

Shire of Boddington

Bridge

Asset Management Plan

Revision 0.1

Document Control

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Contents

Contents.....	3
Executive Summary	4
Background and Objectives	5
Purpose of this Asset Management Plan.....	5
Focus of this Asset Management Plan.....	5
Corporate Document Relationships.....	5
Time Period of the AMP and Next Review Date	5
Service Levels	6
Introduction.....	6
Stakeholder Key Service Attributes.....	7
Service Level Targets and Performance	8
Demand	11
Historic Demand.....	11
Future Demand.....	11
Demand Management.....	12
Lifecycle Management Plan	15
Bridges Assets Condition.....	16
Data Confidence and Reliability.....	18
Operations & Maintenance	19
Operation & Maintenance Strategy.....	19
Maintenance Activities.....	19
Inspections.....	20
Renewal.....	21
Financial	24
Projected Expenditure Requirements.....	24
Plan Improvement and Monitoring	25
Performance Measures.....	25
Asset Consumption Ratio.....	25
Asset Sustainability Ratio	26
Asset Renewal Funding Ratio	27
Improvement Plan	28
Monitoring and Review Procedures	28
Attachment 1	29

Executive Summary

The Shire of Boddington is custodian to an extensive range of community assets that are provided to facilitate the delivery of services to the community. Bridges are an important component of Councils asset portfolio.

Bridges owned by Local Government are required to be maintained and managed in the same manner as all assets. They should be on the Local Government (LG) asset register and controlled by the LG in respect of depreciation, insurance, etc.

The Bridge Asset Management Plan (AMP) will be used, along with other Asset Management Plans (AMP), to balance levels of service, community expectations and affordability of assets and services. It outlines the activities that will be carried out over the next ten years to provide and maintain the portfolio. Council needs to ensure that there is an appropriate level of funding to enable this category of assets to be maintained and renewed to an acceptable standard.

While the document is comprehensive, Asset Management is a journey involving continuous monitoring and improvement. As such there are a number of actions that have been identified that will improve the AMP's accuracy over time. All readers of this AMP must understand its limitations and applied assumptions before acting on any information contained within it.

The Shire has responsibility for all bridges on its road network. This includes annual visual inspections (Level 1), routine and preventative maintenance and emergency repairs which assists in promoting connectivity.

According to Main Roads records, there are 22 bridges within the Shire of Boddington. 14 of these bridges are owned by Main Roads (all of these are on either highways or main roads within Boddington), 5 are owned by the Shire of Boddington and 3 are owned by Department of Biodiversity, Conservation and Attractions' Parks and Wildlife Service. Ownership is generally based on who owns the road on which the bridge is located.

With regards to LG owned bridges, they should be maintained on the LG asset register and managed in the same manner as all assets owned and controlled by the LG in respect of depreciation, insurance, etc.

The Bridge Asset Management Plan covers 5 bridges owned by Local Authority in the Shire of Boddington. (Bridge No. 3084, 3085, 3086, 3090 and 4860.) Overall, the Bridges assets in this plan have significant value estimated at approximately \$9.7 million. Evidence suggests that the general condition of the assets at the 'Fair' overall condition. Deterioration in condition would be obvious and there would be some serviceability loss. However the Asset Consumption Ratio of 71% which is within the target band of 50-75%.

Looking forward, a number of key improvement actions have been identified that would enable the Shire to better manage the Bridge asset portfolio. These have been listed within the Improvement Plan for future implementation.

Background and Objectives

Purpose of this Asset Management Plan

This document is an Asset Management Plan (AMP) for the bridge assets on its road network. The AMP documents shows how the Shire plans to manage these assets, to deliver services of a specified quality (service levels) and what the associated long term costs are.

Focus of this Asset Management Plan

The AMP focuses on the following asset type portfolio.

Asset Class	Number of Assets	Current Replacement Cost
Bridges	5	\$ 9,740,000

Table 1: Assets covered by AMP

Corporate Document Relationships

This AMP integrates with the other following Shire documents:

- = Strategic Community Plan
- = Corporate Business Plan
- = Long Term Financial Plan
- = Annual Budget

Time Period of the AMP and Next Review Date

The AMP covers a 10 year period and will be next reviewed by 1 July 2019.

Service Levels

Introduction

The level of service is the defined service quality for a particular activity or service area against which performance can be measured. Understanding the level of service required of an asset is vital for its lifecycle management, as this largely determines an asset's development, operation, maintenance replacement and disposal. Defining the levels of service that will be provided by the asset portfolio is a key process in the development of Asset Management Plans.

