BRIDGES AND MAJOR CULVERTS ASSET MANAGEMENT PLAN

LODDON
SHIRE

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This document is available in alternative formats (e.g. larger font) if requested.

ACKNOWLEDGEMENT OF COUNTRY

Loddon Shire Council acknowledges the Traditional Custodians of the land comprising the Loddon Shire Council area. Council would like to pay respect to their Elders both past and present.

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This asset management plan has been developed in accordance with Council's Asset Management Policy and principles of the Asset Management Strategy (Objectives).

This asset management plan details information about Council's bridge and major culvert assets. The plan outlines the management approach to:

- describing and aligning the assets to services (as informed by corporate and service planning)
- managing the future demand for assets to achieve and maintain financial sustainability
- optimising the lifecycle management of assets (achieving service demand at lowest lifecycle cost)
- identifying and managing risks associated with the relevant asset (including criticality and condition)
- what funds (operating and capital) are required to operate the asset portfolio in alignment with the asset management plan over a 10-year planning period
- continual improvement in the management of the assets and performance monitoring.

1.2 Asset description

Council's bridges and major culverts contribute to the community through:

- creating a high level of connectivity throughout the municipality
- access and safe movement of pedestrians, lightweight private vehicle users, commercial and industrial mid-heavy vehicle users, cyclists, wheelchairs and prams.

Council manages 219 bridges and major culverts with 24,048 square meters of deck.

The network comprises both bridges and major culverts. Council's bridges and major culvert network has been developed over time to provide vehicle and pedestrian access around the shire area.

The assets that comprise the bridges and major culverts at Council are listed in the following table:

Asset description	Asset quantity	Units
Boxed culvert	76	No.
Bridge steel stringers timber deck	13	No.
Concrete floodway	11	No.
Footbridge concrete	5	No.
Footbridge timber	5	No.
Major culvert concrete	95	No.
Major culvert stone component	5	No.
Minor structure or masonry structure	2	No.
Stone floodway	7	No.

These infrastructure assets have significant replacement value of ***$38,599,332.***

1.3 Levels of service

Council is in the process of developing comprehensive levels of service for our bridges and major culverts. In time, this will include deliberative consultation with the community.

At present, management of assets, including intervention points and chosen treatment methods, is based upon:

- available budget and resource allocations
- feedback from the community
- active monitoring of the performance of the bridges and major culvert network.

Our present funding levels are insufficient to continue to provide existing services at the current levels in the long-term.

This plan, and future revisions, will inform the financial planning to fund the future

renewal and upgrades necessary to meet the capacity demand and levels of service.

1.4 Future demand

The main demands for new services are created by:

- population and demographic change
- ageing infrastructure
- increased freight kilometres travelled and the use of higher productivity vehicles
- changes in traffic composition.

These will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management.

We will implement demand management practices to control future increased costs of our assets, including the consideration of non-asset solutions and mitigating the increased threat (risk exposure) of asset and system failure by:

- develop design guidelines that consider future demand factors and good design principles
- restriction of types of vehicles accessing road network
- introduction of load limits to prolong the useful life of roads and to maintain public safety
- work with others to delineate a priority freight network to meet the needs of the increased freight task and to guide future investment in road upgrades
- develop designated freight networks utilising the National Heavy Vehicle Regulator (NHVR) and encourage freight to arterial roads where possible
- monitor through NHVR database and continued traffic counts. Collaboration with state authorities to focus future planning needs.

1.5 Lifecycle management plan

Lifecycle planning describes the approach to maintaining an asset from construction to disposal. It involves the prediction of future performance of an asset, or a group of assets, based on investment scenarios and maintenance strategies.

Our current approach to managing and operating our transport assets is predominantly reactive with only limited planning. We are striving to improve our approach to lifecycle management to make sure that we deliver on our service commitments in the most cost effective and efficient manner.

1.6 Financial summary

The projected outlays necessary to provide the services covered by this plan includes operations, maintenance, renewal, upgrade and new assets over the 10-year planning period is ***$6,126,404*** or ***$612,640*** on average per year.

1.6.1 What funding sources are available

Estimated available funding for the next 10 financial years is ***$2,407,128*** or ***$240,713*** on average per year as per the Financial Plan or budget forecast. This is ***39%*** of the cost to sustain the current level of service at the lowest lifecycle cost.

Allocated funding contained in Council's 10 year Financial Plan leaves a shortfall of ***$371,923*** on average per year of the projected expenditure required to provide the services in this asset management plan, as assets reach intervention level towards the later part of the 10 year planning period.

However, Council officers assessment is that there is some inaccuracies with the renewal modelling and have proposed a number of projects to undertake to improve projections and to responsibly mitigate this shortfall. This includes capturing asset condition at the component level.

Estimated available funding for bridge and major culvert maintenance over the next 4 financial years is ***$935,189*** or ***$233,797*** on average per year as per the Financial Plan. It is sufficient to maintain the bridges and major culverts in a satisfactory condition.

1.6.2 What we will do with constrained funding

We plan to provide the following related services:

- continue to inspect and maintain our bridges and major culverts to meet the standards of our Road Management Plan
- renew our bridges and major culverts according to priorities and annual budget allocations
- seek alternative funding for bridge and major culvert replacements such as grants.

1.6.3 What we cannot do with constrained funding

Works and services that cannot be provided under present funding levels are:

- an increased overall level of service delivered by bridges and major culvert assets
- upgrade of all identified functional deficiencies across the bridges and major culvert network.

1.7 Risk management

There are risks associated with providing the service and not being able to complete all identified activities and projects.

The main risks are:

- collapse or damage to structure or road approach
- bridge run-off accident
- delays from bridge closure or diversions
- pedestrian accident with road users
- pedestrian fall
- decline in condition and reduced effective life of bridges and major culverts.

We will endeavour to manage these risks within available funding by continuing to implement our inspection, maintenance and renewal programs to keep our bridges and major culverts in a safe and serviceable condition.

1.8 Asset management practices

Council's asset management framework provides a structured approach for the development, coordination, and control of our activities on assets over their life cycle, and for aligning these activities with our vision and strategic objectives.

Council's asset management planning is supported by three key documents:

- Asset Management Policy
- Asset Management Strategy
- asset management plans.

Our systems to manage assets include:

- Finance and accounting – *Attache*
- Asset management system – Moloney Asset Management System

Assets requiring renewal/replacement are identified using a combination of an analysis of the long-term financial needs at a network level and Council's asset information to identify specific assets requiring renewal at a project.

1.9 Monitoring and improvement program

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

- conduct formal componentised condition assessments of the bridges and major culvert network at regular frequencies that are appropriate for the asset class
- determine bridge and major culvert load capacities and signpost bridges when future condition audits are undertaken
- develop a project-based three (3) year Capital Works Program for renewals, upgrades and new works and integrate with Council's Financial Plan.

2 PURPOSE

This asset management plan has been developed in accordance with Council's Asset Management Policy and principles of the Asset Management Strategy (Objectives).

This asset management plan details information about Council's bridge assets. The plan outlines the management approach to:

- describing and aligning the assets to services (as informed by corporate and service planning)
- managing the future demand for assets to achieve and maintain financial sustainability
- optimising the lifecycle management of assets (achieving service demand at lowest lifecycle cost)
- identifying and managing risks associated with the relevant asset (including criticality and condition)
- what funds (operating and capital) are required to operate the asset portfolio in alignment with the asset management plan over a 10-year planning period
- continual improvement in the management of the assets and performance monitoring.

3 BUDET IMPLICATIONS

The projected outlays necessary to provide the services covered by this plan includes operational maintenance, renewal, upgrade and new assets over the 10-year planning period is ***$6.13M*** or ***$613k*** on average per year. Estimated available funding for the next 10 financial years is ***$2.41M*** or ***$241k*** on average per year as per the Financial Plan or budget forecast. This is ***39%*** of the cost to sustain the current level of service at the lowest lifecycle cost. Allocated funding contained in Council's Financial Plan leaves a shortfall of ***$372k*** on average per year of the projected expenditure required to provide the services in this asset management plan. Projects in Section 11.2 of this plan have been listed to evaluate and address this funding shortfall.

4 RISK ANALYSIS

There are risks associated with providing the service and not being able to complete all identified activities and projects.

