GANNAWARRA
SHIRE COUNCIL

H: Road Asset Management Plan – February 2015

Document Format

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

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

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1 Summary

Council adopted the original Road Asset Management Plan in June 2010. The plan was reviewed in June 2012 following a significant investment in the road network due to flooding which affected approximately 50% of the road network.

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

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

This plan covers the proposed levels of service, future demand, routine maintenance, renewal/replacement, acquisition/creation/augmentation of road assets and disposal. It also outlines the financial requirements and the key assumptions made in the financial forecasts.

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

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

This plan does not in any way alter the responsibilities detailed in Council's Road Management Plan.

The ***Road Management Plan*** is developed and implemented in accordance with the "Road Management Act 2005" that prescribed requirements for inspection and maintenance schedules.

Service Background		
Council Plan Area of Achievement		
Service Area	Infrastructure	
Budget Area	Infrastructure	
Service Purpose and Description	The purpose of the service is to provide for the liveability of the community by: • Providing a network that enables safe travel • Providing access to key infrastructure within towns • Linking communities and townships • Providing for freight and economic development To achieve this Council will: • Monitor and maintain the network to an agreed standard • Monitor and schedule upgrades to the network	
Service Planning	Strategic Planning Maintenance & Construction	Manager Design and Projects Manager Operational Services

Service Costs 2013/14			
Maintenance Expenditure	**$2,640,000**		
Capital Income	**$998,000***		
Capital Expenditure	**$2,224,000**	Capital as % of rates	**24.5%**
Total Net Cost	**$3,866,000**	**Overall as % of rates**	**42.5%**

- Grant funding is R2R, it excludes the Country Roads and Bridges funding as the program has now been completed.

2 Plan Format and Definitions

The Road Asset Management Plan is designed to provide a framework for the efficient management of Council's road network.

2.1 Relationship with other Planning Documents

- Council Plan 2013-17
- Road Management Plan
- Rail Safety Interface Agreement
- Disability Action Plan
- Gannawarra 2025
- Tracks and Trails Strategy
- Recreation Reserve Master Plans
- Community Safety Plan
- Integrated Community Plan
- Tourism Strategy

2.2 Infrastructure Assets included in the Plan

Asset Category	Asset Components	Assets Included
Roads	Sealed Roads	Formation Pavement Sealed Surface Kerb Safety Signage
	Unsealed Roads	Formation Pavement Safety Signage
	Earth Formed Roads	Formation Safety Signage

2.3 Assets not included in this Plan

Assets specifically excluded from this plan are:

- Vehicle crossings, driveways and footpaths
- Stormwater infrastructure (excluding kerb)
- Nature strips
- Assets that are not part of the road infrastructure
- Bridges
- Utility assets such as communication, electricity and water infrastructure
- Railway crossing infrastructure that is the responsibility of the rail infrastructure manager
- Assets under a 173 agreement

3 Levels of Service

The primary purpose of a road is to provide access to properties or parcels of land. The construction of the road and road surface will vary depending on a number of factors such as whether the road functions as a linkage between districts, collects traffic from a number of smaller roads or provides access to residences or rural farming properties.

It is Council's aim to provide all weather access to a primary place of residence; this includes roads within the register that are classified as Link, Collector and Access-Major. It is vital to understand that the provision of all-weather access does not require a road to be sealed, nor does it mean a vehicle has the ability to travel at a high speed, the driver of the vehicle must at all times travel at a speed and in a manner appropriate for the conditions of the road.

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

Factors that determine the level of service are primarily:

- Whether alternative access options exist
- Access to a primary place of residence
- The number and type of vehicles using the road
- Community safety
- Strategic and Corporate Goals - Council's goals and values as stated in policies, strategies, and the Council Plan.
- Regional transport requirements

3.1 Customer Engagement and Expectations

Requirement	Example	How measured
Need	A road is required to allow access to a specific location	Customer feedback Review of network Network analysis
Safety	Condition and defects of a road, visibility issues	Condition inspections Customer feedback Defect inspections to comply with the Road Management Act
Aesthetic / Ride quality Complaints	Ride quality issues, eg rough ride	Customer feedback Condition inspections
Maintenance	Grading, pothole patching	Condition inspections Customer feedback Defect inspections to comply with the Road Management Act

3.2 Key performance indicators

KPI	Levels of Service	Performance Measurement	Target Performance
Response to safety issues	Assets safe to use and free of hazards	Response and repair in accordance with Road Management Plan	As detailed in the Road Management Plan
Condition	Maintained at agreed level of service for each asset class	Condition appraisals	95% of the network within intervention level
Accessibility	All weather access provided to a primary place of residence	An occupied dwelling will have an all-weather pavement to a designated point of the property	99% of occupied dwellings will have all weather access

