cohesive, with a strong community spirit.'

Strategic goals have been set by the Council and how these are addressed in this AMP is summarised in Table 3.2.

Table 3.2: GOALS AND HOW THESE ARE ADDRESSED IN THIS AMP

Goal	Objective	How Goal and Objectives are Addressed in the AMP
Environmental Sustainability – A leader in environmental sustainability	Sustainable and attractive streetscapes and open spaces	Development of service levels provided by the infrastructure and the balancing of this with the available funding and acceptable risk.
	Mitigating and adapting to the impacts of climate change	Planning of long term sustainable infrastructure is important and to enable appropriate resources to be identified and provided.
Environmental Sustainability - Sustainable and efficient management of water, waste, energy and other resources.	Implement mechanisms to make better use of water resources including the harvesting and re-use of stormwater.	Planning for water quality improvements upstream of existing stormwater harvesting infrastructure to increase the harvest potential. Planning to harvest stormwater for use in public toilet flushing where available and in conjunction with renewal of public toilet facilities.
Environmental Sustainability - Healthy and sustainable watercourses	Revegetate and restore natural watercourses.	Planning for naturalisation of existing watercourses where feasible in conjunction with Recreation and Open Space projects.
	Improve the water quality in our City's watercourses.	Planning to develop WSUD initiatives as part of integrated stormwater management and streetscape projects.
	Encourage the capture and re-use of stormwater and reduce stormwater run-off.	Planning to develop WSUD initiatives as part of integrated stormwater management and streetscape projects.

3.3 Legislative Requirements

There are a number of legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the Stormwater Management Infrastructure Network are set out in Table 3.3.

Table 3.3: LEGISLATIVE REQUIREMENTS

Legislation	Requirement
Aboriginal Heritage Act 1988	An Act to provide for the protection and preservation of the Aboriginal heritage, and for other purposes.
Australian Accounting Standards	Standards applied in preparing financial statements, relating to the valuation, revaluation and depreciation of transport assets.
Australian Standards	All of the Council's infrastructure projects are undertaken in accordance with Australian Standards, or in the absence of, best practice techniques.
Building Code of Australia 2007	Sets out minimum standards for construction of new assets. Also provides minimum standards for new properties.
Development Act 1993	An Act to provide for planning and regulate development in the State; to regulate the use and management of land and buildings, and the design and construction of buildings; to make provision for the maintenance and conservation of land and buildings where appropriate; and for other purposes.

Disability Discrimination Act 1992	Provides protection for everyone in Australia against discrimination based on disability. It encourages everyone to be involved in implementing the Act and to share in the overall benefits to the community and the economy that flow from participation by the widest range of people.
Environmental Protection Act 1993	Sets out requirements for any works to comply with, as well as water quality standards.
Highways Act 1926	An Act to provide for the appointment of a Commissioner of Highways, and to make further and better provision for the construction and maintenance of roads and works and for other purposes.
Local Government Act 1999	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long-term financial plan supported by infrastructure and asset management plans for sustainable service delivery.
Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices – Part 2 – Code of Technical Requirements	Defines legal requirements for the installation of traffic control devices.
Road Traffic Act (1961)	Defines responsibilities pertaining to roadways and standards.
Road Opening & Closing Act (1991)	Allows for the formalisation of roadways status.
Work Health and Safety Act 2012	Provides minimum standards for health and safety of individuals performing works.

3.4 Citizen Values

Service levels are defined in three (3) ways, Citizen Values, Citizen Levels of Service and Technical Levels of Service.

Citizens Values indicate:

- what aspects of a service is important to the citizen;
- whether they see value in what is currently being provided; and
- the likely trend over time based on the current budget provision.

A summary of the satisfaction measure being used, the current feedback and the expected performance based on the current funding level is set out in Table 3.4.

Table 3.4: CITIZEN VALUES

Citizen Values	Citizen Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Management of watercourses, including flooding	Community Survey & Complaints	Community survey results declined from previous survey. Moderate amount of feedback related to specific rainfall events.	Improved management of watercourses including reduced risk of flooding to private property.
Undertaking environmental initiatives, including water quality and reuse	Community Survey & Complaints	Community survey results declined from previous survey.	Improved with implementation of integrated stormwater management and streetscape projects.
Enhancing natural environment	Community Survey & Complaints	Community survey results declined from previous survey.	Likely to remain unchanged with limited opportunity within urban environment.

3.5 Citizen Levels of Service

The Citizen Levels of Service are considered in terms of:

- **quality:** How good is the service? What is the condition or quality of the service?
- **function:** Is it suitable for its intended purpose? Is it the right service?
- **capacity:** Is the service over or under used? Does the Council need more or less of these assets?

A summary of the performance measure being used, the current performance and the expected performance based on the current funding level is set out in Table 3.5.

These are measures of fact related to the service delivery outcome (e.g. number of occasions when service is not available, condition %'s of Very Poor, Poor/Average/Good, Very Good) and provide a balance in comparison to the citizen perception that may be more subjective.

Confidence levels of current performance and expected trend are set out in Table 3.5 and are categorised as follows:

- **high**: professional judgement supported by extensive data;
- **medium**: professional judgement supported by data sampling; or
- **low**: professional judgement with no data evidence.

Table 3.5: CITIZEN LEVELS OF SERVICE MEASURES

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Quality	Asset condition is 'fit for purpose'	Community survey on managing watercourses	Refer to Table 3.1 for Customer Satisfaction Survey results	No change
	Confidence levels		**High**	**Medium**
Function	Stormwater is managed in a sustainable way	Community survey on water, management & use	Refer to Table 3.1 for Customer Satisfaction Survey results	Improved performance is expected as a result of implementation of AMP
	Confidence levels		**High**	**Medium**
Capacity	Capacity of assets to meet demands	Community survey on managing watercourses	Refer to Table 3.1 for Customer Satisfaction Survey results	Improved performance is expected as a result of implementation of AMP
	Confidence levels		**High**	**High**

3.6 Technical Levels of Service

To deliver the Citizen Values, and impact the achieved Citizen Levels of Service, operational or technical measures of performance are used. These technical measures relate to the activities and allocation of resources to best achieve the desired community outcomes and demonstrate effective performance.

