LODDON
SHIRE COUNCIL

ROAD ASSET MANAGEMENT PLAN 2021-2025

LODDON
SHIRE

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1 PURPOSE

This Road Asset Management Plan outlines key elements involved in managing Council's urban and rural road assets. It combines management, financial, engineering and technical practices to ensure that the level of service required by user groups is provided at the lowest long term cost to the community within the limits of any fiscal constraints that may be imposed by Council.

The specific purpose of the plan is to:

- demonstrate responsible stewardship of road assets managed by Council
- provide a basis for customer consultation to determine the appropriate levels of service
- support financial planning
- assist Council in determining priorities for the maintenance, renewal, upgrade or new construction of roads.

2 BUDGET IMPLICATIONS

The adoption of this plan predicts a required expenditure effort of $11,292,220 per annum averaged over the 10 year life of the plan. This includes new, upgraded and renewal capital works on road, street and kerb and channel assets averaging $4,555,503 per year.

Maintenance and operations expenditure continues to be funded under Local Road Maintenance in the budget. The budget bid is prepared annually by the Manager Operations. It is expected that this will on average be $6,736,717.

Council is able to adequately fund all of the maintenance, operations and capital expenditure requirements of this plan within the current Financial Plan allocations.

3 RISK ANALYSIS

Generally the majority of risks associated with road management relate to maintenance and operational matters which are dealt with in Council's Road Management Plan.

Funding the renewal and upgrade of assets outlined in this plan will ensure Council's road assets remain in good condition which will minimise financial liabilities associated with future high renewal costs and maintain the roads in a safe condition.

4 INTRODUCTION

4.1 Background

4.1.1 Plan format

This plan is part of Council's overall asset management plan suite as described below:

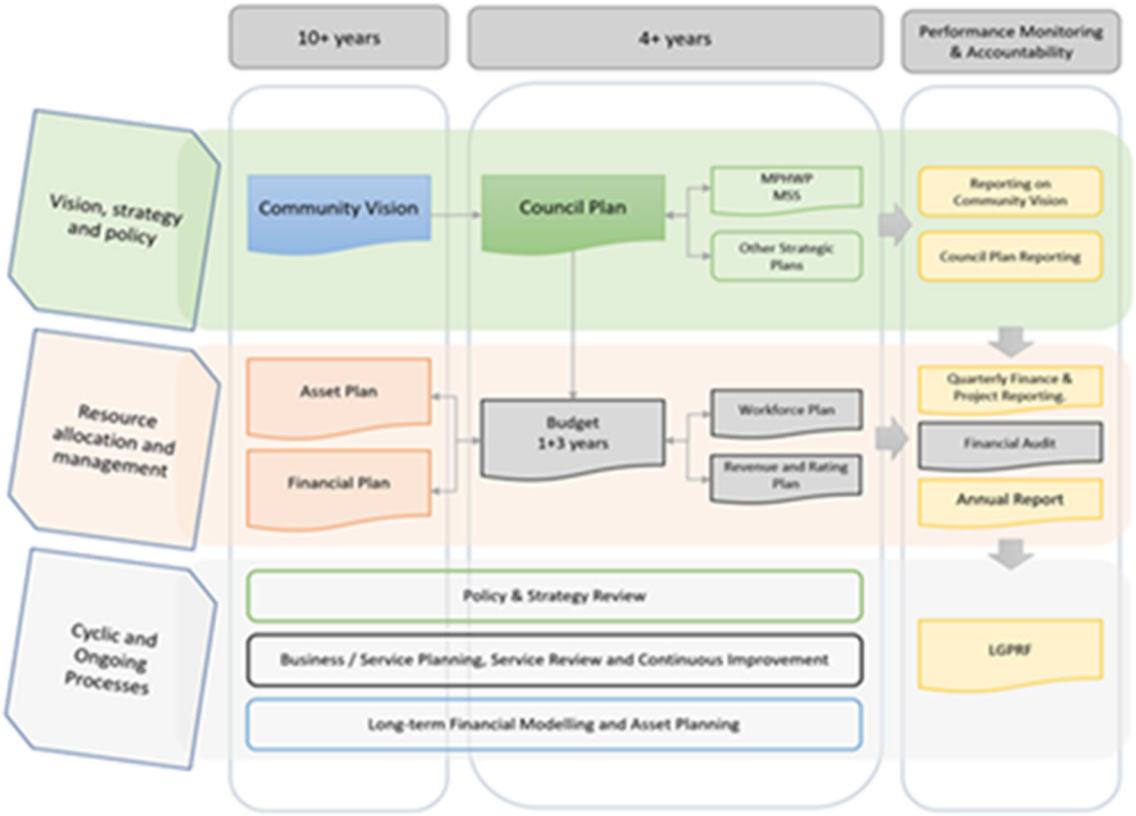
- Part A – General Information: Background or information common to all assets
- Part B – Roads
- Part C – Buildings
- Part D – Footpaths
- Part E – Parks
- Part F – Bridges
- Part G – Urban Drainage.

This plan comprises an asset management plan and several attachments.

4.1.2 Relationship with other strategic documents

The figure below shows the relationship of this plan with other council strategic documents.

Figure 1 Relationship with strategic documents



4.1.3 Infrastructure assets included in the plan

Table 1: Assets included in this plan

Asset category	Asset component
Urban sealed roads	Urban road formation
	Urban sealed pavement
	Urban sealed surface
	Kerb & channel
Rural sealed roads	Rural road formation
	Rural sealed pavement
	Rural sealed surface
	Shoulders
Unsealed roads (urban & rural)	Road formation
	Unsealed road pavement
Traffic control & road related infrastructure	Traffic control & road related infrastructure

This revised asset management plan includes the addition of kerb and channel assets which have not previously been included in any existing asset management plan.

4.1.4 Assets not included in this plan

Assets specifically excluded from this plan include those located on:

- boundary roads allocated to the adjoining municipality. However in some instances the agreements may allow for cost sharing of specified capital works on the roads. Such works will only be carried out if agreement exists between the municipalities concerned
- arterial roads that are declared as such pursuant to section 14 of the Road Management Act 2004. Often these roads were historically referred to as either State Highways or Main Roads. Arterial roads perform a regional link function and as such they usually traverse more than one municipality.
- roads on Crown land which are not included within Councils road register e.g. state forest roads and tracks
- rail crossings components for which Council is not the responsible authority as per Safety Interface Agreement
- utility services
- private vehicle crossings/driveways as covered in the Road Management Plan in section 5.5.1 “Driveways”
- overhanging vegetation from private land
- nature strips
- bridges and major culverts
- water authority bridges and structures
- footpaths
- tracks on “unused roads” (“paper roads”).

4.1.5 Boundary roads

Council’s road network connects to those of seven adjoining municipalities identified as follows:

- Gannawarra Shire
- Campaspe Shire
- City of Greater Bendigo
- Mount Alexander Shire
- Central Goldfields Shire
- Northern Grampians Shire
- Buloke Shire.

Boundary Agreements with adjoining municipalities were formulated and adopted in the late 1990's. Because all boundary roads are rural in nature there are no assets, such as footpaths, on the same section of boundary road reserve where operational responsibility needs to be shared. A more practical approach was adopted, with agreements being reached to equitably allot operational responsibility for full road width for specific sections of boundary road to each municipality.

The sections of boundary roads for which Loddon is the Operational Road Authority are included in Loddon Shire Council's Register of Public Roads.

The boundary with Northern Grampians Shire is the centre of the Avoca River, over which there are several bridges. Northern Grampians Shire undertakes the operational responsibilities for these bridges, with costs being equally shared with Loddon Shire Council.

Part of the boundary with Campaspe Shire is the western bank of the Bendigo Creek. The bridges over the Bendigo Creek are solely in Campaspe Shire. Thus Campaspe Shire Council is the Coordinating and Operational Road Authority for those structures.

4.1.6 Key stakeholders in this plan

Stakeholders in this asset management plan and their role as either a customer or other interested party are tabled below.

Table 2: Stakeholder roles

Stakeholder	Role in this plan
Private car drivers, cyclists, pedestrians, motorised buggy users	Customer
Industrial and commercial operators and other transport services	Customer
Public transport services	Customer
School bus services	Customer
Bicycle user groups	Customer
Road authorities/ Government Departments (Department of Transport, DELWP)	Other interested party
Land developers	Other interested party
Road safety organisations	Other interested party

4.1.7 Asset responsibility

The Asset Responsibility Matrix in appendix C of Council's Asset Management Strategy lists the officers:

- with any road asset responsibility, or
- who have an involvement in the relevant service delivery related to the assets included in this plan.

Council services which utilise the assets included in this plan are:

- road transport
- home and community care
- tourism
- economic development
- community & recreation

4.1.8 Works on roads by others

Works within road reserves by public utilities

Council manages the road reserve areas but utility owners have legal rights of access to open the road to install and maintain their assets. Works on the road reserve by utilities are controlled using the consent process under the Road Management (Works and Infrastructure) Regulations 2015.

Works within road reserves by companies or individuals
From time to time private companies or individuals need to excavate in or bore under a road reserve. Council requires the issue of a Works Within Road Reserve permit for such work. Permits when issued incorporate a list of conditions which allow Council to control how the work is carried out and to ensure the quality of restoration.

Private vehicle crossings/driveways
Council requires the issue of a Works Within Road Reserve permit for the construction of vehicle crossings between the road and the property boundary.

Dja Dja Wurrung Land Use Agreement
The recent establishment of the Recognition and Settlement Agreement (RSA) and associated Land Use Agreement (LUA) with the Dja Dja Wurrung clans, establishes additional obligations for parties undertaking works within the Road Reserve. The LUA spells out which activities within the road reserve are considered exempt from notification or negotiation with the Dja Dja Wurrung.

While assessing or planning works within the road reserve, reference should be made to the LUA so as to determine any additional approval requirements. This applies for Council controlled, agency, government or private works. Separate protocols and requirements for seeking Dja Dja Wurrung comment or approval on proposed works are being developed.

4.2 Goals and objectives

Council Plan strategies that may influence this plan are listed below.

Table 3: Council plan strategies

Document	Section	Strategy	2017-21 Priorities	Key projects
Council Plan 2021-2025	Strategy	A sustainable built and natural environment	Plan for future facilities and infrastructure that meet community need	Finalise asset management plans and long term strategies for Council assets

4.3 Abbreviations and definitions

Abbreviations used in this plan are defined in the table below.

Table 4: Abbreviations

Abbreviation	Meaning
AADT	Average annual daily traffic
CV	Commercial vehicles – trucks exceeding 4.5 tonne gross vehicle mass

IDM	Infrastructure Design Manual
GST	Goods and services tax
MAV	Municipal Association of Victoria
TBD	To be determined
vpd	Vehicles per day - is the average annual traffic per 24 hour day typically measured by axle counters

5 LEVELS OF SERVICE

Road assets serve the community and enable:

- movement of people and goods
- access to properties
- provision for non-vehicular users (pedestrians and cyclists)
- provision of parking space
- use of transport corridors for service provision (water supply, wastewater, communications and energy).

With the use of this broad description of service as a guide, a key objective of this plan is to define the levels of service.

Levels of service in this section will be used to:

- inform stakeholders of the type and level of service offered by Loddon Shire Council on its road network
- formulate life cycle management strategies to deliver the defined levels of service
- enable stakeholders to assess suitability, affordability and equity of the services offered.

The levels of service outlined in this section are based on:

- research or anecdotal expression of community expectations
- strategic and corporate goals
- legislative requirements
- standards and codes of practice.

5.1 Community engagement and expectations

5.1.1 Background and customer engagement undertaken

5.1.1.1 Relevant annual customer engagement survey

The results of the Community Satisfaction Survey that refer to assets included in this plan are provided in Appendix 1 “Results of community satisfaction survey”.

It can be seen from the survey that 50% of survey respondents were satisfied with the condition of sealed roads and 48% were satisfied with the maintenance of unsealed roads.

5.1.1.2 Current and previous community engagement

Current and previous engagement undertaken by Council is included in the table below.

Table 5: Current and previous engagement

Audience/Technique
Customer requests
Annual Community satisfaction surveys
Community workshop on roads - 20 March 2013

The key customer expectations relating to the assets included in this plan are summarised below.

