MITCHELL SHIRE.
BRIDGES ASSET MANAGEMENT PLAN
- Part B(1)

MITCHELL SHIRE COUNCIL

Document Control	Asset Management Plan

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NAMS.PLUS Asset Management Plan Templates

NAMS.Plus offers two Asset Management Plan templates – 'Concise' and 'Comprehensive'.

The Concise template is appropriate for those entities who wish to present their data and information clearly and in as few words as possible whilst complying with the ISO 55000 Standards approach and guidance contained in the International Infrastructure Management Manual.

The Comprehensive template is appropriate for those entities who wish to present their asset management plan and information in a more detailed manner.

The entity can choose either template to write/update their plan regardless of their level of asset management maturity and in some cases may even choose to use only the Executive Summary.

The illustrated content is suggested only and users should feel free to omit content as preferred (e.g. where info not currently available).

The concise Asset Management Plan may be used as a supporting document to inform an overarching Strategic Asset Management Plan.

This is the **Concise** Asset Management Plan template.

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1 EXECUTIVE SUMMARY

1.1. The Purpose of the Plan

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

This asset management plan details information about Mitchell Shire's bridges and major culverts and what funds are required to provide the services over a 10-year planning period. Council still has a way to go to define the level of service and how the service will be provided. Defining service levels will form part of the action improvements at the back of this plan.

Bridges and major culverts contribute to the community by:

- Allowing people to move safely and conveniently around and through the municipality
- Enabling the transport of goods and services
- Connecting people to service centres and other key destinations.

Bridges and Major Culverts are considered part of road services, or transport services, and this asset group will often sit within the Road Asset Management Plan. Due to high replacement value of bridges, and the level of criticality of these assets, a separate plan has been prepared.

Much of the Asset Management Plan Framework for bridges and major culverts is the same as it is for Roads. This asset management plan (Part B(i) should be read in conjunction with Part B - Road Asset Management Plan. Sections of this plan have been removed so as not to repeat what has already been outlined in the Road Asset Management Plan. References to the Road Asset Management Plan will be provided throughout this document where additional information is required.

1.2. Asset Description

Whilst asset planning is about the condition of assets, at the forefront to this planning is our community expectation of these assets; for the current and future users.

Councils Bridge Infrastructure consists of 303 bridges and major culverts throughout the council area that can be categorised as follows:

Asset Category	Asset Sub Category	Quantity
Bridges	Vehicular Bridge	59
	Pedestrian Bridge	37
	Fords	3
Major Culverts	Major Culverts	204
	Total	**303**

These infrastructure assets have significant value estimated at ***$50.7M***.

1.3. Levels of Service

Our present funding levels are sufficient to continue to provide existing services at current levels in the medium term. The immediate backlog of works outside intervention stands at $1.8M, but over the next 10 years, if Council works to the existing allocations in the long-term financial plan, Council will eliminate the funding backlog.

The main service concerns are:

- Load limits on bridges restrict freight movements.
- Bridge failures may isolate communities or cause lengthy bypasses.
- Bridges may not be sufficiently high enough to allow traffic movement during severe weather events.

Over the past two years Council has undertaken level 3 inspections on 24 of its bridges. A common finding of these audits was that Council has not defined a level of service for the bridges which would inform what types of vehicles (and load limits) should be applied to the bridge – and what engineering design standard the bridge should meet.

Many of these bridges have been found not to meet the capacity required for the vehicles currently using the bridges and this will impact future upgrade requirements as service levels are defined and are required to be met.

1.4. Future Demand

The main demands for new services are created by:

- Population change
- Council financial sustainability
- Council operational and services priority changes
- Increasing freight task
- Increased emphasis on bicycle and walking trails

These will be managed through a combination of managing existing assets, upgrading of existing assets

and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures.

Demand management practices may include:

- Restriction of types of vehicles accessing road network
- Introduction of load limits to prolong the useful life of bridges and to maintain public safety
- 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 bridge upgrades
- Renewing bridges with fords or causeways where utilisation is very low.

1.5. Lifecycle Management Plan

1.5.1. What does it Cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan (AM Plan) includes operations, maintenance, renewal and upgrade of existing assets over the 10-year planning period is ***$4,171,088*** or ***$417,108*** on average per year.

1.6. Financial Summary

1.6.1. What we will do

Estimated available funding for this period is ***$5,320,000*** or ***$532,000*** on average per year as per the long term financial plan and current operational budget trends. This is ***128%*** of the cost to sustain the current level of service at the lowest lifecycle cost.

Council has prepared a Long Term Financial Plan ahead of the preparation of the Bridges Asset Management Plan. As such, the Long Term Financial Plan is not informed by bridge condition. However, the figures provided in the LTFP have been used to reflect future investment in this plan.

It is recommended the LTFP will now be adjusted in line with the Bridge Asset Management Plan once it has been adopted.

Council has an immediate bridge renewal backlog of $3.1M. This is made up of a total of 11 bridges and culverts at condition 7 or above. One of these bridges is likely to be rationalised, which will remove $381,405 from this backlog demand immediately.

The emphasis of the Asset Management Plan is to communicate the consequences that this will have on the service and the Organisation, so that decision making is “informed”.

The projected expenditure required to provide services in the AM Plan compared with planned expenditure currently included in the Long Term Financial Plan is shown in the figure below.

Projected V Planned Operating and Capital Expenditure

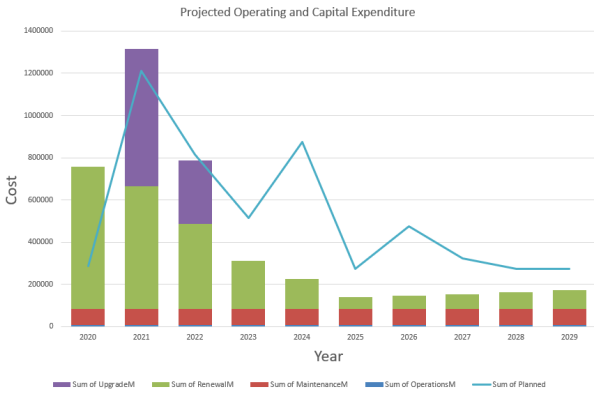


Figure Values are in current (real) dollars.

We plan to provide bridge and major culvert services for the following:

- Operation, maintenance, renewal and upgrade of bridges set by annual budgets (and to meet internal levels of service).
- Annual bridge maintenance and renewal programs within the 10-year planning period.

1.6.2. What we cannot do

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

- Adding new bridge assets to the network based on resident requests.
- Maintain new assets that council may inherit from developments and sub divisions without additional funds being made available

The low level of maintenance funding currently allocated for bridges and culverts should be noted. If we consider the total network value is $50.7M, then presently Council is funding maintenance at 0.14% of the network replacement cost. This figure needs to be reviewed in light of some 24 ‘Level Three’ reports that highlight numerous renewal backlog tasks, many which could have been deferred with increased maintenance investment.

1.6.3. .Managing the Risks

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

The main risk consequences are:

- Bridges deteriorate to a lesser service standard and higher risk situation mainly due to insufficient maintenance regimes.
- Delays from bridge closure or diversions
- Damage to bridges and major culverts as a result of major storm events
- Damage to bridges from overloading
- Insufficient maintenance funding is contributing to short bridge and major culvert useful lives.

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

- Undertaking ongoing inspections of our bridges and major culverts with level 1 qualifications
- Audit bridges and major culverts every 3 years
- Continuing to implement our annual maintenance and renewal programs to maintain existing bridges in a safe and serviceable condition.

1.7. Asset Management Practices

Our systems to manage assets include:

- Finance and accounting - Technology One
- Asset management system - Conquest III
- Exponare and MapInfo – GIS Systems

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 level.

Council has 24 bridges currently being closely monitored as a result of specific bridge information that has been collected in the past two years through level 3 inspections. These bridges should be the main focus for maintenance and renewal tasks.

1.8. Monitoring and Improvement Program

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

- Develop levels of service, in the first instance, by documenting the existing levels of service being delivered, then assessing what opportunities there are to improve on these.
- Introduce componentisation of bridge assets to manage component condition performance and improve renewal demand modelling.
- Ensure bridge components are allocated unique unit rates to better inform renewal requirements
- Finalise data collection for Council's major drainage structures to improve the completeness and accuracy of Council's asset information
- Undertake more research on current utilisation with special attention paid to freight movement. This will help define key transport routes to guide planning of bridge renewal and upgrade works.
- Develop a comprehensive bridges capital works plan to target priority renewal/upgrade tasks.
- Increase the rate of maintenance inspections to coincide with those outlined in the Level 3 Bridge audit reports.
- Review expenditure on bridge maintenance

2. INTRODUCTION

2.1. Background

This asset management plan communicates the actions required for the responsive management of bridge and major culvert assets (and services provided from assets), compliance with regulatory requirements, and funding needed to provide the required levels of service over a 10-year planning period.

Mitchell Shire Council's structure for its asset management plans is sectioned into separate parts based on our asset groups. This structure is as follows:

- Part 'A' – General Asset Management Plan
- Part 'B' – Roads Asset Management Plan
- **Part 'B (1)' – Bridges Asset Management Plan**
- Part 'C' - Buildings Asset Management Plan
- Part 'D' – Open Space Asset Management Plan
- Part 'E' – Drainage Asset Management Plan

Part 'B(i)', the Bridges Asset Management Plan has been developed in accordance with our Asset Management Policy and principles of the Asset Management Strategy.

As bridges are part of the road network, this Asset Management Plan must be read in conjunction with Council's Part B - Road Asset Management Plan. Information provided in Part B covers the Transport Service in considerable detail and is equally relevant to the bridge network. Part B(1) – Bridges has been drafted for this asset group due the network value and the criticality of bridge asset; to ensure they are managed distinct from other road assets. This plan has been slightly refined to remove repetition of content that is already provided in Part B – Roads Asset Management Plan.

The infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are used to:

- Allow people to move safely and conveniently around and through the municipality
- Enable the transport of goods and services
- Connect people to service centres and other key destinations

Bridges are key elements of the road network and represent a major investment of community resources. Because of their location over natural and other obstacles, any bridge failure may severely restrict road traffic with consequent inconvenience and economic loss to the community.

