





Urban Stormwater Infrastructure Asset Management Plan 2020



Version 2

March 2020

Document Control		<div>Asset Management Plan</div> <div><div><div>IPWEA</div><div>INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA</div></div><div></div></div>			
Document ID : NAMS>PLUS Concise Asset Management Plan Template v 3.116					
Rev No	Date	Revision Details	Author	Reviewer	Approver
1	19 July 2010	V1	J.L.	M.G.	G.W.
2	March 2020	V2	J.L.	D.S.	S.C.

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1 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

Asset management planning is a comprehensive process to ensure delivery of services from infrastructure is provided in a financially sustainable manner.

This asset management plan details information about urban stormwater drainage infrastructure assets including 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 the services over a 20-year planning period.

This plan covers the stormwater drainage infrastructure assets allow Council to meet its service aim: *to minimise the risk of flood damage to people and property in urban areas.*

1.2 Asset Description

These assets include:

The Stormwater network comprises:

- Reticulated mains
- Pits (manholes, grated pits, side entry pits, etc)
- Headwalls and culverts
- Open drains

These infrastructure assets have significant replacement value estimated at \$34,825,000.

1.3 Levels of Service

Our present funding levels are sufficient to continue to provide existing services at current levels in the medium term (10-year planning period).

The main services consequences are:

- Significant new/upgrade capital expenditure required in short-term

1.4 Future Demand

The main demands for new services are created by:

- Land subdivision and urban infill and consolidation
- Climate Change
- Increasing environmental awareness

These 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 include non-asset solutions, insuring against risks and managing failures.

- Consider introduction of developer contribution to capital upgrades ('headworks charges').
- Consider measures to encourage greater level of on-site retention of stormwater (e.g. on-site retention systems etc).
- Consider increasing the design standard of new/ upgraded stormwater infrastructure (e.g. 20-year ARI instead of 5-year ARI) including a minimum pipe diameter (e.g. 225mm).
- Review of service levels and/or capital upgrade/new asset expenditures.

1.5 Lifecycle Management Plan

What does it Cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan (AM Plan) includes operations, maintenance, renewal, upgrade and new assets over the 10-year planning period is \$6,164,000 or \$616,000 on average per year.

1.6 Financial Summary

What we will do

Estimated available funding for this period is \$5,972,000 or \$597,000 on average per year as per the long term financial plan or budget forecast. This is 97% 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 emphasis of the Asset Management Plan is to communicate the consequences that this will have on the service provided and risks, so that decision making is "informed".

The projected expenditure requires an additional \$19,000 on average per year to provide services in the AM Plan. This is due to increased operational expenditure arising from planned flood mitigation works. Ways in which this can be managed are to review revenue and/or service levels.

This is shown in the figure below.

Projected Operating and Capital Expenditure

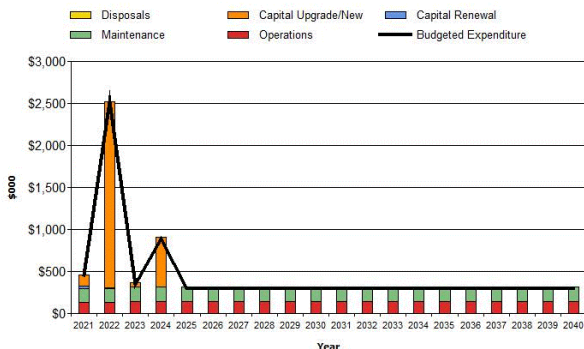


Figure Values are in current (real) dollars.

We plan to provide urban stormwater drainage services for the following:

- Operation, maintenance, renewal and upgrade of stormwater drainage infrastructure to meet service levels set by annual budgets.
- Major renewals/upgrades within the 10-year planning period are:
 - Flood mitigation measures (Wynyard)
 - Somerset capacity issues

What we cannot do

We currently do not recover enough funding through stormwater service rates to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Ensure zero risk of flooding in extraordinary rain events.

Managing the Risks

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

The main risk consequences are:

- flooding risk for properties in identified flood risk areas

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

- Investigation, design and funding of flood mitigation options

1.7 Asset Management Practices

Our systems to manage assets include:

- Authority (Civica Pty Ltd)
- Conquest II (Conquest Solutions Pty Ltd)

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template'.

- **Method 1** uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- **Method 2** uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems), or
- **Method 3** uses a combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'.

Method 2 was used for this asset management plan.

1.8 Monitoring and Improvement Program

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

- Improvement items identified in Stormwater System Management Plan 2020.
- Improvement items identified in the Stormwater Revaluation Report 2019.
- Identify and recognise open drains that are part of the Urban Stormwater System.
- Develop Infrastructure Risk Management Plan.
- Document asset condition inspection procedures.

2. INTRODUCTION

2.1 Background

This asset management plan communicates the actions required for the responsive management of assets (and services provided from assets), compliance with regulatory requirements, and funding needed to provide the required levels of service over a 20-year planning period.

The asset management plan is to be read in conjunction with Council's planning documents:

- Strategic Asset Management Plan
- Long term Financial Plan
- 10 Year Corporate Strategic Plan
- Stormwater System Management Plan

The infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are used to provide for stormwater flow so as to minimise the risk of flood damage to people and property in urban areas.

Table 2.1: Assets covered by this Plan

Asset Category	Dimension	Replacement Value
Reticulated Mains	97.25km	\$25,653,885
Pits (manholes, grated pits, side entry pits, etc	2,950	\$8,643,305
Headwalls and culverts	167	\$106,628
Open Drains	Not recorded	Not recognised
	TOTAL	\$34,403,818

2.2 Goals and Objectives of Asset Ownership

Our goal in 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 expenditure and how it will be allocated.

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

- International Infrastructure Management Manual 2015 ¹
- ISO 550002

2.3 Core and Advanced Asset Management

This asset management plan is prepared as a 'core' asset management plan over a 20 year planning period in accordance with the International Infrastructure Management Manual³. Core asset management is a 'top

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

³ IPWEA, 2015, IIMM.

down' approach where analysis is applied at the system or network level. An 'advanced' asset management approach uses a 'bottom up' approach for gathering detailed asset information for individual assets.

3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

This 'core' asset management plan is prepared to facilitate consultation prior to adoption by the Council. Future revisions of the asset management plan will incorporate community 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 community's ability and willingness to pay for the service.

Table 3.1 shows current available community satisfaction levels for relevant services identified by the 2019 Community Satisfaction Survey carried out by Insync Surveys as well as comparison with previous surveys. The survey asked respondents to rate the importance of each of the identified service elements as well as their perception of Council's performance in delivering that service element. This allowed calculation of a mean gap score for each element where a large gap score signifies a perceived poor performance by Council in a service area relative to its importance to the community.