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

- **acquisition**: the activities to provide a higher level of service (e.g. widening of a waterway) or a new service that did not exist previously (e.g. a new detention basin);
- **operation**: the regular activities to provide services (e.g. inspections and condition assessments);
- **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. stormwater pit repairs);
- **renewal**: the activities that return the service capability of an asset up to that which it had originally provided (e.g. pipeline replacement); and
- **disposal**: the activities associated with the disposal of a decommissioned asset including sale, demolition or relocation (e.g. removal of a pipeline network).

Service and Asset Managers plan, implement and control technical service levels to influence the service outcomes.[3]

Table 3.6 shows the activities expected to be provided under the current Planned Budget allocation and the forecast activity requirements being recommended in this AMP.

[3] IPWEA, 2015, IIMM, p 2|28.

Table 3.6: TECHNICAL LEVELS OF SERVICE

Life-Cycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
Acquisition	Upgrade of drainage catchment performance	Upgrade to defined service levels	Current implementation budget smoothed over ten (10) year timeframe	Current implementation budget smoothed over ten (10) year timeframe
	Gifted infrastructure from developers	Incorporate into asset register upon ownership	Occurs on an ad hoc basis dependent on development	Occurs on an ad hoc basis dependent on development
		Budget	**$29,665,000 over ten (10) years**	**$29,665,000 over ten (10) years**
Operation	Side Entry Pit and Trash Rack Cleaning	Frequency	Conduct on a programmed basis and on request	Conduct on a programmed basis and on request
	CCTV Inspection of underground assets	Frequency	Yearly inspection program of section of underground network	Yearly inspection program of section of underground network
	ASR Operation	Frequency	Conduct as per requirements	Conduct as per requirements
	Drainage Structures Condition Assessment	Frequency	Asset Condition Assessment undertaken once every five (5) years	Asset Condition Assessment undertaken once every four (4) years
		Budget	**$1,935,080 over ten (10) years**	**$2,022,963 over ten (10) years**
Maintenance	Reactive Maintenance	Maintenance frequency	Reactive to limit of budget to repair defects	Reactive to limit of budget to repair defects
	ASR Maintenance	Maintenance frequency	Planned and reactive maintenance	Planned and reactive maintenance
		Budget	**$502,020 over ten (10) years**	**$560,607 over ten (10) years**
Renewal	Renewal of asset	Renewal to requirements of asset register	Monitor condition and amend AMP as required	Monitor condition and amend AMP as required
		Budget	**$0 over ten (10) years**	**$0 over ten (10) years**
Disposal	Disposal of assets no longer in use	As identified in the AMP	No assets identified as no longer in use	No assets identified as no longer in use
		Budget	**$0 over ten (10) years**	**$0 over ten (10) years**

Note: *Current activities related to Planned Budget.

**Forecast required performance related to forecast life-cycle costs.

It is important to regularly monitor the service levels provided by the Council as these will change. The current performance is influenced by work efficiencies and technology and community priorities will change over time.

4.0 FUTURE DEMAND

4.1 Demand Drivers

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices and environmental awareness.

4.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

4.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.3.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this AMP.

Table 4.3: DEMAND MANAGEMENT PLAN

Demand Driver	Current Position	Projection	Impact on Services	Demand Management Plan
Climate change	Renewal program designed to mitigate impacts where possible	Increased stormwater runoff	Higher stormwater flow demand on services during thunderstorm events	Catchment renewal to consider an integrated stormwater management approach
Climate change	Renewal program designed to mitigate impacts where possible	Reduced overall rainfall	Reduced stormwater availability for WSUD and ASR infrastructure	Catchment renewal to consider an integrated stormwater management approach
Infill development	Minimise additional runoff to waterways through planning controls	Increased stormwater runoff	Higher stormwater flow demand on services during thunderstorm events	Maintain and enhance planning controls
Environmental management	Renewal program designed to enhance environmental outcome where possible	Increased water quality and reuse expectations	Increased requirement for WSUD infrastructure	Catchment renewal to consider an integrated stormwater management approach

4.4 Asset Programs to Meet Demand

The new assets required to meet demand may be acquired, donated or constructed and these assets are discussed in Section 5.4.

Acquiring new assets will commit the Council to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the LTFP (refer to Section 5).

4.5 Climate Change and Adaptation

The impacts of climate change can have a significant impact on the assets which the Council manages and the services which are provided. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.

How climate change will impact on assets can vary significantly depending on the location and the type of asset and services provided, as will the way in which the Council responds and manage these impacts.

As a minimum, the Council should consider both how to manage existing assets given the potential impacts of climate change and how to create resilience to climate change in any new works or acquisitions.

Opportunities which have been identified to date to manage the impacts of climate change on existing assets are shown in Table 4.5.1.

Table 4.5.1: MANAGING THE IMPACT OF CLIMATE CHANGE ON ASSETS

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Storm intensity	Increased rainfall intensity during rainfall events	Increased demand to manage increased flows	Catchment renewal to consider an integrated stormwater management approach including renewal materials
Rainfall	Reduced annual rainfall	Reduced availability for water reuse	Catchment renewal to consider an integrated stormwater management approach including renewal materials
Temperature	Higher maximum temperatures	Decreased lifespan of assets	Material selection and tree canopy shading

The way in which the Council constructs new assets should recognise that there is opportunity to build in resilience to the impacts of climate change. Building resilience has a number of benefits including but not limited to:

- assets will be able to withstand the impacts of climate change;
- services can be sustained; and
- assets that can endure the impacts of climate change may potentially lower the life-cycle cost and reduce their carbon footprint

Table 4.5.2 summarises some asset climate change resilience opportunities.

