DRAINAGE NETWORK ASSET MANAGEMENT PLAN

Version 2.1 February 2021 COUNC



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Key:

GF: Greg Fraser DS: Darren Sturgiss BH: Ben Hudson Asset Engineer (Previous) Director Engineering Services Asset Technician DP: Douglas Patterson PB: Peter Benson RD: Robyn Dilnot Director Engineering Services (Previous) Administration Engineer Assets System Administrator

Integrated Planning and Reporting Framework



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ABBREVIATIONS

AAAC	Average annual asset consumption
AMP	Asset management plan
ARI	Average recurrence interval
BOD	Biochemical (biological) oxygen demand
CRC	Current replacement cost
CWMS	Community wastewater management systems
DA	Depreciable amount
DoH	Department of Health
EF	Earthworks/formation
IRMP	Infrastructure risk management plan
LCC	Life Cycle cost
LCE	Life cycle expenditure
MMS	Maintenance management system
PCI	Pavement condition index
PPI	Producer Price Index
RV	Residual value
SS	Suspended solids
vph	Vehicles per hour



GLOSSARY

Annual service cost (ASC)

An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operating, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

Asset class

Grouping of assets of a similar nature and use in an entity's operations (AASB 166.37).

Asset condition assessment

The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset to determine the need for some preventative or remedial action.

Asset management

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

Assets

Future economic benefits controlled by the entity as a result of past transactions or other past events (AAS27.12).

Property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than 12 months.

Average annual asset consumption (AAAC)*

The amount of a local government's asset base consumed during a year. This may be calculated by dividing the Depreciable Amount (DA) by the Useful Life and totalled for each asset OR by dividing the Fair Value (Depreciated Replacement Cost) by the Remaining Life and totalled for each asset in an asset category or class.

Brownfield asset values**

Asset (re)valuation values based on the cost to replace the asset including demolition and restoration costs.

Capital expansion expenditure

Expenditure that extends an existing asset, at the same standard as is currently enjoyed by residents, to a new group of users. It is discretional expenditure, which increases future operating, and maintenance costs, because it increases council's asset base, but may be associated with additional revenue from the new user group, e.g. extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

Source: DVC 2006, Glossary

Note: Items shown * modified to use DA instead of CRC Additional glossary items shown **

Capital expenditure

Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital funding

Funding to pay for capital expenditure.

Capital grants

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

Capital investment expenditure

See capital expenditure definition

Capital new expenditure

Expenditure which creates a new asset providing a new service to the community that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operating and maintenance expenditure.

Capital renewal expenditure

Expenditure on an existing asset, which returns the service potential or the life of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it has no impact on revenue, but may reduce future operating and maintenance expenditure if completed at the optimum time, e.g. resurfacing or re-sheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital upgrade expenditure

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretional and often does not result in additional revenue unless direct user charges apply. It will increase operating and maintenance expenditure in the future because of the increase in the council's asset base, e.g. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Carrying amount

The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.



Class of assets See asset class definition

Component

An individual part of an asset which contributes to the composition of the whole and can be separated from or attached to an asset or a system.

Cost of an asset

The amount of cash or cash equivalents paid, or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, plus any costs necessary to place the asset into service. This includes one-off design and project management costs.

Current replacement cost (CRC)

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

Current replacement cost "As New" (CRC)

The current cost of replacing the original service potential of an existing asset, with a similar modern equivalent asset, i.e. the total cost of replacing an existing asset with an as NEW or similar asset expressed in current dollar values.

Cyclic Maintenance**

Replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, cycle, replacement of air conditioning equipment, etc. This work generally falls below the capital/ maintenance threshold and needs to be identified in a specific maintenance budget allocation.

Depreciable amount

The cost of an asset, or other amount substituted for its cost, less its residual value (AASB 116.6)

Depreciated replacement cost (DRC)

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated based on such cost to reflect the already consumed or expired future economic benefits of the asset

Depreciation / amortisation

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

Economic life

See useful life definition.

Expenditure

The spending of money on goods and services. Expenditure includes recurrent and capital.

Fair value

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction.

Greenfield asset values **

Asset (re)valuation values based on the cost to initially acquire the asset.

Heritage asset

An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

Impairment Loss

The amount by which the carrying amount of an asset exceeds its recoverable amount.

Infrastructure assets

Physical assets of the entity or of another entity that contribute to meeting the public's need for access to major economic and social facilities and services, e.g. roads, drainage, footpaths and cycleways. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally, the components and hence the assets have long lives. They are fixed in place and are often have no market value.

Investment property

Property held to earn rentals or for capital appreciation or both, rather than for:

(a) use in the production or supply of goods or services or for administrative purposes; or

(b) sale in the ordinary course of business (AASB 140.5)

Level of service

The defined service quality for a service against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental, acceptability and cost).

Source: DVC 2006, Glossary Note: Items shown * modified to use DA instead of CRC Additional glossary items shown **



Life Cycle Cost **

The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises annual maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

Life Cycle Expenditure **

The Life Cycle Expenditure (LCE) is the actual or planned annual maintenance and capital renewal expenditure incurred in providing the service in a particular year. Life Cycle Expenditure may be compared to Life Cycle Expenditure to give an initial indicator of life cycle sustainability.

Loans / borrowings

Loans result in funds being received which are then repaid over a period of time with interest (an additional cost). Their primary benefit is in 'spreading the burden' of capital expenditure over time. Although loans enable works to be completed sooner, they are only ultimately cost effective where the capital works funded (generally renewals) result in operating and maintenance cost savings, which are greater than the cost of the loan (interest and charges).

Maintenance and renewal gap

Difference between estimated budgets and projected expenditures for maintenance and renewal of assets, totalled over a defined time (e.g. 5, 10 and 15 years).

Maintenance and renewal sustainability index

Ratio of estimated budget to projected expenditure for maintenance and renewal of assets over a defined time (e.g. 5, 10 and 15 years).

Maintenance expenditure

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

Materiality

An item is material is its omission or misstatement could influence the economic decisions of users taken based on the financial report. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances.

Modern equivalent asset.

A structure like an existing structure and having the equivalent productive capacity, which could be built using modern materials, techniques and design. Replacement cost is the basis used to estimate the cost of constructing a modern equivalent asset.

Non-revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, e.g. parks and playgrounds, footpaths, roads and bridges, libraries, etc.

Operating expenditure

Recurrent expenditure, which is continuously required excluding maintenance and depreciation, e.g. power, fuel, staff, plant equipment, on-costs and overheads.