Table 6: Customer expectations

Audience/technique/date	Expectations/comments/outcomes/issues
Draft expectations developed from the Regional Asset Service project which council participated in under the auspices of the MAV.	Sealed road provided
	Trafficable gravel road network provided
	Kerb & Channel (K&C) provided in urban areas
	All weather access provided
	A safe road network is available
	Wider seal widths
Customer requests	Improvement in the grading or resheeting of gravel roads
Community Satisfaction Survey	Improvement and more frequent grading of gravel roads
Community workshop on roads	More frequent grading of gravel roads

5.1.1.3 Community engagement plan

Community engagement not proposed for the development of this plan but will be considered on future reviews.

5.2 Legislative requirements

Legislation or regulations which impact on this plan are:

- Road Management Act 2004
- Transport Act 1983
- Road Safety Act 1986 (Amended 2004)
- Ministerial Code of Practice – Road Management Plans - September 2004
- Road Management Act 2004 Code of Practice – Operational Responsibilities for Public Roads - December 2004
- Road Management Act 2004 Code of Practice – Management of Road & Utility Infrastructure in Road Reserves – December 2004
- Council's Local Law No 2 "Streets and Roads 2010"
- Roads to Recovery Act 2000
- Subdivisions Act 1988
- Disability Discrimination Act 1992
- Catchment & Land Protection Act 1994
- Flora and Fauna Guarantee Act 1988
- Environment Protection & Biodiversity Conservation Act 1999
- Building Codes
- Water Act 1989
- Aboriginal Heritage Act 2006

- Aboriginal Heritage Amendment Act 2016
- Dja Dja Wurrung Recognition and Settlement Agreement 2012

Council will meet its legislative and statutory obligations concerning the care and maintenance of local roads.

5.3 Current levels of service

5.3.1 Asset functional hierarchy

The objective of developing an asset hierarchy is to provide a suitable framework for assets, which divides the asset base into appropriate classifications. The hierarchy is based on a combination of asset function and asset type.

The intent of the asset hierarchy is to provide the framework in which data is collected, information is reported and decisions are made.

The road hierarchy adopted and detailed in Council's Road Management Plan is defined in the following table.

Table 7 Road and street hierarchy

Hierarchy code	Hierarchy name	Function	Comments
Rural roads (R) & Township Streets (T)			
RSC & TSC	Sealed Collector	Sealed Collector roads distribute traffic between arterials and access roads.	Connecting roads traditionally accommodating higher volumes of traffic or providing efficient access, or an alternative, to the arterial network.
RSA &TSA	Sealed Access	Sealed Access roads provide primary access to residential properties, other developments or facilitate service or tourist traffic.	Usually accommodate high to medium traffic volumes and service multiple residential properties.
RGC & TGC	Gravel Collector	Gravel Collector roads distribute traffic between arterials and primary access roads.	Gravel connecting roads generally accommodating moderate traffic volumes.
RGA & TGA	Gravel Access	Gravel Access roads provide primary access to residential properties, other developments or facilitate service traffic, tourist traffic, school buses, or milk tanker traffic.	Lower use roads primarily used for access to groups or individual residential properties.
RGM & TGM	Minor Gravel	Minor Gravel Roads provide access to non-residential/developed properties or alternative access to residential properties.	Low use gravel roads providing access to rural (non-residential properties.
RF & TF	Formed	Formed roads provide access to undeveloped non-residential properties.	Earthen roads providing dry weather access.
RUF & TUF	Unformed	Unformed roads generally providing access to rural properties.	There is no formation, wheel tracks at best.
RFA	Fire Access	Rural Fire Access roads provide access for firefighting purposes.	Generally located on 'unused' road reserves.

5.3.2 Classification by importance

The order of importance of the hierarchies is as in the Loddon Shire road and street hierarchy table above.

5.3.3 Classification for renewal forecasting

Table 8: Classification by urban/rural location

Location	Description
Urban	Roads with urban type cross section consisting of seal, kerb and channel and nature strip. Generally located within built up areas e.g. concentration of 5 or more residential properties and located within 80km/hr or less speed restricted zones.
Rural	Roads with rural type cross section consisting of seal, shoulders and table drains.

5.3.4 Classification by traffic use

Table 9: Classification by traffic use

Classification	Description
High traffic	>5000vpd urban, >1000 vpd rural
Moderate traffic	500-5000 vpd urban, 100-1000 vpd rural
Low traffic	<500 vpd urban, <100 vpd rural

* Note: Traffic classifications have been adopted in line with the Victorian Grants Commission (VGC) reporting framework. This is to apply a consistent assessment benchmark across Victoria for the purposes of calculating apportionment of available road funding.

5.3.5 Classification for Victoria Grants Commission

Table 10: Road types

Classification	Description
Kerbed Road	Kerb on one or both sides of the road
Unkerbed Road	Roads without kerbs on either side of road

Strategic routes are defined in the following table.

Table 11: Strategic routes

Classification	Description/definition
Kerbed road strategic route	bus route road > 500vpd road with at least 50 trucks/day
Unkerbed road strategic route	bus route road >100vpd with at least 10 trucks/day road >100vpd with average grade at least 6% road >100vpd in drip or flood irrigated horticultural or agricultural area

Definitions are as follows:

- Bus route: Includes both normal scheduled public transport route as well as special school only routes.

- Truck route: Designed to accommodate class 3 to class 12 vehicles.

5.3.6 Classification by purpose

Table 12: Classification by purpose

Classification
Public road
Restricted access road (emergency services only)
Private road or driveway

5.3.7 Community and technical service levels

Levels of service provided by this plan are driven by customer expectation and historic practices modified to suit available funding.

Table 13: Levels of service provided by this plan

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	Service indicator	Community levels of service		Technical levels of service	
		Community measure	Community target	Technical measure	Technical target
Access to rural residences and Developments	Accessibility via all-weather road	Customer requests for upgrade to all weather access standard	Zero per annum upgrade requests that satisfy technical levels of service target	Access to all weather standard	One existing all weather access will be maintained to the entrance of occupied rural dwellings and intensive industries.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	Service indicator	Community levels of service		Technical levels of service	
		Community measure	Community target	Technical measure	Technical target
					When considering planning development approvals in a Farming Zone Council will: 1. Wherever possible guide the placement of the new development to utilise the existing all weather road network. 2. allow a road upgrade provided: a) the extent of the upgrade is minimised and b) the works are at full cost of the developer

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	**Service indicator**	**Community levels of service**		**Technical levels of service**	
		Community measure	**Community target**	**Technical measure**	**Technical target**
Access for school buses	Accessibility via all-weather road	Customer requests for upgrade to all weather access standard	Zero per annum upgrade requests that satisfy technical levels of service target	Access to all weather standard	Existing approved school bus routes will be retained as all-weather access roads Any amendment or adjustment to bus routes requires consultation with Public Transport Victoria (PTV). Where upgrade of roads to all-weather standards are required to facilitate route amendments, funding for required works will be sought from PTV.
Access for tourists to places of special interest or recreation	Accessibility via all-weather road	Customer requests for upgrade to all weather access standard	Zero per annum upgrade requests that satisfy technical levels of service target	Access to all weather standard	Council approved tourist routes as detailed on self-drive CDs will be retained as all-weather access roads. Any upgrade of roads to an all-weather standard will require a business case demonstrating the benefit to Council of providing access to the nominated tourist attraction and associated funding strategy to facilitate required works.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	**Service indicator**	**Community levels of service**		**Technical levels of service**	
		Community measure	**Community target**	**Technical measure**	**Technical target**
Access to rural undeveloped properties (e.g. farming land)	Accessibility via dry weather access road	Customer requests for upgrade to dry weather access standard	No target but use requests received from community in planning works	Access to dry weather standard	One existing dry weather access will be maintained to the nearest property boundary utilising an existing minor gravel, formed or unformed road.
Access to urban properties	Accessibility by all-weather access	Customer requests for upgrade to all weather access standard	Zero per annum upgrade requests that satisfy technical levels of service target	Access to all weather standard	All weather access to township residences will be provided to minimum standard of TGA. Council is required to fund all upgrade works required in the Township Zone pursuant to the Planning Scheme (even for new developments).
Kerb and channel provided in urban areas	Availability of kerb and channel	Customer requests for K&C	No target but use requests in developing Township Street Improvement program	Demonstrated need for K&C to protect road related or private assets. Consideration also given to cost imposition for maintaining swale or table drain systems.	K & C used to resolve drainage issues. Kerb & channel may be constructed under “Township Street Improvement program”. Subject to available funding. Kerb & channel works may also be undertaken as special charge schemes.
Availability of sealed road network	Sealed road available	Customer requests for upgrade to sealed pavement	No target but use requests in developing upgrade programs	Demonstrated need for constructing and sealing a road. Factors taken into consideration	Existing sealed network is functional. Extension of sealed road network will not generally be undertaken.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	**Service indicator**	**Community levels of service**		**Technical levels of service**	
		Community measure	**Community target**	**Technical measure**	**Technical target**
				in determining suitability of sealed surface treatment include: - frequency and cost of maintaining gravel surface - amenity impacts - Safety - traffic volume and makeup e.g. No. of CV's - Potential future usage	Rural unsealed roads with AADT>100 vpd may be considered for construction and sealing subject to detailed evaluation.
					In Rural Living Zone unsealed roads may be upgraded to a sealed surface in "Asset preservation, safety or amenity programs." Funding is not guaranteed.
					In Rural Living Zone unsealed roads may be upgraded to a sealed surface under a special charge scheme.
					Township streets may be upgraded to a sealed surface in asset preservation, safety or amenity programs". Funding is not guaranteed. Upgrade may be undertaken as special charge schemes.
Wider sealed roads	Amenity and safety	Customer requests for shoulder works, edge repairs and drop offs	No targets but used in developing upgrade and safety programs	Demonstrated need	Sealed pavement widening may be considered on single lane rural seal where AADT>200 vpd or >35 CVs per day.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	**Service indicator**	**Community levels of service**		**Technical levels of service**	
		Community measure	**Community target**	**Technical measure**	**Technical target**
Quality, affordable roads	Roads rehabilitated in timely manner	Roads rehabilitated within documented intervention standards	Road users perceive the Council road network as being functional and safe.	Strategy to deliver affordable road network	Less than 2% of roads throughout the network exceed specified intervention standards Rural sealed roads with ≥ 50 vpd or ≥ 10 CV's per day will be renewed when they reach intervention levels or satisfy other conditions within Council's project scoping documents and rolling program e.g. eligibility for upgrade.
					Rural sealed roads with <50 vpd and <10 CV per day may be renewed subject to the process in 8.7.2.2 "Process for handling renewal of low traffic rural sealed roads."
					Sealed surfaces will be resealed in accordance with prioritisation criteria per 8.7.2.4 reseals. Sealed surfaces with <50 vpd will be resealed provided the sealed pavement has significant remaining life.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	Service indicator	Community levels of service		Technical levels of service	
		Community measure	Community target	Technical measure	Technical target
					RGC, RGA, TGA gravel roads will be resheeted when they reach intervention standard and satisfy other requirements in Council's project scoping documents and rolling program.
					RGM and TGM hierarchy roads will not be resheeted. They will be left to degrade into formed only roads. Chemical and mechanical stabilization may be carried out during maintenance for minor gravel roads with history of high frequency maintenance.
					K & C will be replaced when it reaches intervention or satisfies other conditions in Council's scoping documents and rolling program.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	**Service indicator**	**Community levels of service**		**Technical levels of service**	
		Community measure	**Community target**	**Technical measure**	**Technical target**
Quality, affordable roads	Road maintenance, renewal and upgrading carried out in an efficient, cost effective manner	Cost of maintenance and capital works	Road maintenance and capital works delivered within 10% of annual budget	Strategy to deliver affordable road network	Detailed scoping documents will be maintained for all eligible projects within the rolling program. This include documentation of the scope of works as well as determination of estimated cost. Development and of Annual infrastructure program will ensure that investment of Council funding is targeted towards the highest priority projects taking into consideration fiscal and resource constraints.
A safe well maintained road network	Safety and responsiveness	VicRoads crash statistics	Decline in crash stats for local roads	Regular defect inspections.	100% compliance with inspection frequencies in Road Management Plan.
				Defects repaired within Road Management Plan (RMP) intervention standards and response times.	100 % compliance with Road Management Plan.
				Unsealed roads graded as per road grading program.	Roads graded at frequency specified in Road Management Plan.