According to Insync Surveys, the mean gap score can be interpreted as follows:




	Good	Mean gap score <2
	Average	Mean gap score 2 – 3
	Poor	Mean gap score >3

Table 3.1: Community Satisfaction Survey Levels

Service Element	2019 Community Satisfaction Survey			2016 Survey	2014 Survey
	Importance (max score 7)	Performance (max score 7)	Mean Gap Score	Mean Gap Score	Mean Gap Score
Stormwater Drainage System	6.2	4.7	1.5	1.6	1.1

Community satisfaction information is used in developing the Strategic Plan and in the allocation of resources in the budget.

3.2 Strategic and Corporate Goals

This asset management plan is prepared under the direction of the [Entity] vision, mission, goals and objectives.

Our **VISION** is:

To deliver innovative, sustainable services to our Community through strong leadership, clear direction and collaborative relationships.

Our **MISSION** is:

Building our Community and region, providing leadership, a strong voice, and delivering outcomes based on value for money.

Relevant goals and objectives and how these are addressed in this asset management plan are:

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

Goal	Objective	How Goal and Objectives are addressed in AM Plan
<i>Goal 1: Leadership and Governance</i>	We maintain and manage our assets sustainably	Stormwater assets are maintained in good, fit-for-purpose condition to facilitate the provision of services to the community.
<i>Goal 2. Organisational Support</i>	We are future-focussed and value continuous improvement.	At time of replacement, Council allows for the purchase of assets with improved technology and/or safety.
<i>Goal 7: Environment</i>	Stewardship of our land, water and marine ecosystems respects past, present and future generations	Stormwater infrastructure aims to facilitate the removal of stormwater in an ecologically responsible manner, to ensure ongoing service to the community

Council will exercise its duty of care to ensure public safety in accordance with the infrastructure risk management plan prepared in conjunction with this AM Plan. Management of infrastructure risks is covered in Section 6.

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Legislation	Requirement
<i>Local Government Act 1993</i>	To provide for local government and establish councils to plan for, develop and manage municipal areas in the interests of their communities.
<i>Urban Drainage Act 2013</i>	To protect people and property by ensuring that stormwater services, infrastructure and planning are provided so as to minimise the risk of urban flooding due to stormwater flows.

3.4 Customer Levels of Service

Service levels are defined in two terms: customer levels of service and technical levels of service. These are supplemented by organisational measures.

Customer Levels of Service measure how the customer receives the service and whether value to the customer is provided.

Customer levels of service measures are not significantly developed beyond the general understanding obtained from the community satisfaction survey (shown above in section 3.1).

3.5 Technical Levels of Service

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

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

- **Operations** – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc).

- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs),
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),
- **Upgrade/New** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).

Service and asset managers plan, implement and control technical service levels to influence the customer service levels.⁴

Table 3.5 shows the technical levels of service expected to be provided under this AM Plan. The 'Desired' position in the table documents the position being recommended in this AM Plan.

Table 3.5: Technical Levels of Service

Service Attribute	Service Activity Objective	Activity Measure Process	Current Performance *	Desired for Optimum Lifecycle Cost **
TECHNICAL LEVELS OF SERVICE				
Stormwater Service Aim: To protect people and property by ensuring that stormwater services, infrastructure and planning are provided so as to minimise the risk of urban flooding due to stormwater flows.				
Operations & Maintenance	Service Aim	Annual Budget	Current budget funds stated maintenance intervention levels	Stated maintenance intervention levels are met
Renewal	Service Aim	Annual Budget	Asset Renewal Funding Ratio of 100%	Asset Renewal Funding Ratio of 100%
Upgrade/New	Service Aim	Drawn from masterplans, stormwater system management plans and significant developments	Currently all identified upgrade works from major developments and council-initiated masterplans are scheduled to be funded	
		Upgrades to stormwater system not triggered from new developments or stormwater system management plan	Not funded	Would increase current lifecycle cost without furthering the service aim

Note: * Current activities and costs (currently funded).

** Desired activities and costs to sustain current service levels and achieve minimum life cycle costs (not currently funded).

⁴ IPWEA, 2015, IIMM, p 2 | 28.

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time. Review and establishment of the agreed position which achieves the best balance between service, risk and cost is essential.

4. 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 were identified and are documented in Table 4.3.

4.3 Demand Impact on Assets

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

Table 4.3: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Population	Approx. 14,400	It is expected that the municipality will experience a slight decline in population over the next 5-10 years	Could result in reduction in the capacity of the community to pay for maintenance and renewal.
Land subdivision	Land/Property Subdivision continues to occur at a modest rate.	Expected to continue	Additional loading to existing stormwater infrastructure requiring more frequent maintenance.
Urban consolidation and infill	Trend to smaller allotments; strata developments etc	Expected to increase	Increase in impermeable area resulting in additional loading to stormwater system.
Climate change	Advice from peak bodies (such as CSIRO) that climate change is occurring	Potential trend towards more extreme rainfall, tidal and wind events	Capacity of drainage system exceeded with greater frequency requiring more frequent maintenance.
		Potential rise in mean sea level	Reduction in capacity of outfall from stormwater drainage lines due to submerged discharge conditions - low level areas may not drain at high tide.
Environmental awareness	Trend amongst public toward greater awareness of environmental issues	Expected to continue	Increased pressure to control pollution via stormwater system.

Demand drivers	Present position	Projection	Impact on services
			Potential for more on-site storage/use of stormwater.

4.4 Demand Management Plan

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 4.4. Further opportunities will be developed in future revisions of this asset management plan.

