WARRNAMBOOL
CITY COUNCIL

STORMWATER DRAINAGE

Asset Management Plan
Warrnambool City Council

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1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

This Asset Management Plan (AM Plan) 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 plan defines the services to be provided, how the services are provided and what funds are required to provide over a 10-year planning period. The AM Plan will link to the Long-Term Financial Plan.

1.2 Asset Description

Council's stormwater drainage network comprises approximately 296km of underground pipes, 2.8km of drainage tunnels, 12,275 drainage pits and various other assets such as gross pollutant traps, pumps, basins, floodwalls, etc. This complex network has a total replacement cost of $140.4 million.

These stormwater assets represent a significant investment and are of vital importance to protect people, property and public health by collecting, transporting, and disposing of stormwater runoff.

1.3 Levels of Service

The current levels of service have been formulated with regard for legislative requirements, Australian standards, Infrastructure Design Manual, results from the community satisfaction survey and through analysis of customer requests.

Service level performance will be monitored in accordance with this plan over the next 10 years which will provide guidance on the required funding to ensure these service levels.

Council's present funding levels are insufficient to continue to provide existing services at current levels in the medium term. If funding levels are reduced this would impact on Council's ability to maintain current levels of service and performance.

The main service consequences would result in:

- Reduced levels of service leading to a decrease in overall performance of the drainage network.
- Increased risk of flooding and property impact.
- Increased risk of public hazards due to failure of critical drainage infrastructure.

1.4 Future Demand

The main demands for new services are created by:

- Demographics-Residential and commercial land development due to population growth.
- Climate change-Storm intensity and severity due to climate change impacts.
- Finance and economics-Changes in material and resource cost, technology, design regulations and legislative standards.

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:

- Planning for the future of the stormwater drainage system using a strategic approach which considers the most current information about climate change scenarios.
- Continuing to monitor the performance of the drainage system through Council's annual CCTV inspection program.
- Targeted renewal, upgrade and new infrastructure to focus on and address capacity issues that have been identified.
- Ensuring design guidelines consider future demand factors and good design principles.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AM Plan may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AM Plan is the forecast of 10-year total outlays, which for Council's drainage assets is estimated as $23.5 million or $2.35 million on average per year. This excludes contributed assets and works delivered through Council's Development Contributions Plan.

1.6 Financial Summary

1.6.1 What we will do

Estimated available funding for the 10-year period is $14.1 million or $1.41 million on average per year as per the Long-Term Financial plan or Planned Budget. This is 60% of the cost to sustain the current level of service at the lowest lifecycle cost.

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The Informed decision making depends on the AM Plan emphasising the consequences of Planned Budgets on the service levels provided and risks.

The anticipated planned budget for stormwater drainage assets leaves a shortfall of approximately $944K on average per year of the forecast lifecycle costs required to provide services in the AM Plan compared with the Planned Budget currently included in the Long-Term Financial Plan. This is shown in the figure below.

Forecast Lifecycle Costs and Planned Budgets

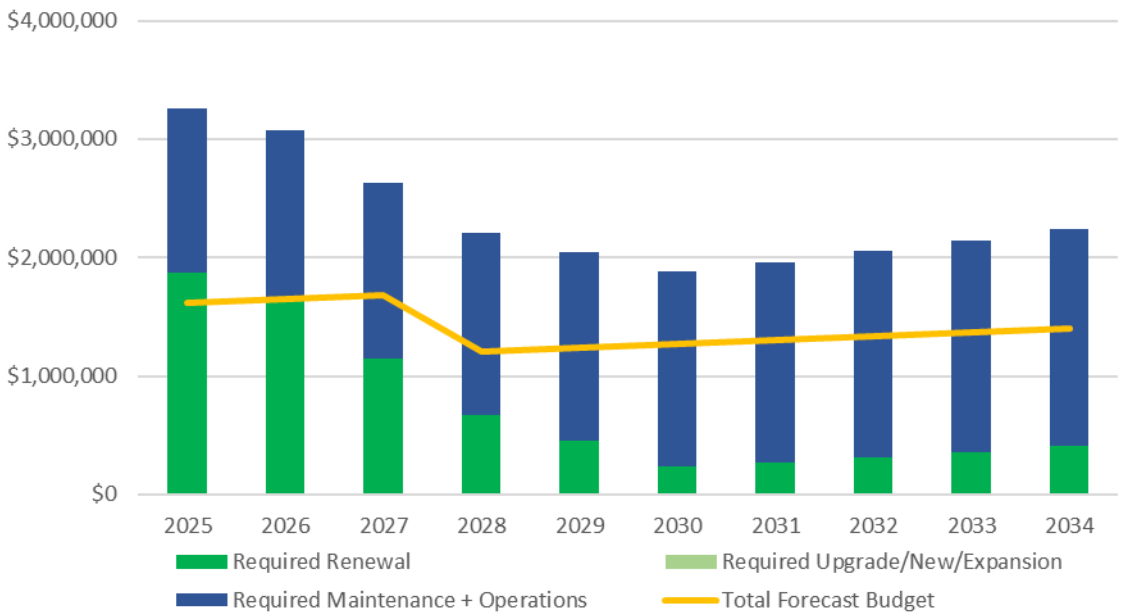

Figure Values are in current dollars.

We plan to provide funding for stormwater drainage assets to undertake:

- Operation, maintenance, renewal and acquisition of stormwater assets to meet service levels.
- Major renewal and improvement work as identified in Council's Long Term Capital Works Program.
- Maintain critical drainage assets as a high priority.

It is recommended that current forecast budgets for capital works and maintenance be retained until such time that greater confidence is established in Council's stormwater drainage data is established and is better aligned with its service objectives.

Council's funding plan for stormwater drainage will be continually reviewed as new information becomes available on growth, demand, service levels, and asset performance. Updates to future funding needs will inform Council's financial planning instruments and updates of this Asset Management Plan.

1.6.2 What we cannot do

We currently allocate sufficient funding to sustain these services at the desired standard but need to manage the expectation to provide all new services being sought. Works and services that may not be provided under present funding levels are:

- Provide a fully compliant drainage network to meet the capacity requirements of the Infrastructure Design Manual.
- Complete condition assessments for all drainage assets.
- Address and mitigate all flood hot spot areas as identified in Council's various drainage studies.
- Address and mitigate impacts of climate change on Council drainage infrastructure (i.e. outfall management impact due to sea level rise).

1.6.3 Managing the Risks

Our present funding levels are sufficient to continue to manage risks in the medium term.

The main risk consequences if Council was unable to maintain funding levels are:

- Further deterioration of critical drainage assets increasing risk of failure.
- Further exposure to risk and liability because of flooding.

We will endeavour to manage these risks within available funding by:

- Proactively inspecting our drainage network and carrying out maintenance or other actions to ensure public safety and property protection is a priority.
- Undertaking further investigations of the identified flooding hotspots to determine the best value for money treatment outcomes.
- Regularly reviewing this Asset Management Plan to ensure alignment with Council's strategic planning cycle and to inform the investment need through the Long-Term Financial Plan.

1.7 Monitoring and Improvement Program

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

- Building on Council's stormwater drainage asset data to improve its completeness, consistency, and accuracy.
- Continuing the annual program of CCTV inspections of network.
- Updating of Council's drainage strategies to include the most current knowledge of future climate change scenarios.
- Establishing processes to measure the community's level of satisfaction with Council's stormwater drainage services.
- Reviewing current operational practices and resources with a view to transitioning to a more proactive maintenance approach to realise efficiencies. This includes formalising levels of service.

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2.0 INTRODUCTION

2.1 Background

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

Warrnambool City Council's ("Council") stormwater drainage system protects property and public health by safely and efficiently collecting, transporting, treating, and disposing of stormwater runoff.

This system comprises a network of stormwater assets including pits, underground pipes, and other drainage infrastructure and can be categorised into 3 functional groupings:

Table 2.1.1: Stormwater Drainage Network Functions

Functional Group	Description
Collection and conveyance	The infrastructure responsible for the collection and conveyance of runoff from impervious surfaces belong in this category. These are the drainage infrastructure used for conveyance including pits, pipes, surface drains, tunnels and minor culverts. The primary responsibility of the infrastructure is to protect the community and assets from the flooding.
Retention	This is a hold point for stormwater. The conveyance infrastructure leads the water to this phase where stormwater is retained to enable some level of treatment and groundwater recharge or reuse. The infrastructure elements included in the retention phase are stormwater basins, aquifer recharge bores, water harvesting tanks and other machinery related to this infrastructure such as pumps in basins and backflow prevention devices.
Water quality	The infrastructure, which helps in enhancing stormwater quality such as Stormwater Quality Improvement Devices (SQID) and Water Sensitive Urban Devices elements (WSUD). SQIDs include litter traps, gross pollution traps, and water sensitive urban devices including swales, rain gardens, etc.

These assets not only represent a significant community investment, but it is also a substantial financial asset for Council with an estimated replacement value of $141.1 million. For a detailed summary of the assets covered in this AM Plan refer to Table in Section 5.

This AM Plan outlines how Council will plan, develop, and maintain its stormwater drainage network and associated assets to meet its service needs in an affordable way. It should be read with along with other key planning documents including:

- Warrnambool 2040
- Council Plan
- Asset Management Policy
- Asset Management Strategy
- Warrnambool Drainage Strategy 2003
- Warrnambool Floodplain Management Plan 2018
- Albert Park Integrated Water Management Plan
- Lake Pertobe Integrated Water Management Plan
- Various Growth Area Structure Plans

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 2.1.2.