The main risks are:

- insufficient funding for maintenance, renewal, and upgrade of the bridge and major culvert network
- collapse or damage to structure or approach
- bridge run-off accidents
- delays from bridge closures or diversions
- pedestrian accidents with road users (vehicles)
- pedestrian falls

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

- regular inspections to identify hazards before they occur
- collation of data relating to bridge and major culvert assets
- develop a bridge componentised capital works program

5 INTRODUCTION

5.1 Background

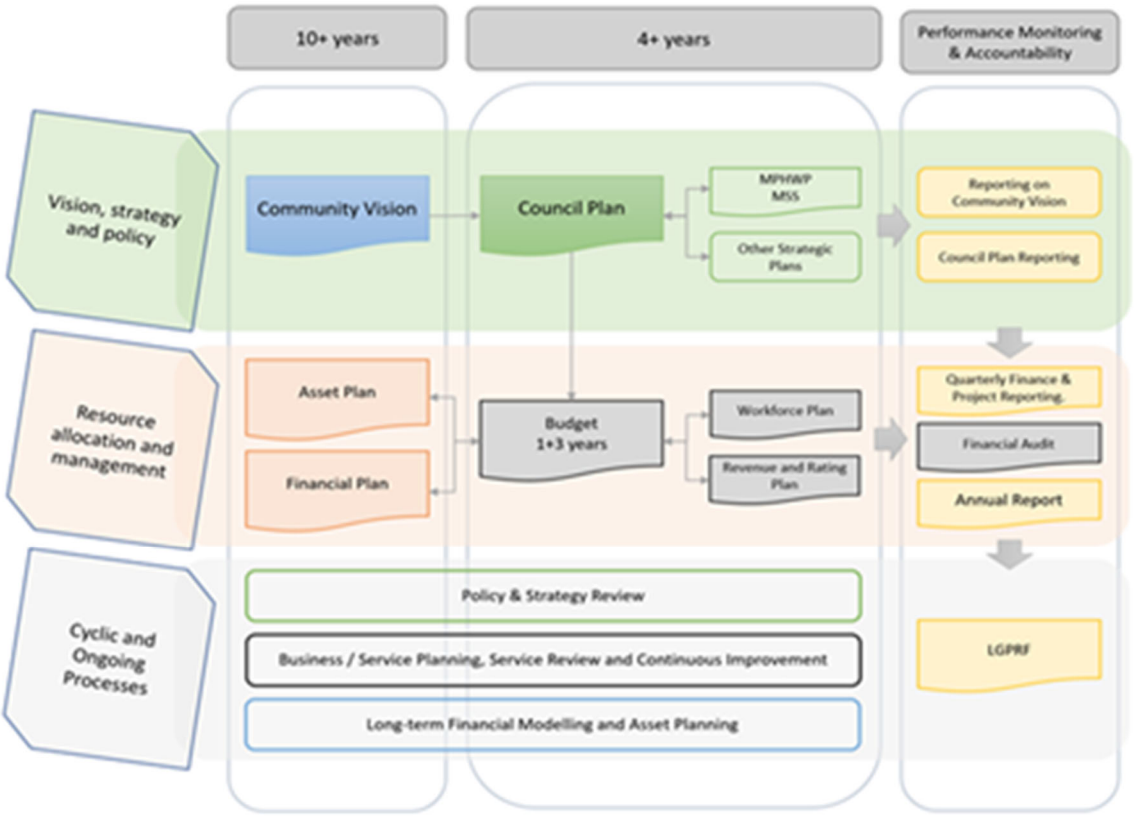
This asset management plan outlines the required management approach to:

- describing and aligning the assets to services (as informed by corporate and service planning)
- managing the future demand for assets to achieve and maintain financial sustainability
- optimising the lifecycle management of assets (achieving service demand at lowest lifecycle cost)
- identifying and managing risks associated with the relevant asset (including criticality and condition)
- what funds (operating and capital) are required to operate the asset portfolio in alignment with the asset management plan over a 10-year planning period
- continual improvement in the management of the assets and performance monitoring.

This asset management plan is to be read with Council's Asset Management Policy and Asset Management Strategy along with Council's Community Vision and Council Plan.

Figure 1 shows the different documents that influence and inform this asset management plan.

Figure 1 - Asset management document relationship



The infrastructure assets covered by this asset management plan are shown in the following table.

Council's bridge and major culvert assets are infrastructure provided to the community which assist in promoting connectivity across the municipality for vehicles, cyclists and pedestrians.

Table 1 - Assets covered by this plan

Asset category	Asset group	Quantity	Unit	Current replacement value ($)	Accumulated depreciation ($)	Depreciated replacement cost ($)	Useful life (Years)
Bridges and Major Culverts	Boxed Culvert	76	No.	$28,774,120	$16,854,533	$11,919,587	80-100
	Bridge Steel Stringers Timber Deck	13	No.	$498,671	$288,761	$209,910	80
	Concrete Floodway	11	No.	$562,183	$419,956	$142,228	80-100
	Footbridge Concrete	5	No.	$43,064	$22,700	$20,364	80-100
	Footbridge Timber	5	No.	$130,535	$74,638	$55,897	80-100
	Major Culvert Concrete	95	No.	$8,079,394	$4,916,997	$3,162,397	80-100
	Major Culvert Stone Component	5	No.	$220,781	$117,787	$102,995	80
	Minor Structure or Masonry Structure	2	No.	$69,607	$48,200	$21,407	80-100
	Stone Floodway	7	No.	$220,967	$132,771	$88,205	100
Total		**219**		**$38,599,332**	**$22,876,343**	**$15,722,990**	

Note: The replacement valuation in the above table is based on 'Greenfield' rates and is used for financial reporting purposes. 'Greenfield' valuation rates are based on the cost to acquire / construct the asset in an undeveloped ('greenfield') location and exclude items such as demolition, disposal, traffic management, and site restoration costs. As 'Greenfield' rates vary from 'Brownfield' rates, financial valuation information is generally not optimal for use in renewal modelling to determine needs based cash flow forecasts. 'Brownfield' rates are based on the total cost to replace the asset in its existing developed or built up location and are used to inform Council's analysis of long-term asset renewal funding demands.

5.2 Plan framework

This asset management plan has been prepared using good practice guidance from the *ISO55000 - Asset Management standard, International Infrastructure Management Manual* and has been developed based on existing processes, practices, data, and standards.

Council is committed to striving towards best practice asset management and it is recognised that this asset management plan will need to be updated periodically to reflect changes to management of Council's assets.

It is intended that Council's asset management plans should always reflect as closely as practicable actual practices used in managing its assets. Only in this way will Council be best able to ascertain its long-term financial needs for delivering sustainable assets and services.

5.3 Key stakeholders

Our assets are utilised by a broad cross-section of the community.

The stakeholders in the management of Council's bridge and major culvert assets are many and often their needs are wide-ranging. The relevant key stakeholders are:

- Councillors
- local residents including cyclists, pedestrians, etc
- visitors to the Shire
- tourism operators
- utility agencies
- developers
- neighbouring Councils
- Department of Transport and other government agencies
- Council's insurers.

The community's needs and expectations are subject to change frequently and are becoming more demanding manifested by demands for services that provide better quality, value for money, environmental awareness and relevant value adding.

This plan will demonstrate to the various stakeholders that Council is managing its bridge and major culvert assets in a responsible manner.

5.4 Goals and objectives of asset ownership

Our goal in managing infrastructure assets is to meet the defined range and levels of service in the most cost-effective manner for present and future consumers.

By achieving the most cost-effective approach, we will contribute to affordability and liveability contributing to a vibrant, growing, and connected community.

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 that meet the defined levels of service
- identifying, assessing and appropriately controlling risks
- linking to a financial plan which identifies required, affordable expenditure and how it will be allocated.

6 LEVELS OF SERVICE

This section defines the level of service or performance criteria that are required and the basis of the decision behind their adoption. The levels of service support Council's strategic goals and are based on customer expectation and statutory requirements.

6.1 Strategic and corporate goals

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

Our Community Vision is:

> *Creating a community where everyone is welcome and has the opportunity to live, work and thrive.*

Relevant Council strategies and Council's role are:

Table 2 - Link to Council objectives

Strategy	Council's role
1.1 We will implement financially and environmentally sustainable infrastructure that supports our social and economic needs	
1.1.1 Plan for future facilities and infrastructure that meet community need Finalise asset management plans and long term strategies for Council assets ▪ We will do this by reviewing and implementing asset management plans across all asset classes to ensure they reflect the current environment	**Deliver**

Council will exercise its duty of care to ensure public safety in accordance with the infrastructure risk management plan prepared in conjunction with this asset management plan.

6.2 Functional hierarchy

Council bridge and major culvert assets are classified according with the road's hierarchy in terms of their specific function, demand, capacity, use patterns, and potential risk. The hierarchy classification is used to assist in prioritising works programs and intervention responses to remedy defects.

Council's hierarchy or classification system for its bridge and major culvert is detailed below.