Table 4.4: Demand Management Plan Summary

Demand Driver	Impact on Services	Demand Management Plan
Population	Could result in reduction in the capacity of the community to pay for maintenance and renewal.	<ul style="list-style-type: none"> Consider measures to encourage greater level of on-site retention of stormwater (e.g. use of permeable paving, on-site retention systems etc). Consider greater development restrictions on land with stormwater drainage issues. Continue to investigate alternative renewal treatments to lower lifecycle costs (e.g. pipe relining)
Land subdivision	Additional loading to existing stormwater infrastructure requiring more frequent maintenance.	<ul style="list-style-type: none"> Require land developers to assess the impact of developments on the capacity of existing infrastructure. Consider implementation of developer contributions toward upgrade of existing council infrastructure to cope with increased inflow from proposed developments (also known as a 'headworks charge') May require review of service levels and/or capital upgrade
Urban consolidation and infill	Increase in impermeable area resulting in additional loading to stormwater system.	<ul style="list-style-type: none"> Consider measures to encourage greater level of on-site retention of stormwater (e.g. use of permeable paving, on-site retention systems etc). May require review of service levels and/or capital upgrade
Climate change	Capacity of drainage system exceeded with greater frequency requiring more frequent maintenance.	<ul style="list-style-type: none"> Consider increasing the design standard of new/upgraded stormwater infrastructure (e.g. 20-year ARI instead of 5-year ARI) including a minimum pipe diameter (e.g. 225mm). Consider new/old infrastructure interface (e.g. investigate new construction techniques and materials such as open, permanent channels/swales in place of underground piping). May require review of service levels and/or capital upgrade

Demand Driver	Impact on Services	Demand Management Plan
	Reduction in capacity of outfall from stormwater drainage lines due to submerged discharge conditions - low level areas may not drain at high tide.	<ul style="list-style-type: none"> • Audit current system capacity to identify weaknesses in the network. • Design ocean outfalls to extend outfalls away from debris line on beach (include use of one way valves etc.) • Increase use of sediment/pollutant traps. • May require review of service levels and/or capital upgrade
Environmental awareness	Increased pressure to control pollution via stormwater system.	<ul style="list-style-type: none"> • Increase use of sediment/pollutant traps. • May require review of service levels and/or capital upgrade or increased maintenance costs
	Potential for more on-site storage/use of stormwater.	<ul style="list-style-type: none"> • Institute recovery of some network capacity. • Consider measures to encourage greater level of on-site retention of stormwater (e.g. use of permeable paving, on-site retention systems etc). • May require review of service levels and/or capital upgrade

4.5 Asset Programs to meet Demand

Where new assets are required for growth, they are generally constructed by developers and donated to councils or constructed/acquired by council.

Acquiring these new assets will commit 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 further in Section 5.

At this stage our data on future asset demand is limited to flood mitigation works. The data required to accurately model the financial impact of new assets from growth on council's operating costs is not readily available. In addition, growth is not considered to be a highly significant factor at this time. Future revisions of this asset management plan will investigate this aspect more thoroughly.

5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how Council plans to manage and operate the assets at the agreed levels of service (defined in Section 3) while managing life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this asset management plan are shown in Table 2.1.

Council's stormwater infrastructure has been designed and constructed to meet local requirements since the early 1950's. It encompasses urban, industrial and residential areas in two principal towns, two coastal seaside villages and a mining town to the south of the municipality. These areas are located in medium to high rainfall zones and recent years have seen the network tested to its capacity.

With all components of the system well within their design lives it is estimated that the network is in sound condition overall. However some sections are known to be overloaded and in need of significant upgrade. The age profile of the assets included in this AM Plan are shown in Figure 2.

Figure 2: Asset Age Profile

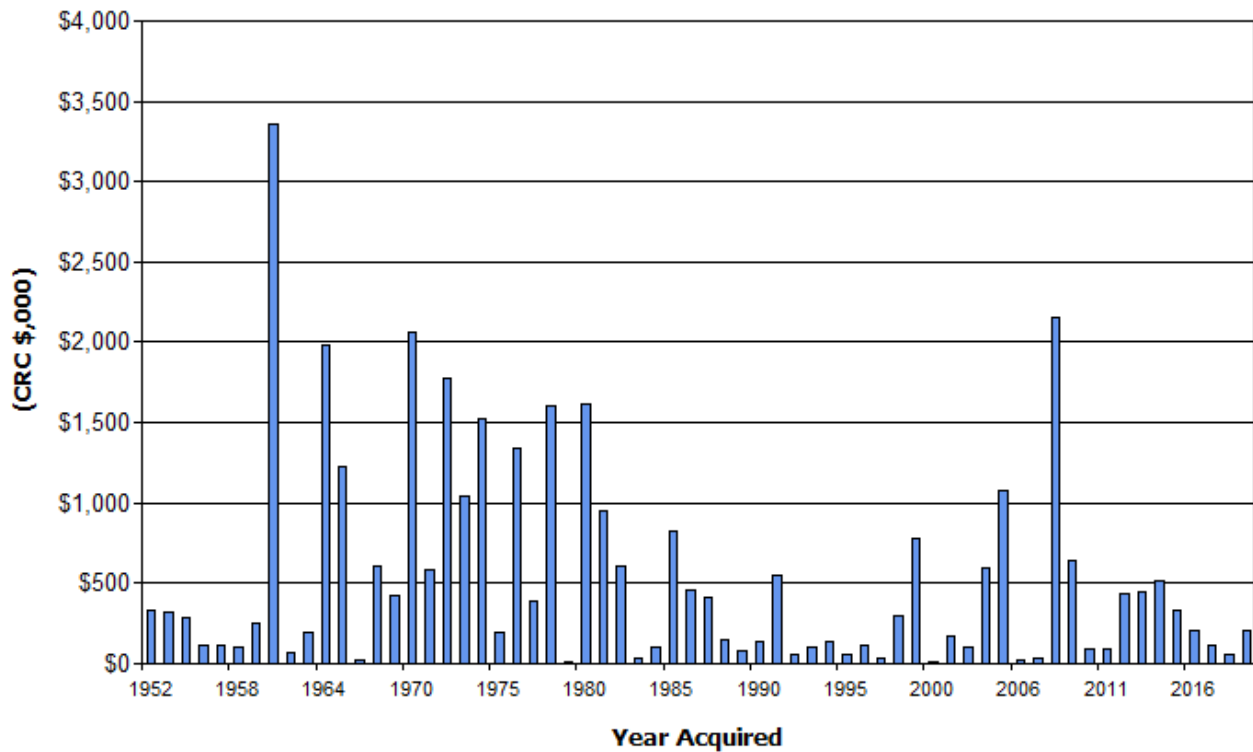


Figure Values are in current (real) dollars.

The data for the age profile is sourced from council's asset management system. While the ages of assets acquired prior to around 1999 are largely based on estimates, the relative accuracy is considered to be good overall due to the presence of long-serving, experienced works staff with high levels of local knowledge.

5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available.

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
Beach Outfalls – Wynyard to Somerset	Outfalls too close to shore and subject to regular blockage by tidal debris and sand movement.
Big Creek/Stanwyn Court, Wynyard	Floods dwellings in intense rain events
Port Creek/Old Bass Highway & surrounds, Wynyard	Floods dwellings in intense rain events coinciding with high tide
Cotton Street low lying areas, south of Inglis St, Wynyard	Floods dwellings in intense rain events

The above service deficiencies were identified from the Stormwater System Management Plan 2019.

