

ASSET MANAGEMENT PLAN – DRAINAGE (2023 – 2027)

Shire of York – Asset Management System

Document Control

Document Name:	Shire of York Asset Management Plan – Drainage (AM Plan)
Document ID:	TA22017_4_York_AMP_Drainage_4.0
Document Owner:	Executive Manager Infrastructure and Development Services
Document Status:	Draft
Document Authority:	Administrative
Review Scheduled for:	July 2028 (5 years)

Revision Schedule

Rev No	Date	Revision Details	Author	Reviewer	Approver
V1.0	Nov 2022	First draft	Talis	Shire staff	n/a
V2.0	Jan 2023	Second Draft	Talis	Shire staff	EMIDS
V3.0	May 2023	Final for Review	Talis	ELT	EMIDS
V4.0	June 2023	For Council for information	Talis	EMIDS	EMIDS

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Acknowledgement of Country

The Shire of York acknowledge the Traditional Custodians of the land, the Ballardong people of the Noongar nation and pays respects to Elders past, present and emerging. We recognise the unique and valuable contribution the Ballardong Noongar people have made and continue to make to our culture and in our community. The land on which we live, meet and thrive as a community always was and always will be Noongar land.

Definitions	
Term	Description
Asset Register	Means a record of asset information considered worthy of separate identification including inventory, historical, condition, construction, technical, and financial
Acquisition	Means the creation of a new asset to meet additional service requirements
Capex	Means Capital Expenditure
Contractor	Means the person or persons, corporation, or corporations whose Response is accepted by the principal, and includes the executors or administrators, successors and assigns of such person or persons, corporation, or corporations
Council	Means the Council of the Shire of York
Grant	Means external funding/monies that are received by the Shire that contribute towards capital works and/or maintenance and operational activities.
Level of Service (LOS)	means meeting community expectations in relation to the quality and quantity of services delivered by Council required to meet the agreed or expected performance. In some contexts, it could be an adjusted performance expectations/standards of an asset in coordination with stakeholders due to limited financial resources.
Lifecycle	Means the cycle of activities that an asset goes through while it retains an identity as a particular asset
Lifecycle Cost	Means the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, disposal and renewal costs
Local Government	Means the Shire of York
Maintenance	Means actions taken to preserve, repair or restore condition and functionality of assets. For ex: corrective repairs, inspection, repair of potholes and cracks on road etc. Maintenance can be reactively performed or proactively performed as part of a planned preventative program of works.
Municipal Funds	Means funds approved for expenditure as part of the annual budget adoption process through Council.
Operations	Means the regular activities to provide public health, safety and amenity and to enable the assets to function e.g. road sweeping, grass mowing, cleaning, street lighting and graffiti removal and support services for the performance of maintenance and asset management services.
Opex	Means Operating Expenditure
Renewal	Means restores, rehabilitates, replaces existing asset to its original capacity. This may include the fitment of new components necessary to meet new legislative requirements in order that the asset may achieve compliance and remain in use
Risk	Means probability and consequence of an event that could impact on the Council's ability to meet its corporate objectives
Shire	Means the Shire of York
Transport Assets	Means to include roads, bridges, drainage and footpaths
Upgrade	Means enhances existing asset to provide a significantly higher level of service
Useful Life	Means the period over which a depreciable asset is expected to be used.
Principal	Shire of York
SoY	Shire of York

1 Executive Summary

1.1 The Purpose of the Plan

This document ‘**Asset Management Plan-Drainages**’ (AM Plan) provides key information on drainage infrastructure assets within the Shire of York (the Shire). This AM Plan has been developed for the management of drainage assets. The AM Plan combines multi-disciplinary management techniques (technical and financial) for the performance of services across four (4) key phases of the lifecycle of the asset, this is known as the ‘Asset Management Lifecycle’.

The four (4) key phases of the Asset Management Lifecycle and their associated services are summarised in **Table 1- Asset Management Lifecycle Phases**. This AM Plan establishes key parameters for the management of bridge assets that include Levels of Service, Future Demand, Lifecycle Management Plans, Financial Projections alongside the implementation of Asset Management Practices including Performance Monitoring and Improvement. This AM Plan links with the Shire’s Long-Term Financial Plan (LTFP) to ensure funding is aligned to meet infrastructure requirements over the same ten (10) year period and to ensure that bridge assets meet Council’s priorities for service delivery.

Table 1- Asset Management Lifecycle Phases

Phases	1- Plan	2- Acquire	3- Operate & maintain	4- Dispose
Services	Asset Management Planning	Investment of funds to acquire new asset or renew asset – Capital funds are typically allocated for these activities.	Allocation of funds to maintain and operate existing assets- Operational funds are typically allocated for these activities across the “useful life” of the asset*	Asset disposal-removal of the asset from service through unpredictable failure or planned decommissioning.
*Useful Life of the asset is the period over which a depreciable asset is expected to perform				

1.2 Asset Description

This document (AM Plan) is limited to discussing bridge assets that are owned or controlled by Council. **Table 2- Shire of York Drainage Assets** below summarises the types of drainage, quantity, material construction and replacement value of Shire drainages.

Table 2- Shire of York Drainage Assets

Class	Sub Class	Asset	Material	Unit	Quantity	Replacement Value
Drainage	culvert	box shaped	concrete	M	209	\$402,336
	culvert	box shaped	timber	M	11	\$20,470
	culvert	circular	concrete	M	8693	\$3,921,810
	culvert	circular	steel	M	102	\$38,409
	culvert	circular	other	M	31	\$19,426
	culvert	other	concrete	M	1735	\$3,876,312

	pit	all	concrete	Ea.	140	\$251,955
	SW Channel	table drain	insitu	M	1216528	\$1,216,528
	SW Channel	kerb	concrete	M	71308	\$2,353,164

The above infrastructure assets have replacement value estimated at \$12.10 Million as of 30 June 2022.

1.3 Levels of Service

A 'Level of service' typically means the expectation of the quality and quantity of services required to be performed to realize an agreed condition and/or service provision. The types of services required to be performed vary depending on the phase of the Asset Management Lifecycle.

Key programs that assist with managing the Level of Service include:

- Asset Management Planning and Monitoring (Asset Performance)
- Asset Renewal or Acquisition (Construction)
- Operational and Maintenance Services (Service Standards)
- Asset Disposal (Asset Acquittal)

This AM plan assumes that the Shire holds the objective of maintaining existing Levels of Service across all bridge assets and that key programs are developed across the asset management lifecycle to reflect this objective. The budget assumptions for maintaining service levels do not make provision for any future demand changes as outlined in section **1.4 Future Demand** in this document.

Table 3-Works Programs Across the Asset Management Lifecycle

Phases	1-Plan	2-Acquire	3-Operate & Maintain	4-Dispose
Programs	Asset Management Planning	Lifecycle Renewal (partial asset replacement)	Operational Services ("soft" services)	Asset Disposal (removal of asset from service)
	Asset Monitoring (demand monitoring, condition monitoring)	Acquisition (Full asset replacement)	Maintenance Services (Planned/Preventative) ("hard services")	
			Maintenance Services (Reactive Maintenance Services) ("hard services")	

The main service consequences of the Planned Budget are:

- Undertake planned regular cleaning and inspection of drainage assets

- Culverts extension program
- Drainage upgrade and renewals on priority basis.
- Develop a stormwater drainage strategy to identify problem sites, solution, and priorities in townsite.

1.4 Future Demand

Service levels across bridge assets may be influenced by future demand. Key factors that influence demand are summarised in **Table 6- Key Factors Influencing Demand**.

Table 6- Key Factors Influencing Demand

Item no.	Factor
1.	Population growth
2	Changing age demographic
3	Infill residential development
4	Precinct development
5	Changed Service use (i.e., changed transport routes or transport type)
6	Motorised scooters and similar
7	Economic constraints
8	Changing Environmental conditions
9	An aged and deteriorated asset portfolio

It is important that Asset Managers monitor factors that may change and impact demand in order that asset management programs can be adjusted to maintain agreed service levels.

Along with demand management (monitoring), asset managers may develop risk management strategies to deal with unpredictable changes in demand levels that may impact on service levels and/or impact on asset failure. **Table 7- Key Tasks to Manage Asset Failure Risk**, summarizes the types of strategies or tasks that asset managers may perform to manage demand and service levels.

Table 7- Key Tasks to Manage Asset Failure Risk

Item no.	Task
1.	Complete Regular Asset Valuations
2	Insure Assets
3	Develop Emergency Response Plans/Procedures
4	Assess Asset Criticality
5	Regular Demand Monitoring

Importantly the impact of the failure for some bridge assets may be higher than others as they form critical parts of the local or regional transport network. Demand monitoring helps to inform asset managers of the potential need for an increase in service level, the associate economic impact and

timelines for asset renewal works. Demand monitoring allows the asset manager to be proactive and ensure that works schedules can be adjusted to changing demand conditions to ensure the asset does not fail or reduce the severity of unpredictable failure.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

This AM Plan forecasts costs necessary to manage the delivery of works programs through each phase of the asset management lifecycle. Costs are assigned to each asset lifecycle phase, these phases include the operational and maintenance phase, lifecycle renewal or acquisition phase, and disposal phase.

The AM Plan may be adjusted for a range of time periods and to suit available budgets. The AM Plan typically helps to inform Long-Term Financial Planning periods of ten (10) years.

