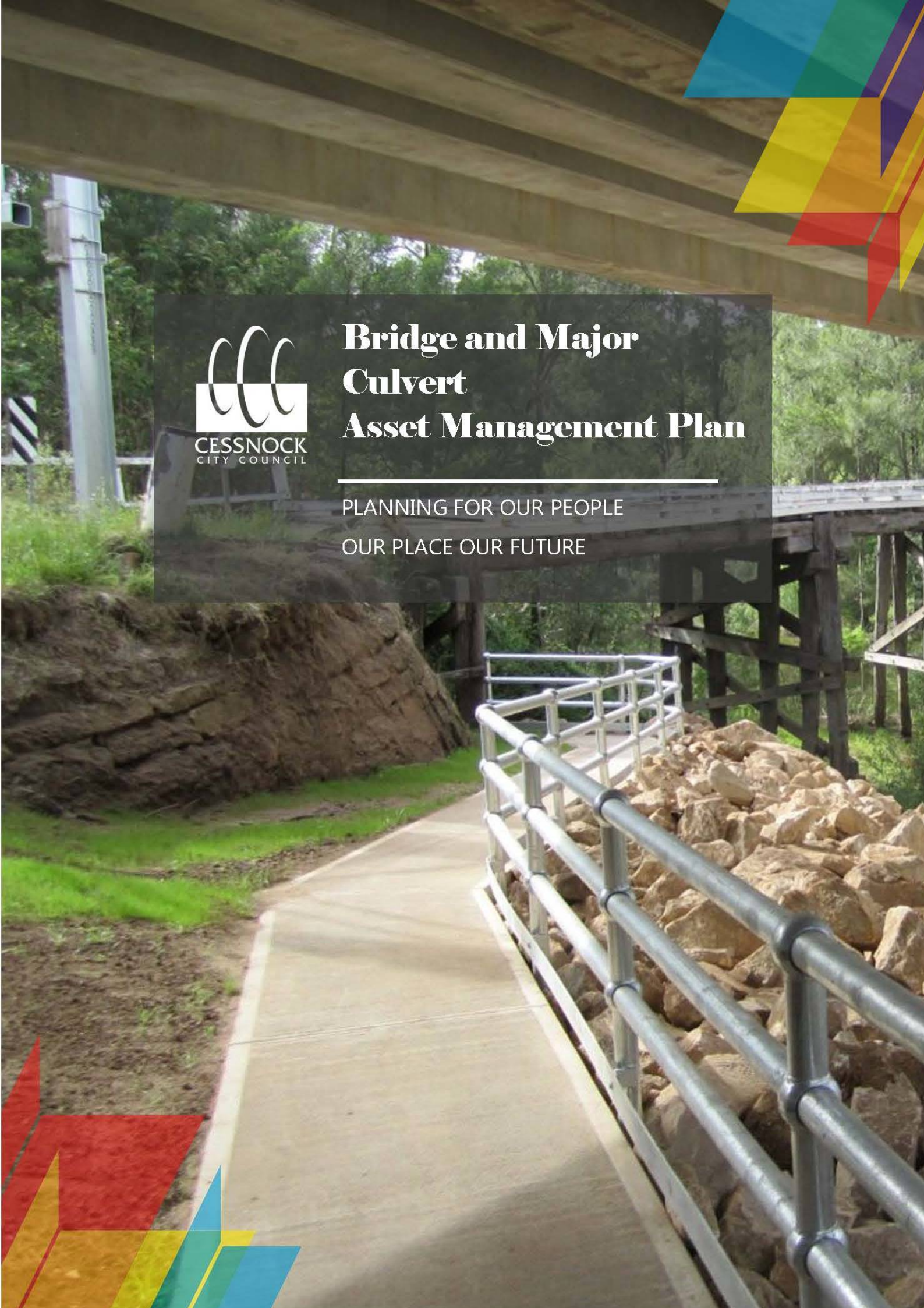




# **Bridge and Major Culvert Asset Management Plan**

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PLANNING FOR OUR PEOPLE  
OUR PLACE OUR FUTURE



**Document Control**

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## 1. EXECUTIVE SUMMARY

### Context

Cessnock City Council provides a bridge network in partnership with other Roads authorities such as Roads and Maritime Services, South Maitland Railways, and neighbouring Councils to allow for safe and efficient pedestrian, cycle and motor vehicle transportation over waterways.

**Council’s Bridge Network** comprises the following mix of Bridges:

### Road Bridges

- 23 Concrete
- 42 Timber
- 1 Steel
- 8 Composite
- 63 Major Culverts

### Pedestrian Bridges

- 40 Various Types

Council considers bridges, that form part of this asset management plan, as any structure including culverts and footbridges that have a single span or overall length of 6m (inlet to outlet) or greater or bridges that have a waterway area of 3m<sup>2</sup> or greater.

These infrastructure assets have a replacement value of approximately **\$38,300,000**.

### What does it Cost?

To determine the projected outlays necessary to provide the services covered by this Asset Management Plan (AM Plan/AMP)

including; operations, maintenance, renewal and upgrade of existing assets over the 10 year planning period, Council has developed two funding scenarios.

Scenario 2, based on feedback received from Community Consultation undertaken in 2015, is the funding required to keep the asset stock in condition 3 “average” or better. Scenario 3 is development from the available funds outlined in Councils’ Long Term Financial Plan. The following tables highlight Councils’ financial position when

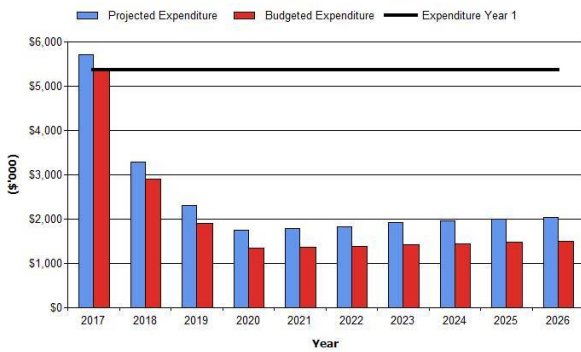
considering the projected outlays of scenario 2 “S2” or scenario 3 “S3”:

<b>2017 Bridges_S2_V4</b>	
<b>Executive Summary - What does it cost?</b>	<b>(\$000)</b>
10 year total cost [10 yr Ops, Maint, Renewal & Upgrade Proj Exp]	<b>\$24,580</b>
10 year average cost	<b>\$2,458</b>
10 year total LTFP budget [10 yr Ops, Maint, Renewal & Upgrade LTFP Budget]	<b>\$20,087</b>
10 year average LTFP budget	<b>\$2,009</b>
10 year AM financial indicator	<b>82%</b>
10 year average funding shortfall	<b>\$-449</b>

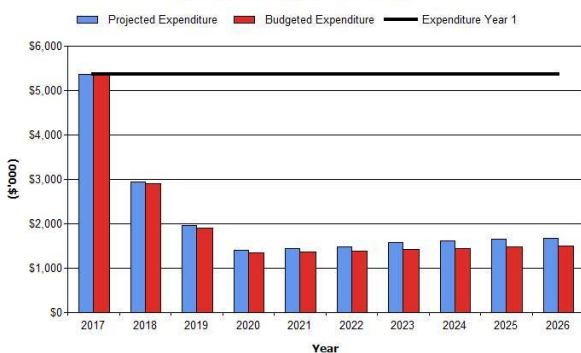
<b>2017 Bridges_S3_V4</b>	
<b>Executive Summary - What does it cost?</b>	<b>(\$000)</b>
10 year total cost [10 yr Ops, Maint, Renewal & Upgrade Proj Exp]	<b>\$21,080</b>
10 year average cost	<b>\$2,108</b>
10 year total LTFP budget [10 yr Ops, Maint, Renewal & Upgrade LTFP Budget]	<b>\$20,087</b>
10 year average LTFP budget	<b>\$2,009</b>
10 year AM financial indicator	<b>95%</b>
10 year average funding shortfall	<b>\$-99</b>

The following graphs show the projected expenditure required to provide services in this AMP, which have been developed from the outlays of scenario 2 & 3. It should be noted that capital construction/upgrade projects, as well as accounting for contributed assets from development will have an influence on projected expenditure. There has been no consideration given to the potential offset that may be possible from additional revenue that Council could generate from these developments.

**Cessnock CC - Projected and Budget Expenditure for (2017 Bridges\_S2\_V4)**



**Cessnock CC - Projected and Budget Expenditure for (2017 Bridges\_S3\_V4)**



**What we will do**

We plan to provide the following bridge services within the 10 year planning period of this AMP:

- On-going operation, maintenance, renewal and upgrade of bridges to meet service levels set by Council in annual budgets.
- Annual Bridge Renewal & Construction Programs
- Annual Bridge Maintenance and inspection Programs

**What we cannot do**

We do **not** have enough funding to provide all services at the desired service levels or provide all required new services. Works and services that cannot be provided under present funding levels are:

- The optimised annual bridge rehabilitation, renewal and replacement programs to remove load limits on bridges identified in Table 5.1.2.

**Managing the Risks**

There are risks associated with providing the service and not being able to complete all identified activities and projects. We have identified major risks as:

- Potential for bridge failure if load limit is ignored;
- Impact of community and businesses as a result of load limits on bridges that provide critical transport.
- Negative public perception/political risk

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

- Continuing regular asset inspections.
- Increasing Level 3 inspections to identify where weight limits are required and what part replacements are necessary to maintain an open load limit.
- Increasing response levels to temporarily repair bridges or mitigated risk levels by reducing weight limits etc.
- Increasing bridge renewal programs as an early intervention strategy to reduce the need for more expensive rehabilitation

**Confidence Levels**

This AM Plan is based on medium level of confidence information.

**The Next Steps**

The actions resulting from this asset management plan are:

- Engage the community on Levels of Service (LoS) and funding matters identified in this AM Plan
- Incorporate the agreed LoS into the future planning, design, maintenance and construction activities relating to bridges.

**Questions you may have:**

**What is this plan about?**

This asset management plan covers the bridge assets that serve the Cessnock City

Council community's needs. These assets include both vehicular and pedestrian timber, concrete, composite and steel bridges, and culverts, which enable people to cross waterways within the Cessnock LGA.

### **What is an Asset Management Plan?**

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

An asset management plan details information about infrastructure assets including actions required to provide an agreed level of service in the most cost effective manner. The plan defines the services to be provided, how the services are provided and what funds are required to provide the services.

### **Why is there a funding shortfall?**

Most of the Council's bridge assets were constructed by Council staff or through historical development of the LGA and from government grants, often provided and accepted without consideration of ongoing operations, maintenance and replacement needs.

Many of these assets are approaching the later years of their life and require replacement. Services from the assets are decreasing and maintenance costs are increasing.

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

### **What options do we have?**

Resolving the funding shortfall involves several steps:

1. Improving asset knowledge so that data accurately records the asset inventory, how assets are performing and when assets are not able to provide the required service levels,
2. Improving our efficiency in operating, maintaining, renewing and replacing

existing assets to optimise life cycle costs,

3. Identifying and managing risks associated with providing services from infrastructure,
4. Making trade-offs between service levels and costs to ensure that the community receives the best return from infrastructure,
5. Identifying assets surplus to needs for disposal to make saving in future operations and maintenance costs,
6. Consulting with the community to ensure that the bridge assets level of services and costs meet community needs and are affordable,
7. Developing partnership with other bodies, where available to provide services,
8. Seeking additional funding from governments and other bodies to better reflect a 'whole of government' funding approach to infrastructure services.

### **What happens if we don't manage the shortfall?**

It is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found. For bridge assets, the service level reduction may include:

- Reduction in bridge maintenance cycles.
- Decrease in LoS for bridges, examples below.





**What can we do?**

We can develop options, costs and priorities for future bridge asset LoS and consult with the community to plan these services to match the community service needs with ability to pay for services and maximise community benefits against costs.

## 2. INTRODUCTION

### 2.1 Background

This asset management plan is required to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service over a 20 year planning period.

The asset management plan follows the format for AM Plans recommended in Section 4.2 of the International Infrastructure Management Manual<sup>1</sup>.

The asset management plan is to be read in conjunction with Council's Asset Management Policy, Asset Management Strategy and the following associated planning documents:

- Cessnock 2027 – Cessnock Community Strategic Plan
- Cessnock City Council Delivery Plan 2017-2021
- Cessnock City Council Operational Plan 2017-2018
- Cessnock City Council Annual Reports
- Infrastructure Asset Revaluation Manual 2014/15
- NSW OLG Integrated Planning Guidelines and manual 2013
- Cessnock City Council Community Research Survey 2014
- Cessnock City Council 2016 Resident Satisfaction Survey Results
- Cessnock City Council 2015 Asset Management Research Satisfaction Survey Results

The infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are part of the transport network used to provide services to the community to enable people to move from place to place safely and efficiently.

**Table 2.1: Assets covered by this Plan**

Assets Categories	Quantity
Bridges – Concrete	23
Bridges – Timber	42
Bridges – Steel	1
Bridges – Culverts	63
Bridges – Composite	8
Pedestrian Bridges	40
<b>TOTAL</b>	<b>177</b>

Key stakeholders in the preparation and implementation of this asset management plan are shown in Table 2.1.1.

**Table 2.1.1: Key Stakeholders in the AM Plan**

Key Stakeholder	Role in Asset Management Plan
Councillors	<ul style="list-style-type: none"> <li>• Represent needs of the community,</li> <li>• Allocate resources to meet the organisation's objectives in providing services while managing risks,</li> <li>• Ensure the organisation is financially sustainable.</li> </ul>

<sup>1</sup> IPWEA, 2015, Sec 4.2, Example of an Asset Management Plan Structure, pp 4|21 – 33.



Key Stakeholder	Role in Asset Management Plan
	<ul style="list-style-type: none"> <li>• Provide stewardship by ensuring the protection of assets for current and future generations.</li> </ul>
General Manager	<ul style="list-style-type: none"> <li>• Ensure the development and implementation of Council's Asset Management Policy, Plans and Processes and for their integration with Council's Integrated Planning and Reporting Framework under the Local Government Act.</li> <li>• Report on the status and effectiveness of Asset Management within Council.</li> </ul>
Council Staff	<ul style="list-style-type: none"> <li>• Development and implementation of Council's Asset Management Plans and Processes and for their integration with Council's Integrated Planning and Reporting Framework under the Local Government Act.</li> <li>• Ensure integration and compliance of the Asset Management Policy and Strategy with other policies and business processes of Council.</li> <li>• Ensure compliance with legal obligations.</li> <li>• Ensure sound business principles are reflected in the Asset Management strategies and plans that are developed.</li> <li>• Implementation of activities in the Plans.</li> <li>• Engage up to date technologies, methodologies and continuous improvement processes.</li> <li>• Facilitate "Best Appropriate Practice in Asset Management".</li> </ul>
Community	<ul style="list-style-type: none"> <li>• Provides input into the services required and the cost the community is prepared to pay</li> <li>• Set expectation levels</li> </ul>

## 2.2 Goals and Objectives of Asset Management

Council exists to provide services to its community. Some of these services are provided by infrastructure assets. We have acquired infrastructure assets by 'purchase', by contract, construction by Council staff and by donation of assets constructed by developers and others to meet increased levels of service.

Our goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Having a long-term financial plan which identifies required, affordable expenditure and how it will be financed.<sup>2</sup>

## 2.3 Plan Framework

Key elements of the plan are:

- **Section 3** - Levels of service – specifies the services and levels of service to be provided by Council;

<sup>2</sup> Based on IPWEA, 2015, IIMM, Sec 1.2.2 p 1|7.

- **Section 4** - Future demand – how this will impact on future service delivery and how this is to be met;
- **Section 5** - Life cycle management – how Council will manage its existing and future assets to provide defined levels of service;
- **Section 6** - Financial summary – what funds are required to provide the defined services;
- **Section 7** - Asset management practices;
- **Section 8** - Monitoring – how the plan will be monitored to ensure it is meeting Council’s objectives;
- **Section 9** - Asset management improvement plan.

A road map for preparing an asset management plan is shown below:

**Road Map for preparing an Asset Management Plan**

Source: IPWEA, 2015, IIMM, Fig 4.2.2, p 4126.



**2.4 Core and Advanced Asset Management**

This asset management plan is prepared as a ‘core’ asset management plan over a 10 year planning period in accordance with the International Infrastructure Management Manual<sup>3</sup>. It is

<sup>3</sup> IPWEA, 2015, IIMM.

prepared to meet minimum legislative and Council requirements for sustainable service delivery and long term financial planning and reporting. Core asset management is a ‘top down’ approach where analysis is applied at the ‘system’ or ‘network’ level. Future revisions of this asset management plan will move towards ‘advanced’ asset management using a ‘bottom up’ approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels.

**2.5 Community Consultation**

In preparing this ‘core’ asset management plan, community consultation may be received through initial feedback of the AMP’s once on public exhibition. Exhibition will occur prior to Council adoption of the plans. Future revisions of the asset management plan will incorporate community consultation on service levels specific to the asset class and costs of providing the service. This will assist the Council and the community in matching the level of service needed by the community, service risks and consequences with the community’s ability and willingness to pay for the service.