2.2. Purpose of this Plan

The specific purpose of this plan is to guide the decision-making process for the management and renewal of our assets. It will also:

- Identify minimum long-term life cycle costs to provide the current level of service,
- Better understand and forecast asset related management options and costs, and the ability to balance out peak funding demands,
- Clearly justify forward works programs and expenditure,
- Manage risk associated with asset failure, and
- Improve decision making based on costs and benefits of alternatives.

The contribution of transportation-based assets and services to Council's vision and AM objectives will be achieved by:

- Demonstrating responsible asset stewardship,
- Providing a basis for community consultation to determine appropriate levels of service,
- Implementing a program of inspections and monitoring activities to assess asset condition and performance,
- Undertaking a risk-based approach to identify operational, maintenance, renewal and capital development needs, and applying economic analysis techniques to select the most cost-effective works program,

- Ensuring services are delivered at the right price and quality,
- Supporting long term financial planning, and
- Continuously reviewing and improving the quality of AM practice.

2.3. Scope of this Plan

The Bridge asset management plan covers all those structures under Council's responsibility which are typically located either in the road reserve, or on footpaths in parks and recreation areas and rail trails. Furthermore, the structure must conform to the following functional definitions of "Bridge" and "Major Culvert" provided by VicRoads.

- Bridge - A structure with the primary purpose of carrying a roadway or pathway over an obstacle with a minimum span of 1.8m or a minimum waterway area of 3 sqm.

- Major Culvert - A structure with the primary purpose of providing a passageway beneath a road or a path, usually but not necessarily for stormwater, with a minimum span or diameter of 1.8m, or a minimum waterway area of 3.0 sqm.

Table 2.1: Assets covered by this Plan

Asset Category	Asset Sub Category	Deck Area	Unit	Current Replacement Value	Depreciated Replacement Cost	Asset Life (Years)
Vehicle Bridges	Concrete Bridge	5,370	sqm	$20,485,518	$10,560,001	72 - 120
	Timber Bridge	159.7	sqm	$347,902	$150,594	50 - 100
	Steel Bridge	2,103	sqm	$8,390,205	$3,720,368	111 - 50
Vehicle Bridge Total		*7,633*	*sqm*	*$29,223,625*	*$14,430,963*	
Pedestrian Bridge	Concrete Bridge	9.96	sqm	$28,291	$17,550	100
	Timber Bridge	234	sqm	$638,538	$392,110	40 - 100
	Steel Bridge	1,288	sqm	$3,772,892	$2,647,387	50 - 100
Pedestrian Bridge Total		*1,531*	*sqm*	*$4,439,721*	$3,057,047	
Major Culverts	Concrete Box Culvert	6,697	sqm	$9,936,848	$5,793,051	72 - 155

	Concrete Pipe	4,276	sqm	$6,213,058	$3,676,055	100
	Steel Pipe	261	sqm	$379,489	$202.22	100
	Masonry Culvert	185	sqm	$268,813	$172,087	100
	Concrete Ford	142	sqm	$310,444	$138,814	100
Major Culverts Total		*11,561*	*sqm*	*$17,108,652*	*$9,780,209*	
	Total	**19,503**	**sqm**	**$50,771,998**	**$27,268,219**	

There are still a number of major culverts within the shire for which Council has no asset data. Information about these structures should be captured and registered in Council's asset management system to enhance the completeness and accuracy of its asset data. While these major culverts may not be recognised in a strict financial sense they continue to be actively managed and maintained as part of normal operations so that the remain functional and safe.

2.4. Key Stakeholders

See Part B - Road Asset Management Plan pg.5

2.5. Goals and Objectives of Asset Ownership

See Part B -Road Asset management Plan

2.6. Core and Advanced Asset Management

See Part B - Roads Asset Management Plan

3. 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.

3.1. Strategic and Corporate Goals

See Road Asset Management Plan

3.2. Functional Hierarchy

See Part B - Road Asset Management Plan

3.3. Levels of Service

Background to Levels of Service is outlined in Part 'A' – General Asset Management Plan. Levels of service standards should provide the basis for the life cycle management strategies and works programs identified within the asset

management plan. While Council works to a level of service, this has not been well documented, and therefore levels of service are not currently driving strategic decision making within the asset management plan.

The Mitchell Shire Council uses its road hierarchy and traffic data as the main source of information to determine the standard to which it will construct, inspect, maintain and repair its road network.

The target levels of service for bridge maintenance as shown in the Road Management Plan aim to reflect current industry standards for maintenance.

3.3.1. Customer Levels of Service

See Part B - Road Asset Management Plan

3.4. Customer Research and Expectations

3.4.1. Community Satisfaction

Council participates in the Local Government Victoria's Annual Customer Satisfaction survey. These surveys poll a sample of residents on their level of satisfaction with Council's services.

At present there are no formal processes used to measure and record the level of community satisfaction with the quality, performance and management of Council's bridges and culverts. However, the survey results provided in section 3.4.1 of the Road Asset Management Plan provide some insight into the level of community satisfaction associated with the management of Council's transport network.(see Road Management Plan, page 14 section 3.4.1)

3.5. Legislative Requirements

See Part B - Road Asset Management Plan

4. FUTURE DEMAND

See Part B - Road Asset Management Plan for Future Demand Requirements

5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how Council plans to manage and operate the bridge assets while managing life cycle costs.

5.1. Background Data

5.1.1. Physical Parameters

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

Table 5.1.1 – Asset Summary

Asset Category	Asset Sub Category	Quantity	Unit	Current Replacement Value ($)	Depreciated Replacement Cost ($)	Useful Life (Years)
Bridges	Vehicular Bridge	59	No.	*$29,223,625*	$14,918,325	80 - 150
	Footbridge	37	No.	*$4,439,721*	$2,974,117	60 - 120
	Fords	3	No.	$310,445	$141,534	120
Major Culverts	Major Culverts	204	No.	$16,798,210	$10,059,532	80 - 100
	Total	**303**		**$50,772,001**	**$28,093,507**	

Council's bridge portfolio consists of 303 assets which are specific to area needs. The portfolio encompasses vehicular and pedestrian bridges whose major components are constructed of either concrete, steel, or timber. Footbridges also include timber platforms which are similar in the way that they provide a walking function albeit over smaller spans. Major culverts are primarily constructed of concrete, however there are a small number of large steel culverts and others constructed of masonry.

5.1.2. Asset Capacity and Performance

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

Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
Sunday Creek Bridge (1421)	**Design load review or carry out strengthening, requires regular stability assessments,**
Apex Park, White Street, Kilmore (11773)	**Requires code compliant pedestrian barrier, beaching around abutments.**
Babbidges Lane, Mia Mia (1383)	**Bridge in very poor condition – load limit "may" be adequate for current 3t limit.**
Boundary Road, Moranding (1384)	**Bridge does no comply with conditions of AS5100.7-2004 for T-44 vehicle loading**
Broadford Pylalong Road, Glenaroua	**non-compliant guardrail,**
Highlands Road, Whiteheads Creek (1407)	**Water way opening may be under capacity and warrants investigation.**
Dropmore Road, Highlands (1394)	**Load limit required – strengthening or replacement options to be considered.**
Duells Road, Tooborac	**Bridge load limit to be reduced to 10t. Strengthen or replace bridge if 10t limit is unacceptable.**
First Street Broadford (12195)	**Bridge load limit to be reduced. Strengthening or replacement required if load limit is unacceptable.**
Highlands Road, Whiteheads Creek (1405)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Highlands Road, Whiteheads Creek (1411)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Hughes Creek Road, Tarcombe (1413)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Kenny's Lane, Broadford (11735)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Kimore East Road, Kilmore East (1414)	**Bridge does not comply with requirements of AS5100.7-2004 for traffic loading. Apply reinforced concrete deck.**
Mahadys Road, Upper Plenty (1416)	**Non-compliant barriers**
Mill Street, Kilmore (1396)	**Bridge is inadequate for 15t GML vehicles and should be restricted to light vehicles**
Walshes Bridge Trach, Pyalong	**Inadequate traffic width for a single lane bridge – does not meet 4.2M min.**
Mugavins Road Bridge (	**Insufficient capacity to carry T44 Loading**
Panyule Road, Panyule (1424)	**Inadequate traffic width for a single lane bridge – does not meet 4.2M min.**

Scullys Lane, Tyaak (1427)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Tooborac-Baynton Road, Tooborac (1438)	**The superstructure of the bridge does not have capacity for the assessment vehicles considered (GML) or (HML). Single Lane bridge which is not signed.**
Walshes Bridge Track, Pyalong (11347)	**Barriers non-compliant**
Watchbox Road, Glenhope (1442)	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant.**
Willowmavin Road, Willomavin	**Bridge superstructure does not comply with requirements AS5100.7 for the T44 design (vehicles at 45t). Barriers are non-compliant. Load limt of 20t recommended.**

The above service deficiencies were identified from Council's Level 3 Bridge condition surveys.

While both bridges and road pavements are designed and built in accordance with contemporary standards, bridges are far more sensitive to increasing loads and changing vehicle dynamics.

As freight vehicles change and their numbers and masses increase, existing structures no longer meet standards to accommodate newer freight vehicles and bridge structures have become more vulnerable to damage. These increasing load demands tend to accelerate the deterioration of a structure's condition and hence its load bearing capacity.

The most critical property of a bridge in performing its function is its load capacity. A major objective of the work related to the ongoing recent renewal of bridges has been to improve the efficiency of the transport system by progressively addressing existing constraints and developing knowledge of the bridge stock to allow for future changes in vehicle configuration and loading.

A high risk to Council is the continuing increase of the loading regime that bridges are subjected to. There are various heavy vehicle usage patterns emerging that may well have a detrimental impact on the road and bridge network. This includes vehicular traffic relating to commercial development, quarries, grain storage and forest harvesting. Such usage may create the need to upgrade or strengthen existing bridge infrastructure in some locations over the medium to long term.

Currently approximately 16% of Council's bridge network has weight restrictions registered. The balance of the network requires a level 3 inspection to determine their suitability for heavy vehicles. Additional funding of upgrade, new and expansion activities will be required in addition to the renewal identified in this assessment to cater for future demand and to address present network capacity issues.

