GANNAWARRA
SHIRE COUNCIL

H: Bridge Asset Management Plan – March 2015

Document Format

This plan forms one part of a suite of Asset Management Plans that have been developed:

A. **Bridges**
B. Buildings
C. Drainage
D. Footpath
E. Levee Banks
F. Pools
G. Recreation Reserves
H. Roads

Contents

1 Summary

Council adopted the original Bridge Asset management Plan in February 2009. The plan was then reviewed in June 2011.

This latest review provides the opportunity to fully update the plan to reflect best practice for asset management plans and will fit within a suite of asset management plans to assist Council to appropriately manage key infrastructure.

This Bridge Asset Management Plan acts as a tool to support Council's ability to deliver well targeted, responsive and value for money maintenance and operational services for the community as a whole.

This plan covers the proposed levels of service, future demand, routine maintenance, renewal/replacement, acquisition/creation/augmentation of bridge assets and their disposal.

Information on the levels of service governing the management of Council's road assets has also been collected and analysed. This information identifies drivers affecting levels of service, key performance indicators, and comparisons between current and best practices.

This Bridge Asset Management Plan should be subjected to a formal review every four to five years.

Service Background		
Council Plan Area of Achievement	1.5.3	Continue to improve existing infrastructure that will support further business development
Service Area	Infrastructure	
Budget Area	Infrastructure	
Service Purpose and Description	The purpose of the service is to provide for the liveability of the community by: • Providing access • Linking communities and townships • Providing for freight and economic development To achieve this Council will: • Monitor and maintain the bridge stock to an agreed standard • Monitor and schedule upgrades to the bridges	
Service Planning	Strategic Planning Maintenance & Construction	Manager Design and Projects Manager Operational Services

Service Costs 2013/14			
Maintenance Expenditure	$ 108,000		
Capital Income	$ 0		
Capital Expenditure	$ 275,000*	Capital as % of rates	2.7%
Total Net Cost	$ **383,000**	**Overall as % of rates**	**3.8%**

* Calculated over the 10 year replacement requirement

2 Plan Format and Definitions

The Bridge Asset Management Plan is designed to provide a framework for the efficient management of Council's bridge stock.

2.1 Relationship with Other Planning Documents

- Council Plan 2013-17
- Road Management Plan
- Road Asset Management Plan
- Disability Action Plan
- Gannawarra 2025
- Tracks and Trails Strategy
- Tourism Strategy
- Emergency Management Plans

2.2 Infrastructure Assets included in the plan

Asset Category	Asset Components	Assets Included
Bridges	Road Bridges	Concrete Bridges Timber Bridges
	Pedestrian Bridges	All structures

2.3 Assets not included in this plan

Assets specifically excluded from this plan are:

- Bridges over irrigation infrastructure
- Bridges on a VicRoads controlled road
- Vehicle crossings, driveways and footpaths
- Stormwater infrastructure
- Culverts
- Fords
- Footpaths up to a pedestrian bridge
- Utility assets such as communication, electricity and water infrastructure
- Assets under a 173 agreement

3 Levels of Service

The primary purpose of a bridge is to provide access across waterways and provide an uninterrupted linkage to the road network.

The levels of service are the required performance standard for an asset. Levels of service determine an asset's design, construction, operation, maintenance, replacement and disposal.

Factors that determine the level of service are primarily:

- Whether alternative access/routes exist
- The number and type of vehicles using the road
- Community safety
- Strategic and Corporate Goals - Council's goals and values as stated in policies, strategies, and the Council Plan.
- Regional transport requirements

3.1 Customer Engagement and Expectations

Requirement	Example	How measured
Need	A bridge is required to allow access to a specific location	• Network analysis • Customer feedback
Safety	Condition of a bridge and provision of guard rails	• Condition inspections • Defect inspections to comply with the Road Management Act • Traffic Counts • Customer feedback
Condition	Condition of a bridge	• Condition inspections • Defect inspections to comply with the Road Management Act • Customer feedback
Capacity	Carriageway width	• Network analysis • Customer feedback

3.2 Key Performance Indicators

KPI	Levels of Service	Performance Measurement	Target Performance
Safety	Assets safe to use and free of hazards	Bridges will undergo regular Level 1 inspections	100% of bridges will be inspected annually
Responsiveness to safety issues	The asset is safe to use	Condition inspections	95% of the network within intervention level
Reliability for freight	A road bridge will handle higher mass limits	Bridges will be constructed to acceptable design standards	100% of new construction to exceed SM1600

3.3 Asset Hierarchy

Council's bridge assets are classified into three main types depending on their construction and function.

Classification	Definition	
Road	Concrete	A road bridge that is constructed entirely from reinforced concrete that may or may not have an asphalt or chip seal surface.
	Timber	A road bridge that contains timber as part of its construction, it may also contain various other components such as steel or concrete.
Pedestrian	A bridge designed for use only by pedestrians	

3.4 Levels of Service

The elements required to be considered for each individual segment are as follows:

- What level of service will be required in the short term, in the medium term, and in the long term for the users of the bridge/road network?
- Are there alternative means of providing access? Can the road network be altered / upgraded in other areas to provide appropriate access?
- What is the traffic volume and vehicle classification? Intervention Levels of Service