This AM Plan estimates that a requirement of 1 million and 50 thousand (\$1,500,000) or \$0.15 Million is required annually over a period of ten (10) years to maintain and operate Shire drainages.

1.6 Financial Summary

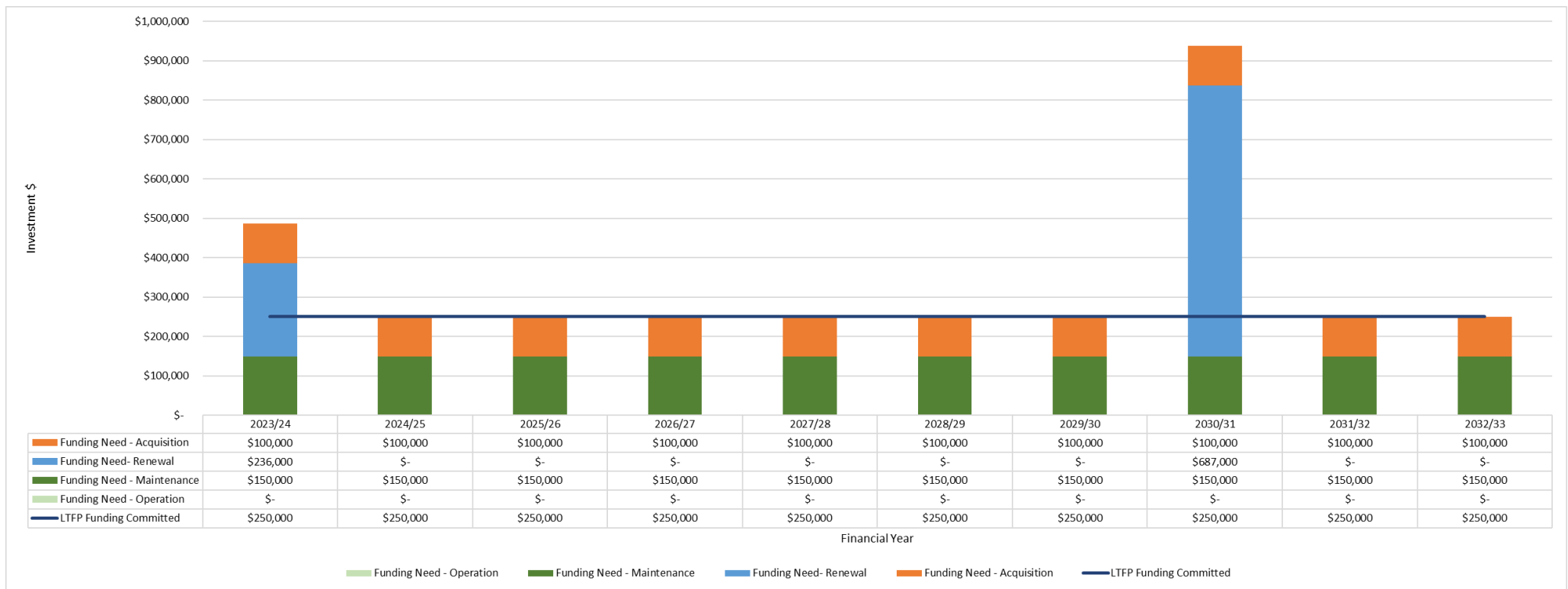
1.6.1 What we will do

Estimated available funding for the 10 year period is \$2.5 Million (or \$0.25 Million on average per year as per the Long-Term Financial plan or Planned Budget). This is 68% 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 Drainage leaves a shortfall of \$0.116 Million 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



Figures are as at May 2023

The current LTFP does not provide any funds to operate, maintain, renew or upgrade drainage assets. At present the Shire responds to urgent issues using the road maintenance budget. It is assumed that 15% of the road maintenance budget were used for maintenance of drainage.

1.6.2 Limitations (What we cannot do)

We currently do **not** allocate enough budget to sustain these services at the proposed standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Annual operation and maintenance of all drainage systems including routine inspection, clearing, maintenance and repairs. (A partial response only is possible)
- Clear all blocked collapsed and damaged culverts immediately
- Address the emerging need for drainage asset renewal and upgrade. *
- Investigate or improve anecdotally known recurring drainage problem sites. *
- Local or systemic drainage improvements*

The services marked * are proposed to be addressed if the recommended budget allocations are made including development of a stormwater management plan.

1.6.3 Managing the Risks

Our present budget levels are insufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Drainage system failures leading to localised flooding, damage.
- Public dissatisfaction with the function, condition, amenity, value for money or other concerns leading to reputational loss
- A major flood event including flooding of the Avon River leading to closure of town streets
- An unexpected consequence (e.g., asset failure) of not being aware of the condition of the drainage including wash outs, road closures, pavement collapse and similar
- Public dissatisfaction with the function, condition, amenity, value for money or other concern about public facilities or private property
- Possible increase of insurance claims against the Shire leading to financial loss, and/or loss of insurance cover.
- A government or insurance industry change requiring the Shire to substantially upgrade stormwater assets, legacy cost, inability to obtain insurance or other financial obligations

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

- Develop a stormwater management plan for the York Townsite
- Adopt a preventative planned inspection and maintenance schedule for drainage assets
- Prioritise renewal of failed, or failing drainage assets
- Apply minimum design standards to acquisition and renewal projects

1.7 Asset Management Planning Practices

Key assumptions made in this AM Plan are:

- The asset register, condition data and other source information is a true reflection of the real world (see confidence statement). A full survey of assets was undertaken in 2018 and a sample survey of 10% in 2022.
- The assets are of sufficiently uniform design, construction, quality, and usage that reliable statistical forecasts can be made.
- The assets are being (and have been) maintained and operated appropriately, such that useful lives will be achieved.
- No data was available to estimate a maintenance budget, and it was estimated on minimal available information. 15% of road maintenance budget is assumed to be spent on drainage maintenance.
- Costs of assets are estimated on average project costs, without project plans or site inspection. On the average these are statistically reliable, but in the individual case variation can be expected

Assets requiring renewal are identified from either the asset register or an alternative method.

- The timing of capital renewals based on the asset register is applied by adding the useful life to the year of acquisition or year of last renewal, or
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

The asset registers and condition data were used to forecast the renewal lifecycle costs for this AM Plan.

This AM Plan is based on a reliable level of confidence information.

1.8 Monitoring and Improvement Program

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

Item	Description	Responsibility	Resources required	Priority	Timeline
R1	Separate funding of drainage assets from other asset funding in the budget and cost reporting, including identify and report operation & maintenance, renewal, and acquisition of drainage separately in the finance system	Council	TBA	Very high	June 2023
R2	Develop and adopt a stormwater management plan including consideration of current and emerging needs, expected service levels, service gaps and infrastructure improvement plan.	EMIDS	TBA	High	June 2024
R3	Commence proactive maintenance of culverts including inspection and clearing of	EMIDS	TBA	High	June 2024

	a portion of culverts on a rolling basis. (estimate 10% of assets per annum with current funds)				
R5	Commence a program to replace or acquire new culverts and urban drainage each year at trouble spots to be identified.	EMIDS	TBA	High	June 2024
R6	Implement the level of service for a 12-month trial period and then review	EMIDS	TBA	Medium	June 2026
R7	Establish separate cost centres for the reporting of drainage maintenance and capital works, with consideration to define activity type and asset worked on	Finance	TBA	Medium	June 2024
R8	Undertake Internal reviews of performance and issues- June 2023,2024,2025.	EMIDS	TBA	Medium	June 2023, 2024, 2025
R9	Undertake external AMS audit June 2026.	EMIDS	TBA	Medium	June 2026
R10	Adopt a data management plan including scheduled updates of drainage data.	EMIDS	TBA	Low	June 2025
R11	Review service levels including drainage protection from river flood and rainfall runoff	EMIDS	TBA	Very Low	June 2027
13	Develop and document processes for key functions such as valuation, acceptance of new assets, inspection, forward works planning and similar.	EMIDS	TBA	Very Low	Future

2 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.

The AM Plan is to be read with the Shire planning documents. This should include the Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Operational Policy – Asset Management
- Shire of York – Strategic Community plan 2020-2030
- Shire of York – Long Term Financial Plan 2016-2026
- Shire of York – Annual Budget 2022-23
- Shire of York Corporate Business Plan 2020-2024

The Shire is currently undergoing a comprehensive review and update of all its asset management planning documentation. The main objective being to implement a suite of transparent and workable documents that will assist Council and Executive Management with effective and purposeful decision making.

The infrastructure assets covered by this AM Plan includes rural and urban drainage infrastructure. For a detailed summary of the assets covered in this AM Plan refer to Table in Section 5.

These assets are used to provide pedestrian and bicycle access services.

The infrastructure assets included in this plan have a total replacement value of \$12.100 Million.