Service: Roads – transport vehicle access				Assets utilised: Urban & rural sealed roads, gravel and natural surface roads	
Customer expectation	Service indicator	Community levels of service		Technical levels of service	
		Community measure	Community target	Technical measure	Technical target
				Curvilinear, alignment and sight distance issues progressively addressed throughout road network	Reactive inspection and treatment identification for reported road network safety issues. Consideration given to sealing isolated areas, widening or realignment pf pavements where significant safety risks identified. Upgrade works subject to prioritisation and funding through the Road Safety Improvement program.
	Roads well maintained	Compliance with inspections frequencies and defect repair response times	100% compliance with RMP	Roads inspected and well maintained	100% compliance with RMP and gravel road grading program
Providing roads of an appropriate condition and standard	Road network condition	Condition of road network	<3% of network above condition intervention level	Condition of road network	<3% of network above condition intervention level

6 FUTURE DEMAND

6.1 Demand forecast and management plan

Factors influencing growth or decline of asset demand are tabled below.

Table 14: Factors influencing asset demand

Factor influencing demand	Impact on the service, cost, timing	Demand management plan:
Traffic trends	Increased through traffic on local collector roads resulting in increased maintenance and renewal costs.	Monitor. Council has implemented a cyclical traffic count program to ascertain usage trends on all sealed roads.
Increasing truck mass	Legal axle loads for trucks have steadily increased, contributing to increased maintenance costs.	Assess suitability for B-double and HML access throughout the network. Where possible gazettal of suitable roads will occur with the National Heavy Vehicle Regulator.
Changes in farming practices	The shift towards wide scale cropping away from grazing has resulted in a significant increase in the tonnage of goods carted off-farm with a corresponding increase in damage to road pavements.	Monitor trends in both road usage and condition deterioration.
Rural population decline	Declining population may marginally impact on infrastructure requirements.	Monitor access network to residences and identify roads of potential hierarchy downgrade if occupation ceases.
Gravel availability	Decline in availability of quality gravel from traditional sources increases construction costs.	Review construction methods and security of gravel supplies within the Shire. Explore establishment of new gravel supplies.
Decline of rural railways	Resulting concentration in truck traffic on local roads in the vicinity of central receival silos when being emptied increasing road damage. Greater reliance being placed on on-farm storage and subsequent transportation to port via the road network.	Continue to monitor trends in road condition profiles. Work with industry stakeholders to identify priority freight routes.
Residential development	There is no evidence to suggest that there will be significant increased demand for new housing in Loddon's townships, therefore impact on road infrastructure will be minimal.	Plan infrastructure when demand is imminent. Ensure development contributions or works meet required construction standards. Integrate transport management considerations into relevant strategic planning work e.g. settlement strategy.

Factor influencing demand	Impact on the service, cost, timing	Demand management plan:
Grain silo centralisation	Closure of many grain storage silos scattered throughout the municipality, along with the establishment of 'central receival points' at Boort, Dunolly, Mitiamo, and Tandarra resulting in a concentration of grain traffic on adjacent local roads.	Continue to monitor trends in road condition profiles. Work with industry stakeholders to identify priority freight routes.

7 RISK MANAGEMENT

7.1 Risk identification

Council's corporate risk management framework is detailed in the "Risk management" section of "Council's Asset Management Plan – General Information".

Generally the majority of risks associated with road management relate to maintenance and operational matters which are dealt with in Council's Road Management Plan.

There are additional risks contributable to:

- inadequate or out dated design standards
- low standard of construction compared to road demand
- incompatible or poor surface condition
- isolated segments of road with lower standard than contiguous segments.

The identified risks associated with the assets included in this plan and the controls proposed are listed in the infrastructure risk identification table below.

Table 15: Risk identification

Risk event	Cause	Main area of impact	Controls
Vehicle accidents on narrow sealed roads	○ shoulder drop offs ○ loose gravel on shoulders ○ slippery surface ○ crests	Public health and safety	○ maintain inspection and repair under Road Management Plan ○ assess for consideration in upgrade (i.e. widening) within relevant annual infrastructure programs
Vehicle accidents on heavily trafficked unsealed roads	○ rough surface ○ corrugations ○ loose surface ○ slippery surface	Public health and safety	○ maintain inspection and repair under Road Management Plan ○ assess for consideration of upgrade or renewal within relevant annual infrastructure programs

7.2 Risk criticality

Asset criticality addresses assets that are:

- critical assets: assets with a high consequence of failure
- high risk assets: assets with a high likelihood of failure.

7.2.1 Critical assets

Critical assets are assets that have a high consequence of failure.

Table 16: Critical assets

Description	Area of impact	Actions to address
A road that is the only access to a dwelling or business for emergency services that is impassable for extended periods	Service Delivery	Give higher priority in capital works program development.
Identified high volume or freight roads where suitable alternative routes (e.g. ability to detour) do not exist.	Service Delivery	Give higher priority in capital works program development. Give consideration to alternate route assessment and upgrade.

7.2.2 High risk assets

These are assets with a high likelihood of failure.

No assets have been identified in this criticality category.

8 LIFECYCLE MANAGEMENT PLANS

8.1 Physical parameters

8.1.1 Current issues

Current issues influencing the assets included in this plan are detailed below.

Table 17: Factors influencing assets in this plan

Issue	Comment
Extent of rural sealed road network.	Significant investment is required to maintain and renew sealed roads.
Extent of low traffic sealed roads.	Considerable funds are required to renew sealed roads within the network which provide marginal benefit to the broader community due to very low traffic volumes.
Performance of low traffic roads.	Information on the performance of pavements towards the end of their life is limited. This may alter the expected rehabilitation forecasts, particularly in relation to lightly trafficked or well-constructed roads.

Issue	Comment
Demand to upgrade gravel streets to sealed surfaces.	While the demand is limited, funding constraints dictate that available resources be preferentially allocated towards renewal as opposed to upgrade or establishment of new assets.
Diverse range of quality and strength of rural sealed pavements.	Affects rehabilitation costs and possibly asset lives and financial forecasting. High degree of variability across the Shire in respect to investment demand and resource deployment.

8.1.2 Asset quantities

The current quantity of assets is detailed in the tables below.

Table 18: Road component lengths

Asset component	Length km
Sealed surface	946
Sealed pavement	946
Unsealed pavement	2,528
Unpaved unsealed roads	1,230
Total roads	4,704
Kerb and channel	63

Table 19: Road hierarchy lengths by surface type

Sealed hierarchy	Length
TSC, RSC	805
TSA, RSA	141
Total sealed	946

Unsealed hierarchy	Length
RGC	247
TGA, RGA	1,080
TGM, RGM	1,201
TF, RF	905
RFA	5
TUF, RUF	325
Total unsealed	3,763

Table 20: Asset quantity (area)

Asset group	Asset component	Classification / hierarchy	Quantity	Unit
Urban roads group	Sealed pavement	Urban	548,186	sqm
	Spray seal	Urban	498,378	sqm
	All kerbs	Urban	62,361	metres
Rural roads group	Sealed pavement	Rural	4,982,804	sqm
	Spray seal	Rural	4,312,387	sqm
	Shoulder pavement	Rural (not modelled)	NA	sqm
Unsealed roads group	Unsealed pavement	Gravel collector & access roads	6,169,898	sqm
	Unsealed pavement	Minor gravel roads	5,089,679	sqm
	Unsealed road with no pavement	(not renewed nor modelled)	7,286,192	sqm

The quantities listed are correct at the time of the development of this plan. Up to date information is obtained from the asset registers.

8.2 Asset capacity/performance

8.2.1 Assets under capacity

Assets which are not achieving the current level of service are listed below.

Table 21: Assets under capacity

Technical level of service measure	Technical level of service target	Current assets under-capacity
Rural seal width	Seal width. Width narrower than that prescribed in the Infrastructure Design Manual (IDM) for indicative maximum traffic volumes	Echuca Serpentine Rd - various sections Logan Kingower Rd - various sections Sebastian Rd

The roads listed are anecdotally under capacity. They need to be assessed against traffic volumes and referred to the rolling program for consideration and prioritisation as upgrade capital works (i.e. widening).

8.3 Asset conditions

8.3.1 Condition monitoring – asset condition survey frequency and responsibility

Condition surveys are conducting in accordance with the program below.

Table 22: Condition survey frequency

Survey name	Frequency	Responsibility
Sealed pavement	As detailed in the Asset Valuation Timeline	Asset Coordinator organises provider
Sealed surface		
Kerb and channel		
Gravel pavement		
Note: gravel pavements are inspected on a rolling program. Currently 20% of the unsealed network is inspected per annum.		

8.3.2 Condition rating

The criteria and methodology for determining condition is described below.

8.3.2.1 Sealed road pavement

Table 23: Sealed pavement condition rating criteria

Condition rating	Description	Roughness	Shape/ distress	Failures
0-1	New or as new	Very smooth	No signs of distress or unwanted movement	No failures
2	Excellent	Minimal roughness	No signs of distress or unwanted movement	No failures
3	Excellent	Minor roughness	Very good and true shape	No failures
4	Good Some signs of distress	Some roughness	Slight loss of shape	Minimal or localised
5	Fair with failures or roughness	Reasonably rough Noticeable at 100 km/h but not requiring attention	Obvious signs of pavement distress	15-20% localised failures
6	Fair with failures and roughness	Quite noticeably rough, but not uncomfortable	Obvious signs of pavement distress	Between 30% - 40% localised failure.
7	Poor. Rehabilitation not needed immediately but serious flaws.	Very rough Speed restricted by roughness	Very poor shape Extensive pavement movement	Extensive areas of failure or potential failure. 40-50% isolated failures.
8	Very poor. Immediate rehabilitation needed. Severe problems	Extreme roughness Driveability a real problem	Very poor shape Extensive pavement movement	50% - 80% segment pavement failure
9	Extremely poor. Very dangerous	Extreme roughness Dangerous at design speed	Extremely poor shape Extensive pavement failures	>80% segment pavement failure
10				

8.3.2.2 Sealed surface

Table 24: Sealed surface condition rating criteria

Score	Cracking extent	Cracking severity	Stripping (loss of aggregate)	Bitumen oxidisation	Patching	Texture
0	Nil visible.	Nil.	Nil.	Full depth lively bitumen. Typically under 3 years old.	Nil	70-80% depth of aggregate.
1	Isolated or small number of locations.	Fine cracks less the 0.5mm.	Minor.		Very little	70-80% depth of aggregate.
2	10-30%.	Fine cracks up to 1.0mm.	Isolated stripping at several locations or major stripping in an isolated area.	Limited signs of age about 30% depth crystallised. Up to 5years old.	Heavy isolated patching in one or two locations or light scattered.	50-60% depth of aggregate.
3	30-50%.	Cracking between 1.0-5.0mm.	Light stripping over whole of section or major in multiple isolated areas.	Up to 60% depth crystallised. Up to 7 years old.	Heavy isolated in several locations or light extending over, most of the section.	30-40% depth of aggregate.
4	50-70%.	Cracking between 5.0-10.0mm.	General and severe.	Up to 80% depth crystallised. Generally over 7 years old.	Heavy at frequent intervals or light at close intervals (under 4m) over majority of section.	20% depth of aggregate. Some stripping.
5	Cracking or block cracking over more than 70%	Severe cracking greater than 10mm.	Across the segment and severe.	Close to fully oxidised.	Extensive heavy over most of section or light at very close intervals (under 1m) over whole or majority.	10% depth of aggregate.

Sealed surface condition rating is calculated from the seal condition factor scores determined as above with a weighting applied to the oxidation score.

8.3.2.3 Gravel pavement

Table 25: Gravel pavements condition rating criteria

Condition rating	% of design resheet depth of pavement remaining (mm)
0	100
1	90
2	80
3	70
4	60
5	50
6	40
7	30
8	20
9	10

Council's standard gravel resheet treatment is placement of a 100mm fine crushed rock product or tertiary gravel. Adjustments to condition score may be made based upon any design variation as a % of remaining gravel depth vs initial design depth.