5.1.3. Asset Condition

Condition inspections of Council's bridges are undertaken every three (3) years. The last condition survey of Council's bridges was completed in 2017.

The following types of inspections are undertaken:

Level 1 - Routine Maintenance Inspections	A visual inspection to check the general serviceability of a structure to road users and to identify any emerging defects. These inspections are undertaken on an annual basis in conjunction with routine maintenance activities. Additional inspections are also required after an abnormal event such as a severe flood or fire.

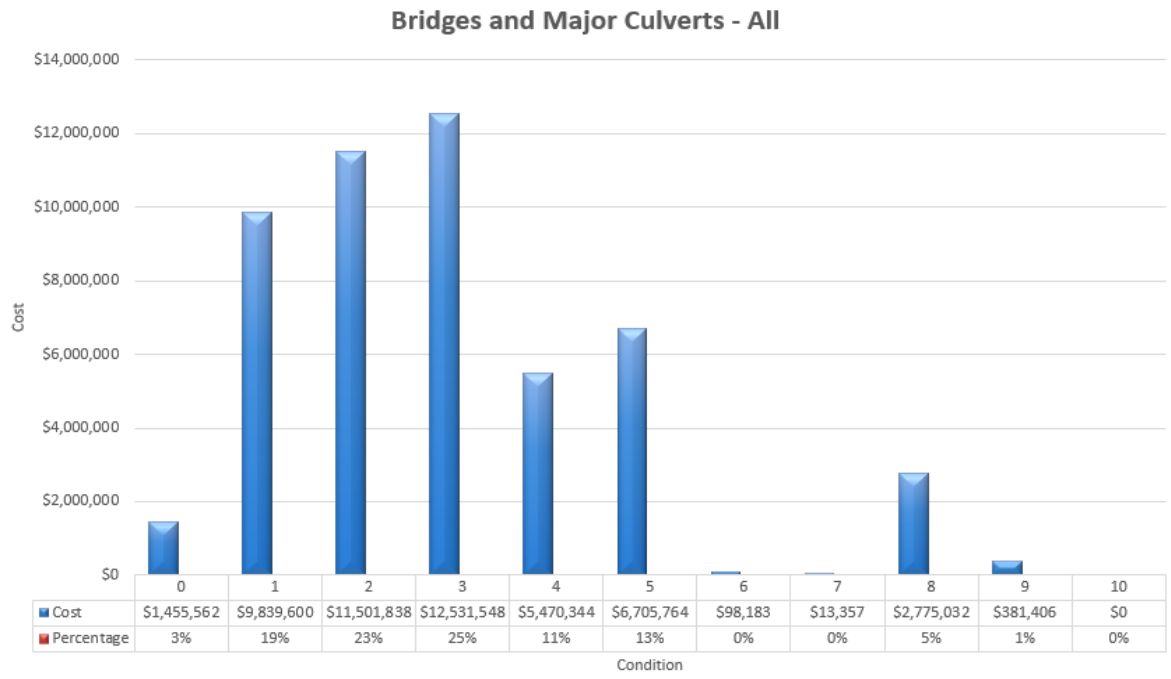
Level 2 - Bridge Condition Inspections	Comprehensive visual inspections to assess the condition of a structure and its major components. The principal objectives are to identify significant defects in structural members above ground level, and to record the extent, severity and criticality of each defect and the appropriate remedial actions. The frequency of these inspections depends on the structure type and its current condition. Level 2 inspections are conducted on a rolling three (3) year cycle.
Level 3 - Detailed Engineering Inspections	This represents an inspection or investigation conducted on a needs basis to assess the structural condition and capacity a structure that has been identified as a potential candidate for rehabilitation, strengthening or replacement. This level of inspection may include materials testing and analysis, structural analysis or load testing in addition to the visual inspection to assess and quantify the condition, behaviour and rate of deterioration of a structure.

All inspections are completed in accordance with VicRoads Bridge Inspection Procedures. Level 2 and Level 3 assessments are undertaken by suitably qualified and experienced structural engineers or bridge practitioners. Council has two asset inspectors on staff who are qualified to undertake Level One routine maintenance inspections.

Annual budgets need to reflect the requirement for staff and training and for the external resourcing of Levels 2 and 3 inspections. Level 2 and 3 inspections not only collect condition data but they also provide an opportunity to validate existing asset attribute information.

The condition profile of our assets is shown in the following Figures. This condition data is taken from the last audit completed in 2017.

Fig 3: Asset Condition Profile – All Bridges and Culverts



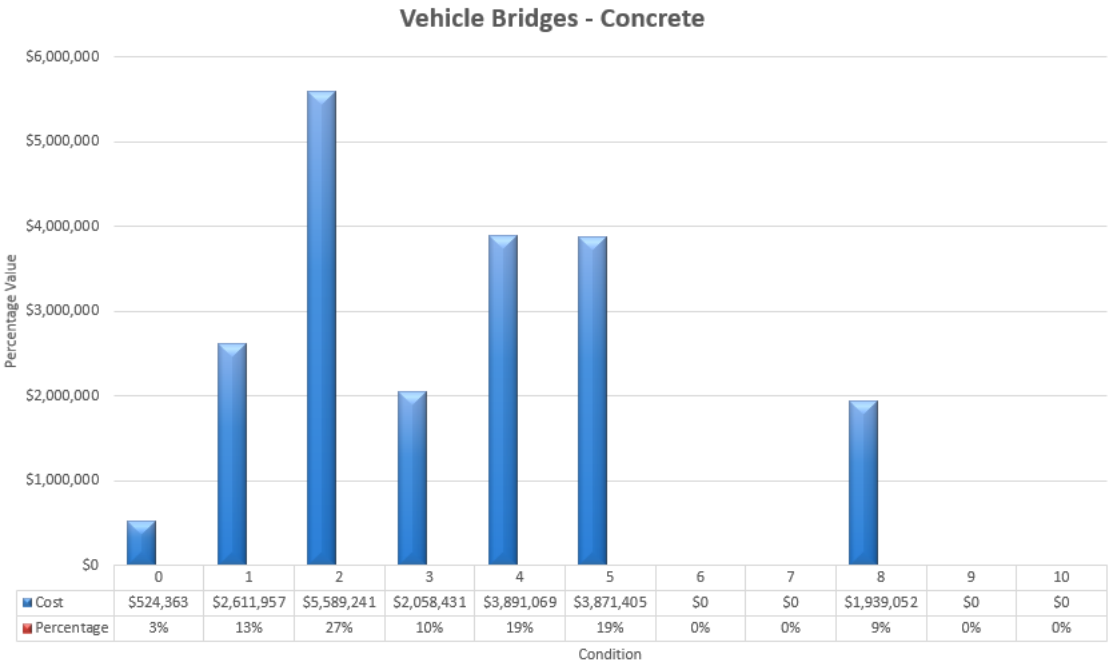
	0	1	2	3	4	5	6	7	8	9	10
Cost	$1,455,562	$9,839,600	$11,501,838	$12,531,548	$5,470,344	$6,705,764	$98,183	$13,357	$2,775,032	$381,406	$0
Percentage	3%	19%	23%	25%	11%	13%	0%	0%	5%	1%	0%

The condition profile above indicates that overall, Council's bridge stock is in relatively good condition. However, there are a total of 11 bridges that are at the condition intervention point of 7 or above. This equates to a renewal backlog of just over $3.1M. Council has one major culvert that is earmarked for rationalisation and will not be replaced. This reduces the backlog figure to $2.7M. Council will need to plan these bridge renewal's early within the life of this plan as the risk and consequence of bridge failure can be extreme.

As can be seen from table 2.1, Council has multiple bridge types; steel, concrete, timber and major culverts. Bridges are of differing design, structural materials and component types. To provide a visual representation of the bridge types by condition and replacement value, the following graphs are also included.

5.1.4. Vehicle Bridges

Fig 4: Asset Condition Profile – Vehicle Bridges, Concrete



There are 36 concrete vehicle bridges. The replacement value is $20.4M. This is the highest value bridge type in Council's bridge portfolio.

There are five concrete vehicle bridges outside intervention and this warrants close attention. These bridges make up $1.9M of the current renewal backlog of $3.1M. Importantly, these bridges poor condition rating is because of particular bridge components.

Table 5.1.3 – Concrete Bridge Level 3 Condition data

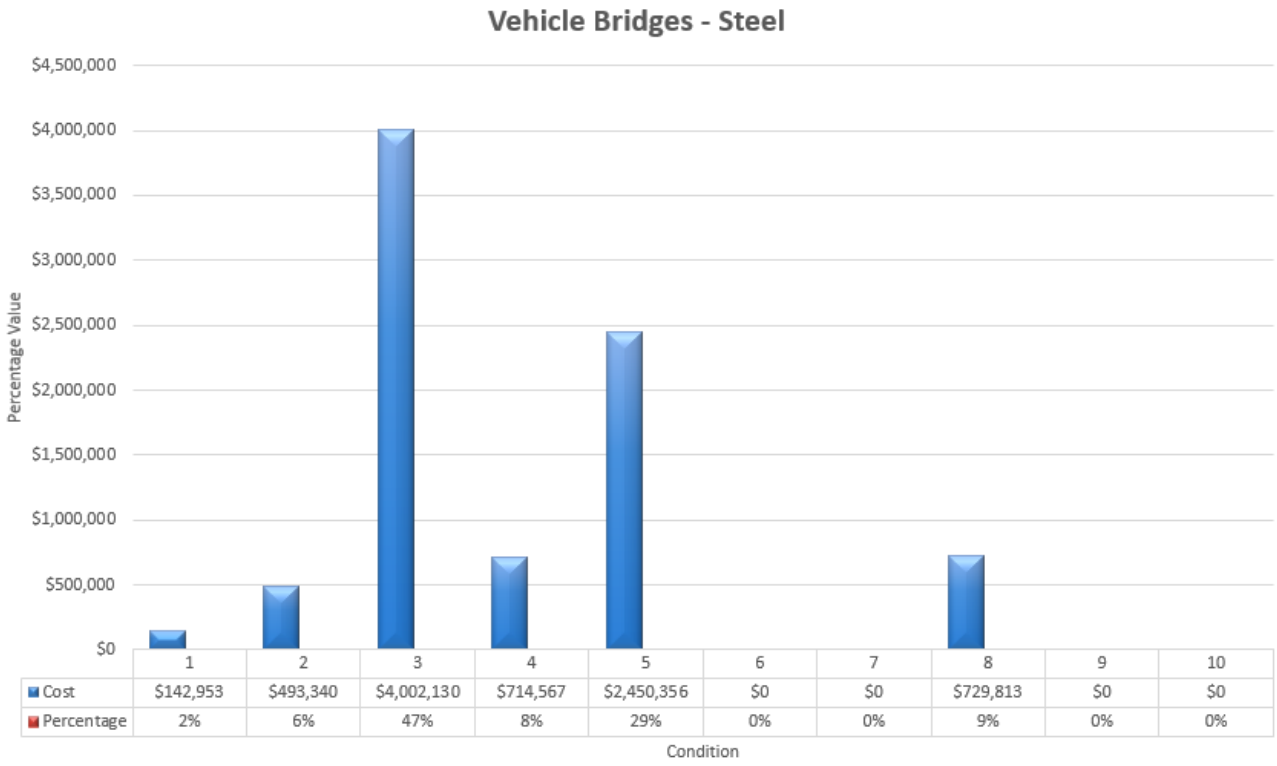
Bridge Name	Asset ID	Component Condition	Planned Expiry
Highlands Road, Seymour	Asset ID 1404	Abutment Condition 8	2080
Highlands Road, Whiteheads Creek	Asset ID 1407	Abutment Condition 8	2051
Smales Road, Seymour	Asset ID 1430	Joint Bearing Fixings Condition 9 Structural Span Condition 8	2067
Tooborac Baynton Road, Tooborac	Asset ID 1438	Structural Span Condition 8	2063
Mooneys Lane, Glenaroua	Asset ID 11613	Structural Span Condition 8	2062