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

Table 2.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Councillors	<ul style="list-style-type: none"> • Represent needs of community/shareholders, • Allocate resources to meet planning objectives in providing services while managing risks, • Ensure service sustainable. • Funding of drainage services
Executive Leadership Team	<ul style="list-style-type: none"> • Prioritise and support the development of a suite of asset management plans • Utilise the findings and recommendations from asset management plans to better inform forward planning, including considerations for budget and updating long term financial plan
Corporate Services	<ul style="list-style-type: none"> • Regularly review and update asset register, ensuring valuations are current and accurate • Comply with the Shire’s significant accounting Policies document • Provision of administration support
Infrastructure Services	<ul style="list-style-type: none"> • Provide local knowledge and detailed condition reports on all the Drainage assets • Provide information around maintenance schedules and ability to meet technical and customer levels of service
External Parties	<ul style="list-style-type: none"> • Community residents and businesses – provision of feedback and desired levels of service • Neighbouring Local Governments – knowledge and experience sharing • Federal and State Government authorities and agencies provide legislative and best practice guidance • Main Roads WA –approval of works on designated Main Roads and Highways, integrated drainage systems • EPA – regulatory role with respect to Avon River catchment

Our organisational structure for service delivery from infrastructure assets is detailed below,

Diagram 2- Shire of York Organisational Structure



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.

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

- International Infrastructure Management Manual 2015 1
- ISO 550002

A road map for preparing an AM Plan is shown in **Diagram 3**.

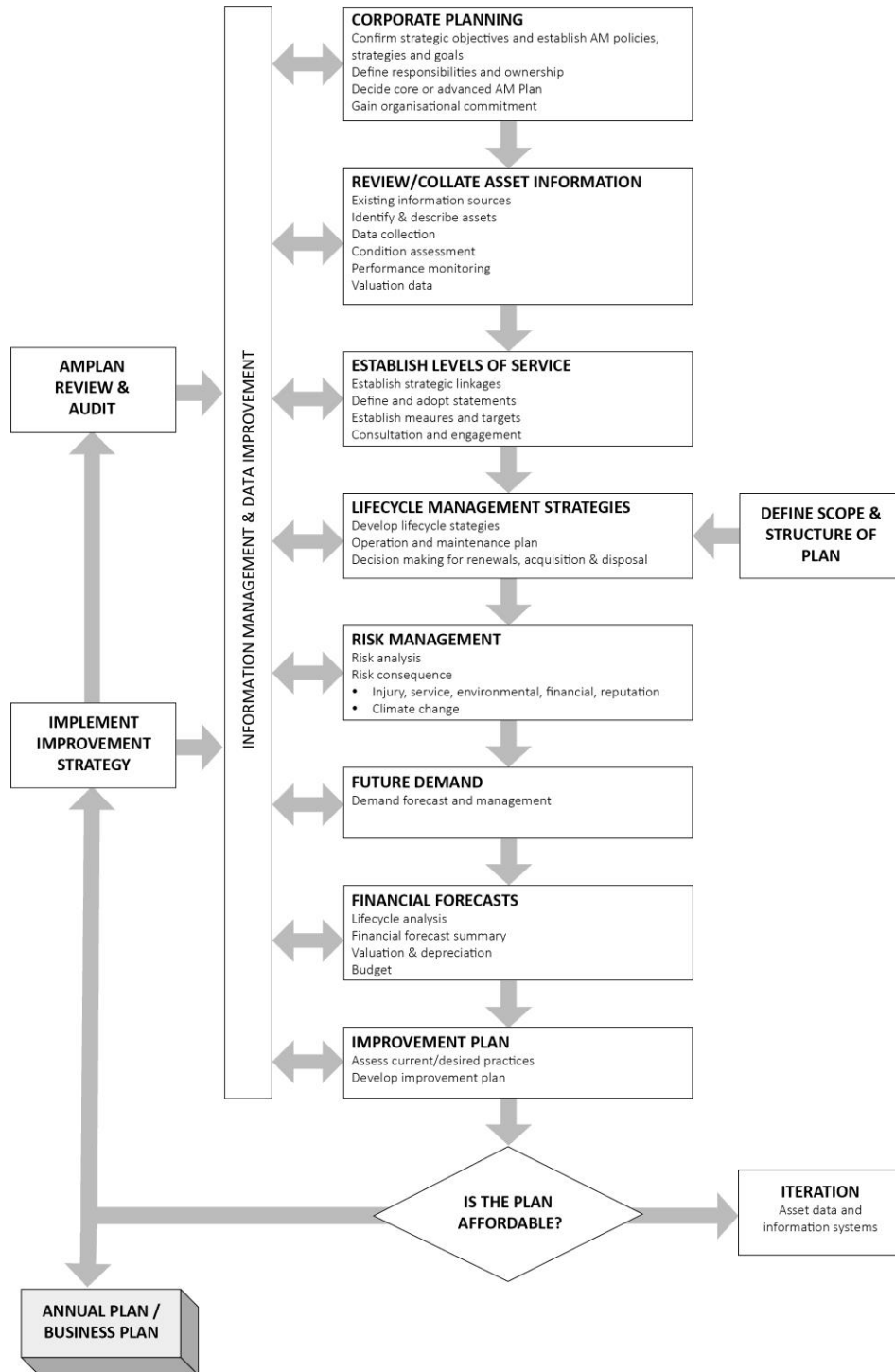
¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2| 13

² ISO 55000 Overview, principles, and terminology

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

Diagram 3-Road Map for preparing an Asset Management Plan

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



3 Levels of Service

3.1 Customer Research and Expectations

There is currently no specific research on customer expectations for drainage. The 2021 Community survey observed a high community interest in the need for drainage improvements. Future revisions of the AM Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist the Shire of York 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.

3.2 Strategic and Corporate Goals

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

Our vision is:

Community, Councillors and Council staff all contributed to the vision and stated that they wanted the Shire of York to be:

- *A proud community, which values and preserves its history, heritage, rural character, and country lifestyle.*
- *A cohesive and vibrant community, respecting diversity and working together with a strategic vision*
- *A friendly and safe place with strong community spirit*
- *An economically strong community, with growth in employment, businesses, agriculture, and tourism*
- *A place with easy access to a full range of social services, including medical, education, law, and order*
- *A unique and beautiful place, attractive to residents, businesses, and visitors – a town where people can come to learn and experience different things away from the city*
- *A place with hope for the next generation, where heritage, the natural environment, farming, and new developments are in balance*
- *A place of opportunity where our young people have a sense of what it means to belong to a community and be included*
- *A community recognised locally, nationally, and internationally for its heritage, arts and crafts, and approach to tourism*
- *A Council, which provides leadership and vision, and is committed to working with all the diverse elements of the community to create a future of promise.*

Our mission is:

- *To Build our History*
- *To Create our Future*

Strategic goals have been set by the Shire. 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	How Goal and Objectives are addressed in the AM Plan
The Place to Be	To be a close-knit community full of life, in a welcoming and accessible place for all.	Provide effective drainage protection of property and community
Driving the York Economy Forward	To have a vibrant, diverse, and prosperous local economy which creates local jobs, business opportunities and a positive image for the Shire	Ensure continuity of business and protection of assets
A leader in sustainable environment	To be a place which is renowned for the quality of its natural environment, the astounding beauty of the landscape, and the care taken by the community	Protect the environment and waterways
Built for lifestyle and resilience	To have a built environment which supports community, economy, and the environment, respects the past and creates a resilient future.	Clean and healthy built environment.
Strong Leadership and Governance	To have an effective and responsive leadership and governance, where a sense of collective purpose and shared direction combine to work together.	Provide well managed and sustainable assets.

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Acts	Subordinate Requirements	Requirement
<i>Local Government Act 2020</i>	<i>Regulations, 1996</i> <i>Functions and General Regulations, 1996</i> <i>Financial Management Regulations, 1996</i> <i>Administration Regulations, 1996</i>	Annual Valuation Budget and Approval Financial Planning Financial Reporting Governance Procurement Rules IPR Framework Accounting standards
<i>Planning and Development Act 2005</i>	Town Planning Scheme Local Planning Strategy	Developer contribution schemes New assets and changing demand for assets Planning Requirements
<i>Main Roads Act 1930</i>	<i>Works on highways</i> <i>Signage and line marking requirements</i>	Signs and line marking State Highways and Main Roads Speed zoning Network reporting
<i>Road Traffic Code (Traffic Act 1974 and various other Acts)</i>	Design Standards As of right usage	Drainage Infrastructure requirements to meet as of right use Road Safety Requirements for the drainage system
<i>Work Health and Safety Act 2020</i>	Occupational Health and Safety Regulations	Safe work practices Safety at worksites Public Safety
<i>Limitation (of Public Liability) Act 2005</i>	Common law Insurance Requirements	Asset inspection and management requirements Evidence based maintenance system addressing risks appropriately
<i>Disability Services Act, 1993</i>	Universal Access	Universal access provisions Design Standards
<i>Environmental Protection Act 1986</i>	Clearing of Native Vegetation Regulations 2004	Limit environmental harm Clearing of native vegetation Protection of rare flora and riparian vegetation
<i>Aboriginal Heritage Act 1972</i>	Native Title Aboriginal Heritage	Access to land subject to claims Cultural considerations

<i>Waterways Conservation Act 1976</i>	Waterways protection	Interference with natural water courses
<i>State Records Act 2000</i>	Preservation of public records	Record keeping

3.4 Customer Values

Service levels are defined in three(3) key ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

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

Table 3.4: Customer Values

Item No.	Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
1	Functional, normal weather	No property flooding instances	Drains needs clearing	Planned drainage clearing work annually and improve service gradually
2	Functional, extreme events	Temporary disruptions only in extreme events	Washout of driveways and blocked drains	Planned drainage clearing work annually and improve service gradually
3	Affordable	Sustainably funded	unknown	satisfactory
4	Value for Money	Customer satisfaction survey	unknown	satisfactory
5	Compliant (safety)	Not applicable	Not applicable	Not applicable
6	Amenable	Not applicable	Not applicable	Not applicable
7	Environmentally Conscious	Prevent pollution of river	unknown	unknown
8	Socially enhancing	Not applicable	Not applicable	Not applicable

3.5 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Condition How good is the service ... what is the condition or quality of the service?