3.3 Asset Hierarchy

Council's urban and rural road network is classified into seven tiers according to their purpose as defined in Council's Road Management Plan:

Classification	Definition	Accessibility	Surface
Link	Primarily a link/connector between townships, declared roads, major residential areas, arterial roads, industrial centres, or areas of significance.	All Weather Access	Generally Sealed
Collector	Primarily connects into districts, residential areas, minor industrial centres, primary commercial access or conveys traffic to link or arterial roads.	All Weather Access	Gravel or Sealed
Access-Major	Primarily provides access to residences or primary commercial/industrial access.	Generally All Weather Access	Gravel or Sealed
Access-Minor	Primarily provides access to property, river access, fire access, and seasonal produce haulage.	All Weather or Dry Weather Only Access	Gravel or Earth
Ancillary Road Areas	A roadway generally contained within a Caravan Park, public park or public reserves. These are generally not within a road reserve but on Council managed land.	Generally All Weather Access	Generally Sealed
Developer Road	A roadway within a road reserve that is currently under construction or within a defects liability period.	Generally All Weather Access	Generally Sealed
Not Maintained	Primarily un-formed roads, tracks, laneways, reserves and rarely used. These are generally within a Government Road Reserve.	Dry Weather Only	Earth or Gravel

3.4 Levels of Service

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

- What level of service will be required in the short term, in the medium term, and in the long term for the users of the road network?
- Are there alternative means of providing access? Can the road network be altered / upgraded in other areas to provide appropriate access?
- What is the traffic volume and vehicle classification?
- Is the road a school bus or milk tanker route?
- Is the road a seasonal haulage road?

3.4.1 Intervention Levels of Service

Pavement Category	Intervention Level
Link	7
Collector	7
Access Major	7
Access Minor	N/A [#]
Ancillary Road Areas	8
Developer Road	1*
Not Maintained	N/A

[#] Access Minor roads are all earth formed and thus an intervention level for replacement cannot apply. The condition or timing of inspections and maintenance grading of these roads is covered in the Road Management Plan.

* The maintenance of a developer road is the responsibility of the developer during a defects liability period prior to it becoming the responsibility of Council. When the road reverts to Council generally after a 12 or 24 month period the road must be in or near "as new" condition.

3.4.2 General Levels of Service

Community Levels of Service	Technical Target	Technical Measure
A primary place of residence will have access to an all-weather road	All weather pavement constructed	100% of primary places of residence will have all weather access
Roads will be safe to use	As defined within Council's Road Management Plan	100% compliance with Council's Road Management Plan
The road will be wide enough	As defined in section 3.5 of this plan	100% of new construction will meet or exceed the minimum width requirements
The road will be free draining and not hold puddles of water	Constructed roads will shed water	100% of new construction/resheets will meet or exceed the minimum requirements to shed water freely
Regulatory signage will be in good condition and viable in all lighting situations	Regulatory signage will be viable on approach	100% compliance with Council's Road Management Plan

Directional signage	All constructed roads will be signed	At least one sign generally at the intersection with the primary access road
Visibility will not be adversely effected by vegetation	Vegetation will be managed in accordance with Council's Road Management Plan	100% compliance with Council's Road Management Plan
Rail crossings will be safe	Signage and advanced warning signs will be in place and in good condition	Signage will be inspected every 6 months and replaced where required

3.4.2.1 Sealed Road Specific Levels of Service

Community Levels of Service	Technical Target	Technical Measure
Roads will have a smooth surface	Roads will be free of severe cracking, rutting and potholes	100% compliance with Council's Road Management Plan
Roads will not have bleeding seals	Reseals will be free of excessive binder	Identified issues will be rectified within 14 days
Drop off at shoulders will be minimal	Road shoulders will be smooth and the transition from road to shoulder will be minimal	100% compliance with Council's Road Management Plan
Giveway and stop lines will be visible	Statutory linemarking will be visible at all required locations	Linemarkings will be visible on approach. 30% of markings are repainted annually
Roads will have dividing/centre lines	Line marking will be provided where width and traffic volume justify in accordance with VicRoads guidelines	100% of new construction will be appropriately line marked as required by the VicRoads guidelines Existing line markings will be maintained

