City of Charles Sturt

Roads Assets

(Includes roads, carpark and civil elements of road safety assets)

Asset Management Plan

Scenario 2 Version 1
Revision 7 March 2018

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1. EXECUTIVE SUMMARY

The City of Charles Sturt includes some of Adelaide's oldest suburban developments. Over time, the City has grown both in size and demand and when reflecting the State's 30 year plan for growth, the expectation for coming years is no different. Asset Management Plans assist the City of Charles Sturt in continuing to balance investment in both new and existing assets to support this growth.

Roads are important lifelines for modern communities. They support easy movement of people whether by bicycle or motorised vehicles and the transport of goods using commercial vehicles. Roads and carparks provide access to schools, shopping centres and recreational areas as well as access to other transport nodes such as railway stations and airports.

The Asset Management Plan (AMP) aims to provide a service level for road assets of a minimum Condition 3 using three triggers for renewal. These are Condition, Function and Capacity based on the road hierarchy. Council is also working to introduce a new Strategic Asset Management (SAM) system which will assist in modelling the timing of intervention to ensure the service level above can remain with the existing LTFP.

1.1 Asset Description

The Road infrastructure asset network comprises of:

Road Seal

Road seals sit over the road pavement. The main purpose of the seal is to protect the pavement from water; it also functions as a safe, secure and dust free surface for vehicles to travel upon.

Road Pavement

The road pavement is made up of multiple layers of either crushed rock or multiple asphalt layers. The pavement provides the structure and load bearing capacity of the road. The key to ensuring pavements remain in good condition is by preventing water ingress into the pavement. Water causes pavement to lose its strength and consequently fail.

Kerb and Gutter

The edges of roads in metropolitan areas are generally lined with kerb and gutter that protect the edge of the asphaltic surface, seal in the sides of the road pavement and provide overland stormwater drainage. In the City of Charles Sturt most areas have concrete kerb and gutter with vertical kerb faces, but some areas have semi-mountable or mountable kerb with sloping kerb face or slate/stone kerb.

Carparks

Public carparks located on community land, open space areas and reserves are also included in this AMP. They are a similar construction to a road, consisting of an asphaltic surface over a pavement with concrete kerb and gutter. Traffic loading in these off-street public carparks is much less than on roads.

Road Safety Devices

Road Safety Devices such as roundabouts, pedestrian crossings (both signalised and signalised), driveway links and many others are primarily constructed with the same materials, occupy road carriageway areas and provide a function to the road network for all road users.

Road Hierarchy

Council has responsibility for all local streets. The street network is arranged in a hierarchical system as described below:

Residential Streets

Local Access Streets are generally used for access to and from the roadway and neighbouring properties. They typically carry up to 1,000 vehicles per day.

Collectors

Collectors are roads that generally function to carry traffic from Local Access Streets to Distributors, or the metropolitan Arterial Road network. They are often associated with local community facilities such as schools, churches, halls and local shops. They typically carry up to 3,000 vehicles per day.

Distributors

Distributors are roads that are generally used for cross suburban access between the metropolitan Arterial Roads and also support access to and from a surrounding suburb. They typically carry up to 9,000 vehicles per day.

Industrial Roads

Industrial roads include all of the above functions. The primary considerations are to carry commercial, heavy and regulated vehicles and kerbside loading, and access to properties for these vehicles.

Arterial Roads

Arterial roads are owned, operated and maintained by the Department of Planning, Transport & Infrastructure (DPTI) however Council have responsibility for the verges, kerbs and gutters.

1.2 Confidence Levels

The data being used in this AMP has medium level of confidence.

The entire street network was most recently audited in 2017 to determine the total amount of the assets in the network and the condition of the asset class.

A visual condition audit was also undertaken in 2012 which provided reasonably reliable data for all road assets (with an estimated 10-25% uncertainty) but there remains conflicting audit data with the kerb & gutter asset.

Kerb and Gutter and pavement are the most important and expensive part of the road asset so has a very large influence on forecast renewals. From experience CCS Engineers are finding the historical data is unreliable when assessing the type of pavement present in each street with an overall estimated 25-50% uncertainty. Whilst the recent 2017 audit means that we have reliable pavement data for collector and distributor roads, there remains a lack of information about the road pavement in residential streets.

An audit of the Council's Kerb and Gutter and additional testing and auditing of the residential pavements is planned for 2020. In the interim this AMP utilises the latest condition data and previously approved Long Term Financial Plan provision to:

- Address the forecast upsurge in renewals which commences in 15-years' time to above $20M per year (when the budget allocations to meet the demand are not sustainable)
- Accommodate uncertainty about the Kerb and Gutter and some pavement, which in residential streets is unknown, or there is insufficient information to make a structural assessment of its condition and remaining useful life
- Make provision for uncertainties around the level of urban renewal and densification; and building extension and restoration activity within the city will have existing road assets.

1.3 What does it Cost?

These road assets have a replacement value of **$647,336,000**. This includes:

- $647,336,000 for roads (which includes $26,032,000 for road safety devices)

This figure varies from the road valuation adopted on June 30 2017 of $621,153,644, due to the value of road safety devices being refined as part of this AMP review, and an increase in asset value, of those assets renewed between July 1 2017 and publication of this AMP.

The projected outlays necessary to provide the services covered by this AMP (including operations, maintenance, renewal and upgrade of existing assets) over the 10 year planning period is $124,514,000 or $12,541,000 on average per year.

The annual budget for expenditure on road assets is summarised for 2018/19 as:

Operations and Management	
Asset management	$188,000
Reactive Maintenance	
Seal maintenance (e.g. potholes)	$232,000
Kerb & gutter maintenance	$450,000
New/Upgrade	
Road Safety Devices (average)	$600,000
Renewals	
Project management	$155,000
Seal preservation	$566,000
Reseal	$2,000,000
Kerb & gutter	$1,200,000
Carpark Renewal (average)	$775,000
Road Safety Devices (average)	$300,000
Reconstruction (varies)	$5,000,000
Total Renewals	$9,996,000
Total Annual Expenditure (average)	**$11,466,000**

Over the life of the plan the existing LTFP has a slight surplus in estimated available funding. This is to account for higher replacement costs and a large up surge in Road Asset renewals in 15 years due to the age profile of the assets and higher replacement costs (e.g. replacement of unknown pavements).

2. INTRODUCTION

2.1 Background

This Asset Management Plan (AMP) communicates the actions required for the management of assets (and services provided from assets), compliance with regulatory requirements, and funding needed to provide the required levels of service over a 20-year planning period.
The AMP is to be read in conjunction with the City of Charles Sturt's planning documents. This should include the Asset Management Policy and Asset Management Strategy (where these have been developed) along with other key planning documents:

- City of Charles Sturt Corporate Plan 2016-2027
- City of Charles Sturt Community Plan 2013-2027 – A city where people come first
- City of Charles Sturt Asset Accounting Policy
- City of Charles Sturt Asset Fund Policy
- City of Charles Sturt Environmental Sustainability Policy
- City of Charles Sturt Living Green to 2020
- City of Charles Sturt Transport Plan 2016-2031
- SA Infrastructure Guidelines

The infrastructure assets covered by this AMP are shown in Table 2.1. These assets are used to provide transportation and mobility services to the local community.

Table 2.1: Assets covered by this Plan

Asset category	*Dimension*	*Replacement Value*
Road Pavements	4,585,169 square metres	$237,926,979
Road Seals	4,732,248 square metres	$93,958,410
Road Kerbing	1,398,379 lineal metres	$289,417,794
Road Safety Devices	952 items	$26,032,817
	TOTAL	**$647,336,000**

NOTE: This figure varies from the road valuation adopted on June 30 2017 of $621,153,644, due to the value of road safety devices being refined as part of this AMP review, and an increase in asset value, of those assets renewed between July 1 2017 and publication of this AMP.

2.2 Goals and Objectives of Asset Ownership

The City of Charles Sturt exists to provide services to its community, some of which are provided by infrastructure assets. Infrastructure assets have been acquired by construction by contract or council staff or through contribution of new public infrastructure from developers. The organisations goal in managing infrastructure assets is to meet a defined level of service 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.
- Linking to a long-term financial plan which identifies required, affordable expenditure and how it will be allocated.

Other references to the benefits, fundamental principles and objectives of asset management are:

- International Infrastructure Management Manual 2015.
- ISO 55000.

2.3 Core and Advanced Asset Management Plan Framework

This AMP is prepared as a combination of 'core' and 'advanced' AMP over a 20 year planning period in accordance with the International Infrastructure Management Manual[1].
Core asset management is a 'top down' approach where analysis is applied at the system or network level. An 'advanced' asset management approach uses a 'bottom up' approach for gathering detailed asset information for individual assets.