Function Is it suitable for its intended purpose Is it the right service?

Capacity/Use Is the service over or under used ... do we need more or less of these assets?

In Table 3.5 under each of the service measure types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

These are measures of fact related to the service delivery outcome (e.g., number of occasions when service is not available or proportion of replacement value by condition %'s) to provide a balance in comparison to the customer perception that may be more subjective.

Table 3.5: Customer Level of Service Measures

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Condition of Culverts	Condition rating of culverts	Most assets are in condition 3 (fair) of better condition and approximately 20% of culverts are in condition 4 (poor) and condition 5 (very poor) condition.	No allocation of budget for Drainage Maintenance is likely to result in deterioration of assets in medium to long term. Gradual improvement if recommendations in AMP are followed.
	<i>Confidence levels</i>		medium (Professional Judgement supported by data sampling)	Medium (Professional judgement supported by data sampling)
Function	Whether the asset is appropriate for its intended use	5 yearly inspection and clearing on rolling basis	Estimate about 10% of culverts are fully obstructed, and 30% mostly obstructed.	No allocation of budget for Drainage Maintenance is likely to result in deterioration of assets in medium to long term. Gradual improvement if recommendations in AMP are followed.
	<i>Confidence levels</i>		Low (Professional Judgement with no specific model evidence)	Low (Professional Judgement with no specific model evidence)
Capacity	Whether the asset is designed and built to required capacity	Action requests during weather events	Properties flooded, blocked drains, washout of driveways etc	Gradual improvement if AMP implemented.
	<i>Confidence levels</i>		Low (Professional Judgement with no data evidence)	Low (Professional Judgement with no data evidence)

3.6 Technical Levels of Service

The Technical Levels of Service relates to the activities and allocation of associated resources to support activities that best achieve the desired customer values and customer levels of service. These are operational or technical measures of performance. Technical service measures are linked to the four (4) asset lifecycle phases and their associated programs(plans). Annual capital budgets (Capex) cover Acquisition and/or Renewal phases. Operating budgets (Opex) cover the Operation and Maintenance phase.

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

- **Phase1-Acquisition** – This involves the allocation of capital funds to acquire new asset. Examples of drainage asset acquisitions include activities that may provide a higher level of service (identifying wash out points on road network and installing a new culvert/drain, extending a culvert to accommodate widened road etc.)
- **Phase 2- Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g., Relining of stormwater drainage, upgrade existing culverts to accommodate increased need, Replacement of aged culverts etc).
- **Phase 3-Operation** – Operational services typically refer to the activities and functions that are essential for the day-to-day operations and functioning of asset. (e.g., regular monitoring and inspection of drainage assets).
- **Phase 2-Planned (Preventative) Maintenance** – Planned (Preventative) Maintenance activities are “hard” services. These maintenance activities are “known”, are routine in nature and deemed necessary maintain the asset to an appropriate service level to achieve the predicted service life of the asset. (e.g., Culvert clearing program and repair, patch lining of culverts etc)
- **Phase 3-Reactive Maintenance** – Reactive Maintenance activities are also “hard” services but are unpredictable and directly correlate with the performance of Planned Maintenance services, for example the failure to regularly inspect and monitor and clear the drainage may lead to blocked drainage and localised flooding. Lesser information on culvert condition will lead to officer not being able to predict the end of service life of drainage leading to drainage collapse. Lack of planned maintenance works lead to reactive maintenance mobilisations to address drainage issues after a significant weather event.

It is therefore important to balance maintenance programs with Planned (Preventative) Maintenance activities and Reactive Maintenance works in order to remove the risk of asset failure which is unlikely to match customer values or levels of service requirements.

Reactive Maintenance mobilisations are typically initiated using the Shire’s Action Request portal located on the Shire’s website. (e.g., collapse of drainage, washed out driveways due to blocked drainage, localised flooding in road reserve or properties due to blocked drainage etc)

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.³

³ IPWEA, 2015, IIMM, p 2|28.

Table 3.6 shows the activities expected to be provided under the current 10 year Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

Table 3.6: Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
Acquisition	Improve urban and rural drainage and resolve flooding issues	New drainage systems/upgrade of drainage assets	No activity currently	Inspect the frequent wash out points and install culverts, Drainage extension program annually.
		Budget	<i>\$100,000 (this has been used for selected capital projects within townsite only.)</i>	<i>\$100,000 per annum***</i>
Operation	Operate the drainage network	Drains inspected and kept clean and clear.	Respond to action requests	Quarterly inspection and clearing, respond to action requests
		Budget	<i>included in maintenance</i>	<i>Included in maintenance</i>
Maintenance	Maintain the drainage system	Regular inspection and maintenance	No activity and/or reaction to faults only	Inspect, maintain all culverts, pits and pipes every year
		Budget	<i>\$unknown (The spending is from road's maintenance budget)</i>	<i>\$150,000 per annum</i>
Renewal	Replace collapsed, aged, and worn-out culverts	No of culverts replaced	No renewal activity occurring	Include under the acquisition program listed above
		Budget	<i>\$0 per annum</i>	<i>\$92,000 per annum</i>
Disposal	No disposal planned	n/a	n/a	n/a
		Budget	<i>\$0 per annum</i>	<i>\$0 per annum</i>

Note: * Current activities related to Planned Budget.
 ** Expected performance related to forecast lifecycle costs.
 *** Budget assumption not based on high quality data

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.

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 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

Changes	Current provision	Projection	Impact on Services	Demand Management Plan
Population Growth	No provision	Very slow growth or slight contraction is currently identified	No substantive impact	No requirement
Changing Age Demographic	No provision	Increasing older demographic	Increase focus on safety and universal access	Design new and replacement work
Infill Residential Development	No provision	Minimal infill development expected.	No substantive impacts	No requirement
Precinct Development	No provision	None planned	No substantive impact	No requirement
Service Expectation increases	Included in AMP	Expected increasing demand for flood and storm protection Aging asset portfolio with increasing risks of failure	Increased service expectations	Set service levels, monitor and update Drainage strategy
Economy tightening	No Provision	Tightening of availability of finance Need to prioritise, justify, and demonstrate value for money from investments	Reduced funding and/or more competition for available funds	Better investment and decision making
Environmental Concerns	No Provision	Increasing expectations to protect and increase vegetation and greenspace Shift to non-motorised transport will increase pedestrian traffic	May need to install environmental protections on river outfalls	Monitor requirements and incorporate in stormwater drainage strategy

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 5.4.

Acquiring new assets will commit the Shire 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 we manage 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 we respond and manage those impacts.⁴

As a minimum we consider how to manage our existing assets given potential climate change impacts for our region.

Risk and opportunities identified to date are shown in Table 4.5.1

Table 4.5.1 Managing the Impact of Climate Change on Assets and Services

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Rainfall	Higher intensity rainfall events	Insufficient capacity of drainage assets to deal with peak events Increased frequency or intensity of Avon River flood events Potential wash outs of roads in peak rain events	Stormwater management plan to include review of design standards, vulnerabilities, and standards
Extended Dry periods	Longer periods without rain	Need to investigate water harvesting options	No requirement
Temperature	Higher temperatures and more frequent hot days	No expected impacts of temperature on drainage	No requirement

⁴ IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

Fire risk	Increased fire risk	No expected impacts on drainage	No requirement
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Additionally, the way in which we construct new assets should recognise that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change.
- Services can be sustained; and
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 4.5.2 summarises some asset climate change resilience opportunities.

Table 4.5.2 Building Asset Resilience to Climate Change

New Asset Description	Climate Change impact These assets?	Build Resilience in New Works
Drainage	Yes	Extent of effect unknown. Monitor technical reviews of design standards. Monitor advice on rainfall pattern changes. Initiate a flood study of Avon River (Multi Agency involvement required)

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

5 Lifecycle Management Plan

The lifecycle management plan details how the Shire 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**. The Shire has a rudimentary urban drainage network. The Shire owns approximately 1400 rural culverts. Most of the drainage is old (50+ years) and was not built to design or specification

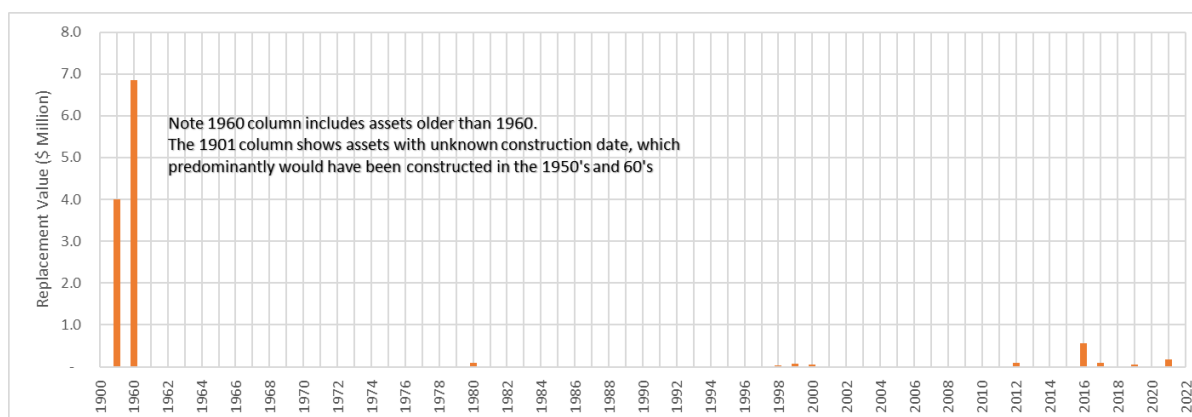
The age profile of the assets included in this AM Plan are shown in **Figure 5.1.1**.