The levels of service support Council's strategic goals and are based on customer expectation and statutory requirements. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost. An important objective of this Plan is to match the level of service provided by Council's bridge infrastructure assets with the expectations of the community given financial, technical and legislative constraints.

Levels of service are defined in terms of:

- Type of structure bridge or major drainage,
- Condition of structure components,
- Bridge service criteria, including trafficable width and load rating,
- The provision of adequate signage, and
- Maintaining the structural integrity of the bridge network

Service levels are divided into two terms:

- Community based; and
- Technical based

Community based levels of service relate to the function of the service provided and how the community/customer receives the service in terms of appearance, availability, comfort and safety.

Technical based levels of service relate to the technical measures and outputs the customer receives in terms of quality, quantity, maintainability reliability and performance, responsiveness, capacity, environmental impacts and affordability.

Service Level Performance

Table 2 details the service level performance that the Shire provides.

Key Performance Indicator (KPI)	Performance	Tactic
Availability	Unknown	Monitoring performance
Safety	Unknown	Monitoring performance
Accessibility	Unknown	Monitoring performance
Function	Unknown	Monitoring performance
Responsiveness	Unknown	Monitoring performance
Condition	Unknown	Monitoring performance
Environment	Unknown	Monitoring performance
Cost/Affordability	Unknown	Monitoring performance

Table 2: Service Level Performance

The Shire of Boddington in 2017 carried out a 'Community Perception Survey' in the process of reviewing its Community Strategic Plan. Levels of satisfaction for overall subjects were obtained. However the survey was not sufficiently detailed to clearly articulate what its *current* levels of service are for bridge assets. New levels of service has been considered in an asset management context. These will need to be refined in further versions of this Plan.

Stakeholder Key Service Attributes

The Shire has considered on behalf of each key stakeholder what they value and expect from Bridge assets. These needs and wants were captured and have been presented in the table below.

Stakeholder	Expectations
Councillors	Meeting community needs, sound management and allocation of resources, good governance
Employees/ Contractors	Safe working environment
Community residents and businesses	Value for money, equitable and responsible service, well maintained assets
Facility Users	Well maintained assets specific to users' needs
Insurers	Appropriate risk management policies and practices, safe working environments, well maintained assets

Stakeholder	Expectations
Tourists	Well maintained assets, accessible services, safe facilities
Government (Federal and State)	Systems in place to sustain Bridge infrastructure, accountability, transparency

Table 3: Service Levels

The perception of what the customer wants will be investigated for future updates of the asset management plan.

Service Level Targets and Performance

The following Level of Service tables' have been developed for our council considering the potential service attributes from the Strategic Community Plan and stakeholder key service attributes. A total of eight KPIs have been selected.

Community Levels of Service for Bridges Assets

Key Performance Indicator	Level of Service	Performance Measurement Process	Target Performance	Current Performance
Safety	To manage transport infrastructure to maximise safety for users. To manage transport infrastructure to maximise safety for staff and contractors	Number of hazards identified and remedied within set timeframes. Number of injuries or accidents attributable to non - conformance with Bridge AMP	100% of hazards actioned within set timeframes. No accidents or injuries sustained due to non compliance	Timeframes not measured. Crash statistics analysed and safety audits conducted every 2-3 years. 0 lost time injuries in the last 12 months
Accessibility & Availability	Bridge infrastructure to be provided in accordance with demonstrated community needs and Council policy	Conformance to Bridge AMP, asset hierarchies and Shire policy.	75 % of community consider local bridges as in good condition or better.	Not measured
Appearance	Infrastructure in public areas maintained and improved to enhance appearance of townships	Annual community satisfaction survey Condition inspections	High satisfaction rate of customers surveyed.	Not measured
Responsiveness	Compliance with target maintenance response times.	Reports from works requests	100% compliance within response targets.	Monthly works request reports measures some timeframes