Table 3 - Asset functional hierarchy: Roads

Hierarchy Code	Classification	Functional Definition
RSC & TSC	Sealed Collector	Sealed Collector roads distribute traffic between arterials and access roads.
RSA &TSA	Sealed Access	Sealed Access roads provide primary access to residential properties, other developments or facilitate service or tourist traffic.
RGC & TGC	Gravel Collector	Gravel Collector roads distribute traffic between arterials and primary access roads.
RGA & TGA	Gravel Access	Gravel Access roads provide primary access to residential properties, other developments or facilitate service traffic, tourist traffic, school buses, or milk tanker traffic.
RGM & TGM	Minor Gravel	Minor Gravel roads provide access to non-residential/ developed properties or alternative access to residential properties.
RF & TF	Formed	Formed roads provide access to undeveloped non-residential properties.
RUF & TUF	Unformed	Unformed roads generally providing access to rural properties.
RFA	Fire Access	Rural Fire Access roads provide access for firefighting purposes.

6.3 Alignment to services

The assets covered by this asset management plan contribute and support the delivery of the following Council services:

Table 4 - Services delivered by assets

Asset type	Council service category	Service delivered
Bridges and major culverts	Local roads	The service is provided to maintain access to users of Council's road infrastructure.

These services align with Council's service planning and delivery framework.

6.4 Levels of service

Service levels can be defined in two interconnected ways, customer levels of service and technical levels of service. These are supplemented by organisational measures which are the Community Plan, Council Plan, and the Annual Budget. Service performance results are reported through Council's Annual Reports.

At present, indications of current and target levels of service are obtained from various sources including:

- community satisfaction surveys
- residents' feedback to Council and staff
- works staff feedback to management
- feedback from other stakeholders
- service requests and related correspondence entered in Council's customer request system
- physical measurements of quality standards
- legislative standards (minimum requirements).

In future, it is expected that Council will undertake deliberative community engagement to validate these levels of service.

6.4.1 Customer levels of service

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

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

Customer levels of service measures used in the asset management plan are:

Quality	How good is the service … what is the condition or quality of the service?
Function	Is it suitable for its intended purpose …. *Is it the right service?*
Capacity/Use	Is the service over or under used … do we need more or less of these assets?

Organisational measures are measures of fact related to the service delivery outcome (e.g. number of occasions when service is not available, condition % of Very Poor, Poor/Average/Good, Very Good).

These organisational measures provide a balance in comparison to the customer perception that may be more subjective.

Table 5 - Customer level of service

Key performance measure	Level of service objective	Performance measure process	Current performance	Target performance
Quality	Providing local streets of an appropriate condition and standard	Annual Community* Satisfaction Survey	52	57^
		Bridge and major culvert network condition	0% of network above condition intervention score of 7	<3%
Function	Meet bridge user requirements as part of the road/ pathway network available, with bridges consistently available in locations needed	Customer requests relating to user requirements, load capacity, availability.	To be determined	To be determined
Capacity/ Utilisation	Bridge structures meet the load requirements of all users	Percentage of structures have no load limit	To be determined	To be determined

Notes
** Results taken from the DEWLP's Local Government Community Satisfaction Survey conducted in 2020*
^ Average community satisfaction for small rural councils group

6.5 Technical levels of service

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

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

Operations	The regular activities to provide services (e.g. temporary signage, inspections, etc.
Maintenance	The activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. Road patching, unsealed road grading, building and structure repairs).
Renewal	The activities that return the service capability of an asset up to that which it had originally (e.g. Road resurfacing and pavement reconstruction, pipeline replacement and building component replacement).
Asset Improvements	The activities to provide a higher level of service (e.g. Widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. A new library).

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

Table 6 shows the technical levels of service expected to be provided under this asset management plan. The 'Desired' position in the table documents the position being recommended in this asset management plan.

Table 6 - Technical levels of service

Key performance measure	Level of service objective	Performance measure process	Current performance	Target performance
Operations and maintenance	Maintaining the safety, functionality, and serviceability of the bridge and major culvert network	Planned maintenance	Maintenance undertaken in accordance with RMP	Maintenance undertaken in accordance with RMP
		Reactive maintenance	Requests responded to in accordance with RMP	Requests responded to in accordance with RMP
		Inspections	Inspections completed in accordance with RMP	Inspections completed in accordance with RMP
Asset renewal	Preserving the condition of bridge and major culvert infrastructure	Annual renewal program	100% of scheduled program delivered	100% of scheduled program delivered
Asset improvements	Providing fit for purpose bridge and major culvert infrastructure	Annual upgrade program	100% of scheduled program delivered	100% of scheduled program delivered

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

Review and establishment of the agreed position which achieves the best balance between service, risk and cost is essential.

6.5.1 Actual levels of service

Council recognises the importance that levels of service play in optimising the lifecycle management of infrastructure assets. For the assets covered by this plan, Council continues to work towards achieving the required service levels in practice.

The development and monitoring of actual service level will be one of the foundations of future improvement through the asset management planning process.

6.6 Customer research and expectations

6.6.1 Community consultation

At this stage, targeted customer research has not been undertaken for Council's bridge and major culvert infrastructure assets.

Council is committed to transparent and informed decision making in relation to the management of its assets and services through engagement with the community. Council undertakes inclusive community consultation to define service levels and performance measures through the development of its Community Plan, the Council Plan, and Annual Budget. These discussions provide input to Council's strategic directions which are supported by the various services, projects, and programmes which its delivers.

Wherever practicable, community input is sought on appropriate aspects of planning our bridge and major culvert infrastructure assets by way of consultation. However, Council acknowledges that it needs to do more work with its community in developing levels of service and it will target discussions when making decisions which influence the way that Council delivers its services and manage our assets.

Once service levels and budget funding issues have been properly reconciled, it is appropriate that Council should consult with the community to ensure that these service levels are meeting community expectations.

6.6.2 Community satisfaction

Council participates in the Local Government Community Satisfaction Survey coordinated by the Department of Environment, Land, Water and Planning on behalf of Victorian councils.

This survey measures community views towards, and satisfaction with, the services delivered by Council. The results from the survey conducted in 2020 are summarised in the following table.

Table 7 - Customer Satisfaction Results

Performance Measure	Loddon Shire Council	Small Rural Councils Group	Statewide Average
	2020	2020	2020
Condition of local streets and footpaths	52	57	58

For further details of the assessment, refer to Council's Community Satisfaction Survey results.

What does this mean?

The result of this community satisfaction survey indicates that our community has a moderate acceptance of the condition and quality Council's road and footpath networks.

Future revisions of this asset management plan will aim to incorporate more community consultation on service levels and costs of providing the service. This will assist the Council and stakeholders in matching the level of service required, and service risks and consequences with the community's ability and willingness to pay for the service.

6.7 Legislative requirements

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

Table 8 - Legislative requirements

Legislation	Requirement
Local Government Act 2020	Sets out role, purpose, responsibilities and powers of Council including the preparation of a financial plan supported by asset management plans for sustainable service delivery.
Road Management Act 2004 and associated Regulations and Codes of Practice	Establishes a coordinated management system for public roads that promotes safe and efficient State and local road networks. This also includes the responsible use of road reserves for other legitimate purposes (e.g. provision of utility services). Defines the responsible authorities for all roads within the state. It makes Council the controlling authority for public local roads, boundary roads, and parts of declared roads within the municipal area.
Transport Act 1983	Relates to the operation of the road network
Road Safety Act 1986	Safety requirements relating to the use and operation of the road network.
Planning and Environment Act 1987	Establishes a framework for planning the use, development and protection of land in Victoria in the present and long-term interests of all Victorians
Heritage Act 1995	Protection of historic buildings, structures and precincts
Occupational Health and Safety Act 2004	Applicable to working within the road reserve.

7 FUTURE DEMANDS

The objective of asset management is to create, operate, maintain, rehabilitate, and replace assets at the required level of service for present and future customers in a cost effective and environmentally sustainable manner. The asset management plan must therefore forecast the needs and demands of the community in the future and outline strategies to develop the assets to meet these needs.

7.1 Demand forecasts and impact on assets

The present position and projections for demand drivers, and their potential impacts on future service delivery and use of assets is identified and documented in Table 9.