5.1.3 Asset condition

Condition is not currently monitored in a formal way with the exception of pits and manholes.

For the most part, reliable and consistent data describing the current condition of the thousands of individual assets which make up the stormwater network have not been recorded. For this reason, the assets' remaining life (useful life minus age) has been selected as the most appropriate basis on which to model future renewals expenditure. It should be noted that, while this approach provides robust results for the network as a whole, it is less than ideal when considering any particular individual asset.

Condition is measured using a 1 – 5 grading system⁵ as detailed in Table 5.1.3.

Table 5.1.3: Simple Condition Grading Model

Condition Grading	Description of Condition
1	Very Good: only planned maintenance required
2	Good: minor maintenance required plus planned maintenance
3	Fair: significant maintenance required
4	Poor: significant renewal/rehabilitation required
5	Very Poor: physically unsound and/or beyond rehabilitation

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety and amenity, e.g. cleaning, street sweeping, utilities costs and street lighting.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again, e.g. road patching.

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.

Maintenance expenditure is shown in Table 5.2.1.

Table 5.2.1: Maintenance Expenditure Trends

Year	Maintenance Budget \$
2018/19	\$101,950 (budgeted operational exp less depr)
2019/20	\$155,093 (budgeted operational exp less depr)
2020/21	\$168,519 (estimated operational exp less depr)

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance expenditure levels are such that they will result in a lesser level of service, the service consequences and service risks have been identified and highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2020 dollar values (i.e. real values).

⁵ IPWEA, 2015, IIMM, Sec 2.5.4, p 2 | 80.

Figure 4: Projected Operations and Maintenance Expenditure

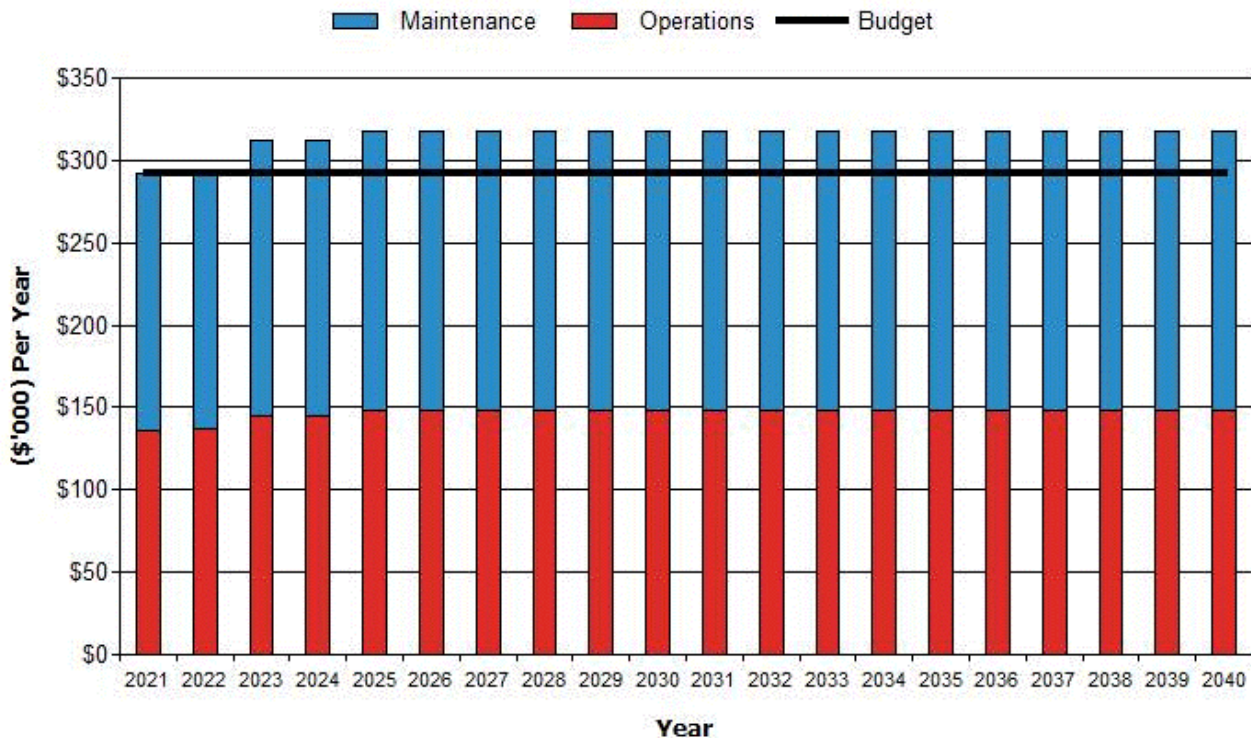


Figure Values are in current (real) dollars.

The step increases in operations and maintenance expenditure increases shown above are as a result of the projected capital New/Upgrade asset expenditure (refer s. 5.4.2).

Deferred maintenance, i.e. works that are identified for maintenance and unable to be funded are to be included in the risk assessment and analysis in the infrastructure risk register.

Maintenance is funded from the operating budget where available. This is further discussed in Section 7.

5.3 Renewal/Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity 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 upgrade/expansion or new work expenditure resulting in additional future operations and maintenance costs.

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template'.

- **Method 1** uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- **Method 2** uses capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems), or
- **Method 3** uses a combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'.

Method 2 was used for this asset management plan.

5.3.1 Renewal ranking criteria

Asset renewal and replacement is typically undertaken to ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. a pipe with structural damage is renewed).

5.3.2 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time when the asset stock increases and more of the assets approach the end of their useful lives (our oldest stormwater infrastructure is still little more than half way through its expected useful life). The expenditure required is shown in Fig 5. Note that all amounts are shown in current (real) dollars.

The projected capital renewal and replacement program is shown in Appendix A.