Table 4. Community Levels of Service for Bridges Assets

Technical Levels of Service for Bridges Assets

Key Performance Indicator	Level of Service	Performance Measurement Process	Target Performance	Current Performance
Maintainability & Condition	Council will maintain its bridge infrastructure in a sustainable manner so that it is safe and fit for purpose.	Compliance with inspection regimes and maintenance intervention levels specified within Bridge AMP. Overall condition of bridge infrastructure	95% compliance with inspection and maintenance targets specified in Bridge AMP. 100% of bridge infrastructure to be below intervention levels	Inspection and maintenance regimes and intervention levels not measured. 100 % of bridge infrastructure below intervention levels
Usage & Capacity	Infrastructure designed, constructed and managed to meet current / anticipated usage and capacity.	Percentage of infrastructure which meet dimensions required for type of usage	All assets designed and constructed to meet capacity as specified in bridge hierarchy. Non-conforming assets to upgrade based on priority.	New construction meets current and anticipated usage
Environment	Infrastructure designed, constructed and maintained taking into account local environment.	Assessment of additional cost caused by environmental impacts. Number of complaints regarding environmental damage as a result of Council works.	All infrastructure designed to minimise damage to local environment. Work practises carried out in a manner that minimised adverse impact on environment.	Current design processes account for assessment of soil types, water movement, storm frequencies and natural environment. Work practices not formally adopted within procedures.
Cost/Affordability	Bridge infrastructure services provided at best value for money	Costs comparison with other similar LGA's/industry standards	Industry data identifies that costs are competitive	Not measured

Table 5. Technical Levels of Service for Bridges Assets

Demand

This section summarises likely factors that may affect the demand for assets based services over the life of the AMP. Full details of past and future demand factors are recorded in the General Guidance Notes.

Historic Demand

A range of historical sources of service demand change have been considered. Their overall effect has been summarised as follows in Table 6.

Driver Type	Effect	Demand Change
Population	Shire population up by 441 people (+31%) from 1,401 (2001) to 1,844 (2016).	Possible Increase in demand.
Demographic	Population increase in all demographic age bands (2001 – 2016) except 30-39. Median age has increased from 35 to 39 years (2001 – 2016).	No change
Recreation Participation	Participation rates continue to fall slightly year on year across the general population. Walking remains the most popular activity for recreation, followed by fitness/gym, jogging & running, swimming/diving and cycling/BMXing.	Possible Increase in demand.
Tourism	Tourist numbers in the 'golden outback' region grew from 1.5m (2012) to 2.1m (2017). This growth may have increase demand on the Bridges facilities.	Possible Increase in demand.
Climate	Annual rainfall has fallen from approximately 730mm to 580mm per annum (1916 to 2017). Annual monthly mean maximum temperatures up from 29.2°C to 31.8°C (1935 to 2017). Address risks from climate changes a result.	Possible Increase in demand.

Table 6: Historic Demand Drivers

Future Demand

Consideration was given to six possible future demand drivers (political, economic, social, technological, legal and environmental) that may influence demand on the provision of bridge assets.

Driver Type	Service Demand Change
Political	Negligible
Economic	Increase from higher energy costs, and potential catastrophic funding constraints if a local mine closes.
Social	Increase due to tourism and vandalism. Changing needs due to demographic and recreation trend changes.
Technological	Opportunity to decrease maintenance costs through implementation of emerging technologies.
Legal	Increase in compliance obligations.
Environmental	Increase in costs due to climate change and implementation of appropriate asset management strategies.

Table 7: Future Demand Drivers

Demand Management

A review of past and future demand factors shows that council does not anticipate demand change has occurred, and will also likely occur into the future. Looking forward, the following initiatives/improvements are proposed to meet demand changes.

- = Improving asset knowledge so that the data accurately records the asset inventory
- = Monitor how assets are performing and when assets are not able to provide the required service levels.
- = Improving our efficiency in operating, maintaining, replacing existing and constructing new assets to optimise life cycle costs.

Risk Management

The following risks have been identified in relation to Councils bridge assets

Risk Details	Risk Assessment			Treatment Strategy	Values after treatment		
	Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Exposure of key structures to damage as a result of bushfire or flood (financial & reputation risk)	Possible	High	High	Maintain vegetation as per the MRWA guidelines	Unlikely	High	Moderate
Inadequate funding for traffic bridge maintenance resulting in deterioration of structure (financial & health risk)	Possible	High	High	Ensure priority given through budget process. Develop 10 year renewal and maintenance plan for traffic bridges.	Rare	High	High
Inappropriate technical practices employed for bridge maintenance resulting in failure of structure (health & reputation risk)	Possible	High	High	Utilise Main Roads WA bridge maintenance guidelines for maintenance standards	Rare	Extreme	High
Inadequate values used for insurance purposes (financial & reputation risk)	Possible	Extreme	High	Annual consultation with Finance and Corporate Directorates for insurance renewal procedures.	Rare	High	Medium
Inappropriate construction and maintenance methods expose work personnel to unacceptable risks (reputation & health risk)	Possible	High	High	Compliance with requirements of Occupational Safety and Health legislation. Adoption and documentation of safe systems of work. Staff training	Unlikely	High	Medium