Table 2.1.2: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Councillors	Custodian of the asset, with Councillors representing the residents and setting strategic direction as per the Corporate and Operational Plans
Employees	Various teams across Council who have strategic and operational lifecycle management responsibilities for the drainage network.
General public	Community members who derive benefit and are serviced by the stormwater drainage system.
Contractors and other suppliers	To ensure provision of the required/agreed level of maintenance services for asset components.
Partners in other government departments	Periodic provision of advice, instruction, and support funding to assist with management of the drainage network.
Glenelg Hopkins Catchment Management Authority	Responsible for the integrated planning and coordination of land, water and biodiversity management in all catchment and land protection regions
Victoria State Emergency Services	Control agency for flood, storm, and other disaster events throughout Victoria.
Insurers.	Insurance and risk management issues.

2.2 Goals and Objectives of Asset Ownership

Our goal for managing 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 lifecycle 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 a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

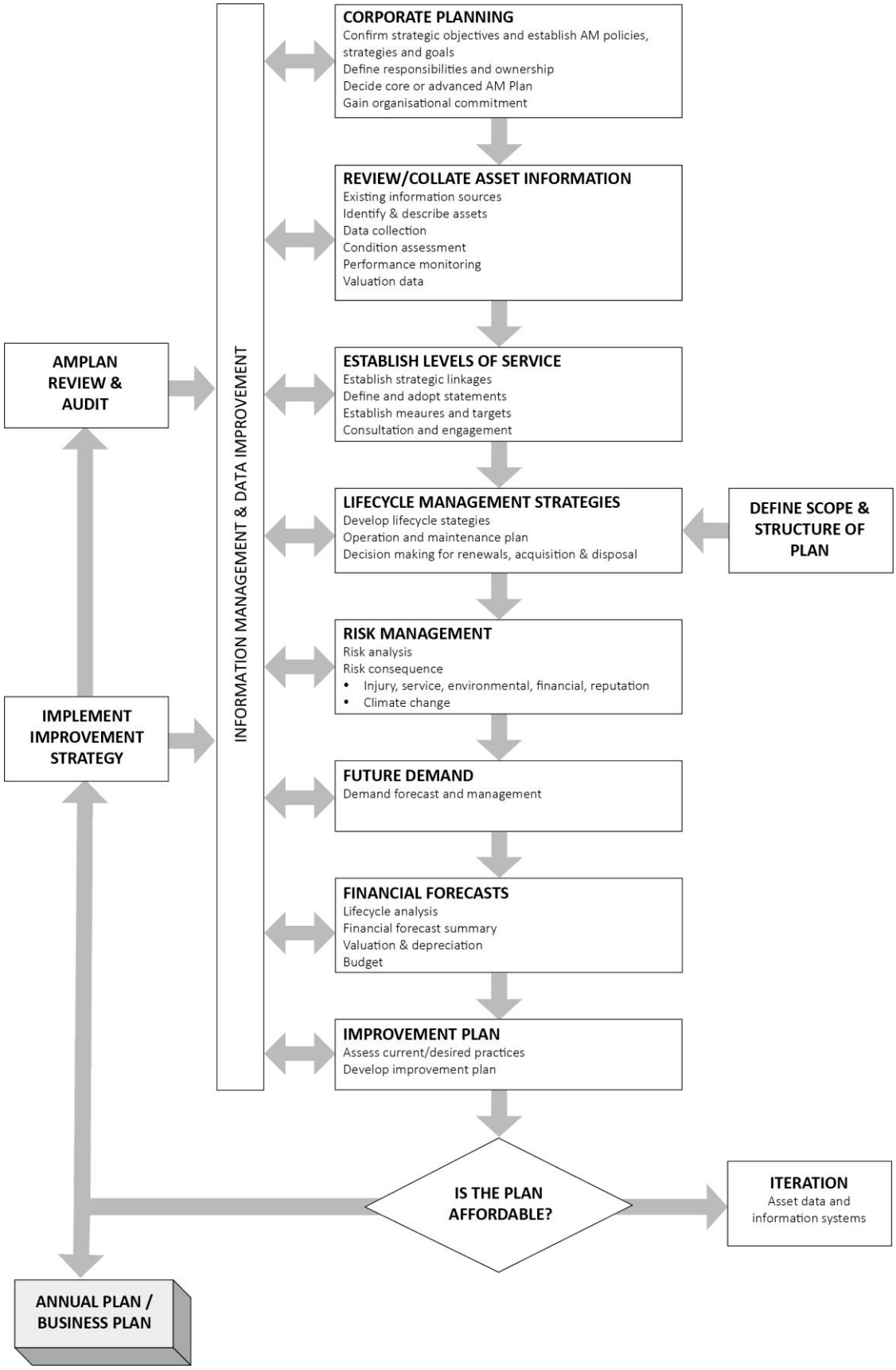
Key elements of the planning framework are

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle 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 we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

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



3.0 LEVELS OF SERVICE

3.1 Customer Research and Expectations

This AM Plan is prepared to facilitate consultation prior to adoption of levels of service by Council. Future revisions of the AM Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist the Council and stakeholders in matching the level of service required, service risks and consequences with the customer's ability and willingness to pay for the service.

Council participates in the annual Local Government Community Satisfaction Survey which is coordinated by the State Government on behalf of Victorian councils. This survey measures community views towards, and satisfaction with, the services Council delivers.

It is acknowledged that past surveys have not specifically gauged the community's satisfaction with the way that Council is managing the stormwater drainage system.

Future surveys should include questions specific to stormwater management to help identify and measure the importance and performance in delivering this service to the community.

3.2 Strategic and Corporate Goals

This AM Plan is prepared under the direction of Council's vision, mission, goals and objectives.

Our vision is:

A thriving city at the heart of coast and country.

Strategic goals have been set by Council. The relevant goals and objectives and how these are addressed in this AM Plan are summarised in Table 3.2.

Table 3.2: Goals and how these are addressed in this Plan

Goal	Objective	Actions
A Sustainable Environment	Council will protect and enhance the health of Warrnambool's coastline and inland waterways to protect and improve biodiversity.	Complete the South Warrnambool Flood Study and begin Planning Scheme Amendment.
	Council will encourage innovation and initiatives that minimise Warrnambool's environmental impact.	Facilitate and support the delivery of climate change mitigation, adaptation and resilience actions to raise awareness and prepare for a changing climate.
	Council will promote and encourage awareness of sustainable practices in our work, and the community including water resource management.	Deliver actions identified in the Albert Park Integrated Start Date Due Date Water Management Plan and the Lake Pertobe Integrated Water Management Plan.
A Strong Economy	Council will support initiatives that foster ongoing development and investment in the industries which underpin Warrnambool's economic strengths and comparative advantages.	Manage Development Plans and Developer Contributions Plans to meet infrastructure requirements of new areas
A Connected and Inclusive Place	Council will promote and encourage the implementation of sustainable design across the municipality including the attractiveness, safety, accessibility and functionality of our built environment.	Update the Drainage Asset Management Plan.

3.3 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of drainage services are outlined in Table 3.3.

Table 3.3: Legislative Requirements

Legislation	Requirement
Local Government Act 2020	Sets out role, purpose, responsibilities and powers of Council including the preparation of a long-term financial plan supported by asset management plans for sustainable service delivery.
Subdivision Act 1988 and Subdivision Regulations (Procedures) 2011	Applies for drainage works to connect the subdivision to the system serving properties outside it
Catchment and Land Protection Act 1994	Establishes a framework for the integrated management and protection of catchments.
Building Act 1993	Provides for regulation of plumbing work and plumbing standards as it impacts discharge of water into the stormwater drainage system from private buildings.
Public Health and Wellbeing Act 2008	Allows the issue of a prohibition notice for the conducting of an activity that may damage public health - in this instance being illegal discharges into the stormwater drainage system
Environment Protection Act 2017	Sets out a general environmental duty which requires entities to take reasonable and practical steps to reduce the human and environmental health risks of their activities.
Occupational Health and Safety Act 2004	To provide a working environment that is safe, and, as far as practicable, without risk to health.
Water Act 1989	Sets out the broad purpose to provide integrated management of the terrestrial water cycle to ensure the equitable and efficient use of water resources to protect and enhance the environmental qualities of waterways and their in-stream uses.
Land Act 1958	Enable authorities to control development on flood-prone land. Subdivisions developed under the new standards, incorporated stormwater drainage systems that could safely accommodate flows from a 100-year storm event.
Road Management Act 2004	Relates to management of the stormwater drainage system where it lies within a public road reserve.
Emergency Management Act 2013	Requires a council to have a Municipal Emergency Management Plan to address local emergency risks. This includes hazards arising from storm flows in the drainage system and associated infrastructure.
Integrated Water Management Framework for Victoria	A framework to deliver greater community value through consistent and strategic collaboration within the water sector – including water corporations, local governments, catchment management authorities, and links with organisations involved in land use planning.

3.4 Current and Target Levels of Service

Current and target levels of service and associated performance measures are outlined in Table 3.4.

These are based on current statutory obligations, organisational goals, current accepted industry standards, and the historic interpretation of customer expectations of service levels.

Several performance indicators have been identified that will be beneficial to measuring Council's overall delivery of stormwater related services in the future.

Council will work to implement the tools and processes and gather data required to monitor and report on these indicators over the life of this Asset Management Plan.

Table 3.4: Customer Values

Customer Value	Customer Outcome	Performance Measure	Current Performance	Goal Over Next 4 Years
Quality	An effective drainage network is provided	Percentage of drainage assets in 'Fair' condition or better.	90%[1]	Maintain
		No. of customer service requests received for flood incidents per annum[2]	222	Reduce (Subject to annual rainfall)
Responsiveness	Drainage complaints are responded to promptly	Percentage of complaints responded to within nominated timeframes	Future measure	Future Measure
Safety	People and property are protected from flooding	Percentage of drains that meet design standards for capacity	59%	Improve
	Drainage assets are managed to mitigate risk	Percentage of total number of stormwater pits in road reserves inspected and cleaned each year	Future measure	Future measure
Environment	Natural waterways are protected from gross pollutants	Percentage of Gross Pollutant Traps inspected and cleaned per annual program	Future measure	Future measure

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

[1] Calculated based on recorded asset age
[2] Rolling 3-year average 2022-24

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, environmental awareness, etc.