**3. LEVELS OF SERVICE**

**3.1 Customer Research and Expectations**

Cessnock Council has engaged Micromex Research to undertake community research. In 2016 a telephone survey poll sample of residents on their level of satisfaction with the Council’s services, and of the Road Network which includes Bridges and Major Culverts identified the following satisfaction levels were reported:

**Table 3.1: Community Satisfaction Survey Levels**

Performance Measure	Satisfaction Level				
	Very Satisfied	Fairly Satisfied	Satisfied	Somewhat satisfied	Not satisfied
Developing and maintaining the road network					
Regulating Traffic flow					

Council also engaged Micromex Research in March of 2015 to undertake further Community Consultation. This was to determine what the community finds as an acceptable condition state of the assets. The concluding evidence from this survey found: *“The majority of residents indicated that ‘Condition 3 or better’ was the acceptable condition for all assets”*. This has therefore been incorporated into “scenario 3” modelling within this AMP.

**3.2 Strategic and Corporate Goals**

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

Our vision is:

***“Cessnock will be a cohesive and welcoming community living in an attractive and sustainable rural environment with diversity of business and employment***

**opportunities supported by accessible infrastructure and services which effectively meet community needs”.**

In summary, the vision is:

**“Cessnock - thriving, attractive and welcoming”.**

The 2017-21 Delivery Program has five Desired Outcomes as identified in the Community Strategic Plan, Cessnock 2027.

They are:

- 1. A connected, safe and creative community;**
- 2. A sustainable and prosperous economy;**
- 3. A sustainable and healthy environment;**
- 4. Accessible infrastructure, services and facilities;**
- 5. Civic leadership and effective governance.**

Relevant organisational goals and objectives and how these are addressed in this asset management plan are:

**Table 3.2: Organisational Goals and how these are addressed in this Plan**

Goal	Objective	How Goal and Objectives are addressed in AM Plan
<b>Accessible infrastructure, services and facilities</b>		
Objective 4.1 – Better Transport Links	4.1.2 – Commence implementation of the Traffic & Transport Strategy.	Council’s Asset Management Plan informs Bridge Renewal and Upgrade Programs.
	4.1.3 - Commence implementation of the Pedestrian Access & Mobility Plan.	Council’s Asset Management Plan informs Bridge Renewal and Upgrade Programs.
	4.1.4 - Commence implementation of the Cycling Strategy.	Council’s Asset Management Plan informs Bridge Renewal and Upgrade Programs.
	4.1.8 – Adopt the City Wide Section 94 Contributions Plan.	S94 Contribution plans used to develop information for section 4 of this AMP.
Objective 4.2 - Improving the Road Network	4.2.1 Develop prioritised capital works programs in line with adopted asset management plans.	Council’s Asset Management Plan informs Bridge Renewal and Upgrade Programs.
	4.2.2.c – Advocate for and support applications for grant funding to improve road infrastructure.	The AMP informs future budget cycles and assists with grant submissions

Council will exercise its duty of care to ensure public safety in accordance with the infrastructure risk management plan prepared in conjunction with this Asset Management Plan. Management of infrastructure risks is covered in Section 5.2.

### **3.3 Legislative Requirements**

Council has to meet many legislative requirements including Australian and State legislation and State regulations. These include:

Legislation	Requirement
Local Government Act 1993	<p>Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.</p> <p>The purposes of this Act are as follows:</p> <p>(a) to provide the legal framework for an effective, efficient, environmentally responsible and open system of local government in New South Wales,</p> <p>(b) to regulate the relationships between the people and bodies comprising the system of local government in New South Wales,</p> <p>(c) to encourage and assist the effective participation of local communities in the affairs of local government,</p> <p>(d) to give councils:</p> <ul style="list-style-type: none"> <li>• the ability to provide goods, services and facilities, and to carry out activities, appropriate to the current and future needs of local communities and of the wider public;</li> <li>• the responsibility for administering some regulatory systems under this Act;</li> <li>• a role in the management, improvement and development of the resources of their areas.</li> </ul> <p>(e) to require councils, councillors and council employees to have regard to the principles of ecologically sustainable development in carrying out their responsibilities.</p>
Local Government Act Annual Report Section 428(2)(d)	<p>(d) A report of the condition of the public works (including public buildings, public road and water sewerage and drainage works) under the control of council as at the end of that year; together with</p> <p>(i) An estimate (at current values) of the amount of money required to bring the works up to a satisfactory standard; and</p> <p>(ii) An estimate (at current values) of the annual expense of maintain the works at that standard; and</p> <p>(iii) The Council's programme for maintenance for that year in respect of the works.</p>
Public Works Act 1912	Sets out the role of Council in the planning and construction of new assets.
Environmental Planning and Assessment Act 1979	An Act to institute a system of environmental planning and assessment for the State of New South Wales. Among other requirements the Act outlines the requirement for the preparation of Local Environmental Plans (LEP), Development Control Plans (DCP), Environmental Impact Assessments (EIA) and Environmental Impact Statements.
Work Health and Safety Regulations 2011	These Regulations implement the model Work Health and Safety Regulations in the Commonwealth jurisdiction and form part of a system of nationally harmonised occupational health and safety laws. The Regulations apply to the Commonwealth, public authorities and, for a transitional period, non-Commonwealth licensees. Some of the various chapters which are covered include: Chapter 2 covers representation and participation, including persons responsible for workplace health and safety. Chapter 3 covers general risks and

Legislation	Requirement
	workplace management. Chapter 4 covers hazardous work; this includes job specific tasks such as management of noise, manual handling, working at heights, confined spaces, demolition, electrical work and diving. Chapter 5 plant and structures and Chapter 6 Construction work.
Work Health and Safety Act 2011	The main object of this Act is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces.
Threatened Species Conservation Act 1995	An Act to conserve threatened species, populations and ecological communities of animals and plants.
Protection of the Environment Operations Act 1997	Council is required to exercise due diligence to avoid environmental impact and among others are required to develop operations emergency plans and due diligence plans to ensure that procedures are in place to prevent or minimise pollution.
Road Transport (Safety and Traffic Management) Act 1999	Facilitates the adoption of nationally consistent road rules in NSW, the Australian Road Rules. It also makes provision for safety and traffic management on roads and road related areas including alcohol and other drug use, speeding and other dangerous driving, traffic control devices and vehicle safety accidents.
Road Transport (General) Act 2005	Provides for the administration and enforcement of road transport legislation. It provides for the review of decisions made under road transport legislation. It makes provision for the use of vehicles on roads and road related areas and also with respect to written off and wrecked vehicles.
Roads Act 1993	Sets out rights of members of the public to pass along public roads, establishes procedures for opening and closing a public road, and provides for the classification of roads. It also provides for declaration of the RMS and other public authorities as roads authorities for both classified and unclassified roads, and confers certain functions (in particular, the function of carrying out roadwork) on the RMS and other roads authorities. Finally it provides for distribution of functions conferred by this Act between the RMS and other roads authorities, and regulates the carrying out of various activities on public roads.
Disability Discrimination Act 1992	The objects of this Act are: (a) to eliminate, as far as possible, discrimination against persons on the ground of disability in the areas of: (i) work, accommodation, education, access to premises, clubs and sport; and (ii) the provision of goods, facilities, services and land; and (iii) existing laws; and (iv) the administration of Commonwealth laws and programs; and (b) to ensure, as far as practicable, that persons with disabilities have the same rights to equality before the law as the rest of the community; and (c) to promote recognition and acceptance within the community of the principle that persons with disabilities have the same fundamental rights as the rest of the community.
Native Vegetation Act 2003	This Act regulates the clearing of native vegetation on all land in

Legislation	Requirement
	NSW, except for excluded land listed in Schedule 1 of the Act. The Act outlines what landowners can and cannot do in clearing native vegetation.
Local Government (Highways) Act 1982	An Act to consolidate with amendments certain enactments concerning the functions of the corporations of municipalities with respect to highways and certain other ways and places open to the public.
AS 1742	Australian Standard 1742 which refers to a variety of road and traffic issues.
NSW Road Rules 2008	A provision of road rules that are based on the Australian Road Rules so as to ensure that the road rules applicable in this State are substantially uniform with road rules applicable elsewhere in Australia.
Road and Rail Transport (Dangerous Goods) 1997 No 113	The purpose of this Act is to regulate the transport of dangerous goods by road and rail in order to promote public safety and protect property and the environment.
NSW Government Flood Prone Land Policy – Floodplain Development Manual	Council's obligations in relation to the management of flood liable land in accordance with Section 733 of the Local Government Act, 1993.

Council will exercise its duty of care to ensure public safety in accordance with the infrastructure risk management plan linked to this AM Plan. Management of risks is discussed in Section 5.2.

### 3.4 Community Levels of Service

Service levels can be defined in two terms - community levels of service and technical levels of service.

Community Levels of Service measure how the community receives the service and whether Council is providing community value.

Community levels of service measures used in the Asset Management Plan are:

- **Quality** *How good is the service?*
- **Function** *Does it meet users' needs?*
- **Capacity/Utilisation** *Is the service over or under used?*

The Council's current and expected community service levels are detailed in Tables 3.4 and 3.5. Table 3.4 shows the agreed expected community levels of service, which has been based on; Cessnock City Council 2027 Community Strategic Plan, resource levels in the current long-term financial plan, and community consultation/engagement undertaken to date. A detailed community consultation is yet to be undertaken on community service levels specific to each asset class, this will form part of the improvement plan for the next iteration of the AMP's.

**Table 3.4: Community Levels of Service**

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Desired Performance
<b>COMMUNITY LEVELS OF SERVICE</b>				
Quality	Well maintained bridge structures that are fit for purpose	Customer Survey  Condition Rating	Developing and maintaining the road network: 8% satisfaction level (6% very satisfied and 2% satisfied)  94% in condition 1,2,3	To Be Determined  100% in condition 1,2,3
Function	Transport Network is accessible	Customer Survey	Regulating Traffic flow: 30% satisfaction level (10% very satisfied and 20% satisfied)	Desired service standards to be developed after further community consultation.
Capacity / Utilisation	Meeting traffic capacity, and load requirements as well as rain events.	Customer service requests  Load Limits	5 Bridge and Major Culvert service requests were received in 2016  14 Bridge and Major Culverts have load limits	Desired service standards to be developed after further community consultation.  Desired service standards to be developed after further community consultation.

### 3.5 Technical Levels of Service

**Technical Levels of Service** - Supporting the community service levels are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that Council undertakes to best achieve the desired community outcomes and demonstrate effective organisational performance.

Technical service measures are linked to annual budgets covering:

- **Operations** – the regular activities to provide service such as opening hours, cleaning, mowing grass, energy, inspections, etc.;
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition (e.g. road patching, unsealed road grading, building and structure repairs);
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally (eg frequency and cost of road resurfacing and pavement reconstruction, pipeline replacement and building component replacement);



- **Upgrade** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).

Service and asset managers plan, implement and control technical service levels to influence the customer service levels<sup>4</sup>.

Table 3.5 shows the technical level of service expected to be provided under this Asset Management Plan.

**Table 3.5: Technical Levels of Service**

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Desired Performance
<b>TECHNICAL LEVELS OF SERVICE</b>				
Operations	Infrastructure meets user's needs	Defects inspections	Bridge and Culverts are inspected regularly on a reoccurring routine cycle	Bridge and Culverts are inspected regularly on a reoccurring routine cycle
Maintenance	Bridge and Culvert infrastructure is suitable for purpose	Maintenance service request completed within adopted time frames	5 Bridge and Major Culvert service requests were received in 2016	100% of repairs completed within 90 working days
Renewal	Bridge and Culvert infrastructure is suitable for purpose	Condition of Bridges and Culverts	At 2016 Bridges and Culverts in Poor and Very Poor Condition (Condition 4 and 5): 6%	Bridges and Culverts in Poor and Very Poor Condition (Condition 4 and 5): 5%
Upgrade/New	Bridge and Culvert infrastructure is meeting traffic capacity, and load requirements	Customer service requests	5 Bridge and Major Culvert service requests were received in 2016	To Be Determined
		Load Limits	14 Bridge and Major Culverts have load limits	To Be Determined

#### 4. FUTURE DEMAND

##### 4.1 Demand Drivers

Drivers affecting demand include population change, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

##### 4.2 Demand Forecast

The present position and projections for demand drivers that may impact future service delivery and utilisation of assets were identified and are documented in Table 4.3.

<sup>4</sup> IPWEA, 2011, IIMM, p 2.22

### 4.3 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and utilisation of assets are shown in Table 4.3.

**Table 4.3: Demand Drivers, Projections and Impact on Services**

Demand drivers	Present position	Projection	Impact on services
Population	50,840 as at the 2011 Census	The projected population for 2031 is 68,364 <sup>5</sup> (low scenario) and 101,9872 (high scenario)	Population growth will increase traffic volumes, and increase demand on transport infrastructure, such as bus & transport facilities, footpaths & cycle ways, improved road network, etc.
Demographics	Approximately 9% of the residents are from non-English speaking backgrounds	More migrants from non-English speaking Backgrounds are expected to settle in the Cessnock LGA	Better Traffic Management Devices are Required, and Clearer Signage
Demographics	Over 7% of the population need assistance in their day-to-day lives	Expect to see an increase in demand for services due to the ageing population	Increase in demand for DDA compliant Infrastructure, Services and Equitable Access
Climate Change	Scientific evidence supporting the notion of climate change.	Increase Severity of Weather events Temperature Rise Rise in Sea Level	Cessnock Bridge Infrastructure Assets will need to adapt to new climate risks to ensure appropriate infrastructure investment decisions are made to reduce long-term costs.
Residential Development	Increase in demand for residential land and infrastructure	Estimated Increase in population of between 9,090 (low scenario) and 25,520 (high scenario)	Increase in demand for maintenance of Bridge, footpaths and associated infrastructure assets. Potential upgrade of some bridges to meet increased traffic volumes and types.
Changes in Land use	Changes in land use will result from rezoning and higher density developments	As part of State Government policy higher density developments will be encouraged in the Hunter Valley Area. The current levels of growth (although small) are	Increased loading on existing infrastructure from development works (construction works can cause significant damage to existing infrastructure). Potential upgrade at some bridges to meet increased

<sup>5</sup> Source: Cessnock City Council, Community Planning Unit

Demand drivers	Present position	Projection	Impact on services
		anticipated to continue	traffic volumes & types.

#### 4.4 Demand Management Plan

Demand for new services 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. Non-asset solutions focus on providing the required service without the need for Council to own the assets and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures<sup>6</sup>. Examples of non-asset solutions include providing services from existing infrastructure such as aquatic centres and libraries that may be in another community area or public toilets provided in commercial premises. Opportunities identified to date for demand management are shown in Table 4.4. Further opportunities will be developed in future revisions of this asset management plan.

**Table 4.4: Demand Management Summary**

Demand Driver	Impact on Services	Demand Management Strategy
Community Engagement – Explore community demand for Transport Infrastructure Services	Community expectation may increase	Engage with the community to identify justifiable community needs from other expectations and consider only community needs consistent with Council's charter.
Optimised Delivery Program	Decrease maintenance and reduce the need for more expensive renewal	Study bridge condition rating from this plan and prioritise a list of bridges to be included in the annual renewal program. Investigate alternative treatments to lower life cycle costs e.g. concrete replacement of timber bridges, alternate maintenance and rehabilitation methods adopted for timber bridges.
New Land Divisions & Planning Proposals	Increased traffic	Implement enhanced quality control measures for donated assets. Review S94 and seek contributions towards future bridge upgrades or new as a result of development.
Capital Works	Potential decrease in maintenance	Schedule long-term capital works program. New projects will need to be assessed with a balance between competing demands for investment to renew existing assets, as well as providing expenditure for new assets to meet growing demand.