3.4.1 Road Bridges

Community Levels of Service	Technical Target	Technical Measure
A bridge will be safe to use	As defined within Council's Road Management Plan	A Level 1 inspection will be conducted on all bridges annually and identified works undertaken as required
The bridge will be wide enough	A bridge will be constructed to single or double lane depending on traffic volumes and use	A new bridge will be a minimum of 4 metres wide for a single lane or 7 metres wide between guard rails for a double lane bridge
A bridge will have run off protection	New bridges will have guard railing	All reconstructed bridges will have guard railing that complies with VicRoads standards.
The bridge will be strong enough	New bridges will be capable of taking higher mass vehicles	All reconstructed bridges will be built to exceed SM1600 standard

3.4.2 Pedestrian Bridge

Community Levels of Service	Technical Target	Technical Measure
A bridge will be safe to use	As defined within Council's Road Management Plan	A Level 1 inspection will be conducted on all bridges annually and identified works undertaken as required
A bridge will have railing	All pedestrian bridges will have railing	Hand rails will be provided on all pedestrian bridges

3.5 Maintenance

In accordance with Council's Road Management Plan and the Road Management Act 2004 all bridges managed by Council are inspected and recorded in the "Confirm" Asset Management System on a regular basis.

Bridges are inspected to varying degrees depending on their condition and age. A level 1 inspection is conducted annually on all bridges and will identify standard maintenance requirements that must be undertaken in the following 12 months.

Should this inspection identify any major structural issues a Level 2 or Level 3 inspection will be undertaken.

4 Future Demand

There are many factors influencing future demand of assets, from a changing population demographic to general community expectations that determines what is acceptable. While Council will strive to meet demand for future asset expansion, this must be done in a sustainable way that meets the needs of the community as a whole.

It is not anticipated there will be any reduction to the current number of bridges maintained across the municipality.

5 Risk Management

The identified risks associated with bridge assets included in this plan are monitored and controlled through Council's Road Management Plan.

5.1 Asset Criticality

Asset criticality addresses assets that have both a high consequence of failure (being a major or catastrophic consequence) and have a high risk of failure. All bridge assets within the municipality are considered critical due to the catastrophic consequence of failure.

5.2 Legislative Requirements

The relevant legislation governing bridge construction and maintenance operations are listed below:

- Road Management Act 2004
- Council's Road Management Plan
- Local Government Act 1989
- Road Safety Act 1986
- Environment Protection Act 1970
- Planning and Environment Act 1987
- Australian Standards and VicRoads guidelines

6 Lifecycle Management Plans

6.1 Asset Ownership

Asset	Number
Road Bridge Concrete	36
Road Bridge Timber	19
Pedestrian Bridge	4

6.2 Asset Life Cycle

Asset	Life in Years
Road Bridge Concrete constructed post 1980	100
Road Bridge Concrete constructed pre 1980	60
Road Bridge Timber	60
Pedestrian Bridge	60

6.3 Asset Quantities

The table below shows the quantity of assets by the area of bridge deck managed by Council.

Asset	Quantity
Road Bridge Concrete	5,899m^2
Road Bridge Timber	2,671m^2
Pedestrian Bridge	201m^2

6.4 Asset Replacement Costs

All bridges are replaced with reinforced concrete structures when they reach the end of life. The only recent exception being Condidorios Bridge in Koondrook. The replacement cost per square metre based on recent contract pricing is \$2,279m^2 for a road bridge.

A pedestrian bridge is valued at \$1,700m^2

6.5 Asset Valuations

The table below shows the total replacement value of each asset class.

Asset	Replacement Valuation
Road Bridges	\$22,044,167
Pedestrian Bridges	\$341,700

6.6 Programming and recording of works undertaken

All defect and condition inspections including Level 1, 2 and 3 inspections are recorded utilising Councils asset management software "Confirm". This will ensure an up to date and accurate record of the state of the network at any given time. Any works that are conducted in field, whether pro-active or reactive must be issued with a corresponding accurate works order to enable recording of network improvements.

6.7 Future Bridge Replacement

Aside from unprecedented events there are three bridges that will require replacement within the next 10 year period.

6.7.1 Wells Bridge

Wells Bridge is located on the northern boundary of the municipality near Benjeroop. Extensive works have recently been undertaken to seal approximately 10km of Benjeroop-Tresco Road to improve access and gain efficiencies for freight. It is a strategic freight route through the region and supports the growing farming industry. It is anticipated this will dramatically increase both traffic volumes and weight of vehicles through this region.

A failure of this bridge would lead to a detour length of approximately 70km.

The bridge is in very poor condition and is a composite structure of timber piles, steel beams and a trough deck. Major defects of the current structure include splitting piles, broken cross heads and a rotting deck. These will in the near future lead to load limits on the bridge and eventual closure.

The bridge will continue to be closely monitored with regular Level 1 inspections at a minimum.

6.7.2 Appin South Road Bridge

Appin South Road Bridge is located at the southern end of the municipality on Appin South Road. The western abutment of the bridge forms the boundary of the municipality.

The bridge is constructed in an identical fashion to Wells Bridge however the timber piles have been encased in concrete. This old method of repair did not contain any reinforcement with in the concrete nor did it address the issue of rotting piles.

A failure of this bridge would lead to a detour route of approximately 40km.

6.7.3 Apex Park Bridge

Apex Park Bridge is a single span timber bridge with steel stringers that provides the only access to Apex Park at Reedy Lake. The abutments of this bridge have sunk and are beginning to rot.

This area has important regional significant for both passive and active recreation.

6.8 Proposed Capital Budget

Bridge	Road	Stream	Cost
Wells Bridge	Benjeroop-Lake Charm Road	Loddon River	$1,700,000
Appin South Bridge	Appin South Road	Loddon River	$800,000
Apex Park Bridge	Apex Park Road	Washpen Creek	$250,000
		10-year Total	$2,750,000