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 AM Plan.

Table 4.3: Demand Management Plan

Demand Drivers	Present Position	Projection	Impact	Management Plan
Increasing Dwelling Density	The Warrnambool City-Wide Housing Strategy forecasts that housing densities should be expected to increase in many parts of Warrnambool.	Increased density is expected to continue across the city.	▪ Increased impervious areas. ▪ Increased pollutants in receiving waters. ▪ Capacity of existing stormwater network inadequate to cope with excess runoff.	All the infill developments are guided through the planning process, which should satisfy various amendments, including amendment VC154 on stormwater management.
City Growth and Development	Drainage infrastructure will be constructed in growth areas as per the Council's adopted growth area structure plans. This includes North of Merri, West Dennington, East Warrnambool and Logan's Beach.	It is anticipated to have an additional 8.5km of pipes, 325 pits, minimum of 25 soak pits, 15 GPT's, 7km of swales and five basins in the next 10 year as per planned development.	New drainage assets will be acquired by way of developer contributions. This will result in a need to increase current maintenance and operations budgets from existing levels to meet service objectives.	▪ The planning and construction of drainage in new subdivisions is managed through the planning process, which includes a detailed drainage study and design for each area. ▪ Ensure that delivery teams are informed on handover, and requisite increases are made to annual maintenance budget allocations.
Ageing Infrastructure	▪ Deteriorating condition of assets as they age. ▪ Increasing asset obsolescence as new, more sustainable pipe designs and material become available.	While drainage pits and pipes have a long service life, some parts of the network, based on their age profile, will need to be planned for renewal or rehabilitation in the medium term.	▪ Increased demand for timely asset renewal and upgrade. ▪ Advancement in designs, technologies and systems will have increased costs in some areas, and reduced costs in other areas.	▪ Continue to monitor the performance of the drainage system through CCTV inspection programs. ▪ Prepare long term asset maintenance and renewal programs according to priorities and funding availability.

Demand Drivers	Present Position	Projection	Impact	Management Plan
Technology Improvement and Utilisation	Increase in available technology for the construction, management, maintenance, and renewal of drainage infrastructure.	Further analysis required.	Opportunity of cost savings in service delivery as well as improvement in structural integrity resulting in more life span for the assets.	Continue to monitor and be updated with the new developments in this space.
Climate Change	Recent studies show that the drainage system is exposed to risk by climate change through: ▪ Increasing storm surges ▪ Sea-level rise ▪ Groundwater changes ▪ Frequency and intensity of extreme rainfall events.	Warrnambool might experience a sea-level rise of 0.49 metres and increased rainfall intensity with climate change.	The city will be more vulnerable to flooding, especially in areas like Koroit Street, Japan Street and Koroit Street intersection, Harrington Road, Morriss Road and Anthony Street.	The Warrnambool Climate Change Drainage Impact Study details the impact of Climate change and suggests the flood mitigation measures associated with it.
Council Financial Sustainability	Council is required to provide its projects, programs, and services within an environment of constrained revenue control resulting from rate capping.	Rate capping, has the potential to negatively impact effective asset management if sufficient funds are unable to be secured to manage existing assets to agreed levels of service, or to provide new or upgraded transport assets desired by the community	Council will be faced with challenges with respect to future provision of transport infrastructure, including: - Achieving equitable distribution of resources and the provision of transport networks and assets. - Making sure that the community receives maximum benefit from the investment in transport infrastructure.	▪ Prepare long term asset maintenance and renewal programs according to priorities and funding availability. ▪ Conduct level of service analysis and review affordability and risks. ▪ Ensure that the Financial Plan and Asset Plan are integrated and reflect future asset whole of life costs and account for any expected climate change impacts.

4.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.6.

Warrnambool City Council is presently experiencing a period of rapid growth. Demand for provision new and upgraded drainage infrastructure will continue to be a significant challenge for Council. The new assets required to meet demand may be acquired, donated, or constructed by Council.

Council has many strategies and policies that provide the means to continually assess future needs and to identify opportunities to enhance or upgrade the drainage network to meet growth and changes in demand. This also includes Council's current Development Contributions Plan which is used as a mechanism to fund growth related projects.

Acquiring new assets will commit 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 long-term financial plan (Refer to Section 5).

4.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets Council manages and the services they provide. 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 impacts on assets will vary depending on the location and the type of services provided, as will the way in which Council responds and manage those impacts.[3]

As a minimum Council considers how it manages its existing assets given potential climate change impacts for the region.

Risk and opportunities identified to date are shown in Table 4.5.

[3] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

Table 4.5: Managing the Impact of Climate Change on Assets and Services

Climate Change Indicator	Potential Impact on Assets and Services	Management Actions
More frequent, long-running and intense heatwaves	▪ Increased heat related damage to assets including concrete cracking. ▪ Reduced lifespan of water infrastructure assets. ▪ Increased costs to provide the same level of service. ▪ Premature obsolescence as functionality is not met.	Strategic Planning, Asset Management and Project Delivery (including design and procurement) will continue to focus on ensuring that climate risk mitigation and adaption is a key focus. Mitigation and adaptation measures will include: ▪ Ongoing reviews and updates to Council's design standards and technical specifications to ensure its assets transition towards having a lower carbon footprint with improved circular economy outcomes as well as ensure they are more resilient to withstand the impacts of an unstable climate. ▪ Proactively reviewing Council's asset management strategies with respect to the impacts of climate change, to ensure it continues to provide the agreed level of service at the lowest lifecycle cost.
Less rain overall but more intense storms and flooding	▪ Increased stormwater related damage to assets including earth, rubble and concrete erosion resulting in a loss of structural integrity/strength. ▪ Reduced lifespan of water infrastructure assets ▪ Premature obsolescence as functionality is not met (e.g. drainage pipe capacity does not meet demand)	Additional to the above, adaptation measures will also consider: ▪ Developing stormwater management plans to identify assets at risk and priority mitigation controls such as upgrading existing underground assets and creating new assets such as wetlands and detention basins to increase water storage capacity. ▪ Continue to work with other authorities to support community education and awareness in flood-prone areas. ▪ Catchment renewal to consider an integrated stormwater management approach including materials selection.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this Asset Management Plan.

It is recommended to continue monitoring the impacts of climate conditions and associated cost implications as further investigation is undertaken and more data becomes available. This is included as a key action within this Asset Management Plans Improvement Plan.

5.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle 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 AM Plan are shown in Table 5.1.1.

Council's stormwater drainage system protects property and public health by safely and efficiently collecting, transporting, treating, and disposing of stormwater runoff.

This system comprises a network of stormwater assets including pits, underground pipes, and other drainage infrastructure.

Table 5.1.1: Assets covered by this Plan

Asset Type	Quantity	Unit	Replacement Cost ($)	Written Down Value ($)	Useful Life (Years)
Pipes	295,889	metres	69,571,168	48,035,419	100
Pits	12,275	No.	38,415,614	25,988,051	80 - 100
AG Drains	25,849	metres	952,750	845,590	100
Aquifer Recharge Bore	1	No.	40,020	37,619	200
Basins	285,202	sqm	11,032,900	9,183,503	100 - 200
Drainage Pumps	7	No.	815,500	248,100	20
Flood Walls	1,225	metres	1,563,100	1,435,857	100
Rain Gardens	100	No.	696,056	587,335	60
Rainwater Harvesting Tanks	7	No.	397,239	332,927	50
Retention Cells	4	No.	716,477	715,520	50
SQIDs	38	No.	4,920,916	4,341,516	25 - 100
Swales	923,441	sqm	18,469	18,154	60
Tunnels	2,861	metres	11,270,843	3,494,843	100
Total			**140,411,052**	**95,264,434**	

All figure values are shown in current day dollars.

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 identified in Appendix C.

The capacity of underground pipes that form Council's stormwater drainage network has been assessed against their prescribed Infrastructure Design Manual (IDM) standard according to abutting land use types. The IDM documents and standardises Council's requirements for the design and development of municipal infrastructure, including stormwater drainage assets.

Drains in or around commercial areas, essential utilities, institutions and hospitals should have a capacity for a 5% AEP, drains in the industrial area should have a capacity to take 10% AEP and drains in residential areas should have a capacity for an 18% AEP flood event (Table 5.1.2a)

Pipes under capacity have been given a performance score of 1 indicating adequate performance. Those pipes that are operating at capacity are given a score of 2, indicating they are meeting current demand without issue but that there is no potential to cater for increasing future demand under current condition. Assets that are over capacity are given a performance score of 5 indicating a failure in meeting their functional levels of service. Pipes that are operating at over capacity generally coincide with areas of known flooding hotspots or other drainage issues.

Table 5.1.2a: IDM Design Drainage Capacity by Land Use Type

Zone	Capacity Score		
	Under Capacity	At Capacity	Over Capacity
Commercial	1% AEP	5% AEP	10% AEP
Essential utilities/Institutions/Hospitals	1% AEP	5% AEP	10% AEP
Industrial	5% AEP	10% AEP	18% AEP
Residential	10% AEP	18% AEP	>20% AEP

Flood modelling has been used to calculate the maximum amount of stormwater that can flow through Council's underground stormwater pipes. This modelling assumes that there are no blockages, root intrusions or other debris present that may reduce the capacity of these pipes.