The organisation is moving to implementing a new Strategic Asset Management (SAM) system which uses advanced asset management principles to model service levels, future demands and network risks. The data used in generating this AMP has been broken down into individual assets using advanced principles however this AMP will focus on the assets at a network level. In the next AMP revision the new SAM system will be implemented to model the current advanced data against, current service and intervention levels, risks based on road hierarchy and future population demands.

Key elements of the plan are:

- Levels of service – specifies the services and levels of service to be provided by the organisation.
- Future demand – how this will impact on future service delivery and how this is to be met.
- Life cycle management – how we will manage our existing and future assets to provide defined levels of service.
- Financial summary – what funds are required to provide the defined services.
- Asset management practices,
- Monitoring – how the plan will be monitored to ensure it is meeting the organisation's objectives,
- Asset management improvement plan.

A road map for preparing an asset management plan is shown overpage.

[1] IPWEA, 2015, IIMM.

INFORMATION FLOWS

- Asset register data on size, age, value, remaining life of the network
- Unit rates for categories of work/material
- Adopted service levels
- Projections of various factors affecting future demand for services
- Correlations between maintenance and renewal, including decay models
- Data on new assets acquired by council

ASSET MANAGEMENT PLAN

- Assumed Works Program and trends
- Resulting budget, valuation and depreciation projections
- Useful life analysis

- Long term financial plan
- Strategic business plan
- Annual budget
- Departmental business plans and budgets

Source: Burnside Council Transport AMP 2016 COB 2017 revision p21.

3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

The City of Charles Sturt has undertaken community consultation on service levels and costs of providing the current level of service. Consultation feedback against current performance is listed below in table 3.1.

Table 3.1: Community Satisfaction Survey Levels

Performance Measure	Satisfaction Level				
	Very Satisfied	Fairly Satisfied	Satisfied	Somewhat satisfied	Not satisfied
Overall satisfaction with Council's performance of service levels		√			

A Charles Sturt Community Survey Report was conducted in April 2017 to capture residents' and business owners' satisfaction with aspects of services and facilities provided by Council and also to test the importance of specific aspects of service provided to the community.

Overall 63% of people were satisfied with the current service level of local roads and 37% were not satisfied.

3.2 Strategic and Corporate Goals

This asset management plan is prepared under the direction of the City of Charles Sturt's planning documents outlined in section 2.1 above. Relevant goals and objectives addressed in this asset management plan are:

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

Goal	Objective	Strategy
A liveable city of great places	City assets and infrastructure are developed and well maintained on a strategic and equitable basis	• Implement asset improvements and maintenance via Asset Management Plans to ensure they are fit for purpose and meet changing demands • Manage maintenance service levels and asset lifecycles to optimise design life and achieve service efficiency in line with community needs and diverse urban densities.
A liveable city of great places	Drive an integrated responsive transport system and network	• Continue to implement improvements to our transport network to improve road safety. • Invest in upgrades to the whole transport network to promote a balanced distribution of residents walking, cycling, using public transport and driving.
A liveable city of great places	Enhance the quality and diversity of open and public spaces	• Create public and open spaces that are engaging, safe and connected, and meet diverse community needs. • Ensure when required Road assets are made part of Integrated Streetscape Projects. Where possible incorporate road reconstructions in strategic redevelopment of precincts.
An environmentally responsible and sustainable city	Lead and educate to reduce the City's impact on the Environment and build resilience	• Promote and implement sustainable business practices to minimise our impact on the environment. • Increase the opportunity for incorporating recycled content, in particular glass fines, WAM Asphalt mix and Recycle Asphalt Pavement (RAP). • Incorporate climate adaptation in the design and ongoing management of road assets.

Leadership A leading and transformational local government organisation	Adaptive and sustainable management of the City's finances.	• Review and regularly update the Long Term Financial Plan to ensure financial sustainability into the future.

The City of Charles Sturt will exercise its duty of care to ensure public safety in accordance with the infrastructure risk management plan prepared in conjunction with this AMP. Management of infrastructure risks is covered in Section 6.

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Legislation	Requirement
South Australian Local Government Act 1999	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.
South Australian State Records Act 1997	To ensure the City of Charles Sturt records and stores all relevant information as set out by the State Government of SA
Environment Protection Act 1993	To ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment having regard to the principles of ecologically sustainable development
Work Health and Safety Act 2011	To take a constructive role in promoting improvements in work health and safety practices whilst assisting in the preservation of public health and safety in all undertakings of the organisation.
Development Act 1993	An act to provide for planning and regulate development in the state; to regulate the use and management of land and building and for other purposes
Australian Road Rules	An act which gives road authorities in each state delegated power to establish standards for all aspects of roadways, including bridges and shared use paths.
Disability Discrimination Act 1992	Provides protection for everyone in Australia against discrimination based on disability. It encourages everyone to be involved in implementing the Act and to share in the overall benefits to the community and the economy that flow from participation by the widest range of people.

3.4 Customer Levels of Service

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

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

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

Quality How good is the service … *what is the condition or quality of the service?*
Function Is it suitable for its intended purpose …. *is it the right service?*
Safety Is the road safe for users … *are roads free of hazards and safe for driving on?*

The current and expected customer service levels are detailed in Tables 3.4 and 3.5. Table 3.4 shows the expected levels of service based on resource levels in the current long-term financial plan.

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

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

Table 3.4: Customer Level of Service

CUSTOMER LEVEL OF SERVICE				
	Service Expectation	**Performance Measure Used**	**Current Performance**	**Expected Position in 10 Years based on the current budget.**
Quality				
Appearance	Extent of pavement failures (potholes and cracks) Extent of water ponding	Overall 2017 Condition data Complaints regarding cracks, potholes, poor trench reinstatement, kerb damage, organic matter etc	Intervention level for reseal condition 3 and for pavement reconstruction level 4.	Minimum Condition 3 Desirable network average 2 (on 1 to 5 scale) Minimum Condition 3 Desirable network average 2
Ride ability	Smooth ride	Overall 2017 Condition data Complaints regarding ride surface roughness	Measured through Customer Request Management System.	Reduction in CRM's (Customer Requests) over a 10 year planning period.
Road widths	Carriageway maximised where required except where restricted by trees and traffic issues.	Overall 2017 Condition data. Carriageway width meets/exceeds requirements for road hierarchy	When roads are reconstructed road width optimised depending on tree presence and other capacity issues and residents consulted on design.	Continue current performance.
Reactivity	Responsiveness	Time taken to inspect failures	Measured through Customer Request Management System.	Reduction in CRM's (Customer Requests) over a 10 year planning period.
Function				
Network Functionality	Provide roads that meet need for all types of vehicles and other users.	Reliability of access for all types of vehicles and decrease complaints about potholes. Reduce number of roads that fall below condition rating 3. Reduce requests for kerb and gutter repairs	Measured through Customer Request Management System.	Reduction in CRM's (Customer Requests) over a 10 year planning period.

Safety				
Hazards	No traffic hazards	Overall 2017 Condition data. Potholes, surface failures and poor trench reinstatements Thermal heat effect on roads and road users	Measured through Customer Request Management System. Measured through research on urban island heat effect	Reduction in CRM's (Customer Requests) over a 10 year planning period. Reduction in urban island heat effect over life of the asset.
Conditions	Safe driving conditions	Overall 2017 Condition data. Time taken to respond to unsafe issues.	Measured through Customer Request Management System.	Reduction in CRM's (Customer Requests) over a 10 year planning period.
Traffic Issues	Minimising traffic congestion on local roads	Resident complaints about Volume and speeding vehicles	Measured through Customer Request Management System.	85% of vehicles travelling below speed limit.

3.5 Technical Levels of Service

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

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

- Operations – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc.).
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs).
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement).
- Upgrade/New – 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).

Asset Managers plan, implement and control technical service levels to influence the customer service levels.[2]
Table 3.5 shows the technical levels of service expected to be provided under this AMP. The 'desired' position in the table documents the position being recommended in this AMP.

[2] IPWEA, 2015, IIMM, p 2|28.