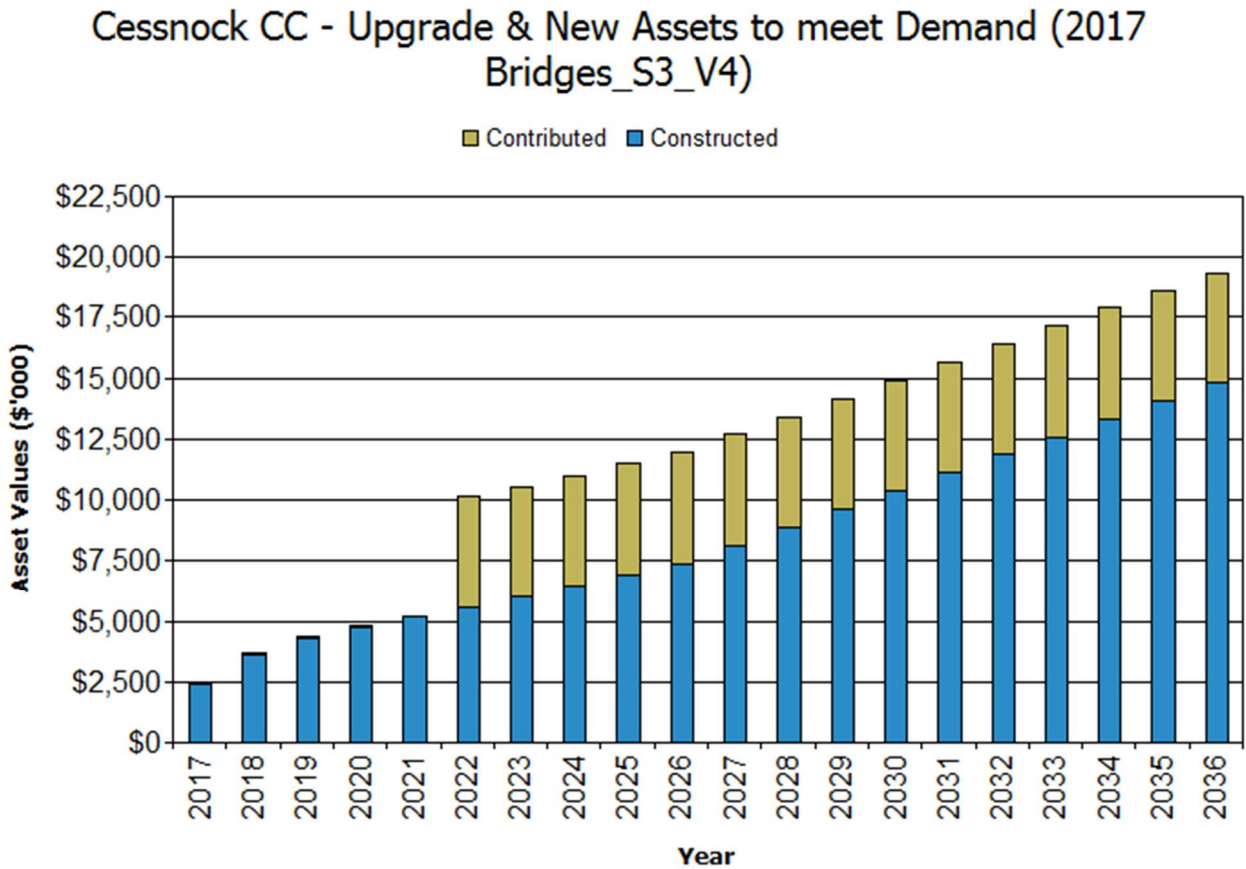
#### 4.5 Asset Programs to meet Demand

The new assets required to meet growth will be acquired free of up-front costs from land developments and constructed/acquired by Council. New assets constructed/acquired by Council

<sup>6</sup> IPWEA, 2011, IIMM, Table 3.4.1, p 3|58.

are discussed in Section 5.5. The cumulative value of new contributed and constructed asset values are summarised in Figure 1.

**Figure 1: Upgrade and New Assets to meet Demand**



The year 2022 shows an increase due to the contributed assets from the development at Huntlee. Acquiring these new assets will commit the Council to fund ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs in Section 5.

**5. LIFECYCLE MANAGEMENT PLAN**

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

**5.1 Background Data**

**5.1.1 Physical parameters**

The assets covered by this asset management plan are shown in Table 2.1. The age profile of the assets included in this AM Plan is shown in Figure 2.

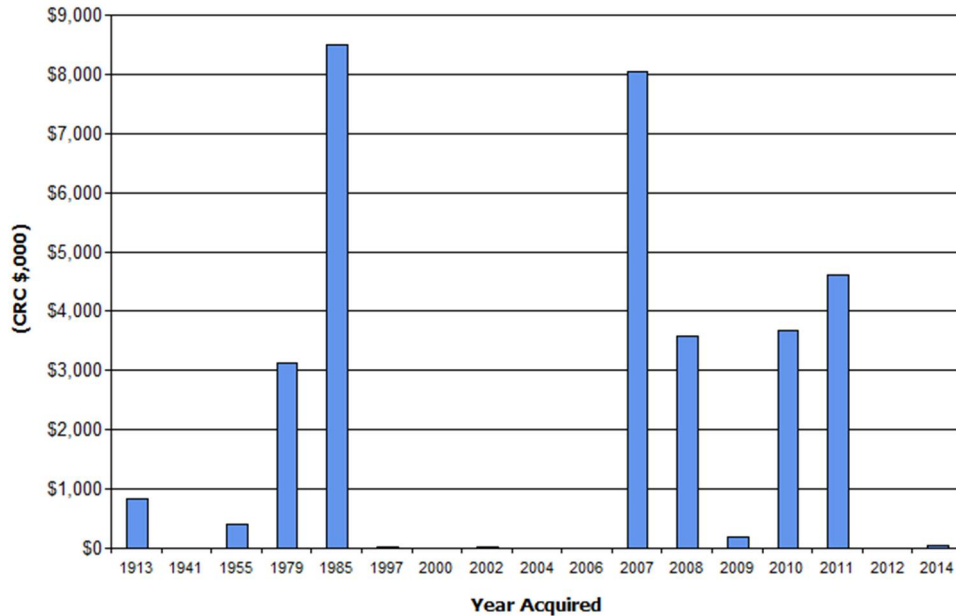
**Table 2.1: Assets covered by this Plan**

Assets Categories	Quantity
-------------------	----------

Bridges – Concrete	23
Bridges – Timber	42
Bridges – Steel	1
Bridges – Culverts	63
Bridges – Composite	8
Pedestrian Bridges	40
<b>TOTAL</b>	<b>177</b>

**Figure 2: Bridge Asset Age Profile<sup>7</sup>**

**Cessnock CC - Age Profile (Bridges\_S1\_V1)**



**5.1.2 Asset capacity and performance**

Council’s services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance (as of 30 June 2016) are known are detailed in Table 5.1.2.

**Table 5.1.2: Known Service Performance Deficiencies**

Location	Service Deficiency
Watagan Creek Bridge #1, Watagan Creek Road, Laguna	20 Tonne Load Limit.
Anvil Creek Bridge, Nelson Street, Greta	20 Tonne Load Limit.
Stockyard Creek Bridge, Stockyard Creek Road, Paynes Crossing	20 Tonne Load Limit.
Milsons Arm Bridge, Milsons Arm Road, Laguna	15 Tonne Load Limit.
Williams Bridge, Paynes Crossing Road, Wollombi	5 Tonne Load Limit. Currently closed for renewal.

<sup>7</sup> Age of bridges and major culverts estimated from historical data.

Abbotsford Bridge, Abbotsford Street, Bellbird	5 Tonne Load Limit.
Paynes Crossing Bridge, Paynes Crossing Road, Paynes Crossing	6 Tonne Load Limit.
Fosters bridge, Sandy Creek Road, Quorrobolong	20 Tonne Load Limit.
Gillies Bridge, Wilderness Road, Rothbury	15 Tonne Load Limit.
Frame Drive Bridge, Frame Drive, Abermain	Currently closed to traffic.
Lomas Lane Bridge, Lomas Lane, Nulkaba	12 Tonne Load Limit and floods in minor storm events <1 in one year
Duffie Drive Culvert, Duffie Drive, Aberdare	25 Tonne Load Limit.
Boundary Street Culvert, Boundary Street, Kurri Kurri	3 Tonne Load Limit.
Neath Road Culvert, Neath Road, Kearsley	5 Tonne Load Limit.

The above service deficiencies were identified from regular safety and technical inspections undertaken by Cessnock City Council engineers and qualified/ bridge maintenance staff.

The following bridge has a load restriction however it is not currently considered to be a service performance deficiency.

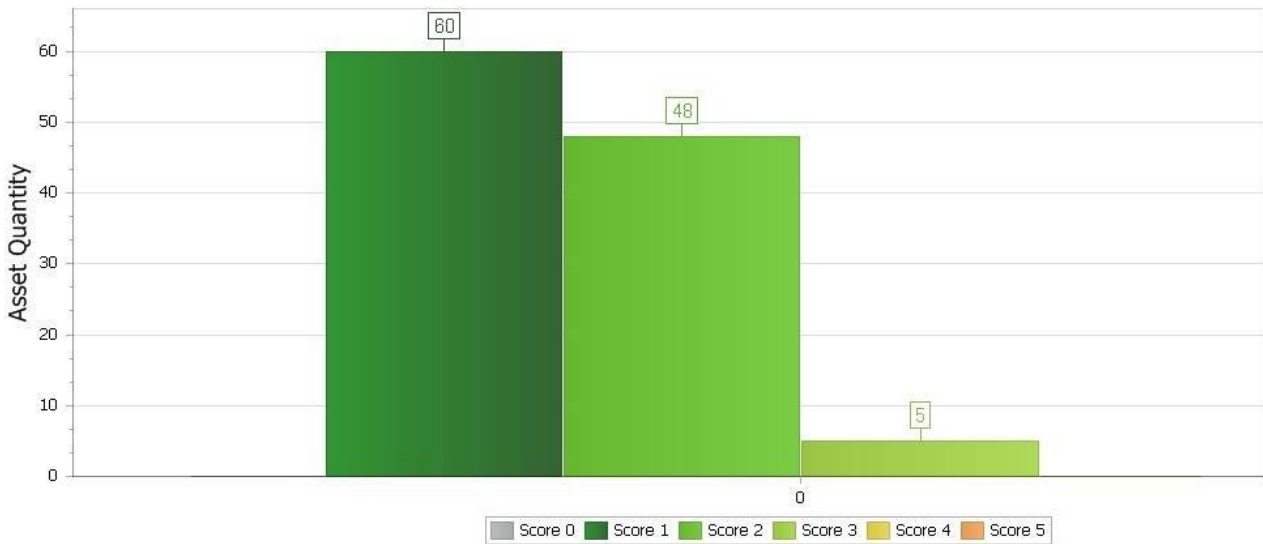
Location	Service Provided
Dairy Arm Bridge, Dairy Arm Road, Laguna	44 Tonne Load Limit. Not considered to be a performance deficiency

### 5.1.3 Asset condition

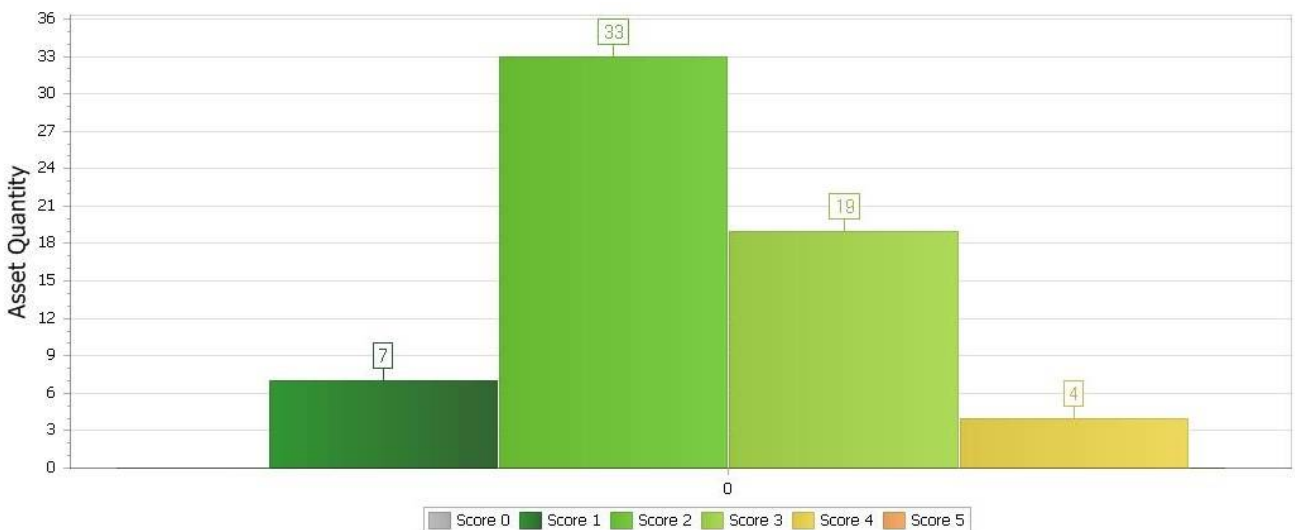
The condition profile of Council's bridge assets as at June 2015 is shown below in Figures 3<sup>8</sup> and 3a.

**Fig 3: Asset Condition Profile of Cessnock CC Bridge Network**

<sup>8</sup> Frame Drive Bridge has been removed for this graph.



**Fig 3a: Asset Condition Profile of Cessnock CC Culvert Network**



Condition is measured in both a BCN (Bridge Condition Number) and using a 1 – 4 grading system with the addition of condition state 0 to represent newly constructed assets, and end of life (EOL) for assets out of service/closed to the public, see table 5.1.3 below:

Cessnock City Council undertakes proactive inspections to determine the bridge asset conditions in accordance with the following:

- **Level 1 Inspections:** are carried out by qualified Council staff to identify obvious safety issues and defects. The information collected through these inspections forms the basis of the bridge maintenance program, which is carried out by Council's Bridge Maintenance Crew on an ongoing basis. Level 1 inspections occur approximately every 6-8 weeks for Timber Bridges.
- **Level 2 inspections:** are also carried out by qualified Council staff and are condition rating inspections carried out in accordance with the RTA Bridge Inspection Procedure. Level 2

inspections occur every 12 months for timber bridges and every 24 months for Concrete, Steel and Composite Bridges. The information gained from the level 2 inspections is used in Council’s asset management system to calculate a Bridge Condition Number (BCN). The BCN is a weighted calculation which includes an average condition score for all components (sub structure (weighted by 8.75), super structure (weighted by 8.75), rails (weighted by 3.75), and surface (weighted by 3.75) of the bridge to give an overall condition number. The lower the number the worse condition of the bridge. In cases where the Level 2 inspection indicates that there are a number of defects and/or more serious issues with the bridge structure a Level 3 inspection is requested.

- **Level 3 inspections:** are provided by external specialist bridge consulting engineers engaged, as required, to provide a more detailed assessment of the structural components of the bridge and to identify the need or otherwise for load limits to be imposed. The Level 3 assessments inform the bridge maintenance program (heavy maintenance) and the identification and prioritisation process for Council’s Bridge Construction Program.

CCC assesses bridge condition as a numerical value formed by a mathematical combination of a number of element condition states on a scale from 0 to 75. This scale is the Bridge Condition Number (BCN), and is used to develop the prioritisation of the renewal works program, and show trends over time of the health of the bridge network. The BCN is calculated using a formula derived from an average element condition of each component and weighted according to the critical nature of each component.

$$BCN = 100 - ((Sub-Structure \times 8.75) + (Super-Structure \times 8.75) + (Rails \times 3.75) + (Surface \times 3.75)).$$

With a systematic inspection regime in place, monitoring condition over time is a means of tracking the performance of an element and ultimately of the bridge. A worsening change in condition is a clear indicator of element deterioration. In addition, change in condition may be used to test and demonstrate the effectiveness of adopted maintenance repair strategies. Bridge element condition is a most useful input for identifying maintenance repair needs, particularly at the local level.

The 4 condition states used to determine elemental condition is defined in general terms in the table below. The condition of an element is not necessarily confined to one condition state. Bridge element condition is recorded as the quantity, or the percentage of the elements total quantity, in each of the four condition states, at the time of inspection.

**Table 5.1.3: Condition Grading Model using Bridge Condition Number (BCN) Interpretation**

Condition	BCN Range	Description
0	100	Newly Constructed, less than 12 months old.
1	62.51 - 75	The element is in good condition with little or no deterioration. Superficial cracks and discoloration may be present, but without effect on strength and/or serviceability
2	37.51 - 62.50	Minor decay, insect infestation, splitting, cracking, checking or crushing may exist but none is sufficiently advanced to affect serviceability
3	12.51 - 37.50	Medium decay, insect infestation, splitting, cracking, or crushing has produced loss of strength of the element but not of a sufficient magnitude to affect the serviceability of the bridge.



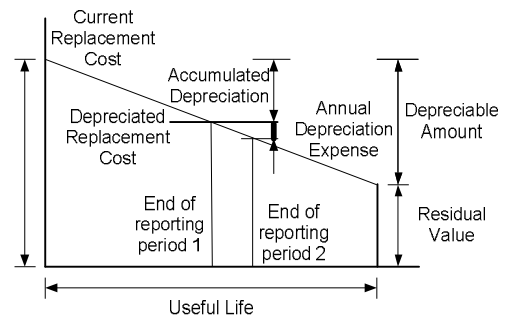
Condition	BCN Range	Description
4	0.1 - 12.50	Advanced deterioration. Heavy decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.
EOL		End of Life (EOL) asset has failed/no longer in use

The bridges with known service performance deficiencies are listed in Table 5.1.2. Council’s proposed 4-year-project capital renewal, replacement, and upgrade works program is provided in Appendix B.

**5.1.4 Asset valuations**

The value of assets recorded in the asset register as at 30 June 2016 covered by this Asset Management Plan is shown below. Assets were last revalued at 30 June 2015. Assets are valued using replacement cost method (based on unit rates and dimensions).

	(\$000)
Current Replacement Cost	\$38,300
Depreciable Amount	\$38,300
Depreciated Replacement Cost <sup>9</sup>	\$26,060
Annual Depreciation Expense	\$354



Useful lives were last reviewed in June 2015 by benchmarking CCC values against industry standards. The bridge asset category was revalued in 2014/15, key assumptions made in preparing the 2014/15 valuations were:

- Current condition of assets is based on an inspection regime and numerical formula described in 5.1.3;
- The depreciation matrix has been assumed to be straight line condition based throughout all bridge and culvert assets in the network.