Fig 5: Projected Capital Renewal and Replacement Expenditure

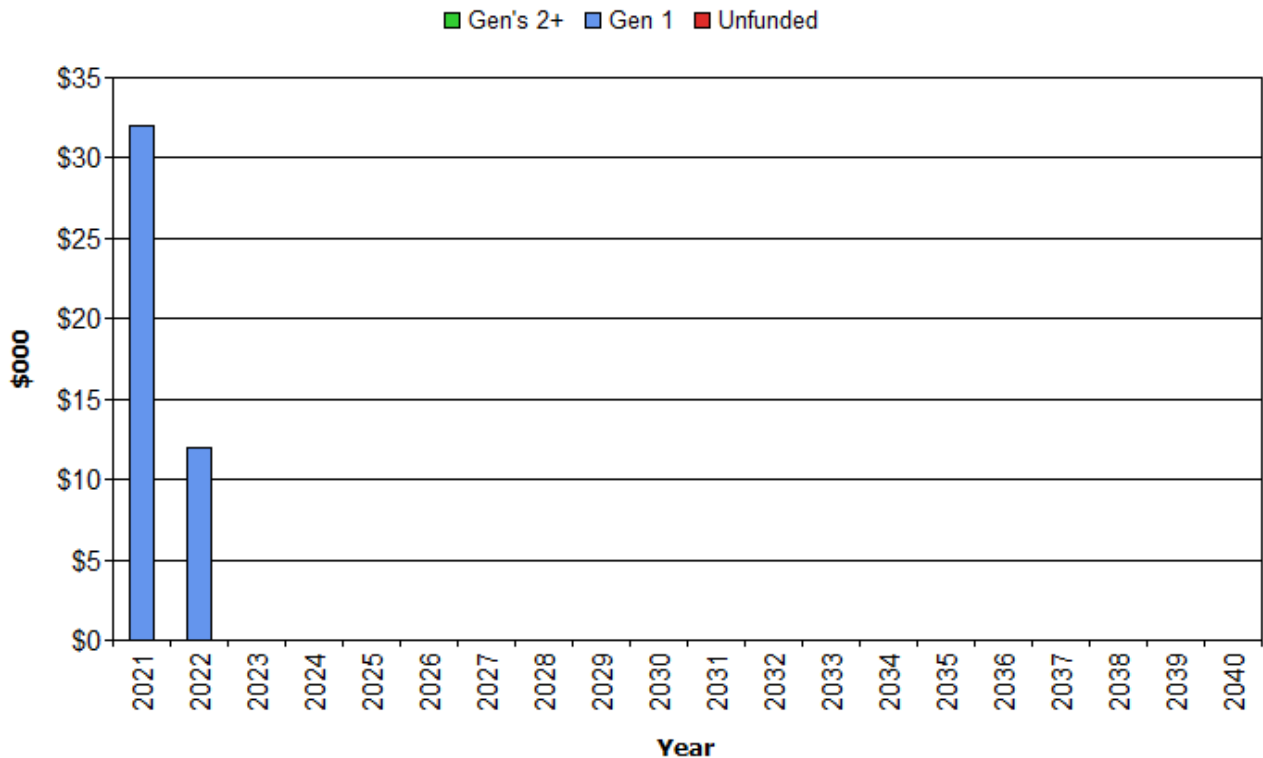


Figure Values are in current (real) dollars.

The assets identified for renewal comprise structurally failed assets and will incur minor losses on disposal.

Deferred renewal and replacement, i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.

Renewals and replacement expenditure in the capital works program will be accommodated in the long term financial plan. This is further discussed in Section 7.

5.4 Creation/Acquisition/Upgrade Plan

New works are those that create a new asset that did not previously exist, or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost. These additional assets are considered in Section 4.4.

5.4.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from major developments such as subdivisions and/or strategic master plans from Council and are prioritised from the Stormwater System Management Plan. Community requests for upgrades not directly attributed to flood risk to person or property are typically unfunded without an economic driver.

5.4.2 Summary of future upgrade/new assets expenditure

Projected upgrade/new asset expenditures are summarised in Fig 6. The projected upgrade/new capital works program is shown in Appendix B. All amounts are shown in real values.

Fig 6: Projected Capital Upgrade/New Asset Expenditure

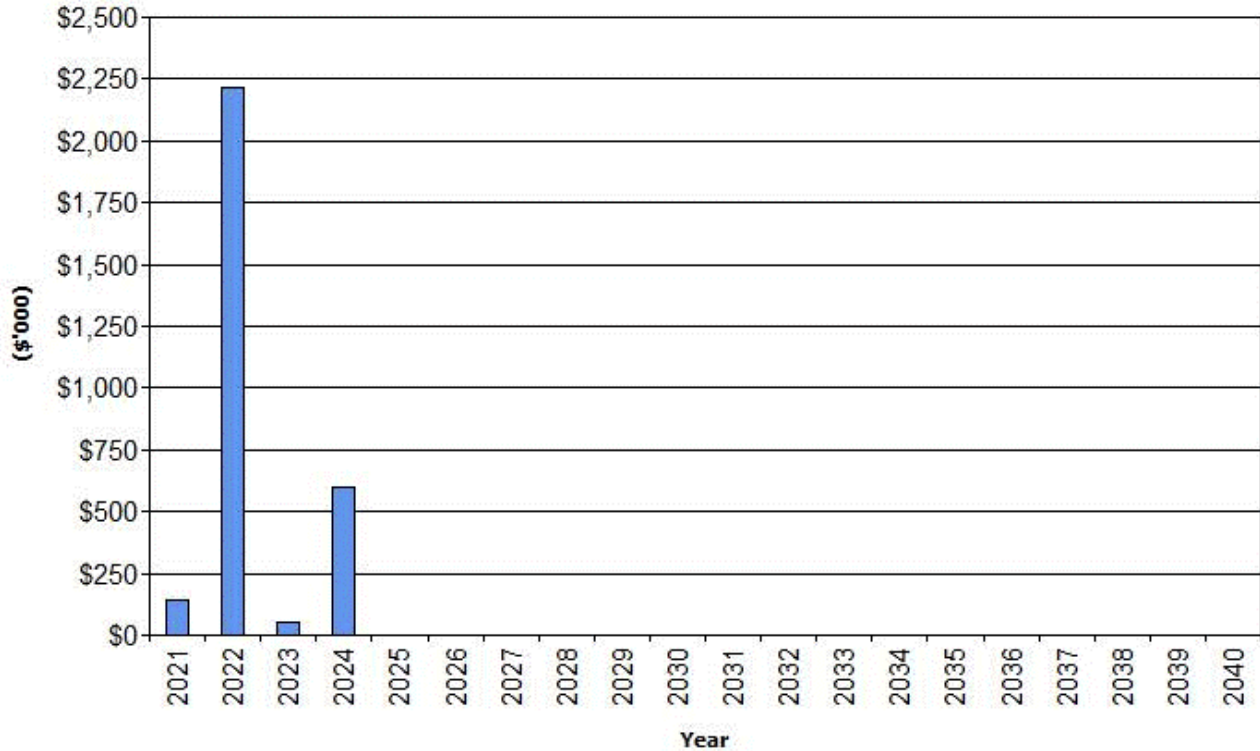


Figure Values are in current (real) dollars.

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 of the available funds.