8.3.2.4 Kerb and channel

Table 26: Kerb and channel condition rating criteria

<table>
<tr><th>Condition rating</th><th colspan="2">General description</th><th>Transfer water</th><th>Wear</th><th>Displacement</th></tr>
<tr><td>0</td><td rowspan="2">New</td><td rowspan="2">Functioning</td><td rowspan="3">Does not hold water i.e. no low spots</td><td>Nil</td><td>Nil</td></tr>
<tr><td>1</td><td rowspan="2">Very little</td><td rowspan="2">Small</td></tr>
<tr><td>2</td><td rowspan="2">Very good</td><td rowspan="3">Slightly impaired function</td></tr>
<tr><td>3</td><td rowspan="2">Holds water in places only to limited extent</td><td rowspan="2">Some</td><td rowspan="2">Minor</td></tr>
<tr><td>4</td><td>Good</td></tr>
<tr><td>5</td><td>Fair</td><td>Noticeably impaired function</td><td rowspan="3">Obvious</td><td rowspan="3">Obvious</td></tr>
<tr><td>6</td><td>Fair to poor</td><td rowspan="2">Impaired function</td><td rowspan="2">Holds water at several locations.</td></tr>
<tr><td>7</td><td>Poor. Replace in near future.</td></tr>
<tr><td>8</td><td>Very poor. Needs replacing.</td><td rowspan="3">Not functioning</td><td rowspan="3">No longer draining road</td><td rowspan="3">Extreme</td><td rowspan="3">Excessive</td></tr>
<tr><td>9</td><td>Extremely poor. Replace immediately</td></tr>
<tr><td>10</td><td>Extremely poor. Dangerous. Remove immediately.</td></tr>
</table>

8.3.3 Current asset condition

8.3.3.1 Condition inspections

The latest condition inspections are summarised in the following table.

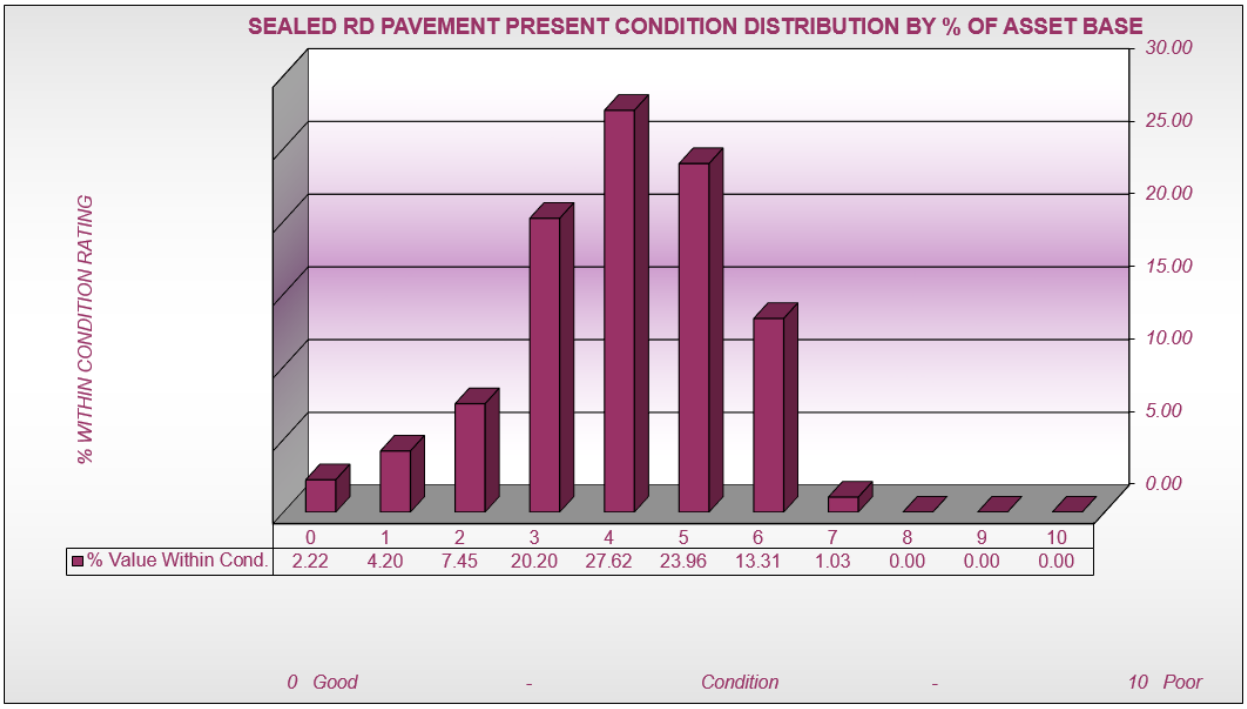
Table 27: Condition inspection details

Asset component	Inspected by	Last inspection	Previous inspection	Extent of latest inspections
Sealed pavements	Moloney Asset Management Services	June 2020	October 2016	100% network
Sealed surface		June 2020	October 2016	100% network
Kerb & channel		December 2019	October 2016	100% network
Unsealed pavements		June 2020 (20%)	March 2019 (20%)	20% network

The current condition of assets is shown graphically in the following sections.

8.3.3.2 Sealed pavement condition

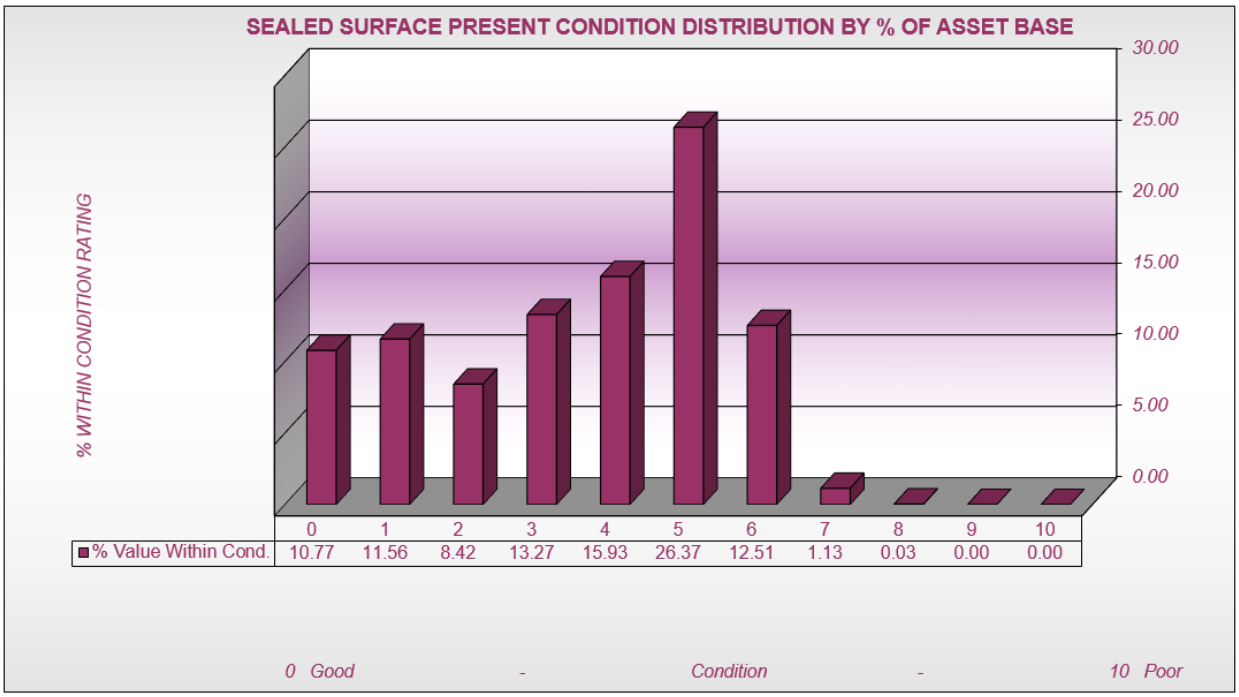
Figure 2: Sealed pavement condition distribution in June 2021



In June 2020 during the full condition based valuation of the sealed network, Moloney reported that while the sealed pavement network was in fair overall condition the condition has remained stable since the 2010 survey. Sound management has reduced the extent of urgent failures and the extent of segments in very poor condition. Next cycle of full condition based valuation of the sealed network is due in 2022.

8.3.3.3 Sealed surface condition

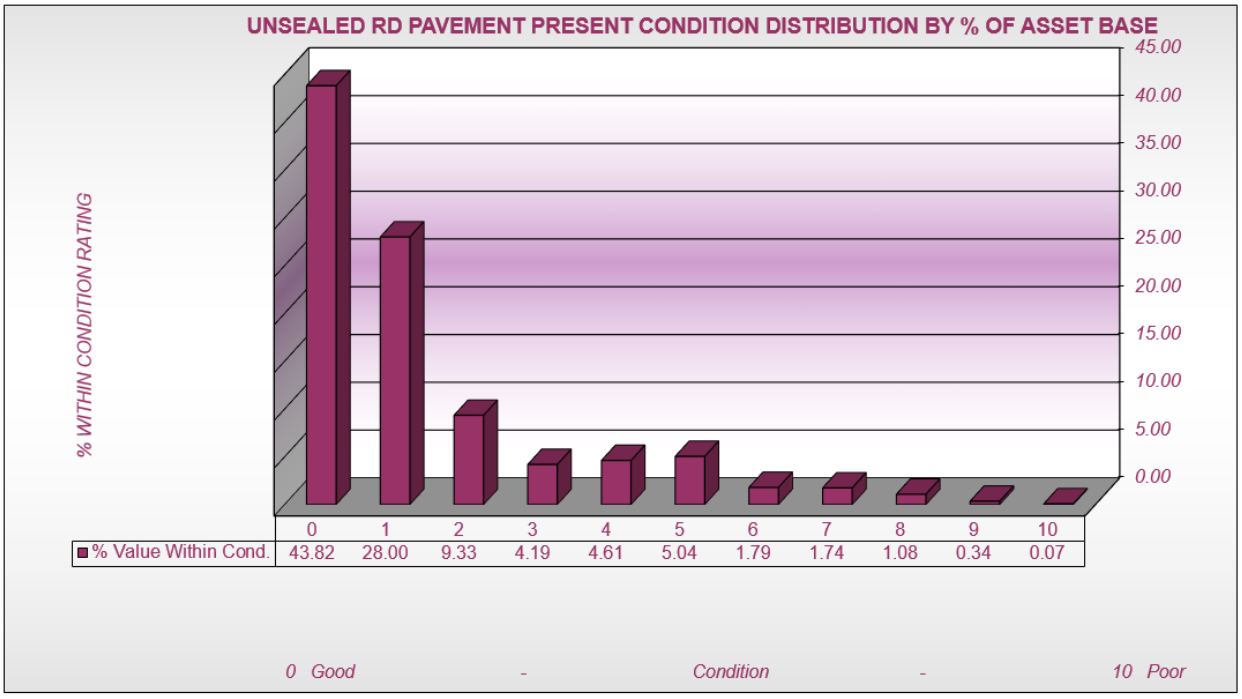
Figure 3: Sealed surface condition distribution in June 2021



Moloney reported that in December 2020 sealed surface assets were in fair overall condition and has improved since the 2016 survey.