Table 4.5.2: BUILDING ASSET RESILIENCE TO CLIMATE CHANGE

New Asset Description	Climate Change Impact These Assets?	Build Resilience in New Works
WSUD infrastructure	Reduced annual rainfall	Higher quality stormwater more likely to be captured by ASR and reused for irrigation
Stormwater detention assets	Increased rainfall intensity during rainfall events	Reduce requirement to increase the capacity of the existing pit and pipe network

The impact of climate change on assets is a new and complex issue and opportunities will be developed in future revisions of this AMP.

5.0 LIFE-CYCLE MANAGEMENT PLAN

The Life-Cycle Management Plan details how the Council plans to manage and operate the assets at the agreed levels of service (refer to Section 3) while managing life-cycle costs.

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this AMP are shown in Table 5.1.1.

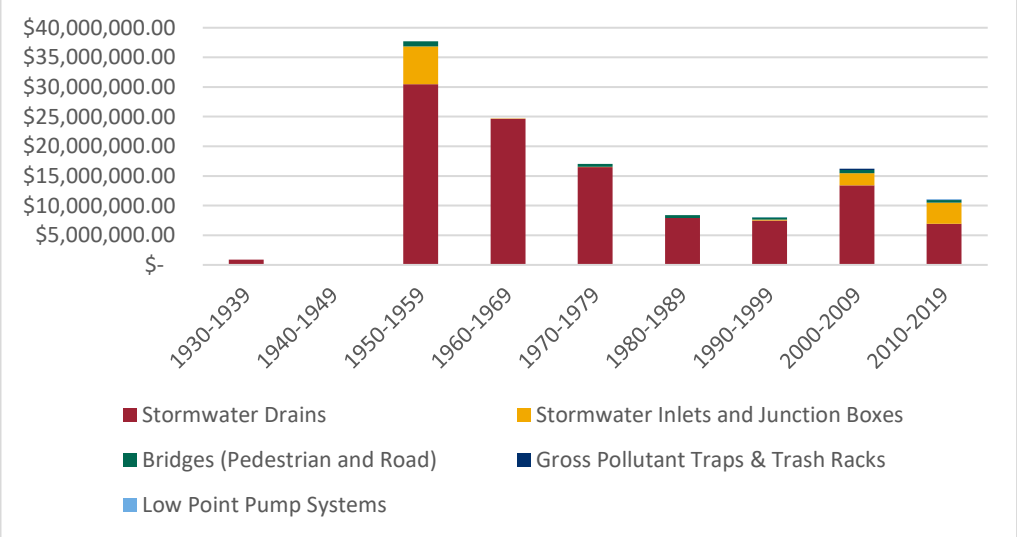
Stormwater Management Infrastructure assets includes all the stormwater drains, inlets, junction boxes, pedestrian and vehicular bridges, GPTs, trash racks, pump systems and ASR systems across the City.

The age profile of the assets included in this AMP are shown in Figure 5.1.1.

Table 5.1.1: ASSETS COVERED BY THIS AMP

Asset Category	Dimension	Replacement Value
Stormwater Drains	114km Pipe and Channel	$109,473,927
Stormwater Inlets and Junction Boxes	2609 Units	$12,291,201
Bridges (Pedestrian and Road)	18 Pedestrian & 37 Road	$3,212,097
Gross Pollutant Traps & Trash Racks	6 Units 5 Installations	$282,360
Low Point Pump Systems	2 Installations	$107,611
Aquifer Storage Recharge System	1 installation (Linde Reserve, Stepney)	$1,499,668
TOTAL		**$126,866,864**

Figure 5.1.1: ASSET AGE PROFILE



All figure values are shown in current (2020) dollars.

Stormwater Management Infrastructure assets typically have a long life, often in excess of 80 to 100 years. The majority of the City's underground Stormwater Management Infrastructure was constructed between 1950 and 1970 and has remaining life. It is anticipated that renewal activities will be required to commence in the 2030s, just beyond planning period for this AMP.

5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: KNOWN SERVICE PERFORMANCE DEFICIENCIES

Location	Service Deficiency
Trinity Valley	Level of flood protection provided
Joslin Valley	Level of flood protection provided
First Creek	Level of flood protection provided
Linde Reserve ASR	Injection capacity not achieved

The above service deficiencies have been identified through the Flood Mapping and Management Strategy commissioned by the Council together with operational reports and historical data. The acquisition plan aims to improve the service identified deficiencies.

5.1.3 Asset condition

The condition of assets is currently monitored by undertaking a condition assessment of the Stormwater Management Infrastructure assets accessible from ground (e.g. bridge, pumps and ASR) once every five (5) years. The next condition assessment will be undertaken during the 2020-2021 financial year. The periodic condition assessments of accessible infrastructure will occur at a four (4) year interval following the current inspection to more closely monitor change in asset condition and to align with the preparation of the AMP. Yearly CCTV inspections of some inaccessible underground assets (e.g. pipes and culvert) is completed to systematically monitor asset condition.

A formal condition rating has not been historically provided with Stormwater Management Infrastructure condition assessments. The output has consisted of defects lists and associated maintenance requirements. It is planned to formalise a condition assessment rating system commencing with the next condition data collection.

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, asphalt patching, and equipment repairs.

The trend in operation and maintenance budgets are shown in Table 5.2.1.