Table 3.5: Technical Levels of Service

TECHNICAL LEVELS OF SERVICE				
Service Attribute	**Service Activity Objective**	**Activity Measure Process**	**Current Performance ***	**Desired for Optimum Lifecycle Cost ****
Operations				
	To ensure services are provided to achieve best value for money.	Number of customer complaints about potholes and kerb damage.	Predominantly adhoc based on CRM from residents, elected members and staff	Roads managed taking all data into account and producing programs for maintenance and renewals to be implemented at optimal times to achieve best value for money based on CCS intervention level (condition 3) and road hierarchy.
		Budget	**$188,000**	
Maintenance				
	Ensure that road infrastructure is well maintained	Quantity of work done e.g. number of potholes repaired, number of square metres of area patching compared to quantity of work required to be done.	Predominantly on CRM from residents, elected members and staff. Repair potholes as soon as practical after reporting. Ensure K & G is not lifted more than 40mm; conveys water and is not damaged by trees, trucks or development.	Formalised program for Local Area Patching for Asphalt Seals. Formal program for kerb and gutter maintenance.
		Budget	**$1.25M**	
Renewal				
	Develop and maintain a safe and effective road network for all road users.	Successfully delivering annual road renewal program on time and on budget.	Determined from road strategy of renewing road assets that are at condition 3 and below.	Intervene when road asset condition prior to declining to an unserviceable state and start to decline in condition (e.g. condition 3).
		Budget	**$10.75M**	
Upgrade/New				
	Develop and maintain a safe and sufficient road network. Upgrade only if need arises.	Monitor to determine upgrade requirements	Currently new roads are “inherited” or contributed from sub divisions etc.	Have all road assets meet capacity and safety requirements of the community.
		Budget	**As required**	

The organisation will continually monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology. Customer priorities will change over time hence review and establishment of the agreed position which achieves the best balance between service, risk and cost is essential. It is expected the new SAM system will be able to model expected service levels and easily alter them as they change over time. This will be incorporated in the next AMP.

4. FUTURE DEMAND

4.1 Demand Drivers

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

4.2 Demand Forecasts

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

4.3 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and use 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	114,688 (2016 figure)	2021 – 120,658 2026 – 125,889	Increase and demand in in traffic loads which will reduces useful life of road assets.
Subdivision	CCS is experiencing significant development which creates a number of higher density locations through urban renewal, infill development and subdivision.	Multiple stages of developments such as St Clair, Bowden, Woodville West and Ray St are completed. The WEST development in the AAMI Stadium precinct is well underway and future stages of Bowden and Woodville West are planned for construction in 2018 and onwards. Renewal SA are also investing in renewing existing housing trust areas with new roads and dwellings. Future land divisions expected in the Council area are in the industrial estate (Detmold Site) in Brompton due to current DPA amendments in progress. Smaller infill development continues with creating 2 or 3 allotments from one larger allotment.	Some localised strain on existing community infrastructure and services is expected. Increased number of service trenches by services authorities impacting and reducing useful life of roads if not properly reinstated.

Field Staff Numbers	CCS currently employs approximately 168 field staff	Water Proofing the West; Bowden; St Clair; Woodville West and WEST (AAMI Stadium) developments will require additional field staff to maintain new assets. Beverley Centre and the Horticultural Centre are currently at capacity.	Some localised strain on existing Community infrastructure and services is expected.
Environmental impacts	Roads are constructed to with stand today's known and future environmental conditions. Roads are constructed to meet current environmental standards.	Greater environmental sustainability requirements placed on the construction industry.	Higher costs associated with construction methods that are environmentally sustainable, e.g. dealing with disposal of contaminated old road pavement material, using Warm Asphalt Mix.
Legislative Requirements	New roads constructed and maintained according to current legislation.	Roads constructed according to current legislative requirements.	Unknown

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 can include non-asset solutions, insuring against risks and managing failures.

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 Plan Summary

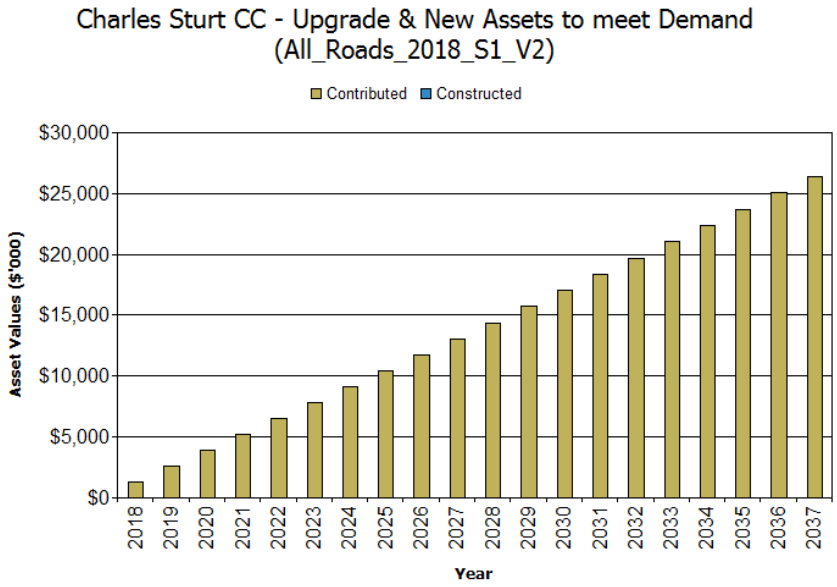
Demand Driver	Impact on Services	Demand Management Plan
Increasing land use density	Greater demand for and use of roads	Investigate the impact of rising activity on roads in the Growth Corridor and higher density development areas with our partners (e.g. State Government, DPTI)
Redevelopment activities	Damage caused by others undertaking works that affect roads.	Develop improved partnerships with service agencies and improve monitoring of development activities.
Increasing awareness of the environmental impact and cost of motorised transport	Greater demand for and use of roads	Investigate the impact of rising activity on roads with our partners (e.g. State Government, DPTI).
Increasing desire to realise benefits of active recreational activities	Greater demand for and use of roads to reach peoples desired activities destinations.	Investigate the change in our community toward increase recreational activity with our partners (e.g. Heart Foundation).

4.5 Asset Programs to meet Demand

In most instances new assets required to meet demand and growth of the community will be acquired free of initial cost acquired from developers contributing to the construction of new public infrastructure. New assets that will be

constructed by the organisation are discussed in Section 5.5. The cumulative value over the next 20 years expected for the community of additional assets is shown in Figure 1 (note values are in dollars).

Figure 1: Upgrade and New Assets to meet Demand – (Cumulative)



Acquiring these new assets will commit the organisation to fund ongoing operations, maintenance and renewal costs of these assets for their economic lives. 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 the organisation plans to manage and operate the assets at the agreed levels of service (defined in Section 3) while optimising life cycle costs. Based on Council's current knowledge and audit data, the useful lives of Road assets have been altered.

In previous AMP revisions Expected Useful Life (years) of road assets were represented as below;

- Road Seal 33 years
- Road Pavement 76 years
- Kerb & Gutter 55 years
- Road Safety Devices 35 years – 90 years

With the organisation moving to an advanced AMP and new SAM system in future years the lifecycle management plan of assets has been altered. The new plan uses new "range" of useful lives based on 2017 condition and valuation audit of road assets for each individual asset type. This then will allow the organisation to model the expected economic life of each type of individual asset type and intervene at the correct time to ensure the organisations service levels are not compromised.

Council's current knowledge and audit data, shows that each different type of asset has a different useful life therefore a range of road asset useful lives have been incorporated. Useful lives have been adjusted to the following;

Seal – Useful life: 35-90 years

In an optimum environment a 30mm thick asphalt seal useful life is 35 years and a 100mm thick concrete road seal has a useful life of 90 years. Useful lives for each seal type asset also change dependant on what street the seal is located on in the overall network. e.g. the useful life for a seal on a Distributor road is different to the useful life for a seal on a dead end residential street.

Kerb and Gutter – Useful life: 50-90 years

Kerb and gutter useful lives are impacted by environmental factors such as heavy vehicles, private building construction and the locality of different tree species in relation to the kerb and gutter.

Pavement

Base Layer – Useful life: 60-120 years

Sub Base Layer – Useful life: 95-200 years

Generally for Charles Sturt Council pavement is split up into 2 layers; a Base Layer and a Sub Base Layer. These are typically made up of different types of granular material. The organisation is also investing in "Deep-Lift" asphalt type pavements, which uses multiple layers of asphalt, laid on a layer of granular material In some cases deep lift construction allows one or even both pavement layers to remain from the old road and deep lift asphalt pavement is installed on top the. Typically deep lift asphalt layers are reflected in the asset system as multiple layers of seal assets.

Road Safety Devices – Useful life: 2-60 years

A range of useful life for these assets was incorporated in the Road Safety Asset Management Plan in 2016 and these useful lives have been carried over as the organisations data shows for each different type of Road Safety Device. For example a driveway slow point has a different useful life when compared to a signalised pedestrian crossing.