Pavement management system

A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

Planned Maintenance**

Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

PMS Score

A measure of condition of a road segment determined from a Pavement Management System.

Rate of annual asset consumption*

A measure of average annual consumption of assets (AAAC) expressed as a percentage of the depreciable amount (AAAC/DA). Depreciation may be used for AAAC.

Rate of annual asset renewal*

A measure of the rate at which assets are being renewed per annum expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

Rate of annual asset upgrade*

A measure of the rate at which assets are being upgraded and expanded per annum expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

Reactive maintenance

Unplanned repair work that carried out in response to service requests and management/supervisory directions.

Recoverable amount

The higher of an asset's fair value, less costs to sell and its value in use.

Source: DVC 2006, Glossary

Note: Items shown * modified to use DA instead of CRC Additional glossary items shown **



Recurrent expenditure

Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operating and maintenance expenditure.

Recurrent funding

Funding to pay for recurrent expenditure.

Rehabilitation

See capital renewal expenditure definition above.

Remaining life

The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining life is economic life.

Renewal

See capital renewal expenditure definition above.

Residual value

The net amount which an entity expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal.

Revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, e.g. public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

Risk management

The application of a formal process to the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probability of occurrence.

Section or segment

A self-contained part or piece of an infrastructure asset.

Service potential

The capacity to provide goods and services in accordance with the entity's objectives, whether those objectives are the generation of net cash inflows or the provision of goods and services of a volume and quantity to the beneficiaries thereof.

Service potential remaining*

A measure of the remaining life of assets expressed as a percentage of economic life. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (DRC/DA).

Strategic Management Plan (SA)**

Documents Council objectives for a specified period (3-5 yrs.), the principle activities to achieve the objectives, the means by which that will be carried out, estimated income and expenditure, measures to assess performance and how rating policy relates to the Council's objectives and activities.

Sub-component

Smaller individual parts that make up a component part.

Useful life

Either:

- (a) the period over which an asset is expected to be available for use by an entity, or
- (b) the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the council. It is the same as the economic life.

Value in Use

The present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate new cash flows, where if deprived of the asset its future economic benefits would be replaced.

Source: DVC 2006, Glossary

Note: Items shown * modified to use DA instead of CRC Additional glossary items shown **



1. EXECUTIVE SUMMARY

What Council Provides

Council provides a drainage network to enable the safe and effective transport of storm water to the.

The drainage network consists of:

- Approximately 354 km of Pipe
- Approximately **12,256** Pits
- Approximately **501** Headwalls
- 6 Gross Pollutant Traps (GPT)
- 13 Detention basins

What does it Cost?

There are two key indicators of cost to provide the drainage network.

- The life cycle cost being the average cost over the life cycle of the asset, and
- The total maintenance and capital renewal expenditure required to deliver existing service levels in the next 10 years covered by Council's long-term financial plan.

The life cycle cost to maintain the drainage network and drainage structures is estimated at **\$911,230** per annum. Council's planned life cycle expenditure for year 1 of the asset management plan is **\$521,200** which gives a life cycle sustainability index of **0.57**, resulting in a funding shortfall of -**\$390,030** for year 1

The total maintenance and capital renewal expenditure required to provide the drainage network over the next 10 years is estimated at **\$7,042 million**. This is an average of **\$704,151** per annum.

Council's maintenance and capital renewal expenditure for year 1 of the asset management plan of **\$521,200** giving a 10-year sustainability index of **0.74**, resulting in a funding shortfall of -**\$182,951** for year 1

Plans for the Future

Council plans to operate and maintain the stormwater network to achieve the following strategic objectives.

- 1. Ensure the drainage network is maintained at a safe and functional standard as set out in this infrastructure asset management plan.
- 2. Ensure the network is planned appropriately to cater for future growth.
- 3. Maximise an assets useful life whilst minimising lifecycle expenditure.
- 4. Maintain a high level of community satisfaction in the delivery of stormwater drainage services.

Measuring our Performance

Quality

Drainage network assets will be maintained in a reasonably usable condition. Defects found or reported that are outside our service standard will be repaired.

Function

Our intent is that an appropriate drainage network is maintained in partnership with other levels of government and stakeholders to ensure public health is upheld and the environment is not compromised.

Key functional objectives are met:

- Safe and efficient transport of stormwater.
- Maintenance and renewal of the network is within budget.

Safety

Council will react to customer requests and requests regarding the drainage system according to response times. These are prioritised according to the risk the customer requests present.

The Next Steps

The action resulting from this asset management plan are:

- Improve the database on drainage conditions.
- Improve the collection of physical data pertinent to the maintenance of the drainage system.
- Improve financial data collection.
- Investigate the need for a condition inspection regime covering drainage assets.



2. INTRODUCTION

2.1 Background

This asset management plan is to demonstrate responsive management of drainage assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service.

The asset management plan is to be read with the following associated planning documents:

- Bathurst Regional Council Delivery Plan 2019-2022
- Bathurst Regional Council Detailed Budget 2019-2022
- Bathurst Urban Waterways Management Plan 2009
- Bathurst City Council Stormwater management plan 1996

The drainage system provides a basic and essential service – the collection and safe removal of stormwater to receiving waters. Any rain that falls on roofs or is collected via paved areas such as driveways, roads or footpaths is called stormwater. The drainage network within Bathurst is a combination of pits, pipes, open channels, natural waterways and road reserves, which carry the stormwater and dispose it in creeks, and eventually the Macquarie River.

Table 2.1. Assets covered by this Plan

Asset category	Dimension	Replacement Value (\$)
Drainage pipe network	354 km	\$180,002,907
Drainage pits	12,256	\$21,046,454
Drainage headwalls	501	\$653,759
Gross pollutant traps	6	\$1,206,602
Detention basins	13	\$3,781,599
Flood Penstock Pumps	44	\$387,974
TOTAL		\$207,079,295

Key stakeholders in the preparation and implementation of this asset management plan are:

The Councillors	Formulate policy for the allocation of resources to maximise benefit to the community whilst minimising the Council's exposure to risk.	
The Council	To manage the implementation of policy in a timely and cost-effective manner. To ensure resources are effectively utilised	
General Public	The stormwater network is designed, constructed and maintained to provide adequate protection to the residents of Bathurst from flooding associated with rainfall events	
Catchment Management Authority		



2.2 Goals and Objectives of Asset Management

The Council exists to provide services to the community. Some of these services are provided by infrastructure assets. Council has acquired infrastructure assets by 'purchase', by contract, by construction from council staff and by donation of assets constructed by developers and others to meet increased levels of service.