Table 5.2.1: OPERATION AND MAINTENANCE BUDGET TRENDS

Year	Operation and Maintenance Budget
2019 – 2020	$235,710
2020 – 2021	$235,710
2021 – 2022	$235,710

Operation and maintenance budget levels are considered to be adequate to meet projected service levels, which is equal to current service levels.

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

The service hierarchy is shown is Table 5.2.2.

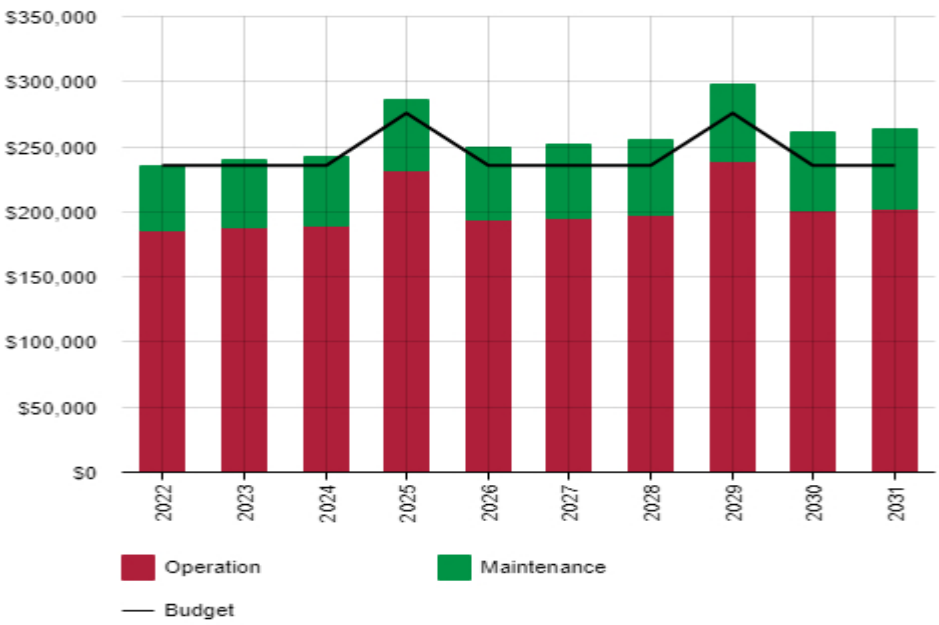
Table 5.2.2: ASSET SERVICE HIERARCHY

Service Hierarchy	Service Level Objective
Pedestrian and road bridges	In good condition to provide safe movement over rivers and creeks
Pits and underground drainage infrastructure	In good condition and clear of debris
Stormwater reuse infrastructure	In good condition to capture and reuse stormwater
WSUD infrastructure	In good condition to treat stormwater surface flow

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed, the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: OPERATIONS AND MAINTENANCE SUMMARY



All figure values are shown in current (2020) dollars.

Operation and maintenance costs remain consistent over the course of the AMP as the cost for the Stormwater Management Infrastructure Network are stable due to the nature and location of the assets. Additional operation and maintenance costs have not been planned for due to specific requirements of each project being unknown at this point in time. The AMP will be updated accordingly as information becomes available.

5.3 Renewal Plan

Renewal involves major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from either of the following approaches in the Life-Cycle Model:

- the first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year); or
- the second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical "useful lives" of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed during the 2019 – 2020 financial year.

Table 5.3: USEFUL LIVES OF ASSETS

Asset Category	Useful Life
Stormwater pipes, culverts, inlets and junction boxes	80 – 100 years
Bridges (pedestrian and vehicular)	80 – 100 years
Reno Mattress and Gabion Walls	70 years
Pumps and Control Systems	10 – 20 years
ASR Bore	50 years

The estimates for renewals in this AMP were based on the Asset Register Method.

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate; or
- to ensure the infrastructure is of sufficient quality to meet the service requirements.[4]

It is possible to prioritise renewals by identifying assets or asset groups that:

- have a high consequence of failure;
- have high use and subsequent impact on users would be significant;
- have higher than expected operational or maintenance costs, and
- have potential to reduce life-cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[5]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.3.1.

[4] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[5] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Table 5.3.1: RENEWAL PRIORITY RANKING CRITERIA

Criteria	Weighting
Pedestrian and road bridges	50%
Pits and underground drainage infrastructure	40%
Stormwater reuse infrastructure	10%
TOTAL	**100%**

5.4 Summary of Future Renewal Costs

No renewal expenditure has been forecast in this AMP, as existing assets have remaining life. Proposed upgrades to the Stormwater Management Infrastructure Network are detailed in Section 5.5.

5.5 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated to the Council.

5.5.1 Selection criteria

Proposed upgrading of existing assets and constructing new assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Council's needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 5.5.1.