Risk Details	Risk Assessment			Treatment Strategy	Values after treatment		
	Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Traffic bridge fails under its load (reputation & health risk)	Possible	High	High	Main Roads WA is responsible for ongoing structural assessment of bridges occurs to determine existing carrying capacities. Implementation of load ratings on traffic bridges will be imposed where required.	Rare	High	High
Damage to structure or risk of injury due to inadequate railing (reputation & health risk)	Possible	High	High	Bridge railing installation program to be developed.	Unlikely	High	Medium

Table 8: Major Asset Management Risks

Lifecycle Management Plan

The lifecycle management plan details how the Shire intends to manage and operate its Bridge Asset portfolio at the agreed service levels.

Bridges Assets Physical Parameters

Asset ID	Bridge No.	Route Name	Crossing Name	Structure Type	No. of Spans	Length	Width	Current Replacement Cost	Fair Value	Annual Depreciation
RBCXX027001	3084	Crossman Road	Crossman River	Timber	3	18.20m	8.05m	\$ 857,000	\$ 402,790	\$ 26,482
RBCXX028001	3085	Crossman Road	Crossman River	Timber	3	19.75m	7.95m	\$ 1,050,000	\$ 833,070	\$ 12,446
RBR001XX004	3086	Lower Hotham Road	Marradong Brook	Timber	3	17.28m	7.84m	\$ 937,000	\$ 693,380	\$ 15,128
RBR001XX003	3090	Harvey Quindanning Road	Coolakin Creek	Timber	3	78.77m	7.80m	\$ 986,000	\$ 818,380	\$ 9,286
RBR002XX004	4860	Lower Hotham Road	Williams River	Timber	13	79.50m	7.15m	\$ 5,910,000	\$ 4,373,400	\$ 95,424
								\$ 9,740,000	\$ 7,121,020	\$ 158,766

Table 9: Bridges Asset Physical Parameters

Bridges Assets Condition

As at 30 June 2018, the Shire holds condition ratings for all the Bridge Assets derived from the last asset valuation. While the condition ratings provide some indication, the Shire recommends to implement a programme of inspections as per Main Roads WA guidelines across the portfolio has been listed.

Asset ID	Image	Image	Asset Name	Current Replacement Cost	Fair Value	Depreciation Expense	Condition 0-10	Remaining Useful Life (Years)	FV Short	FV Long	Remaining Useful Life Short (Years)	Remaining Useful Life Long (Years)
RBCXX027001			BRIDGE 3084 CROSSMAN ROAD	\$ 857,000	\$ 402,790	\$ 26,482	9.0	15	\$ 128,550	\$ 274,240	5	160
RBCXX028001			BRIDGE 3085 CROSSMAN ROAD	\$ 1,050,000	\$ 833,070	\$ 12,446	5.0	67	\$ 497,070	\$ 336,000	48	160
RBR001XX004			BRIDGE 3086 LOWER HOTHAM ROAD	\$ 937,000	\$ 693,380	\$15,128	6.0	46	\$ 393,540	\$ 299,840	30	160
RBR001XX003			BRIDGE 3090 HARVEY QUINDANNING ROAD	\$ 986,000	\$ 818,380	\$ 9,286	4.0	88	\$ 502,860	\$ 315,520	69	160
RBR002XX004			BRIDGE 4860 LOWER HOTHAM ROAD	\$ 5,910,000	\$ 4,373,400	\$ 95,424	6.0	46	\$ 2,482,200	\$ 1,891,200	30	160
				\$ 9,740,000	\$ 7,121,020	\$ 158,766	Ave 6					

Table 9: Bridges Asset Physical Parameters

Data Confidence and Reliability

Table 11 details the reliability and confidence levels of the current asset data the Shire holds. It is the Shire's intention to progress towards a position whereby data confidence levels for all areas are classified as either a 1 or 2.