The recommended remedial action for each bridge has been detailed in a Level 3 Bridge Condition audit.

It is important to recognise here the limitations of modelling without good component condition data. The weakest structural component can see a bridge have a very poor overall condition score and flag the bridge for renewal based on its total replacement cost. The reality is that components of bridges can be renewed to restore service levels and expected service life for less than replacement cost and see the planned expiry date realised; however, where the value of component replacement nears full replacement cost, or levels of service are not being adequately met, consideration (sound business decisions) should be given to a full replacement.

Insufficient levels of maintenance may have contributed to the component degradation; contributing to very poor bridge condition. Business decisions around higher maintenance expenditure should be considered as current funding levels are only at 0.14% of overall bridge replacement cost.

Fig 5: Asset Condition Profile – Vehicle Bridges, Steel



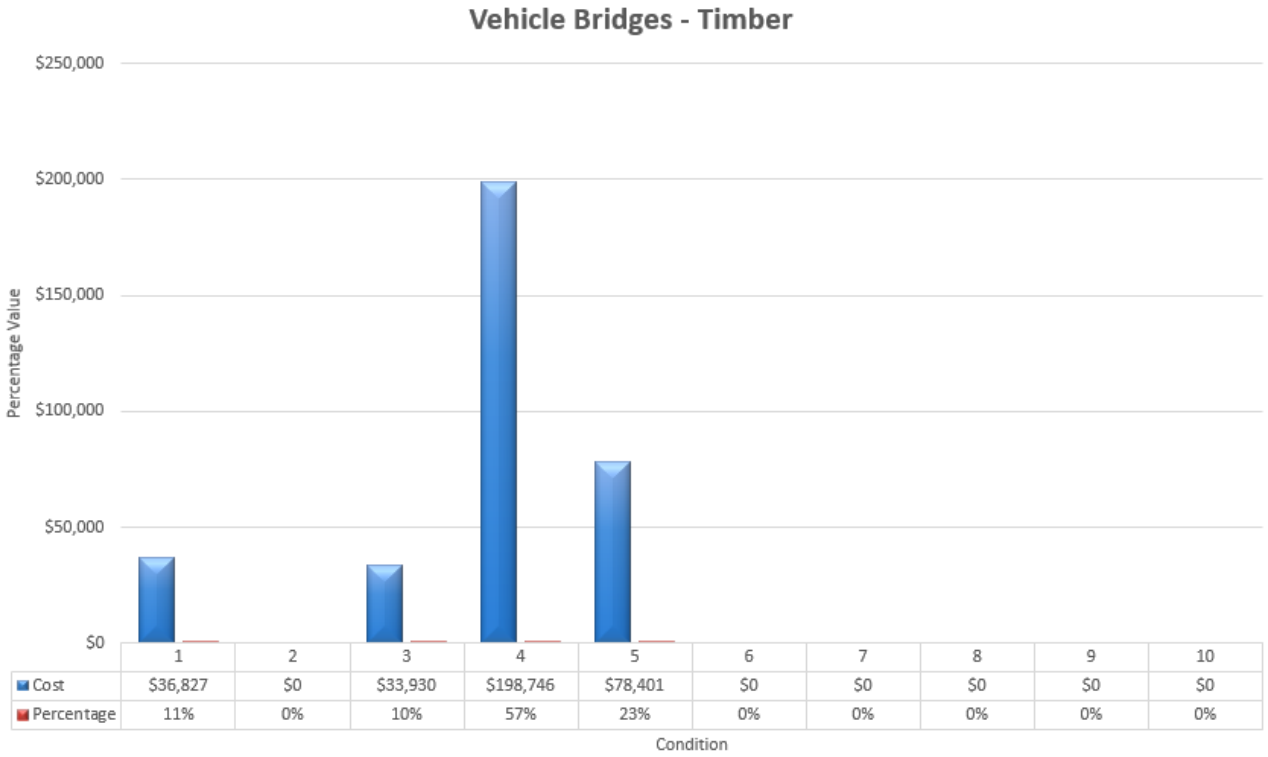
There are 19 steel vehicle bridges with a replacement value of $8.4M. There are three bridges of this type that have exceeded Council's current intervention level of 7. The value of these three bridges is $730,000.

The three bridges are;

Table 5.1.4 – Steel Bridge Level 3 Condition data

Bridge Name	Asset ID	Component Condition	Planned Expiry
Broadford Pyalong Road, Glenaroua	Asset ID 1389	Structural Span Condition 8 Abutments Condition 8	2042
Mill Street, Kilmore	Asset ID 1396	Decking Condition 8 Abutment Condition 8	2037
Panyule Road, Pyalong	Asset ID 1423	Decking Condition 8 Abutment Condition 9	2050

Fig 6: Asset Condition Profile – Vehicle Bridges, Timber



	1	2	3	4	5	6	7	8	9	10
Cost	$36,827	$0	$33,930	$198,746	$78,401	$0	$0	$0	$0	$0
Percentage	11%	0%	10%	57%	23%	0%	0%	0%	0%	0%

Council has just four vehicle timber bridges in its portfolio at a replacement value of $348K. These bridges are in overall good condition with no renewal requirement within the timeframe of this plan.

5.1.5. Component Condition

The below table is taken from the Pitt and Sherry Level 2 Condition Inspection 2017. This data was collected for the 94 vehicle and pedestrian bridges only; not major culverts. Pit and Sherry have used a 1 – 5 Condition rating score for components; 1 being new and 5 being failed.

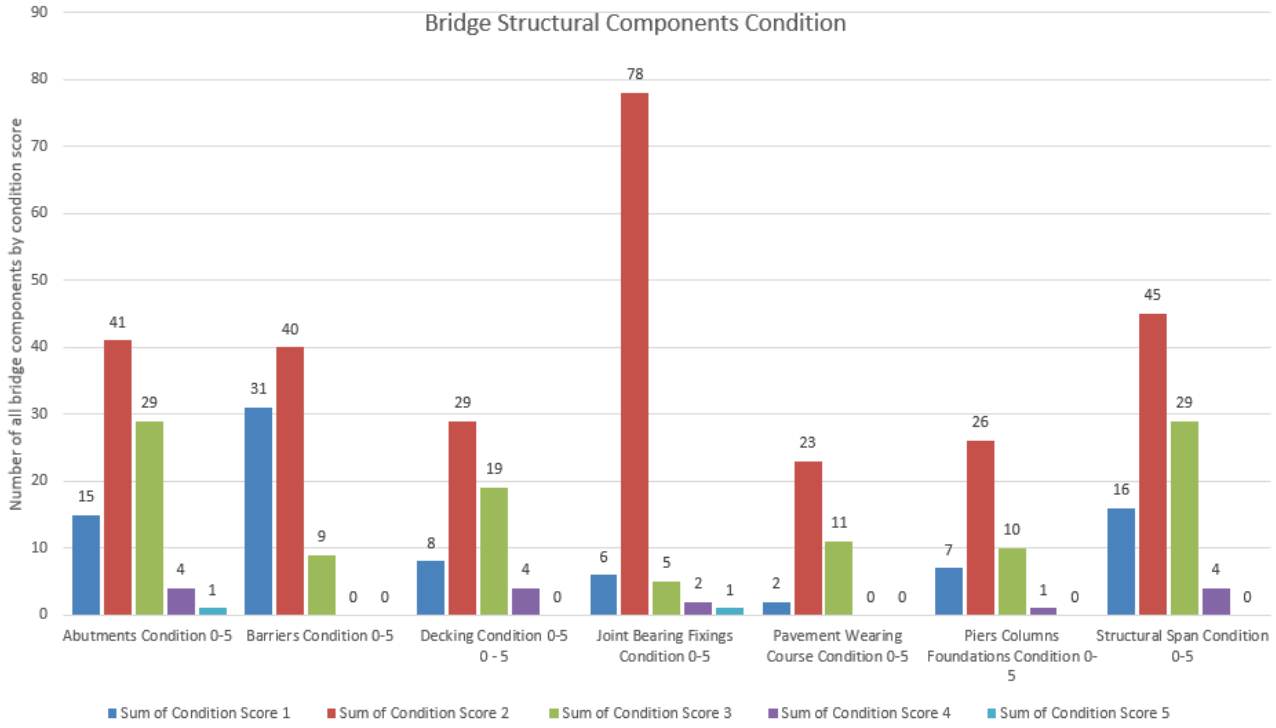
As previously mentioned a bridge is a set of components which have differing useful lives and replacement costs. The modelling provided in the blue graphs has represented bridges as one overall condition score with a total replacement value equal to replacing all components.