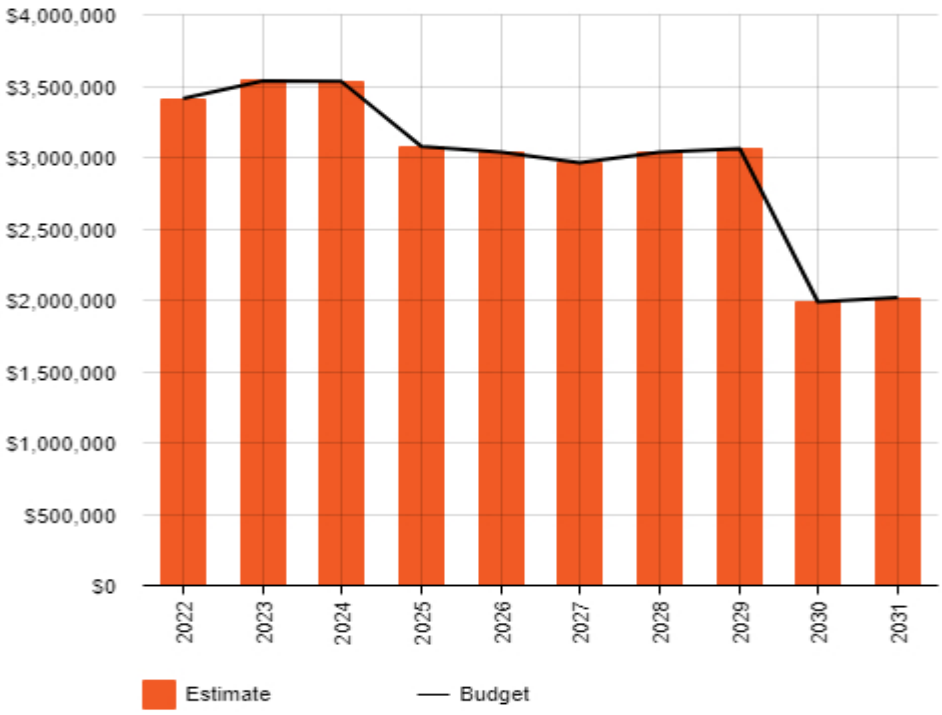
Table 5.5.1: ACQUIRED ASSETS PRIORITY RANKING CRITERIA

Criteria	Weighting
Flood hazard reduction	70%
Stormwater reuse	15%
Stormwater quality improvements	15%
TOTAL	**100%**

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.5.1 and shown relative to the proposed acquisition budget. The forecast acquisition Capital Works Program is shown in Appendix A.

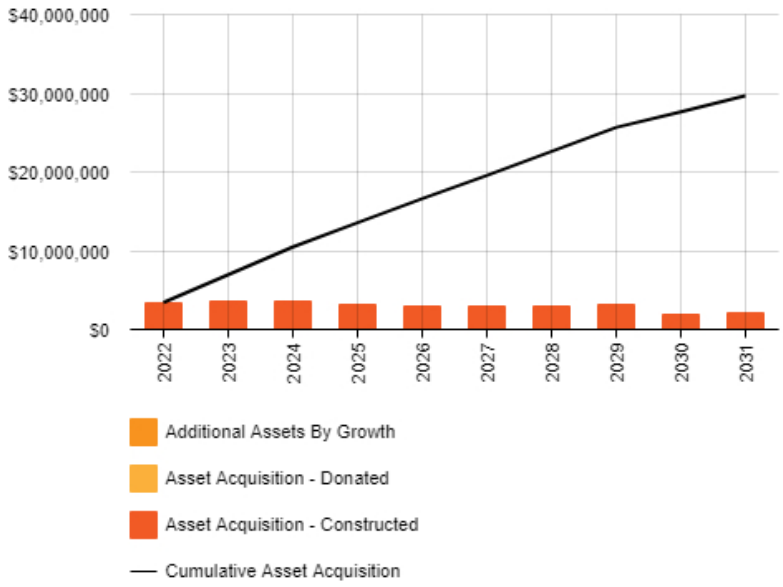
Figure 5.5.1: FORECAST ACQUISITION COSTS



All figure values are shown in current (2020) dollars.

When the Council commits to constructing new assets, the Council will be prepared to fund future operations, maintenance and renewal costs. The Council will account for future depreciation when reviewing long-term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Council. The cumulative value of all acquisition work, including assets that are constructed and contributed, are shown in Figure 5.5.2.

Figure 5.5.2: ACQUISITION SUMMARY



All figure values are shown in current (2020) dollars.

Expenditure on new assets and services in the Council's Capital Works Program will be accommodated in the Council's LTFP, but only to the extent that there is available funding.

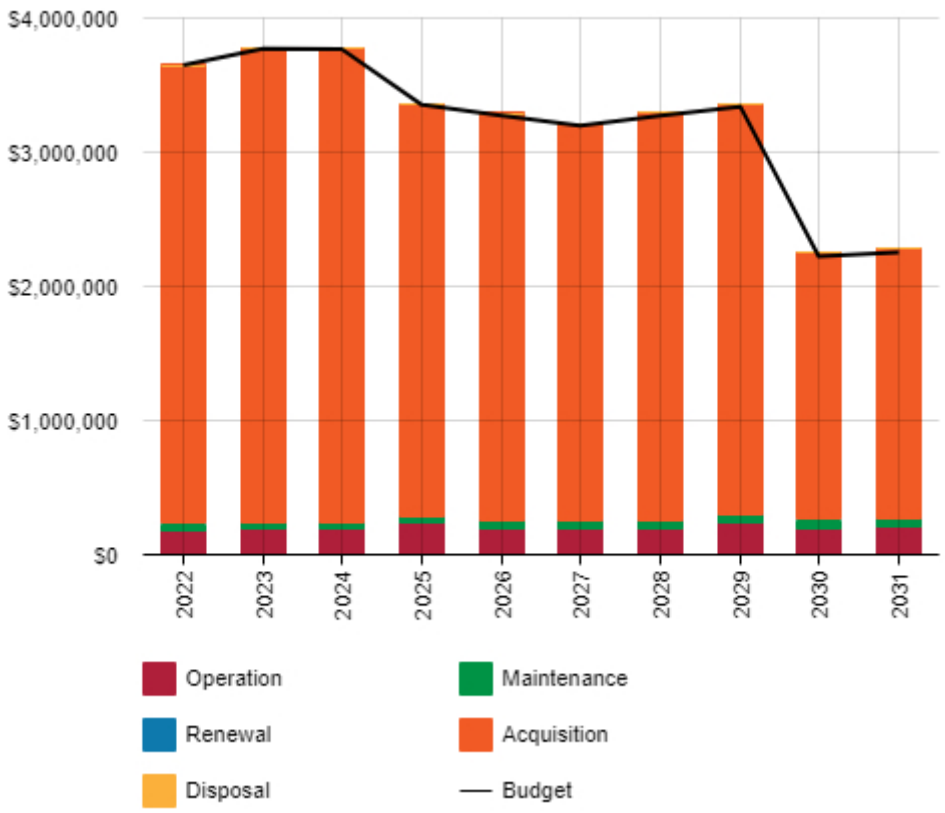
The proposed new and upgraded projects associated with the Stormwater Management Infrastructure Network have been programmed to be constructed in conjunction with the renewal and acquisition requirements of other asset classes, such as road reseals or recreation and open space upgrades, wherever possible, to increase the efficiency of expenditure. Programming of new works and upgrades has been undertaken into account with the development of the LTFP to ensure that the Council has the financial capacity to afford the proposed new and upgraded assets.