Confidence Grade	Description	Accuracy
1 – Excellent	Accurate	100%
2 – Good	Minor inaccuracies	± 5%
3 – Average	50% estimated	± 20%
4 – Poor	Significant data estimated	± 30%
5 – Very Poor	All data estimated	± 40%

Table 10: Data Confidence Measures

Asset Type	Inventory	Condition	Valuation
Bridges	1	2	2

Table 11: Bridge Assets Data Confidence Levels

Operations & Maintenance

Maintenance activities relate to the repair of faults and attention to an assets structure to ensure ongoing serviceability and to prevent premature deterioration or failure. Maintenance management is a systematic approach to the planning and execution of maintenance activities. This management method delivers the benefits of operational efficiencies and reduced maintenance costs. Council's management process encompasses the following activities:

- Regular inspections,
- Keeping of proper records,
- Condition rating of bridge infrastructure to support strategic asset management,
- Program preparation including planning, minimising and scheduling, and
- Effective execution of maintenance operations

Operation & Maintenance Strategy

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

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

In order to deliver best value to the community and to ensure safety, the Shire of Boddington has determined that it is vital to have frequent inspections which will assist in determining the best 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 their rehabilitation/replacement.

Maintenance Activities

Maintenance includes both reactive and proactive activities that preserve or restore the condition of a structure or its components.

In regards to maintenance, the owner of the bridge is responsible for the maintenance of the bridge. Funding for routine and preventative maintenance of Local Government (LG) bridges is the responsibility of the local government. Funding sources for the specific maintenance of LG bridges includes funding through the Local Government Grants Commission (LGGC) grants and supplemented with a funding contribution from Main Roads. LG's, as the asset owner, can apply for Federal funding or utilise their own funds to maintain the bridges.

Main Roads WA arranges funding of specific maintenance for complex or expensive maintenance items via the Bridge Maintenance Programme. This work is funded 2/3 from the Commonwealth Government (via the WA Local Government Grants Commission) and 1/3 from the State Government (via MRWA). The WA Local Government Grants Commission funding policy requires local authorities to undertake the required annual visual inspections and routine maintenance to access the funding on the Bridge Maintenance Programme.

Routine Maintenance

Routine bridge maintenance comprises those activities, identified primarily by Level 1 inspections, which maintain the serviceability of the structure. Works of this type generally do not change condition and include clearing of drainage, minor repairs to approaches, road surface and timber decking, cleaning and adjusting deck joints, and painting.

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.

The majority of issues or defects identified relate to the delivery of routine maintenance and road user safety. These issues include:

- Clearing of waterways and debris from structures,
- Maintenance of roadway on bridge approaches,
- Provision of guardrail on approaches to unprotected structures,
- Provision and maintenance of railing across structures,
- Maintenance of batters to prevent excessive erosion,
- Maintenance of concrete abutments, wing walls and headwalls,
- Maintenance of roadway across bridge (i.e. potholing, etc.), and
- Maintenance of steel beams to protect against excessive corrosion

Inspections

The purpose of inspections is to identify, record and report defects that are causing, or have the potential to cause:

- Disruption to service provision
- Decline in asset performance and/or condition
- A public safety risk
- Inconvenience to the community
- Breach of regulations or legislation
- A financial risk
- Infrastructure damage

Inspections of varying detail are completed on a regular basis to continually monitor the condition and performance of the network of bridges which service the community. The following types of inspections are undertaken:

TYPE	DESCRIPTION	RESPONSIBILITY
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.	Shire of Boddington. Routine maintenance inspections are completed by Council's technical staff.
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. Level 2 inspections are conducted on a rolling three (3) year cycle.	Main Roads WA
Level 3 Detailed Engineering Inspections	Engineering inspections are conducted on a needs basis to assess the structural condition and capacity of 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.	MRWA coordinates Engineering inspections on road bridges.

Table 12: Type of Inspections

Main Roads WA has responsibility for arranging detailed inspections (Level 2) on all the Shire road bridges every 5 years for timber bridges and 7 years for non-timber bridges. MRWA arranges load rating and where required load posting of the Shire bridges.

Renewal

The objective of renewal is to restore a structure to "as new" condition with respect to the original designed load capacity and level of service. This excludes the strengthening of bridges to provide a greater load capacity than the original design. Renewal activities include deck replacement, splicing piles, installation of supplementary piles or barrier replacements.

It is emphasised that although the listed bridges are Shire of Boddington assets for the Asset Renewal Program for all bridges in WA, it is the responsibility of the Local Government to include the bridges in their asset register, and asset management systems and their revaluation regime.

Bridge renewal is funded by WA Local Government Grants Commission 2/3 and Main Roads WA 1/3. Please refer to Attachment 1.