3.4.2.2 Unsealed Road Specific Levels of Service

Community Levels of Service	Technical Target	Technical Measure
School bus routes / milk tanker routes will be maintained to a higher standard	Known routes will generally be maintained at a higher level of service	90% of these roads will be targeted at an intervention level of no greater than 7
Roads will have a smooth surface	Roads will be free of corrugations, rutting and potholes	100% compliance with Council's Road Management Plan
There will be minimal loose stones or material on the road way	The build-up of loose material on the carriage way will be minimised	100% compliance with Council's Road Management Plan

3.5 Construction widths

3.5.1 Sealed pavements rural areas

As part of the reconstruction, upgrade or new construction of sealed roads the following dimensions shall be followed as a minimum unless funding or other factors dictate otherwise:

Road Hierarchy Classification	Seal Width(m)	Formation	Clear Trafficable Width (m)
Link Road >500vpd or high truck count	7	9	11
Link Road <500vpd	6	7	10
Collector Road	6	7	10
Access-Major Road - all volumes	4	6	8

3.5.2 Sealed pavements urban areas

Pavement widths in urban areas will generally be different to that in rural areas due to the inclusion of kerb, parking areas and utilities within the road reserve. As part of the reconstruction, upgrade or new construction of sealed roads the following dimensions shall be followed as a minimum.

Road Hierarchy Classification	Seal Width (m)	Reserve Width (m)
Link Road	7.5	16m
Collector Road	7.5	16m
Access-Major Road	6.0	14m
Access-Minor Road	N/A	N/A

3.5.3 Unsealed pavements construction width

As part of the reconstruction, upgrade, new construction or resheet of unsealed roads, the following dimensions shall be followed:

Classification	Gravel Width Traffic Lane (m)	Trafficable Width including shoulder (m)
Link	6.0	7.0
Collector traffic dependant	3.5 or 6.0	5.5 or 7.0
Access-Major	3.5	5.5
Access-Minor	N/A	3.5

3.6 Maintenance

In accordance with Council's Road Management Plan and the Road Management Act 2004 all roads managed by Council are inspected and recorded in the "Confirm" Asset Management System on a regular basis. These inspections are designed to identify defects within the road network such as potholes, corrugations, cracking etc.

The timing of follow-up maintenance for these defects is also governed by the Road Management Plan and will include such tasks as maintenance grading, crack sealing and pothole patching. These maintenance activities are designed to ensure the road asset will reach its design life and provide a ride quality as detailed in this plan.

4 Future Demand

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

Factor Influencing Demand	Impact on the service, cost, timing	Demand Management Plan Actions
Residential development	New residential developments generally have permit conditions requiring the construction of internal roadways by the developer. These must be constructed in accordance with this plan and the Infrastructure Design Manual.	Ensure all residential developments have the requirement to construct roads to standard.
Population shifts	The change in population across the municipality can impact on the traffic volumes each road receives and thus the function of the road. It is also possible that vacated dwellings can impact significantly on the function / requirement of a road.	Where the function of a road alters the classification of the road will require review.
School bus routes	The change in demographics of a region and land use can have an effect on the need for school buses to travel down different roads from year to year.	Requests from schools will be monitored and roads maintained accordingly.
Change in land use	The change in land use from farming to industrial or to nature reserves can impact the traffic volumes and types.	Where the function of a road alters the classification of the road will require review.
Altered farming practices	Changes to farming equipment or to specific crops and stock types can alter the traffic volumes and types.	Where the function of a road alters the classification of the road will require review.
Public transport changes	Changes to the frequency and availability of public transport can lead to a change in traffic on a road.	Where the function of a road alters the classification of the road will require review.
Changes in freight vehicles and capacity	The move towards higher mass and larger vehicles can reduce the traffic volumes on a road while potentially increasing the axel loading. This may have the impact of reduced pavement life and the requirement to strengthen pavements and alter lines of sight.	Monitor the condition and review the pre-approved higher mass roads.
Change in land ownership	Over time through property ownership changes, there are no through roads that are now bound on all sides by a single property owner and in effect are private driveways.	Review and discontinue these roads where appropriate and facilitate the property owner in obtaining a licence over the land.

4.1 Network Augmentation

Under some circumstances it may be considered necessary to alter the classification of a road due to a change in demand. It must be clearly understood that the reclassification of roads must be based on objective data in relation to usage, construction cost and maintenance costs. The actual level of service required must be assessed separately to the desired level of service.

Under section 41 of the Road Management Act 2004, Council, being the relevant road authority may determine the standard to which it will construct, inspect, maintain and repair roadways, pathways, road infrastructure and related infrastructure. Should the reclassification of the road translate to an increased level of service, under most circumstances Council is not required to advertise this alteration.

However, should it be determined that the reclassification could relate to a decrease in the level of service, notice will be provided in accordance with the regulations.