The reality is that if bridges are managed well, components with shorter useful lives, or components that fail while the rest of the structure remain in good condition, can be replaced at a cost much lower than the full replacement value of the entire bridge structure.

Council did not collect unique unit rates for the component parts when it did the last Level 2 inspection, and without unit rates, modelling at the component level is not possible as these are required in combination with condition and useful life to predict when renewal will occur and at what cost. It is the case that renewal will be much less when modelled at component level than at full bridge level.

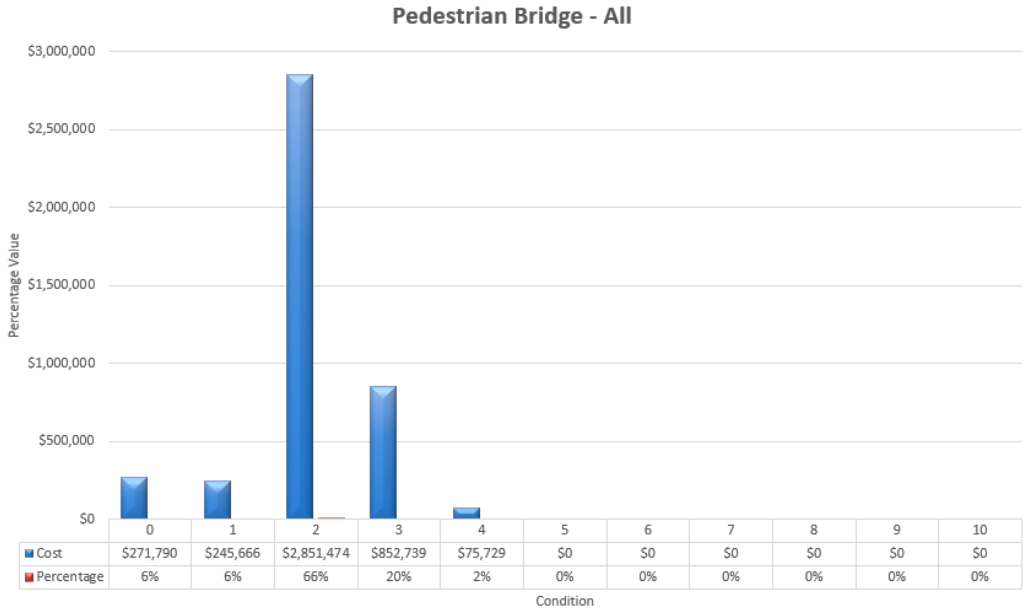
It is possible that Council's renewal backlog is now overstated as many of the 11 bridge structures earmarked for renewal will only require some component renewal (but possibly some upgrade). From the component condition score table, it can be seen there are only 16 components across the entire bridge network at condition 4 and 5 (on a 1-5 scale).

Fig 7: Bridge Component Condition Profile



5.1.6. Pedestrian Bridges

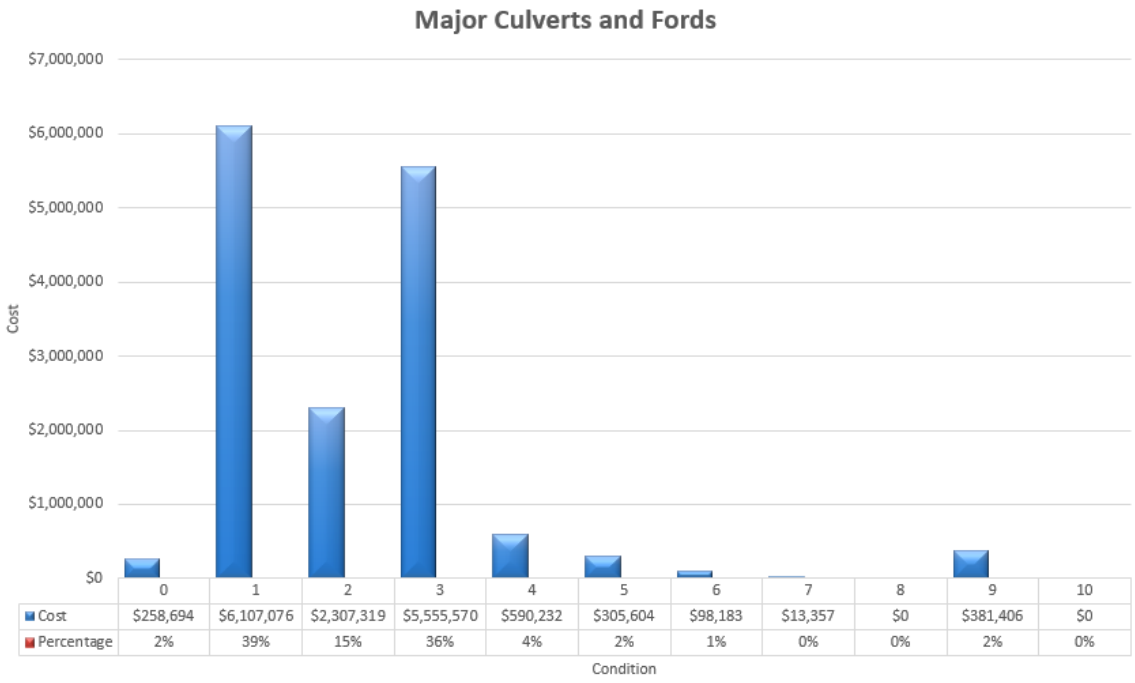
Fig 8: Asset Condition Profile – All Pedestrian bridges



Council has a total of 36 pedestrian bridges in its network which is in overall very good condition. The replacement value of pedestrian bridges is just under $4.3M. There will be no renewal requirement for pedestrian bridges through the life of this plan.

5.1.7. Major Culverts

Fig 9: Asset Condition Profile – All Major Culverts and Fords



	0	1	2	3	4	5	6	7	8	9	10
Cost	$258,694	$6,107,076	$2,307,319	$5,555,570	$590,232	$305,604	$98,183	$13,357	$0	$381,406	$0
Percentage	2%	39%	15%	36%	4%	2%	1%	0%	0%	2%	0%

Council has 205 major culverts and Fords in its bridges network with a replacement value of just over $17M. The condition profile demonstrates most of these assets sit within condition range 0-3.

One very old culvert is shown here as condition 9. The culvert has in fact completely failed and should be scored as 10. This culvert sits on Ford Road Seymour which is now classified as a No Through Road. Discussions are underway as to whether this culvert will be replaced. If it is not, the replacement value of $380K will not be required. There is also one old steel culvert on Kobyboyn Road, Whiteheads Creek at condition 7 which does have a planned expiry date of 2066 but is most likely required for replacement during the period of this plan.

Condition is measured using a 0 – 10 grading system[1] as detailed in Table 5.1.3.

Table 5.1.5: Simple Condition Grading Model

Rating	Description	
0	New	New or an asset recently rehabilitated back to new condition.
1	Near New	No visible signs of deterioration often based upon the time since construction rather than observed condition decline.
2	Excellent	Very slight condition decline obvious, no longer in new condition.
3	Very Good	Early stages of deterioration minor no serviceability problems.

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

Rating	Description	
4	Good	Some obvious deterioration evident slightly impaired serviceability.
5	Fair	Obvious deterioration some serviceability loss.
6	Fair to Poor	Quite obvious deterioration serviceability would be affected and rising maintenance cost.
7	Poor	Severe deterioration serviceability limited high Maintenance cost
8	Very Poor	Serviceability heavily impacted. very high Maintenance cost needed to be rehabilitated.
9	Extremely Poor	Severe serviceability problems needing rehabilitation immediately. Could also be a risk to remain in service
10	Failed	No longer serviceable and should not remain in service extreme risk

5.2. Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety and amenity, e.g. cleaning culverts of debris, sweeping bridge decking, and any utility costs associated with lighting around bridges.

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

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating.

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

5.2.1. Road Management Plan

Council's Road Management Plan identifies the standards of maintenance applicable to local roads, bridges, pathways, and associated infrastructure listed in the Register of Public Roads for which Council is the responsible 'Road Authority'.

5.2.2. Maintenance Service Agreement

Bridge maintenance services are delivered by Council's own road maintenance team and contractors. Works are funded through the annual maintenance budgets. Bridge renewal and upgrade projects are managed by Council's Engineering and Major Projects Team

5.2.3. Maintenance and Operations Costs

The following table summarises maintenance and operations costs for the assets covered by this asset management plan:

Table 5.2: Maintenance and Operations Expenditure Trends

Expenditure Category	2015/16 Actual	2016/2017 Actual	2017/2018 Budget	2018/19 Budget
Operations	$41,350	$3,060	$0	$0
Maintenance	$136,470	$11,608	$47,330	$74,130