Table 5.1.1 Assets covered by this plan

Class	Sub Class	Asset	Material	Unit	Quantity	Replacement Value
drainage	culvert	box shaped	concrete	M	209	\$402,336
drainage	culvert	box shaped	timber	M	11	\$20,470
drainage	culvert	circular	concrete	M	8693	\$3,921,810
drainage	culvert	circular	steel	M	102	\$38,409
drainage	culvert	circular	other	M	31	\$19,426
drainage	culvert	other	concrete	M	1735	\$3,876,312
drainage	pit	all	concrete	Ea.	140	\$251,955

Note that Stormwater channel assets (kerb, table drain) have been included in the road asset management plan.

Figure 5.1.1: Asset Age Profile



All figure values are shown in current day dollars.

Note 33% by value of assets (\$3.99 Million) have an undetermined construction date, and by default are listed as age 60 or greater. 56.5% of assets are greater than 60 years old. Only 8% by value of drainage assets have been replaced or built in the last 20 years, and this is almost exclusively made up of the replacement of two bridges with concrete culverts in 2016, and assets added in 2021. The recommended life of concrete pipes is 60-80 years (DLGSC).

The age (and condition) data suggest that approximately 89.5% of shire drainage (by value) with an estimated value of \$20.4 million will need replacement within the next 0-20 years.

5.1.2 Asset capacity and performance

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

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
Multiple Locations around the town	There are several known flooding locations and several known locations where storm discharge enters private property or temporarily floods roads
Main Street	The Main Street, Avon Park and low-lying areas of the town are known to be flooded when the Avon River is in flood. This includes several river bridges becoming impassable.
Multiple rural locations	There are many sites on rural roads where stormwater discharge routinely washes out road pavements leaving erosion damage.
Culverts blocked or collapsed	A recent sample inspection of drainage found approximately 5% of rural culverts were completely obstructed by debris and silt (or had collapsed headwalls or pipes). A further 30% were mostly obstructed and the majority of the sample were at least partially obstructed

The above service deficiencies were identified from the drainage condition sample survey (2022) which covered approximately 5% of the Shire’s culverts.

5.1.3 Asset condition

Condition is currently monitored by a sample condition survey in 2022.

Condition is measured using a 1 – 5 grading system⁵ as detailed in Table 5.1.3. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication.

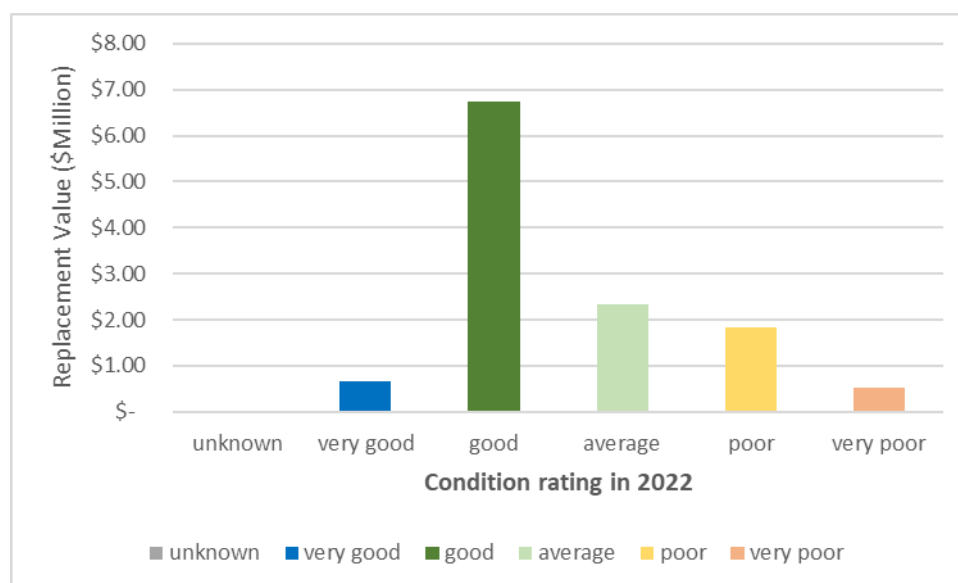
⁵ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Table 5.1.3: Condition Grading System

Condition Grading	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: Asset Condition Profile



All figure values are shown in current day dollars.

Condition was sample assessed in 2022. It was previously surveyed fully in 2018. The 2022 sample survey noted a lack of maintenance and high proportion of blocked culverts. It confirmed the 2018 condition survey, adjusted for time lapsed is still representative.

The normal adopted intervention level for replacement of drainage assets is condition 4 (poor).

Approximately 4% by value of the drainage assets have failed (or are in the process of failing) – condition 5 very poor. A further 15% are at the point where replacement needs to be considered – condition 4 poor. 6% of the assets by value are in very good condition.

This estimate of good condition assets is distorted and mostly reflects 2 large (expensive) box culvert structures constructed in 2016 which are in good condition, whereas the bulk of smaller low value assets are in poor condition. The lack of maintenance was observed (2022 survey) to be affecting the function of most assets.

5.2 Operations and Maintenance Plan

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

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

The trend in maintenance budgets are shown in **Table 5.2.1**.

Table 5.2.1: Maintenance Budget Trends

Year	Maintenance Budget
2021-2022	\$unknown
2022-2023	\$unknown
2023-2024	Proposed \$150,000

Note the Shire does not currently budget or account for maintenance costs of drainage separately to road maintenance. The proposed allocation is an estimate only with no source data.

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

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

Asset Hierarchy

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

The service hierarchy is shown in Table 5.2.2.

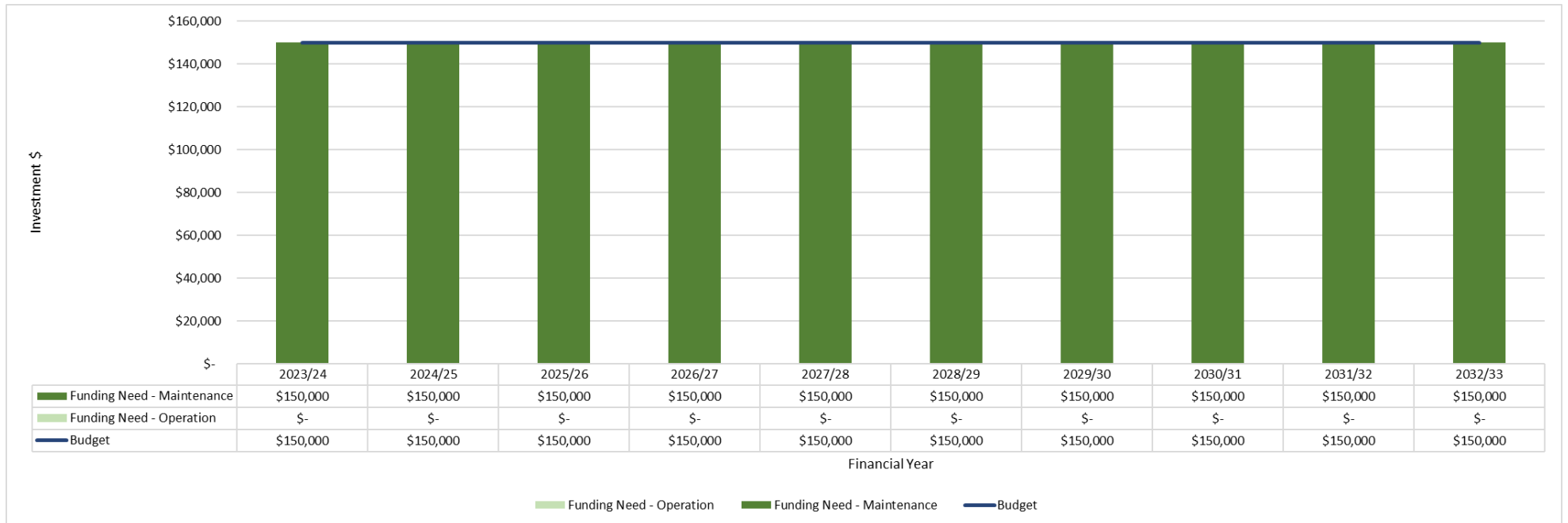
Table 5.2.2: Asset Service Hierarchy

Service Hierarchy	Service Level Objective
Rural Culverts	Safely convey stormwater across, along and away from road pavements
Pits	Transfer urban stormwater runoff into underground pipes
Pipes	Convey urban stormwater away from infrastructure
Stormwater channel	Collect and convey runoff from roads in open drains and channels (including kerbs)

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

Figure 5.2: Operations and Maintenance Summary



Figures current as at May 2023.

Historically drainage maintenance has been budgeted and accrued to the same account as road maintenance making analysis difficult. The estimate provided for maintenance is based on estimated historical spend for clearing and managing culverts. It would be desirable to invest more in drainage infrastructure maintenance.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) is included in the infrastructure risk management plan.