4.2 Identified Network Linkage Improvements

Population and usage trends of roads throughout the Shire are dynamic. Council recognises this and the need that some roads may in the future require upgrading to a higher level of service, however it must be kept in mind that the process for road upgrades need to be based on objective data and not a desirable level of service.

5 Risk Management

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

5.1 Asset Criticality

Asset criticality addresses assets that have both a high consequence of failure (being a major or catastrophic consequence) and have a high risk of failure. There are a number of roads included in this management plan that meet these criteria under certain situations such as floods or fire.

5.2 Legislative Requirements

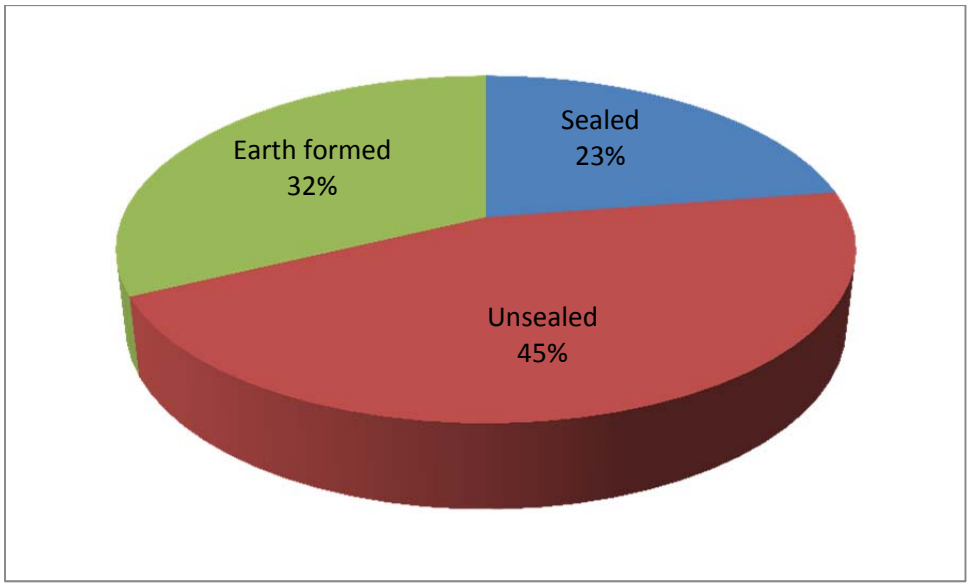
The relevant legislation governing road construction and maintenance operations are listed below:

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

6 Lifecycle Management Plans

6.1 Asset Ownership

- Sealed Network: 501km
- Unsealed Network: 1,003km
- Earth Formation: 752km



6.2 Asset Life Cycle

Asset	Life in Years
Pavement (High Traffic) Urban	100
Pavement (Low Traffic) Urban	100
Asphalt Seal (High Traffic) Urban	22
Asphalt Seal (Low Traffic) Urban	22
Spray Seal (High Traffic) Urban	17

Asset	Life in Years
Spray Seal (Low Traffic) Urban	17
All Kerbs	80
Pavement (High Traffic) Rural	100
Pavement (Low Traffic) Rural	100
Spray Seals (High Traffic) Rural	17
Spray Seals (Low Traffic) Rural	17
Shoulder Pavement (High Traffic or Narrow Seal)	15
Shoulder Pavement (Low Traffic)	30
Pavement (High Traffic) Unsealed	15
Pavement (Low Traffic) Unsealed	20

6.3 Asset Quantities

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

Asset	Quantity
Pavement (High Traffic) Urban	318,747 m^2
Pavement (Low Traffic) Urban	504,898 m^2
Asphalt Seal (High Traffic) Urban	559 m^2
Asphalt Seal (Low Traffic) Urban	20 m^2
Spray Seal (High Traffic) Urban	282,161 m^2
Spray Seal (Low Traffic) Urban	524,013 m^2
All Kerbs	143,671 m
Pavement (High Traffic) Rural	2,181,208 m^2
Pavement (Low Traffic) Rural	198,157 m^2
Spray Seals (High Traffic) Rural	2,196,253 m^2
Spray Seals (Low Traffic) Rural	204,023 m^2
Shoulder Pavement (High Traffic or Narrow Seal)	1,102,845 m^2
Shoulder Pavement (Low Traffic)	119,400 m^2
Pavement (High Traffic) Unsealed	922,942 m^2
Pavement (Low Traffic) Unsealed	3,654,961 m^2

6.4 Asset Condition

The table below shows the percentage of each asset class within a given condition rating.