Major changes from previous valuations are due to:

- Revised unit rates for various bridge types
- Additional found assets
- Reviewed and updated useful life’s of all assets

Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time.

Rate of Annual Asset Consumption (Annual depreciation exp/Depreciable amount)	0.9%
Rate of Annual Asset Renewal (Capital renewal exp/Depreciable amount)	6.1%
Rate of Annual Asset Upgrade/New	6.3%

<sup>9</sup> Also reported as Written Down Current Replacement Cost (WDCRC).

(Capital upgrade exp/Depreciable amount)

In 2017 Council plans to renew assets at 662.4% of the rate they are being consumed and will be increasing its asset stock by 6.4% in the year.

**5.1.5 Historical Data**

**Table 5.1.5.1: Expenditure for Bridges**

	2012	2013	2014	2015	2016
Maintenance	\$396,657.00	\$646,716.00	\$712,231.00	\$769,963.00	\$562,389.00
Capital Renewal	\$1,261,414.00	\$3,269.00	\$914,074.00	\$1,729,104.00	\$2,053,633.00

**5.2 Infrastructure Risk Management Plan**

An assessment of risks associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a ‘financial shock’ to Council. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

Critical risks, being those assessed as ‘Very High’ - requiring immediate corrective action and ‘High’ – requiring prioritised corrective action identified in the Infrastructure Risk Management Plan, together with the estimated residual risk after the selected treatment plan is operational are summarised in Table 5.2. These risks are reported to management and Council.

**Table 5.2: Critical Risks and Treatment Plans**

Service or Asset at Risk	What can Happen	Risk Rating (VH & H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Bridge/Culvert	Deterioration of a structural member from poor quality, age or inadequate maintenance could result in bridge being non-trafficable, closed or collapsing and a disruption to the traffic flow	H	Regular inspections & maintenance as identified from level 2 & 3 inspections. Level 3 inspection, including load capacity rating, implementation of load ratings where required. New construction is assessed by competent engineer. Upgrade of bridges consistent with community demand and available funding.	H	TBA
Bridge/Culvert	Vandalism resulting in the use of unbudgeted maintenance money to be spent to rectify the issue	L	Regular Maintenance	L	TBA
Bridge/Culvert	Structural damage from	H	Regular inspections,	H	TBA

Service or Asset at Risk	What can Happen	Risk Rating (VH & H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
	oversize/overmass vehicles due to non-compliance of existing controls		installation of dimension restriction structure		
Bridge/Culvert	Subsidence on approaches resulting in sharp bump on approach to bridge	L	Regular inspections, and customer requests	L	TBA
Bridge/Culvert	Narrow traffic lanes or inadequate safety rails on bridge could cause collision with cars or pedestrians	M	Regular inspections, and maintenance	M	TBA
Bridge/Culvert	Blocked drainage on surface can result in ponding of water on the bridge	M	Regular inspections, and maintenance	M	TBA
Bridge/Culvert	Flood damage from trees blocking the waterway	L	Regular inspections, and maintenance	L	TBA
Bridge/Culvert	Guardrail missing or damaged resulting in a safety hazard due to no clear path of travel	M	Regular inspections, and maintenance	M	TBA
Bridge/Culvert	Inadequate design could result in an accident on the bridge	M	Regular inspections, new construction are assessed by competent engineer.	M	TBA

Note \* The residual risk is the risk remaining after the selected risk treatment plan is operational.

### 5.3 Routine Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety and amenity, e.g. cleaning, street sweeping, grass mowing and street lighting.

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

#### 5.3.1 Operations and Maintenance Plan

**Operational** activities affect service levels including quality and function through frequency (e.g. street sweeping, and grass mowing), intensity (e.g. spacing of street lights) and opening hours (of building and other facilities).

**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, e.g. road patching but excluding rehabilitation or renewal. Maintenance may be classified into reactive and planned maintenance.

**Reactive Maintenance** is unplanned repair work carried out in response to service requests and management/supervisory directions.

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

Actual past maintenance expenditure is shown in Table 5.3.1.

**Table 5.3.1: Maintenance Expenditure Trends**

Maintenance Activity	2012	2013	2014	2015	2016
Maintenance	\$396,657.00	\$646,716.00	\$712,231.00	\$769,963.00	\$562,389.00

**Required Maintenance** is considered to be the amount of funding originally budgeted for in the adopted Long Term Financial Plan, this is reviewed annually. Future iterations of this AMP will further define the required maintenance.

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences have been identified and highlighted in this AM Plan.

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

**5.3.2 Operations and Maintenance Strategies**

Council will operate and maintain assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner;
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50 – 70% planned desirable as measured by cost);
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council;
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs;
- Review asset utilisation to identify underutilised assets and appropriate remedies, and over utilised assets and customer demand management options;

- Maintain a current hierarchy of critical assets and required operations and maintenance activities;
- Develop and regularly review appropriate emergency response capability;
- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

**Asset hierarchy**

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery. Council’s service hierarchy is shown in Tables 5.3.2 and 5.3.3.

**Table 5.3.2: Asset Service Hierarchy**

Service Hierarchy	Service Level Objective
Bridge on Regional Roads (Urban & Rural)	High level of management required due to the high importance of the structure. Regional Roads are a category of Council controlled road, agreed with Roads and Maritime Services (RMS) for road administration purposes. Regional Roads perform an intermediate function between the main arterial network of RMS controlled State Roads and the network of local access and circulation roads controlled by Council.
Bridge on Local Urban Road	Reasonable level of management required due to the medium importance of the structure. For movement of cars and trucks in urban areas, from higher hierarchies for access to residences or businesses within the LGA.
Bridge on Local Rural Road	Standard level of management required due to the lower importance of the structure. For movement of cars and trucks in rural areas, from higher hierarchies for access to residences or businesses within the LGA.

**Critical Assets**

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, organisations can target and refine investigative activities, maintenance plans and capital expenditure plans at the appropriate time.

Operations and maintenance activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc. For this iteration critical assets have been defined as being those which have no available detour or a detour which is greater than 50km. Future revisions of this AMP will further define critical assets and include a critical assets management plan. Critical assets failure modes and required operations and maintenance activities are detailed in Table 5.3.2.1.

**Table 5.3.2.1: Critical Assets and Service Level Objectives**

Critical Assets	Critical Failure Mode	Operations & Maintenance Activities
Williams Bridge	Structural failure or deteriorated condition of asset affecting the use/ availability/capacity/function of the asset	Regular inspections and early intervention/identification of major renewal items.
Paynes Crossing		
Thompsons Bridge		
Cedar Creek		
Stockyard Creek		
Yango Creek		
Milsons Arm		
Watagan Creek 1		
Watagan Creek 3		
Watagan Creek 4		
Dairy Arm		
Hunter Lodge		
Murrays Run 2		
Thursby's Bridge		
Burgesses Bridge		
Dog Hole Rd Bridge		
Watagan Creek Arch		
Vermont		
Stockyard Creek 2		
Culvert Tunnel Road		
Culvert Congewai Road		
Culvert #1 Wollombi Rd		
Culvert #2 Wollombi Rd		
Culvert #3 Wollombi Rd		
Culvert #4 Wollombi Rd		
Culvert Lynchs Gully		
Culvert #2 Broke Road		
Culvert #3 Broke Road		
Culvert #1 Great North Road		
Culvert #2 Great North Road		
Culvert Kent Street		
Culvert York Street		
Cunneens (2010)		
Culvert Thompsons	Structural failure or deteriorated condition of asset affecting the	Regular inspections and early intervention/identification of major
Sweetmans Creek		

Critical Assets	Critical Failure Mode	Operations & Maintenance Activities
Slacks Creek	use/ availability/capacity/function of the asset	renewal items.
Narone Creek		
Culvert DeBeyers Road		
Culvert Murrays Run 1		
Culvert Lowes Bridge		
Crawfords Bridge		

**Standards and specifications**

Bridge maintenance work is carried out in accordance with the Standards and Specifications detailed in Table 5.3.3.2.

**Table 5.3.2.2: Renewal Standards & Specifications**

Standards / Specifications	Purpose
Australian Standard 5100.1 – 2004 – Bridge Design Scope and General Principles	The objectives of AS 5100 are to provide nationally acceptable requirements for— (a) the design of road, rail, pedestrian and bicycle-path bridges; (b) the specific application of concrete, steel and composite steel/concrete construction which embody principles that may be applied to other materials in association with relevant Standards; and (c) the assessment of the load capacity of existing bridges.
Australian Standard 5100.2—2004vAP-G15.2/04 Bridge Design; Part 2 Design Loads (Incorporating Amendment No.1)	This Standard sets out minimum design loads, forces and load effect for road, railway, pedestrian and bicycle bridges, and other associated structures.
Australian Standard 5100.3: Bridge Design - Foundations and Soil Supporting	This Standard sets out minimum design requirements for foundations and soil support.
Australian Standard 5100.4: Bridge Design - Bearings and Deck Joints	This Standard sets out minimum design requirements for bearings and deck joints.
Australian Standard 5100.5: Bridge Design - Concrete	This Standard sets out minimum design requirements for bearings and deck joints.
Australian Standard 5100.6: Bridge Design - Steel and Composite Construction	This Standard sets out minimum design requirements for steel and composite bridges.
Australian Standard 5100.7: Bridge Design - Rating of Existing Bridges	This Standard sets out minimum requirements for rating of existing bridges.
Austrroads, Australian Bridge Design Code	Guide to designing bridges in accordance with As 5100.
Australian Standard 1170 Minimum design loads on structures (SAA Loading Code)	Sets out the minimum design loads for structures.
Australian Standard 1684 National Timber Framing Code	This Standard sets out minimum requirements for timber.
Australian Standard 3600 - Concrete structures	This Standard sets out minimum requirements for concrete structures.

Standards / Specifications	Purpose
Australian Standard 4100 - Steel structures	This Standard sets out minimum requirements for steel structures.
Australian Rainfall and Runoff	A national guideline document for the estimation of flood flows in Australia.
Aust Roads R252/04 – Guidelines for Bridge Management	Provides guidelines for Bridge Management practices.
Aust Roads G68/01 – Guide to Heritage Bridge Management	Provides guidelines for management of Heritage Bridges.
Aust Roads AP-23 – A Guide to Hydraulic Design of Bridges, Culverts & Floodways	Provides a Guide to Hydraulic Design of Bridges, Culverts & Floodways.
Aust Roads Guide To Traffic Engineering	Seeks to capture the contemporary traffic management practice of member organisations, including emerging techniques and technologies, and also relevant international experience. It provides valuable guidance to practitioners in the implementation of efficient, safe and economical management of road traffic.
Local Roads Bridge Management Manual – Guidelines to Good Practice	Provides guidelines for Bridge Management practices.
AS 3610 - Formwork for Concrete	This Standard sets out minimum requirements for undertaking concrete form works.
AS 4678 - Earth Retaining Structures	This Standard sets out minimum requirements for earth retaining structures.
Australian Accounting Standards.	<p>Sets out the financial reporting standards relating to infrastructure assets. Standards of particular relevance to Infrastructure Assets include:</p> <ul style="list-style-type: none"> <li>AASB 116 Property, Plant &amp; Equipment – prescribes requirements for recognition and depreciation of property, plant and equipment assets</li> <li>AASB 136 Impairment of Assets – aims to ensure that assets are carried at amounts that are not in excess of their recoverable amounts</li> <li>AASB 1021 Depreciation of Non-Current Assets – specifies how depreciation is to be calculated</li> <li>AAS 1001 Accounting Policies – specifies the policies that Council is to have for recognition of assets and depreciation</li> <li>AASB 1041 Accounting for the reduction of Non-Current Assets – specifies the frequency and basis of calculating depreciation and revaluation basis used for assets</li> <li>AAS 1015 Accounting for acquisition of assets – method of allocating the value to new assets on acquisition</li> </ul>

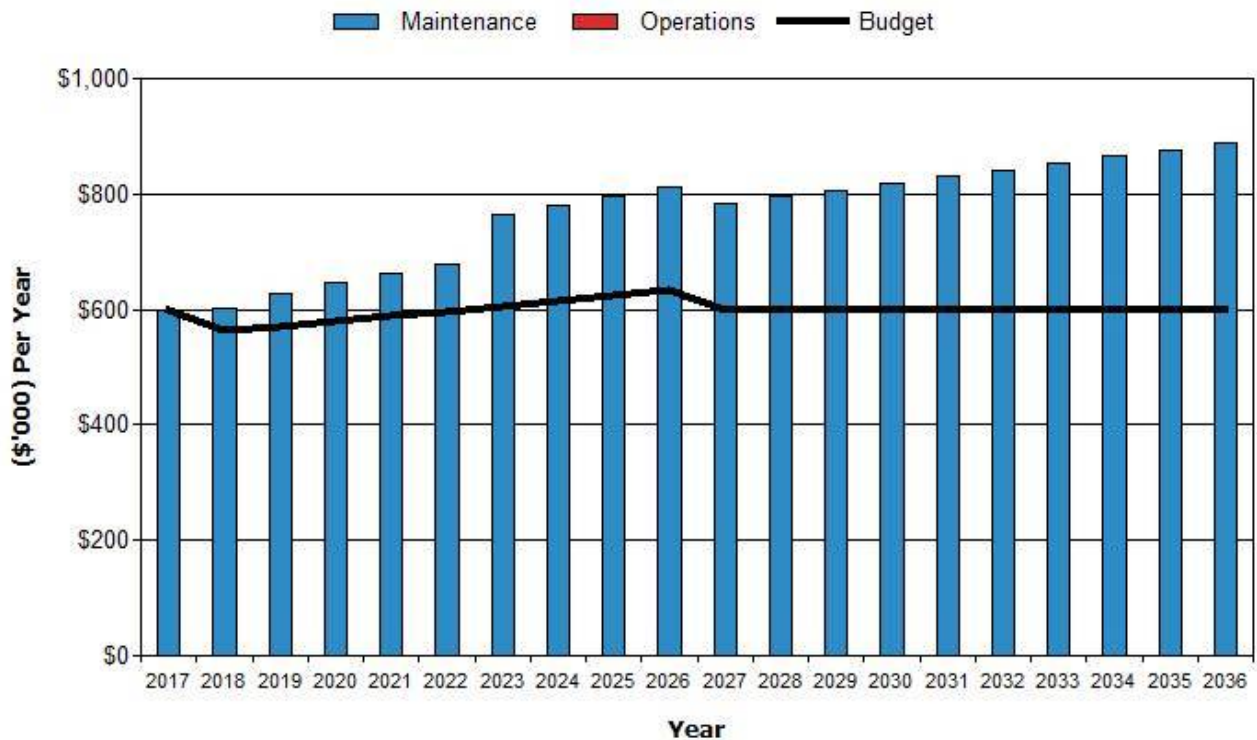
### 5.3.3 Summary of future operations and maintenance expenditures



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 dollar values (i.e. real values).

**Figure 4: Projected Operations and Maintenance Expenditure**

### Cessnock CC - Projected Operations & Maintenance Expenditure (2017 Bridges\_S3\_V4)



#### 5.4 Renewal/Replacement Plan

Renewal expenditure is major work which does not increase the asset’s design capacity but restores, rehabilitates, replaces or renews an existing asset to its original or lesser required service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

##### 5.4.1 Renewal plan

Assets requiring renewal/replacement are identified from one of three methods provided in the ‘Expenditure Template’.

- **Method 1** uses Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year, or
- **Method 2** uses capital renewal expenditure projections from external condition modelling systems (my predictor, level 3 inspections), or
- **Method 3** uses a combination of average *network renewals* plus *defect repairs* in the *Renewal Plan* and *Defect Repair Plan* worksheets on the ‘Expenditure template’.

**Methods 2 & 3 are both used for this Asset Management Plan.**

The useful lives of bridge and major culvert assets used to develop the projected asset renewal expenditures are shown in Table 5.4.1. Asset useful lives were last reviewed on 30<sup>th</sup> June 2015. This is monitored annually but a full review is only undertaken in line with the revaluation cycle. For this asset category the next revaluation will be undertaken in 2019/20.

**Table 5.4.1: Useful Lives of Assets**

<b>Asset (Sub)Category</b>	<b>Useful Life (Yrs)</b>
Concrete Bridge Sub Structure	120
Concrete Bridge Super Structure	120
Steel Bridge Sub Structure	120
Steel Bridge Super Structure	120
Timber Bridge Sub Structure	120
Timber Bridge Super Structure	120
Culvert	120

### **Renewal Standards**

Renewal work is carried out in accordance with the Standards and Specifications identified in Table 5.3.2.2 above.