Economic life for all road assets

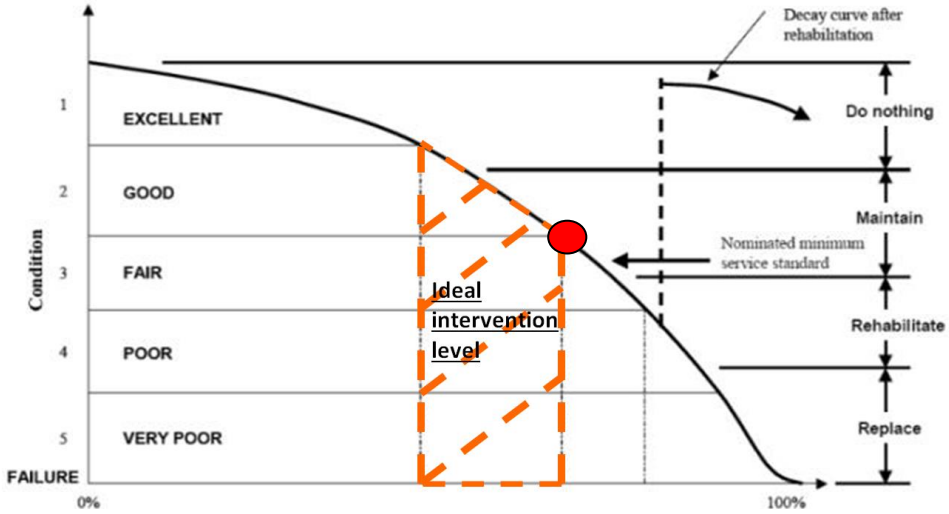
It is important to consider how assets behave throughout their useful life; although an asset can have a useful life of say 50 years the asset may not be serviceable for its entire useful life. As assets get older and their condition decreases they can potentially become unserviceable rapidly. The Deterioration Curve in Figure 2 below shows how assets behave (in particular road assets) during their useful lives. As assets get to a condition 3 (approximately 60%) of their useful life, they require intervention of maintenance and rehabilitation to ensure they can remain serviceable prior to being replaced.

The City of Charles Sturt's current level for intervention based on the condition of an asset is condition 3. This is shown in a red circle on the deterioration curve in Figure 2. In order to ensure assets always remain at an almost optimum

level Figure 2 shows an ideal intervention level is between a Condition 2 and a Condition 3 – this is not always achievable or sustainable.

Figure 2: Economic Life and Decay in Condition of Assets

Source: Network Management – Asset Management (Pavements): http://www.tii.ie/roads-tolling/operations-and-maintenance/Pavements/



With the new revision of useful lives in this AMP, it is important to remember that although the organisations road data shows that road assets in the City of Charles sturt last longer than previous AMP's predicted, maintaining the correct service and intervention levels is key to ensure all Road assets remain sustainable over the entire planning period of the AMP.

The above values will be monitored as more historical data is recorded, so that over time the expected lives and deterioration curves can be validated or adjusted. This will allow the condition to be better estimated at any point in time for each base and seal type. The introduction of the new SAM system in future years will assist with modelling the "optimum level" or "Council agreed level" of intervention on the decay curve for road assets in future.

5.1 Background Data

5.1.1 Physical parameters

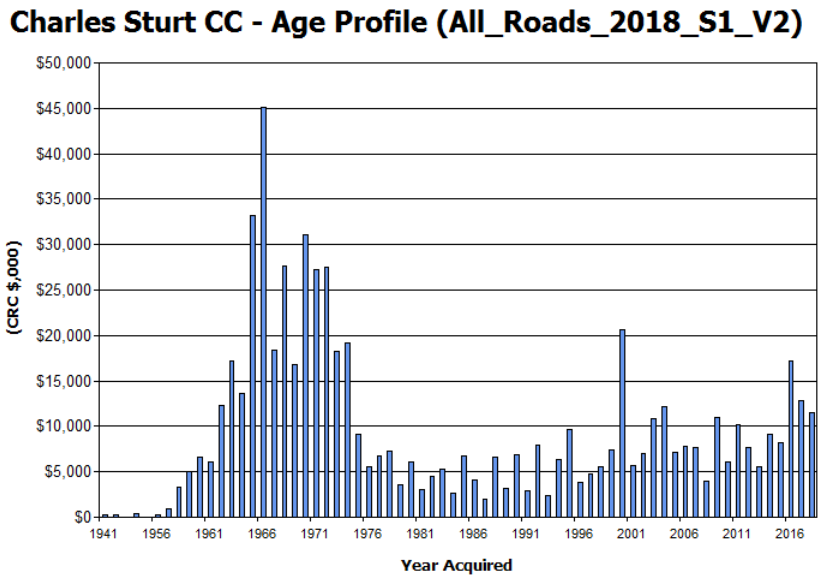
The assets covered by this asset management plan are shown in Table 2.1.

The majority of the roads in the City of Charles Sturt were constructed in their current forms from about the 1950's and re-constructed as needed over time. In the 1950's through to 1970's the previous City of Woodville embarked on a major road reconstruction program called the 15 Year Plan when most of their roads were reconstructed to what we see today. Most roads were constructed about 8 metres wide with 150mm high kerb and gutter on both sides to provide effective drainage paths to the underground drainage system. The large number of roads constructed under the 15 Year Program are starting to reach the end of their useful lives over the next 10 to 20 years and may exert higher than normal funding pressures.

There has also been a substantial increase in traffic loads over the last 50 years and many seals and pavements do not meet current standards and where identified to be required, will need to be reconstructed to a higher standard. This means the cost of construction will be higher than reported replacement costs.

The age profile of the assets included in this AMP are shown in Figure 3.

Figure 3: Asset Age Profile



In order to be sustainable in the future and ensure road assets are managed to a satisfactory level the organisation needs to ensure that intervention levels are continually met and road condition is intercepted early. If this does not happen, a significant amount of construction costs will be expected to either, repair, maintain or reconstruct Road assets in 15 years' time. This is due to the significant amount of assets constructed in the 1960's.

5.1.2 Asset capacity and performance

The organisation's services are generally provided to meet design standards where these are available.
Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: Known Service Performance Deficiencies

Service Deficiency
Road pavements with insufficient pavement to reach the estimated useful life. Such pavements will need to be reconstructed earlier than expected.
Traffic loads and volumes have increased substantially over recent years and will have the effect of reducing pavement useful life.
Most road pavements constructed last century do not meet current design standards.
Areas of Fulham Gardens, Henley Beach South and Brompton have soils that react with moisture variations causing road cracking and pavement deterioration.

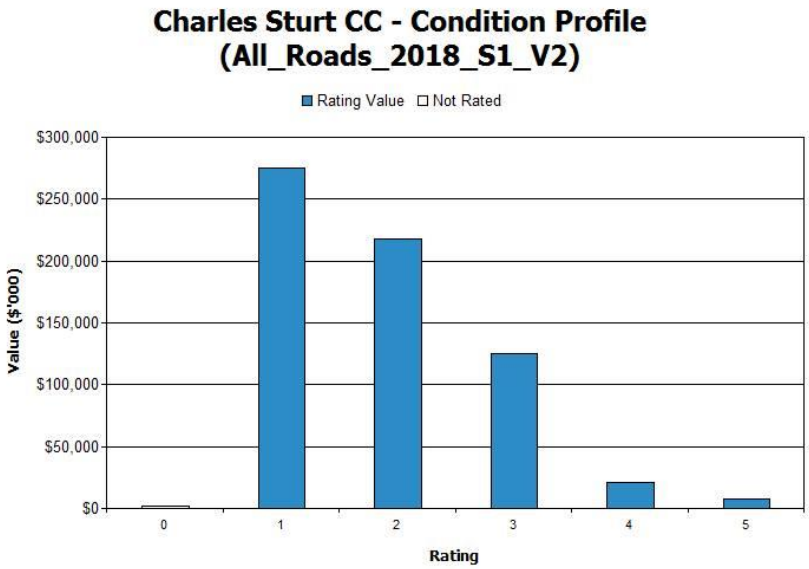
The above service deficiencies were identified from;

- Historical knowledge of road construction
- Knowledge gained from pavement testing
- Observing road deterioration after sustained wet seasons. i.e. number of potholes and pavement failures.