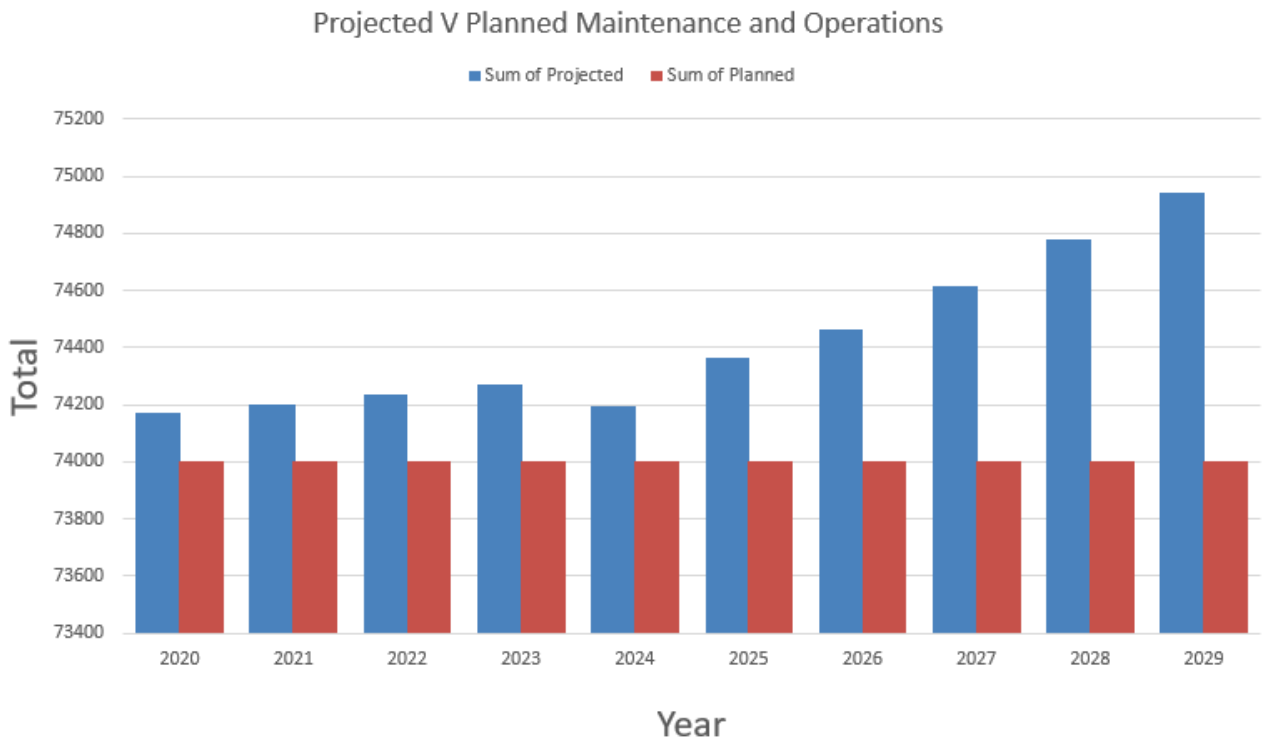
Total	**$177,820**	**$14,668**	**$47,330**	**$74,130**

Maintenance and operations expenditure should be reviewed to ensure that it is adequate 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.

5.2.4. Future Operations and Maintenance Expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2018/19-dollar values (i.e. real values).

Figure 10: Projected V Planned Operations and Maintenance Expenditure



With 303 bridge structures in its network, current maintenance and operating expenditure is considered insufficient. In total the operations and maintenance budget is just 0.14% of the total replacement cost of the asset network. Industry standards for maintenance expenditure ranges from 1% to 3% of the asset network. At 1% this would amount to $0.5M per annum. Council is not resourced to spend this amount of money and without levels of service clearly defined, there is no outcome target to be reached. Levels of Service must be reviewed and defined in the first instance.

Any deferred maintenance works, i.e. works that are identified for maintenance and unable to be funded, should be prioritised and managed according to their risk profile.

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

5.2.5. Staffing Resources

To meet its ongoing obligations to manage the road and bridge network in a sound and competent manner, Council needs to ensure that resources are made available to undertake the inspections, maintenance and capital renewal work.

Council relies heavily on external consultants for detailed engineering opinion through Level 2 and Level 3 audits. It is essential these audits form a priority works program. Currently there are 24 bridges with a Level 3 report requiring remedial works.

Council must devise a process where any maintenance tasks being generated from Level 2 and 3 inspections is packaged into a multi-year costed maintenance program.

5.2.6. Maintenance Strategy

Bridge maintenance is the work performed during the service life of a structure to:

- Maintain its designed load capacity, other functional capability and serviceability,
- Protect the investment in assets by ensuring that the structure completes its designed service life, and
- Ensure safety of the public.

Maintenance includes both reactive and proactive activities that preserve or restore the condition of a structure or its components. Restorative works are generally termed rehabilitation or renewal activities.

In order to deliver best value to the community and to ensure safety, Council has determined that it is vital to have both proper and frequent inspections and a good preventive maintenance program for its bridge infrastructure.

This means providing adequate maintenance to bridge components to ensure that they do not deteriorate to a condition which inevitably requires expensive rehabilitation/replacement.

There are two main components of the Council's maintenance programs, these are:

Routine Maintenance	Proactive bridge maintenance comprises those activities, identified primarily by inspections, which maintain the serviceability of the structure. Works of this type generally do not change condition and include clearing of drainage, localised repairs to approaches, road surface and timber decking, cleaning and adjusting deck joints, removal of debris, painting and sign maintenance.
Programmed Maintenance	Programmed bridge maintenance comprises those activities, identified from bridge inspection programs, which maintain serviceability of the structure but fall outside the scope of routine maintenance. While these activities generally do not change the structural condition, they may include the replacement of isolated timber bridge members and non-load bearing components in all structures. Programmed maintenance activities include painting of steelwork, repair or replacement of deck joints or seals, barrier repairs, timber member replacement and repair of scour damage to beds and batters.

Most defects are either notified by the public, assessed during proactive inspections or via routine patrols.

A systematically planned approach is undertaken to ensure maintenance is effective. This includes the implementation of a maintenance strategy to key asset types, such as roads, bridges, drainage, and other road related infrastructure.

For the assets included in this plan, Council's maintenance strategy includes the following considerations:

- A sound maintenance policy as a basis for planning all maintenance activity on that asset type,
- Consideration at both the design and construction phases in order to reduce potential maintenance problems and in-service costs,
- A maintenance management system, including:
  - A current inventory for the asset type in question (e.g. pavements, signs, bridges, etc.).
  - A hierarchy of assets to govern service levels and to enable prioritisation of works.
  - A regime of asset inspections to satisfy adopted schedules.

- An effective asset condition and inspection recording system to produce informed decisions regarding maintenance requirements.
- Service levels and maintenance standards with consideration to community expectations and resource allocation.

5.2.7. Prioritising Maintenance

- See Part B – Road Asset Management Plan

5.2.8. Inspections

See Part B – Road Asset Management Plan

5.2.9. Maintenance Standards

See Part B – Road Asset Management Plan

5.2.10. Bridge Management Responsibilities

See Part B – Road Asset Management Plan (same as Roads)

5.3. Renewal/Replacement Plan

See Part B – Road Asset Management Plan

5.3.1. Renewal ranking criteria

See Part B – Road Asset Management Plan

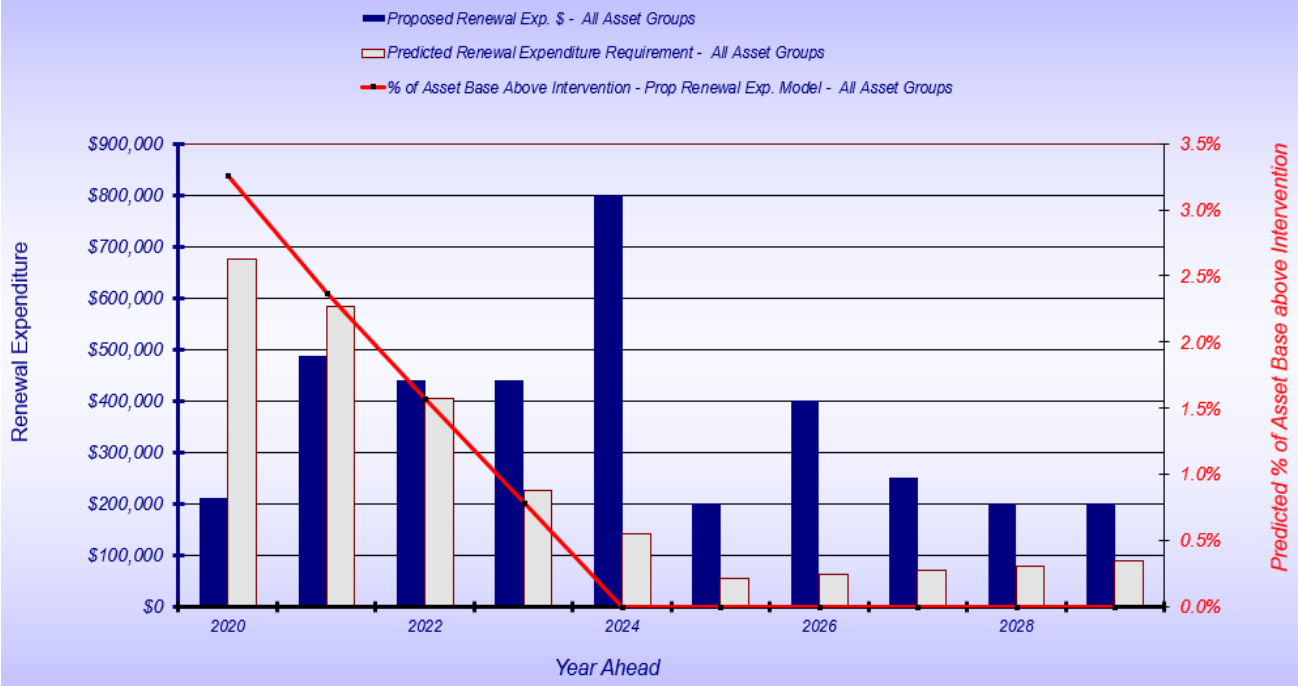
5.3.2. Future Renewal Expenditure

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

The following graph shows a comparison between the:

- Level of funding required to renewal Council's bridges and major drainage structures to achieve its service level objectives; and
- The amount of funding which Council is projected to commit to renewing these assets.

Fig 11: Projected Renewal Demand and Expenditure



This forecast indicates that Council is projected to marginally over fund the renewal of its bridges and major culverts.

The amount of funding set aside for bridge renewal which is included in Council's Long Term Financial Plan has been used as a basis for calculating the long-term projection of Council's renewal position.

Over the next 10 years:	
Average renewal demand	***$238K***
Average renewal funding	***$363K***
Average renewal gap	***$-125K***

Council's current and future renewal position is calculated at a broad portfolio level. The results of the renewal profiling should be used as a guide to inform the prioritisation of budget allocations in Council's Strategic Resource Plan and Long Term Financial Plan. In reality, expenditure for bridge renewal should be identified on a project basis with works scheduled according to priority.

Council will need to develop a prudent Long Term Financial Plan to responsibly manage its future asset renewal demands.

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 projections only represent future asset renewal requirements at an overall network level. This modelling does not project level assessments or programs.