### **5.4.2 Renewal and Replacement Strategies**

Council will plan capital renewal and replacement projects to meet level of service objectives and minimise infrastructure service risks by:

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
  - the service delivery 'deficiency', present risk and optimum time for renewal/replacement;
  - the project objectives to rectify the deficiency;
  - the range of options, estimated capital and life cycle costs for each option that could address the service deficiency;
  - and evaluate the options against evaluation criteria adopted by Council; and
  - select the best option to be included in capital renewal programs;
- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible;
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council;
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs;
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required;
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

**Renewal ranking criteria**

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. roughness of a road).<sup>10</sup>

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

- Have a high consequence of failure,
- Have a high utilisation and subsequent impact on users would be greatest,
- The total value represents the greatest net value to Council,
- Have the highest average age relative to their expected lives,
- Are identified in the AM Plan as key cost factors,
- Have high operational or maintenance costs, and
- Where replacement with modern equivalent assets would yield material savings.<sup>11</sup>

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 5.4.2.

**Table 5.4.2: Renewal and Replacement Priority Ranking Criteria**

<b>Criteria</b>	<b>Weighting</b>
Current Super Structure Condition	15%
Current Sub Structure Condition	15%
Financial Impact	5%
Importance to road network, industry and community for structure to provide continued service	30%
Grant Funding Approved	10%
Current Load Limit	25%
<b>Total</b>	<b>100%</b>

**5.4.3 Summary of future renewal and replacement expenditure**

Projected future renewal and replacement expenditures are forecast to increase over time as the asset stock increases from growth. Figures 5 & 5.1 below summarise future projected expenditure, Fig.5 utilising scenario 2 financial outlays (based on community desired condition state) and Fig 5.1 scenario 3 (LTFP outputs). Note that all amounts are shown in real values. The projected capital renewal and replacement program is shown in Appendix B.

**Fig 5: Projected Capital Renewal and Replacement Expenditure – Scenario 2**

<sup>10</sup> IPWEA, 2011, IIMM, Sec 3.4.4, p 3|60.

<sup>11</sup> Based on IPWEA, 2011, IIMM, Sec 3.4.5, p 3|66.

### Cessnock CC - Projected Capital Renewal Expenditure (2017 Bridges\_S2\_V4)

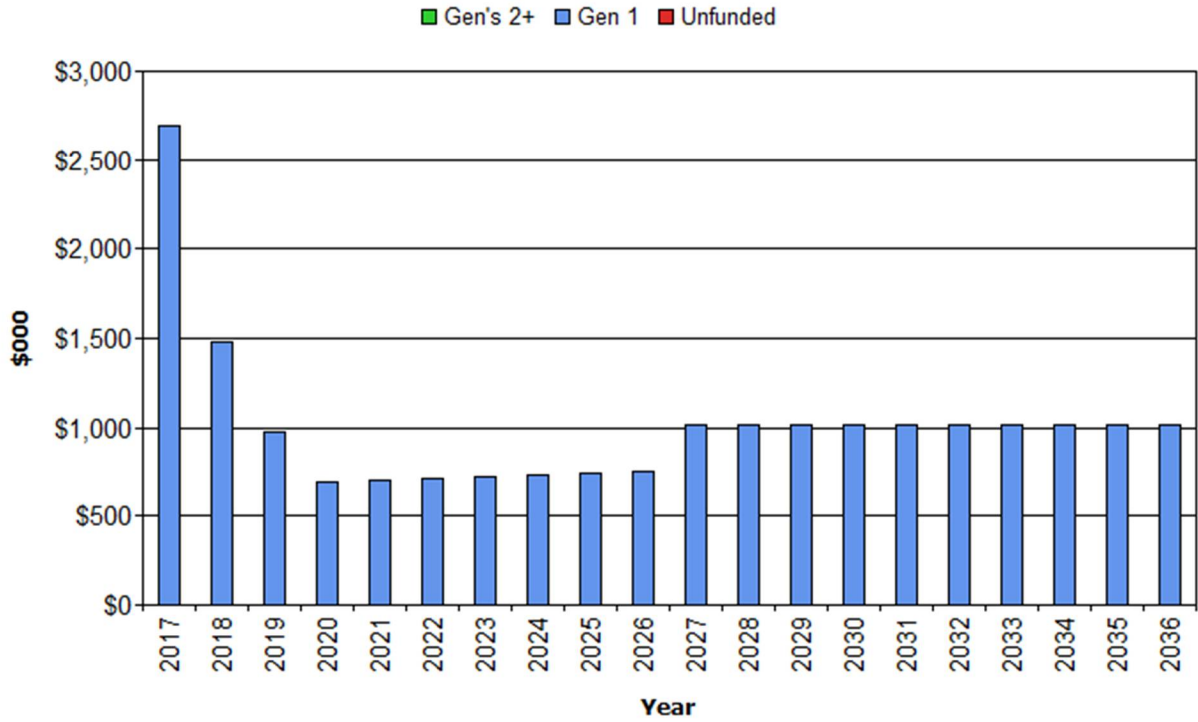
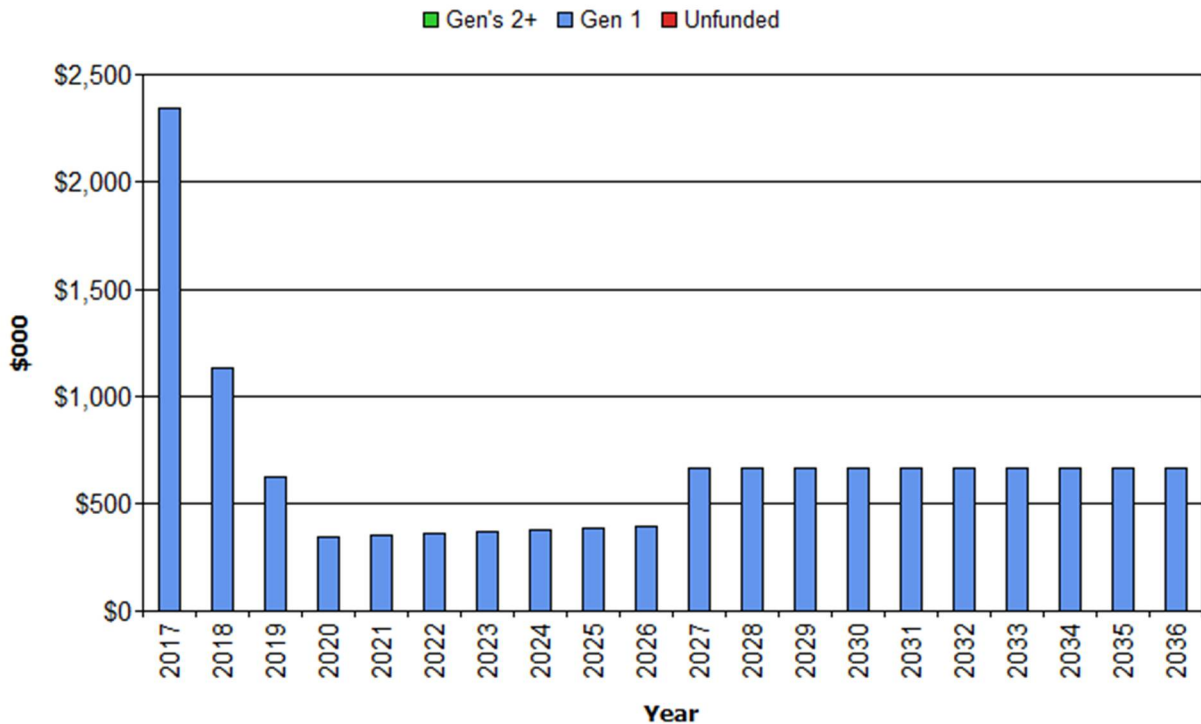


Fig 5.1: Projected Capital Renewal and Replacement Expenditure – Scenario 3

### Cessnock CC - Projected Capital Renewal Expenditure (2017 Bridges\_S3\_V4)



Renewals and replacement expenditure in Council’s capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2.

**5.5 Creation/Acquisition/Upgrade Plan**

New works are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost to Council from land development. These assets from growth are considered in Section 4.4.

**5.5.1 Selection criteria**

New assets and upgrade/expansion of existing assets are identified from various sources such as councillor/director or community requests, proposals identified by strategic plans or partnerships with other organisations. Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed below.

**Table 5.5.1: New Assets Priority Ranking Criteria**

Criteria	Weighting
Financial Impact	5%
Importance to road network, industry and community for structure to provide service and New Development	60%
Grant Funding Approved	35%
<b>Total</b>	<b>100%</b>

**5.5.2 Capital Investment Strategies**

Council will plan capital upgrade and new projects to meet level of service objectives by:

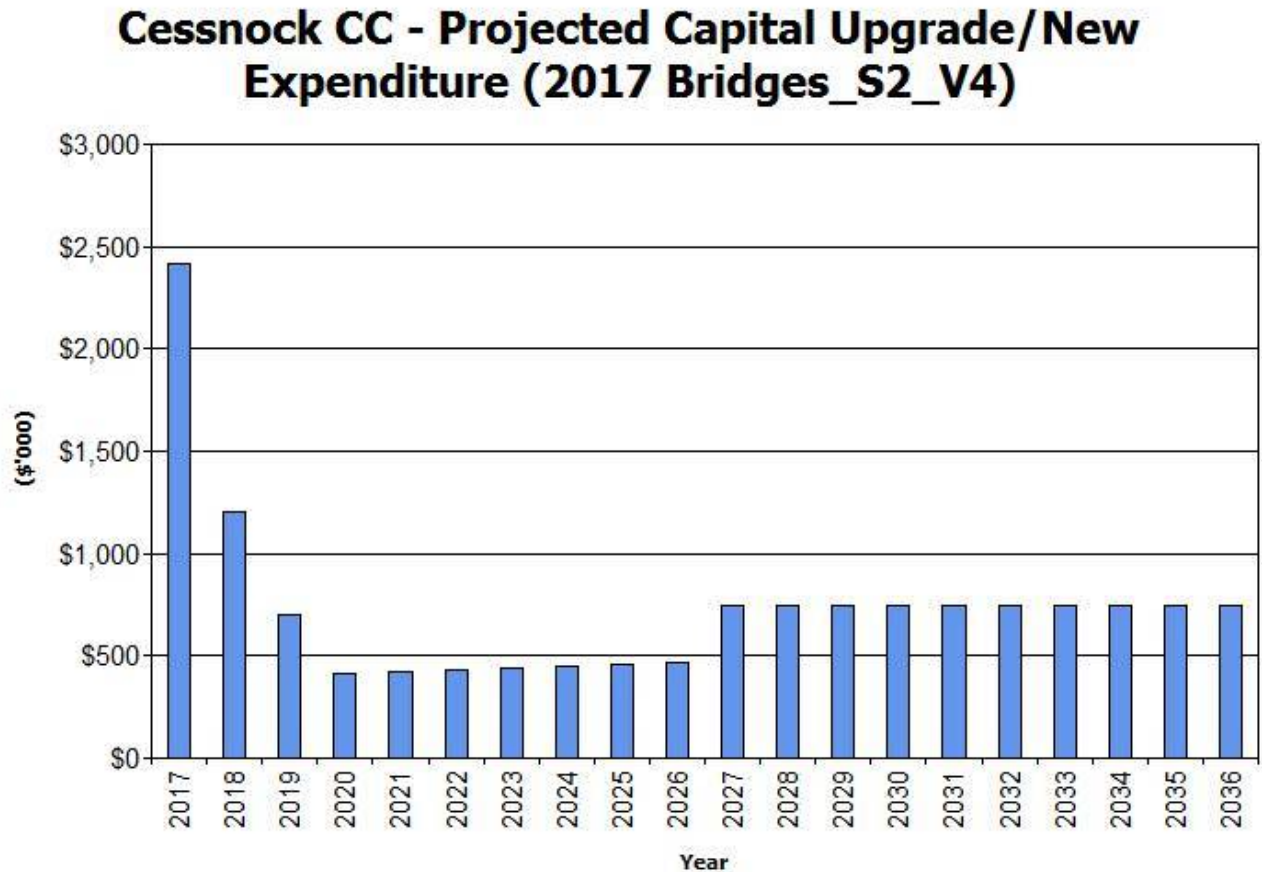
- Planning and scheduling capital upgrade and new projects to deliver the defined level of service in the most efficient manner;
- Undertake project scoping for all capital upgrade/new projects to identify:
  - the service delivery ‘deficiency’, present risk and required timeline for delivery of the upgrade/new asset;
  - the project objectives to rectify the deficiency including value management for major projects;
  - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency;
  - management of risks associated with alternative options,
  - evaluation of options against evaluation criteria adopted by Council; and
  - select the best option to be included in capital upgrade/new programs;
- Review current and required skills base and implement training and development to meet required construction and project management needs;
- Review management of capital project management activities to ensure Council is obtaining best value for resources used.

Standards and specifications for new assets and for upgrade/expansion of existing assets are the same as those for renewal shown in Section 5.4.2.

**5.5.3 Summary of future upgrade/new assets expenditure**

Projected upgrade/new asset expenditures are summarised in Fig 6. The projected capital renewal, replacement, and upgrade works program is shown in Appendix B. All amounts are shown in real values.

**Fig 6: Projected Capital Upgrade/New Asset Expenditure**



Expenditure on new assets and services in the Council’s capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2. The projected upgrade / new capital works reflect the proposed upgrade of Frame Drive Bridge and Fosters Bridge in the 2016/17, 2017/18 and 2018/19 Financial Years.

**5.6 Disposal Plan**

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6, together with estimated annual savings from not having to fund operations and maintenance of the assets. These assets will be further investigated to determine the required levels of service and see what options are available for alternate service delivery, if any. Revenue gained from asset disposals is accommodated in Council’s long term financial plan.

**Table 5.6: Assets Identified for Disposal**

Asset	Reason for Disposal	Timing	Disposal Expenditure	Maintenance Annual Savings
Bridges	None proposed	N/A	N/A	N/A

## **5.7 Service Consequences and Risks**

The Council has prioritised decisions made in adopting this Asset Management Plan to obtain the optimum benefits from its available resources. Decisions were made based on the development of 3 scenarios of AM Plans.

**Scenario 1** - What we would like to do based on asset register data.

**Scenario 2** – What we should do with existing budgets and identifying level of service and risk consequences (i.e. what are the operations and maintenance and capital projects we are unable to do, what is the service and risk consequences associated with this position). This may require several versions of the AMP.

**Scenario 3** – What we can do and be financially sustainable with AMPs matching long-term financial plans.

The development of scenario 1 and scenario 2 AM Plans provides the tools for discussion with the Council and community on trade-offs between what we would like to do (scenario 1) and what we should be doing with existing budgets (scenario 2) by balancing changes in services and service levels with affordability and acceptance of the service and risk consequences of the trade-off position (scenario 3).

Scenarios 2 & 3 have been developed for this AMP.

### **5.7.1 What we cannot do**

There are some operations and maintenance activities, and capital renewal projects that are unable to be undertaken within the next 10 years. This includes:

- All of the required renewal and maintenance items required annually for all bridges and major culvert assets to stay in average/fair condition (3) or better
- Renewal / rehabilitation work to enable the removal of all service deficiencies identified in Table 5.1.2.
- Increase in the required maintenance for assets to achieve their useful life

### **5.7.2 Service consequences**

Operations and maintenance activities, and capital projects that cannot be undertaken will maintain or create service consequences for users. These include:

- Increased quantity of assets requiring load limit restrictions and / or out of service.

### **5.7.3 Risk consequences**

The operations and maintenance activities, and capital projects that cannot be undertaken may maintain or create risk consequences for Council. These include:

- Potential increase in risk to the community through asset structural failure
- Likely increase in more expensive rehabilitation costs
- Negative public perception / political risk
- Impact on community and businesses as a result of load limits on bridges that provide important transport links.

These risks have been included with the Infrastructure Risk Management Plan summarised in Section 5.2 and risk management plans actions and expenditures included within projected expenditures.