8.3.3.4 Unsealed pavement

Figure 4: Unsealed pavement condition distribution June 2021



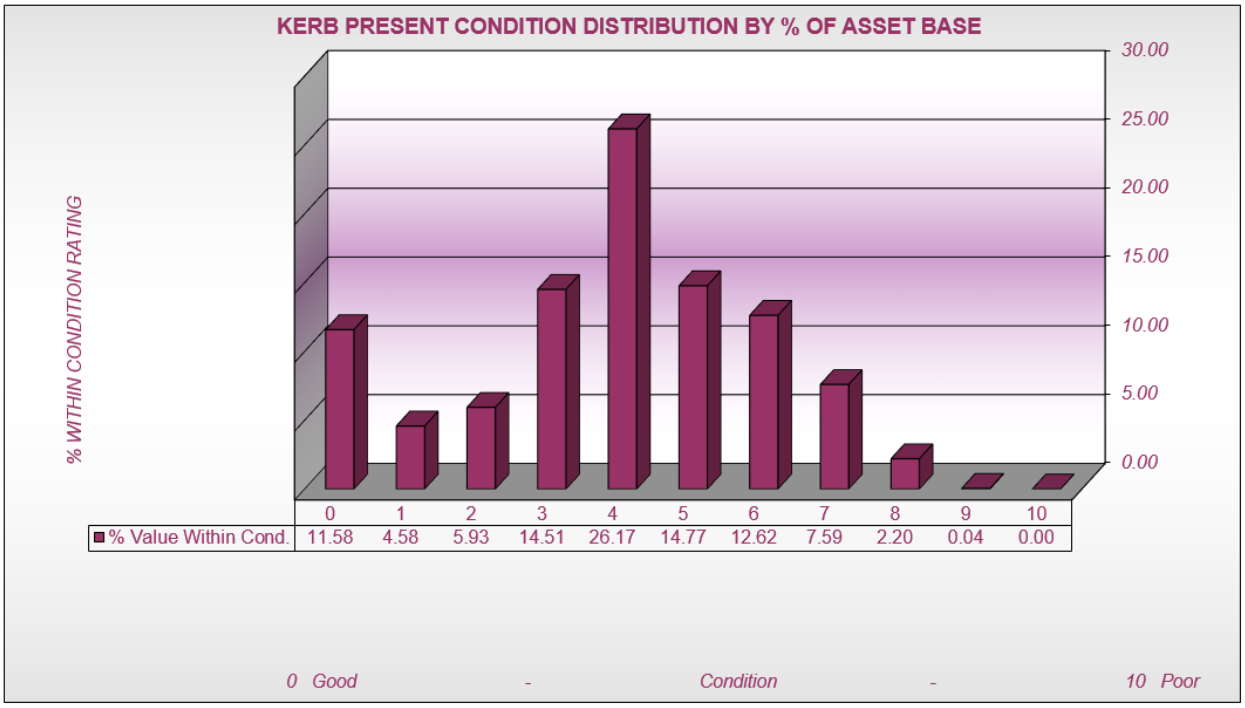
The condition is based on a design depth of 100mm for all unsealed pavements.

It can be seen that 99% of the unsealed pavement network is in good condition. This is primarily because of extensive renewal resheeting carried out Councils Road Infrastructure Flood

Restoration program following major flood events in 2010-11 along with the current ongoing focus on conditions 7.5 and above.

8.3.3.5 Kerb and channel

Figure 5: Kerb and channel condition distribution June 2021



It can be seen that 99.96% of the kerb and channel network is in good condition. This is due to Council's regular investment through the annual infrastructure program along with the current ongoing focus on conditions 8.5 and above.

8.3.4 Deterioration curves

Deterioration curves used in renewal financial modelling may be custom curves derived from Council's own condition records or default curves established by Moloney based on industry experience.

Modelling within the plan utilises a mixture of both default industry accepted degradation curves and Loddon Specific curves. This is due to a need to obtain more data for certain asset classifications in order to accurately model Loddon specific asset performance over time.

The basis for the adoption of deterioration curves used for financial modelling by Loddon is shown in the following table.

Table 28: Basis for the adoption of deterioration curves

Asset component	Asset set description	Basis for adoptions of deterioration curve
Urban Sealed Pavement	High traffic	Not modelled not used
	Low/moderate traffic	Custom – Loddon data
Urban Sealed surface	Asphalt high traffic	Not modelled not used
	Asphalt low/moderate traffic	Not modelled not used
	Spray seal high traffic	Not modelled not used
	Spray seal low/moderate traffic	Custom – Loddon data
Kerb & channel	Kerb	Default Moloney
Rural Sealed Pavement	High traffic	Not modelled not used
	Low/moderate traffic	Custom – Loddon data
Rural Sealed surface	High traffic	Not modelled not used
	Low/moderate traffic	Custom – Loddon data
Shoulders	High traffic	Not modelled not used
	Low/moderate traffic	Not modelled not used
Unsealed Road Pavement	High traffic	Not modelled not used
	Low/moderate traffic	Default Moloney

8.3.5 Asset useful lives and intervention levels

The life cycle of a sealed road is affected by a number of factors including:

- the initial design of the road
- the quality of construction methods and of materials used
- traffic volume and type of traffic
- climate
- roadside vegetation
- quantity and quality of maintenance carried out.

The life cycle of a gravel road is affected by a number of factors including:

- quality of gravel used
- depth of gravel placed on the road
- quality of construction methods
- traffic volume and type of traffic
- climate
- roadside vegetation
- quantity and quality of maintenance carried out
- profile of the road.

The adopted intervention levels and useful lives of the asset components used in financial modelling are stated in the tables below

Table 29: Effective asset lives

Asset component	Asset life in years
Sealed surface	21
Sealed Pavement	120
Gravel Shoulder	32
Gravel pavement	32
Kerb and channel	60

Sealed surfaces of roads have in the past been resealed on a 15 -16 year cycle, depending on aggregate size and seal condition. This asset management plan is based on an average reseal period of 18 years.

Using four condition surveys since 2005 and the resulting deterioration curves, the effective useful pavement life for sealed pavements adopted in this plan is 115 years (i.e. years before intervention is required). This is an increase from the previous useful pavement life of 80 years. While this is a significant increase in the expected useful life, it does not result in a significant impact to the predicted percentage of sealed pavement above intervention.

Table 30: Intervention levels and asset lives

Asset component	Intervention level	Life to condition 10	Useful life (life to intervention level) (years)	Basis for useful life
Urban sealed pavement	7.5	120	115	Moloney report and deterioration curves based on condition survey results
Urban sealed surface	7.5	21	18	
Kerb & channel	8.5	60	57	
Rural sealed pavement	7.5	120	115	
Rural sealed surface	7.5	21	18	
Unsealed road pavement	8.0	32	31	Based on anecdotal information referenced against MAV benchmarking.
Gravel shoulders	Not separately modelled, included in sealed pavement modelling			
Road formation	Not modelled			

8.3.6 Historical asset condition

The results of previous condition surveys with comments and trends are listed in the table below.

Table 31: Asset condition history

Asset	Survey years	Comments/trend
Sealed pavement	1996, 2000, 2003, 2005, 2007, 2010, 2013, 2016, 2019, 2021	Sealed pavements have been maintained in a fair condition
Sealed surface		Sealed surfaces have been maintained in fair condition but have declined in the most recent survey
Kerb & channel		Generally in poor to average condition
Unsealed pavement	20-33% annually inspected since 2012	Pavements in good condition bolstered by recent extensive flood damage reinstatement

8.3.7 Age profiles

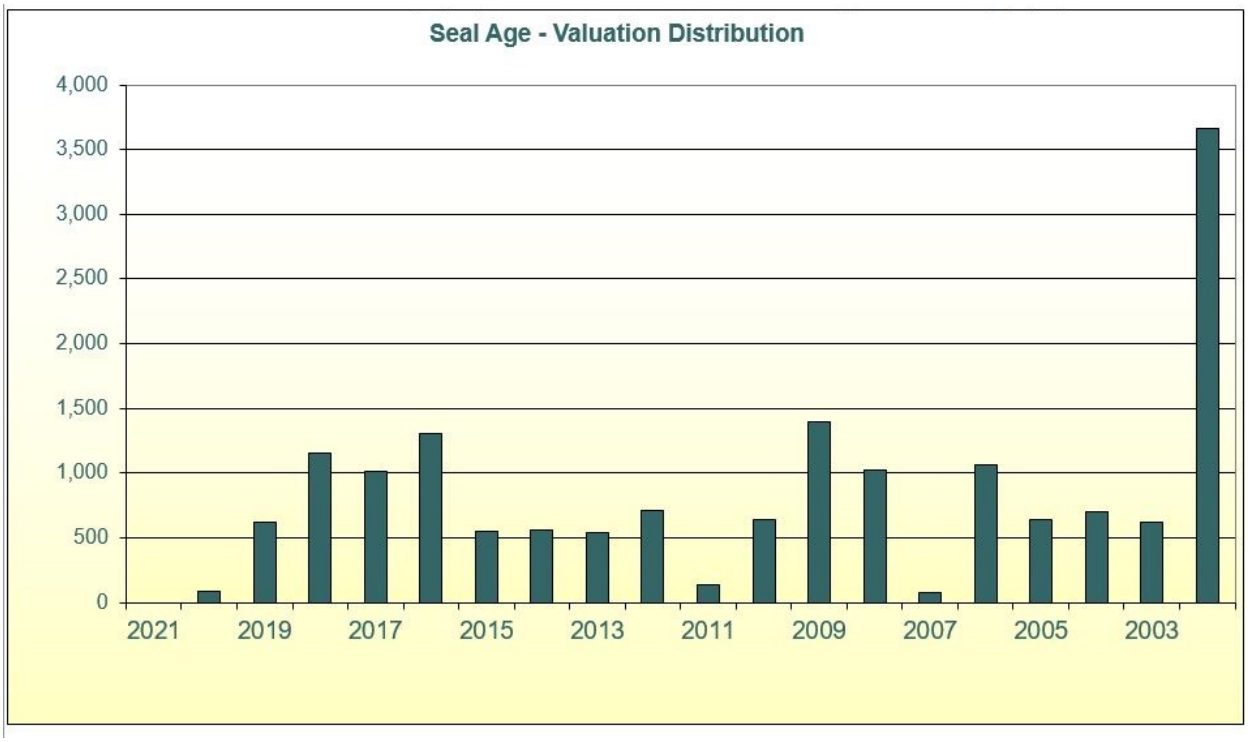
In rural municipalities from the late 1950's to the late 1980's there was a massive expansion of the rural sealed road network to accommodate public passion for modern cars, to provide easy access to towns and to provide safe and comfortable routes for school buses, funded primarily from federal sources.

Records of sealed pavement construction dates for Loddon Shire Council are incomplete as the records from seven pre-amalgamation municipalities varied in quality and detail.

With the average estimated life of 115 years used is in this plan, sealed pavements could be between 42 and 75 years of age. The actual life of sealed pavements may be affected by factors such as traffic loading, pavement material quality, variability of naturally occurring pavement materials, pavement strength, foundation capacity, differing standards and construction techniques used by individual pre-amalgamation councils, inundation by floodwaters and drainage conditions.

For sealed surface assets the availability of good records allows a detailed analysis of seal age to be graphed as shown in the figure below.

Figure 6: Sealed surface age graph



Unsealed pavements have been inspected since 2012 but insufficient information is available to prepare an age profile for gravel pavements.

For kerb and channel there is insufficient data to establish an age profile.

8.4 Asset valuations

The unit rates used for valuation, or replacement cost, of the assets used for financial reporting are calculated using the most recent available Council contract rates, observed works expenditure and Consumer Price Index (CPI) from the Australian Bureau of Statistics (ABS). Asset registers are updated on an annual basis with the most recent unit rates to determine current replacement cost.

8.4.1 Total asset valuation

Asset valuation is carried out before the end of each financial year by the Assets & Infrastructure Department and is forwarded to Financial Services Department. The valuation process is executed through Moloney's asset management system.

8.5 Historical data

Relevant historical data in the form of engineering plans applicable to the assets included in this plan are located as detailed below.

Table 32 Historical data

Available historical data	Location
Road and kerb and channel engineering plans	Plan filing cabinets and K:\Plans Database on Loddon Shire Council network

8.6 Routine maintenance plan

Typical maintenance defects are listed in the table below. Full details of applicable intervention standards and rectification timeframes are provided within Council's Road Management Plan.

Table 33: Typical maintenance defects

Typical maintenance defects
Pot holes
Edge breaks
Isolated pavement failures
Edge drop offs
Scours on unsealed surfaces
Rutting of unsealed surfaces
Corrugations on unsealed surfaces
Illegible or missing signs
Missing guide posts
Fallen trees/branches
Obstruction of sight distance by vegetation

8.6.1 Maintenance activities included within the budget

The road maintenance activity in the general ledger is:

331 Local road maintenance

This maintenance activity is further divided into the following ledgers:

- sealed road
- gravel road
- formed and unformed road
- storm clean up
- bridge and culvert
- roadside maintenance
- sign, furniture & delineation
- drainage maintenance
- street cleaning
- tree maintenance
- emergency call out
- grading.

8.6.2 Delivery of road maintenance and operations activities

Road maintenance and operational activities on sealed and unsealed roads are carried out by Council's in-house operations teams in accordance with specified intervention standards and response times detailed in Council's Road Management Plan.