These renewal funding projections are based on the following assumptions:

- The renewal costs are based on the asset data register as at 30 June 2017.
- 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 used within, 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.
- No growth in asset base.
- Renewal funding is based on current renewal expenditure levels contained in Council's 2018/19 Budget and Council's Strategic Resource Plan 2017-21.
- Confidence Grade: 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%

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

5.3.3. Renewal and Replacement Standards

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

These standards take into consideration the extensive work previously undertaken by the various professional and industry bodies such as:

- Infrastructure Design Manual
- Australian Standards
- Austroads Design Guidelines
- VicRoads Road Design Guidelines
- VicRoads Road Design Manual
- VicRoads Traffic Engineering Manual Vol 1
- VicRoads Traffic Engineering Manual Vol 2

All renewal works shall comply with Council's engineering standards and specifications for road design and construction which apply at the time.

The design of bridge renewal works should in all cases be undertaken by suitably qualified and experienced practitioners.

5.4. Creation/Acquisition/Upgrade Plan

See Road Asset Management Plan – Part B

5.4.1. Capital Investment Strategies

See Part B – Road Asset Management Plan

5.4.2. Selection Criteria

See Part B – Road Asset Management Plan

5.4.3. Standards and Specifications

Where new assets are replaced or created they will be 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 through the life of the structure.

To achieve this, reinforced concrete structures will generally be used but where this is impractical, composite steel and concrete structures are considered the next best option.

5.4.4. Summary of Future Upgrade/New assets Expenditure

Projected upgrade/new asset expenditures are summarised in Fig 6.

Fig 12: Projected Capital Upgrade/New Asset Expenditure ('000)

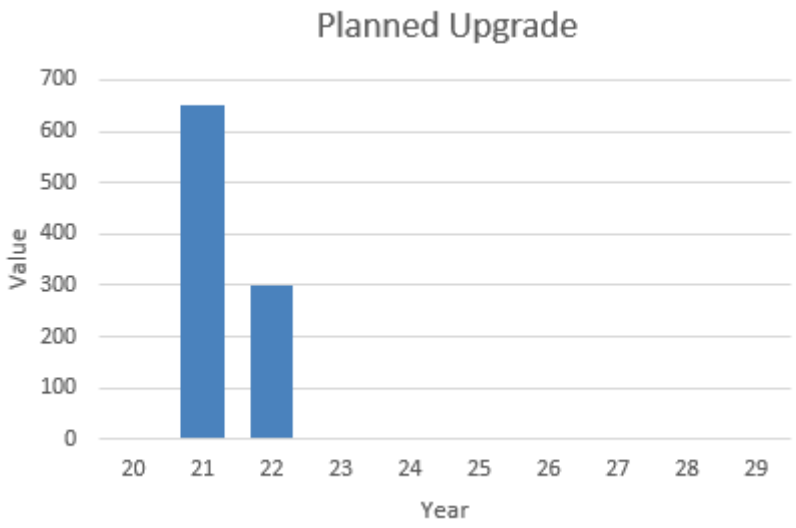


Figure Values are in current (real) dollars.

There are two projects on the horizon that are classified as Upgrade/New Assets. These include;

- Delatite Road, Seymour – Bridge construction over Whiteheads Creek ($650k)
- Kilmore Creek, Kilmore – Pedestrian Bridge ($300k)

Expenditure on new assets and services in the capital works program will be accommodated in the long term financial plan but only to the extent of the available funds

5.4.5. Summary of Asset Expenditure Requirements

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

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

Fig 13: Projected Operating and Capital Expenditure

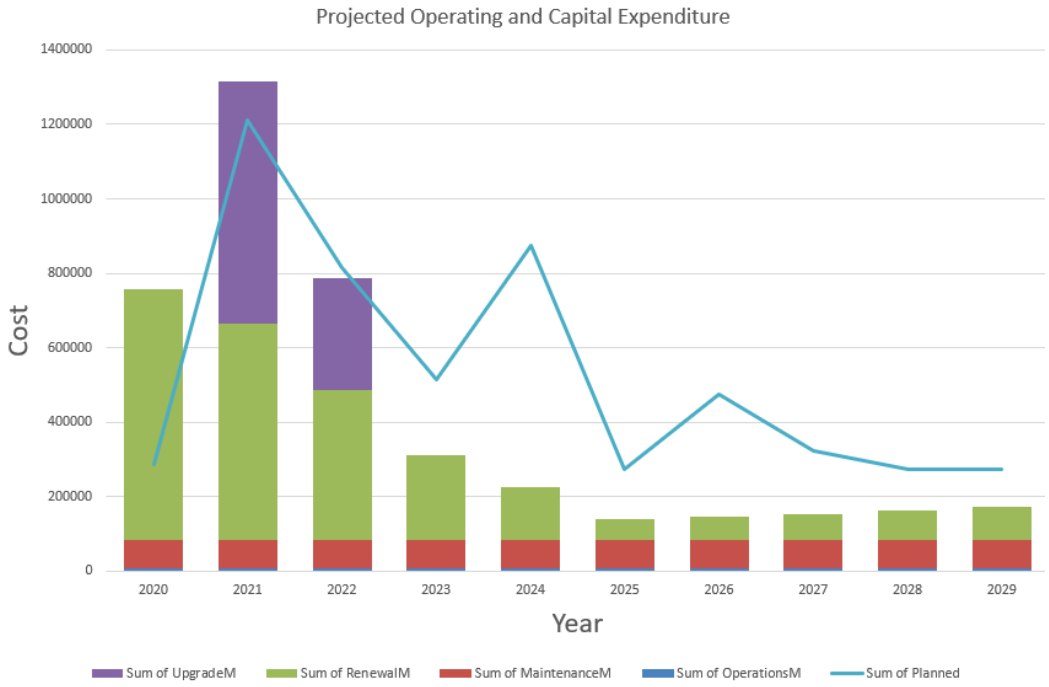


Figure Values are in current (real) dollars.

At present Council is allocating sufficient funding to maintain the current overall standard of the bridge portfolio. Further strategic work is required to determine any future bridge upgrades which may be required to cater for increasing traffic demands and increased freight vehicle size. Once identified, funding of these projects should be included in the Long Term Financial Plan.

5.5. Disposal Plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. The upgrading of bridges and changes to road alignment may bring about the retirement of old bridges and structures, but it is not common place that bridge services are discontinued.

At present Council has one bridge structure that is being considered for rationalisation, without replacement. This bridge is Asset ID: 1498, Ford Road Hildene. The structure is a concrete Ford with a replacement value of $380k. The ford is on a No Through road. There are properties to the north and south of the ford, however there are alternate routes; Sungarrin Road for the properties on the south end of Ford Road, and Seymour-Tooborac Road for the properties on the north end of Ford Road.

6. RISK MANAGEMENT PLAN

The purpose of this section is to describe the basis of Council's strategic risk and investment policies and the manner in which it will manage risk associated with its road network and associated infrastructure.

6.1. Risk Management Process

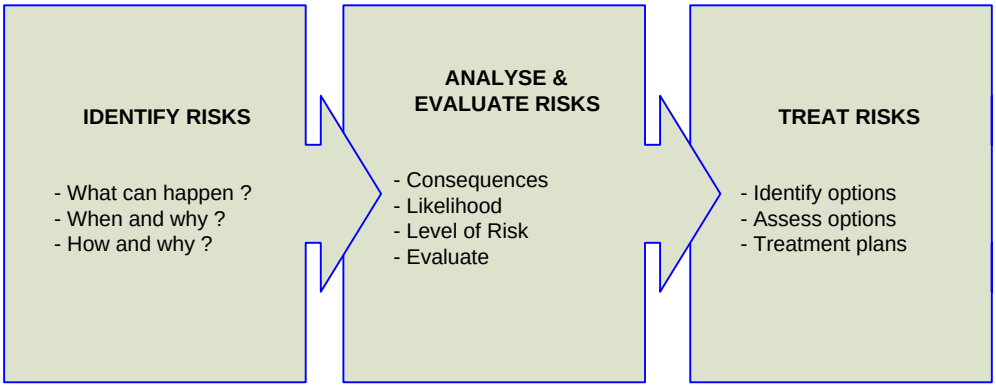
A risk management process which is consistent with Council's Risk Management Framework and International Standard ISO 31000:2009 Risk Management – Principles and Guidelines is used to identify specific risks associated with the assets covered by this plan. This process also enables the operational strategies and activities that will be considered to reduce the recognised risks.

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

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of the ISO risk assessment standard ISO 31000:2009.

Fig 6.2 Risk Management Process – Abridged



6.2. Risk Assessment

Critical risks, being those assessed as 'Very High' - requiring immediate corrective action and 'High' – requiring prioritised corrective action identified in the Infrastructure Risk Management Plan, are summarised in Table 6.1.

Table 6.1 Infrastructure Risk Register

Risk Event	Cause	Risk Rating (VH, H)	Risk Treatment Plan	Residual* Risk
Bridges deteriorate to a lesser service standard and higher risk situation	Rudimentary asset management practices do not support effective decision making	High	▪ Update data for bridges ▪ Develop service strategy to inform objectives and outcomes ▪ Implement asset management systems improvements	Low
Damage to bridges and major culverts as a result of major storm events	Extreme weather events	High	• Continue to refine asset data • Develop Climate Adaptation Strategy • Climate resilience considered at project planning stage • Implement targeted infrastructure improvements to mitigate impacts from storm events	Low

Risk Event	Cause	Risk Rating (VH, H)	Risk Treatment Plan	Residual* Risk
Road management systems (i.e. asset inspections and maintenance response) not in compliance with standards defined by Council's Road Management Plan	Standards documented in Road Management Plan not complied with (e.g. inspections and response times)	High	• Road Management Plan performance reporting	Low
Collapse or damage to structure or road approach	• Overloading and or oversize vehicle use • Poor structural condition • Lack of maintenance • Severe weather events	High	• Condition survey undertaken and renewal works programmed. • Bridges assessed for load limits. • Maintenance inspection and works programming.	Moderate
Bridge asset lives not being maximised	Due to lack of renewal and maintenance funding	High	• Review funding allocations made to the maintenance and renewal of local roads • Address any funding shortfalls through an appropriate financial strategy	Low
Delays from bridge closure or diversions	• Bridge collapse • Bridgeworks • Load limits • Width restrictions • Flooding	High	• Condition survey undertaken and renewal works programmed. • Level of service for: - Load Limits - Flooding access	Low

6.2.1. Risk Profile of Existing Bridges

Council has previously completed an assessment to assign a risk rating against individual bridges. This risk rating is assessed based on functional road hierarchy, the type of traffic which passes over the bridge, and the condition rating of major structural elements. These factors combined provide an overall risk rating for each structure.