5.3 Renewal Plan

Asset 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 typically considered a new asset. Importantly future operations and maintenance costs should typically be considered alongside renewal works in order to maximise the return on investment.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

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

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset useful lives were last reviewed on 30 June 2022.⁶

Table 5.3: Useful Lives of Assets

Asset (Sub)Category	Useful life
Drainage, concrete components	80
Drainage, steel components	60
Drainage, Timber	40
Drainage, HDPE	60
Drainage Fabric	40

The estimates for renewals in this AM Plan were based on the asset register, as updated 2022.

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g., Rehabilitation of culverts), or

⁶ Enter Reference to Report documenting Review of Useful Life of Assets

- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g.: Relining an existing culvert to increase its hydraulic efficiency).⁷

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.⁸

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

Table 5.3.1: Renewal Priority Ranking Criteria

Criteria	Weighting
Safety or compliance	Takes immediate priority 100%
Risk Consequence	25% out of 100%
Condition	40% out of 100%
Service Benefit	35% out of 100%

Note a weighted Multi criteria score is not used. The priority is fixing things that are not working.

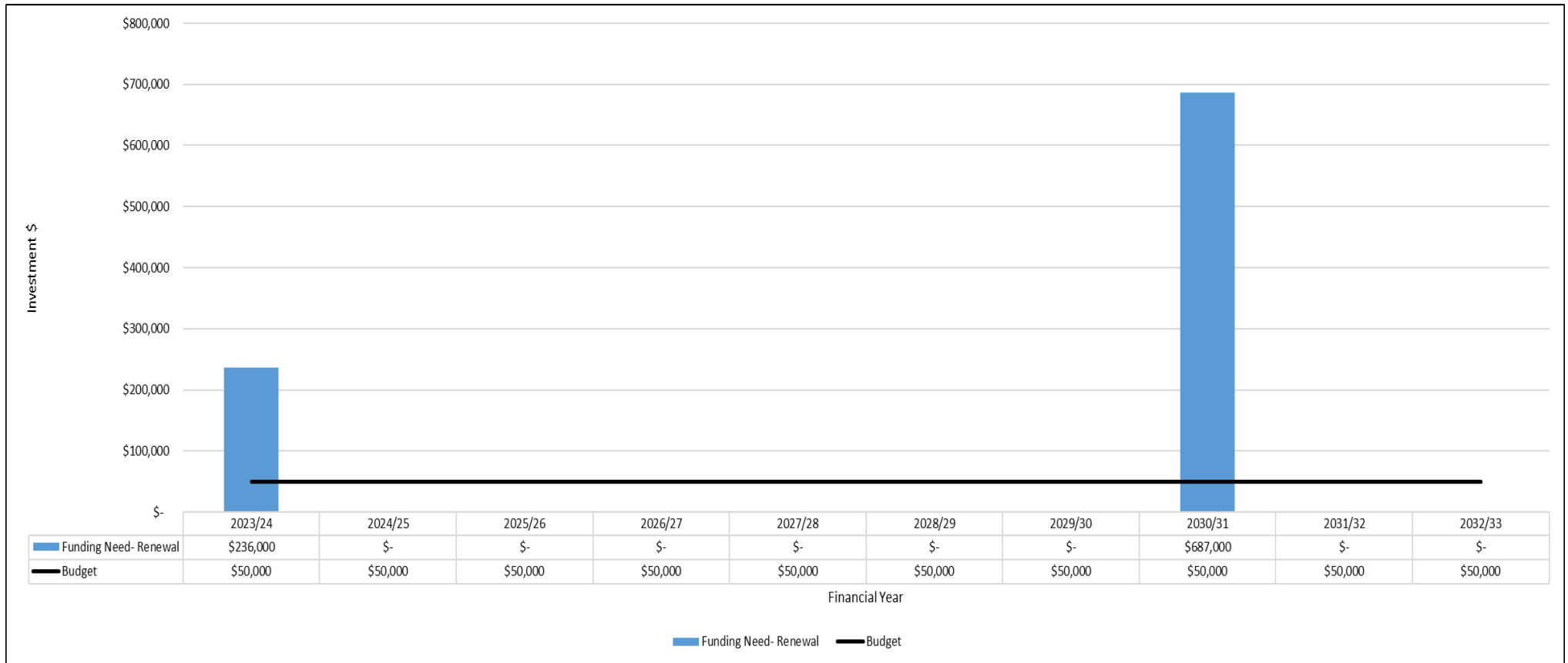
5.4 Summary of future renewal costs

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 5.4.1. A detailed summary of the forecast renewal costs is shown in **Appendix D**.

⁷ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁸ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 5.4.1: Forecast Renewal Costs



Figures current as at May 2023

This allocation represents a small investment to address network problems.

As of 2022 there is a backlog of renewal need of \$0.236 million. There is a further emerging need within the next 10 years of \$0.687 Million (assets expected to deteriorate to condition 4: poor). This estimate does not include normal maintenance requirements. It does not include improvements where services are not meeting requirements and replacement assets will need to be upgraded (see section 3 service levels).

The current budget and LTFP have \$0.100M allocation for capital acquisition.

A proposal of this plan is to develop a comprehensive stormwater management plan, including review of community expectations and service requirements to inform future investment.

5.5 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 donated to the Shire.

5.5.1 Selection criteria

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

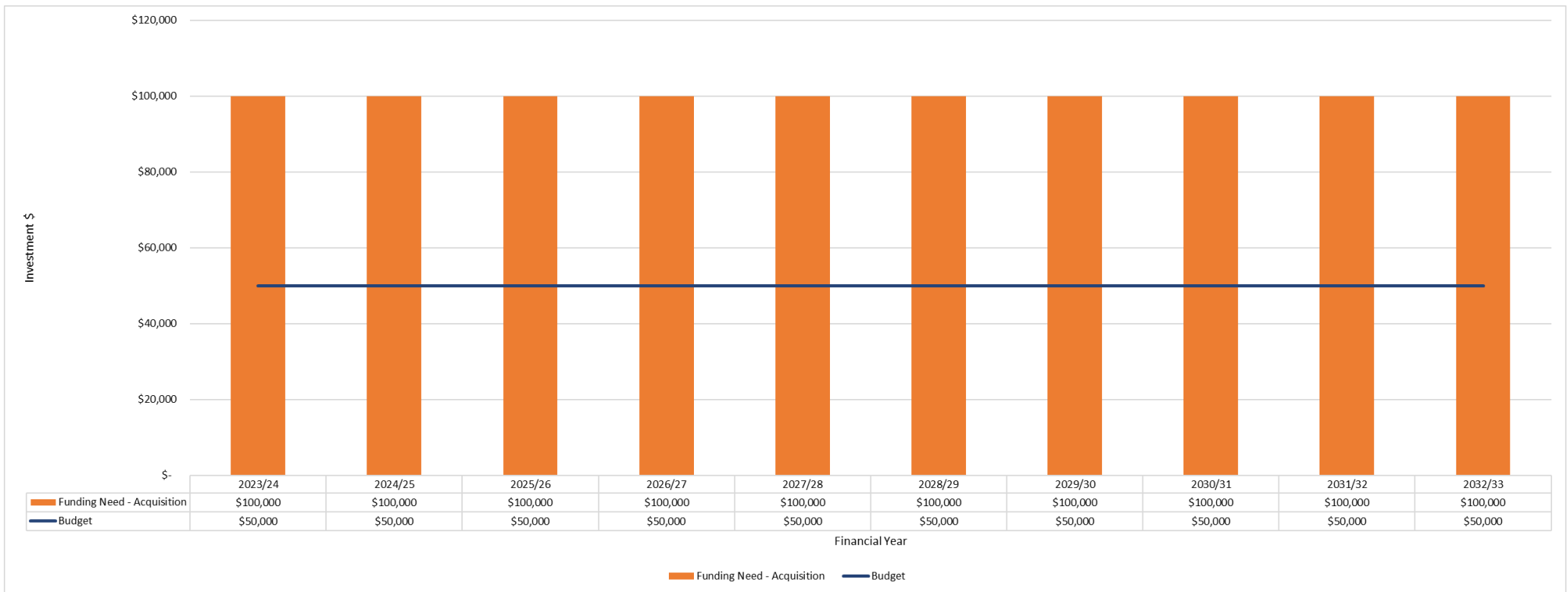
Table 5.5.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Safety or compliance	Takes immediate priority 100%
Risk Consequence	25% out of 100%
Condition	40% out of 100%
Service Benefit	35% out of 100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in **Figure 5.5.1** and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in **Appendix A**.

Figure 5.5.1: Acquisition (Constructed) Summary



Figures current as at May 2023

The allocation of \$100,000 is suggested indicative allocation to fix one problem site per year. Costs will vary from site to site. It is also intended to identify need and discussion in the LTFP and Council financial planning. The drainage assets require investigation and an informed Council strategy.

When a Shire commits to new assets, they 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 the Shire. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in **Figure 5.5.1**.

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. Additional maintenance costs for the new acquisitions are individually minimal but add up over time. Maintenance budget should be increased annually proportional to the additional acquisitions.