**6. FINANCIAL SUMMARY**

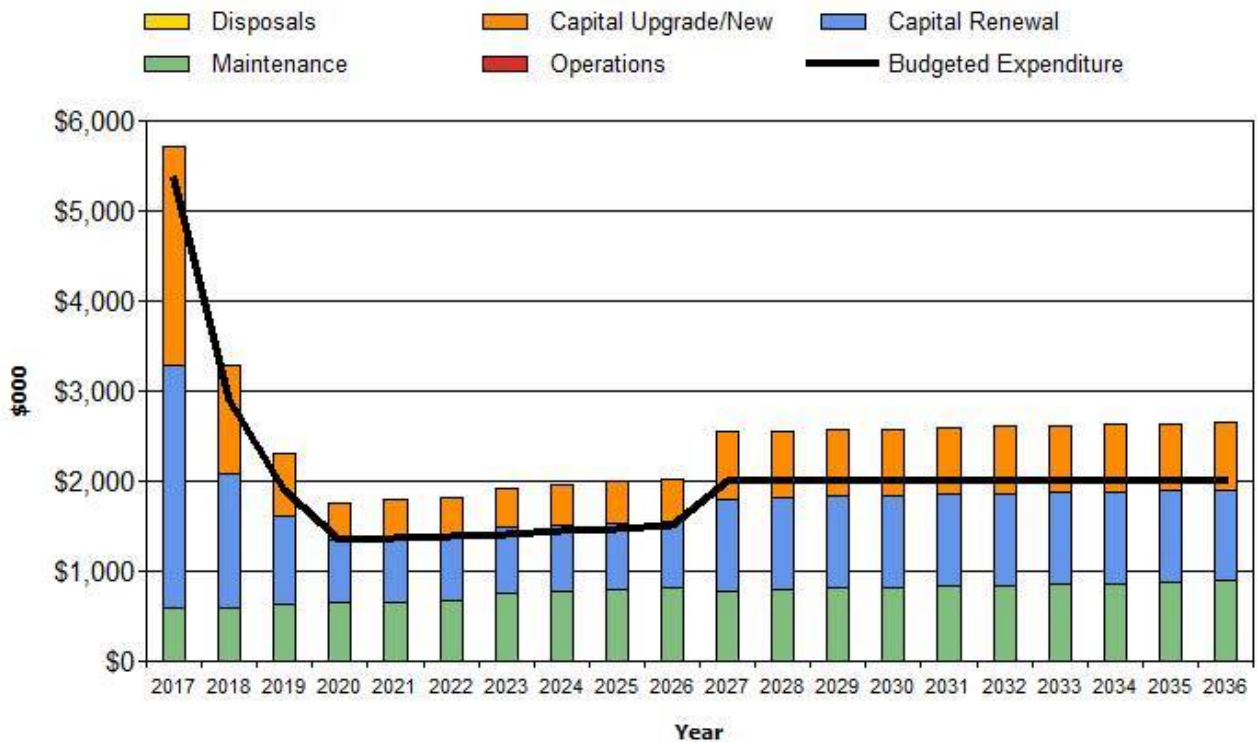
This section contains the financial requirements resulting from all the information presented in the previous sections of this Asset Management Plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected future asset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

**6.1 Financial Statements and Projections**

The financial projections are shown in Fig 7 (scenario 2) and 7.1 (scenario 3) for projected operating, maintenance, and capital expenditure, including; renewal and upgrade/expansion/new assets. Note that all costs are shown in real values.

*Fig 7: Projected Operating and Capital Expenditure – Scenario 2*

**Cessnock CC - Projected Operating and Capital Expenditure (2017 Bridges\_S2\_V4)**







### **Long term - Life Cycle Cost**

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the asset life cycle. Life cycle costs include maintenance expenditure and asset consumption (depreciation expense). The life cycle cost for the services covered in this asset management plan is \$1,051,000 per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years).

Life cycle costs can be compared to life cycle expenditure to give an initial indicator of affordability of projected service levels when considered with age profiles. Life cycle expenditure includes maintenance and capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure over the 10 year planning period is \$1,268,000 per year (average maintenance plus capital renewal budgeted expenditure in LTFP over 10 years).

A shortfall between life cycle cost and life cycle expenditure is the life cycle gap. The life cycle surplus for services covered by this asset management plan is +\$217,000 per year (-ve = gap, +ve = surplus). Life cycle expenditure is 121% of life cycle costs. This surplus is likely to be due to the use of a long term average budget amount for the 10 years past where the LTFP ends. An average is used due to the reduced confidence in accurate funding options more than 10 years into the future. In this case the average is considerably higher than the final year budgeted in the LTFP.

The life cycle costs and life cycle expenditure comparison highlights any difference between present outlays and the average cost of providing the service over the long term. If the life cycle expenditure is less than that life cycle cost, it is most likely that outlays will need to be increased or cuts in services made in the future.

Knowing the extent and timing of any required increase in outlays and the service consequences if funding is not available will assist organisations in providing services to their communities in a financially sustainable manner. This is the purpose of the asset management plans and long term financial plan.

### **Medium term – 10 year financial planning period**

This asset management plan identifies the projected 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 maintenance and capital renewal expenditure required over the 10 year planning period is \$1,367,000 on average per year.

Estimated (budget) maintenance and capital renewal funding is \$1,268,000 on average per year giving a 10 year funding shortfall of **-\$99,000** per year. This indicates that Council expects to have 93% of the projected expenditures needed to provide the services documented in the asset management plan.

### Medium Term – 5 year financial planning period

The projected maintenance and capital renewal expenditure required over the first 5 years of the planning period is \$1,588,000 on average per year.

Estimated (budget) maintenance and capital renewal funding is \$1,541,000 on average per year giving a 5 year funding shortfall of **-\$48,000**. This indicates that Council expects to have 99% of projected expenditures required to provide the services shown in this asset management plan.

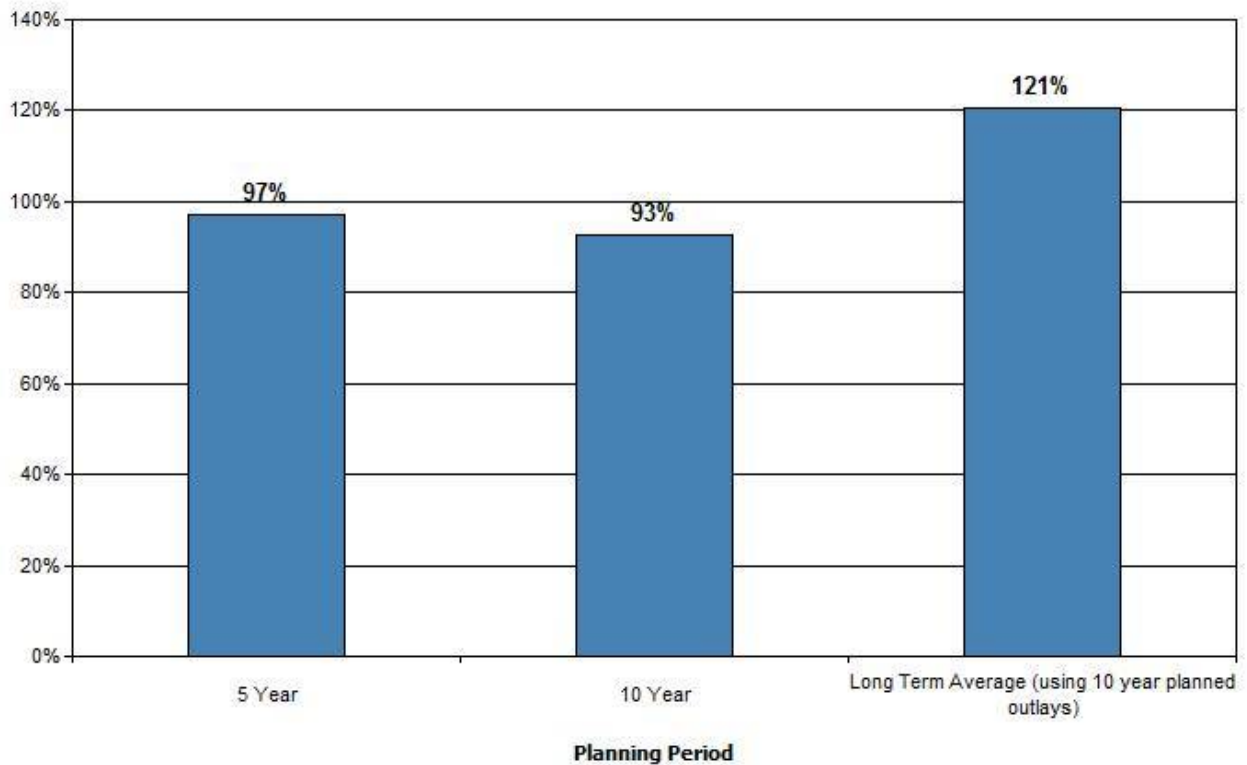
### Asset management financial indicators

Figure 7A shows the asset management financial indicators over the 10 year planning period and for the long term life cycle, this is based on scenario 3 which matches the LTFP.

**Figure 7A: Asset Management Financial Indicators**

**Cessnock CC - AM Financial Indicators (2017 Bridges\_S3\_V4)**

■ Comparison of LTFP Outlays as a % of Projected Requirements



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 1.0 for the first years of the asset management plan and ideally over the 10 year life of the Long Term Financial Plan.

Figure 8 shows the projected asset renewal and replacement expenditure required from Scenario 2 over a 20 year planning period. The projected asset renewal and replacement expenditure is compared to renewal and replacement expenditure in the capital works program, which is accommodated in the long term financial plan.

**Figure 8: Projected and LTFP Budgeted Renewal Expenditure**

## Cessnock CC - Projected & LTFP Budgeted Renewal Expenditure (2017 Bridges\_S2\_V4)

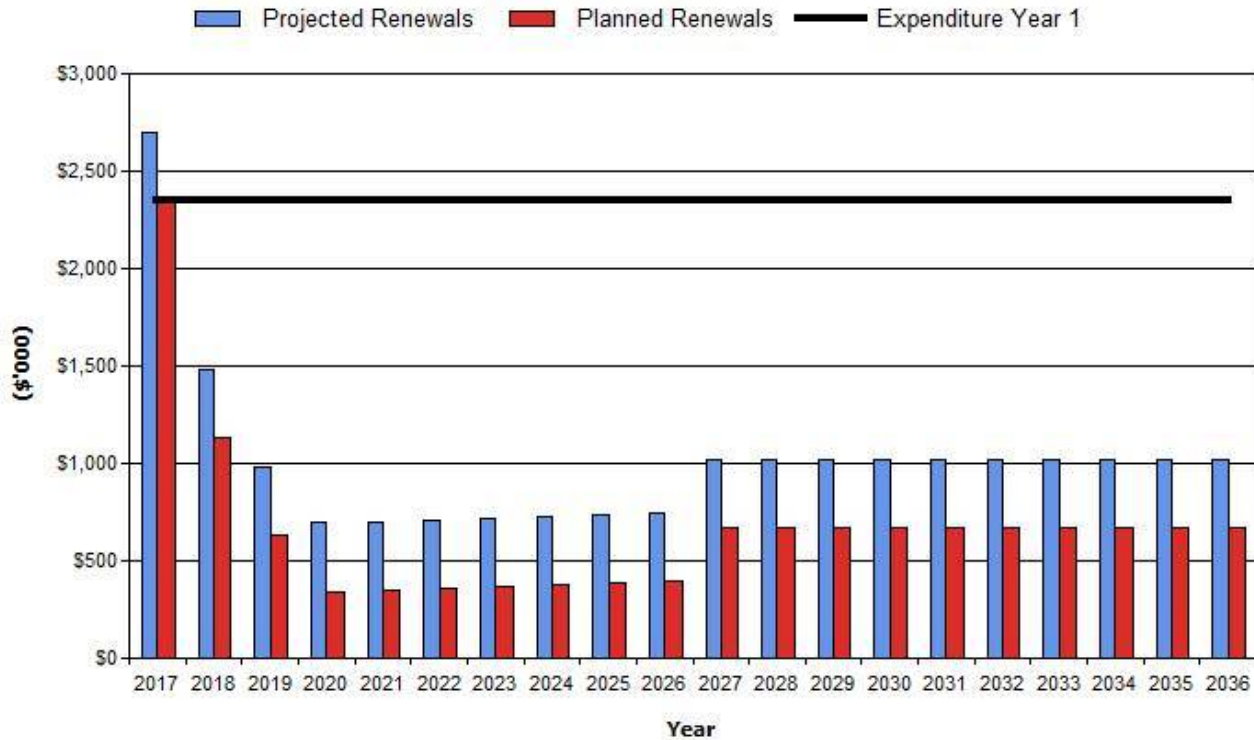


Table 6.1.1 shows the shortfall between projected renewal and replacement expenditures required from scenario 2 and expenditure accommodated in long term financial plan. Budget expenditures accommodated in the long term financial plan or extrapolated from current budgets are shown in Appendix C.

**Table 6.1.1: Projected and LTFP Budgeted Renewals and Financing Shortfall**

Year End June 30	Projected Renewals (\$'000)	LTFP Renewal Budget (\$'000)	Renewal Financing Shortfall (- gap, + surplus) (\$'000)	Cumulative Shortfall (- gap, + surplus) (\$'000)
2017	\$2,695	\$2,345	\$-350	\$-350
2018	\$1,484	\$1,134	\$-350	\$-700
2019	\$979	\$629	\$-350	\$-1,050
2020	\$694	\$344	\$-350	\$-1,400
2021	\$702	\$352	\$-350	\$-1,750
2022	\$711	\$361	\$-350	\$-2,100
2023	\$720	\$370	\$-350	\$-2,450
2024	\$730	\$380	\$-350	\$-2,800
2025	\$739	\$389	\$-350	\$-3,150
2026	\$748	\$398	\$-350	\$-3,500
2027	\$1,020	\$670	\$-350	\$-3,850
2028	\$1,020	\$670	\$-350	\$-4,200

Year End June 30	Projected Renewals (\$'000)	LTFP Renewal Budget (\$'000)	Renewal Financing Shortfall (- gap, + surplus) (\$'000)	Cumulative Shortfall (- gap, + surplus) (\$'000)
2029	\$1,020	\$670	\$-350	\$-4,550
2030	\$1,020	\$670	\$-350	\$-4,900
2031	\$1,020	\$670	\$-350	\$-5,250
2032	\$1,020	\$670	\$-350	\$-5,600
2033	\$1,020	\$670	\$-350	\$-5,950
2034	\$1,020	\$670	\$-350	\$-6,300
2035	\$1,020	\$670	\$-350	\$-6,650
2036	\$1,020	\$670	\$-350	\$-7,000

Note: A negative shortfall indicates a financing gap, a positive shortfall indicates a surplus for that year.

Should the Council wish to meet the community demand for assets to improve to a minimum of condition 3, in order to be sustainable in meeting this service level, there will be a requirement to match projected asset renewal and replacement expenditure with the corresponding capital works program accommodated in the long term financial plan.

A gap between projected asset renewal/replacement expenditure and amounts accommodated in the LTFP indicates that further work is required on reviewing service levels in the AM Plan (including possibly revising the LTFP) before finalising the asset management plan to manage required service levels and funding to eliminate any funding gap.

We will manage the 'gap' by developing this asset management plan to provide guidance on future service levels and resources required to provide these services, and review future services, service levels and costs with the community.

**6.1.2 Projected expenditures for long term financial plan**

Table 6.1.2 shows the projected expenditures for the 10 year long term financial plan. Expenditure projections are in 2016/17 FY real values.

**Table 6.1.2: Projected Expenditures for Long Term Financial Plan (\$000)**

Year	Operations	Maintenance	Projected Capital Renewal	Capital Upgrade/New	Disposals
2017	\$0	\$598	\$2,345	\$2,413	\$0
2018	\$0	\$601	\$1,134	\$1,203	\$0
2019	\$0	\$628	\$629	\$700	\$0
2020	\$0	\$647	\$344	\$416	\$0
2021	\$0	\$663	\$352	\$424	\$0
2022	\$0	\$678	\$361	\$433	\$0
2023	\$0	\$764	\$370	\$442	\$0
2024	\$0	\$780	\$380	\$451	\$0
2025	\$0	\$796	\$389	\$460	\$0
2026	\$0	\$812	\$398	\$469	\$0

Year	Operations	Maintenance	Projected Capital Renewal	Capital Upgrade/New	Disposals
2027	\$0	\$784	\$670	\$741	\$0
2028	\$0	\$795	\$670	\$741	\$0
2029	\$0	\$807	\$670	\$741	\$0
2030	\$0	\$818	\$670	\$741	\$0
2031	\$0	\$830	\$670	\$741	\$0
2032	\$0	\$842	\$670	\$741	\$0
2033	\$0	\$853	\$670	\$741	\$0
2034	\$0	\$865	\$670	\$741	\$0
2035	\$0	\$876	\$670	\$741	\$0
2036	\$0	\$888	\$670	\$741	\$0
<b>All dollar values are in (\$'000)'s</b>					

## 6.2 Funding Strategy

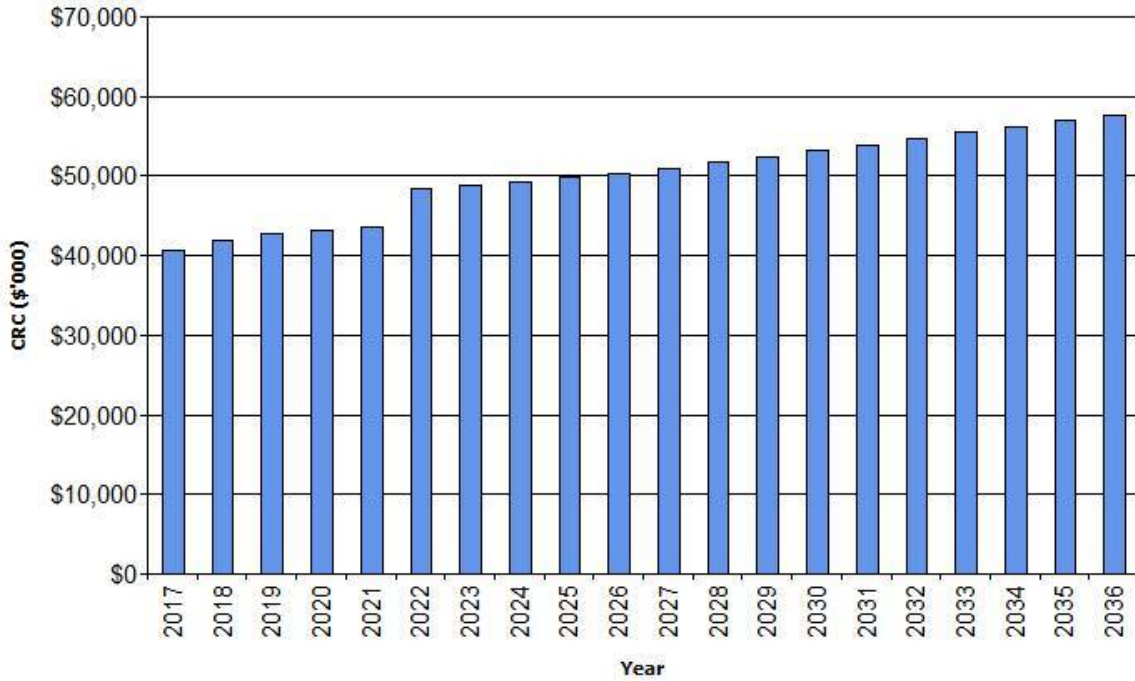
After reviewing service levels to ensure ongoing financial sustainability projected expenditures identified in Section 6.1.2 will be accommodated in the Council's 10 year long term financial plan, and reviewed where necessary.