5.1.3 Asset condition

Condition is continually monitored using 'casual' surveillance by Council staff and reports from the community. Defects are captured in the Works and Assets System and programmed for repair should a renewal not be pending in the short term. A formal audit by organisations specialising in auditing is conducted regularly, around every 5 years for Road Assets Register reconciliation and updated road condition assessment.
A review of those assets with poor condition ratings, is undertaken by staff annually as part of the preparation of the road renewal capital works program and subsequent budget bid process.
The condition profile of our assets is shown in Figure 4.

Fig 4: Asset Condition Profile



Overall the condition of Charles Sturt Council's Road assets are in good condition, this is due to the intervention and expected service levels established in early AMP's. Current data confidence in Road Seals, Pavements and Road Safety Devices is medium to high. It is also important to note although data confidence in Pavements is medium to high staff only have sufficient knowledge of pavement profiles for Collector and distributer roads. There is a lack of knowledge in the existing pavement profiles (if existing) for residential streets. Residential streets make up a significant amount of the road asset class and will require further auditing on their existing pavement profiles in future auditing (planned for 2020).

It is important to note that although current data suggests roads are in good condition there is a lack of confidence in the existing data for Kerb and Gutter. The road audits conducted in 2012 and 2017 both show conflicting results of where the condition of the asset sits. Kerb and gutter makes up almost 50% of the road asset class and can have a significant influence on how the condition of the asset class sits. Staff is of the opinion that 70% of the kerb and gutter sit in a condition 3 rating; if this is correct it may alter the overall condition of Road Assets. This will need to be investigated in future auditing (planned for 2020) and the data refined accordingly.

Condition is measured using a 1 – 5 grading system[3] as detailed in Table 5.1.3.

Table 5.1.3: Simple Condition Grading Model

Condition Grading	Description of Condition
1	**Very Good**: only planned maintenance required
2	**Good**: minor maintenance required plus planned maintenance
3	**Fair**: significant maintenance required
4	**Poor**: significant renewal/rehabilitation required
5	**Very Poor**: physically unsound and/or beyond rehabilitation

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

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services such as public health, safety and amenity, e.g. cleaning, street sweeping, utilities costs 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, e.g. road patching.

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.

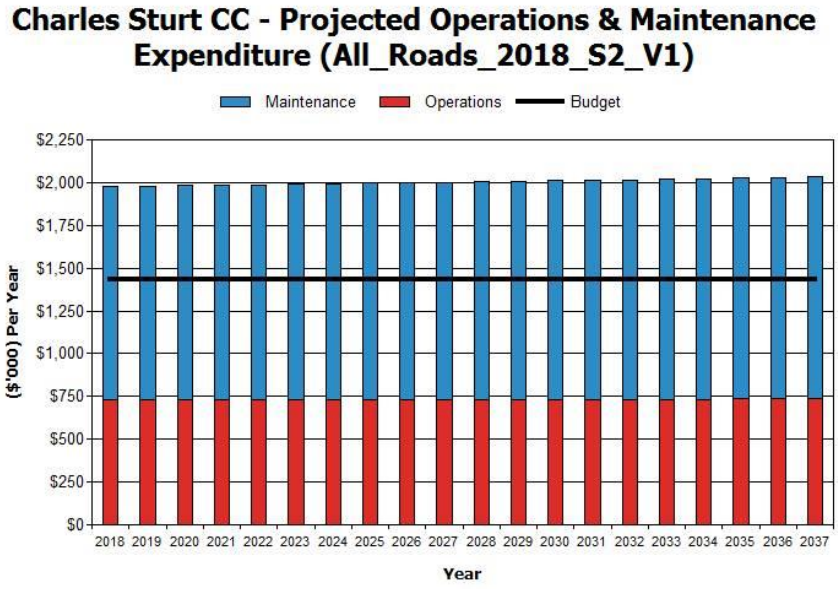
Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Maintenance work is carried out in accordance with the following Standards and Specifications:

- AS2876 Kerb and Gutter Standard
- Councils Internal Standards, which includes RoCond 90 principles
- Austroads (http://austroads.com.au/about-austroads/about-austroads)

5.2.1 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 5. Note that all costs are shown in current 2018 dollar values (i.e. real values).

Figure 5: Projected Operations and Maintenance Expenditure



A review of current operation and maintenance expenditure has been undertaken as part of this AMP. There has been an increase in operation and maintenance expenditure over the last 2-3 years, hence why the expenditure is higher than the original budgeted amount in the AMP. The maintenance shown in the graph above the black line is funded from the Road Rehabilitation program for major maintenance practices.

Council has begun to make allowances for major maintenance in the road rehabilitation program for seal preservation. This maintenance is required to be undertaken to allow assets to achieve closer to their useful lives and potentially defer intervention for renewal as these preservation treatments can keep roads at a serviceable level.

Such seal preservation treatments include;

- Crack Sealing – Seals all cracks in roads.
- Micro Sealing – thin self-levelling seal that sits upon an existing seal when surface is uneven.
- Slurry Sealing – preservation treatment painted onto existing roads to prevent oxidation of binders in asphalt.

Maintenance is funded from the operating budget and the road rehabilitation program. This is further discussed in Section 7.

5.3 Renewal/Replacement Plan

Renewal and replacement expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an upgrade/expansion or new work expenditure resulting in additional future operations and maintenance costs.

Assets requiring renewal/replacement are identified from one of three methods provided in the 'Expenditure Template':

Method 1
Asset Register data to project the renewal costs using acquisition year and useful life to determine the renewal year

Method 2
Capital renewal expenditure projections from external condition modelling systems (such as Pavement Management Systems)

Method 3
A combination of average network renewals plus defect repairs in the Renewal Plan and Defect Repair Plan worksheets on the 'Expenditure template'

Method 2 was used for this AMP.

The organisation 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 options that could address the service deficiency.
    - and evaluate the options against evaluation criteria adopted by the organisation.
    - 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 Extreme 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 the organisation is obtaining best value for resources used.

5.3.1 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. seal and pavement in reactive soil), or To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. roughness of a road).[4]

[4] IPWEA, 2011, IIMM, Sec 3.4.4, p 3|60.

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 the organisation.
- Have the highest average age relative to their expected lives.
- Are identified in the Asset Management Plan as key cost factors.
- Have high operational or maintenance costs.
- Where replacement with modern equivalent assets would yield material savings.[5]

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 5.3.1.

Table 5.3.1: Renewal and Replacement Priority Ranking Criteria based on Condition and Road Hierarchy

Criteria	Weighting*
Where road condition has deteriorated to unacceptable level that could lead to Public Liability claims against Council	4
Road Hierarchy - distributor, collector, local access	3,2,1
Public Transport routes	3
Access to local industrial areas	2
Access to Emergency Services Depots	3
Roads that attract high numbers of tourist or other visitors e.g.` coastal roads	2

Although not used in preparing this AMP, the above criteria and weighting are used to assist the Asset Manager to prioritise assets on a risk basis for inclusion in the capital works renewal program.

5.3.2 Renewal and replacement standards

Renewal work is carried out in accordance with the following Standards and Specifications.

- Austroads Pavement Design.
- PM 2000 DPTI Standard Specification for delivery of pavement materials.
- ReCond 90 Principles.
- Councils Internal Standards including NATSPEC specification.

5.3.3 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time when the asset stock increases. Due to the age profile of the City of Charles Sturts roads it is expected that a sudden jump of renewal and replacement expenditure is required in 15 years when roads constructed in the 1960's reach closer to their economic or useful lives.

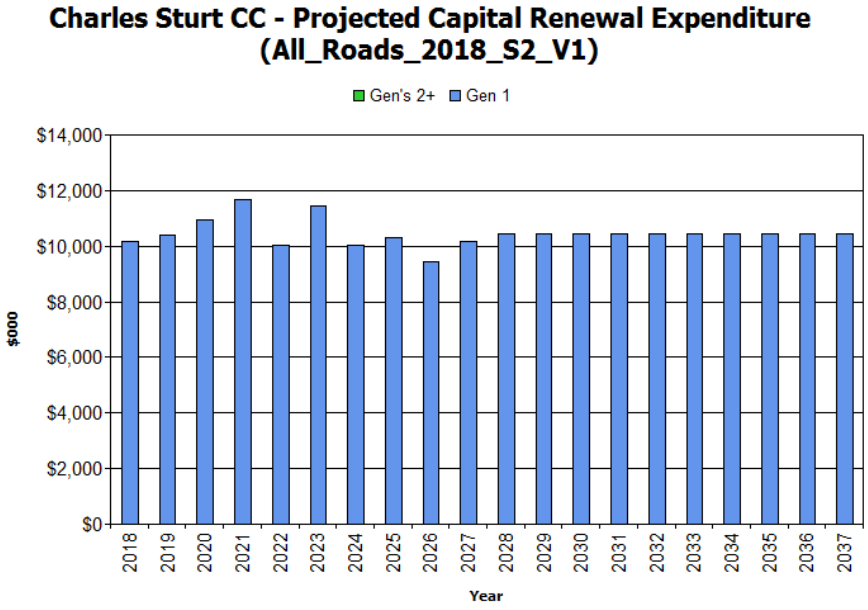
The expenditure associated with this AMP is shown in Fig 6. Note that all amounts are shown in current (real) dollars.