Condition Rating	Pavement (High Traffic) Urban	Pavement (Low Traffic) Urban	Spray Seals	All Kerbs	Pavement (High Traffic) Rural	Pavement (Low Traffic) Rural	Shoulders	Pavement (High Traffic) Unsealed	Pavement (Low Traffic) Unsealed
10	0.0	0.0	0.5	2.0	0.1	0.0	0.0	0.0	0.0
9	1.6	0.5	1.3	3.0	0.5	0.3	0.0	0.0	0.0
8	0.0	0.0	2.9	5.0	1.0	0.0	3.0	0.0	1.0
7	0.0	0.0	5.0	6.0	2.6	0.0	4.0	2.0	2.0
6	2.9	1.1	8.9	10.0	8.7	7.8	8.0	3.0	8.0
5	9.2	6.4	10.2	19.0	12.2	8.3	14.0	6.6	5.0
4	4.2	6.8	10.3	20.0	11.1	16.1	20.0	8.0	4.1
3	15.2	16.4	14.8	18.0	15.6	17.5	21.0	40.9	32.7
2	21.1	20.5	18.2	11.0	23.7	20.3	13.0	22.0	26.5
1	15.8	20.5	17.2	4.0	13.9	16.6	12.0	13.5	15.9
0	30.0	27.8	10.7	2.0	10.8	13.1	5.0	4.0	4.8

6.5 Asset Replacement Costs

The table below shows the cost per unit of each asset class, based on valuation.

Asset	Unit Replacement Cost
Pavement (High Traffic) Urban	$33.20
Pavement (Low Traffic) Urban	$33.21
Asphalt Seal (High Traffic) Urban	$45.00
Asphalt Seal (Low Traffic) Urban	$45.00
Spray Seal (High Traffic) Urban	$4.80
Spray Seal (Low Traffic) Urban	$4.80
All Kerbs	$110.00
Pavement (High Traffic) Rural	$22.45
Pavement (Low Traffic) Rural	$22.50
Spray Seals (High Traffic) Rural	$4.80
Spray Seals (Low Traffic) Rural	$4.80
Shoulder Pavement (High Traffic or Narrow Seal)	$1.00
Shoulder Pavement (Low Traffic)	$1.00
Pavement (High Traffic) Unsealed	$4.85
Pavement (Low Traffic) Unsealed	$4.85

6.6 Asset Valuations

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

Asset	Replacement Valuation
Sealed Pavements	$81,495,710
Sealed Surface	$15,364,633
Sealed Formation	$16,514,293
Kerb	$15,803,810
Unsealed Pavement	$22,189,189
Unsealed Formation	$21,637,370

6.7 Programming and recording of works undertaken

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

Monitor: *Conduct regular audits on works undertaken to ensure orders are placed*

6.8 Predicted future condition

The following three graphs from the asset modelling show the following:

Predicted Renewal Expenditure (white column) – is the modelled cost required annually to treat all assets that are predicted to reach the intervention level in that year. This value will increase and decrease from year to year and is highly dependent on the condition profile of the asset.

Proposed Renewal Expenditure (blue column) – is the proposed expenditure each year for that asset class. It is generally slowly increased or decreased to remove funding hurdles in future years.