Council's goal in managing infrastructure assets is to meet the required level of service in the most costeffective manner for present and future consumers. The key elements of infrastructure asset management are:

- Taking a life cycle approach,
- Developing cost-effective management strategies for the long term,
- Providing a defined level of service and monitoring performance,
- Understanding and meeting the demands of growth through demand management and infrastructure investment,
- Managing risks associated with asset failures,
- Sustainable use of physical resources,
- Continuous improvement in asset management practices.¹

This asset management plan is prepared under the direction of Council's vision, mission, goals and objectives.

Council's vision:

Bathurst: A vibrant and innovative region that values our heritage, culture, diversity and strong economy."

Relevant Council goals and objectives from the adopted 2040 Community Strategic Plan and how these are addressed in this asset management plan are:

Table 2.2. Council Goals and how these are addressed in this Plan

Community Strategic Plan Objective	How Goal and Objectives are addressed in AMP		
1.4 Protect and improve the region's landscapes, views, vistas and open space.	Maintaining and providing Drainage infrastructure to adequately disperse stormwater in accordance with Council's Design Standards, Protection of the Environment Operations Act 1997, Water		
1.5 Promote good design in the built environment.			
3.1 Protect and improve natural areas and ecosystems, including the Macquarie River.	Management Act 2000 and Catchment Management Authorities Act 2003. With the goal of prevent scouring, erosion, flooding and causing		
3.2 Protect the City's water supply	complication for other Council assets.		
4.3 Ensure services, facilities and infrastructure to meet the changing needs of the region.	Maintain and improve existing drainage network and ensure there's adequate footpath infrastructure is in place to provide for future economic development of the Bathurst Regional area.		
6.1 Communicate and engage with the community, government and business groups on important matters affecting the Bathurst Region.	All works conducted and completed under relevant policies and standards. Following correct procedures.		
6.4 Meet the legislative and compliance requirements.	Communication between Council's Departments to manage expenditure for renewal/upgrade works. Apply for government funding for new assets.		
6.6 Manage our money and our assets to be sustainable now and into the future	Communication between Council's Departments to manage expenditure for renewal/upgrade works. Apply for government funding for new assets.		

The key issues of the drainage network asset management plan are:

- Deterioration of network
- Potential pollution of environment
- Loss of amenity
- Regulatory control
- Community concern
- Potential for localised flooding if not built to correct standard.

2.3 Plan Framework

Key elements of the plan are

- Levels of service specifies the services and levels of service to be provided by council.
- Future demand how this will impact on future service delivery and how this is to be met.
- Life cycle management how Council will manage its existing and future assets to provide the required services.
- Financial summary what funds are required to provide the required services.
- Asset management practices.
- Monitoring how the plan will be monitored to ensure it is meeting Council's objectives.
- Asset management improvement plan.

A road map for preparing an asset management plan is shown over.

2.4 Core and Advanced Asset Management

This asset management plan is prepared as a 'core' asset management plan in accordance with the International Infrastructure Management Manual. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long-term financial planning and reporting. Core asset management is a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this asset management plan will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels.



Soil erosion behind Kerb outlet pipes, Eglinton road



Road Map for preparing an Asset Management Plan Source: IIMM Fig 1.5.1, p 1.11





3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

The Council undertakes community surveys on a 2-yearly basis to gauge community expectations and satisfaction with the services Council provides. A series of questions are put to a broad cross section of the community including residents from rural and urban areas each year. Using the data from the Community Survey helps council gauge the community's perception of how it's meeting objectives; 1.4, 2.1, 3.1, 3.2, 3.3, 6.1, 6.4 and 6.6 within Council's adopted 2040 Community Strategic Plan.

In the 2018 Community Survey, residents were asked to rate the over importance and satisfaction they consider the drainage network is to them. They were asked to rate them on a scale of 1 to 5. 1 being not at all important and 5 being very important.

Overall, the public rated the drainage network as being 4.33 out of 5 in importance. In terms of saitisfaction, they rated the drainage network as being 3.60 out of 5.

In addition to the key findings of the community survey council continues to use the measure of the network performance from Customer Requests (see fig 3.1a and 3.1b).





Figure 3.1a shows a somewhat inconsistent pattern in the number of requests registered in Council's Customer Request Management System/Confirm Customer Service System (CRMS – Now Decommissioned) per month from July 2016 to Present. With council's Confirm Customer Service System data confidence has increased regarding the number of requests and conformed subject groups.







Data shown in the above graph has been compiled from council's Confirm Customer Service (CCS) and the percentage of each category of drainage requests made by customers. As visible by the graph, very few requests are not due to blocked pipes and pits. Further improvement, in future to the CCS drainage request categories may reflect a different position.



Flood penstock and gate valves, Bicentennial Park



3.2 Legislative Requirements

Council must meet many legislative requirements including Australian and State legislation and State regulations. The primary acts and regulations relating to the drainage network are:

Legislation	Requirement
Local Government Act	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long-term financial plan supported by asset management plans for sustainable service delivery.
Water Management Act 2000	Legislates the sustainable and integrated management of water resources for NSW
Environmental Planning and Assessment Act 1979	The principal planning instrument in NSW – specifies environmental considerations required for all development activities.
Local Land Services Act 2013	Seeks to co-ordinate policies, programs and activities within a catchment area that have an effect on the environment
Civil Liabilities Act 2002	Sets out the provisions that give protection from civil liability and the responsibilities of Council and public alike.
Protection of the Environment Act 1997	To protect, restore and enhance the quality of the environment having regard to the need to maintain ecologically sustainable development.

Table 3.2. Legislative Requirements



Gross Pollutant Trap, Jordan Creek off Durham Street



3.3 Current Levels of Service

Service levels can be defined by two terms.

Community Levels of Service relate to how the community receives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency and legislative compliance.