Projected capital upgrade/new expenditure will require additional ongoing operations, maintenance and renewal funding for the period that the service provided from the assets is required into the future.

5.4.3 Summary of asset expenditure requirements

The financial projections from this asset plan are shown in Fig 7 for projected operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets). Note that all costs are shown in real values.

The bars in the graphs represent the anticipated budget needs required to achieve lowest lifecycle costs, the budget line indicates what is currently available. The gap between these informs the discussion on achieving the balance between services, costs and risk to achieve the best value outcome.

Fig 7: Projected Operating and Capital Expenditure

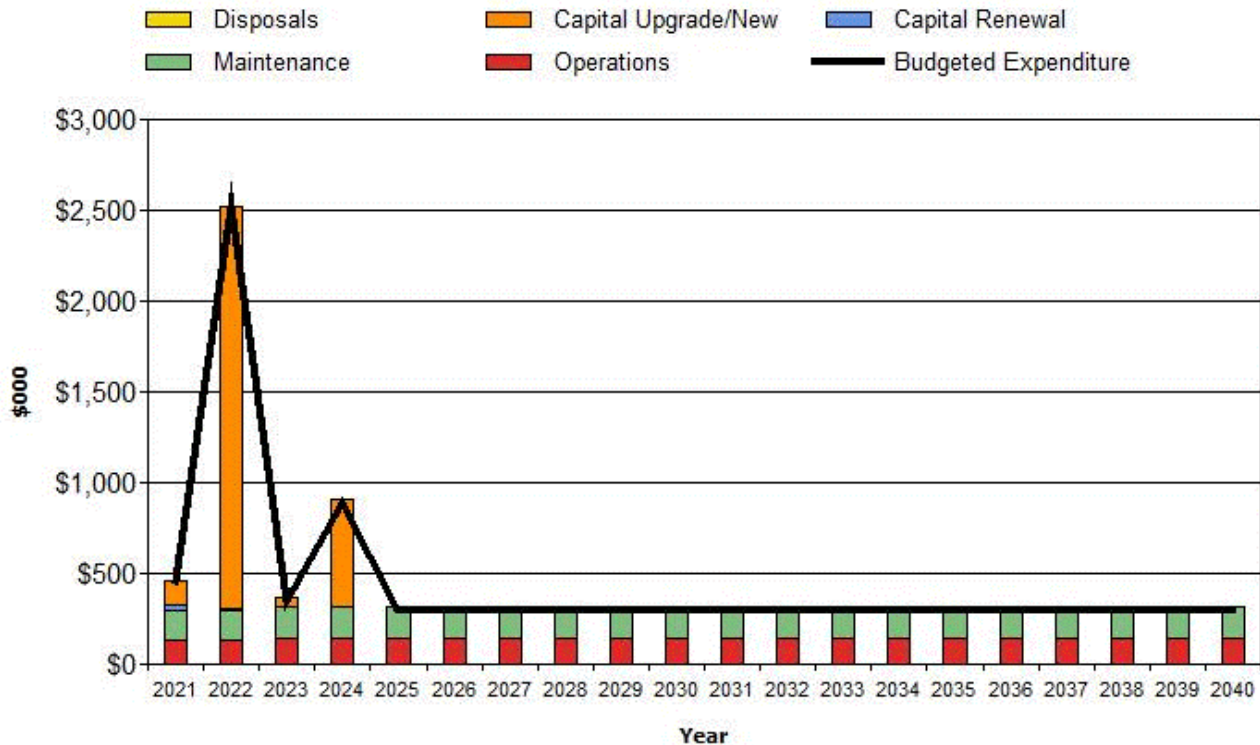


Figure Values are in current (real) dollars.

While some significant upgrade/new capital expenditure is forecast, it is considered able to be funded at this stage

5.5 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets to be replaced are disposed of as a normal part of the accounting process of asset renewal (e.g. replacement of a drainage pit). No additional assets are identified for decommissioning at this stage.

6. RISK MANAGEMENT PLAN

The purpose of infrastructure risk management is to document the results 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 31000:2009 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2009 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery from stormwater infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a ‘financial shock’. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

⁶ ISO 31000:2009, p 2

⁷ Waratah Wynyard Council’s risk register and Stormwater System Management Plan

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Similarly, critical failure modes are those which have the highest consequences.

Critical assets have been identified and their typical failure mode and the impact on service delivery are as follows:

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Beach Outfalls – Wynyard to Somerset	Outlet blockage	Risk of flooding to property upstream of blockage during rain events
Big Creek/Stanwyn Court, Wynyard	Flooding	Flooding affecting dwellings in high rainfall events
Port Creek/Old Bass Highway & surrounds, Wynyard	Flooding	Flooding affecting dwellings in high rainfall events
Cotton Street low lying areas, south of Inglis St, Wynyard	Flooding	Flooding affecting dwellings in high rainfall events

By identifying critical assets and failure modes investigative activities, condition inspection programs, maintenance and capital expenditure plans can be targeted at the critical areas.

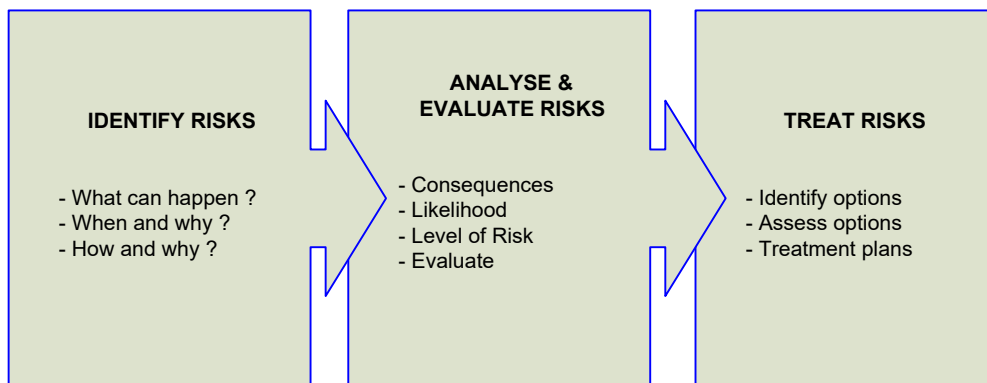
6.2 Risk Assessment

The risk management process used in this project 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 the ISO risk assessment standard ISO 31000:2009.

Fig 6.2 Risk Management Process – Abridged



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

An assessment of risks⁸ associated with service delivery from infrastructure assets has identified the critical risks that will result in significant loss, 'financial shock', or a reduction in service.