Table 9 - Demand drivers, projections, and impact on services

Demand factor	Projection	Impact on assets
Population change	Census figures estimate the population of Loddon Shire is stable.	▪ Population stability reduces the capacity of Council to raise revenue through rates. ▪ While forecasts indicate a current stable population heavy vehicle use is expected to increase on strategic routes.
Ageing infrastructure	Council has a legacy whereby road and bridges and major culvert assets, based on their age profile, will require renewal or rehabilitation in the near term to maintain basic service levels.	▪ Without adequate funding, the declining condition of Council's bridge and major culvert assets will result in reduced levels of service and increased risk of failure.
Increased freight kilometres travelled and the use of Higher Productivity Vehicles	It is expected, freight operators will continue to update their fleet with Higher Productivity Vehicles with higher axle loadings	▪ The projected increase in freight volumes and the move to vehicles with higher axle loadings will put Council's bridge infrastructure under pressure and may result in shorter useful lives.
Changes in Traffic Composition	Expected changes in traffic composition involving heavier vehicle loads than those anticipated in the original design and provision of bridges.	▪ Increased demand on bridges to cater for transport vehicles operating at Higher Mass Limits will most likely shorten the useful life of structures.
Climate Change	It is expected that climate change will intensify in the medium to long term resulting in an increased number of extreme weather events	▪ There will be an increase of structural damage caused by extreme events and an increase in deterioration rates of the network

7.2 Demand management strategy

Demand management is not intended to reduce the scope or standard of services provided by an asset, but rather, it is concerned with aligning demand or expectation of service provided by an asset with the available resources to ensure that genuine needs are met and community benefit is maximised.

Demand management components may include:

Table 10 - Demand management strategies

Demand Factor	Applicable Strategy(s)
Operation ***(modification of access to an asset)***	▪ Develop design guidelines that consider future demand factors and good design principles.
Regulation ***(restriction on the type of use of an asset)***	▪ Restriction of types of vehicles accessing road network ▪ Introduction of load limits to prolong the useful life of roads and to maintain public safety
Incentives ***(Influence the use of an asset)***	▪ Plan network improvements to coincide with major land use changes ▪ Work with others to delineate a priority freight network to meet the needs of the increased freight task and to guide future investment in road upgrades
Education ***(promotion of alternatives)***	▪ Develop designated freight networks utilising the National Heavy Vehicle Regulator (NHVR) and encourage freight to arterial roads where possible. ▪ Monitor through NHVR database and continued traffic counts. Collaboration with State Authorities to focus future planning needs

7.3 Strategic direction

There are a number of existing strategies and plans which have been developed to provide a strategic response to the demands, challenges and opportunities which the ongoing management of the assets covered by this plan present. These documents include:

- Community Vision
- Council Plan
- Road Management Plan
- Disability Access and Inclusion Plan 2018-2021

8 LIFECYCLE MANAGEMENT PLAN

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

8.1 Background data

8.1.1 Physical parameters

The bridges and major culvert network which Council is responsible, consists of 219 structures.

The network comprises of bridges - structures that allow vehicular or pedestrian traffic to traverse an obstacle and comprise components such as abutments, piles, piers, crossheads and decking; and major culverts - self-contained major drainage structures that allow vehicular and pedestrian traffic to traverse obstacles, and includes pipe and box culverts which are overlain with the road/ embankment supporting the road/ pathway.

8.1.2 Asset condition

Asset condition is a measure of the health of an asset and is a key consideration in determining remaining useful life, as well as predicting how long it will be before an asset needs to be repaired, renewed or replaced. Asset condition is also an indicator of how well it can perform its function. Condition data is valuable for developing long term funding scenarios for strategic planning of Council's budget.

Council measures the condition of its assets using a standardised 0 to 10 grading system.

A summary of the condition rating scale used for the assets covered by this asset management plan is detailed in

Table 11. Council's condition grading system follows good practice guidance as provided by various industry standards including the *International Infrastructure Management Manual.*

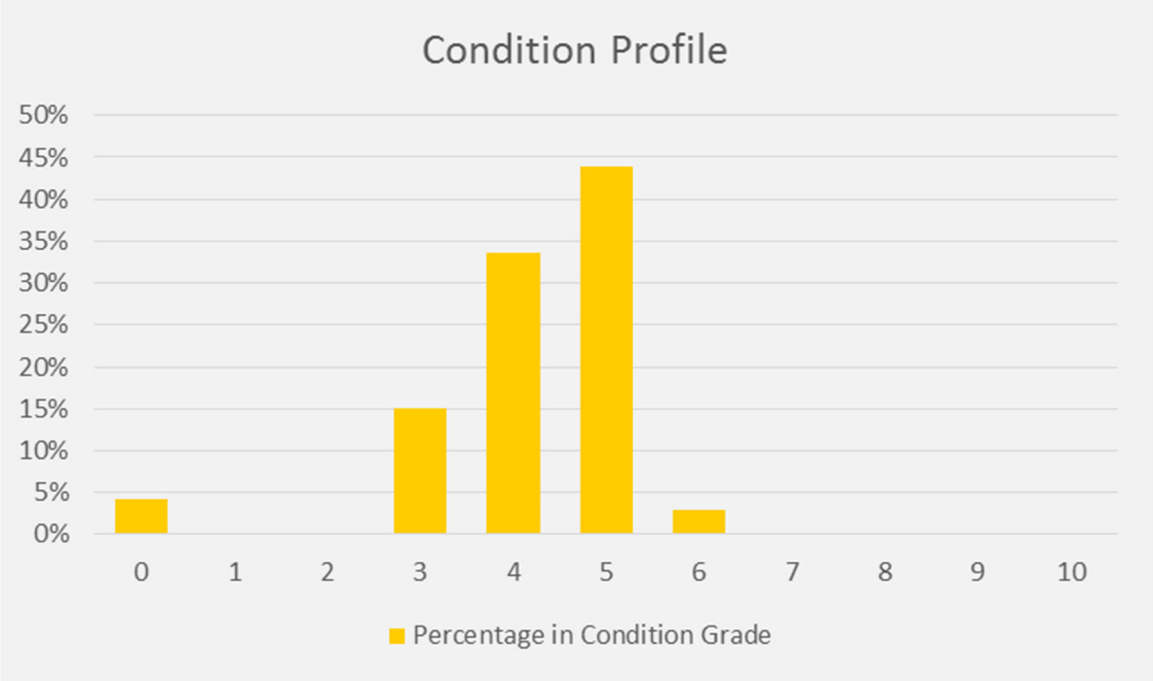
Condition data for Council's bridges and major culvert is recorded in its asset register and is used for renewal modelling, capital works planning, and financial reporting.

Table 11 - Condition rating system

Score	Condition Rating	Description
0	New	New or an asset recently rehabilitated back to new condition.
1	Near new	Near new no visible signs of deterioration often based upon the time since construction rather than observed condition decline.
2	Excellent	Excellent. Very slight condition decline obvious no longer in new condition.
3	Very good	Very good early stages of deterioration minor no serviceability problems.
4	Good	Good some obvious deterioration evident slightly impaired serviceability.
5	Fair	Fair obvious deterioration some serviceability loss.
6	Fair to poor	Fair to poor. Quite obvious deterioration serviceability would be affected and rising maintenance cost.
7	Poor	Poor severe deterioration serviceability limited high maintenance cost
8	Very poor	Very poor serviceability heavily impacted. Very high maintenance cost needed to be rehabilitated.
9	Extremely poor	Extremely poor severe serviceability problems needing rehabilitation immediately. Could also be a risk to remain in service
10	Failed	Failed no longer serviceable and should not remain in service extreme risk

The following figure provides an overview of the condition of Council's bridges and major culvert assets:

Figure 2 - Condition profile: Bridges and major culverts



What does this mean?

The overall condition profile for Council's bridges and major culvers indicates that they are in a fair overall state which promotes safety and efficiency.

The graph indicates that 4.3% of the total value of the bridge and major culvert network is in 'as new/ near new' condition. This equates to approximately $1.6M of the network essentially being brand new. This is reflective of the investment that Council has made over recent times towards replacing assets that were due for renewal and providing new assets to further improve the condition of the network.

Approximately 47% ($18.1M) of the network is currently in 'fair/poor' condition indicating renewal/ upgrade of these assets is required in the medium term. This is a key driver of the annual bridge and major culvert replacement program. This appears to be a significant proportion of the network and Council must continue to allocate responsible levels of funding towards asset renewal to ensure that its assets are presented to the community in a safe and functional condition.

8.2 Routine operations and maintenance plan

Effective maintenance strategies are essential to ensure that an asset performs at the desired service level on a day-to-day basis.

Operations	Regular activities to provide public health, safety, and amenity (e.g. street sweeping, grass mowing, street lighting, cleaning pipes, etc).
Maintenance	Regular ongoing day–to-day work necessary to ensure asset achieves its defined useful life (e.g. pothole patching, replacement of a window, footpath grinding, etc).

8.2.1 Maintenance strategy

The following general maintenance and operations strategies are applied to Council's bridges and major culvert assets:

Table 12 - Maintenance strategy summary

Operations	Use and manage the assets in a manner that minimises the long term overall total cost. Undertake scheduled inspections as justified by the consequences of failure on levels of service, costs, public health, or safety.
Reactive maintenance	A suitable level of preparedness for prompt and effective response to service requests or asset failures is maintained.
Planned or preventative maintenance	Undertake planned asset maintenance activities to minimise the risk of critical asset failure and to maintain assets in a manner that minimises ongoing lifecycle costs.