Supporting the community service levels are operational or technical measures of performance developed to ensure that the minimum community levels of service are met. These technical measures relate to service criteria such as:

Service Criteria Technical measures may relate to	
Quality	The reliability of the drainage network (number of pit surcharges, etc).
Quantity	The extent of the drainage network
Availability	The rainfall event that the stormwater system is planned to meet (generally 1in 5-year AEP for piped network)
Safety	Consequences of network failure or exceedance

Table 3.3. Current Service Levels

COMMUNITY LEVELS OF SERVICE

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
Quality & Availability	Network is adequately maintained to prevent flooding	Customer requests relating to blocked or partially blocked pipes or pits causing local flooding	Customer requests are	189*
	Stormwater system capacity is adequate for a 1 in 5-year event	Customer requests relating to blocked drains and inadequate drainage network components	requests per year	Requests
	Stormwater is clean when entering receiving waters	Customer requests relating to the level of gross pollutants reaching the receiving waters	Nil customer requests regarding stormwater related gross pollutants	17* Customer Requests
Safety	The drainage network design is such that safety to the public is maintained	Customer requests or incidents of compromised safety relating to drainage structures	0 Insurance claims resulting to Stormwater Assets	2 Insurance Claims
	Localised flooding of urban roadways is minimised	Customer requests relating to water over road	0 customer requests relating to water over road during rainfall events of 1 in 5 years	0 Customer Requests

*Denotes Customer requests statistic from July 2018 – November 2019





TECHNICAL LEVEL OF SERVICE

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
	Trade waste is disposed of correctly into the sewer system and not the drainage network	Trade waste discharging businesses are correctly connected to the sewer and are not discharging to stormwater	No Businesses Connected incorrectly to stormwater network	0 Businesses Connected incorrectly to stormwater network
Quality	Outflow to receiving waters is free of gross pollutants	Gross pollutant traps are cleaned regularly and are sufficient to collect pollutants	Bi-annual cleaning and maintenance of GPT	GPT Cleaned as necessary
	Drainage pipes and pits are	Nuisance flooding in areas serviced by the drainage system is minimised.	Inspect and clean 5% of No proactive network p.a. Drainage Network	
	stormwater	Organisation Measure of	Desired Budget (Over 10yrs)	2019/20 Budget
		Maintenance and Operations Budget Expenditure	Avg. \$522,918 p.a.	Avg. \$446,995 p.a.
Availability	Drainage pipes and pits are large enough to ensure free flow of stormwater (1 in 5-year AEP)	Pit surcharge is limited to rainfall events > 1 in 5 AEP	Zero reported pit surcharge from rainfall events < 1 in 5 AEP	0 Reports
Cost Effectiveness	Maintenance of stormwater network is within budget	work is Drainage maintenance is Expenditure is within allocated budgets ±10% of Budget		Within 10% of Budget
		Drainage Network Age	Age of assets are not exceeding Useful Life (100yrs)	5 Assets Exceeding Useful Life
Condition	Majority of drainage assets are in reasonable condition		Avg. Age of Drainage Assets	22yrs
		Organisation Measure of Drainage Network Condition	<u>Network Condition</u> 75% Excellent/Good 10% Poor/Bad	<u>Network Condition</u> 82% Excellent/Good 3% Poor/Bad



Bathurst Showground, Culvert headwall outlet

4. FUTURE DEMAND

4.1 Demand Forecast

Factors which will impact council's drainage network: population, climate change (impact on rainfall), Water sensitive urban design, Environmental standards, urban consolidation and Stormwater Harvesting.

Table 4.1.	Demand Factors,	Projections and	Impact on Services
	,		

Demand factor	Present position	Projection	Impact on services
Population	42,389 (2016 census)	52,500 (2031)	
Demographic (see Fig.3)	22.2% of population >60 yrs. in 2016 26.9% of population <20 yrs. in 2016	26.1% of population >60 yrs. in 2031 25.6% of population <20 yrs. in 2031	 Increased population results in a greater developed area requiring stormwater management.
Climate Change²	Developing awareness in community and profession	Predicted decline in overall rainfall with an increase in severe rainfall events	An increase in exceedance events may require a review of the minimum drainage requirements as network capacity is reduced.
Water Sensitive Urban Design	An increasing awareness of the value of urban wetlands and their overall role in a healthy environment		A change from stormwater removal to stormwater recovery, an increase in environmental controls to increase water quality and associated increases in cost of construction and maintenance.
Environmental Standards	The NSW Environmental Protection Authority through the discharge licensing system dictates the allowable discharge from the sewage treatment plant.		As new legislation demands council is required to ensure that all stormwater transport is compliant with the relevant sections of the Government acts
Urban Consolidation	Increasing popularity of multiple dwelling allotments.		Increase in impermeable areas Potential increase of pollutants in the stormwater system.
Stormwater Harvesting	Addition of Stormwater detention to provide addition water to the Bathurst Catchment, as a relief option from Water Restrictions.		Large Increase to the Drainage network with the addition of Stormwater harvesting infrastructure.



Grated Junction Pit, Cnr Beddie & Commonwealth Street



Redundant Watermain inside Kerb inlet pit, Russell/Manilla Street Intersection



4.2 Changes in Technology

Table 4.2.	Changes in	Technology a	nd Forecast	effect on	Service Delivery
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Technology Change	Effect on Service Delivery	
Water sensitive urban design & Stormwater Harvesting	Reduced flow rates from new developments Higher quality of runoff Greater detention, storage and reuse of stormwater Increased cost of maintenance. Loss of control due to use stormwater systems not in Council's ownership	
Increased range of prefabricated inlet and outlet structures	Reduction in construction time and a possible reduction in the construction costs of a given section of the network	
Improvements in maintenance techniques	The continuing development of in-situ pipe renewal systems and advancements in pipe cleaning methods. These new technologies reduce the cost of renewing pipes at the end of their useful life, e.g. relining of pipes.	

4.3 Demand Management Plan

The future management of stormwater services and the demand on them is somewhat difficult to predict as much depends on the severity climactic changes and the effect, they have in rainfall distribution.

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

Table 4.3. Demand Management Plan Summary

Service Activity	Demand Management Plan
Rainwater collection tanks	Council, along with the State Government is administering the BASIX (Building Sustainability Index) program - this includes the mandatory installation of rainwater collection tanks on all new residences. This will reduce the overall load on the network.
Water sensitive urban design	WSUD includes the use of natural surface drainage channels as an alternative to subterranean pipe and pit networks. Reduce water velocity and scouring. WSUD requiring long term planning for ongoing maintenance expenditure and land acquisitions for appropriately sized designs.
Use of detention basins	Using detention basins can reduce the capacity of pipe reaches required to remove runoff as a result of a large rainfall event.
Discharge to storm water	A comprehensive public education campaign including marking kerb inlets for stormwater only and the importance or reducing phosphorous in storm water.
Inflow to receiving waters	Increased use of engineered wetlands to provide bio-filtering of effluent prior to discharge into receiving waters.
Increasing urbanisation	Investigate the need for future developments to consider the drainage required not only the area of development but for downstream sections of the network.
Stormwater Harvesting	Stage 1 of the stormwater harvesting will be to pump water, immediately upstream of Waste Water Treatment Plant, construction of a holding pond built within site and transfer pipe back to Water Filtration Plant.