Following an assessment of existing infrastructure under current IDM standards, approximately 41% of Council's underground drains are under capacity according to current drainage design standards. Table 5.1.3b details the current capacity of the drainage network associated with various land use types.

Table 5.1.2b: Pipe Length with Capacity Limits

Zone	Pipe Capacity					Length of Pipes with Capacity than Design Flood Immunity (km)
	1% AEP (1 in 100 year event)	5% AEP (1 in 20 year event)	10% AEP (1 in 10 year event)	18% AEP (1 in 5 year event)	>20% AEP	
Commercial	1%	14%	14%	17%	54%	16.3
Essential utilities/Institutions/Hospitals	1%	18%	14%	9%	58%	13.2
Industrial	3%	21%	6%	10%	60%	9.8
Residential	5%	25%	17%	14%	39%	82

Flooding hotspots are identified through operating knowledge of the drainage network, flood modelling, and other strategic work completed by Council. Twenty prioritised hotspots are considered for upgrade projects to increase the capacity of drainage to reduce the risk of ongoing nuisance flooding.

Annual Exceedance Probability (AEP) - Is the probability of an event occurring in any given year. For example, a 1% AEP means there is a 1% chance in any given year of the event occurring. This means that on average 1 event of this size will occur every 100 years. Therefore, 1% AEP is equal to a 100-year ARI, a 2% AEP is a 50-year ARI, and a 10% AEP is a 10-year ARI.

Annual Recurrence Interval (ARI) - Is sometimes also known as 'return period'. It is the average number of years that it is predicted will pass before an event of a given magnitude occurs. For example, a 50-year ARI event would on average happen every 50 years.

Both ARI and AEP values are based on statistical calculations and represent the average timing of events. These may not be exact and although unlikely, a number of 1% AEP or 100-year ARI events could occur within the same year.

5.1.3 Asset condition

Council has an annual program of CCTV inspections of its underground stormwater drainage network. The current budget allows for approximately 3% of the network to be inspected each year. To date, around 66km of the underground pipe network has been inspected for structural condition and serviceability. This represents around 22% of the overall drainage system.

Condition data for drainage assets is recorded in Council's asset register and is used for renewal modelling, capital works planning, and financial reporting.

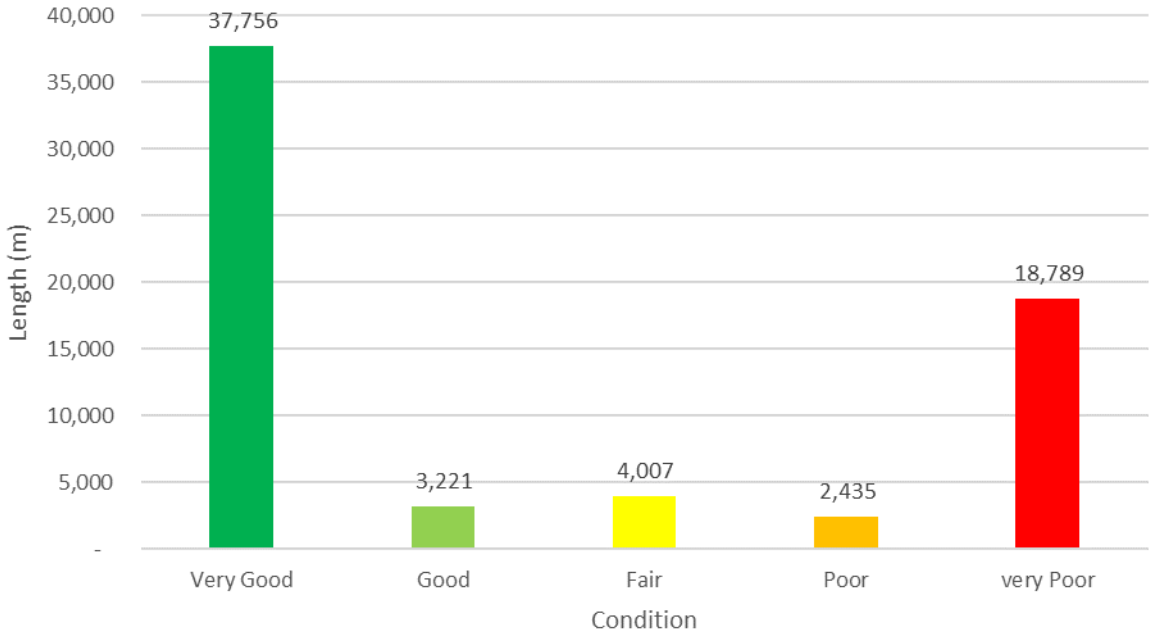
Condition is measured using Water Services Association of Australia (WSAA) defect codes which is then converted to a 1 – 5 grading system[4] as detailed in Table 5.1.3 based on the combination of the extent and severity of the various defects identified.

Table 5.1.3: Condition Grading System

Score	Condition Rating	Description of Condition
1	Very Good	Free of defects, only planned and/or routine maintenance required
2	Good	Minor defects, increasing maintenance required plus planned maintenance
3	Fair	Defects requiring regular and/or significant maintenance to reinstate service
4	Poor	Significant defects, higher order cost intervention likely
5	Very Poor	Physically unsound and/or beyond rehabilitation, immediate action required

The condition profile of our assets is shown in Figure 5.1.3.

Figure 5.1.3: Pipe Condition Profile by Length



[4] IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Around 28% of the pipes inspected so far are in very poor structural condition. The condition of an underground pipe can be influenced by the standard at the time of construction, material quality, soil conditions, impact from other works and property connections, etc.

Treatment interventions to these pipes such as relining, replacement, etc. will be required in the short to medium term to address condition and mitigate any risk of major failure. Condition information is used as the basis for informing Council's capital works program for the stormwater drainage network.

There are opportunities to estimate the condition of the parts of the network that are yet to be formally assessed as part of the annual CCTV inspection program. This could be done by extrapolating known condition across the balance of the network by considering pipe material, construction date, topography, maintenance history, and other environmental factors.

Better data would enhance asset management decision-making practices and would also be useful in validating asset valuations and depreciation calculations.

An additional area of improvement for Council is to review the current selection process used to determine which pipes are included in the CCTV inspection program each year. There may be occasions where it is possible to better align the program with investigative works that are necessary to scope Council's capital works projects (e.g. building a comprehensive understanding of the condition of underground drains in the vicinity of planned road renewal works).

There is also a need to continually review the accuracy, completeness, and consistency of Council's drainage asset data. This is important where this information is used for analysis or is used to inform third parties of the location of underground services. New or updated information collected from operational activities, inspections, and other investigations needs to be captured and used to update Council's asset registers and spatial information.

5.1.4 Asset serviceability

Serviceability is connected to hydraulic capacity which can be diminished by factors such as intrusions by tree roots, sedimentation, and collection of debris.

Council uses a 1 to 5 rating system to measure serviceability of its drainage assets as described in table 5.1.4.

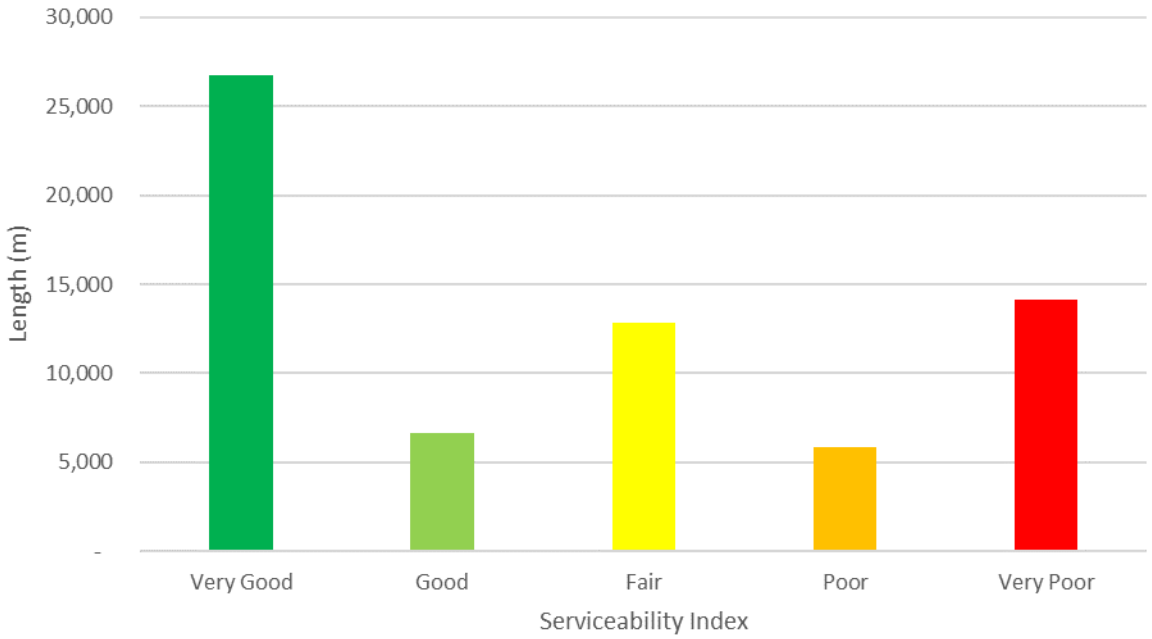
Table 5.1.4: Serviceability Grading System

Score	Serviceability Rating	Description
1	**Very Good**	No or insignifanct loss of hydraulic capacity.
2	**Good**	Minor loss of hydraulic capacity.
3	**Average**	Moderate loss of hydraulic performance but asset still functions safely at adequate level of service.
4	**Poor**	Significant loss of hydraulic performance. Substantial work required in short term to keep asset servicable.
5	**Very Poor**	Complete loss of hydraulic performance which present a possible risk to public safety.