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

⁸ Waratah Wynyard Council's risk register and Stormwater System Management Plan

treatment cost after the selected treatment plan is implemented is shown in Table 6.2. These risks and costs are reported to management and Council.

Table 6.2: Critical Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Big Creek / Stanwyn Court	Flooding of dwellings	H	Consider options of: <ul style="list-style-type: none"> Levee wall 375m x 2m Detention basin upstream (dam) 	L	\$850,000
Cotton Street	Flooding of dwellings	M	Consider options of: <ul style="list-style-type: none"> Detention basin upstream (dam) Automated sluice gate & utilise natural detention pond Install correct stormwater network 	L	\$265,000
Port Creek	Flooding of dwellings	H	Consider options of: <ul style="list-style-type: none"> Widening of creek and levee construction Increase requirements on developers Investigate flow restrictors upstream 	L	\$1,285,000

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

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to our customers and the services we provide. To adapt to changing conditions and grow over time we need to understand our capacity to respond to possible disruptions and be positioned to absorb disturbance and act effectively in a crisis to ensure continuity of service.

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

Formal measures of resilience have not been developed and will be addressed in a future iteration of this asset management 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

No operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years have been identified at this stage however further work is required to identify under-capacity parts of the network.

6.4.2 Service trade-off

Operations and maintenance activities and capital projects that cannot be undertaken will maintain or create service consequences for users, namely less effective stormwater drainage.

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may maintain or create risk consequences, namely higher risks of flooding for affected properties.

These actions and expenditures are considered in the projected expenditures, and where developed are included in the risk management plan.

7. FINANCIAL SUMMARY

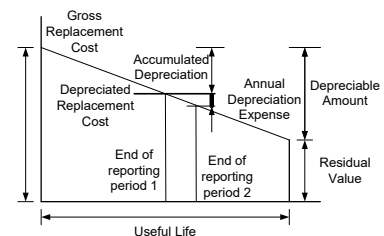
This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset performance.

7.1 Financial Statements and Projections

7.1.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. Assets are valued at current replacement cost.

Gross Replacement Cost	\$34,825,000
Depreciable Amount	\$34,825,000
Depreciated Replacement Cost⁹	\$18,151,000
Annual Average Asset Consumption	\$437,000



7.1.2 Sustainability of service delivery

Two key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category, these being the:

- asset renewal funding ratio, and
- medium term budgeted expenditures/projected expenditure (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹⁰ 100%

The Asset Renewal Funding Ratio is the most important indicator and indicates that over the next 10 years of the forecasting that we expect to have 100% of the funds required for the optimal renewal and replacement of assets.

Medium term – 10 year financial planning period

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed 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.

These projected expenditures may be compared to budgeted expenditures in the 10 year period to identify any funding shortfall. In a core asset management plan, a gap is generally due to increasing asset renewals for ageing assets.

⁹ Also reported as Written Down Value, Carrying or Net Book Value.

¹⁰ AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

The projected operations, maintenance and capital renewal expenditure required over the 10 year planning period is \$316,000 on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is \$296,000 on average per year requiring additional funding of \$19,000 per year.

Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 1.0 for the first years of the asset management plan and ideally over the 10-year life of the Long Term Financial Plan.

7.1.3 Projected expenditures for long term financial plan

Table 7.1.3 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2020 real values.

Table 7.1.3: Projected Expenditures for Long Term Financial Plan (\$000)

Year	Operations (\$000)	Maintenance (\$000)	Projected Capital Renewal (\$000)	Capital Upgrade / New (\$000)	Disposals (\$000)
2021	\$136	\$156	\$32	\$140	\$0
2022	\$137	\$157	\$12	\$2,213	\$0
2023	\$145	\$167	\$0	\$55	\$0
2024	\$145	\$167	\$0	\$600	\$0
2025	\$148	\$169	\$0	\$0	\$0
2026	\$148	\$169	\$0	\$0	\$0
2027	\$148	\$169	\$0	\$0	\$0
2028	\$148	\$169	\$0	\$0	\$0
2029	\$148	\$169	\$0	\$0	\$0
2030	\$148	\$169	\$0	\$0	\$0

7.2 Funding Strategy

Funding for assets is provided from the budget and long-term financial plan.

The financial strategy of the entity 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.

7.3 Valuation Forecasts

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, as well as the need for future renewal. Additional assets will also add to future depreciation forecasts.

7.4 Key Assumptions Made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan are:

- The services provided by assets are consumed at a constant rate over the pre-defined standard useful lives recorded in council's asset management system for each of the asset sub-categories (eg stormwater mains – 80yrs etc)
- Present service levels will remain constant for the life of the plan
- Present levels of expenditure (and the relative distribution of planned & reactive maintenance, and capital renewals & new/upgrades) will remain constant for the life of the plan
- No new assets from growth over life of plan (see comments in s5.4)

7.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale¹¹ in accordance with Table 7.5.

Table 7.5: 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 $\pm 2\%$
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 $\pm 10\%$
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 $\pm 25\%$
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 $\pm 40\%$
E. Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be **Uncertain (C)**.

¹¹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

8. PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices¹²

8.1.1 Accounting and financial data sources

- Authority
- Budget 2019/20
- Long Term Financial Plan

8.1.2 Asset management data sources

- Conquest
- 10 Year Works Plan

8.2 Improvement Plan

8.2.1 Status of Previous Improvement Plan

The status of improvement plan items identified in the previous plan (2010) are shown in Table 8.2.1 below.

Table 8.2.1: Status of Improvement Plan Items Identified in 2010 Asset Management Plan

Task No	Task	Timeline
1	Review and adopt Council's Asset Management Policy	Complete
2	Develop and adopt Levels of Service for stormwater infrastructure	Complete
3	Estimate new assets from growth factor	Not Started
4	Audit stormwater network and review asset attribute data and valuations	Substantially complete
5	Conduct system capacity analysis	Substantially complete
6	Develop asset condition inspection procedures	Commenced
7	Develop Infrastructure Risk Management Plan	Commenced
8	Formalise maintenance intervention levels for stormwater infrastructure	Complete
9	Develop weighted capital works priority ranking criteria	Complete

8.2.2 Improvement Plan

The asset management improvement plan generated from this asset management plan is shown in Table 8.2.2.