New, Upgrade, Disposal

New Strategy

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.

Council has no plans to construct any new bridges as the road network is well developed. In the event that a new bridge was required it is expected that it would be funded by a developer or by other levels of government.

Where new assets are 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.

Upgrade

Upgrade refers to works which improve an existing asset beyond its current capacity. They may result from growth, social or environmental needs. Upgrade/expansion of infrastructure will contribute to the overall infrastructure inventory and will require ongoing maintenance and renewal. Recognition of the impact that this activity has on the future sustainability of infrastructure should be considered for all projects. As such, any potential upgrades should undergo a 'whole of life' analysis to ensure the overall viability of the project.

If Local Government bridges require replacement, then funding sources other than the Local Government Grants Commission (LGGC) can be sought, such as the Federal Governments Roads to Recovery and Bridge Renewal Programmes. It is the responsibility of the Local Government to apply for these funding sources. Main Roads can assist the Local Government in submission of these applications. These funding sources mostly require a co-contribution from the applicant. To enable support from Main Roads to occur the Local Government should consult with Main Roads during the process of developing the submission to gain Main Roads technical support.

Disposal Strategy

Disposal works are those activities necessary to dispose of decommissioned assets as required. Disposal works involve an evaluation of the asset to be able to answer a number of questions about the asset, including:

- Is the asset still required by the community
- Can the need be satisfied by a less expensive or alternative asset
- Is it the role of Council to provide a particular service delivered by the asset

Asset Disposal Process

Surplus asset disposal is a three step process whereby the asset is evaluated from a strategic perspective, the disposal process is implemented where required, and the disposal process is reviewed. The emphasis is on ensuring that non-essential assets are identified and disposed.

Asset Evaluation

The disposal process begins with identifying surplus assets. Council should conduct regular strategic evaluations of its asset needs. During this process, assets are evaluated against the asset disposal principles outlined above. Where it is identified that an asset does not meet these criteria, it is to be identified as surplus and disposed. The evaluation process will also take into account public interest considerations. Examples of public interest considerations would be:

- where an asset has some form of significance to the community and there could be expected to be significant public resistance to disposal or transfer of ownership of the asset;
- Where an asset has strategic significance for future infrastructure development. In such instances, a clear and demonstrated future planning requirement is needed to support continued ownership. Speculation on future usage does not constitute a clear and demonstrated future requirement;
- Where there are significant heritage, environmental or public usage requirements that require ongoing local government ownership and management.

Bridge assets are not frequently disposed of (this is where the asset is not replaced/renewed). Where a potential need is identified, then this is considered by Main Roads WA.

Main Roads WA have programmed works to make Bridge 3084 (Crossman Road) absolute. This has been satisfied by a less expensive or alternative asset and in this case the bridge with 16 x 1200 RCP culvert. The works include side-mounted Thriebeam on culvert with W-beam extensions and ET2000 End Terminals on all approaches/departures.

Financial

There are delegated funds for the Bridge assets in the current 10 year financial year. However the requirements to maintain the infrastructure has estimates of significant maintenance costs and therefore a review will be required.

Projected Expenditure Requirements

Expense Type	Year 1 2018/19	Year 2 2019/20	Year 3 2020/21	Year 4 2021/22	Year 5 2022/23
Operations					
Maintenance	\$ 16,669	\$ 16,836	\$ 17,008	\$ 17,430	\$ 17,779
Renewal & Upgrade	\$ 167,000	\$ 800,000	\$ 145,999	\$ 149,560	\$ 153,103
New					
Disposal					

Expense Type	Year 6 2023/24	Year 7 2024/25	Year 8 2025/26	Year 9 2026/27	Year 10 2027/28
Operations					
Maintenance	\$ 18,223	\$ 18,679	\$ 19,239	\$ 19,816	\$ 20,411
Renewal & Upgrade	\$ 156,712	\$ 160,231	\$ 163,811	\$ 167,453	\$ 171,158
New					
Disposal					

Table 12: Bridge Assets Expenditure Requirements

Planned Renewal Expenditure over the next 10 years (Renewal/Upgrade) \$ 2,235,027

Plan Improvement and Monitoring

This Section of the AMP outlines the degree to which it is an effective and integrated tool within the Shire. It also details the future tasks required to improve its accuracy and robustness.

Performance Measures

The effectiveness of the AMP will be monitored by the performance of the three statutory ratios that the Shire reports on. The Shire’s current performance is recorded in Table 17.