This risk rating is used to determine work priorities and allocation of resources for maintenance and capital renewal. These risk ratings are presently retained in a separate database from Council's asset management system. Ideally this risk information should be updated and transferred into Council's asset database so that it is retained as corporate knowledge and to enable improved analysis and reporting.

6.3. Critical Assets

Critical assets are defined as those which have a high consequence of failure or reduction in service (not necessarily a high probability of failure).

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

The following failure modes are considered when determining asset criticality and its contribution to service delivery:

- Structural: where the physical condition of the asset is the measure of deterioration, service potential and remaining life.
- Capacity / utilisation: where it is necessary to understand the level of under- or overcapacity against the required level of service to establish remaining life or timing for renewal.
- Level of service failures: e.g. reliability, image, where performance targets are not achieved.
- Obsolescence: technological change or lack of replacement parts can render assets uneconomic to operate or maintain.
- Cost or economic impact: where the cost to maintain and operate an asset is likely to exceed the economic return expected, or the customer's willingness to pay, to retain an asset.

Having an appreciation of these potential failure modes allows us to better plan for the impacts of an event should it occur.

Table 6.1 Critical Assets

Critical Assets	Failure Mode	Impact
Bridges at various locations	Bridge function in supporting higher order roads in the RMP road hierarchy	▪ Structure condition and/or capacity not suitable to cater for demand ▪ Accelerated deterioration due to increased vehicle loadings

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

7. FINANCIAL SUMMARY

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

7.1. Financial Statements and Projections

7.1.1. Asset valuations

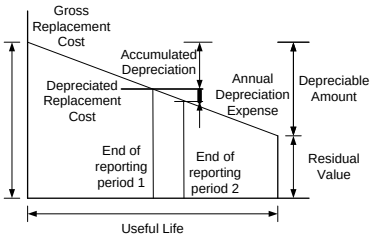
The best available estimate of the value of assets included in this Asset Management Plan are shown below.

Gross Replacement Cost ***$50,773,000***

Depreciable Amount ***$50,773,000***

Depreciated Replacement Cost[2] ***$27,657,000***

Annual Average Asset Consumption ***$498,000***



The value of assets recorded in the asset register as at 30 June 2018 covered by this asset management plan are shown.

Assets were last revalued during 2017. Assets are valued at fair value based on depreciated replacement cost. Quantities represent those assets whose replacement cost meets Council's capitalisation threshold.

[2] Also reported as Written Down Value, Carrying or Net Book Value.

7.1.2. Sustainability of Service Delivery

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

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

7.1.3. Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[3] ***152%***

The Asset Renewal Funding Ratio is the most important indicator and indicates that over the next 10 years of the forecasting that we expect to have ***152%*** of the funds required for the optimal renewal and replacement of assets. The reason for the extra funding is Council's recent programme to catch-up on the backlog of bridge renewals.

7.1.4. Medium term – 10-year Financial Planning Period

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

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

The projected operations, maintenance and capital renewal expenditure required over the 10 year planning period is ***$***322,108 on average per year. Estimated (budget) operations, maintenance and capital renewal funding is ***$437,000*** on average per year. This translates into a funding surplus of approximately ***$114,892*** per annum.

It should be noted that these measures are averages over the 10-year planning horizon. In reality investment in the replacement or renewal of bridges generally occurs as a large one-off capital outlay as a structure nears the end of its useful life. It may appear that Council may be overfunding this asset class under the current Long Term Financial Plan projections, however any changes to this funding strategy should be carefully considered in in light of Council service and risk management obligations.

Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 100% for the first years of the asset management plan and ideally over the 10-year life of the Long Term Financial Plan.

7.1.5. Projected Expenditures for Long Term Financial Plan

Table 7.1.5 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2019/20 real values.

Table 7.1.2: Projected Expenditures for Long Term Financial Plan

Year	Renewal	Upgrade	New	Expansion	Maintenance	Operations
2019/20	$212,000	$0	$0	$0	$74,000	$0
2020/21	$488,000	$650,000	$0	$0	$74,000	$0
2021/22	$440,000	$300.000	$0	$0	$74,000	$0
2022/23	$440,000	$0	$0	$0	$74,000	$0
2023/24	$800,000	$0	$0	$0	$74,000	$0
2024/25	$200,000	$0	$0	$0	$74,000	$0
2025/26	$400,000	$0	$0	$0	$74,000	$0

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

Year	Renewal	Upgrade	New	Expansion	Maintenance	Operations
2026/27	$250,000	$0	$0	$0	$74,000	$0
2027/28	$200,000	$0	$0	$0	$74,000	$0
2028/29	$200,000	$0	$0	$0	$74,000	$0

The above financial projections are taken directly from Council's current Long Term Financial Plan or are estimated from current budget trends.

7.2. Funding Strategy

Funding for assets is provided from the budget and Long Term Financial Plan.

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

7.3. Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council. Asset values will also increase as the asset stock is upgraded to cater for demand.

Additional assets will generally add to the operations and maintenance needs in the longer term, as well as the need for future renewal. Additional assets will also add to future depreciation forecasts.

7.4. Key Assumptions Made in Financial Forecasts

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

Key assumptions made in this asset management plan are:

- Forecasted on present day dollars
- Staffing needs are resourced adequately
- No significant changes in legislation
- No growth in bridge portfolio
- Increases in maintenance and operational budgets are consistent with the Strategic Resource Plan and Long Term Financial Plan

7.5. Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale[4] in accordance with Table 7.5.

Table 7.5: Data Confidence Grading System

Confidence Grade	Description
A - Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 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

[4] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

Confidence Grade	Description
	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 considered to be: ***B- Reliable.***

8. PLAN IMPROVEMENT AND MONITORING

8.1. Status of Asset Management Practices[5]

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

Table 8.1: Overview of Corporate Systems

Module	System
Financial/Accounting	Technology One (Main) Conquest III (Journaled into T1)
Records Management	Hewlett Packard Content Manager
Mapping (GIS)	Exponare MapInfo Crest – Rapid Maps
Asset Management	Conquest III Technology One (plant, equipment, furniture, Technology, land)
Renewal Modelling	Moloney Asset Management Systems IPWEA-NAMS
Works Management	Conquest III Crest – Rapid Maps Manual / spreadsheets

[5] ISO 55000 Refers to this the Asset Management System

8.2. Improvement Plan

The asset management improvement plan generated from this asset management plan is shown in Table 8.2.

Table 8.2: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Ensure that operational staff responsible for bridge inspections are adequately trained to undertake Level 1 Routine Maintenance Inspections	Manager Operations and Parks	Internal Staff	Ongoing
2	Draft a Levels of Service document which defines current levels of service being provided by the Mitchell Shire Council	ELT Director Infrastructure	Internal Staff	Dec 2019
3	Componentise each bridge to understand the condition performance of various components to build improved medium to long term forecasting of asset component replacement.	Coordinator Strategic Assets	Internal Staff/Consultant	To be done as part of next Level 2 Audit.
4	Collect and allocate unit rates for bridge components to be utilised as part of long term modelling of bridge components.	Coordinator Strategic Assets	Consultant	To be done as part of next Level 2 Audit.
5	Develop and implement a program to collect data for major culverts which are not presently captured in Council's asset register. This information should be stored in Council's corporate asset management system and GIS.	Coordinator Strategic Assets	Internal Staff/Consultants	To be done as part of next Level 2 Audit. (preliminary mapping of newly identified assets by internal staff)
6	Formalise agreements/MOU for the management of municipal boundary roads and bridges between Mitchell Shire and neighbouring Council's to clearly articulate the responsibilities of the various coordinating road authorities.	Manager Engineering and Major Projects	Internal Staff/Consultant (shared cost)	Dec 2019
7	Risk assessments made for each bridge should be reassessed and updated. This information should be transferred to Council's asset register.	Manager Strategic Assets	Internal Staff	June 2019
8	Conduct a review of the bridge and major culvert portfolio to identify and record critical infrastructure through consultation with key stakeholders	Manager Engineering and Major Projects	Internal Staff/Consultants	Dec 2019
9	Review the structural capacity of those bridges which are presently subject to load restrictions to verify that the posted load restrictions are still current.	Manager Engineering and Major Projects	Consultants	June 2020
10	Review current funding allocations made to bridge maintenance to ensure that it is sufficient to deliver current levels of service.	Manager Operations and Parks	Internal Staff	March 2019
11	Annually review modelling of long term financial forecasts based on updated asset	Manager Strategic Assets	Internal Staff	Annual/Ongoing

Task No	Task	Responsibility	Resources Required	Timeline
	data. Revised forecasts should be provided as an input in the Long Term Financial Plan, Strategic Resource Plan, and annual budget.			
12	Develop a transport strategy to delineate a priority freight network to meet the needs of the increased freight task and to guide future investment in bridge upgrades. This should also involve determining alternative routes to avoid bridges or major culverts with limited load carrying capacity.	Manager Engineering and Major Projects	Consultant	June 2020

Council's Strategic Asset Management Working Group will be responsible for determining the priority of the actions in this improvement plan and to allocate a responsible officer and to identify resource needs. This is to ensure that the implementation of these improvement actions align with Council's overall asset program.

8.3. Monitoring and Review Procedures

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

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

The Bridge AM Plan will have a life of four (4) years and will be completely reviewed and updated in order to inform the development of the Council Plan which follows the election of a new Council.

8.4. Performance Measures

Performance measures will be developed to ensure that work practices and the AM Plan are reflective of each other.

The performance of the AM 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 including Council's Road Management Plan.
- 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.

9. REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.

- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.

- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- Council Plan 2017 - 2021
- Long Term Financial Plan
- Strategic Resource Plan
- Annual Budget
- Asset Management Policy and Strategy