¹² ISO 55000 Refers to this the Asset Management System

Table 8.2.2: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Refer to sections 4 to 6 of Stormwater System Management Plan	Director IDS	Staff time	2022/23
2	Refer to section 2.3 of Stormwater Revaluation Report (2018-19) for improvement to data practices	Manager Asset Services	Staff time	2022/23
3	Identify and recognise open drains that are part of the Urban Stormwater System	Director IDS	Staff time	2020/21
4	Develop Infrastructure Risk Management Plan	Manager Asset Services	Staff time	2020/21
5	Document asset condition inspection procedures	Manager Asset Services	Staff time	2020/21
6	Purchase of pipe camera for condition monitoring and fault finding	Manager of Works & Projects	Capital budget allocation	2020/21
7	Purchase of GPS surveying equipment	Manager of Works & Projects	Capital budget allocation	2020/21
8	Estimate new assets from growth factor	Manager Asset Services	Staff time	2023/24
9	Develop resilience measures (ref section 6.3)	Manager Asset Services	Staff time	2023/24

8.3 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The AM Plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the long term financial plan.

The AM Plan has a life of 4 years and is due for complete revision and updating within 4 years of plan adoption.

8.4 Performance Measures

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

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long term financial plan,
- The degree to which 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the asset management plan,
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the target of 1.0.

9. 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.
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- IPWEA, 2012 LTFP Practice Note 6 PN Long Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- Waratah-Wynyard Council 10 Year Corporate Strategic Plan 2017-2027
- Waratah-Wynyard Council Annual Plan and Budget/s
- Waratah-Wynyard 10 Year Plan/s
- Local Government Act 1993
- Stormwater System Management Plan

10. APPENDICES

- Appendix A Projected 10 year Capital Renewal and Replacement Works Program
- Appendix B Projected 10 year Capital Upgrade/New Works Program
- Appendix C LTFP Budgeted Expenditures Accommodated in AM Plan

Appendix A Projected 10-year Capital Renewal and Replacement Works Program

Data from 10 year works plan

DRAINAGE 10 YEAR WORKS PLAN

Renewal Year	Project/Asset Name	Description/Notes	Locality	Renewal
2020/21	Stormwater upgrade crn Dodgin & St		Wynyard	32,000
2020/21	Replace stormwater pipe & manhole Church Street		Wynyard	11,800

Appendix B Projected Upgrade/Exp/New 10-year Capital Works Program

Data from 10 year works plan

DRAINAGE 10 YEAR WORKS PLAN

Renewal Year	Project/Asset Name	Description/Notes	Locality	Upgrade	New
2020/21	Flood mitigation - Big Creek - design and planning	Big Creek flood retention basin - prelim investigation / design - NEED PLANNING PERMIT (and DPIPWE approval)	Wynyard		40,000
2020/21	Flood mitigation - Port Creek - design and planning	Port Creek flood retention levee bank - prelim investigation, site survey, geotech and design - NEED PLANNING PERMIT (and DPIPWE approval)	Wynyard		85,000
2020/21	Flood mitigation - Cotton Street - design and planning	Cotton Street flow retention - prelim investigation, site survey and design	Wynyard		15,000
2021/22	Flood mitigation - Big Creek - construction	Big Creek flood retention basin - construction (incl purchase of land and compensation for trees) - 100yr LIFE - Est Oper \$10k p/a	Wynyard		762,500
2021/22	Flood mitigation - Port Creek - construction	Port Creek flood retention levee bank - construction - NORTH SIDE ONLY - 100yr LIFE - Est Oper \$10k p/a	Wynyard		1,200,000
2021/22	Flood mitigation - Cotton Street - construction	Cotton Street flow retention - construction - 25yr LIFE - Est Oper \$10k p/a	Wynyard		250,000
2022/23	BHB - Uphill of residential creek (Uphill of VOS subdivision) - open drain - PLANNING & DESIGN				15,000
2022/23	Somerset capacity issues - Ant Smith - PLANNING & DESIGN		Somerset		40,000
2023/24	BHB - Uphill of residential creek (Uphill of VOS subdivision) - open drain - CONSTRUCTION		Sisters Beach/ Boat Harbour		100,000
2023/24	Somerset capacity issues - Ant Smith - CONSTRUCTION		Somerset		500,000

Appendix C Budgeted Expenditures Accommodated in LTFP

NAMS.PLUS3 Asset Management		Waratah-Wynyard								
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Stormwater 2020_S2_V3		Asset Management Plan								
First year of expenditure projections		2021 (financial yr ending)								
Stormwater 2020										
Asset values at start of planning period		Calc CRC from Asset Register								
Current replacement cost	\$34,825 (000)	\$0 (000)								
Depreciable amount	\$34,825 (000)	This is a check for you.								
Depreciated replacement cost	\$18,151 (000)									
Annual depreciation expense	\$437 (000)									
Planned Expenditures from LTFP		Operations and Maintenance Costs for New Assets								
		Additional operations costs: 0.39% Additional maintenance: 0.45% Additional depreciation: 1.25% Planned renewal budget (information only)								
20 Year Expenditure Projections		Note: Enter all values in current 2021 values								
Financial year ending	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Expenditure Outlays included in Long Term Financial Plan (in current \$ values)										
Operations										
Operations budget	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136
Management budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
AM systems budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total operations	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136	\$136
Maintenance										
Reactive maintenance budget	\$47	\$47	\$47	\$47	\$47	\$47	\$47	\$47	\$47	\$47
Planned maintenance budget	\$109	\$109	\$109	\$109	\$109	\$109	\$109	\$109	\$109	\$109
Specific maintenance items budget	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total maintenance	\$156	\$156	\$156	\$156	\$156	\$156	\$156	\$156	\$156	\$156
Capital										
Planned renewal budget	\$32	\$12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Planned upgrade/new budget	\$140	\$2,213	\$55	\$600	\$0	\$0	\$0	\$0	\$0	\$0
Non-growth contributed asset value	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Asset Disposals										
Est Cost to dispose of assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Carrying value (DRC) of disposed assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)										
Additional Expenditure Outlays required and not included above	2021 \$000	2022 \$000	2023 \$000	2024 \$000	2025 \$000	2026 \$000	2027 \$000	2028 \$000	2029 \$000	2030 \$000
Operations	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Renewal	to be incorporated into Forms 2 & 2.1 (where Method 1 is used) OR Form 2B Defect Repairs (where Method 2 or 3 is used)									
Capital Upgrade	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
User Comments #2										
Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)										
Forecast Capital Renewal from Forms 2A & 2B	2021 \$000	2022 \$000	2023 \$000	2024 \$000	2025 \$000	2026 \$000	2027 \$000	2028 \$000	2029 \$000	2030 \$000
	\$32	\$12	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Forecast Capital Upgrade from Form 2C	\$140	\$2,213	\$55	\$600	\$0	\$0	\$0	\$0	\$0	\$0