4.4 New Assets from Growth

The new assets required to meet growth will be acquired from land developments and constructed by Council. The new asset since 2008 are summarised in Fig 4.4 and Fig 4.4.1.



Fig 4.4 New Assets 2008 to 2019

Since 2008 the average length of pipe added to the drainage network was 1.6km p.a. As can be seen from the above graph, the network has increased by >10km p.a. from 2017 to 2019 (2019 Values are as of 30/10/19).



Fig 4.4.1 Predicted new assets

The above projected Drainage pipe network length has been determined from the average increase over the past 10 years and project the drainage network to increase 16.1km by 2029. Acquisition/Donation of these future assets will commit council to fund ongoing operations and maintenance costs for the period that the service provided from the assets is required.



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 optimising life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

Table 5.1a – pipe network

Pipe Diameter (mm)	Length (m)	% of network
100	4,353	1.23%
150	23,758	6.72%
225	33,815	9.56%
300	1,143	11.82%
375	12,6342	35.72%
450	35,784	10.12%
525	14,929	4.22%
600	15,883	4.49%
675	5,225	1.48%
750	7,791	2.20%
825	1,741	0.49%
900	8,587	2.43%
1050	4,158	1.18%
1200	3,607	1.02%
1350	3,294	0.93%
1500	1,174	0.33%
1650	214	0.06%
1800	618	0.17%
Box Culvert	1,735	0.49%
Other	17,469	4.94%
Not Assessed	234	0.07%
Total	353,661	100.00%



Oil Sludge runoff into Inlet pit, 125 Durham Street



150mm Dia Sewer main inside Junction Stormwater pit, Havannah Street

Table 5.1b – Pits and headwalls

Asset	Asset Details
Kerb inlet pits	4800
Junction pits	1486
Grated Inlet Pits	4884
Headwalls	501







Note;

- Approximately 30% of the network age has been estimated by using the approximate dates of development.
- Drainage records since 2000 are more reliable than previous decades. Scanned images of Works As Executed (WAE) drawings are meticulously recorded as each subdivision is completed.

5.1.2 Asset capacity and performance

Council's services 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
Bathurst CBD	There are numerous areas within the CBD where pipes have insufficient capacity resulting in flooding during high intensity rainfall events. The most serious capacity constraint in the CBD is the large drainage pipes on the eastern side of Bentinck Street.
Numerous locations	Individual drainage reaches have not been designed with possible future development taken into account. Subsequent development has discharged into an existing system that has not been designed for the new total catchment area resulting in capacity constraints.



Cast-in situ modified pit structure, Cox Street Eglinton



Site erosion into Kerb inlet pit, Westbourne Drive Llanarth



5.1.3 Asset condition

The condition profile of the sub-surface parts of the drainage network is difficult to ascertain. In lieu of condition information the age of the pipe network (see Fig 4.4.2) will be used to estimate the condition.



Fig 5.1.3 Asset Condition Profile

Condition is measured using a 1-5 rating system.

Condition Rating		Description	Useful Life % Remaining
1	Excellent	Only planned maintenance required.	100-90%
2	Good	Minor planned & reactive maintenance required.	80-70%
3	Fair	Significant maintenance required.	60-40%
4	Poor	Significant renewal/upgrade required.	30-10%
5	Bad	Unserviceable.	<10%

Average Network age is 22yrs

Satisfactory			Unsatisfactory	
1	2	3	4	5
Excellent	Good	Fair	Poor	Bad



5.1.4 Asset inspections

Currently, Council only carries out inspections on the drainage system assets in response to customer requests or during large rainfall events to assess possible capacity constraints or blockages. There are no regular inspections. Due to this there is no comprehensive information on the overall network condition.

An inspection program will allow the condition of drainage network components to be assessed as they approach their theoretical end of life. If asset condition is showing significant deterioration an annual or biannual inspection regime should be implemented. Inspections may take the form of visual inspections for pits and limited use of CCTV inspections for strategic pipe reaches like Water and Sewer mains.

5.1.5 Asset Valuations

The current replacement cost to replace all of council's drainage network as of **30/06/2019** is **\$207,079 million**. The depreciation replacement cost, the accumulated depreciation shown as the cost of the drainage network consumed/expired is **\$152,664 million**. Meaning the drainage network has depreciated by **\$54,415 million** or **\$419,120p.a**.

The total **2019/20** maintenance/operational and capital renewal/upgrade budget is **\$2,208 million**. At present there is no capital renewal expenditure allocated for drainage, as for capital upgrade/expansion it comprises **19%** or **\$420 thousand** of the overall budget. The remaining **81%** or **\$1,788 million** is allocated for maintenance and operations.



Gross Pollutant Trap Adjacent to levee bank at back of Showground



5.2 Risk Management Plan

An assessment of risks associated with service delivery from infrastructure assets has identified critical risks to Council. 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.

Critical risks, being those assessed as 'Extreme' - requiring immediate corrective action and 'High' – requiring prioritised corrective action identified in the infrastructure risk management plan are summarised in Table 5.2.

Rick

Risk	What can Happen	Rating	Risk Treatment Plan
Open drainage channels	During large rainfall events open channels may convey large quantities of runoff at dangerous speeds	EXTREME	Install signs warning of the potential danger of flooding In some circumstances a man proof fence may be used to limit access.
Detention basins	During large rainfall events detention basins are designed to fill with runoff	EXTREME	Install signs warning of the potential danger of flooding
Environment and public health	Illegal stormwater discharge from business and industry can cause environmental damage and be a possible source of contamination	HIGH	Council's trade waste section inspects all business classified as discharging to ensure correct connection to sewer system rather than the stormwater system
Nuisance flooding	Through insufficient capacity or blockage of pipes or pits localised flooding can occur during rainfall events	HIGH	Reacting promptly to customer requests of flooding caused by network failure. Inspecting known problem areas during rainfall events
Damaging flooding	Through insufficient capacity or blockage of pipes or pits localised flooding can occur during rainfall events that may cause property damage.	EXTREME	New drainage is designed for 2% AEP.