5.6 Disposal Plan

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

Table 5.6: Assets Identified for Disposal

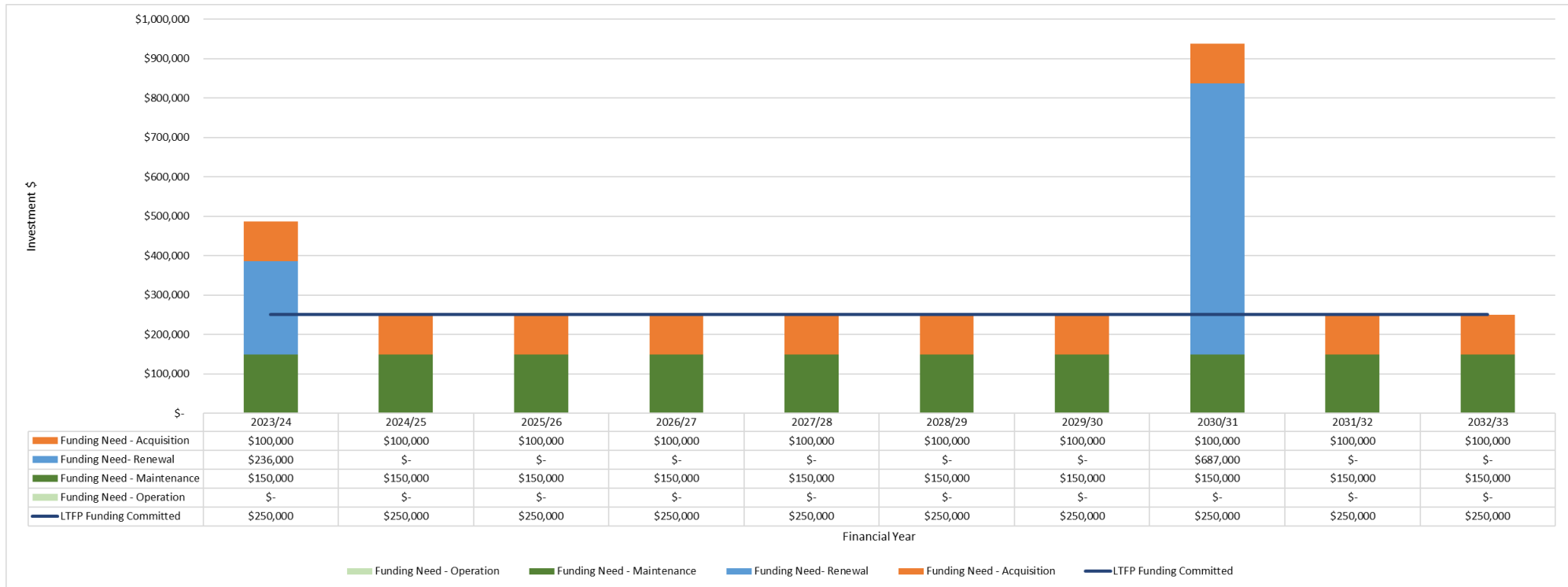
Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Nil	n/a	n/a	[n/a	n/a

5.7 Summary of asset forecast costs

The financial projections from this asset plan are shown in **Figure 5.7.1**. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

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

Figure 5.7.1: Lifecycle Summary



Figures shown are as at May 2023.

The current allocated budget is not sufficient to meet required needs. The Shire will need to invest heavily in drainage infrastructure over the coming decades to continue to provide services.

6 Risk Management

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’⁹.

An assessment of risks¹⁰ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock,’ reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Critical Assets

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

Table 6.1 Critical Assets

Critical Asset	Failure Mode	Impact
A criticality assessment has not been completed. This should form part of proposed the drainage study	TBA	TBA
There are 392 assets listed as condition 5 (very poor)	Loss of function, collapse Capacity overloaded	Drainage function cease. Increased demand for reactive maintenance Loss of services and reputation

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

⁹ ISO 31000:2009, p 2

¹⁰ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

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.

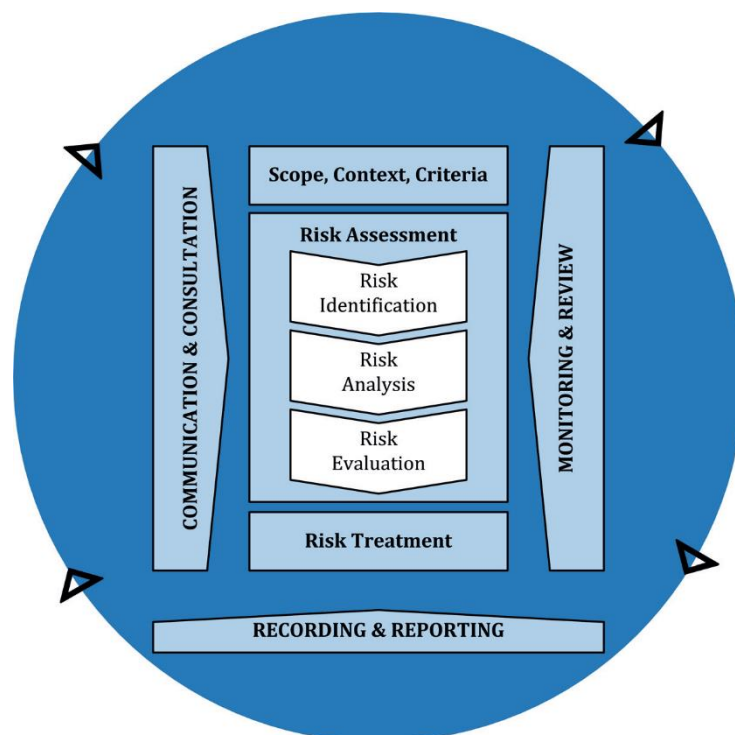


Fig 6.2 Risk Management Process – Abridged

Source: ISO 31000:2018, Figure 1, p9

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

An assessment of risks¹¹ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock,' reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action), and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The

¹¹ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

residual risk and treatment costs of implementing the selected treatment plan is shown in **Table 6.2**. It is essential that these critical risks and costs are reported to management and the Council.

Table 6.2: Risks and Treatment Plans

Identified Risk	Consequence	Likelihood	Consequence Rating	Assessed Risk	Treatment	Residual Risk
Asset failure	Loss of service, loss of reputation.	Likely	Minor	Moderate	Regular inspections Provide timely maintenance Replace assets prior to failure	Low
Lack of knowledge of assets	Unexpected event, loss of service, loss of reputation.	Likely	Minor	Moderate	Regular inspections	Low
Asset defect contributes to major accident	Major accident up to and including death.	Unlikely	Severe	High	Conform to design and construction standards	Moderate
Asset defect contributes to minor accident.	Minor accident including personal injury or property damage. Liability claim	Probably	Medium	Moderate	Conform to design and construction standards Maintain and inspect assets regularly	Low
Public Liability claim	Financial Cost, Reputational damage.	Possible	Major	High	Conform to design and construction standards Maintain and inspect assets regularly	Moderate
Loss of Budget	Unable to fully complete improvement, replacement or maintenance works costs incurred.	Unlikely	Major	Moderate	Prioritise expenditure with focus on operations, preserve existing assets, Adopt LTFP	Low

Identified Risk	Consequence	Likelihood	Consequence Rating	Assessed Risk	Treatment	Residual Risk
Change in demand - Shire Growth	New residents not provided with access.	Rare	Minor	Low	Include drainage network planning in scheme and development approval considerations	Low
Change in demand – service standards	Residents demand higher service standards or new assets.	Possible	Major	High	Set service standards and budget in agreement with ratepayers	Low
Change in demand – external requirement	Unexpected need to construct new or upgrade drainage linkages.	Possible	Major	High	Active involvement in regional planning	Low

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

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to ‘withstand a given level of stress or demand,’ and to respond to possible disruptions to ensure continuity of service.

Resilience recovery planning, financial capacity, climate change risk assessment and crisis leadership.

We do not currently measure our resilience in service delivery, this will be included in future iterations of the AM Plan

Table 6.3: Resilience Assessment

Threat / Hazard	Assessment Method	Current Resilience Approach
None identified	n/a	n/a

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:

- Install culverts at all locations where there are known wash out damage and erosion problems
- Clear, repair and inspect culverts in a single year (without compromising other needs)
- Upgrade the Town drainage to protect private property where flooding is currently occurring
- Implement a flood mitigation strategy for the Avon River

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:

- Wash outs and erosion damage of roads will continue to occur for the foreseeable future, requiring short interruptions of service quality and additional maintenance costs
- Flooding of property will continue until a drainage management plan is prepared and improvements can be implemented.

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:

- Increased risk of wash out, erosion and other damage of infrastructure causing interruption of services and additional costs
- Higher risks of localised flooding of spaces interrupting services and causing damages

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

7 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 / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio¹² 54%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have 54% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

Medium term – 10-year financial planning period

This AM Plan identifies the forecast operations, maintenance and renewal costs 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.

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 \$242,300 on average per year. The proposed (budget) operations, maintenance and renewal funding is \$155,000 * on average per year giving a 10-year funding shortfall of \$87,300 on average each year. This indicates that 64% 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.

Also, that drainage maintenance is currently funded out of the road maintenance general budget and is not technically \$0. The amount is not known and not described in the budget and LTFP.

¹² AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the 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

Table 7.1.3 shows the forecast costs (outlays) required for consideration in the 10-year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the long-term financial plan.

A gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing service levels in the AM Plan (including revising the long-term financial plan).

We will manage the ‘gap’ by developing this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community.