## 6.3 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. Figure 9 shows the projected replacement cost asset values over the planning period in real values.

Figure 9: Projected Asset Values

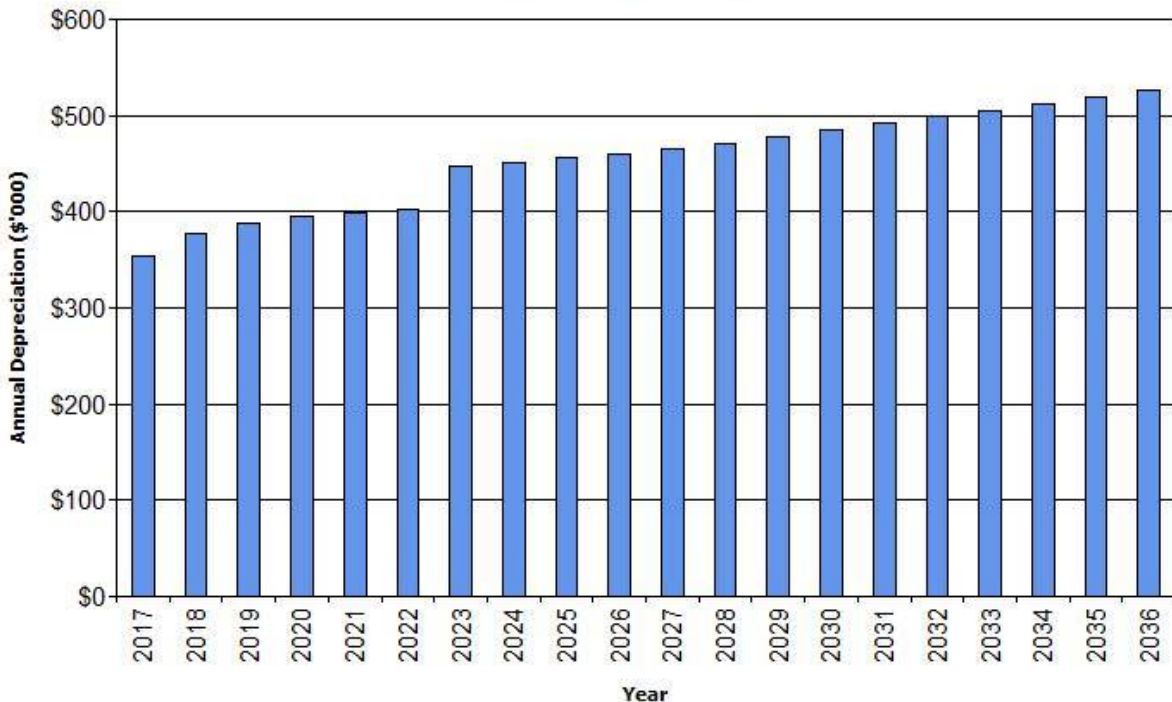
### Cessnock CC - Projected Asset Values (2017 Bridges\_S3\_V4)



Depreciation expense values are forecast in line with asset values as shown in Figure 10.

Figure 10: Projected Depreciation Expense

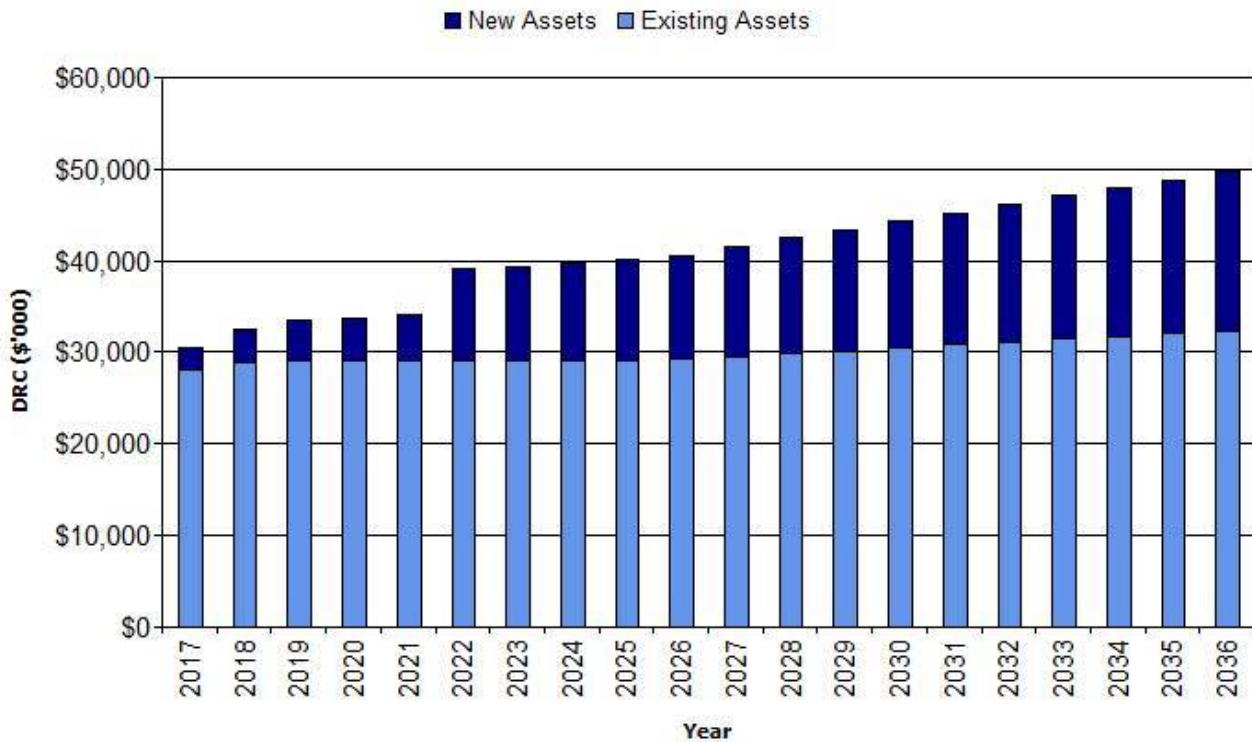
### Cessnock CC - Projected Depreciation Expense (2017 Bridges\_S3\_V4)



The depreciated replacement cost will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets. Forecast of the assets' depreciated replacement cost is shown in Figure 11. The depreciated replacement cost of contributed and new assets is shown in the darker colour and in the lighter colour for existing assets.

**Figure 11: Projected Depreciated Replacement Cost**

**Cessnock CC - Projected Depreciated Replacement Cost (2017 Bridges\_S3\_V4)**



**6.4 Key Assumptions made in Financial Forecasts**

This section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan and risks that these may change are shown in Table 6.4.

**Table 6.4: Key Assumptions made in AM Plan and Risks of Change**

Key Assumptions	Risks of Change to Assumptions
Use of existing inventory and condition data as at 30 June 2015.	Condition data was last compiled during the revaluation exercise undertaken in 2014/15.
Use of 2014/15 Asset Revaluation Manual.	This Asset Management Plan is based on asset



Key Assumptions	Risks of Change to Assumptions
	revaluation undertaken in 2014/15 that would be subject to change by revaluation in 2019/20.
Planned expenditure values obtained from current budgets and Council's four year delivery program (2017-2021), and Council's updated LTFP 2017 – 2027.	The four year Delivery Program and LTFP may change in the future. Any changes in funding, planned capital and maintenance will be reflected in future asset management plans.

### 6.5 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<sup>12</sup> in accordance with Table 6.5.

**Table 6.5: Data Confidence Grading System**

Confidence Grade	Description
A Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and recognised as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
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 $\pm 25\%$
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 $\pm 40\%$
E Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 6.5.1.

**Table 6.5.1: Data Confidence Assessment for Data used in AM Plan**

Data	Confidence Assessment	Comment
Demand drivers	B	Based on demographic analysis undertaken in 2014 and State Government projections.
Growth projections	B	Based on demographic analysis undertaken in 2014 and State Government projections.
Maintenance expenditures	A	Council financial records.
Projected Renewal exps. Asset values	B	Assets reviewed in 2014/15 and renewal costs determined from Benchmark Rates.
Asset residual values	B	Asset residual values based on current rehabilitation methods
Asset useful lives	B	Useful lives based on industry standards.

<sup>12</sup> IPWEA, 2011, IIMM, Table 2.4C.6, p 2|59.

Data	Confidence Assessment	Comment
Condition	B	Condition profile based on an ongoing inspection regime.
Network renewals	B	Based on Renewal and Replacement Priority Ranking Criteria Table 5.4.2
Defect repairs	B	Developed from customer requests and officer inspections.
Upgrade/New expenditures	A	Based on known capital allocations from State Government Grand funding.
Disposal expenditures	B	Disposals developed from Timber Bridge Priority ranking

Over all data sources the data confidence is assessed as medium confidence level for data used in the preparation of this AM Plan.

## 7. PLAN IMPROVEMENT AND MONITORING

### 7.1 Status of Asset Management Practices

#### 7.1.1 Accounting and financial systems

Council's accounting and financial system is CIVICA/Authority.

#### Accountabilities for financial systems

The financial systems are primarily managed by Council's Finance section within the Corporate and Community Services Directorate.

#### Accounting standards and regulations

In accounting for Cessnock City Council assets the following statutory requirements shall be adhered to:

- Australian Accounting Standards (AASB116).
- NSW Local Government Act 1993.
- NSW Code of Accounting Practice and Financial Reporting (updated annually).
- Australian Infrastructure Management Guideline

#### Capital/maintenance threshold

A summary of capital / maintenance threshold for bridge assets is provided in Table 7.1.

**Table 7.1: Capital / Maintenance Threshold for Bridge Assets**

Asset	Operations	Maintenance and Repair	Capital Renewal	Capital New
<b>Bridge &amp; Associated Infrastructure</b>	<ul style="list-style-type: none"> <li>• Pavement markings signs</li> <li>• Clear culvert/table drain</li> <li>• Street sweeping</li> <li>• Street lighting</li> <li>• Mowing</li> <li>• Cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• Reactive maintenance (guardrail repair, signs repair, etc.</li> <li>• Component replace/renew &lt; \$10,000.</li> <li>• Components replace/renew &lt;20% of the bridge.</li> </ul>	<ul style="list-style-type: none"> <li>• Bridge renewal to same standard. Or &gt;\$10,000.</li> <li>• Component replace/renew &gt; 20% of component</li> </ul>	<ul style="list-style-type: none"> <li>• New assets/upgrade assets</li> <li>• Replacement with higher standard (&gt;same standard)</li> </ul>

## **Required changes to accounting financial systems arising from this AM Plan**

In order to assist with future iterations of this AM Plan it is recommended that the accounting ledger be restructured to better reflect the different types of expenditure, i.e. operational, maintenance, and capital renewal and upgrade programs for asset that are yet to have these allocated.

### **7.1.2 Asset management system**

Cessnock City Council Asset Management Implementation Project includes the deployment of a software tool; MyData (Assetic Software Package) Asset Management System.

#### **ASSETIC – MyData**

MyData, is an 'Asset Management System' (AMS) designed to assist with the management of all infrastructure assets as well as the potential to expand to non-infrastructure assets such as fleet, plant, computer, etc.

The MyData register has the ability to:

- Assign global formulae for remaining life based on age and/or condition.
- Use predictive modelling as basis for defensible valuations (written down value and remaining life).
- Automatically update annual or monthly valuations.
- Add or remove assets but maintain an archived list.
- Perform audit trails for changes between two valuations.
- Import and export reports.
- Apply a range of unit replacement costs across asset categories.
- Classify each asset class into various sub-classes.

#### **Asset registers**

The key information flows into this asset management plan are:

- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projects of various factors affecting future demand for services;
- Correlations between maintenance and renewal, including decay models;
- Data on new assets acquired by Council.

#### **Linkage from asset management to financial system**

The key information flows from this Asset Management Plan are:

- The assumed asset renewal profile and trends;
- The resulting budget, valuation and depreciation projections;
- The useful life analysis.

These will impact the Long Term Financial Plan, Strategic Business Plan, annual budget and unit plans and budgets.

#### **Accountabilities for asset management system and data maintenance**

See Asset Management Strategy.

**Required changes to asset management system arising from this AM Plan**

Changes to the asset management system resulting from this Asset Management Plan may include:

- Modification of asset categories or sub-categories to assist in maintenance management systems;
- Improving the work order system for job planning and control;
- Improving the quality of specific data;
- Improving software systems and links to other systems (e.g. GIS and Authority to MyData, and);
- Adopting a more frequent reconciliation cycle between the financial and technical asset registers.

**7.2 Improvement Plan**

The asset management improvement plan generated from this asset management plan is shown in Table 7.2.

**Table 7.2: Improvement Plan**

<b>Task No</b>	<b>Task</b>	<b>Responsibility</b>	<b>Resources Required</b>	<b>Timeline</b>
1	Review response levels of service for reactive maintenance (appendix A)	Works & Infrastructure/Assets	In-house	Prior to adoption 2018
2	Assess the structure and resources within Council, to ensure that the Asset Management Plan can be effectively implemented.	Works & Infrastructure/Assets	In-house	Prior to adoption 2018
3	Review finance system to provide clear separation of capital expenditure into renewal, upgrade / expansion, and new works.	Works & Infrastructure/Assets and Finance	In-house	Prior to adoption 2018
4	Review future demand impacts of this Asset Management Plan in consultation with internal staff.	Works & Infrastructure/Assets	In-house	Prior to adoption 2018
5	Document Service Level Targets for all assets in each Asset Management Plan	Works & Infrastructure/Assets / Finance & Admin Services Manager / Service Delivery Managers	In-house	Prior to adoption 2018
6	Develop a critical assets management plan	Works and Infrastructure/Assets	In-house	Prior to adoption 2018
7	Undertake community consultation for all assets.	Works and Infrastructure/Assets	In-house	June 2017
8	Review service levels once and agreed community service level is determined for bridge and culvert assets.	Works and Infrastructure/Assets	In-house, external	Prior to adoption 2018

NOTE: In 2015, an independent assessment was undertaken by an external consultant on Councils' overall asset maturity TRIM reference number DOC2015/020878. Council is intending to obtain another review of their asset maturity by the end of 2018.

### **7.3 Monitoring and Review Procedures**

This Asset Management Plan will be reviewed during annual budget planning processes and amended to recognise any material changes in service levels and/or resources available to provide those services as a result of budget decisions.

The 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 Council's long term financial plan.

The AMP is to be reviewed annually in line with the budget, and a full revision undertaken during the year after the asset class is revalued.

### **7.4 Performance Measures**

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

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into Council's long term financial plan;
- The degree to which 1-5 year detailed works programs, budgets, business plans and organisational structures take into account the 'global' works program trends provided by the asset management plan;
- The degree to which the existing and projected service levels and service consequences (what we cannot do), risks and residual risks are incorporated into the Council's Strategic Plan and associated plans;
- The Asset Renewal Funding Ratio achieving the target of 1.0.