Table 5.2. Critical Risks and Treatment Plans



Surcharge Pit - Bradwardine Road Allowing for 2% AEP flow under Bradwardine Road, reverting back to open channel.



5.3 Routine Maintenance Plan

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.

5.3.1 Maintenance plan

Maintenance includes reactive, planned and cyclic maintenance work activities. The intermittent and unpredictable nature of the load placed on the drainage network requires that the majority of maintenance is reactive

<u>Reactive maintenance</u> is unplanned repair work carried out in response to service requests and management/supervisory directions. The majority of drainage network is reactive. Reactive maintenance to the drainage network includes:

- Clearing pit and pipe blockages.
- Repairing or replacing broken pipes.
- Replacing damaged pit lids and grates.

<u>Planned maintenance</u> is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance. There is very little planned maintenance on the stormwater network. Planned maintenance includes:

- Periodic cleaning of gross pollutant traps.
- Routine Inspection (not currently performed)
- Routine flushing (not currently performed)

<u>Cyclic maintenance</u> is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, etc. This work generally falls below the capital/maintenance threshold. Cyclic maintenance of the drainage network includes:

• Street sweeping

Maintenance expenditure trends are shown in Table 5.3.1

Table 5.3.1. Maintenance Expenditure Trends

Year	Maintenance Expenditure
2015/16	\$351,817
2016/17	\$369,500
2017/18	\$387,300
2018/19	\$404,400
2019/20	\$416,200



Kerb inlet survey, Russell/Manilla Street Intersection

Assessment and prioritisation of reactive maintenance is undertaken by Council staff using experience, training and judgement.

5.3.2 Standards and specifications

Maintenance work is carried out in accordance with the following Standards and Specifications.

- Bathurst Regional Council 2011, Guidelines for engineering works, Bathurst Regional Council
- NSW Office of Water 2006 Code of Practice for Plumbing and Drainage
- Pilgrim, D.H. (Ed) 1987 Australian rainfall and runoff: a guide to flood estimation, Institution of Engineers, Barton



5.3.3 Summary of future maintenance expenditures

Future maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Fig 5.3.3. Note that all costs are shown in current 2019-dollar values.



Fig 5.3.3 Planned and Projected Maintenance Expenditure

The above graph has been determined from past, current budgets and extrapolating current budget expenditure by 4.2% PPI for projected expenditure. Average planned maintenance for the current 2019/20 financial year is \$446,995 and over the next 20 years is \$707,462. The projected expenditure will be sufficient to compensate for growth in the Drainage Network.



Drainage Channel & Basin's, Mount Panorama



5.4 Renewal/Replacement Plan

Renewal 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 upgrade/expansion or new works expenditure.

5.4.1 Renewal plan

Drainage pipes do not have an explicit life published, however pipes complying with **AS4058** and installed to **AS3725** assures a design life of **100** years. The expected life of uPVC pipes is expected to be well in excess of **100** years when installed to the manufacturer's recommendations. The intermittent

Possible future drainage asset inspections (Section 5.1.4) will provide renewal candidates and a process of prioritisation based on Table 5.4.1. will allow programming of renewals.

Table 5.4.1 Renewal Priority Ranking CriteriaCriteriaWeightingCondition of asset40%Importance in network20%Catchment area serviced20%Land use20%Total100%



Harris Park Stormwater Drainage, Mount Panorama

5.4.2 Renewal standards

Renewal work is carried out in accordance with the Bathurst Regional Council's engineering guidelines. Future renewal work should take into account predicted changes in rainfall patterns, including an increase in the intensity of storms Bathurst may be subject to.

5.4.3 Summary of future renewal expenditure

Projected future renewal expenditures are forecast to increase over time as the asset stock ages. As the age of the bulk of the drainage network is less than 100 years, there is little renewal projected for the next 20 years. Small sections of pipe or individual pits that may require replacement will generally be renewed through the maintenance program. Other sections of drainage will be renewed as part of road reconstruction and as such are not programmed into a separate drainage renewal program.

5.5 Creation/Acquisition/Upgrade Plan

New works are those works that create a new asset that did not previously exist or works which 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 to the Council from land development. These assets from growth are considered in Section 4.4.



5.5.1 Selection criteria

New drainage network assets are constructed as new growth dictates. Drainage assets include pipes, collection pits, pollutant traps and Detention basins.

Necessary upgrades are identified through comprehensive computer modelling of the drainage network as a result of customer requests or known system deficiencies. There are relatively few upgrade candidates and the prioritisation of them is not generally an issue. For future programming of upgrades Table 5.5.1 can be used as a prioritisation guide.

Table 5.5.1	Upgrade	Priority	Ranking	Criteria
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Criteria	Weighting
Capacity constraint	40%
Importance in network	20%
Catchment area serviced	20%
Land use	20%
Total	100%



5.5.2 Standards and specifications

New work is carried out in accordance with the Bathurst Regional Council's engineering guidelines.

5.5.3 Summary of future upgrade/new assets expenditure

In order to better understand the expenditure patterns, Fig 5.5.3 shows the previous 5 years capital expenditure on planned drainage projects and actual drainage projects.



Fig 5.5.3 Capital Upgrade/New Asset Expenditure

The above graph has been determined from past, current budgets and extrapolating average budget expenditure by 4.2% PPI for projected expenditure. The \$400,000 gap in budget and projected expenditure is due to a number of Drainage capital works projects in 2018/19 (Eleven Mile Drive Drainage Augmentation - \$1.5million).



6. 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.

6.1 Financial Statements and Projections

The financial projections are shown in Fig 6.1 for planned/projected maintenance (operations and maintenance) & capital expenditure (renewal and upgrade/expansion/new assets).



Fig 6.1 Planned and Projected Maintenance/Capital Expenditure

The above graph has been determined from past, current budgets and extrapolating budget expenditure by 4.2% PPI for projected expenditure and average Drainage Network growth over the past 10 years (8.9km p.a.). Over the next 20 years the overall budget expenditure for council's drainage network is estimated to increase from \$521,200 (2019/20) to \$1,979,865 (2039/40). The average maintenance & capital renewal expenditure expected over the long term is \$1,281,959 and the backlog of capital expenditure to upgrade assets in Bad condition to Excellent (Refer to 5.1.3) is \$908,400. Projected capital expenditure will vary over the projected period shown (as visible from 2017/18 to 2022/23) and has been determined by the average expenditure of recent budgets, multiplied by 4.2% PPI.