The organisation will need to maintain its current Long Term Financial Plan (LTFP) to meet the demands of the projected expenditure in 15 years. It is expected that the LTFP will be reviewed after the implementation of the SAM system and after the next Kerb and Gutter audit planned for 2020.

[5] Based on IPWEA, 2011, IIMM, Sec 3.4.5, p 3|66.

The Council 4 year projected capital renewal and replacement program as required by the Act is provided as a separate document to Council to the AMP.

Fig 6: Projected Capital Renewal and Replacement Expenditure



Deferred renewal and replacement, i.e. those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.
Renewals and replacement expenditure in the capital works program will be accommodated in the long term financial plan. This is further discussed in Section 7.

5.4 Creation/Acquisition/Upgrade Plan

New works are those that create a new asset that did not previously exist, or works which will 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 directly to Council from major land developments.

These additional assets are considered in Section 4.4.

5.4.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. 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 5.4.1: New Assets Priority Ranking Criteria

Criteria	Weighting
Function due to growth – road hierarchy ranking, usage, risk	50%
Amenity and future predicted climate conditions	25%
Lifecycle Cost	25%
Total	100%

5.4.2 Summary of future upgrade/new assets expenditure

There are no plans to build new road assets for the life of this plan. As such new expenditure works are at zero values. No upgraded or new assets (e.g. carpark upgrade) have been accommodated in the long term financial plan.

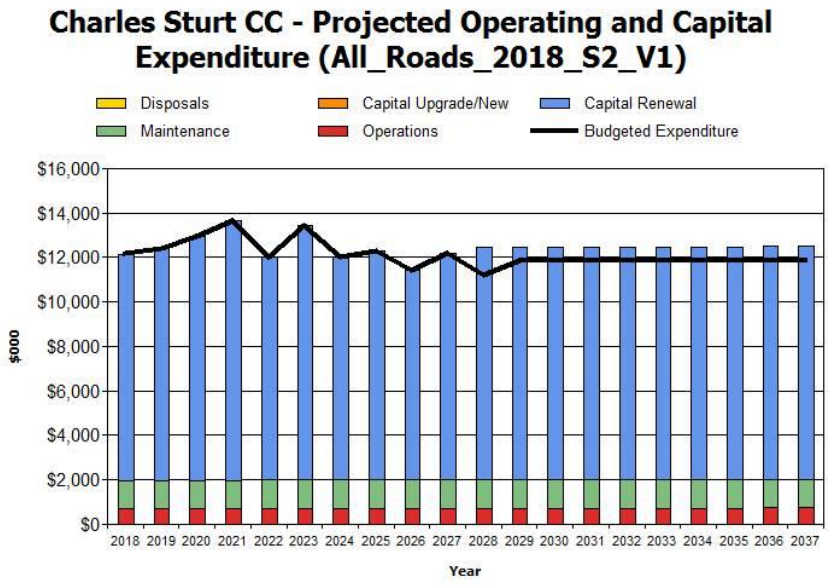
Expenditure on new assets and services in the capital works program will be generated as required and budget approval will be at the discretion of Council approval.

5.4.3 Summary of asset expenditure requirements

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

The bars in the graphs represent the anticipated budget needs required to achieve lowest lifecycle costs, the budget line indicates what is currently available. The gap between these informs the discussion on achieving the balance between services, costs and risk to achieve the best value outcome. As above the organisation will need to maintain its current Long Term Financial Plan (LTFP) to meet the demands of the projected expenditure in 15 years. It is expected that the LTFP will be reviewed after the implementation of the SAM system and after the next Kerb and Gutter audit planned for 2020.

Fig 7: Projected Operating and Capital Expenditure



5.5 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Together with estimated annual savings from not having to fund operations and maintenance of the assets. Any costs or revenue gained from asset disposals is accommodated in the long term financial plan. When new road assets are constructed the old asset is decommissioned and disposed of.

6. RISK MANAGEMENT PLAN

The purpose of infrastructure risk management is to document the results and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2009 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2009 as: 'coordinated activities to direct and control with regard to risk'[6].

An assessment of risks[7] 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'. 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.

6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Similarly, critical failure modes are those which have the highest consequences.

Critical assets have been identified and their typical failure mode and the impact on service delivery are as follows:

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
All Roads	Failure resulting in inability for users to conduct daily business. Injury risk to elderly and people with reduced mobility.	Maintenance and repairs in accordance with agreed response and service levels
Road Seal	Cracking, Pot Holes, etc.	Repatching or Resealing Causes water ingress into road pavement and can result in reduced useful life of pavement
Road Pavement	Distortion / wave	Reconstruction Soil under road has failed/pavement is not suitable for road function/traffic demand
Kerb and Gutter	Cracking, depression, lifting causing water ponding and water ingress into road pavement	Repair Causes water ingress into road pavement and can result in reduced useful life of pavement and kerb & gutter

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

6.1.1 Standards and specifications

Maintenance work is carried out in accordance with the following Standards and Specifications:

- AS2876 Kerb and Gutter Standard
- Councils Internal Standards, which includes RoCond 90 principles
- Austroads (http://austroads.com.au/about-austroads/about-austroads)

[6] ISO 31000:2009, p 2

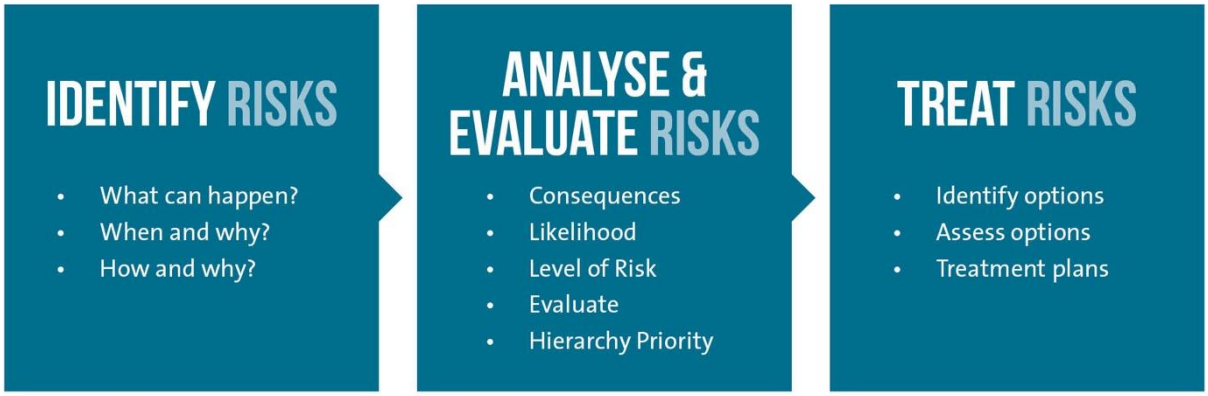
6.2 Risk Assessment

The risk management process used in this project is shown in Figure 8 below.

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

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

Fig 8 Risk Management Process – Abridged



The risk assessment process identifies credible risks, the likelihood of the risk event occurring, road priority in the road hierarchy, the consequences should the event occur develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

Table 5.3.1 outlines weighting criteria for roads based on condition or hierarchy.

6.2.1 Service Consequences and Risks

The organisation has prioritised decisions made in adopting this AMP to obtain the optimum benefits from its available resources. Decisions were made based on the development of 3 scenarios of AMPs.

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 AMPs 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).

This AMP has been completed using a combination of all 3 Scenarios. Council has an existing budget that allows the AMP to balance the risks of the road assets and the asset register data provides a basis for where the AMP and future works is generated from.

6.2.2 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 15 years. These include:

- Renewal of roads with poor base that may fail prematurely

- Renewal of Roads associated with transport routes that may fail prematurely due to increased traffic conditions
- Renewal of large Kerb and Gutter sections that are not associated with the CCS Road Rehab program

6.2.3 Service consequences

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

- Some lack of connectivity for public transport, vehicular and cycling activities.
- Deterioration of residential access.
- Increase in area maintenance costs in residential streets.