8.6.3 Defect inspections

Maintenance defect inspection schedules are set out in 12.2 "Road and street inspection regimes" within Council's Road Management Plan (RMP).

8.6.4 Prioritisation of maintenance works

8.6.4.1 Routine Maintenance Program:

Maintenance works are prioritised in order of importance as follows:

1. emergency maintenance
2. hazard rectification
3. routine maintenance
4. programmed maintenance.

Routine maintenance is prioritised based on due date determined from prescribed defect response times in the Road Management Plan.

Programmed maintenance work is undertaken in line with the road grading program.

8.6.4.2 Reseal preparation

Maintenance works required in preparation for resealing works are identified by the Technical Services Department and undertaken by the Operations Department.

8.6.4.3 Periodic maintenance

Line marking and road marking of centrelines, stop and give-way lines is undertaken in conjunction with similar required following the resealing program.

8.6.5 Defect repair response times

Defect repair response times are as set out in Road Management Plan.

8.6.6 Standards and specifications

The standards for maintenance are described in the Road Management Plan in appendix 12.6 "Defect intervention levels and response times for roads and bridges".

8.6.7 Basis for future maintenance costs

Future maintenance costs for road maintenance are as detailed in 8.6.1 Maintenance activities included in the budget" and summarized in the "Financial projections" attachment.

8.7 Renewal plan

8.7.1 Renewal capital works program

Current capital works programs which may contain renewal works projects are:

- Reseals
- Local road amenity
- Local road safety
- Local road constructions
- Local road gravel resheets
- Local road shoulder sheets
- Township street improvements.

An annual infrastructure capital works program is developed each year by the Manager Assets & Infrastructure and Asset Management Coordinator. This program is then presented for consideration and adoption by Council.

Projects are sourced from a rolling program and are prioritised as detailed in section 8.7.2 below.

Allocation of funding between program categories e.g. reseals vs resheets is determined using the following influencing factors:

- available capital works funding within Council Long Term Financial Plan and Annual Budget.
- value of outstanding work contained within each rolling program category
- identified investment requirement from financial modelling to keep assets below intervention
- Council or strategic plan priorities
- availability of additional external funding sources
- risk to Council

8.7.2 Renewal priority ranking

8.7.2.1 Sealed pavement rehabilitation

Project prioritisation is based on the following criteria scored as per Council's project scoping document template:

- road hierarchy
- traffic volume AADT
- commercial vehicles - No per Day
- school bus route
- crash statistics, No. in 5 Years
- widening requirement - AADT & CV's See Above
- condition - Moloney
- level of maintenance required
- benefit contribution available.

8.7.2.2 Process for handling renewal of low traffic rural sealed roads

As a general rule the average whole of life costs for sealed roads are higher than those for gravel roads. This is not always the case due to specific variables for local roads such as weather conditions, geology, traffic impact and construction methodology.

This plan proposes the continue Councils policy of downgrading existing sealed pavements which have been identified as no longer warranting being sealed. Typically such pavements accommodate very low traffic volumes (<50 vpd) and have relatively stable geology and environmental conditions. Roads will only be reverted from sealed to gravel surfaces at the time that they are identified as requiring renewal. Through this strategy long term funding requirements for the road network may be reduced.

Sealed roads which notionally have been identified as not warranting being sealed are tabled in Attachment 2 “Low trafficked sealed pavements.”

The final determination of roads with sealed pavements which should not to be renewed to a similar standard is a three stage process.

When renewal of a low trafficked sealed pavement is imminent, stage 1 involves confirming that existing traffic volume data appears to have an Average Annual Daily Traffic (AADT) of less than 50 vehicles per day and less than 10 commercial vehicles per day.

In the second stage, consideration is given to the seven criteria detailed in 8.7.2.3 “Matters for consideration for renewal of low trafficked rural sealed roads”.

Finally the Manager Assets & Infrastructure reports the investigation to Council with a recommendation to either retain the road or segment of road as a sealed pavement or to discontinue sealed pavement renewal.

When discontinuance of renewal is adopted for a particular road, as the sealed pavement begins to fail, failed sections will be progressively scarified, reshaped and compacted, returning the road to a gravel surface.

The sections downgraded will be maintained as gravel pavements. The remaining sealed sections will continue to be maintained as sealed roads.

8.7.2.3 Matter for consideration for renewal of low trafficked rural sealed pavements

1) Seasonal heavy traffic

Additional traffic counts shall be undertaken throughout the year to identify any seasonal variations in commercial vehicle use. An assessment of the likely impact of these variations on maintenance and renewal costs if the road became unsealed shall be made.

2) Flooding

A review of flooding records shall be undertaken to identify whether any sections of the road are subject to flooding. Irrespective of any other considerations made in Stage 2, those sections subject to flooding shall be retained in a sealed condition.

3) Reactive and dispersive sub-grade material.

A review of maintenance, rehabilitation and construction records shall be undertaken to identify whether in-situ subgrade material exists that is dispersive and/or reactive. If deemed necessary, laboratory testing may also be undertaken.

An assessment of the likely impact of such sub-grades on maintenance and renewal costs if the road became unsealed, shall be made.

4) Emergency service access

Each emergency service organisation operating within the Shire shall be asked to assess what impact the change of the road from sealed to unsealed would have on its ability to meet its service obligations.

5) Future demand

An assessment of the potential future demands on the road shall be undertaken by Assets and Infrastructure department who will monitor traffic data.

6) Topography, road alignment and other infrastructure

An assessment of the local topography and road geometry shall be undertaken to identify sections of road that would tangibly increase the risk of vehicle accidents, or increase maintenance costs, if changed from sealed to unsealed.

Irrespective of any other considerations made in Stage 2, those sections approaching railway crossings and vertical and horizontal curves (where oncoming traffic cannot be seen) shall be retained in a sealed condition.

7) Continuity of standard of service

An assessment of the safety impact of changing within a given road length from sealed to unsealed shall be made.

8.7.2.4 Reseals

Projects to be considered on the annual local road reseal program are prioritised using seal surface condition outputs from Moloney Asset Management System, combined with field inspections

8.7.2.5 Final seals

Final seals are undertaken typically one year following completion of a primer-seal on a pavement rehabilitation or construction project.

8.7.2.6 Gravel resheeting program

Candidate projects to be considered on the annual gravel resheeting program are identified by team leaders in the field and prioritised using Council's Project Scoping process.

Projects are prioritised based on the following criteria scored as per Council's project scoping document template:

- road category (hierarchy)
- number of houses serviced
- school bus route
- significant business/industry route
- pavement depth
- historical level of maintenance required.

8.7.2.7 Shoulder sheeting program

Candidate projects to be considered on the annual shoulder sheeting program are identified by team leaders in the field and prioritised using Council's Project Scoping process.

Projects are prioritised based on the following criteria scored as per Council's project scoping document template:

- road category (hierarchy)
- number of houses serviced
- school bus route
- significant business/industry route
- seal width
- shoulder material depth
- historical level of maintenance required.

8.7.2.8 Kerb and channel rehabilitation

Project prioritisation is based on the following criteria scored as per Council's project scoping document template:

- road hierarchy
- number of houses serviced
- effect on pavement condition
- condition – Moloney
- level of maintenance required
- area is not sewered
- benefit contribution available.

8.7.3 Treatment options

Treatment options that are available for pavement renewal are summarised below.

Table 34: Renewal treatment options

Asset component	Treatment option	Comments
Sealed pavement	Reconstruction: Replacement of road base course and/or sub-base	Replacement of the existing base courses with new material. An expensive treatment which is not often used.
	Rehabilitation: Strengthen road sub-base and/or base course, resheet and primer seal.	Used extensively in rural areas. Involves removing the existing seal, reworking the existing pavement, often including stabilisation, then providing an additional pavement layer over the existing pavement then primer sealing.
	Major patching repair of isolated pavement failures	Removal of the failed section of pavement material (and possibly subgrade) and replacement with new materials, including surfacing. Usually involves areas greater than 10 sqm.
	In-situ pavement stabilisation to strengthen road base course	Increase the strength of existing base course materials by ripping and mixing existing material and adding a stabiliser (hydrated lime or cement), re-compacting and sealing
Sealed surface	Aggregate sizes	Generally 7mm, 10mm and/or 14mm aggregates are used on rural roads. In urban areas to minimise noise factors, 7 mm or 10mm aggregates are used.
	Bitumen binder	Increased use of polymer modified binders is occurring on cracked seals rather than undertaking extensive crack sealing prior to resealing.

8.7.4 Basis for future renewal costs

8.7.4.1 Renewal modelling - renewal unit rates

Moloney's asset management system and asset register is used to model renewal of infrastructure and renewal unit rates are obtained from the "Codes" tab in the asset register spreadsheet.

Moloney asset sets not used in renewal modelling are tabled below:

Table 35: Unused asset sets for renewal modelling purposes

Standard Moloney set not used	Reasons for not using
Pavement (High traffic) Urban	All treated as low traffic and included in low traffic urban sealed pavements
Asphalt seal (High traffic) Urban	Included in low traffic urban spray seals
Asphalt seal (Low traffic) Urban	Included in low traffic urban spray seals
Spray Seal (High traffic) Urban	All treated as low traffic and included in low traffic urban spray seals
Pavement (High traffic) Rural	All included in low traffic rural sealed pavements.
Spray Seals (High traffic) Rural	All treated as low traffic and included in low traffic rural spray seals.
Shoulder pavement (High traffic or narrow seal)	Shoulders (gravel) included in low traffic rural sealed pavements.
Shoulder pavement (Low traffic)	Shoulders (gravel) included in low traffic rural sealed pavements.
Pavement (High traffic) Unsealed	All treated as low traffic and included in low traffic unsealed pavements.

8.7.4.2 Renewal expenditure

The proposed renewal expenditure detailed in the “Financial Projections Attachment” is based on renewal demand determined in financial modelling.

As gravel shoulders are not modelled, the renewal expenditure required is based on the length of road shoulder for seals less than 6m and a renewal life of 30 years.

The renewal funding strategy options are explained in the following section.

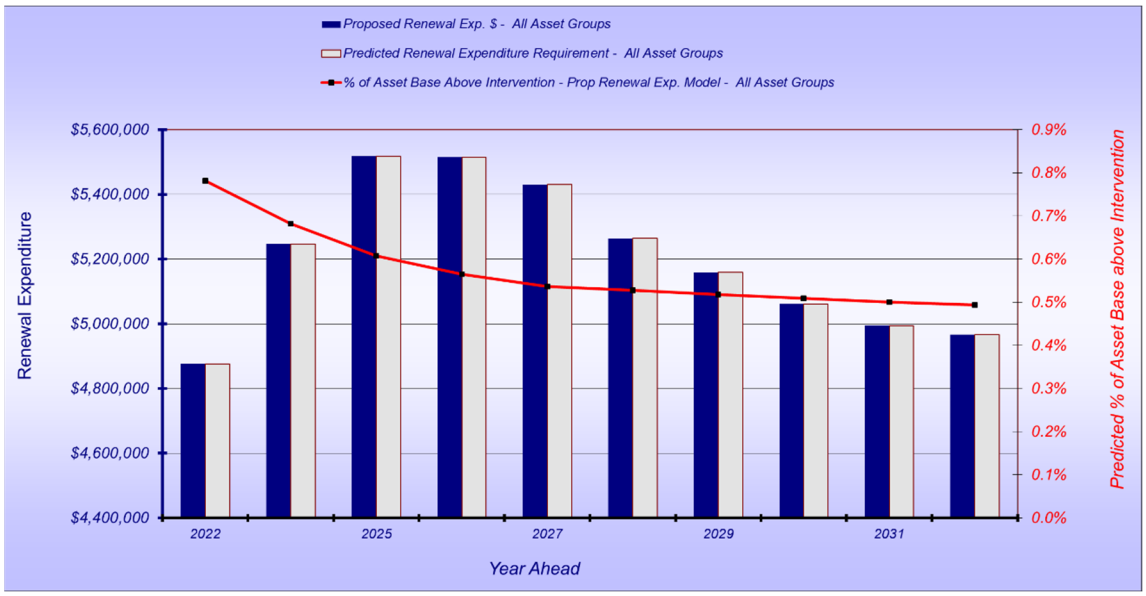
8.8 Funding Strategy for Renewal

8.8.1 Option 1 – Full funding of renewal demand

To demonstrate that it is a responsible asset custodian, Council should commit to funding its long term asset liabilities. This also aligns with Council’s *Asset Management Policy* objective of focussing on asset renewal before allocating funding to new assets and limiting asset expansion unless justified through sound business case.