8.2.2 Management approach to maintenance and operations

Council's management response to its maintenance and operations responsibilities for its bridge and major culvert assets is detailed in Table 13:

Table 13 - Maintenance and operations management approach

Activity category	Activity examples	Prioritisation factors	Challenges/Deficiencies with current practice	Improvement strategy
Operations	▪ Inspections ▪ Emergency callouts ▪ Debris/litter removal ▪ Response to incidents	▪ There are statutory or Council policy obligations/drivers. ▪ Continued asset functionality is critical to network performance. ▪ The health and safety of the community or Council staff has the potential to be compromised.	▪ No issues have been identified with current maintenance practices for Council's bridges and major culverts.	▪ Nil improvement initiatives required at this time however Council's maintenance practices are subject to ongoing review to value for money is delivered.
Reactive maintenance	▪ Responding to issues raised via customer requests ▪ Minor repair works to bridges and major culverts such as filling of potholes, guardrail repair. ▪ Interim repairs made to preserve safety until further works are undertaken	▪ Formal risk assessment in accordance with Council's RMP	▪ No issues have been identified with current maintenance practices for Council's bridges and major culverts.	▪ Nil improvement initiatives required at this time however Council's maintenance practices are subject to ongoing review to value for money is delivered.
Planned or preventative maintenance	▪ Maintain its design load capacity, functionality and serviceability. ▪ Repairs to approaches at abutments, repairs to the deck surface, cleaning and adjusting deck joints, removal of debris, painting and sign maintenance	▪ Works identified by level 1 bridge inspections. ▪ Protect the investment in the asset by ensuring that the structure attains its designed service life. ▪ Formal risk assessment in accordance with Council's RMP	▪ No issues have been identified with current maintenance practices for Council's bridges and major culverts.	▪ Nil improvement initiatives required at this time however Council's maintenance practices are subject to ongoing review to value for money is delivered.

Regardless of any specific intervention standard or guideline nominated, Council will take reasonable actions necessary to maintain safety and compliance of its bridges and major culvert assets.

8.2.3 Maintenance arrangements

Bridges and major culverts maintenance works are undertaken by Council's Works Department. This is supplemented by external contractors in cases where specialist services or further technical skills are required to address specific issues.

8.2.4 Maintenance standards

The standard of work for repair and maintenance of Council's bridges and major culvert assets will be that typically provided to ensure that the works carried out are suitable for purpose.

All materials used in the maintenance and repair of Council's bridges and major culvert assets will comply with all relevant technical standards.

8.2.5 Inspections

For Council to carry out effective planning and competent management of its bridges and major culvert assets, both in a strategic and operational sense, it is essential that maintenance and performance related information is collected through disciplined and regular inspections of the whole portfolio.

Council's inspection activities can be grouped into the following categories based on definition and purpose:

Table 14 - Asset inspection type summary

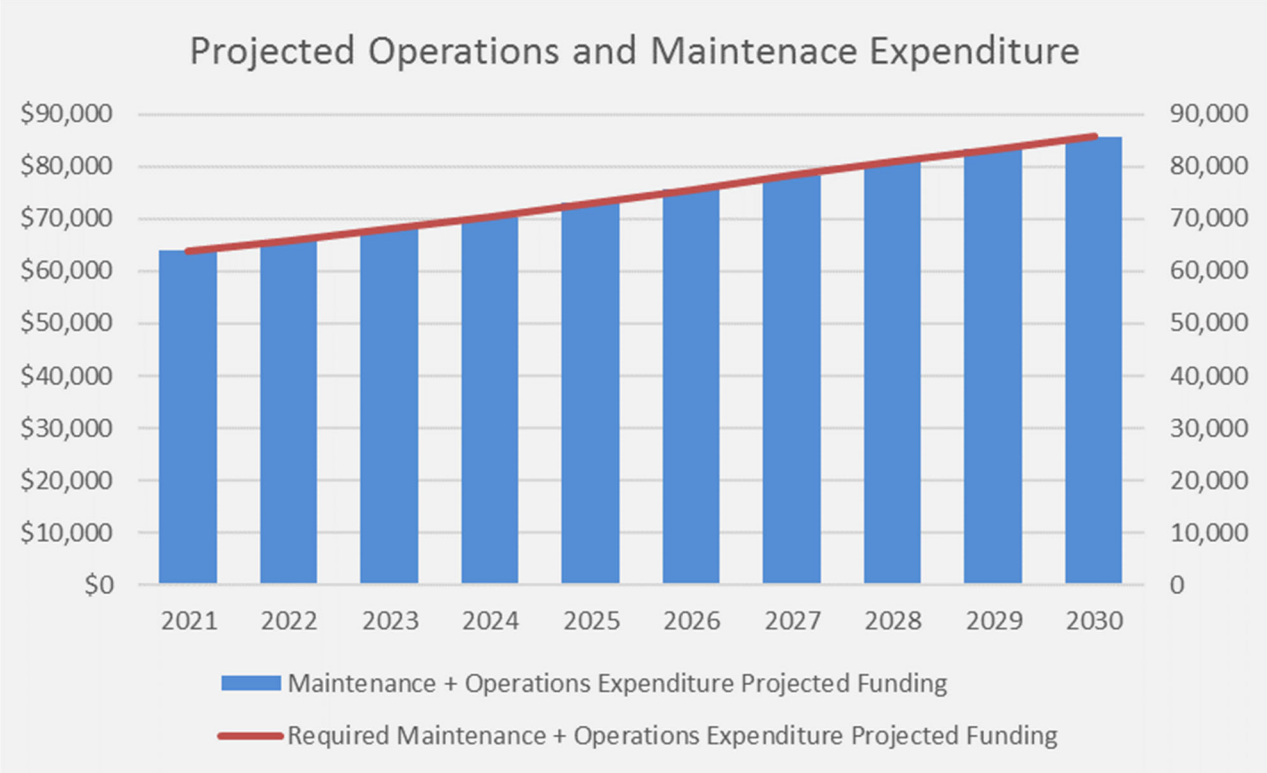
Inspection type	Description	Current status	Inspection frequency
Cyclic inspections	Cyclic inspections involve a visual investigation to assess for hazards or maintenance issues that do not meet Council's levels of service or risk management objectives. These inspections provide a basis for urgent, preventative, and recurrent maintenance needs.	Cyclic inspections are coordinated by the Works department.	Cyclic inspections are undertaken in accordance with Council's RMP. Level 1 inspections - All structures are to be subject to a minimum of 2 inspections per year with a maximum interval of 6 months between successive inspections. Level 2 inspections are to be carried out at 2-5-year intervals depending on age and condition.
Reactive inspections	Reactive inspections are initiated generally by requests for maintenance received from asset users. Council's objective in relation to maintenance requests is to inspect and prioritise the work requests within specific timeframes.	Inspections or site assessments are undertaken in response to customer requests by Council's Works Department and officers from the Assets and Infrastructure team	Reactive inspections are undertaken as required in accordance with Council's RMP.
Condition inspections	A condition audit is a systematic inspection and identification and recording of the physical and functional adequacy of assets. The purpose of these	Condition inspections are coordinated by the Assets and Infrastructure team.	Bridge condition for asset management, planning and valuation purposes, is assessed at the time

Inspection type	Description	Current status	Inspection frequency
	inspections is to provide an input for life-cycle cost analysis, and asset planning purposes. This level of inspection does not identify detailed maintenance requirements but provides a basis for managing the asset portfolio from a strategic perspective.		of undertaking Level 2 Bridge inspections. Additional asset condition inspections may be required to coincide with asset revaluation requirements.

8.2.6 Future operation and maintenance costs

Future operation and maintenance costs are forecast to trend in line with the value of the asset stock as shown in Figure 3. Note that all costs are shown in current 2021/22 dollar values (i.e. real values). The amount of funding required for operations and maintenance is forecast to be $744,801 over the next 10 years, or $74,580 per year.

Figure 3 - Projected operations and maintenance expenditure



What does this mean?

Figure 3 shows the predicted maintenance and operations expenditure compared with the forecast funding proposed in Council's current Financial Plan.

The increase in maintenance and operations requirements is indicative of the increasing costs associated with above intervention assets.

It is predicted that Council will fund the maintenance and operational funding requirements over the next ten (10 years). Operations and Maintenance funding for bridges and major culverts is funded under the Roads operations and maintenance funding and expenditure is captured as being for bridge assets.

Council should undertake a review a review of its future maintenance and operations allocations to ensure that they are sufficient to meet current service levels which achieve compliance with Council's Road Management Plan. This should form the basis of a more comprehensive service level review to better align levels of service with community expectations while also sustaining affordability.