Summary of asset forecast costs

The financial projections based upon this AMP are shown in Figure 5.5.3. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life-cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.5.3: SUMMARY OF LIFE-CYCLE COSTS



All figure values are shown in current (2020) dollars.

The life-cycle summary shown in Figure 5.5.3 has been constructed based on the life-cycle requirements of the Stormwater Management Infrastructure assets and incorporates new and upgrade projects in line with the Council's strategic directions. The expenditure requirements have been programmed and budgeted across the ten (10) year planning period in conjunction with the LTFP to ensure the AMP is feasible and affordable.

5.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the LTFP.

Table 5.6: ASSETS IDENTIFIED FOR DISPOSAL

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
No disposals have been identified in the AMP	Nil	Nil	$0	$0

6.0 RISK MANAGEMENT PLANNING

The purpose of risk management associated with infrastructure assets is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[6].

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery are summarised in Table 6.1. Failure modes can include physical failure, collapse or essential service interruption.

Table 6.1: CRITICAL ASSETS

Critical Assets	Failure Mode	Impact
Bridges	Degradation, third party damage	Service interruption
Levee banks	Failure, removal	Increased flood risk
Pumps	Breakdown	Increased flood risk

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.2 Risk Assessment

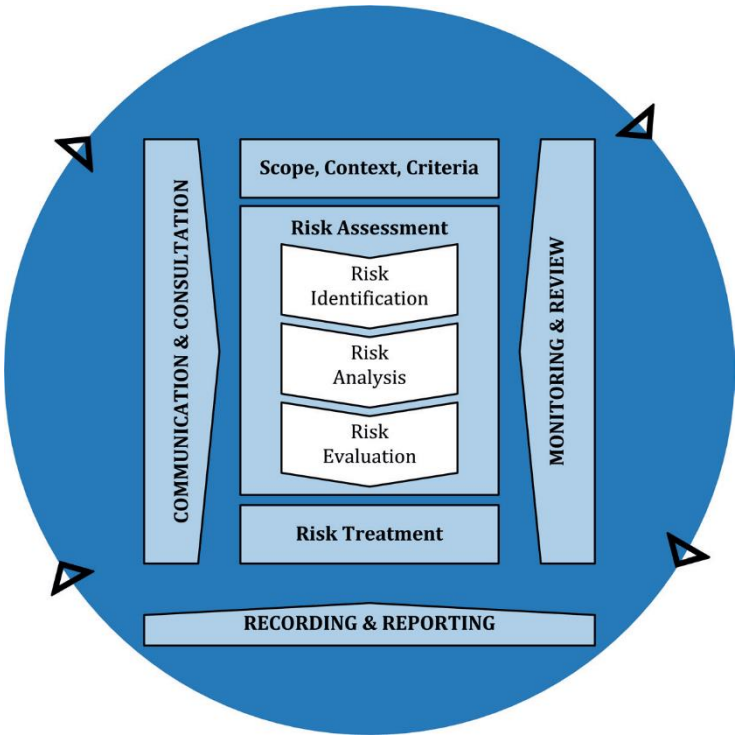
The risk management process used is shown in Figure 6.2.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

[6] ISO 31000:2009, p 2

Figure 6.2: RISK MANAGEMENT PROCESS – ABRIDGED



Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the Council.

Table 6.2: RISKS AND TREATMENT PLANS

Service or Asset at Risk	What Can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Bridges	Bridge failure	H	Period inspection and maintenance	L	Ongoing in AMP life-cycle
Stormwater drainage assets	Potential for uninformed decision making	H	Update condition data and review renewal program.	L	Ongoing in AMP life-cycle

Note *The residual risk is the risk remaining after the selected risk treatment plan is implemented.

6.3 Infrastructure Resilience Approach

The resilience of the Council's critical infrastructure is vital to the ongoing provision of services to the community. To adapt to changing conditions the Council needs to understand its capacity to 'withstand a given level of stress or demand' and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

The Council does not currently measure our resilience in service delivery. This will be included in future iterations of the AMP.

6.4 Service and Risk Trade-Offs

The decisions made in adopting this AMP are based on the objective to achieve the optimum benefits from the available resources.

6.4.1 What the Council cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next ten (10) years. These include:

- new and upgrade projects identified that are unaffordable with the AMP timeframe.

6.4.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- flood risk and water quality improvements not entirely met.

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- loss of the Council's reputation.

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

7.0 FINANCIAL SUMMARY

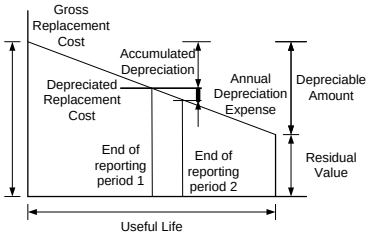
This section contains the financial requirements resulting from the information presented in the previous sections of this AMP. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Statements and Projections

7.1.1 Asset valuations

The best available estimate of the value of assets included in this AMP are shown below. The assets are valued at cost to replace service capacity:

Current (Gross) Replacement Cost	$126,866,864
Depreciable Amount	$126,866,864
Depreciated Replacement Cost[7]	$61,894,513
Depreciation during the 2019 – 2020 Financial Year	$1,407,929



7.1.2 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the AMP for this service area, namely:

- asset renewal funding ratio (proposed renewal budget for the next ten (10) years / forecast renewal costs for next ten (10) years); and
- medium term forecast costs / proposed budget (over ten (10) years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[8] 100%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next ten (10) years, the Council expects to have 100% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget is illustrated in Appendix D.