6.1.1 Sustainability of service delivery

There are two key indicators for financial sustainability that have been considered in the analysis of the services provided by this asset category, these being long term life cycle costs and medium-term costs over the 10-year financial planning period.

Long term - Life Cycle Cost

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the longest asset life. Life cycle costs include maintenance and asset consumption (depreciation expense). The annual average life cycle cost for the services covered in this asset management plan is **\$1,067 million**.

Life cycle costs can be compared to life cycle expenditure to give an indicator of sustainability in service provision. Life cycle expenditure includes maintenance plus capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure at the start of the plan is **\$521,200**.

A gap between life cycle costs and life cycle expenditure gives an indication as to whether present consumers are paying their share of the assets, they are consuming each year. The purpose of this asset management plan is to identify levels of service that the community needs and can afford and develop the necessary long-term financial plans to provide the service in a sustainable manner. The life cycle gap for services covered by this asset management plan is -\$545,866 p.a. funding shortfall over the long term and a backlog of capital upgrade (Upgrading assets in Bad Condition to Excellent) of \$908,400. The life cycle sustainability index is **0.49**.

Medium term – 10-year financial planning period

This asset management plan identifies the estimated maintenance and capital expenditures required to provide an agreed level of service to the community over a 20-year period for input into a 10-year financial plan and funding plan to provide the service in a sustainable manner. This may be compared to existing or planned expenditures in the 20-year period to identify any gap. In a core asset management plan, a gap is generally due to increasing asset renewals.

Council's long-term financial plan covers the first 10 years of the 20-year planning period. The total estimated capital works and maintenance expenditure required over the 10 years is **\$7,042 million**. This is an average expenditure of **\$704,151 pa**. Estimated maintenance and capital works expenditure in year 1 is **\$521,200**, the 10-year sustainability index is **0.74**, resulting in a funding shortfall of **\$182,951** for year 1.



Brilliant Street Drainage Reserve, Brilliant/Havannah Street Intersection



6.2 Funding Strategy

Council's stormwater drainage network is unique compared to other assets owned by Council, as the assets within the network have such a long life (100 years) and have an average age 22yrs. Given the average, stormwater assets have >50yrs until renewal/upgrade is required for majority of the network, which at the time of this asset management plans puts a large expenditure projected for 2055.



6.3 Valuation Forecasts

Asset values are forecasted to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council. Fig. 6.3 shows the projected replacement cost asset values over the planning period in current 2019-dollar values.





Replacement cost is projected to increase by >\$250,000 over the 20-year period. The replacement cost of the overall Drainage Network has been determined from Council's asset management software as of 30/06/19 and extrapolated with 4.2% PPI.



6.4 Key Assumptions made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. 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:

- Useful life and value of assets are calculated using the NSW Reference Rates Manual for Valuation of Water Supply.
- Depreciation is calculated using the straight-line method.
- Assets with unknown details required for valuation have been standardised using the below table.

Asset type	Parameter	Value
Drainage Pit	Pit size	600mm x 600mm
	Pit depth	1 - 2 m
	Pit age	15 years
	Pit cover	Galvanised steel
	Kerb lintel size	1200mm
Drainage Pipe	Pipe size	375mm
	Pipe material	Reinforced concrete
	Pipe depth	1 - 2 m
	Pipe age	22 years



Inter-allotment Pit, Hughes Street Kelso

Accuracy of future financial forecasts may be improved in future revisions of this asset management plan by the following actions.

- Improving the accuracy of unit rates by collecting more detailed financial information from construction work and comparing and adjusting the unit rates derived from the Department of Utilities and Energy (now Department of Water and Energy).
- Development of condition-based depreciation method that satisfies accounting standards.
- Collection of condition data through either a randomised sample or a comprehensive network survey.



Bio Retention Garden Beds, Adventure Playground



7. ASSET MANAGEMENT PRACTICES

Council currently uses Civica Authority as the primary corporate finance system.

Administrator: IT manager and Assets System Administrator

Relevant accounting standards are:

- AASB 136 Impairment of Assets
- AASB 1021 Depreciation of Non-Current Assets
- AASB 1041 Accounting for the reduction of Non-Current Assets
- AAS 1015 Accounting for acquisition of assets
- AAS 27 Financial reporting by Local Government

7.2 Asset Management Systems

Council uses CONFIRM asset management software. The current version is 19.00e.AM.12665.

CONFIRM team:	
Team leader:	Administration Engineer
Administrator:	Assets System Administrator
Data entry:	3 x Asset Technicians
Field Inspections:	Asset Inspector

Confirm consists of:

- A comprehensive drainage inventory;
- Data Management, with reporting procedure to present inventory and assessment information;
- Asset Accounting, AAS27 reporting capability and life cycle costing
- MapInfo GIS system linked to CONFIRM.

As a result of this plan it is intended to improve the Asset management system by:

- Ascertaining more accurate unit rates for work performed in the drainage network.
- Linking of Confirm to Financial Software to gain more accurate costs of works.

7.3 Information Flow Requirements and Processes

The key information flows into this asset management plan are:

- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of various factors affecting future demand for services;
- Correlations between maintenance and renewal, including decay models;
- Data on new assets acquired by council.
- MapInfo GIS system linked to CONFIRM.
- Asset Accounting, AAS27 reporting capability and life cycle costing

The key information flows from this asset management plan are:

- The assumed Works Program and trends;
- The resulting budget, valuation and depreciation projections;
- The useful life analysis.



8. CONCLUSION

8.1 Current position statement

The provision of the drainage network is one of council's principal activities. Council provides the drainage network within the Bathurst city area. This includes the villages of Raglan, Eglinton and Perthville. limited amount of drainage is present in some of the rural villages.

The current city drainage network consists of **353.66 km** of pipes, approximately **12,256** drainage pits, **6** gross pollutant traps and **13** Detention basins. Over the last 10 years the network has increased in length at an average of **2.5%**p.a. The increases in the network include a substantial amount of inter-allotment drainage. Council is not responsible for the management of inter-allotment drainage and it is not part of the plan. The average age of the pipe and pit drainage assets is **22** years.

The first major drainage works within the Bathurst city area commenced during the early 1930's. There are some original brick arch culverts still forming a functional part of the network, making them at least **80** years old. Approximately **2%** of the network has been assessed as in poor condition and **0%** in bad condition, based on the age of the pipes.