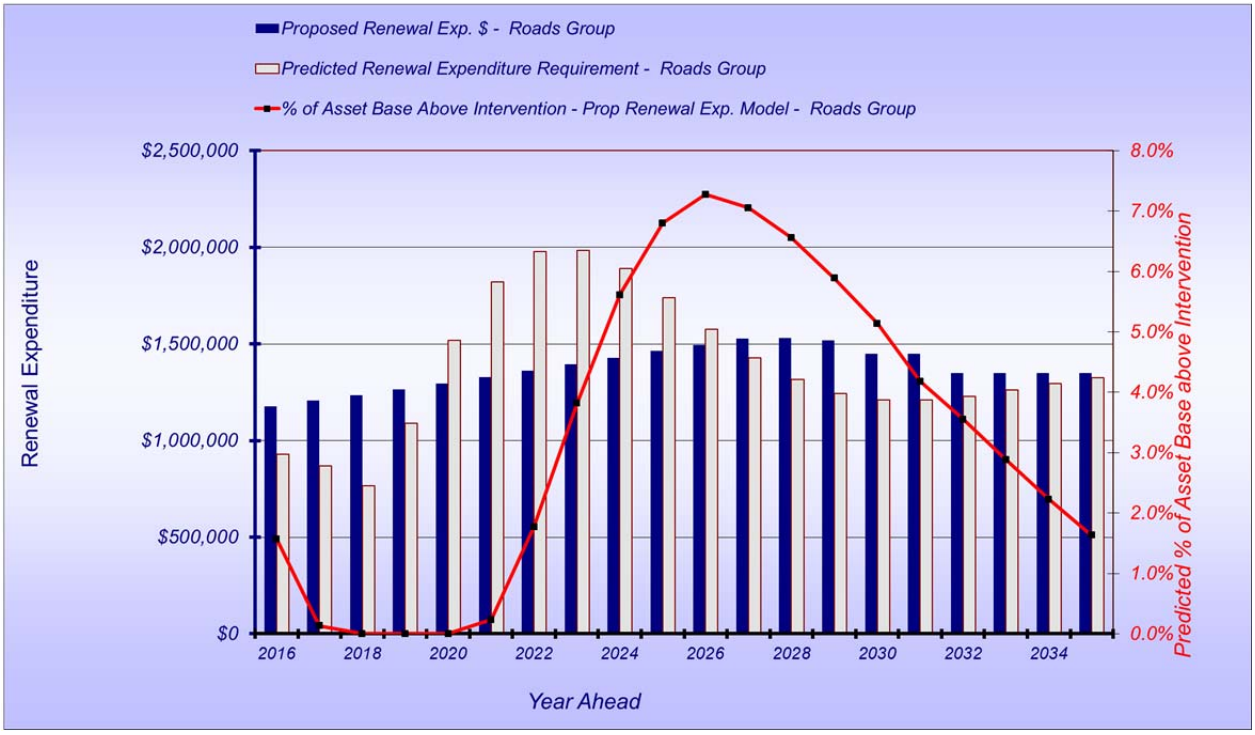
% of asset above intervention (red line) – is the predicted percentage of assets that will be outside the intervention level in a particular year based on the proposed expenditure. If the amount indicated by the predicted renewal was applied to that asset class the percentage of assets above intervention each year would be zero.

6.8.1 Unsealed Roads

The condition of Councils road network and associated infrastructure over the past 5 years improved in overall condition. This is in part due to extensive works undertaken following the 2011 flooding event which saw approximately 50% of the unsealed network reconstructed.

Modelling indicates that expenditure on this asset class be maintained to prevent a large number of these roads from requiring reconstruction in a very short period of time. This is evident in the predicted renewal expenditure in year 2020 through to 2027.

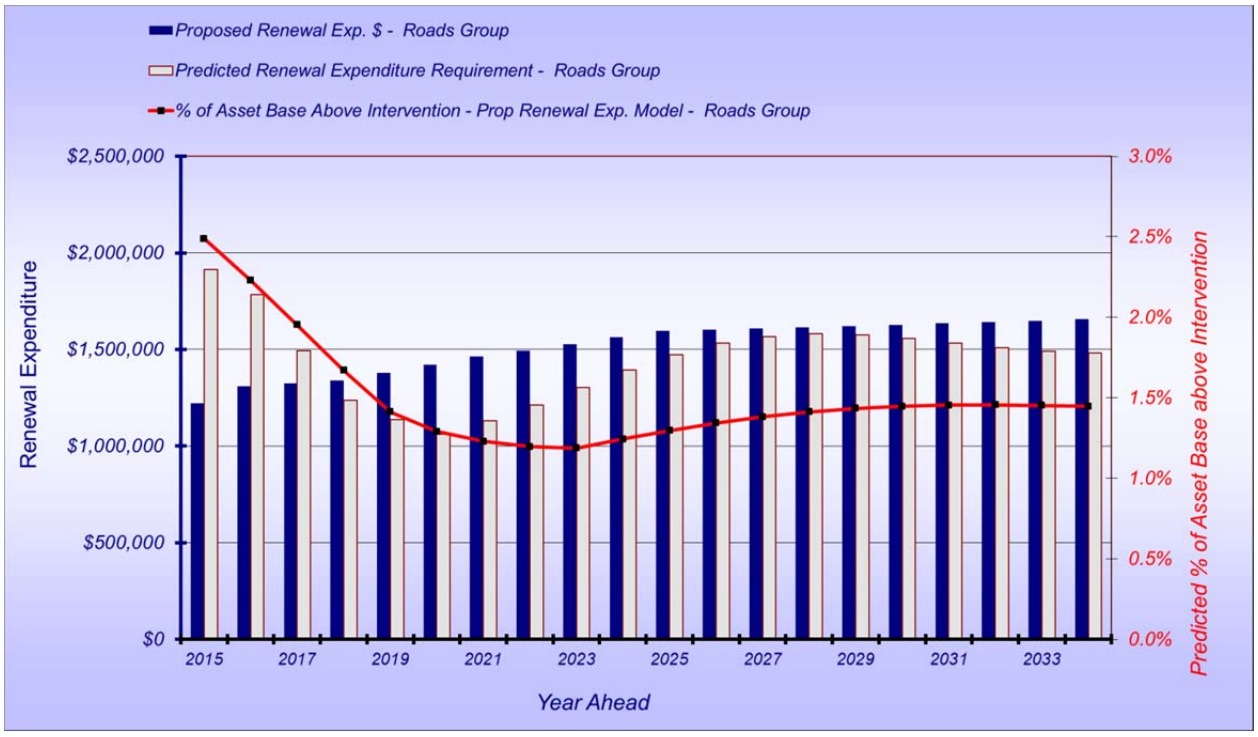
At the proposed expenditure level it is predicted there will be up to 7% of the network outside intervention level in approximately 2026, but this reduces back to an acceptable level a few years later allowing funding to return to normal levels.