Medium term – ten (10) year financial planning period

This AMP identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a ten (10) year period. This provides input into ten (10) year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the ten (10) year period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the ten (10) year planning period is $258,357 on average per year.

The proposed (budget) operations, maintenance and renewal funding is $243,710 on average per year giving a ten (10) year funding shortfall of $14,647 per year. This indicates that 94% of the forecast costs needed to provide the services documented in this AMP are accommodated in the proposed budget. This excludes acquired assets.

[7] Also reported as Written Down Value, Carrying or Net Book Value.
[8] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AMP and ideally over the ten (10) year life of the LTFP.

7.1.3 Forecast Costs (outlays) for the LTFP

Table 7.1.3 shows the forecast costs (outlays) for the ten (10) year LTFP.

Table 7.1.3: FORECAST COSTS (OUTLAYS) FOR THE LTFP

Year	Forecast Acquisition	Forecast Operation	Forecast Maintenance	Forecast Renewal	Forecast Disposal
2022	$3,412,500	$185,508	$50,202	$0	$0
2023	$3,537,500	$187,556	$51,567	$0	$0
2024	$3,532,500	$189,678	$52,982	$0	$0
2025	$3,077,500	$231,798	$54,395	$0	$0
2026	$3,037,500	$193,644	$55,626	$0	$0
2027	$2,962,500	$195,467	$56,841	$0	$0
2028	$3,037,500	$197,244	$58,026	$0	$0
2029	$3,062,500	$239,067	$59,241	$0	$0
2030	$1,987,500	$200,904	$60,466	$0	$0
2031	$2,017,500	$202,097	$61,261	$0	$0

All figure values are shown in current (2020) dollars.

7.2 Funding Strategy

The proposed funding for assets is outlined in the Council's Annual Budget and LTFP.

The Council's financial strategy outlines how funding will be provided, whereas the AMP communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

7.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to service.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts.

7.4 Key Assumptions Made in Financial Forecasts

In compiling this AMP, it has been necessary to make some assumptions. This section details the key assumptions made in the development of this AMP and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AMP are:

- all figure values are shown in current (2020) dollars;
- acquisition costs have been based on professional judgement; and
- current operations and maintenance budget have been used.

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AMP are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on an A - E level scale[9] in accordance with Table 7.5.1.

Table 7.5.1: DATA CONFIDENCE GRADING SYSTEM

Confidence Grade	Description
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 but up to 50% is extrapolated data and accuracy estimated ± 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.

The estimated confidence level for and reliability of data used in this AMP is shown in Table 7.5.2.

Table 7.5.2: DATA CONFIDENCE ASSESSMENT FOR DATA USED IN AMP

Data	Confidence Assessment	Comment
Demand drivers	A	Based on Resilient East climate reports and Flood Mapping and Management Strategy
Growth projections	A	Based on Resilient East climate reports and Flood Mapping and Management Strategy
Acquisition forecast	C	In line with strategic plans, policy and procedures
Operation forecast	C	In line with previous years
Maintenance forecast	C	In line with previous years
Renewal forecast - Asset values	B	As per approved methodology
- Asset useful lives	B	Current estimates from asset register
- Condition modelling	C	Methodology and data capture to be updated
Disposal forecast	NA	NA

The estimated confidence level for and reliability of data used in this AMP is considered to be reliable.

[9] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices

8.1.1 Accounting and financial data sources

This AMP utilises accounting and financial data. The source of the data is the Council's accounting and financial system.

8.1.2 Asset management data sources

This AMP also utilises asset management data. The source of the data is the Conquest Asset Management system licenced to the Council.

8.2 Improvement Plan

It is important that the Council recognise areas of their AMP and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AMP is shown in Table 8.2.

Table 8.2: IMPROVEMENT PLAN

Task No.	Task	Responsibility	Resources Required	Timeline
1	Prioritise acquisition expenditure	Project Manager, Assets	Project Officer, Assets and Finance Section	3 months
2	Establish formal condition rating process and GIS data storage system	Project Manager, Assets	Project Officer, Assets and Asset Consultants	6 months
3	Review opportunities for stormwater reuse and WSUD	Project Manager, Assets	Project Officer, Assets	1 year
4	Further develop risk assessment and management planning	Project Manager, Assets	Project Officer, Assets and Asset Consultants	1 year
5	Review resilience of critical infrastructure	Project Manager, Assets	Project Officer, Assets and Asset Consultants	2 years
6	Review adaptive technologies to prolong life of assets	Project Manager, Assets	Project Officer, Assets and Asset Consultants	2 years
7	Assess adequacy of operations and maintenance budget	Manager, City Services	City Assets Section	3 years
8	Continue to develop long term models predicting services level and risks based on varying funding models	Acting Manager, City Assets	City Assets Section and Asset Consultants	4 years
9	Continue the development of integration between strategic plans, AMP and LTFP	Chief Executive Officer and General Manager, Urban Services	City Assets Section and Finance Section	4 years

8.3 Monitoring and Review Procedures

The AMP will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed budgets.

These forecast costs and proposed budget are incorporated into the LTFP or will be incorporated into the LTFP once completed.

The AMP has a maximum life of four (4) years and is due for complete revision and updating within two (2) years of each Council election.