The following figure shows the impact of fully funding the renewal demand driven by Council’s road network. In this scenario, there is no asset renewal gap. In year one of the analysis, 0.8% of road assets do not meet Council’s service standards. Based on the proposed funding profile, at year 10 of the forecast period this is reduced to 0.5% of the network.

Figure 7: Project renewal expenditure for full funding of renewal demand



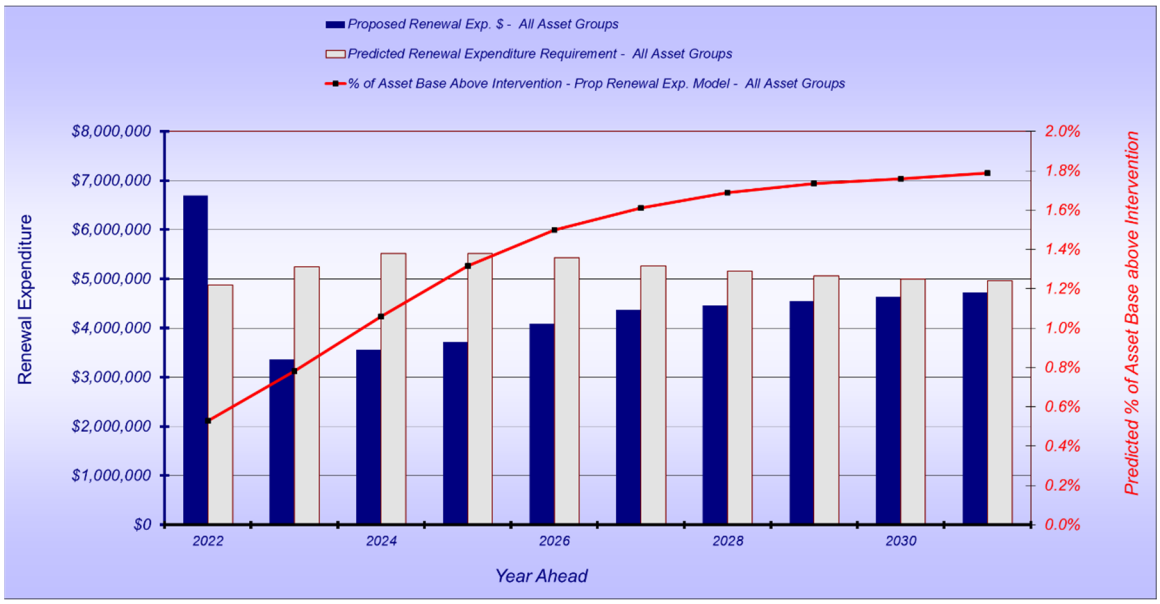
The required funding for Option 1 is greater than that currently in the Financial Plan. It would require Council to increase the amount of funding directed to roads by $7,592,919 over the next 10 years.

8.8.2 Option 2 – Current Financial Plan

One of the challenges for Council will be the ability to manage the liability associated with road assets. To meet this challenge, a funding solution as per the existing Financial Plan has been developed to assess the impact on Council's roads if the existing funding as per the Financial Plan is maintained.

The following figure shows the impact of adopting this funding strategy on Council's road network. In year one of the analysis, 0.53% of road assets do not meet Council's service standards. Based on the proposed funding profile, at year 10 of the forecast period this is increased to 1.79% of the network. Whilst this is an increase, the level of service of keeping 3% of Council's road network below the intervention level is met. In addition, additional funding can be sought for roads by applying for grants to offset the renewal gap that will exist with this level of funding.

Figure 8: Projected renewal expenditure for renewal expenditure as per the Financial Plan



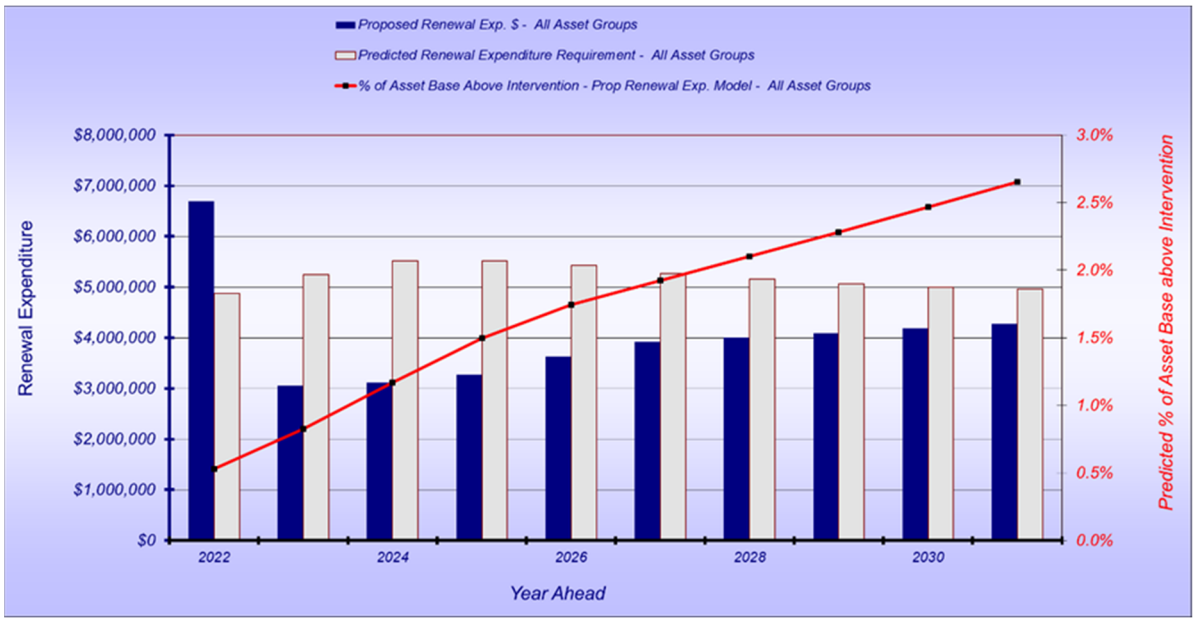
8.8.3 Option 3 – Current Financial Plan minus an allocation for new assets in other programs

Another of Council's challenges is funding new assets where there is Council and community support (e.g. footpaths). To meet this challenge, a funding solution has been developed as per the existing Financial Plan with an additional allocation for new assets.

Three categories of new assets have been included. The first is for the continuation of the Amenity Program which is due to finish after the 2023/24 financial year in the current Financial Plan. An allocation of $75,000 per year from 2023/24 was included in this modelling scenario. The second is for the continuation of the Safety Program which is due to finish after the 2023/24 financial year in the current Financial Plan. An allocation of $75,000 per year from 2023/24 was included in this modelling scenario. Finally, an allocation of $300,000 per year was included for new assets in the other category which can be directed to any other program (e.g. Footpaths) within the Financial Plan.

The following figure shows the impact of adopting this funding strategy on Council's road network. In year one of the analysis, 0.53% of road assets do not meet Council's service standards. Based on the proposed funding profile, at year 10 of the forecast period this is increased to 2.65% of the network. Whilst this is an increase, this is below the level of service of keeping 3% of Council's road network below the intervention level. In addition, additional funding can be sought for roads by applying for grants to offset the renewal gap that will exist with this level of funding.

Figure 9: Projected renewal expenditure for renewal expenditure as per the Financial Plan minus an allocation for new assets



8.8.4 Assessment of funding options

Option 3 is considered the preferred funding model for the renewal of road assets whereby the existing Financial Plan funding is adopted minus an allocation each financial year which is directed to new assets. Under this funding model, the service level of keeping 3% of road assets below the condition intervention level will also be met. Whilst a funding gap exists with the proposed funding, this can be offset by applying for grants.

The full details of the funding by year are in the Appendix in Attachment 1.

8.9 New and upgrade works

8.9.1 New and upgrade works program

New and upgrade works may include:

- new roads
- upgrade of road surface type
- pavement widening
- safety improvements
- isolated intersection treatments
- new kerb and channel.

An annual infrastructure capital works program is developed each year by the Manager Assets & Infrastructure and Asset Management Coordinator and reported to council for consideration and adoption.

Projects are sourced from a rolling program and are ranked as detailed in section 8.8.2 below.

8.9.2 New and upgrade project ranking

8.9.2.1 Sealed pavement construction

Project prioritisation is the same as for sealed pavement rehabilitation in “8.7 Renewal Plan”.

8.9.2.2 Kerb and channel construction

Project prioritisation is the same as for kerb and channel rehabilitation “8.7 Renewal Plan”.

8.9.2.3 Safety program

Project prioritisation is based on the following criteria scored as per Council’s project scoping document template:

- traffic Volumes
- number of crashes / near misses reported in last 5 years
- sight distance & delineation
- provision of suitable guard rails, protective barriers or separation mechanisms
- vegetation
- drop off height
- road alignment assessment.

8.9.2.4 Amenity program

Project prioritisation is based on the following criteria scored as per Council’s project scoping document template:

- township or rural Location
- traffic volumes
- number of residential properties (houses / 100m)
- strategic location or precinct (Recreation, commercial / residential & tourist area's)
- specific surface / ride quality improvement
- road subject to antisocial behaviour (Hoon activity)
- through road or transit route.

8.9.3 Basis for future new and upgrade costs

New and upgrade capital expenditure appears in the 10 year financial projections when there are not sufficient renewal projects available to satisfy the annual capital expenditure projection.

Table 36: Future new and upgrade costs

Program	Timing	Cost ($ p.a.)
Safety program	Next 3-8 years	50,000 – 150,000
Amenity program (Sealing pavements)	Next 3-8 years	40,000 – 120,000
Kerb and channel	Next 1-7 years	35,000 – 50,000

8.10 Operations plan

Operations activities are carried out by Council’s in-house operations teams in conjunction with road maintenance activities under Council’s Road Management Plan.

Typical operational activities include:

- street cleaning
- tree trimming
- roadside vegetation maintenance
- storm clean-up
- emergency callout
- removal of dead animals,
- accident clean-ups
- drain cleaning
- inspection program.

Operational activities and costs are combined with maintenance costs.

Based on the low cost and impact of the operational activities there is no benefit in separately costing operations.

8.10.1 Current operations programs

Current asset operations costs are tabled below.

Table 37: Operations costs

Operations costs	Annual
Current operations activities	Local road maintenance activities in budget

8.10.2 Basis for future operations costs

Operating costs are combined with maintenance costs and detailed in the Financial Projections attachment.

8.11 Disposal plan

8.11.1 Forecast disposal of assets

Generally disposal of roads assets is very limited in practice.

However Council needs to reduce its maintenance and renewal effort wherever possible. Council will investigate options to close or dispose of roads to relieve it of responsibility for sections of:

- dead-end roads which service only one dwelling or property
- roads which are not required for public use.

The actual costs associated with disposal of any roads will be insignificant. No cost for disposal is identified in the 20 year financial forecast.

Potential rationalisation/disposals identified are tabled below.

Table 38: Identified assets for disposal

Asset	Justification for disposal	Timing
None identified	N.A	N.A

9 FINANCIAL PLAN

9.1 Financial statements and projections

Financial projections for maintenance and operations, capital renewal, new and upgrade expenditure are provided for:

- sealed pavement
- sealed surface
- gravel shoulders
- unsealed pavement
- kerb and channel
- amenity program
- safety program.

Required investment projections over 20 years are detailed in the Financial Projections Attachment.

Expenditure projections are in 2021-2022dollar values and exclude GST.

No required expenditure is predicted for disposal of road assets.

9.2 Funding strategy

Expenditure has historically been funded from the following sources:

- rates
- Roads to Recovery
- Victoria Grants Commission
- other grants
- special charge schemes.

9.2.1 External funding

Council relies on external funding primarily from Roads to Recovery and Victoria Grants Commission Local Roads Funding allocations to manage its local road network.

External funding levels are summarised in the following table.