## 8. REFERENCES

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NAMS.Plus Maturity Assessment Report Cessnock City Council 2015

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## **9. APPENDICES**

Appendix A Maintenance Response Levels of Service

Appendix B Draft 4-Year Capital Renewal, Replacement, and Upgrade Works Program

Appendix C Budgeted Expenditures Accommodated in AM Plan

Appendix D Abbreviations

Appendix E Glossary

**Appendix A Maintenance Response Levels of Service**

<b>Routine Maintenance Activity</b>	<b>Intervention Level</b>	<b>Response Time</b>
Graffiti Offensive	When graffiti is visible to the public	5 Days
Graffiti Non-Offensive	When graffiti is present	240 Days
Deck & Footway Cleaning	<b>Routine Maintenance</b> Build-up of aggregate, soil & debris capable of: a) Supporting vegetation growth b) Impeding flow of water	As Per Program
Deck & Footway Cleaning	<b>Emergency Works*</b> Build-up of aggregate, soil & debris capable of: a) Supporting vegetation growth b) Impeding flow of water	2 Days
Waterway Clearing	<b>Routine Maintenance</b> Where debris impedes the performance of the bridge / culvert structure > 50% of waterway exit points blocked.	As Per Program
Waterway Clearing	<b>Emergency Works*</b> Where debris impedes the performance of the bridge / culvert structure > 50% of waterway exit points blocked.	2 Days
Retro-reflective markers Maintenance	Reflective markers are damaged or missing as identified by Council Staff or from customer requests	As Per Program
Guardrail / Balustrade Maintenance	Guardrail / balustrade identified as having loose bolts connections, safety issue*	1 day
Guardrail / Balustrade Maintenance	Guardrail / balustrade identified as having loose bolts connections, non-safety issue	60 days
Approach Rails	Approach rails misaligned or about to fall over, safety issue*	60 Days
Approach Rails	Approach rails misaligned requiring repair, non-safety issue	90 Days
Painting	The paint work is no longer effective on significant areas. There will be exposed timber or metal or concrete.	90 Days
Termite Treatment	Application of termite treatment	As Required
Bearing Maintenance	Bearings show signs of significant cracking, splitting or bulging may be present. Moderate misalignment or lateral movement may be present. Dowels may be severely corroded.	120 Days
Timber Deck Maintenance	Local decay, insect infestation, or crushing of some timber laminates may exist. Some relative movement between laminates may be observed under traffic. There may be local loss of prestress and the tie down bolts may be loose. The defects are only affecting the deck locally < 20m <sup>2</sup>	30 Days * Make Safe Immediately
Joint Maintenance	Worn expansion joints, cork joint, compression joint or assembly joint / seal require rehabilitation due to abrasion / tearing	90 Days



Routine Maintenance Activity	Intervention Level	Response Time
Deck Maintenance	Some delamination, significant cracks or spalls may be present. There is no evidence of deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is minor. There is not sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.	120 Days*
Superstructure Maintenance	Bracing, crossheads, bearers show signs of wear, rot, termite presence, decay, spalling or cracking	240 Days*
Substructure Maintenance	Columns, piles, headstock show signs of wear, rot, termite presence, decay, spalling or cracking	240 Days*
Abutment Maintenance	Abutment show signs of wear, rot, termite presence, decay, spalling, cracking or loose components	240 Days*

**NOTES:**

1. All times specified in this manual are in working days.
2. \* Denotes – If the defects is considered to be a safety issue as identified by either Council Staff, Bridge Level 3 report or detailed engineering report, then the defect will be rectified as soon as practical depending on availability of materials and/or contractors. However, the asset will be made safe to the public.

**Appendix B Draft 4 year Capital Renewal, Replacement, and Upgrade Works Program**

BRIDGE CONSTRUCTION PROGRAM (CBS)		FUNDING YEAR							
LOCATION	PROJECT	2017/18		2018/19		2019/20		2020/21	
Abermain	Bathurst Street investigation and design			\$10,000	CBS-2019-004			\$10,000	CBS-2019-004
Bellbird	Abbotsford Street Bridge refurbishment	\$315,000	CBS-2018-007						
Buchanan	Buchanan Road Culvert (North Valley View Lane) - investigation					\$10,000	CBS-2020-001		
Cedar Creek	Sawpit Road Crossing			\$85,000	CBS-2019-005				
Cessnock	Doyle Street investigation and design							\$10,000	CBS-2021-001
Cessnock	Ferguson Street investigation and design			\$10,000	CBS-2019-002				
Congewai	Thursbys Bridge refurbishment	\$45,000	CBS-2018-002						
Greta	Anvil Creek replacement			\$624,100	CBS-2017-005	\$485,000	CBS-2017-005		
Laguna	Watagan Creek #3 refurbishment	\$70,000	CBS-2018-006						
Mulbring	Whitebridge Rd culvert replacement	\$65,000	CBS-2018-003						
Paynes Crossing	Paynes Crossing Bridge (Grant Funding Dependent)			\$300,000	CBS-2019-001				
Quorrobolong	Fosters bridge construction	\$1,425,500	CBS-2016-001						
Quorrobolong	Whitings Bridge investigation and design and refurbishment	\$10,000	CBS-2018-004	\$200,000	CBS-2018-004				
Rothbury	Wilderness 2 refurbishment	\$300,000	CBS-2018-001						
Weston	Kline Street investigation and design and construction	\$10,500	CBS-2018-005			\$10,000	CBS-2018-005	\$330,900	CBS-2018-005
Wollombi	Cunneens investigation			\$10,000	CBS-2019-003				
Wollombi	Yango Creek investigation and design and replacement	\$10,000	CBS-2017-004			\$164,600	CBS-2017-004	\$335,400	CBS-2017-004
	<b>TOTAL</b>	<b>\$2,250,500</b>		<b>\$1,239,100</b>		<b>\$669,600</b>		<b>\$686,300</b>	
<i>Funding Source:</i>	Loan	\$1,217,262		-		-		-	
	Grants	\$1,033,238		\$1,007,500		-		-	
	General Fund	-		\$231,600		\$669,600		\$686,300	

**Appendix C Budgeted Expenditures Accommodated in LTFP**

<b>Cessnock CC - Report 7 - LTFP Expenditure Projections (2017 Bridges_S3_V4)</b>										
<b>Projected Expenditure</b>	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Capital Expenditure on Renewal/Replacement of existing assets	\$2,345	\$1,134	\$629	\$344	\$352	\$361	\$370	\$380	\$389	\$398
Capital Expenditure on Upgrade/New assets	\$2,413	\$1,203	\$700	\$416	\$424	\$433	\$442	\$451	\$460	\$469
Operational cost of existing assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance cost of existing assets	\$598	\$563	\$571	\$579	\$588	\$597	\$606	\$615	\$624	\$633
Operational cost of New assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Maintenance cost of New assets	\$0	\$38	\$57	\$68	\$75	\$81	\$158	\$165	\$172	\$179
Disposal of Surplus assets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>All dollar values in (\$'000)'s</b>										

## **Appendix D Abbreviations**

AAAC	Average annual asset consumption
AM	Asset management
AM Plan	Asset management plan
ARI	Average recurrence interval
ASC	Annual service cost
BOD	Biochemical (biological) oxygen demand
CRC	Current replacement cost
CWMS	Community wastewater management systems
DA	Depreciable amount
DRC	Depreciated replacement cost
EF	Earthworks/formation
IRMP	Infrastructure risk management plan
LCC	Life Cycle cost
LCE	Life cycle expenditure
LTFP	Long term financial plan
MMS	Maintenance management system
PCI	Pavement condition index
RV	Residual value
SoA	State of the Assets
SS	Suspended solids
Vph	Vehicles per hour
WDCRD	Written down current replacement cost

## Appendix E Glossary

### Annual service cost (ASC)

- 1) Reporting actual cost  
The annual (accrual) cost of providing a service including operations, maintenance, depreciation, finance/opportunity and disposal costs less revenue.
- 2) For investment analysis and budgeting  
An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operations, maintenance, depreciation, finance/opportunity and disposal costs, less revenue.

### Asset

A resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity. Infrastructure assets are a sub-class of property, plant and equipment which are non-current assets with a life greater than 12 months and enable services to be provided.

### Asset category

Sub-group of assets within a class hierarchy for financial reporting and management purposes.

### Asset class

A group of assets having a similar nature or function in the operations of an entity, and which, for purposes of disclosure, is shown as a single item without supplementary disclosure.

### Asset condition assessment

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

### Asset hierarchy

A framework for segmenting an asset base into appropriate classifications. The asset hierarchy can be based on asset function or asset type or a combination of the two.

### Asset management (AM)

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

### Asset renewal funding ratio

The ratio of the net present value of asset renewal funding accommodated over a 10 year period in a long term financial plan relative to the net present value of projected capital renewal expenditures identified in an asset management plan for the same period [AIFMG Financial Sustainability Indicator No 8].

### Average annual asset consumption (AAAC)\*

The amount of Council's asset base consumed during a reporting period (generally a year). This may be calculated by dividing the depreciable amount by the useful life (or total future economic benefits/service potential) and totalled for each and every asset OR by dividing the carrying amount (depreciated replacement cost) by the remaining useful life (or remaining future economic benefits/service potential) and totalled for each and every asset in an asset category or class.

### **Borrowings**

A borrowing or loan is a contractual obligation of the borrowing entity to deliver cash or another financial asset to the lending entity over a specified period of time or at a specified point in time, to cover both the initial capital provided and the cost of the interest incurred for providing this capital. A borrowing or loan provides the means for the borrowing entity to finance outlays (typically physical assets) when it has insufficient funds of its own to do so, and for the lending entity to make a financial return, normally in the form of interest revenue, on the funding provided.

### **Capital expenditure**

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

### **Capital expenditure - expansion**

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

### **Capital expenditure - new**

Expenditure which creates a new asset providing a new service/output that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operations and maintenance expenditure.

### **Capital expenditure - renewal**

Expenditure on an existing asset or on replacing an existing asset, which returns the service capability of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it generally has no impact on revenue, but may reduce future operations and maintenance expenditure if completed at the optimum time, e.g. resurfacing or resheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval.

### **Capital expenditure - upgrade**

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase operations and maintenance expenditure in the future because of the increase in the Council's asset base, e.g. widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility.

### **Capital funding**

Funding to pay for capital expenditure.

### **Capital grants**

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

### **Capital investment expenditure**

See capital expenditure definition.

### **Capitalisation threshold**

The value of expenditure on non-current assets above which the expenditure is recognised as capital expenditure and below which the expenditure is charged as an expense in the year of acquisition.

### **Carrying amount**

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

### **Class of assets**

See asset class definition.

### **Component**

Specific parts of an asset having independent physical or functional identity and having specific attributes such as different life expectancy, maintenance regimes, risk or criticality.

### **Core asset management**

Asset management which relies primarily on the use of an asset register, maintenance management systems, job resource management, inventory control, condition assessment, simple risk assessment and defined levels of service, in order to establish alternative treatment options and long-term cash-flow predictions. Priorities are usually established on the basis of financial return gained by carrying out the work (rather than detailed risk analysis and optimised decision-making).

### **Cost of an asset**

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

### **Critical assets**

Assets for which the financial, business or service level consequences of failure are sufficiently severe to justify proactive inspection and rehabilitation. Critical assets have a lower threshold for action than noncritical assets.

### **Current replacement cost (CRC)**

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

### **Deferred maintenance**

The shortfall in rehabilitation work undertaken relative to that required to maintain the service potential of an asset.

### **Depreciable amount**

The cost of an asset, or other amount substituted for its cost, less its residual value.

### **Depreciated replacement cost (DRC)**

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

### **Depreciation / amortisation**

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

**Economic life**

See useful life definition.

**Expenditure**

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

**Expenses**

Decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or increases in liabilities that result in decreases in equity, other than those relating to distributions to equity participants.

**Fair value**

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

**Financing gap**

A financing gap exists whenever an entity has insufficient capacity to finance asset renewal and other expenditure necessary to be able to appropriately maintain the range and level of services its existing asset stock was originally designed and intended to deliver. The service capability of the existing asset stock should be determined assuming no additional operating revenue, productivity improvements, or net financial liabilities above levels currently planned or projected. A current financing gap means service levels have already or are currently falling. A projected financing gap if not addressed will result in a future diminution of existing service levels.

**Heritage asset**

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

**Impairment Loss**

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

**Infrastructure assets**

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

**Investment property**

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

- (a) use in the production or supply of goods or services or for administrative purposes; or
- (b) sale in the ordinary course of business.

**Key performance indicator**

A qualitative or quantitative measure of a service or activity used to compare actual performance against a standard or other target. Performance indicators commonly relate to statutory limits, safety, responsiveness, cost, comfort, asset performance, reliability, efficiency, environmental protection and customer satisfaction.



### Level of service

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

### Life Cycle Cost \*

1. **Total LCC** The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs.
2. **Average LCC** The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises average operations, maintenance expenditure plus asset consumption expense, represented by depreciation expense projected over 10 years. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

### Life Cycle Expenditure

The Life Cycle Expenditure (LCE) is the average operations, maintenance and capital renewal expenditure accommodated in the long term financial plan over 10 years. Life Cycle Expenditure may be compared to average Life Cycle Cost to give an initial indicator of affordability of projected service levels when considered with asset age profiles.

### Loans / borrowings

See borrowings.

### Maintenance

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, eg road patching but excluding rehabilitation or

renewal. It is operating expenditure required to ensure that the asset reaches its expected useful life.

- **Planned maintenance**

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

- **Reactive maintenance**

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

- **Specific maintenance**

Maintenance work to repair components or replace sub-components that needs to be identified as a specific maintenance item in the maintenance budget.

- **Unplanned maintenance**

Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

### Maintenance expenditure \*

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

### **Materiality**

The notion of materiality guides the margin of error acceptable, the degree of precision required and the extent of the disclosure required when preparing general purpose financial reports. Information is material if its omission, misstatement or non-disclosure has the potential, individually or collectively, to influence the economic decisions of users taken on the basis of the financial report or affect the discharge of accountability by the management or governing body of the entity.

### **Modern equivalent asset**

Assets that replicate what is in existence with the most cost-effective asset performing the same level of service. It is the most cost efficient, currently available asset which will provide the same stream of services as the existing asset is capable of producing. It allows for technology changes and, improvements and efficiencies in production and installation techniques.

### **Net present value (NPV)**

The value to the Council of the cash flows associated with an asset, liability, activity or event calculated using a discount rate to reflect the time value of money. It is the net amount of discounted total cash inflows after deducting the value of the discounted total cash outflows arising from eg. the continued use and subsequent disposal of the asset after deducting the value of the discounted total cash outflows.

### **Non-revenue generating investments**

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

### **Operations**

Regular activities to provide services such as public health, safety and amenity, eg street sweeping, grass mowing and street lighting.

### **Operating expenditure**

Recurrent expenditure, which is continuously required to provide a service. In common use the term typically includes, e.g. power, fuel, staff, plant equipment, on-costs and overheads but excludes maintenance and depreciation. Maintenance and depreciation is on the other hand included in operating expenses.

### **Operating expense**

The gross outflow of economic benefits, being cash and non-cash items, during the period arising in the course of ordinary activities of an entity when those outflows result in decreases in equity, other than decreases relating to distributions to equity participants.

### **Operating expenses**

Recurrent expenses continuously required to provide a service, including power, fuel, staff, plant equipment, maintenance, depreciation, on-costs and overheads.

### **Operations, maintenance and renewal financing ratio**

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

### **Operations, maintenance and renewal gap**

Difference between budgeted expenditures in a long term financial plan (or estimated future budgets in absence of a long term financial plan) and projected expenditures for operations, maintenance and renewal of assets to achieve/maintain specified service levels, totalled over a defined time (e.g. 5, 10 and 15 years).

**Pavement management system (PMS)**

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

**PMS Score**

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

**Rate of annual asset consumption \***

The ratio of annual asset consumption relative to the depreciable amount of the assets. It measures the amount of the consumable parts of assets that are consumed in a period (depreciation) expressed as a percentage of the depreciable amount.

**Rate of annual asset renewal \***

The ratio of asset renewal and replacement expenditure relative to depreciable amount for a period. It measures whether assets are being replaced at the rate they are wearing out with capital renewal expenditure expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

**Rate of annual asset upgrade/new \***

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

**Recoverable amount**

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

**Recurrent expenditure**

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

**Recurrent funding**

Funding to pay for recurrent expenditure.

**Rehabilitation**

See capital renewal expenditure definition above.

**Remaining useful life**

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

**Renewal**

See capital renewal expenditure definition above.

**Residual value**

The estimated amount that an entity would currently obtain from disposal of the asset, after deducting the estimated costs of disposal, if the asset were already of the age and in the condition expected at the end of its useful life.

**Revenue generating investments**

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

**Risk management**

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

**Section or segment**

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

**Service potential**

The total future service capacity of an asset. It is normally determined by reference to the operating capacity and economic life of an asset. A measure of service potential is used in the not-for-profit sector/public sector to value assets, particularly those not producing a cash flow.

**Service potential remaining**

A measure of the future economic benefits remaining in assets. It may be expressed in dollar values (Fair Value) or as a percentage of total anticipated future economic benefits. It is also a measure of the percentage of the asset's potential to provide services that is still available for use in providing services (Depreciated Replacement Cost/Depreciable Amount).

**Specific Maintenance**

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

**Strategic Longer-Term Plan**

A plan covering the term of office of councillors (4 years minimum) reflecting the needs of the community for the foreseeable future. It brings together the detailed requirements in the Council's longer-term plans such as the asset management plan and the long-term financial plan. The plan is prepared in consultation with the community and details where the Council is at that point in time, where it wants to go, how it is going to get there, mechanisms for monitoring the achievement of the outcomes and how the plan will be resourced.

**Sub-component**

Smaller individual parts that make up a component part.

**Useful life**

Either:

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

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

**Value in Use**

The present value of future cash flows expected to be derived from an asset or cash generating unit. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate net cash inflows, where the entity would, if deprived of the asset, replace its remaining future economic benefits.

*Source: IPWEA, 2009, Glossary*

*Additional and modified glossary items shown \**