Asset Consumption Ratio

The ratio is a measure of the condition of the Shire’s physical assets, by comparing their condition based fair value (what they’re currently worth) against their current replacement cost (what their replacement asset is currently worth as new). The ratio highlights the aged condition of the portfolio and has a target band of between 50%-75%. Non-depreciating assets (e.g. land etc.) should be excluded from the calculation.

$$\text{Asset Consumption Ratio} = \frac{\text{Depreciated Replacement Cost (Fair Value) of Depreciable Bridge Assets}}{\text{Current Replacement Cost of Depreciable Bridge Assets}}$$

This ratio seeks to highlight the aged condition of a local government’s stock of physical assets. If a local government is responsibly maintaining and renewing / replacing its assets in accordance with a well prepared asset management plan, then the fact that its Asset Consumption Ratio may be relatively low and/or declining should not be cause for concern – providing it is operating sustainably.

Asset ID	Asset Name	Current Replacement Cost	Fair Value	Asset Consumption Ratio %
RBCXX027001	BRIDGE 3084 CROSSMAN ROAD	\$ 857,000	\$ 402,790	47%
RBCXX028001	BRIDGE 3085 CROSSMAN ROAD	\$ 1,050,000	\$ 833,070	79%
RBR001XX004	BRIDGE 3086 LOWER HOTHAM ROAD	\$ 937,000	\$ 693,380	74%
RBR001XX003	BRIDGE 3090 HARVEY QUINDANNING ROAD	\$ 986,000	\$ 818,380	83%
RBR002XX004	BRIDGE 4860 LOWER HOTHAM ROAD	\$ 5,910,000	\$ 4,373,400	74%
		\$ 9,740,000	\$ 7,121,020	Average 71%

Table 13: Bridge Assets Consumption Ratios

The average Asset Consumption Ratio of the Bridge assets does meet the standard range of 50% - 75%. The Average is 71%

Asset Sustainability Ratio

The ratio is a measure of the extent to which assets managed by the Shire are being replaced as they reach the end of their useful lives. The ratio is essentially past looking, and is based upon dividing the average annual depreciation expense of the Bridge asset portfolio by the average annual renewal expenditure, for a number of past years (e.g. 3).

Asset	Renewal Expenditure			Average Renewal Expenditure
	2015/16	2016/17	2017/18	
Bridge	\$ 37,560	\$ 31,853	\$ 282,000	\$ 117,138

Table 14: Bridge Assets Sustainability Ratios

$$\begin{aligned}
 \text{Asset Sustainability Ratio} &= \frac{\text{Past Bridge Asset Renewal Expenditure}}{\text{Bridge Asset Depreciation}} \\
 &= \frac{\$ 117,138}{\$ 158,766} \\
 &= 74\%
 \end{aligned}$$

Asset Renewal Funding Ratio

The ratio is a measure as to whether the Shire has the financial capacity to fund asset renewal as and when it is required over the future 10 year period. The ratio is calculated by dividing the net present value of planned renewal expenditure over the next 10 years in the LTFP, by the net present value of planned renewal expenditure over the next 10 years in the AMP. The same net present value discount must be applied in both calculations.

Planned Renewal Expenditure					
2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
\$ 167,000	\$ 800,000	\$ 145,999	\$ 149,560	\$ 153,103	\$ 156,712

Planned Renewal Expenditure				
2024/25	2025/26	2026/27	2027/28	Total sum
Year 7	Year 8	Year 9	Year 10	Year 1 - 10
\$ 160,231	\$ 163,811	\$ 167,453	\$ 171,158	\$ 2,235,027

Table 15: Bridge Assets Planned Renewal Expenditure

Required Renewal Expenditure					
2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
\$ 158,766	\$ 161,941	\$ 165,180	\$ 168,484	\$ 171,853	\$ 175,290

Required Renewal Expenditure				
2024/25	2025/26	2026/27	2027/28	Total sum
Year 7	Year 8	Year 9	Year 10	Year 1 - 10
\$ 178,796	\$ 182,372	\$ 186,020	\$ 189,740	\$ 1,738,443

Table 16: Bridge Assets Required Renewal Expenditure at 2% per year

Asset Renewal Funding Ratio = $\frac{\text{NPV of LTFP Planned Renewal Expenditure over the next 10 years}}{\text{NPV of AMP Required Renewal Expenditure over the next 10 years}}$

$$= \frac{\$ 2,235,027}{\$ 1,738,443} = 129\%$$

Year	Asset Consumption Ratio	Asset Sustainability Ratio	Asset Renewal Funding Ratio
2018/19	71%	74%	129%

Table 17: AMP Performance Measures

Improvement Plan

The asset management improvement plan generated from this AMP is shown in Table 18.