Table 7.1.2: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Acquisition	Operation & Maintenance	Renewal	Disposal
2023	\$50,000	\$150,000	\$50,000	\$0
2024	\$50,000	\$150,000	\$50,000	\$0
2025	\$50,000	\$150,000	\$50,000	\$0
2026	\$50,000	\$150,000	\$50,000	\$0
2027	\$50,000	\$150,000	\$50,000	\$0
2028	\$50,000	\$150,000	\$50,000	\$0
2029	\$50,000	\$150,000	\$50,000	\$0
2030	\$50,000	\$150,000	\$50,000	\$0
2031	\$50,000	\$150,000	\$50,000	\$0
2032	\$50,000	\$150,000	\$50,000	\$0

Forecast costs are shown as at June 2022.

7.2 Funding Strategy

The proposed funding for assets is outlined in the Shire’s budget and Long-Term financial plan.

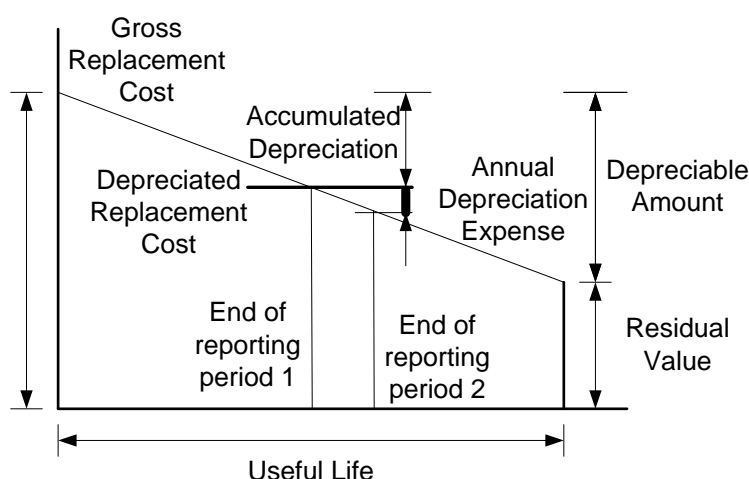
The financial strategy of the Shire determines how funding will be provided, whereas the AM Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

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. The assets are valued at Fair value by cost replacement method, as of 30 June 2022.

- Replacement Cost (Current/Gross) \$12,100,410
- Depreciable Amount \$12,100,410
- Depreciated Replacement Cost¹³ \$6,878,437
- Cumulative Depreciation \$5,221,973
- Annual Depreciation \$152,525



7.3.2 Valuation forecast

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

Additional assets will 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.

¹³ Also reported as Written Down Value, Carrying or Net Book Value.

Key assumptions made in this AM Plan are:

- 15% of Roads' maintenance budget is spent on maintenance of drainage.
- The asset register, condition data and other source information is a true reflection of the real world (see confidence statement)
- The assets are of sufficiently uniform design, construction, quality, and usage that reliable statistical forecasts can be made.
- The assets are being (and have been) maintained and operated appropriately, such that useful lives will be achieved.
- No data was available to estimate a maintenance budget and assumptions were made about maintenance standards and practices
- Costs of assets are estimated on the basis of typical project costs, and have been developed without project scopes, plans specifications or site inspection. On the average these are statistically reliable, but in the individual case variation can be expected

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 a A - E level scale¹⁴ in accordance with **Table 7.5.1**.

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 $\pm 2\%$
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 $\pm 10\%$
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 complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
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 $\pm 40\%$
E. Very Low	None or very little data held.

¹⁴ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

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
Demand drivers	C	Demand drivers are minimal, evidence is limited
Growth projections	B	Growth is projected as minimal
Acquisition forecast	C	This depends on whether this plan is followed or needs to be adjusted
Operation forecast	D	This is an estimated based on no data and limited understanding
Maintenance forecast	D	This is an estimated based on no data and limited understanding
Renewal forecast - Asset values	C	Based on a sample survey (2022), comprehensive condition survey (2016), assessment of needs and forecast of works needed
- Asset useful lives	C	Industry standards have been adopted
- Condition modelling	C	Modelling was unsophisticated and based on generic assumptions. Data for more complete modelling not available
Disposal forecast	A	No disposals forecast

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

8 Plan Improvement and Monitoring

8.1 Status of Asset Management Practices

8.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is the adopted Long term Financial Plan, extracts from Annual budgets and Annual reports and the 2022 Asset Valuation Report.

8.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is extracts from the Asset Register, as updated 2022.

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

Item	Description	Responsibility	Resources required	Priority	Timeline
1	Separate funding of drainage assets from other asset funding in the budget and cost reporting, including identify and report operation & maintenance, renewal and acquisition of drainage separately in the finance system	Council	TBA	Very high	June 2023
2	Develop and adopt a stormwater management plan including consideration of current and emerging needs, expected service levels, service gaps and infrastructure improvement plan.	EMIDS	TBA	High	June 2024
3	Commence proactive maintenance of rural culverts including inspection and clearing of a portion of culverts on a rolling basis. (estimate 10% of assets per annum with current funds)	EMIDS	TBA	High	June 2024
4	Commence proactive maintenance of urban pits and pipes including inspection and clearing of a portion urban pipes and pits on a rolling basis (estimate 10% of assets per annum with current funds)	EMIDS	TBA	High	June 2024
5	Commence a program to replace or acquire new culverts and urban drainage each year	EMIDS	TBA	High	June 2024

	at trouble spots to be identified. Nominally 1 urban location fix or 10-12 new/replacement culverts with current budget				
6	Implement the service for a 12-month trial period and then review	EMIDS	TBA	Medium	June 2026
7	Establish separate cost centres for the reporting of drainage maintenance and capital works, with consideration to define activity type and asset worked on	Finance	TBA	Medium	June 2024
8	Undertake Internal reviews of performance and issues- June 2023,2024,2025.	EMIDS	TBA	Medium	June 2023, 2024, 2025
9	Undertake external AMS audit June 2026.	EMIDS	TBA	Medium	June 2026
10	Adopt a data management plan including scheduled updates of drainage data.	EMIDS	TBA	Low	June 2025
11	Review service levels including drainage protection from river flood and rainfall runoff	EMIDS	TBA	Very Low	June 2027
12	Develop and document processes for key functions such as valuation, acceptance of new assets, inspection, forward works planning and similar.	EMIDS	TBA	Very Low	Future

8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets because of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years.

8.4 Performance Measures

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

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,

-
- The degree to which the 1–5-year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
 - The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
 - The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

9 References

1. IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
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5. IPWEA, 2020 'International Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney
6. IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney
7. IPWEA, 2012, Practice Note 6 Long-Term Financial Planning, Institute of Public Works Engineering Australasia, Sydney, <https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6>
8. IPWEA, 2014, Practice Note 8 – Levels of Service & Community Engagement, Institute of Public Works Engineering Australasia, Sydney, <https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8>
9. ISO, 2014, ISO 55000:2014, Overview, principles, and terminology
10. ISO, 2018, ISO 31000:2018, Risk management – Guidelines
11. Long Term Financial Plan, Shire of York, 2016
12. Corporate Business Plan, Shire of York, 2020
13. Annual budget 2022-23, Shire of York 2022
14. Operational Policy Asset Management, Shire of York 2016
15. Strategic Community Plan, Shire of York, 2020

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

A provisional sum for acquisition of drainage improvements has been included to address service deficiencies. Specific projects and budgets are to be assessed through a drainage study and strategy in 2023

A.2 – Acquisition Project Summary

Specific project sites to be identified in the drainage strategy.

Table A3 - Acquisition Forecast Summary

Year	Constructed	Donated	Growth
2023	\$-	\$-	\$-
2024	\$50,000	\$-	\$-
2025	\$50,000	\$-	\$-
2026	\$50,000	\$-	\$-
2027	\$50,000	\$-	\$-
2028	\$50,000	\$-	\$-
2029	\$50,000	\$-	\$-
2030	\$50,000	\$-	\$-
2031	\$50,000	\$-	\$-
2032	\$50,000	\$-	\$-

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

Operation costs are included in the maintenance budget with the exception of the drainage study

Operation costs (inspection, cleaning) do not require separate accounting)

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

No evidence available.

C.2 – Maintenance Forecast Summary.

Table C2 - Maintenance Forecast Summary

Year	Maintenance Forecast
2023	\$150,000
2024	\$150,000
2025	\$150,000
2026	\$150,000
2027	\$150,000
2028	\$150,000
2029	\$150,000
2030	\$150,000
2031	\$150,000
2032	\$150,000

Cost estimates are as at May 2023.

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

The renewal forecast is based on replacing 6 culverts per year

D.2 – Renewal Project Summary

A draft renewal plan is under consideration

D.3 – Renewal Forecast Summary

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast	Renewal Budget
2023	\$92,300	\$50,000
2024	\$92,300	\$50,000
2025	\$92,300	\$50,000
2026	\$92,300	\$50,000
2027	\$92,300	\$50,000
2028	\$92,300	\$50,000
2029	\$92,300	\$50,000
2030	\$92,300	\$50,000
2031	\$92,300	\$50,000
2032	\$92,300	\$50,000

D.4 –Renewal Plan

A detail renewal plan is to be developed in a drainage strategy

Appendix E Disposal Summary

E.1 – Disposal Forecast Assumptions and Source

No disposals forecast.

E.2 – Disposal Project Summary

No disposals forecast

E.3 – Disposal Forecast Summary

Table E3 – Disposal Activity Summary

Year	Disposal Forecast	Disposal Budget
all	No activity planned	\$-