6.2.4 Risk consequences

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

- Increased potholes in streets.
- Increased customer complaints regarding lack of renewal of roads.

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.

7. FINANCIAL SUMMARY

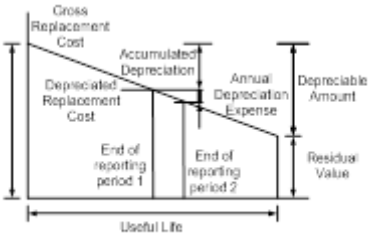
This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available with the SAM system in the next AMP on desired levels of service and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

7.1 Financial Statements and Projections

7.1.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. Assets are valued at $647,336,000.

Gross Replacement Cost	$647,336,000
Depreciable Amount	$647,336,000
Depreciated Replacement Cost[8]	$405,518,000
Annual Average Asset Consumption	$8,829,000



7.1.2 Sustainability of service delivery

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

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

7.1.3 Long Term Asset Renewal Funding Costs

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 operations and maintenance expenditure and asset consumption (depreciation expense). The life cycle cost for the services covered in this asset management plan is $10,818,000 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 operations, 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 $12,464,000 per year (average operations and 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 gap for services covered by this AMP is +$1,646,000 per year (-ve = gap, +ve = surplus).

Life cycle expenditure is 115% of life cycle costs. This means for the life of the AMP the councils existing budget can fund the required expenditure for road assets at the current service level. The surplus that is generated will assist in allowing for higher replacement costs of construction (in particular where road pavement layers do not exist; replacement cost is significantly higher).

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. This is not the case in this revision of the AMP.

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

7.1.4 Projected expenditures for long term financial plan

Table 7.1.2 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in 2018 real values. It is evident that the road asset age profile will have significant impact on the LTFP in approximately 15 years with projected required renewals starting at $10 Million and then increasing beyond the life of the plan.

Table 7.1: Projected Expenditures for Long Term Financial Plan ($000)

Year	Operations ($000)	Maintenance ($000)	Projected Capital Renewal ($000)	Capital Upgrade/ New ($000)	Disposals ($000)
2018	$728	$1,248	$10,181	$0	$0
2019	$728	$1,250	$10,407	$0	$0
2020	$729	$1,253	$10,955	$0	$0
2021	$729	$1,256	$11,670	$0	$0
2022	$730	$1,258	$10,019	$0	$0
2023	$730	$1,261	$11,429	$0	$0
2024	$730	$1,263	$10,030	$0	$0
2025	$731	$1,266	$10,324	$0	$0
2026	$731	$1,268	$9,429	$0	$0
2027	$731	$1,271	$10,180	$0	$0
2028	$732	$1,273	$10,462	$0	$0
2029	$732	$1,276	$10,462	$0	$0
2030	$733	$1,278	$10,462	$0	$0
2031	$733	$1,281	$10,462	$0	$0
2032	$733	$1,283	$10,462	$0	$0
2033	$734	$1,286	$10,462	$0	$0
2034	$734	$1,289	$10,462	$0	$0
2035	$734	$1,291	$10,462	$0	$0
2036	$735	$1,294	$10,462	$0	$0
2037	$735	$1,296	$10,462	$0	$0

NOTE: $1.016 Mil of the above Maintenance is funded by the Capital Renewal Budget each year for Seal Preservation and Larger K&G Renewal. This reduces the overall spend on Renewals for the Road Rehabilitation and Road Re-Seal Programs.

7.2 Funding Strategy

Funding for assets is provided from the budget and long term financial plan.

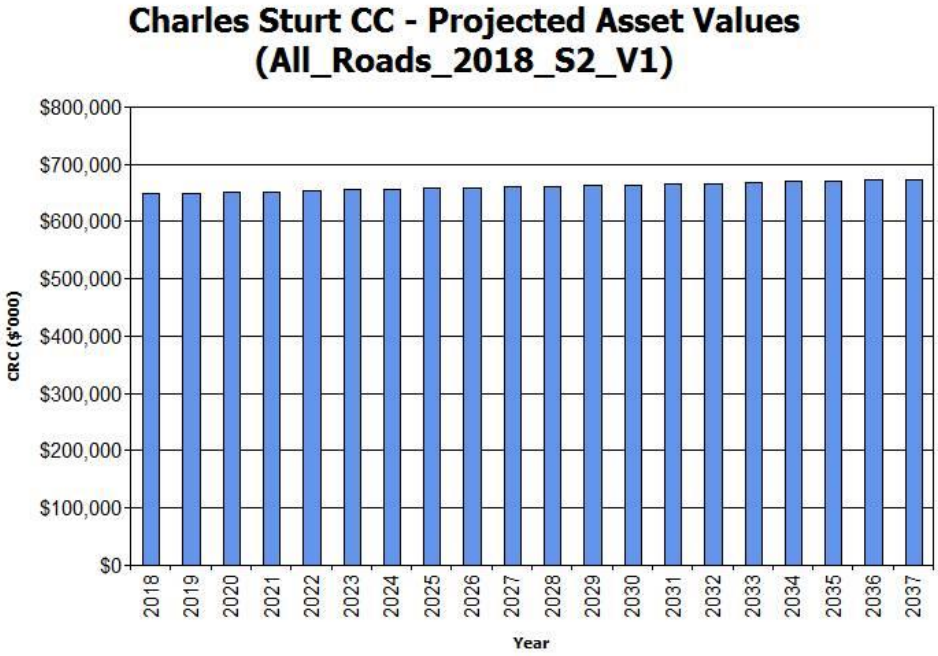
The financial strategy of the entity determines how funding will be provided, whereas the asset management plan communicates how and when this will be spent, along with the service and risk consequences of differing options.

7.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by the organisation and from assets constructed by land developers and others and donated to the organisation. Figure 9 shows the projected replacement cost asset values over the planning period in real values.

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

Figure 9: Projected Asset Values



7.4 Key Assumptions Made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this AMP 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 7.4.

Table 7.4: Key Assumptions made in AM Plan and Risks of Change

Key Assumptions	Risks of Change to Assumptions
Forecasted on "today's" dollars, CPI is added in the financial budgeting cycle	If CPI is not added, forecast will be inaccurate
Staffing needs are resourced adequately	Unable to resource planned asset management activities
No significant changes in Legislation	Changes may demand unplanned/unbudgeted asset management activities
Growth as forecast	Forecasted growth may demand unplanned/unbudgeted asset management activities

7.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AMP 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[9] in accordance with Table 7.5.

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

Table 7.5: Data Confidence Grading System

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

The estimated confidence level for and reliability of data used in this Asset Management Plan is shown in Table 7.6.

Table 7.6: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Reliable	Existing demand drivers are reliably researched
Growth projections	Uncertain	Based on State Government 30 year plan and known increases in the short medium term
Operations expenditures	Reliable	Based on known expenditure and type of issue
Maintenance expenditures	Uncertain	Dependent on industry wide cost structure. Recently decreased, but long term average is still increasing.
Projected Renewal exps. - Asset values	Reliable	Many competing projects.
- Asset residual values	Reliable	Well researched and up-dated yearly
- Asset useful lives	Reliable	Well researched
- Condition modelling	Uncertain (Due to Kerb Data)	SAM system and advanced Asset Management will allow better modelling
- Network renewals	Uncertain	SAM system and advanced Asset Management will allow better modelling
- Defect repairs	Uncertain	SAM system and advanced Asset Management will allow better modelling
Upgrade/New expenditures	Uncertain	Many competing projects
Disposal expenditures	Reliable	Well researched and up-dated yearly

Over all data sources, the data confidence is assessed as **reliable (B)** confidence level for data used in the preparation of this AMP.

8. PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices

City of Charles Sturt engaged Jeff Roorda and Associates (JRA) to undertake a review of the existing roads asset register and provide a revaluation report as at 30 June 2017 in accordance with the relevant Australian Accounting Standards and Local Government Regulations.

Revaluation is the act of recognising a reassessment of values of non-current assets at a particular date and must be carried out with sufficient regularity to ensure that the carrying amount does not differ materially from that which would be determined using fair value at the reporting date.

Reporting on infrastructure assets using the fair value process enables Council to meet the requirements for financial reporting. It results in financial reports, financial sustainability indicators, asset management and long term financial plans more accurately reflecting the financial performance and position of the Council and its ability to provide goods and services to community.

8.1 Improvement Plan

The asset management improvement plan generated from this AMP is shown in Table 8.1.