8.3 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 an upgrade/expansion or new work expenditure resulting in an increase in future operations and maintenance costs.

Assets requiring renewal are identified using a combination of an analysis of the long-term financial needs at a network level and Council's asset information to identify specific assets requiring renewal at a project level.

8.3.1 Renewal strategy

Renewal strategies are based on assessing a range of factors to ensure the appropriate level of investment is targeted at the optimum time to ensure assets remain fit for purpose and that renewal plans are efficient and effective. The factors considered include the following:

- criticality
- maintenance and/or failure history (i.e. when do ongoing maintenance works become uneconomic)
- age
- expected life
- remaining useful life
- condition (where known)
- condition prediction
- geographical grouping
- timing in relation to linked asset renewal plans

As a general principle the number and cost of repairs will determine the optimum timing to invest in the renewal of assets. Every time an asset is repaired it provides information about its performance, rate of deterioration, and a prediction of the optimum time to renew.

As the rate of repairs increase a prediction can be made about the optimum time to renew an asset to keep the cost of ownership at the optimum level.

8.3.2 Renewal standards

Council's construction standards are based on various standards necessary to accommodate the demands and technical requirements placed on our assets.

All renewal works shall comply with Council's engineering standards and specifications for design and construction that apply at the time. The design of bridges and major culvert renewal works is in all cases undertaken by suitably qualified and experienced practitioners where necessary.

8.3.3 Renewal ranking criteria

In general, renewal works are prioritised and planned by assessing the following considerations:

- safety issues
- physical condition

- risk and asset criticality
- community/user feedback
- location and use type and patterns

It is possible to get some indication of capital renewal and replacement priorities by identifying assets or asset groups that:

- have a high consequence of failure
- have high use and subsequent impact on users would be greatest
- have a total value representing the greatest net value
- have the highest average age relative to their expected lives
- are identified in the AM Plan as key cost factors
- have high operational or maintenance costs
- have replacement with a modern equivalent asset that would provide the equivalent service at a savings.

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 15.

Table 15 - Renewal and replacement priority ranking criteria

Criteria	Scoring method
Road Hierarchy	<RGA=1, RGA & RGC=2, RSA & RSC=3
Traffic Volume AADT	<100=1, 1-200=2, >200=3
Commercial Vehicles – No per Day	<10=1,10-20=2, >20=3
School Bus Route	No = 0, Yes = 3
Significant Business – Industry Route	No = 0, Yes = 2
Load Limit	No = 0, Yes = 2
Condition Moloney	<6=1, 6-6.5=2, 6.5-7=3,7-8=4, >8=5
OR L2 inspection recommendation to replace	Replace = 3
Level of Maintenance Required	>Av=1, High=2, Very High=3
Benefit Contribution Available	Yes=2, No=0

Council's Infrastructure renewal demand forecasts are developed using the predictive modelling capabilities of its asset management information system. These forecasts are reviewed periodically and updated as new information (e.g. condition assessments) becomes available.

These forecasts and the underlying assumptions are further reviewed to factor in specific projects and any upgrade projects that include a renewal component to provide the best available guide to renewal requirements. These forecasts are then referred for consideration in the development of the Financial Plan which provides a specific allocation for the renewal of assets for each year of the Plan.

8.3.4 Future renewal and replacement expenditure

Renewal demand and expenditure forecasts for the assets covered by this plan are summarised in
Figure 4. These forecasts have been extrapolated from existing finance data and are presented as long-term projections to provide input into Council's Financial Plan.

The following graph shows a comparison between the:

- level of funding required to renew Council's bridges and major culvert assets to achieve its service level objectives
- the amount of funding which Council is projected to commit to renewing these assets.

Figure 4 - Projected capital renewal and replacement expenditure

Figure 4 values are in current (real) dollars.

What does this mean?

This forecast indicates that Council is presently significantly under funding the renewal of its bridges and major culvert assets.

Council has allocated ***$210,000*** towards the renewal and replacement of its bridge and major culvert network within its 2021/22 budget. The amount of funding set aside for bridges and major culvert renewal which is included in Financial Plan has been used as a basis for calculating the long-term projection of Council's renewal position.

Over the next ten (10) years, the predicted average annual renewal demand associated with Council's bridge and major culvert network is ***$538,160***. According to Council's current Financial Plan, it is projected to allocate approximately ***$166,232*** on average per year for the renewal of these assets. This indicates that there is an average renewal funding gap of approximately ***$371,928*** (average) per annum.

The red line shown in the above figure represents the percentage of the asset base that no longer meets minimum performance or service standards. This is also referred to as the intervention condition.

At the commencement of the forecast period ***0%*** Council's bridges and major culvert network does not meet minimum service standards. At Year 10 (2030), based on the current Financial Plan, this rises to ***10%***. This increase in asset deterioration is a direct function of the projected underinvestment in asset renewal.

Anecdotally, an authority responsible for managing public assets should aim to not let the percentage of assets above the intervention condition to exceed 3% to 4%. Beyond this, the community notices a decrease in standards that may result in an increase in the number of service requests for asset maintenance and repairs.

It is important that Council considers increasing the funding amounts which are allocated to the renewal of its bridge and major culvert assets.

A renewal funding strategy has been prepared as part of this asset management plan and is detailed in section 10.2.

8.3.5 Renewal modelling assumptions

The analysis to determine Council's future asset renewal requirements is based on the best available information held at this time. The future funding forecasts will be revised and refined to best represent the performance of the asset base as the maturity of Council's asset management practices improves.

These renewal funding projections are based on the following assumptions:

- the renewal costs are based on the asset data register as at 30 June 2020.
- asset quantities within the asset register are assumed to be correct.
- modelled outcomes are derived using the Moloney Renewal Model and are therefore subject to the limitations of that model and data is used in it, which includes assumed performance of the asset types and trigger intervention levels.
- useful Service Lives derived from the asset register are assumed to be a reasonable estimate of the life of the assets.
- condition data has been derived from Council's asset register.
- service levels are based on a technical assessment and may not reflect community expectations or the organisations goals and objectives.
- all projections are in present dollar value.
- annual growth of the network is 2% over the full forecast period.
- renewal funding is based on current renewal expenditure levels contained in Council's current Financial Plan.
- these projections only represent future asset renewal requirements at an overall network level. This modelling does not provide project level assessments or programs.

The following variables and input values have been used to calculate the long-term renewal projections for Council's bridge and major culvert network:

Table 16 - Renewal modelling variables and input values

Asset Type	Model Variable and Input Value						
	Useful Life	**Unit Rate**	**Condition Profile**	**Confidence Level**	**Asset Degradation Profile**	**Renewal Condition**	**Returned Asset Condition**
Bridge and Major Culvert							
Bridge and Major Culvert	80-100	Various		High	Standard	Condition 7 (Poor)	Condition 0 (As new)

8.4 Creation/Acquisition/Upgrade plan

New works are those works that create a new asset that did not previously exist or works that upgrade or improve an asset beyond its existing capacity or performance in response to changes in supply needs or customer expectations.

Within the context of bridges and major culvert assets, new asset, or upgrade creation includes:

- those works that create a new asset that did not exist in any shape or form, i.e. new roads typically resulting from land development
- works which improve an existing asset beyond its existing capacity or performance.
  - safety improvement projects
  - construction of a new bridge at a new location
  - adding a new span to an existing bridge
  - widening a bridge
  - providing new approach railing
  - upgrading existing bridge railings
  - constructing a deck overlay to increase capacity
  - strengthening to provide for higher mass limits vehicles

There are occasions when Council is required to upgrade an asset because of changing demand or use requirements. In such instances, the project is scrutinised closely by officers and is considered as part of the annual budget planning process.

In accordance with Council's budget development framework, when Council considers its discretionary capital expenditures for new or upgraded assets it is essential to establish the consequential recurring operational and maintenance costs that will occur once the new or upgraded asset becomes operational.

This consequential additional cost is 'non-discretionary' as it will be incurred if the new asset is provided.

As new projects are brought forward for consideration with the annual budget, they will also have an assessment of these ongoing operational (recurrent) costs presented to Council as part of the overall project cost projections.

8.4.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from various sources such as councillor/director or community requests, proposals identified by strategic plans or partnerships with other organisations. Verified proposals are ranked by priority and available funds and are scheduled in future works programmes.

The prioritisation of asset improvement works is undertaken in accordance with the following criteria to ensure alignment with Council's strategic direction and to deliver maximum and affordable community benefits.

Factors considered in the prioritising process include:

- road hierarchy
- traffic volume
- commercial vehicles per day
- school bus routes
- significant business/industry route
- load limit
- condition/Level 2 inspection recommendation

- level of maintenance required
- contribution availability.