6.8.2 Sealed Roads

Increases in capital expenditure in recent years are also beginning to show in the sealed road network. This expenditure includes both the rehabilitation of sealed roads and the annual reseal requirement.

At the proposed rates of expenditure it will be possible to maintain the network at the levels specified in this plan. Any reduction in expenditure, in particular on the reseal component of the program would in a very short period of time be reflected in the condition of the pavement, and a consequential increase in both pavement rehabilitation and emergency maintenance works. Therefore it is recommended that the current level of expenditure on this asset category be maintained.

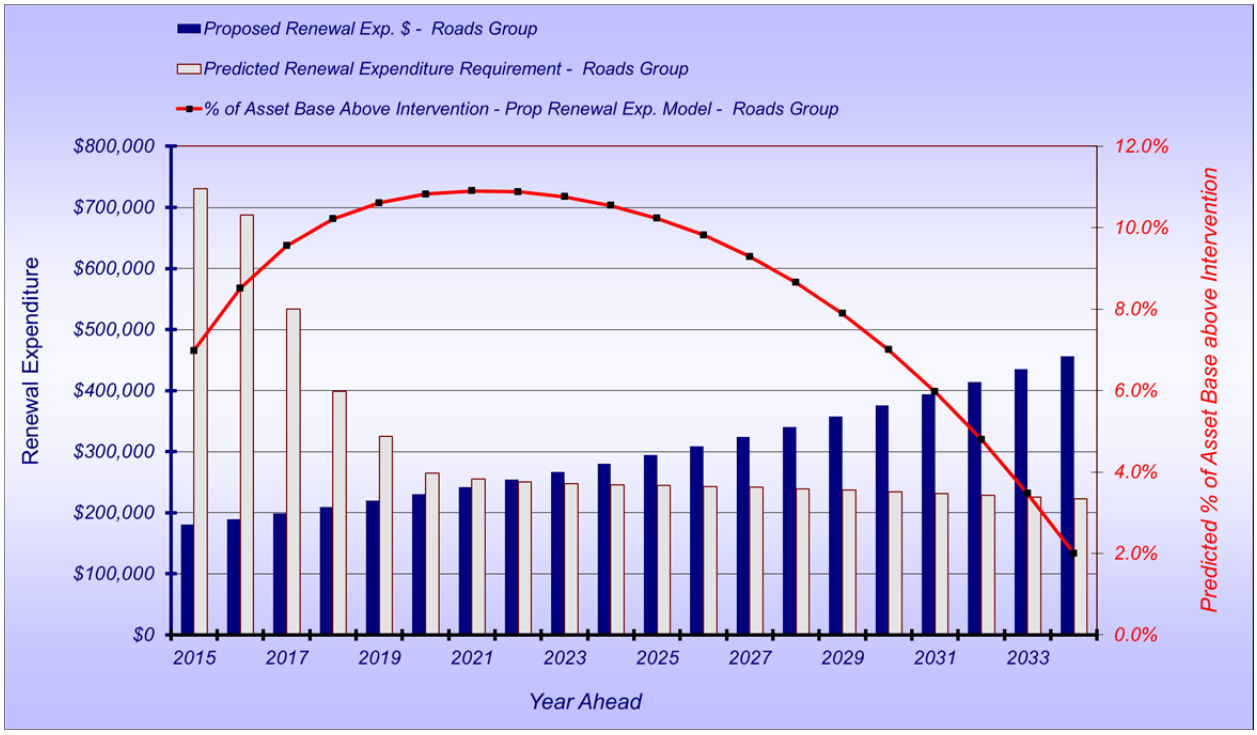


6.8.3 Kerb

The majority of kerb in the municipality was installed throughout the 1960's and 70's that were pre-cast sections that were simply placed on a clay base. As a consequence it is now in very poor condition and the majority of original kerb requires replacement. Functioning kerb is extremely important to prevent water ponding on the road and damaging the pavement leading to pavement failure.