Task No.	Task	Responsibility	Timeline
1	Complete the implementation of the Synergy Soft AM module.		
2	Update new assets when handed over to the council		
3	Identify future technologies that can facilitate more effective and cost-efficient asset management practices.		
4	Provision of detailed work program for renewal		
5	Monitor the service levels recorded within this AMP.		
6	Implement an Level 1 - Routine Maintenance Inspection		
7	Develop Bridge Maintenance and Operational Plan for the Shire's bridge assets.		
8	Develop an upgrade/new project evaluation and prioritisation framework.		

Table 18: AMP Improvement Plan

Monitoring and Review Procedures

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

Attachment 1

WA Local Government Grants Commission

POLICY FOR ALLOCATION OF SPECIAL PROJECT FUNDS FOR BRIDGES

Under the current principles, 93% of the Federal road funds are allocated to local governments in accordance with road asset preservation needs. The remaining 7% is allocated as Special Projects, two thirds for bridges and one third for roads serving remote Indigenous communities.

The cost of preventive maintenance and annual routine maintenance of bridges is taken into account in calculating road asset preservation needs. The current rates are \$24.60 per square metre for timber bridges and \$12.30 per square metre for steel and concrete bridges. The cost of specific maintenance, refurbishment and replacement of bridges is not taken into account because funds are specifically provided for these works through the Special Project funds.

The Commission's policy for allocating the Special Project funds for bridges recognises that there are a large number of Local Government bridges in poor condition, and that the preservation of these bridges must be given priority in allocating the Special Project funds.

The Commission's policy on Special Project funds for bridges restricts funding to only preservation type projects, recognising that some of these projects may involve some upgrading, and preservation includes replacement when the existing bridge has reached the end of its economic life.

Bridges must meet the following definition to be eligible for Special Projects funds:

A bridge is defined as:

A structure with a clear opening in any span of greater than 3 metres measured between the faces of piers and or abutments.

A structure with a clear span of less than 3 metres where the deck is supported on timber stringers. This provision is in recognition of the higher maintenance costs and management requirements of timber structures.

A footpath attached to a road bridge or a footbridge over a road is eligible for Special Project funds. A free-standing footbridge over a river is not eligible.

The Commission will not allocate funds for the construction of a new bridge where there is no existing bridge, or where an existing bridge has not reached the end of its economic life.

The Commission considers recommendations of the Bridge Committee in allocating the Special Project funds. The Committee is made up of representatives of Main Roads WA, the Western Australian Local Government Association and the WA Local Government Grants Commission.

The Bridge Committee makes its recommendations after considering technical advice and priority ratings from Main Roads WA. These ratings take into account bridge condition data and issues such as safety considerations which are identified through liaison with local governments.

The Bridge Committee will not support grants for the repair or replacement of a bridge if the bridge has not been given the degree of routine and preventive maintenance necessary to prevent undue deterioration. For timber bridges, owners are referred to the Main Roads WA document “Timber Bridge Maintenance and Refurbishment – Preventive Maintenance Standards”.

Commission Policy

That Special Project funds be allocated to only preservation type projects. These include:

- 1. Specific maintenance and refurbishment aimed at preserving the bridge.***
- 2. Replacement of an existing bridge where it has reached the end of its economic life.***
 - Where a bridge is replaced with a new bridge, the new structure must be of a similar geometric standard to the existing bridge; e.g. a single lane bridge is replaced with a single lane bridge. Replacement may include minor upgrading and widening [up to one metre] to meet current design and safety standards.***
 - Where widening greater than one metre is required to meet current design standards or to satisfy local government policies, the additional cost of the widening will be met by the local government.***
 - A bridge that has reached the end of its economic life may be replaced with a culvert or a floodway where engineering investigations show that this is the best solution.***
- 3. In special circumstances, and where the existing bridge has not reached the end of its economic life, the Commission may agree to the Special Project funds allocated for the preservation of the existing bridge being put towards the construction of a new bridge of a higher standard than the existing structure. This provision would apply where a local government is able to access the additional funds needed for the new bridge from other sources.***