Table 17 – New upgrade/expansion priority ranking criteria

Criteria	Scoring method
Road Hierarchy	<RGA=1, RGA & RGC=2, RSA & RSC=3
Traffic Volume AADT	<100=1, 1-200=2, >200=3
Commercial Vehicles – No per Day	<10=1,10-20=2, >20=3
School Bus Route	No = 0, Yes = 3
Significant Business – Industry Route	No = 0, Yes = 2
Load Limit	No = 0, Yes = 2
Condition Moloney	<6=1, 6-6.5=2, 6.5-7=3,7-8=4, >8=5
OR L2 inspection recommendation to replace	Replace = 3
Level of Maintenance Required	>Av=1, High=2, Very High=3
Benefit Contribution Available	Yes=2, No=0

A ranking process is used for assisting in determining the priority of new capital works. This process enables key criteria for each type of asset to be assessed in an objective manner, ranked, and a composite "need" score to be assigned to each project. This enables several projects of the same asset type to be objectively ranked against each other and prioritised.

Council carries out a capital works planning process each year prior to commencing its overall budget process.

Council determines the capital works program for the coming financial year based upon the objective rankings provided from Council's asset management system and Council's own priorities. In the process, a 'rolling' capital works program is developed.

8.4.2 Standards and specifications

As with replacements where new assets are created, they are designed using all relevant design codes and Australian Standards and by using materials to achieve the greatest asset life while trying to minimise maintenance costs.

8.4.3 Summary of future upgrade/new assets expenditure

Expenditure on new assets in the capital works program is considered for inclusion within the Financial Plan.

While the provision of new and upgraded assets is important in maintaining and enhancing services to the community there must be a clear business justification for the investment in capital improvement projects that is aligned with Council's strategic and service objectives.

Evaluation of proposals for new and upgraded assets is underpinned, and informed, by sound business, investment, and risk assessment practices to maximise public value of infrastructure investment.

Funding of capital improvement projects is only included within the Financial Plan where it is deemed a priority according to Council's capital works evaluation framework.

At present, extensions and improvements to Council's bridges and major culvert network are identified according to community feedback and staff knowledge of problem areas.

8.5 Disposal plan

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

Bridges and major culvert assets are rarely, if ever, disposed. Council currently has no immediate or current strategic direction to retire or dispose of any elements of the local bridges and major culverts in the network however does respond to requests for acquisition from other parties as required.

9 RISK MANAGEMENT PLAN

The purpose of this section is to describe the basis of Council's strategic risk and investment policies and the way it will manage risk associated with Council's bridge and major culvert assets.

9.1 Risk management process

Council's risk management framework and processes are in accordance with AS/NZS ISO 31000:2009 – Risk Management – Principles and Guidelines and HB 436:2013 – Risk Management Guidelines.

The framework is designed to provide the architecture for a common platform for all risk management activities undertaken by Council and is used to identify specific risks associated with Council's delivery of services and management of assets.

The objective of the risk management process with regards to Council's assets is to ensure that:

- all significant operational and organisational risks are understood and identified;
- the highest risks that need to be addressed in the short to medium term are identified; and
- strategies and treatments to address risks are identified and applied.

An assessment of risks associated with service delivery from infrastructure assets has identified the most critical risks to Council. The risk assessment process identifies and assesses risks, develops a risk rating and develops a risk treatment plan for non-acceptable risks.

9.1.1 Risk assessment

Network or system risks assessed as 'Very High' - requiring immediate corrective action and 'High' – requiring prioritised corrective action identified by Council's asset risk assessment process are summarised in the following table.

Table 18 - Infrastructure risk register

Risk event	Cause	Risk rating (VH, H)	Risk mitigation plan
Investment and decision making not effective	▪ Lack of accurate asset data, processes, supporting systems, prioritisation methodology and responsibility framework.	High	▪ Confirm accuracy of asset data, ensure, network assessment to confirm processes are documented and update responsibility matrix.
Collapse or damage to structure or road approach	▪ Overloading, oversize/injury ▪ Poor structural condition ▪ Lack of maintenance ▪ Severe weather event ▪ Waterway users	High	▪ Regular inspections of bridges and major culvert s to identify hazards and condition issues. Defects above intervention standards rectified in accordance with RMP, others as per available budget ▪ Condition survey undertaken and renewal works programmed ▪ Bridges assessed for load limits

Risk event	Cause	Risk rating (VH, H)	Risk mitigation plan
			▪ Maintenance inspection and works programming
Bridge run-off accident	▪ Vehicle conflict ▪ Obstruction (fallen limbs) ▪ Surface condition (timber decks, road interface) ▪ Inadequate drainage ▪ Inadequate signage, delineation ▪ Poor sight distance	Medium	▪ Maintenance inspection and works programming ▪ Risk assessment of bridges and bridge guard rail renewal/upgrade
Delays from bridge closure or diversions	▪ Bridge collapse ▪ Bridgeworks ▪ Load limits ▪ Width restrictions ▪ Flooding	Medium	▪ Condition survey undertaken and renewal works programmed ▪ Level of service for: o Load Limits o Flooding access
Pedestrian accident with road users.	▪ No path present, walking on road ▪ Inappropriate, missing signage ▪ Inadequate protection ▪ Inappropriate use	Medium	▪ Level of service for provision of path appropriate for level of use ▪ Level of service for provision of footpath, and barriers appropriate for location and use
Pedestrian fall.	▪ Rough uneven surface ▪ Inappropriate, missing ▪ signage ▪ Slippery surface, water	Medium	▪ Defect inspection frequency ▪ Street lighting

Refer Appendix A for details of the risk assessment.

9.2 Critical assets

Critical assets are defined as those which have a high consequence of failure or reduction in service.

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

Criticality is applied to Council's bridges and major culverts are based on importance and function and is reflected in the adopted road hierarchy.

10 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 forecasts made will be refined as Council improves its understanding of future asset performance and required levels of service.

10.1 Financial statements and projections

10.1.1 Asset valuations

The value of the assets covered by this asset management plan as recorded in Council's asset register as at 30 June 2020 are shown below.

Current Replacement Cost	**$38,599,332**
Accumulated Depreciation	**$15,722,990**
Depreciated Replacement Cost	**$22,876,343**
Annual Average Asset Consumption	**$391,248**

Assets are valued at fair value based on depreciated replacement cost according to Greenfield rates. Quantities represent those assets whose replacement cost meets Council's adopted capitalisation thresholds.

10.1.2 Asset sustainability

Council uses the following indicators to measure asset sustainability:

- Asset renewal funding ratio
- Projected funding requirements compared with budget allocations (Financial Plan).

10.1.3 Asset renewal funding ratio

Asset renewal funding ratio	**31%**

The Asset Renewal Funding Ratio is the most important indicator and shows that over the next ten (10) years we expect to have ***31%*** of the funds required for the optimal renewal and replacement of assets according to our current Financial Plan.

10.1.4 Financial planning

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide agreed levels of service over the next ten (10) years.

These projected funding requirements may be compared to the allocations made in the Financial Plan to determine possible funding shortfalls.

The projected operations, maintenance, renewal expenditure required over the next ten (10) years for Council's bridges and major culverts is ***$612,640*** on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is ***$240,713*** on average per year giving a 10-year funding shortfall of ***$371,928*** per year. This indicates that Council is projected to underfund the maintenance and renewal of its bridges and major culvert assets.

If this gap is left unaddressed in the mid to long-term Council will be faced with significant risks relating to:

- continued deterioration of its bridges and major culverts
- poor performing assets
- asset failure
- public health and safety liability
- loss of financial and economic viability
- ultimately declining community satisfaction and public confidence.