Figure 5.1.4 summarises the serviceability of pipes that have been visually condition assessed to date. Approximately 21% of pipes have a serviceability score of 'Very Poor', which suggests blockages in these pipes are greatly preventing stormwater conveyance and potentially causing flooding upstream.

It is recommended that these pipes are programmed to be cleared of sediment, root intrusions, or other obstructions to restore their drainage function as best as possible. These activities should only be applied where pipes are structurally sound enough to withstand this type of work.

Figure 5.1.4: Serviceability Profile by Length



5.2 Operations and Maintenance Plan

Operational activities can include service delivery items such as removal of debris from pits, cleaning blocked pipes, etc. Operations also include proactive and reactive inspections. These inspections are completed by Council's staff or specialist contractors in some cases. Operations activities do not improve the condition of assets.

Stormwater assets are long lived and over time minor faults can occur within the network. Council addresses repairs and maintenance of these faults (i.e. broken pipes or pit lids, blocked pipes or pits, etc.) as it becomes aware of such issues or identify them through ongoing monitoring programs.

Current maintenance programs are centred on ensuring that known problem areas perform to their service potential to mitigate the risk of nuisance flooding. This requires focussed effort from Council's drainage maintenance team meaning that other parts of the network may be left unattended.

There are further challenges presented with the maintenance of SQIDs such as rain gardens vegetated swales, sediment basins, etc. A more programmed approach is required to ensure these items of stormwater drainage infrastructure perform their function as they are intended to. Melbourne Water's *WSUD Maintenance Guidelines* provide simple, standardised guidance for designing and implementing maintenance programmes for SQIDs. Council will also need to ensure that it is properly resourced, and its staff have the requisite skills and knowledge to adequately perform maintenance on SQIDs.

Most drainage maintenance activities are undertaken by Council's in house resources using a dedicated combination drain cleaning truck to deliver these works. Other activities such as emptying of gross pollution traps of rubbish are undertaken by contractors working on Council's behalf.

Council carries out annual CCTV inspections of a small percentage of the underground pipe network each year. These inspections help identify what work needs to be done including cleaning, repairs, or in some cases pipe replacement.

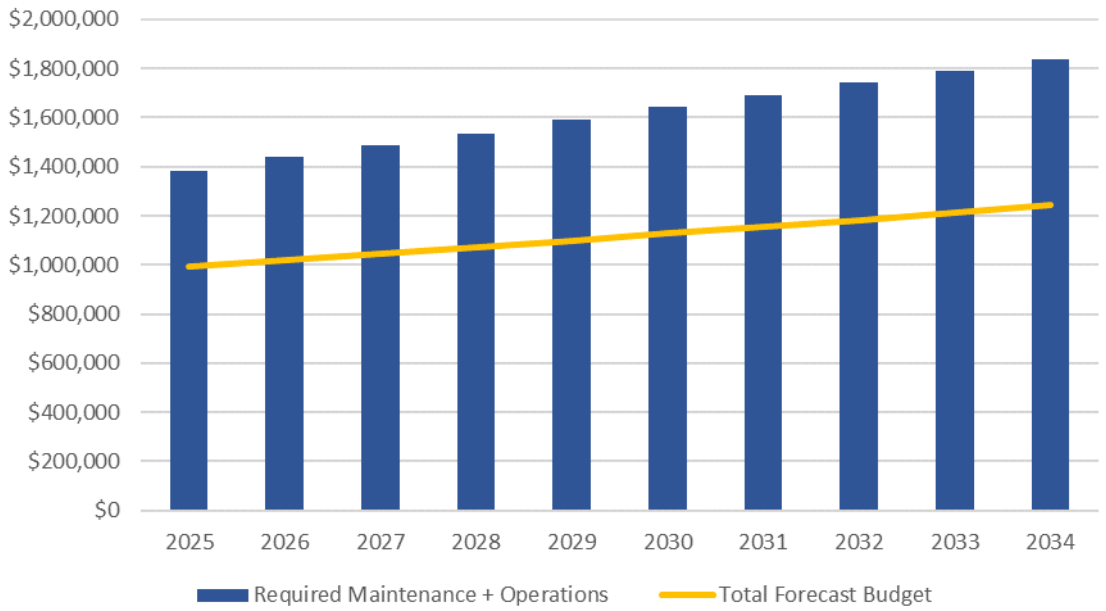
All the maintenance and other operational work that Council does is prioritised within the constraints of its annual budgets.

5.3 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 of the forecast operation and maintenance costs are expected to decrease.

Figure 5.3 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.3: Operations and Maintenance Summary



All figure values are shown in current day dollars.

Through the work Council has done in preparing this Asset Management Plan, it has identified that it is projected to underfund the maintenance of the stormwater drainage system relative to the size and value of the network.

Before Council makes any adjustments, it first needs to validate its levels of service and then cost these appropriately to make sure that it can deliver on its commitments.

5.4 Renewal Plan

Renewal is 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 that need replacing are identified through analysis of asset information, site knowledge, inspections, and community feedback.

Stormwater drainage asset renewal and replacement strategies are based on the most current asset condition available at the time of developing Council's forward works programs.

5.4.1 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.[5]

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.[6]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.4.1.

Table 5.4.1: Renewal Priority Ranking Criteria

Criteria	Weighting
Assets with an alarming defect and zero or no remaining life, criticality score 4 & 5 and extremely high risk	1 (Extreme)
Assets with an alarming defect and up to 10-year remaining life with criticality score 3 and high risk	2 (High)
Assets with a significant defect and up to 15-year remaining life with criticality score 2 and medium risk	3 (Medium)
Assets with a significant defect and more than 15-year remaining life with criticality score 1 and low risk	4 (Low)

Council's Infrastructure renewal demand forecasts are developed using predictive modelling. These forecasts are annually reviewed and updated as new information (e.g. condition assessments) becomes available.

These forecasts and the underlying assumptions are further reviewed to factor in specific projects and any upgrade projects that include a renewal component to provide the best available guide to renewal requirements.

The process used for formulation of the schedule of stormwater drainage renewal works submitted for budget consideration is as follows:

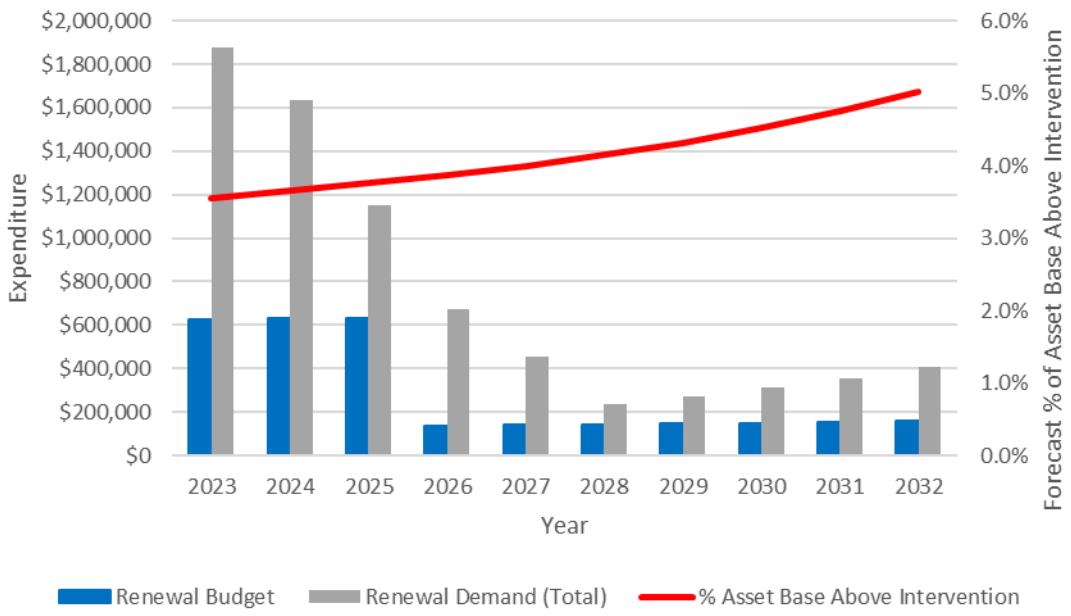
- Condition information from Council's asset management information system is used to prepare a preliminary priority listing of drainage assets that may require renewal.
- This list forwarded to the Infrastructure Management Team to validate the priority list and to define the scope of work required to match available budgets.
- The final schedule of works forms the annual drainage renewal program.

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

5.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.5.

Figure 5.5: Forecast Renewal Costs



All figure values are shown in current day dollars.

The forecast of Council's long term asset renewal liabilities indicates that it is projected to underfund the renewal of the stormwater drainage network.

Over the next 10 years, the predicted average annual renewal demand for Council's drainage assets is approximately $737K. According to Council's current long term capital works program, it is projected to allocate $292K on average per year for the renewal of these assets. This indicates that there is an average renewal funding gap of approximately $445K per annum.

If Council does not appropriately manage this gap, it could be faced with risks of:

- Continued deterioration of stormwater assets.
- Poor performing assets and the potential for critical asset failure.
- A decline in public confidence and community satisfaction.
- Compromised public safety and associated liability.

Council's imperative is to ensure that its assets are safe, fit for purpose and meet the needs of the community.

Council will strive to responsibly fund the renewal of its stormwater drainage network in the future. This is so it minimises the impact to the community of the costs of unsustainable asset provision by proactively renewing and maintaining Council's assets.

Council is still building a comprehensive understanding of the condition of the underground stormwater drainage system. Further analysis is required to determine how to best use what information it does have on asset condition to model the performance of the balance of the network.

In the interim, age-based calculations have been used to analyse what the long-term renewal liabilities are for Council's drainage system.