8.4 Performance Measures

The effectiveness of this AMP can be measured in the following ways:

- the degree to which the required forecast costs identified in this AMP are incorporated into the LTFP;
- the degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the AMP;
- 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 plans; and
- the Asset Renewal Funding Ratio achieving the Organisational Target (this target is often 1.0).

9.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long-Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- *CityPlan 2030: Shaping Our Future*
- Long Term Financial Plan
- Annual Business Plan
- Flood Mapping and Management Strategy
- Asset Management Policy (2019)
- Community Surveys
- Resilient East - Regional Climate Change Adaptation Plan
- Resilient East - Climate Projections Report

10.0 APPENDICES

Appendix A

Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

The new and upgrade projects contained within this AMP have been derived from the Council's Flood Mapping and Management Strategy.

A.2 – Acquisition Project Summary

Table A2: ACQUISITION PROJECT SUMMARY

Year	Project	Cost
2022-2028	Trinity Valley (multiple projects)	$15,200,000
2022-2031	First Creek (multiple projects)	$3,670,000
2022-2030	Joslin Valley (multiple projects)	$8,200,000
2024-2031	Third Creek (multiple projects)	$4,465,000

A.3 – Acquisition Forecast Summary

Table A3: ACQUISITION FORECAST SUMMARY

Year	Constructed	Donated	Growth
2022	$3,412,500	$0	$0
2023	$3,537,500	$0	$0
2024	$3,532,500	$0	$0
2025	$3,077,500	$0	$0
2026	$3,037,500	$0	$0
2027	$2,962,500	$0	$0
2028	$3,037,500	$0	$0
2029	$3,062,500	$0	$0
2030	$1,987,500	$0	$0
2031	$2,017,500	$0	$0

Appendix B

Operation Forecast

B.1 – Operation Forecast Assumptions and Source

The operational forecast has been based on previous expenditure for the same service levels with requirements of additional operational expenditure due to new and upgrade projects factored in the year following completion.

B.2 – Operation Forecast Summary

Table B2: OPERATION FORECAST SUMMARY

Year	Operation Forecast	Additional Operation Forecast	Total Operation Forecast
2022	$185,508	$2,048	$185,508
2023	$187,556	$2,123	$187,556
2024	$189,678	$2,120	$189,678
2025	$231,798	$1,847	$231,798
2026	$193,644	$1,823	$193,644
2027	$195,467	$1,778	$195,467
2028	$197,244	$1,823	$197,244
2029	$239,067	$1,838	$239,067
2030	$200,904	$1,193	$200,904
2031	$202,097	$1,193	$202,097

Appendix C

Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

The maintenance forecast has been based on previous expenditure for the same service levels with requirements of additional maintenance expenditure due to new and upgrade projects factored in the year following completion.

C.2 – Maintenance Forecast Summary

Table C2: MAINTENANCE FORECAST SUMMARY

Year	Maintenance Forecast	Additional Maintenance Forecast	Total Maintenance Forecast
2022	$50,202	$1,365	$50,202
2023	$51,567	$1,415	$51,567
2024	$52,982	$1,413	$52,982
2025	$54,395	$1,231	$54,395
2026	$55,626	$1,215	$55,626
2027	$56,841	$1,185	$56,841
2028	$58,026	$1,215	$58,026
2029	$59,241	$1,225	$59,241
2030	$60,466	$795	$60,466
2031	$61,261	$795	$61,261

Appendix D

Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source
The renewal forecast was based on the asset register. No renewal projects have been identified from the Council's Asset Register for the period of this AMP.

D.2 – Renewal Project Summary
No renewals have been forecast over the AMP period.

D.3 – Renewal Forecast Summary

Table D3: RENEWAL FORECAST SUMMARY

Year	Renewal Forecast	Renewal Budget
2022	$0	$0
2023	$0	$0
2024	$0	$0
2025	$0	$0
2026	$0	$0
2027	$0	$0
2028	$0	$0
2029	$0	$0
2030	$0	$0
2031	$0	$0

Appendix E

Disposal Summary

E.1 – Disposal Forecast Assumptions and Source
No disposals have been forecast over the AMP period.

E.2 – Disposal Project Summary
No disposals have been forecast over the AMP period.

E.3 – Disposal Forecast Summary

Table E3: DISPOSAL ACTIVITY SUMMARY

Year	Disposal Forecast	Disposal Budget
2022	$0	$0
2023	$0	$0
2024	$0	$0
2025	$0	$0
2026	$0	$0
2027	$0	$0
2028	$0	$0
2029	$0	$0
2030	$0	$0
2031	$0	$0

Appendix F

Budget Summary by Life-Cycle Activity

The Planned Budget matches the forecast budget for acquisition and renewal, while the Planned Budget for operation and maintenance has not incorporated increases due to new and upgrade projects which have been allowed in the forecasts. Any additional operations and maintenance requirement from new and upgraded works will be factored into revisions of this plan.

Table F1: BUDGET SUMMARY BY LIFE-CYCLE ACTIVITY

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2022	$3,412,500	$185,508	$50,202	$0	$0	$3,648,210
2023	$3,537,500	$185,508	$50,202	$0	$0	$3,773,210
2024	$3,532,500	$185,508	$50,202	$0	$0	$3,768,210
2025	$3,077,500	$225,508	$50,202	$0	$0	$3,353,210
2026	$3,037,500	$185,508	$50,202	$0	$0	$3,273,210
2027	$2,962,500	$185,508	$50,202	$0	$0	$3,198,210
2028	$3,037,500	$185,508	$50,202	$0	$0	$3,273,210
2029	$3,062,500	$225,508	$50,202	$0	$0	$3,338,210
2030	$1,987,500	$185,508	$50,202	$0	$0	$2,223,210
2031	$2,017,500	$185,508	$50,202	$0	$0	$2,253,210