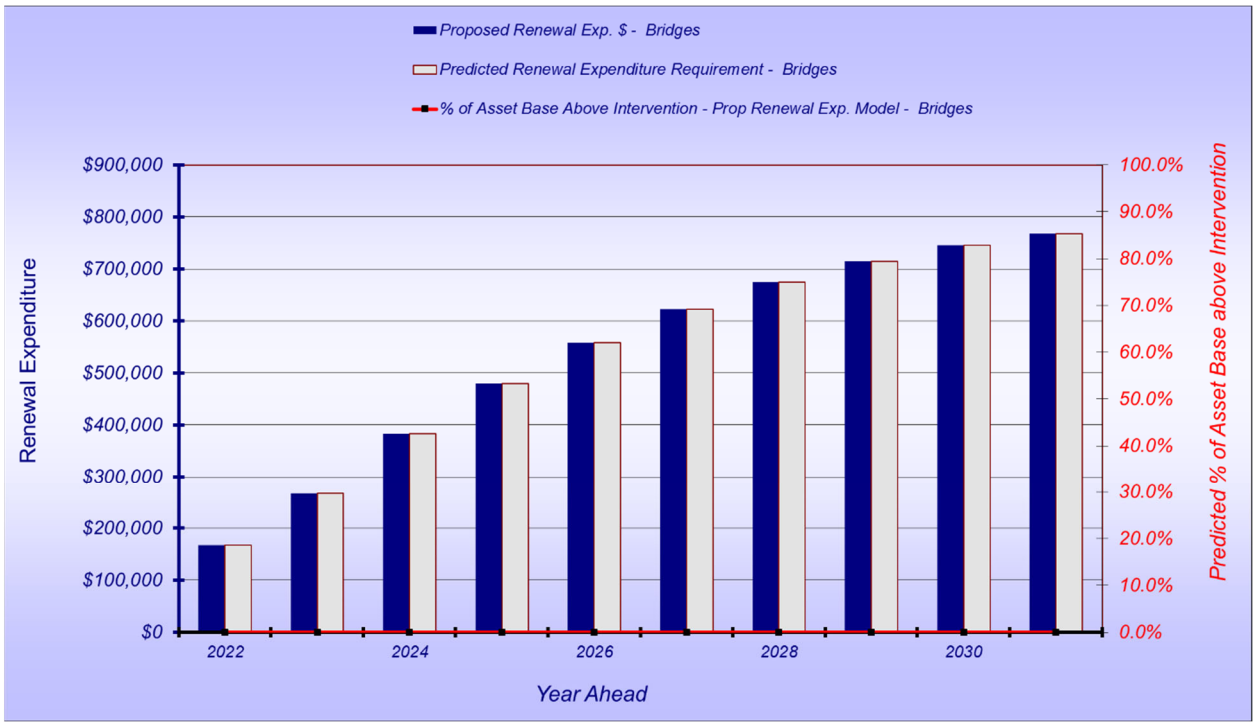
10.2 Funding strategy

10.2.1 Option 1 – Full funding of renewal demand

To demonstrate that is a responsible asset custodian, Council should be committed to funding its long-term asset renewal liabilities. This also aligns with Council's *Asset Management Policy* objective of focussing on asset renewal before allocating funding to new assets and limiting asset expansion unless justified through sound business cases.

The Figure following shows the impact of fully funding the renewal demand of Council's bridge and major culvert network. In this scenario, there is no asset renewal gap. In year one of the analysis, ***0%*** of the network does not meet Council's service standards. Based on the proposed renewal funding profile at year 10 of the forecast period the entire network would meet Council's service objectives with no assets being in a condition above Council's intervention criteria. Under this scenario, Council would be projected to spend ***$5.382 million*** on renewal over the 10-year forecast period. At present, Council is projected to allocate ***$1.662 million*** towards renewal over the next 10 years as identified in its current Financial Plan.

Figure 5 - Renewal forecast: Full funding of renewal



10.2.2 Option 2 – Optimised funding solution

One of the major challenges Council will face in the future is its ability to manage and fund the renewal liability associated with its bridge and major culvert assets.

To meet this challenge, an optimised renewal funding solution should be developed to Council's funding strategy for its assets. Bridge and Major culverts, unlike other simple infrastructure asset groups, requires a significant level of detail at component level to develop an optimised funding solution. Renewing components of the bridge and major culverts will significantly alter the condition of the asset at a fraction of the cost. It is for this reason a componentised condition assessment must be carried out during both level 1 and 2 inspections to determine an optimised funding strategy.

Any adopted funding strategy should be used to inform Council's Financial Plan. In the event that the recommended budget allocations are not able to be accommodated within the Financial Plan due to other competing priorities, then the allocations that are able to be funded should be analysed and modelled to determine the long term impacts and risks to Council's bridge and major culvert network. Developing this funding strategy has been listed as an improvement project in section 11.2 of this plan.

10.2.3 Recommended funding solution

Option 2 is considered the preferred option, but until this option is further investigated it is recommended that the funding as per the existing Financial Plan is maintained.

10.3 Funding sources

Funding for assets is provided from Council's annual budget and Financial Plan.

Council's financial strategy determines how funding will be provided, whereas this asset management plan communicates how and when this will be spent, along with the service and risk consequences of differing options.

Council uses several different funding sources to maintain, renew and improve its bridges and major culverts. These are:

Table 19 - Funding sources

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

10.4 Key assumptions made in financial forecasts

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

Key assumptions made in this asset management plan are:

- forecasted on present day dollars.
- staffing needs are resourced adequately.
- no significant changes in legislation.

- average growth in asset base of 2% per annum over the period of this asset management plan.
- increases in maintenance and operational budgets are consistent with the Financial Plan.
- bridges and major culverts have been modelled at the class level providing an indication of renewal requirements at a high level, improved accuracy can be obtained by condition assessments at the component level.

10.5 Forecast reliability and confidence

The expenditure and valuations projections in this asset management plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a five (5) level scale in accordance with Table 20.

Table 20 - Data confidence grading system

Confidence Grade	Description
A – Highly reliable	Data based on sound records, procedures, investigations, and analysis, documented properly, and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B - Reliable	Data based on sound records, procedures, investigations, and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C - Uncertain	Data based on sound records, procedures, investigations, and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D - Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy ± 40%
E - Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is ***C - Uncertain*** at this stage. The implementation of the improvement actions identified will result in increased levels of confidence in future revisions of this asset management plan.

11 PLANNED IMPROVEMENT AND MONITORING

11.1 Status of asset management practices

Council currently uses the following corporate information systems for recording relevant asset data and information:

Table 21 - Overview of corporate systems

Module	System
Customer Request Management	▪ Merit
Financial/Accounting	▪ Attache ▪ Magiq
Records Management	▪ LCM
Mapping (GIS)	▪ QGIS ▪ Pozi
Asset Register	▪ Moloney Asset Management System
Strategic Asset Management	▪ Moloney Asset Management System
Mobile Solutions	▪ Reflect
Works Management	▪ Reflect

The asset management system underpins asset management capacity and capabilities and is a key source of information for decision making, coordination of operations, and performance reporting.

11.2 Improvement plan

The asset management improvement plan generated from this asset management plan is shown in Table 22.

Table 22 - Improvement Plan

Task	Responsible Person	Resource Type	Timeline
Conduct formal componentised condition assessments of the bridges and major culvert network at regular frequencies that are appropriate for the asset class. The results of each audit must be used to adjust the financial model presented in this document and inform renewal requirements in Council's Financial Plan and Annual Budget.	Asset Management Coordinator	Internal	As resources permit
Determine bridge and major culvert load capacities and signpost bridges when future condition audits are undertaken.	Asset Management Coordinator	Internal	As resources permit

Task	Responsible Person	Resource Type	Timeline
Develop a project-based ten (3) year Capital Works Program for renewals, upgrades and new works and integrate with Council's Financial Plan.	Asset Management Coordinator	Internal	As resources permit

Council's Manager Assets & Infrastructure will need to determine the priority of the actions in this improvement plan, allocate a responsible officer and identify resource needs. This is to ensure that the implementation of these improvement actions align with Council's overall asset program. This prioritisation and allocation of resources should be consistent with Council's Asset Management Strategy and overall asset management framework.

11.3 Monitoring and review procedures

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

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

The asset management plan will have a life of **4 years** and will be completely reviewed and updated in order to inform the development of the Community Plan, Council Plan, and the Financial Plan. This asset management plan will be reviewed and update in accordance with Council's deliberative engagement practices as set out in its *Community Engagement Policy*.

11.4 Performance measures

Performance measures will be developed to ensure that work practices and the asset management plan are reflective of each other.

The performance of the asset management plan shall be monitored against the following criteria in accordance with the process detailed below.

- maintenance and renewal programs - to confirm that allocated budget projects were delivered on time, within budget and to the specified level of service (see following item on delivery performance).
- inspection programs - to confirm that they were undertaken as specified in the asset management plans and any other service level agreements which may be in operation.
- scheduled condition surveys – to confirm that they were undertaken as required.
- maintenance of asset information systems - to ensure that stored data is current and accurate.
- external factors - including legislative requirements, ongoing development of Council policies, plans, and other major system implementations, that may affect the contents of the asset management plan.

12 APPENDICES

12.1 Appendix A – Bridge risk assessments

No	Risk	Likelihood	Consequence	Risk severity
1	Investment and decision making not effective	Possible	Major	High
2	Collapse or damage to structure or road approach	Possible	Major	High
3	Bridge run-off accident	Possible	Minor	Medium
4	Delays from bridge closure or diversions	Possible	Minor	Medium
5	Pedestrian accident with road users.	Possible	Moderate	Medium
6	Pedestrian fall.	Unlikely	Major	Medium