The financial forecasts made in this Asset Management Plan will be refined as Council continues to improve its data and knowledge of the stormwater drainage network.

5.6 Acquisition Plan

Acquisition reflects are 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 acquired from land developments and constructed by private developers who then gift these assets to Council.

5.6.1 Selection criteria

The nature of the city, being a mature urban environment in some areas and young rural environment in other parts, means that some of the municipality is generally considered to be fully serviced by the existing stormwater drainage system and in other parts, new assets will be required because of developments.

Upgrade and expansion works are associated with improving service levels (e.g., increasing the size of a stormwater pipe, etc.). Additionally, expansion works include activities that extends the capacity of an existing asset, to provide higher levels of service and/or meet changes in asset resilience requirements. Upgrade/expansion is different to asset renewal which only restores service capability.

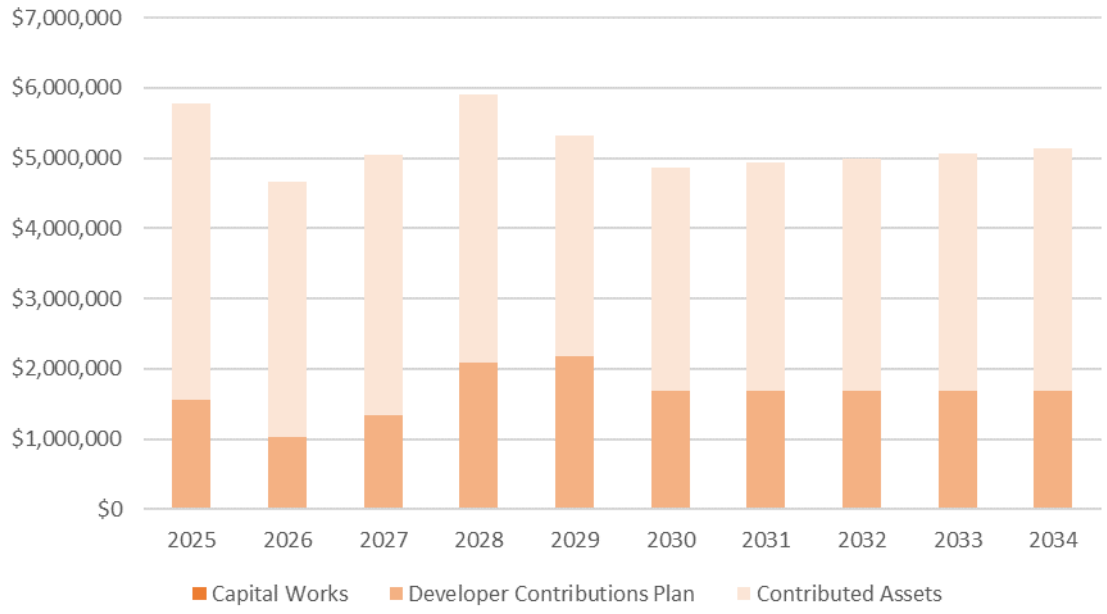
Upgrade and expansion of existing assets are identified from various sources such as drainage capacity studies, community requests, proposals identified by strategic plans, or through partnerships with other organisations.

Council's drainage strategy and other management plans helps it to rank its known flood prone sites in order of importance. It also outlines potential flood mitigation works that may be considered in alleviating flooding at these locations. Candidate projects are ranked utilising Council's capital works evaluation processes and scheduled in future works programmes depending on funding availability.

5.7 Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.7 and shown relative to the proposed acquisition budget.

Figure 5.7: Acquisition Summary



All figure values are shown in current day dollars.

Funding of new and upgrade works fall into the following categories depending upon the extent and type of works:

- Council funded.
- Externally funded.
- Contributed assets resulting from property development.
- Works funded through Council's Development Contributions Plan (DCP). This can be DCP Reserves or works in kind. In some cases, a cash contribution from Council is also required.

Expenditure on new assets and services in the capital works program will be accommodated in the long-term financial plan, but only to the extent that there is available funding.

Growth of the stormwater drainage network will primarily be driven by assets created through development works.

Council is working towards updating its drainage strategy to accommodate updated climate change scenarios. This work will inform further augmentation works to the existing drainage system to address capacity and flooding issues.

When Council commits to new assets, it must be prepared to fund future operations, maintenance and renewal costs. They must also 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 Council.

5.8 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation.

It is envisaged that minimal existing stormwater drainage assets may be considered for decommissioning in the foreseeable future through some renewal projects.

5.9 Summary of asset forecast costs

The financial projections from this Asset Management Plan are shown in Figure 5.9.

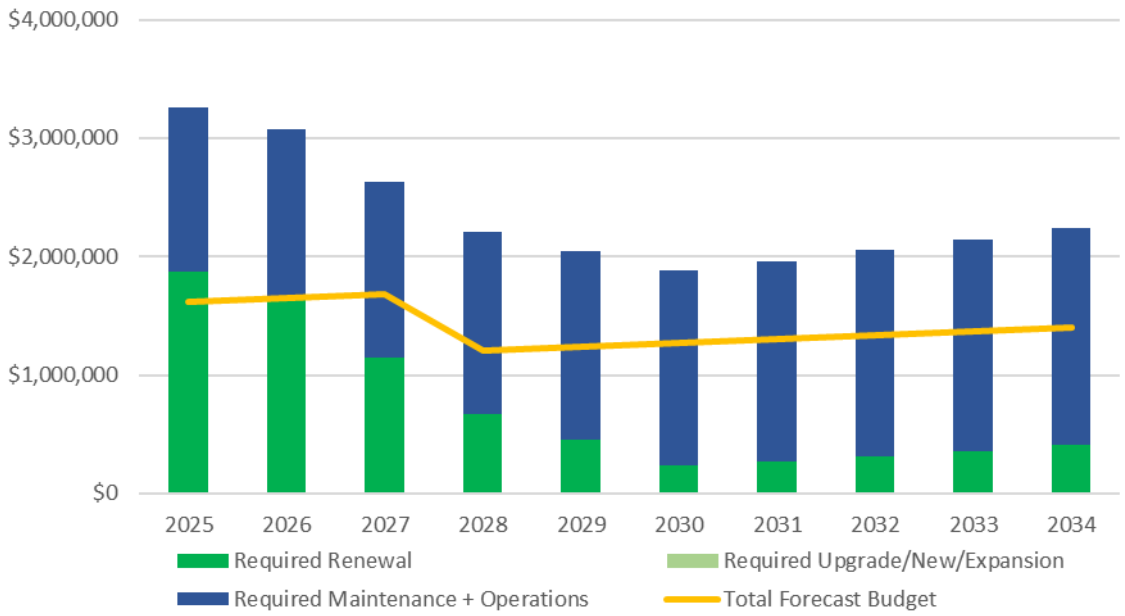
These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast lifecycle costs associated with current and future 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 5.9: Lifecycle Summary



All figure values are shown in current day dollars.

The analysis completed for this Asset Management Plan shows that there is a shortfall in capital and operational funding that is required to sustain current levels of service.

Operational and maintenance costs are expected to continue to grow as the asset base increases in size and value in line with land development.

Most stormwater drainage renewal works are not funded and continued deferral of will have a cumulative impact resulting in an ever-increasing backlog.

Council is also building a better understanding of what new and upgrade works will be required across the drainage network to improve capacity. This will place additional fiscal pressure on Council to fund upgrade works, particularly considering climate change impacts, to provide a drainage system that is fit for purpose.

6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management 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'[7].

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 or reduction in service. It is important to identify critical assets as well as the critical failure modes. This makes it possible to target and refine maintenance plans, capital expenditure plans, and investigative activities at the critical areas.

The criticality framework Council uses for its stormwater drainage assets is shown in Table 6.1. This framework considers the consequences from Council's risk management procedure and other factors that affect the community. Further work is needed to systemise this framework to ensure it is embedded as part of Council's overall approach to managing service and infrastructure risk.

Table 6.1 - Criticality Framework

Factor	Assessment Guide
Location of infrastructure	At regionally significant lifelines facility (hospitals), schools, arterial roads, buildings, city centre, under train track, industrial zones.
Flooding Factor	Flood depth as per flood model to assess the impact due to the depth of flooding
Density of the areas	To assess the impact due to loss of service
Critical facilities	If the infrastructure is servicing critical facilities like hospitals, schools, etc.
Cause of pollution	Asset with no GPT/Swales/Raingardens or leading to or near to pollution prone areas.
Catchment area	Basins with catchment Area with area >500,000,000 sq. metres

Application of this framework allows Council to allocate its finite resources through targeting its inspection and maintenance efforts and by informing capital expenditure plans.

Criticality needs to be quantified and incorporated in Council's asset management data to fully realise the benefits of this framework.

[7] ISO 31000:2009, p 2

6.2 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

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.