Table 8.1: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Implementation of Strategic Asset Management (SAM) System	Asset Management	Asset Management Team	6 months
2	Modelling using Strategic Asset Management (SAM) System	Asset Management Engineering Assets	Asset Management Team members Road Asset Manager Project Engineer	12-18 months
3	Audit of Kerb & Gutter and Residential pavement profiles	Asset Management Engineering Assets	Asset Management Team members Road Asset Manager Project Engineer	24 months
4	Establishment and confirmation of intervention levels for road preservation treatments.	Engineering Assets	Road Asset Manager Project Engineer	3 years
5	Formal Crack Sealing and road preservation program	Engineering Assets	Road Asset Manager Project Engineer	3 years
6	Future revisions of the Road AMP to include transport assets and bridge assets	Asset Management Engineering Assets	Asset Management Team members Road Asset Manager Project Engineer	3 years
7	Rolling condition audit and re-valuation of road assets (ongoing)	Asset Management Engineering Assets	Asset Management Team members Road Asset Manager Project Engineer	5 years (Ongoing)
8	Designing for predicted future climate conditions and understanding cost implications for assets	Engineering Assets Waste & Sustainability	Waste & Sustainability Team members Road Asset Manager Project Engineer	5 years

8.3 Monitoring and Review Procedures

This AMP will be reviewed during annual budget planning processes and amended to show any material changes in service levels and/or resources available to provide those services as a result of budget decisions.
The AMP will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the long term financial plan.

The AMP has a life of 4 years but is due for complete revision and updating within 12 months of the upcoming Council election. The next AMP will incorporate the introduction of modelling data with the new SAM system.

8.4 Performance Measures

The effectiveness of the AMP can be measured in the following ways:

- The degree to which the required projected expenditures identified in this asset management plan are incorporated into the long term financial plan.
- The degree to which 1-5 year detailed works programs, budgets, business plans and corporate 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 Strategic Plan and associated plans.
- The Asset Renewal Funding Ratio achieving the target of 1.0.

9. REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2012 LTFP Practice Note 6 PN Long Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- City of Charles Sturt Roads Revaluation Report FINAL – JRA – 25 September 2017

10. APPENDICES

Appendix A - Budgeted Expenditures Accommodated in LTFP

Roads and Carparks Renewal

Year End June 30	Projected Renewals ($'000)	LTFP Renewal Budget ($'000)	Renewal Financing Shortfall (- gap, + surplus) ($'000)	Cumulative Shortfall (- gap, + surplus) ($'000)
2018	$10,181	$10,747	$566	$566
2019	$10,407	$10,973	$566	$1,132
2020	$10,955	$11,521	$566	$1,698
2021	$11,670	$12,236	$566	$2,264
2022	$10,019	$10,585	$566	$2,830
2023	$11,429	$11,995	$566	$3,396
2024	$10,030	$10,596	$566	$3,962
2025	$10,324	$10,890	$566	$4,528
2026	$9,429	$9,995	$566	$5,094
2027	$10,180	$10,746	$566	$5,660
2028	$10,462	$9,751	$-711	$4,949
2029	$10,462	$10,402	$-60	$4,888
2030	$10,462	$10,402	$-60	$4,828
2031	$10,462	$10,402	$-60	$4,767
2032	$10,462	$10,402	$-60	$4,707
2033	$10,462	$10,402	$-60	$4,647
2034	$10,462	$10,402	$-60	$4,586
2035	$10,462	$10,402	$-60	$4,526
2036	$10,462	$10,402	$-60	$4,465
2037	$10,462	$10,402	$-60	$4,405

Road Safety Devices Renewal

Year End June 30	Projected Renewals ($'000)	LTFP Renewal Budget ($'000)	Renewal Financing Shortfall (- gap, + surplus) ($'000)	Cumulative Shortfall (- gap, + surplus) ($'000)
2018	$250	$0	$0	$0
2019	$350	$350	$0	$0
2020	$250	$250	$0	$0
2021	$350	$350	$0	$0
2022	$250	$250	$0	$0
2023	$350	$350	$0	$0
2024	$250	$250	$0	$0
2025	$350	$350	$0	$0
2026	$250	$250	$0	$0
2027	$350	$350	$0	$0
2028	$250	$250	$0	$0
2029	$350	$350	$0	$0
2030	$250	$250	$0	$0
2031	$350	$350	$0	$0

2032	$250	$250	$0	$0
2033	$350	$350	$0	$0
2034	$250	$250	$0	$0
2035	$350	$350	$0	$0
2036	$250	$250	$0	$0
2037	$350	$350	$0	$0

Road Safety Devices New

Year End June 30	Projected New Assets ($'000)	LTFP New Budget ($'000)	Renewal Financing Shortfall (- gap, + surplus) ($'000)	Cumulative Shortfall (- gap, + surplus) ($'000)
2018	$0	$550	$0	$0
2019	$550	$550	$0	$0
2020	$650	$650	$0	$0
2021	$550	$550	$0	$0
2022	$650	$650	$0	$0
2023	$550	$550	$0	$0
2024	$650	$650	$0	$0
2025	$550	$550	$0	$0
2026	$650	$650	$0	$0
2027	$550	$550	$0	$0
2028	$650	$650	$0	$0
2029	$550	$550	$0	$0
2030	$650	$650	$0	$0
2031	$550	$550	$0	$0
2032	$650	$650	$0	$0
2033	$550	$550	$0	$0
2034	$650	$650	$0	$0
2035	$550	$550	$0	$0
2036	$650	$650	$0	$0
2037	$550	$550	$0	$0

Appendix B – Intervention Levels for road assets

Sub Activity	Reporting			Specification		Performance	
	Unit	Rate	Qty	Intervention Criteria	Scope of Work	Response Times	Outcomes (Unit Level)

Kerb/Gutter Repairs
 	
Information to be Reported:
• Quantity of Work;
  • Kerb & Gutter/Tray (m)
  • Kerb (m)
  • Median Kerb (m);
• Value of Work;
• Locations of work;
• Dates initiated &/or required response times
• Dates completed &/or actual response times
	K & G (300) m
	
	K & G (375) m
	
	K & G (375+) m
	
	Kerb only m
	
	Median Kerb m
	
	Spoon Drain m
		$
		
		$
		
		$
		
		$
		
		$
		
		$
				• Request or referral through CTS, RRT or Client;
				• Vertical Displacement > 25mm adjacent to driveway;
				• Vertical Displacement > 40mm elsewhere;
				• Water ponding due to damaged, failed or disrupted sections;
				• Water ponding full width of tray
				• Failed Reinstatements
				• Cracks more than 1mm wide that are visibly open and allow water to penetrate
					▪ Reconstruct affected sections including kerbs, kerb & gutter (channel), kerb & trays, spoon drains and median kerbs – various profiles. Note reconstruction may not be limited to adjacent sections, insitu longitudinal grade should be taken into account when determining extent of work.
					▪ If reconstruction length is significant (e.g. more than 40% of road asset segment) escalate to Asset Manager for direction
					▪ Up to 50m long length of repair
						Where RRT have repaired - 10 business days;
						
						Where RRT have barricaded area and not repaired – 3 business days;
							• Free flow of stormwater to drainage structures;
							• Kerb and channel uniform in shape free from damage, undulation disruptions or displacements.
							• Reduction in risk from flooding

Pothole Maintenance **Information to be Reported:** • Quantity of Work (No.); • Value of Work; • Locations of work; • Dates initiated &/or required response times • Dates completed &/or actual response times	No.	$		• Request or referral through CTS, RRT or Client; or • Potholes any size and quantity;	▪ Repair potholes in vehicular pavements:	Vehicular Pavements: Collector Roads – 2 business days; Residential Streets – 5 business days; Minor cul de sacs – 10 business days.	• Maintain 555km of roads; • Pavements uniform in shape with surface free from damage holes undulation, disruptions or displacements

Area Patching **<u>Large Area Patching Requests to be escalated to Asset Manager for Roads</u>** **Information to be Reported:** • Quantity of Work (m^2); • Value of Work; • Locations of work; • Dates initiated &/or required response times • Dates completed &/or actual response times	m^2	$		• Request or referral through CTS, RRT or Client; or • Failed pavements < 80m^2 or • Failed reinstatements; or • Cracks	▪ Reconstruct failed asphalt vehicular pavements ▪ Cracks in asphalt vehicular pavements with vertical displacement reconstruct pavement < 20 m^2 ▪ Cracks in asphalt vehicular pavements without vertical displacement seal with suitable sealant.	Vehicular Pavements: Collector Roads – 2 business days; Residential Streets – 5 business days; Minor cul de sacs – 10 business days.	• Maintain 555km of roads; • Pavements uniform in shape with surface free from damage holes undulation, disruptions or displacements