The current replacement cost of the drainage network is **\$206,691 million**. The annual depreciation expense is **\$418,579**. Asset valuations are at greenfield rates and based on rates published by the NSW Department of Primary Industries, Office of Water.

Customer requests regarding the drainage network have, on a monthly average stayed constant since 2016. This suggests that the level of service provided by the drainage network is being maintained and current maintenance expenditure is adequate.

In technical terms the current maintenance budget appears to be adequate for the drainage network. The network deterioration rate appears to be in line with or slower than the useful life used to calculate remaining asset life.

The current drainage maintenance budget for **2019/20 FY** is **\$416,200** and the current budget required over the medium term is **\$522,918** creating an estimated shortfall of -**\$106,718** for year 1 of the planning period. The shortfall in funding does not allow for any upgrades, only maintaining the pre-existing infrastructure. In the medium term (10yrs) the average maintenance and capital renewal expenditure required is **\$704,151 p.a.** and the current maintenance and capital renewal budget is **\$521,200**. This is average shortfall of -**\$182,951 p.a**.

The present backlog of capital works (cost of Upgrading assets in Bad condition to Excellent) is \$908,400.

The budget for maintenance and repair is currently forecast by adding an additional amount due to PPI on the previous year's budget. This budget is used for basic maintenance caused by tree roots, sediment runoff and miscellaneous damage. It has not been used to replace any of the existing drainage network. In the future expenditure will need to be set aside to replace old assets as they reach the end of their lives. As the drainage assets age and the network expands to meet the growth in areas of Bathurst, the expenditure required to meet maintenance needs will increase at a rate higher than the PPI.

Capital renewal of the drainage network will be based upon criteria laid out in section 5.4.1. However, asset age will be the most reliable indicator to initially target potential assets requiring renewal expenditure and then applying council's criteria to those assets.

Currently there are no significant areas within the drainage network requiring widespread renewal. As the drainage network ages a review of current maintenance and operation practices may change and routine inspections of drainage assets introduced.



8.2 Recommendations

Council aims to ensure drainage assets are sustainable and appropriate. The key outcomes of this asset management plan are to keep the drains clear, keep the drains working and bring them up to standard.

To ensure that Council can achieve this, the following actions have been identified:

8.2.1 Maintenance recommendations

- The current level of maintenance appears to be adequate;
- To supplement the current maintenance regime a proactive flushing program based on asset inspection will assist in keeping pits and pipes clear of blockages;
- Contractor work joining a council-maintained stormwater drain should be inspected by a council officer to ensure compliance with the Council standards;
- Maintenance budgetary requirements will increase in real terms as the network expands and ages. An increase of the current budget in real terms of approximately **1 % p.a.** (this is half the rate of growth in the drainage network over the previous 10 years) be required to maintain the current levels of maintenance; and
- Implementation of water sensitive drainage designs has the potential to markedly increase maintenance costs. This should be monitored and taken into account when designing areas of natural drainage.



Flood Penstock & Culvert Outlet, Hope Street



8.2.2 Renewal recommendations

- A network inspection should be carried out. The inspection should be limited to areas where age and/or condition are known to be an issue. This will identify candidates for renewal;
- A subsequent inspection 5 years after the initial inspection will give an indication of the rate of deterioration of the network;
- A program of asset renewal based on inspections should be implemented. It is not expected that large numbers of drainage assets will require replacement;
- Relining with uPVC should be considered as a renewal option where replacement is prohibitively expensive or not practical due to above ground development.

8.2.3 Upgrade and new asset recommendations

- Developers should model drainage requirements for new development from inlet to discharge into receiving water to ensure previously installed drainage is of sufficient capacity for the new development. Identified capacity constraints upgrades may be joint funded by Council and the developer;
- Changes in climactic conditions, and specifically rainfall intensity will affect drainage design. CSIRO predictions should be considered when designing and constructing new drainage assets;
- Water sensitive urban design should be carefully considered. The maintenance costs required to
 maintain WSUD when compared to traditional subterranean drainage are significantly higher. The
 higher maintenance costs should be considered when examining the environmental benefits. Larger
 scale projects (such as the Hector Park system of drainage ponds) offer greater cost/benefit ratio
 than smaller street-based designs; and
- Designs should aim to minimise impervious ground covering to reduce runoff.

8.2.3 Asset management recommendations

- The maintenance and renewal budgets should be monitored, and the programmed budget adjusted according to inspection results;
- A program of drainage asset inspection should be implemented. This should take the form of a sample of assets and aim to inspect the entire network every 10 years;
- Asset inspection results and condition information should be recorded on the Council's asset management system;
- Maintenance and renewal costs should be closely monitored using the asset management system's maintenance management capabilities. This will provide more accurate unit rates and better valuation figures.



Junction Pit, Manilla Street



900mm Dia Queen Charlottes Vale Outlet, Havannah Street



9. PLAN IMPROVEMENT AND MONITORING

9.1 Performance Measures

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

- The degree to which the required cash flows identified in this asset management plan are incorporated into council's long-term financial plan and strategic management plan;
- The degree to which 1-5-year detailed works programs, budgets, business plans and organisational structures take into account the 'global' works program trends provided by the asset management plan.

9.2 Monitoring and Review Procedures

This asset management plan will be reviewed during annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services as a result of the budget decision process.

The Plan has a life of 4 years and is due for revision and updating within 2 years of each Council election.

Table 9.2 Improvement Plan

Task	Responsibility	Resources Required	Timeline
Routine Inspection of Drainage Assets	Drainage Ganger/Asset Technician	Mobile Inspections, pending confirmation to inspect assets routinely.	
Specified CCS categories for Drainage Requests	Assets System Administrator/ Asset Technician	Feedback on applicable categories.	4 Years
More specific categorisation of Budget items into Operations/Maintenance/Upgrade/Renewal	Finance Section/Asset Section	-	-



Inlet Pit Installation, Mount Panorama



REFERENCES

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- Bathurst Regional Council, 'Detailed Financial Budget and Revenue Policy 2019-2023
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- IPWEA, 2015 'International Infrastructure Management Manual', Institute of Public Works Engineering Australia, Sydney.
- NSW Department of Water and Energy 2006 Code of Practice for Plumbing and Drainage
- IPWEA, 2009 First Ed 'Australian Infrastructure Financial Management Guidelines', Institute of Public Works Engineering Australia, Sydney
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- Protection of the Environment Operations Act 1997
- Water Management Act 2000
- Catchment Management Authorities Act 2003



Stormwater Installation, Bathurst Street Perthville



APPENDICES