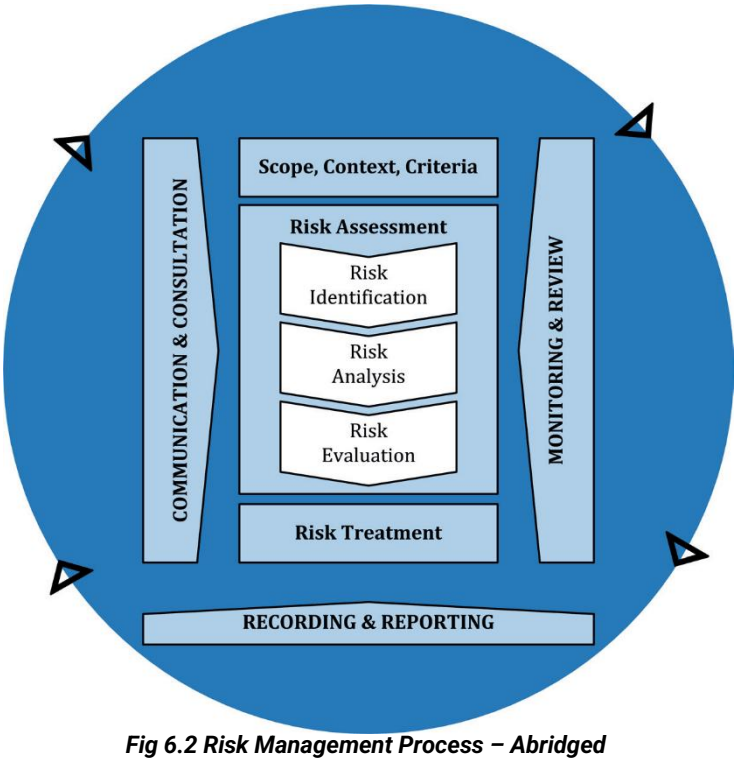


Fig 6.2 Risk Management Process – Abridged

Source: ISO 31000:2018, Figure 1, p9

An assessment of risks associated with service delivery from infrastructure assets identifies the most critical risks. The risk assessment process also helps Council to identify and assess credible risks, assign a risk rating, and develop risk mitigation plans for non-acceptable risks.

An assessment of risks associated with service delivery has identified risks that will result in public disruption, personal injury, a 'financial shock' or reputational impacts. These risks are presented in Appendix A. The residual risk of implementing the selected treatment plan/control is also shown. Note that the residual risk is the risk remaining after the selected risk treatment plan is implemented.

6.3 Infrastructure Resilience Approach

The resilience of Council's critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions 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.

We do not currently measure our resilience in service delivery. Measures of resilience will be developed in future updates of this AM Plan.

6.4 Service and Risk Trade-Offs

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

6.4.1 What we cannot do

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

- Provide a fully compliant drainage network to meet the capacity requirements of the Infrastructure Design Manual.
- Complete condition assessments for all drainage assets.
- Address and mitigate all flood hot spot areas as identified in Council's various drainage studies.
- Address and mitigate impacts of climate change on Council drainage infrastructure (i.e. outfall management impact due to sea level rise).
- Improve stormwater discharge quality to align with the performance targets within the CSIRO guidelines.

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:

- Property owners will continue to be impacted by overland flooding during heavy storm events.
- Stormwater discharge water quality may continue to impact on water body quality.
- Delayed renewal and replacement of existing drainage infrastructure assets.
- Reduction of investment and provision of new and upgraded drainage infrastructure.

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:

- Reduction in serviceability or failure of critical drainage infrastructure
- Stormwater drainage failure risk remains due to gaps in asset condition assessment data.
- Property owners will continue to be impacted by overland flooding during heavy storm events.
- Stormwater discharge water quality may continue to impact on natural water bodies and local environment.

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 AM Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Sustainability and Projections

7.1.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. The two indicators are the:

- Asset Renewal Funding Ratio (proposed renewal budget for the next 10 years / proposed renewal outlays for the next 10 years shown in the AM Plan), and
- Lifecycle Funding Ratio (proposed lifecycle budget for the next 10 years / proposed lifecycle outlays for the next 10 years shown in the AM Plan).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[8]: **40%**

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years Council expects to have **40%** of the funds required for the optimal renewal of assets.

Lifecycle Funding Ratio – 10-year financial planning period

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed, and affordable level of service to the community over a 10-year period. This provides input into 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 first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10-year planning period is $2.35 million on average per year.

The proposed (budget) operations, maintenance and renewal funding is $1.41 million on average per year giving a 10-year funding shortfall of $944K per year. This indicates that 0.60 of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets.

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 AM Plan and ideally over the 10-year life of the Long-Term Financial Plan.

7.1.2 Forecast Costs (outlays) for the long-term financial plan

Appendix B shows the proposed 10-year funding plan for Council's stormwater drainage assets to inform the long-term financial plan.

It is recommended that current forecast budgets for capital works and maintenance be retained until such time that greater confidence is established in Council's stormwater drainage data is established and is better aligned with its service objectives.

Council's funding plan for stormwater drainage will be continually reviewed as new information becomes available on growth, demand, service levels, and asset performance. Updates to future funding needs will inform Council's financial planning instruments and updates of this Asset Management Plan.

[8] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

7.2 Funding Strategy

The proposed funding for assets is outlined in Council's annual budget and Long-Term financial plan.

Council's financial strategy determines how funding will be provided, whereas the Asset Management Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

7.2.1 Funding Sources

Funding for assets is provided from Council's annual budget and Financial Plan. The financial strategy determines how funding will be provided, whereas the Asset Management Plan communicates how and when this will be spent, along with the service and risk consequences of differing options.

Council uses several different funding sources to maintain, renew and improve its drainage assets. These are:

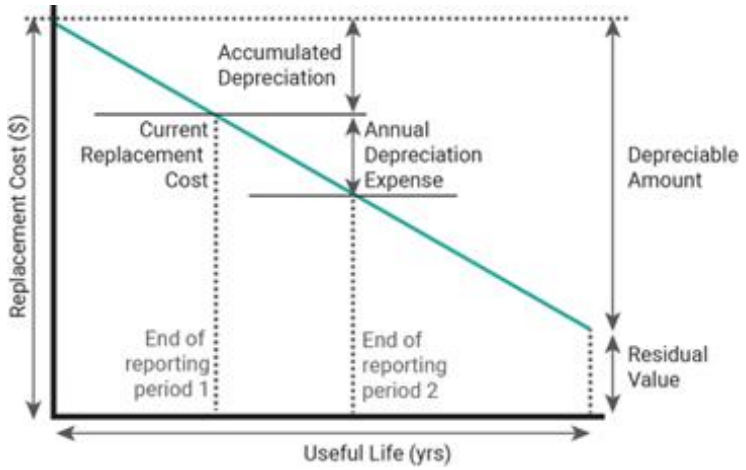
Table 7.2.1: Funding Sources

Activity	Funding Source
Maintenance and Operations	▪ Council's own source funds.
Renewal	▪ Council's own source funds.
Capital Improvement **(i.e., new, upgrade, and expansion**	▪ Council's own source funds. ▪ Council's available cash reserves. ▪ External grant opportunities. ▪ Special Charge Schemes. ▪ Developer contributions and donated assets.

7.3 Valuation Forecasts

7.3.1 Asset valuations

The best available estimate of the value of assets included in this AM Plan are shown below.



Assets are valued at fair value at cost to replace service capacity:

Replacement Cost (Gross)	$ 140,411,052
Depreciable Amount	$ 140,411,052
Depreciated Replacement Cost[9]	$ 95,264,434
Annual Depreciation Expense	$ 1,018,262

7.3.2 Valuation forecast

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

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 AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- All expenditure is stated in dollar values as of 1 July 2024 with no allowance made for inflation over the 10-year planning period.
- Operations and maintenance expenditure are based on the current 2024/25 budget allocations and includes forecast annual increases for materials and services and employee costs (2.5 per cent annually).
- Staffing needs are resourced adequately.
- Capital expenditure forecasts are taken from Council's Long Term Capital Works Program.
- The forecast renewal costs made in this Asset Management Plan are based on the asset data register as of 1 July 2024.
- Useful lives used for renewal analysis are as indicated in Council's asset register.
- Renewal intervention condition for all assets included in the calculation of future renewal demand is '4 – Poor'.
- Stormwater drainage assets will remain in Council ownership throughout the period covered by this Asset Management Plan unless specifically detailed otherwise.
- Standards, Acts and Regulations concerning drainage assets will remain essentially the same over the period covered by this Asset Management Plan.

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan 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[10] in accordance with Table 7.5.1.

[9] Also reported as Written Down Value, Carrying Amount or Net Book Value in some jurisdictions.
[10] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	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. High	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. Medium	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. Low	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. Very Low	None or very little data held.

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

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Levels of Service and Performance Measures	D	Service levels are yet to be formalised for stormwater drainage assets. Work is required to document these validate performance measures and targets against annual budget allocations.
Demand forecast analysis and projections	C	Work is being done to update Council's drainage strategy. Once completed, recommended outcomes need to inform Council's Long Term Capital Works Program and future versions of this Asset Management Plan.
Performance data (asset degradation)	C	Further analysis of historical condition information needed to establish actual degradation patterns.
Condition data	C	Council has a rolling program to assess small portions of the drainage network each year. Further analysis is needed to build a condition profile for the whole of the system using available information.
Asset inventory data	C	The stormwater drainage asset register should be reviewed to make sure that information is consistent including asset descriptions.
Risk management	A	Customer requests related to drainage clearly categorised. Low level of insurance claims and effective risk register.
Long Term Financial Plan	C	Integration between financial outputs from Asset Management Plans and the Financial Plan needs strengthening.

The estimated confidence level for and reliability of data used in this AM Plan is C - Medium. The implementation of improvement actions identified in Section 8 will result in increased levels of confidence in future revisions of this Asset Management Plan.

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices[11]

8.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Council's Asset Management Information System, Conquest.

8.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Council's Asset Management Information System, Conquest.