Table 39: Future external funding

Year	Roads to Recovery funding ($)	Victoria Grants Commission Local Roads Funding ($)	Total external funding ($)
2021-22	2,387,726	3,867,460	6,255,186
2022-23	2,387,726	3,983,484	6,371,210
2023-24	2,387,726	4,102,989	6,490,715
2024-25	2,507,112	4,352,861	6,859,973

9.2.2 Commitment of capital works funding

The capital works funding identified in this plan is an annual commitment. Funding will primarily be used for renewal works but where insufficient renewal projects are available to fully expend this commitment, unexpended funds will be used to fund:

- road improvements such as intersection realignments
- upgrades such as pavement widening
- safety and amenity program works
- renewal, upgrade or construction of other infrastructure (e.g. footpaths).

9.2.3 Financial projections

The financial projections in this plan are used in developing the Financial Plan. In the annual budget development process Council may not be able to fully fund the projections in this plan or the Financial Plan. As a result these financial projections may be amended on a prorate basis from time to time.

Redistribution of available funding between annual infrastructure program categories may also occur during development of the annual budget, in accordance with the factors described in section 8.7.

9.2.4 Key assumptions made in financial forecasting

The following assumptions have been made in developing the financial forecast:

- there will be no significant net increase in the overall extent of the road network
- corporate administration charges, interest costs and other indirect overheads have been excluded from operational expenditure
- all expenditure predictions are based on current costs, excluding GST
- external funding will continue at current or known levels.

10 ASSET MANAGEMENT PRACTICES

10.1 Asset management systems

Details on asset management systems used by Council are summarised below.

Table 40: Asset management systems used for individual asset categories

Asset category	Software/asset management system	Data collection/review
Urban sealed roads	Moloney Asset Management System – Roads module	At time of condition survey or when otherwise notified.
Rural sealed roads		
Unsealed roads		
Kerb & channel		

The current asset management system has no link to the financial/accounting system.

10.2 Standards and guidelines

Standard drawings and technical standards applicable to the assets included in this plan are detailed in:

- Infrastructure Design Manual (IDM)

and the following subsidiary documents referenced in the IDM:

- Austroads Design Manual,
- Austroads Standard Drawings
- Traffic Management: VicRoads Traffic Management Manual Volumes 1 & 2,
- Signs: AS 1742 Manual of uniform traffic control devices,
- Signs: Tourism Victoria & VicRoads, Tourist Signing Guidelines.

Standards applicable to this plan are as in Clause 12 “Design of roads” in the Infrastructure Design Manual but with variations detailed below.

10.2.1 Urban road standards

Section 12.3 “Urban roads” details standards for urban roads.

In Loddon the standards used for sealed streets are detailed in:

- standard drawing SD 610 “Typical road profiles access place & street/collector level 1 & 2” in the following profiles:
    - access street and
    - collector street Level1

and in

- Table 2 “Urban road/street characteristics” for the following street types:
    - access street and
    - collector/connector street level 1.

Urban gravel streets are constructed to the rural access – group A councils profile in standard drawing SD 615 “Typical road profiles low density residential collector/rural access” with a minimum compacted design pavement depth of 100mm.

In Selection Table 4 “Kerb profiles” Loddon uses kerb and channel sections B2, SM2 and SM2 Modified, depending on the location.

10.2.2 Rural road standards

Section 12.4 “Rural roads” details standards for rural roads.

In Loddon the standards used for rural roads are detailed in:

- standard drawing SD 615 “Typical road profiles low density residential collector/rural access” in the following profiles:
    - rural access - group A councils and
    - low density residential collector road - group A councils

and in

- Table 6 “Rural road characteristics” for the following road types for standard A councils:
    - rural access and
    - rural collector roads.

But for rural gravel roads the minimum pavement width is 4.6m and the design pavement depth is a minimum of 100 mm compacted gravel of crushed rock.

10.2.3 All weather access standard

The minimum standard for an all-weather access road is:

Pavement width	4.6m
Design pavement depth	100 mm compacted depth of gravel or crushed rock

11 IMPROVEMENTS AND MONITORING

11.1 Improvement program

The asset management improvement plan generated from this asset management plan is shown in the following table. At this stage, targeted customer research has not been undertaken for Council’s road assets.

Table 41: Improvement Plan

Task	Responsible person	Resource type	Timeline
Conduct formal condition assessments of the roads network at regular frequencies that are appropriate for this asset class.	Asset Management Coordinator	Internal	As resources permits
Confirm community levels of service through engagement with the public. Current technical levels of service should be reviewed accordingly.	Manager Assets & Infrastructure	Internal	As resources permits
Council should review and implement processes to measure the community's level of satisfaction with Council's roads at least annually.	Director Corporate Services	Internal	As resources permits
Review modelling of financial forecasts on a biannual basis (2 yearly). Forecasts to provide input in the Financial Plan, Annual Budget, and Capital Works Program.	Manager Assets & Infrastructure	Internal	As resources permits
Develop a project-based three (3) year Capital Works Program for renewals, upgrades and new works and integrate with Council's Financial Plan.	Asset Management Coordinator	Internal	As resources permits
Develop a process to review the applicable road hierarchy e.g. where rural residences are no longer occupied.	Asset Management Coordinator	Internal	As resources permits

Council's Manager Assets & Infrastructure will need to determine the priority of the actions in this improvement plan, allocate a responsible officer and identify resource needs. This is to ensure that the implementation of these improvement actions align with Council's overall asset program. This prioritisation and allocation of resources should be consistent with Council's Asset Management Strategy and overall asset management framework

12 COSTING AND FUNDING OF ACTIONS

Table 42: Cost and funding of this plan

Activity	Estimated Cost ($)	Expected external funding ($)	Net cost to Council ($)	Proposed funding source	Funding timeframe
Annual maintenance - operations costs & capital expenditure, on roads, streets, kerb and channel	9,930,210	6,371,210	3,572,504	Roads to Recovery & Victoria Grants Commission.	2022-23

Annual maintenance - operations costs & capital expenditure, on roads, streets, kerb and channel	10,189,715	6,490,715	3,685,931	Roads to Recovery & Victoria Grants Commission.	2023-24
Annual maintenance - operations costs & capital expenditure, on roads, streets, kerb and channel	10,608,973	6,859,973	3,468,377	Roads to Recovery & Victoria Grants Commission	2024-25

Costs are in 2021-2022 dollar values and exclude GST.

13 REFERENCES

Asset Management Policy 2020
Asset Management Strategy 2011
Road Management Plan 2021

14 APPENICES

14.1 Appendix 1 Community satisfaction survey

The latest community satisfaction survey was undertaken in 2021.

Outcomes of the survey relating to roads is summarised in the table below.

Table 43: Results of community satisfaction survey

Performance measure	% of respondents who rated performance					
	Very good	Good	Average	Poor	Very poor	Can't say
Condition of sealed roads	7	31	28	21	11	1
Maintenance of unsealed roads	7	26	30	22	12	3

15 ATTACHMENTS

15.1 Attachment 1 - Financial Projections

15.2 Attachment 2 - Low trafficked sealed pavements

16 ATTACHMENT 1 – FINANCIAL PROJECTIONS

This attachment contains the financial projections resulting from strategies within the Road Asset Management Plan and from renewal gap modelling undertaken from time to time. Note that all costs are shown in 2016 dollar values and don't include footpath and drainage capital expenditure.

Projected 10 year maintenance and capital expenditure

		Capital renewal ($)					Capital new or upgrade ($)				Total annual capital expenditure ($)
Budget Year	Maintenance & operations expenditure ($)	Sealed pavement	Sealed surface	Gravel shoulder	Unsealed pavement	K & C	K & C	Amenity Program	Safety Program	Other	
21-22	6,295,694	4,905,633	723,259	86,580	838,018	166,576	0	397,084	459,407	0	7,576,557
22-23	6,385,040	1,243,513	1,130,667	194,156	405,419	85,995	30,000	78,831	90,093	300,000	3,558,674
23-24	6,477,869	1,369,169	1,027,403	202,040	458,325	58,449	30,000	120,957	120,957	300,000	3,687,300
24-25	6,579,619	1,402,659	1,074,384	210,081	517,874	63,733	30,000	75,000	75,000	300,000	3,748,731
25-26	6,669,388	1,638,857	1,121,578	218,282	586,791	69,193	30,000	75,000	75,000	300,000	4,114,701
26-27	6,768,598	1,778,469	1,167,733	226,649	670,447	74,834	30,000	75,000	75,000	300,000	4,398,132
27-28	6,877,595	1,814,161	1,192,770	237,316	683,185	76,825	30,000	75,000	75,000	300,000	4,484,257
28-29	6,989,222	1,850,530	1,218,283	248,249	696,166	78,855	30,000	75,000	75,000	300,000	4,572,083
30-31	7,103,516	1,887,580	1,244,280	259,453	709,393	80,923	30,000	75,000	75,000	300,000	4,661,629
31-32	7,220,631	1,925,353	1,270,771	270,941	722,872	83,031	30,000	75,000	75,000	300,000	4,752,968

N.B The 2021-22 budget year has carryovers and other one off funding included in it which was not detailed earlier in the asset management plan. This year has already been allocated so this has no material effect on budget allocations going forward.

17 ATTACHMENT 2 – LOW TRAFFICKED SEALED PAVEMENTS

Road	Traffic Volume AADT (vpd)	Commercial vehicles (cvpd)
Abattoirs Rd	14	1.68
Appin South Rd	24	10.08
Arnold Newbridge Rd	24.2	2.904
Arnold West Inglewood Rd	31	14.57
Barclay Rd	24	3.36
Baringhup Eddington Rd	45	5.4
Barraport East Rd	31.6	6.004
Barraport West Rd	35	4.55
Bealiba Wehla Rd	13	3.25
Berrimal Wedderburn Rd	35	3.5
Boort Fernihurst Rd	40	3.6
Boort Kurting Rd	43	3.87
Boort Yando Rd	14	1.82
Calivil Mail Rd	26	8.32
Canary Island Leaghur Rd	33	17.49
Cemetery Rd	15	0.9
Charlton Borung Rd	49	16.66
Dalziels Rd	31.6	0.948
Dingee Settlement Rd	12	2.28
Dunns Rd	35	9.8
Dunolly Rheola Rd	27	9.99
Eastville Rd	35	9.45
Elmsford Rd	28	6.44
Fentons Creek Wehla Rd	14	3.08
Fiery Flat Rd	38	3.8
Hamleys Rd	45	3.15
Hangmans La	6	0.96
Hill Rd	49	2.94
Kamarooka Store Rd	30	1.8
Keoghs La	14	0.28
Kingower Kurting Rd	28	1.68
Loddon West Rd	21	8.19

Road	Traffic Volume AADT (vpd)	Commercial vehicles (cvpd)
Mincha Canary Island Rd	38	4.94
Mysia East Rd	23	3.22
Mysia West Rd	17	0.68
Neivandts Rd	22	5.28
Newbridge Bridgewater Rd	46	14.26
Nine Mile Wedderburn Rd	19	2.47
Nine Mile Woosang Rd	10	2.5
Old Charlton Boort Rd	12	2.64
Penny La	7	0
Pyramid Cemetery Rd	5	0.75
Quambatook Wychitella Rd	17.1	10.773
Rheola Arnold Rd	12	1.8
Rheola Llanelly Rd	30	5.1
Richards Rd	33.6	16.8
Richmond Plains Wedderburn Rd	34	1.7
Rothackers Rd	26.9	5.918
Shelbourne Rd	11	2.09
Silo Woolshed Rd	31	17.05
Simpson Creek La	7	1.26
Slatterys Rd	20	11.6
Sylvaterre Rd	35	16.45
Tandarra Elmore Rd	49	9.8
Tandarra Serpentine Rd	20	9.2
Tarnagulla Eddington Rd	11	1.21
Wedderburn Buckrabanyule Rd	24	6.96
Wedderburn Serpentine Rd	50	7.5
Wedderburn Wychitella Rd	22	0
Wehla Wedderburn Rd	10	1.1
Weir Rd	12	0.24
Whittaker La	41	4.92
Wilkinsons Swamp Rd	27	6.75
Woodstock Rd	34	15.64
Wychitella Bus Route Rd	31	1.86
Wychitella North Rd	11	1.1
Yallook Mail Rd	36.4	6.916
Yarrawalla East Rd	43	10.75
Yarrawalla West Rd	45	19.8