8.2 Improvement Plan

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

Table 8.2: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Continue to collect and refine drainage asset data suitable to inform strategic and operational analysis and decisions.	Strategic Asset Management	Internal/External	Ongoing
2	Continue annual CCTV condition inspections of network samples to improve the quality of existing asset data including spatial mapping.	Strategic Asset Management	Internal/External	Ongoing
3	Extend annual condition audits of stormwater pipes to include drainage pits.	Strategic Asset Management	Internal/External	2024/25
4	Complete review and update of Council's drainage strategies. Review the Long-Term Capital Works Program and this Asset Management Plan to include key outputs.	City Strategy Strategic Asset Management	Internal/External	2024/25

[11] ISO 55000 Refers to this as the Asset Management System

Task	Task	Responsibility	Resources Required	Timeline
5	Establish a hierarchy for stormwater drainage assets and apply to the existing drainage network to identify critical assets. Include this information in Council's asset register.	Strategic Asset Management	Internal	2025/26
6	Review and implement processes to measure the community's level of satisfaction with Council's stormwater drainage services at least annually.	Strategic Asset Management	Internal	2025/26
7	Review and formalise levels of service for operational management of the stormwater drainage network. This should include establishing annual budget and resource requirements.	Strategic Asset Management Municipal Operations	Internal	2025/26
8	Review current operational practices with a view to transitioning to a more programmed maintenance approach across the whole of the drainage system.	Strategic Asset Management Municipal Operations	Internal	2025/26
9	Review current selection process used to determine which pipes are included in the annual CCTV inspection program to potentially compliment investigative works necessary to scope Council's capital works projects.	Strategic Asset Management	Internal	2025/26
10	Using collected condition data, assess asset performance by considering pipe material, construction date, topography, maintenance history, and other environmental factors and apply to network.	Strategic Asset Management	Internal/External	2026/27
11	Develop a maintenance and operations plan for SQIDs to ensure their proper function. Ensure that relevant staff have the requisite skills and knowledge to adequately perform maintenance on SQIDs.	Strategic Asset Management Municipal Operations	Internal/External	2026/27
12	Complete a revaluation of stormwater drainage assets consistent with Council's Asset Accounting Policy.	Strategic Asset Management	Internal	Align with policy

8.3 Monitoring and Review Procedures

This Asset Management Plan has a long-term vision with a 4-year focus. It is a living document which is relevant and integral to daily asset management activity. This Plan will be formally reviewed and updated in the year following Council general elections, in line with s92.4 of the Local Government Act 2020.

Intermediate reviews and amendments may be made should there be any material changes to Council financial policy, levels of service, or to accommodate any resource needs from relevant strategies.

8.4 Performance Measures

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

- The degree to which the required cash flows identified in this asset management plan are incorporated into Council's long-term financial planning process and works planning.
- The performance against the measures assigned to levels of service.
- The Asset Renewal Funding Ratio achieving the Council's target of between 90-110%.

  The progress of implementing the actions identified in the improvement plan.

9.0 REFERENCES

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- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Warrnambool 2040 (Community Vision)
- Council Plan
- Long Term Financial Plan
- Asset Management Policy
- Asset Management Strategy

10.0 APPENDICES

Appendix A – Stormwater Drainage Risk Register

RISK IDENTIFICATION			RISK ASSESSMENT				Effect. of Current Controls	Further Action if Required
Risk Event	Cause	Possible Impact	Current controls	Likelihood	Consequence	Level of Risk (current controls)		
Failure to deliver and maintain assets that are safe and sustainable	Lack of resources to manage stormwater drainage services	Safety	Responsibilities for lifecycle asset management functions are defined and understood Long Term Capital Works Program, financial modelling and analysis outcomes from Asset Management Plans inform the Financial Plan	Unlikely	Moderate	Medium	Fully Effective	
Ineffective financial forecasting and strategic decision making	Lack of quality of processes, accurate asset data, and supporting systems	Financial	Current asset register with complete, accurate, and consistent data Asset Management Information System Lifecycle management plans Continuing staff development	Unlikely	Moderate	Medium	Substantially Effective	Review existing data to ensure that information for stormwater drainage assets is complete (e.g. quantities, condition - where available, etc.).
	Using age as a determinant for asset condition does not give a realistic assessment of network performance	Financial	Current asset register with date of commissioning CCTV inspection program.	Possible	Moderate	Medium	Substantially Effective	Continue with ongoing inspections of drainage network - Use criticality to guide priorities. Review existing data sources (i.e. design plans) to establish construction dates for legacy assets. Where information does not exist, establish construction dates based on reasonable assumptions. Record date of construction for newly constructed assets.

RISK IDENTIFICATION			RISK ASSESSMENT				Effect. of Current Controls	Further Action if Required
Risk Event	Cause	Possible Impact	Current controls	Likelihood	Consequence	Level of Risk (current controls)		
Flooding threatening the safety of property and people	Ability of the stormwater drainage network to cater for the potential for increased extreme rainfall events	Safety	Flood mapping information Flood modelling investigation and feasibility study to identify under capacity assets CCTV inspections Maintenance, renewal, and upgrade of stormwater drainage network	Possible	Major	High	Fully Effective	
	Modification of drainage patterns leading to flooding	Reputation	Flood mapping information Planning controls Long Term Capital Works Program	Unlikely	Moderate	Medium	Fully Effective	
	Failure of critical drainage infrastructure (e.g. drainage tunnels, large diameter pipes, etc.).	Safety	CCTV inspections Maintenance, renewal, and upgrade of stormwater drainage network	Possible	Moderate	Medium	Fully Effective	
	Lack of capacity in areas of drainage network due to blockages, undersized pipes, etc.	Reputation	Flood modelling and mapping to identify under capacity drainage assets CCTV inspections Maintenance, renewal, and upgrade of stormwater drainage network Development Contributions Plan	Possible	Moderate	Medium	Fully Effective	

RISK IDENTIFICATION			RISK ASSESSMENT				Effect. of Current Controls	Further Action if Required
Risk Event	Cause	Possible Impact	Current controls	Likelihood	Consequence	Level of Risk (current controls)		
Contamination of environment and natural waterways	Stormwater pollutants (i.e. natural, chemical, and litter) discharges to waterways	Reputation	Integrated Water Management Plan Maintenance, renewal, and upgrade of stormwater drainage network Street sweeping program Water Sensitive Urban Design (WSUD)	Possible	Moderate	Medium	Substantially Effective	Increased proactive maintenance of stormwater drainage system Greater incorporation of WSUD in the urban environment, including gross pollutant traps Implementation of recommendations from Blue Warrnambool initiatives Increased public education and awareness of environmental protection. Establish stormwater quality benchmarks and actively monitor and report

Appendix B – Proposed 10 Year Expenditure Plan

Project	Exp. Category	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	2033/34
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Capital											
Drainage Capital Works	Renewal	626,595	627,260	627,941	28,640	29,356	30,090	30,842	31,613	32,403	33,214
Total CAPEX		**626,595**	**627,260**	**627,941**	**28,640**	**29,356**	**30,090**	**30,842**	**31,613**	**32,403**	**33,214**
Recurrent – Operations and Maintenance											
214500 - Roads & Drainage Operations & Admin											
1014 - Plant Operating Costs	OPEX	32,905	33,728	34,571	35,435	36,321	37,229	38,160	39,114	40,092	41,094
1070 - Management	OPEX	161,665	165,707	169,849	174,096	178,448	182,909	187,482	192,169	196,973	201,897
1167 - Storm Damage Response	OPEX	20,835	21,356	21,890	22,437	22,998	23,573	24,162	24,766	25,385	26,020
1189 - Emergency Response/Callouts/Standby Allow	OPEX	36,725	37,643	38,584	39,549	40,538	41,551	42,590	43,654	44,746	45,864
1220 - West Warrnambool Operations	OPEX	35,500	36,388	37,297	38,230	39,185	40,165	41,169	42,198	43,253	44,335
1700 - Tool Box/Staff Meetings	OPEX	28,937	29,660	30,402	31,162	31,941	32,740	33,558	34,397	35,257	36,138
1740 - Sundry Items	OPEX	24,500	25,113	25,740	26,384	27,043	27,720	28,412	29,123	29,851	30,597
214000 - Stormwater Drainage											
1212 - Outfall Drains/Litter Traps	OPEX	31,732	32,525	33,338	34,172	35,026	35,902	36,799	37,719	38,662	39,629
1213 - Pumping Stations	OPEX	10,000	10,250	10,506	10,769	11,038	11,314	11,597	11,887	12,184	12,489
1215 - Urban - Pit Maintenance	OPEX	165,748	169,892	174,139	178,492	182,955	187,529	192,217	197,022	201,948	206,997
1216 - Urban - Pit & Pipe Cleaning	OPEX	257,056	263,482	270,069	276,821	283,742	290,835	298,106	305,559	313,198	321,028
1219 - West Warrnambool Basin	OPEX	11,315	11,598	11,888	12,185	12,490	12,802	13,122	13,450	13,786	14,131
1729 - Main Drain Cleaning	OPEX	45,095	46,222	47,378	48,562	49,776	51,021	52,296	53,604	54,944	56,317
1730 - Main Drain Maintenance	OPEX	31,150	31,929	32,727	33,545	34,384	35,243	36,124	37,028	37,953	38,902
1732 - Open Drain Maintenance	OPEX	48,095	49,297	50,530	51,793	53,088	54,415	55,775	57,170	58,599	60,064
1733 - Outfall Drain/Litter Traps Maintenance	OPEX	47,095	48,272	49,479	50,716	51,984	53,284	54,616	55,981	57,381	58,815
1734 - Pump Station Maintenance	OPEX	7,472	7,659	7,850	8,047	8,248	8,454	8,665	8,882	9,104	9,332
Total OPEX		**995,825**	**1,020,721**	**1,046,239**	**1,072,395**	**1,099,204**	**1,126,685**	**1,154,852**	**1,183,723**	**1,213,316**	**1,243,649**
Total Expenditure		**1,622,420**	**1,647,981**	**1,674,180**	**1,101,035**	**1,128,560**	**1,156,774**	**1,185,694**	**1,215,336**	**1,245,719**	**1,276,862**

Appendix C – Drainage Capacity Analysis