Defective kerb is currently one of Council's largest renewal gap liabilities being around $1.8M over the next 5 years. A dramatic increase in expenditure is required to bring this under control. Historical expenditure on kerb has been approximately $35,000 per year, continuing at this level would see 35% of all kerb over intervention level within 20 years.

An increase in expenditure to the levels described in the below modelling will still see an increase in kerb outside intervention level in the short term. However continued expenditure will see the asset returned to normal levels of around 2% over intervention level in 20 years.



6.9 Proposed Capital Budget

This table summarises the required capital expenditure over the next five years to maintain each asset class at the required level of service.

	2015	2016	2017	2018	2019
Reseals	$831,910	$831,910	$831,910	$856,867	$882,573
Sealed Rd Rehab	$477,621	$491,950	$506,708	$521,910	$537,567
Resheet Unsealed Rd	$1,206,080	$1,235,207	$1,265,138	$1,295,895	$1,327,504
Kerb Replacement	$189,654	$199,136	$209,093	$219,548	$230,525
	$2,707,280	**$2,760,220**	**$2,814,867**	**$2,896,238**	**$2,980,188**

Appendix A

"**Ancillary Area**" refers to a roadway generally contained within a Caravan Park, public park or public reserves. These are generally not within a road reserve but on Council managed land.

"Asset Group" a subset of a particular asset category, generally broken down by the assets characteristic.

"Assets" in the context of this Plan, refers to any resource with a financial value attached to it, normally acquired to ensure local service delivery.

"Bridge" refers to any structure, being a bridge or culvert >6m^2 or other designated structure, which has been assigned an asset structure number.

"Condition Rating" refers to the condition of the asset, generally related to age and wear and tear. A detailed image sample of condition ratings is provided in the supporting documentation.

"Disposal" refers to the process of removing the asset or conversion of the asset to a different form.

"Flushed/Bleeding Surface" where there is surplus binder on the road surface, which is slippery in wet or frosty weather or becomes soft in hot weather.

"Functional Requirements of Maintenance" The functional requirements of each asset feature are detailed in Council's Road Management Plan.

"Hazard" An event or substance, which has the potential to cause harm to the health and safety of persons.

"IDM" Infrastructure Design Manual that describes the minimum standard for the construction of a variety of Council assets and is available from www.designmanual.com.au

"Inhabited Primary Place of Residence" refers to a currently inhabited primary dwelling or a primary dwelling capable of being occupied within the short term. This will generally not include a residence that has been unoccupied for a period of 12 months or more, or where a building surveyor has placed a notice on a building declaring it unfit for habitation.

"Intervention Level" refers to the condition level at which it is deemed necessary under this plan to replace or dispose of the asset.

"Kerb B2" is a barrier kerb used to prevent vehicle access over the kerb other than where it has been replaced with a layback. It is a standard profile.

"Kerb SM2" is a semi-mountable kerb that allows a vehicle to mount the kerb without the need to install a layback, however a layback may still be installed.

"New" Refers to works or activities to construct new infrastructure that was not in place previously.

"Other Paved Areas" Any paved areas other than through carriageways and may include footpaths, traffic islands and car parks. Paving may include, but not be limited to concrete, brick paving or asphalt surfacing.

"Pavement" Any area of the road formation that includes sealed surface, unsealed surface, shoulder and drainage.

"Prime" A surface treatment without aggregate used prior to sealing a road to assist adhesion.

"Rehabilitation" refers to works conducted on a sealed pavement to rebuild the pavement from the formation level restoring the asset to a new condition under capital works.

"Resheet" is a process of replacing gravel or sandstone on an unsealed pavement and restoring the asset to a new condition under capital works**.**

"Reseal" is the application of an emulsion and stone over a previously sealed surface to return the surface to a new condition under capital works.

"Renewal" Refers to works or activities to renew, refurbish or replace existing infrastructure of equivalent capacity or performance capability.

"RICL" – The Retreatment Intervention Condition Level, the level specified at which the asset requires replacement.

"Road Classification" refers to the classification given to a road determined by access requirements and traffic counts. The classification is as specified in the road register.

"Road Identification Number" The identification number of the asset.

"Road Reserve" The area in which a parcel of land has been declared as a public highway. It generally includes for municipal roads all land from fence line to fence line. A road reserve may not necessarily contain a formed roadway.

"Road" in the context of this plan refers to a maintained carriage way within a road reserve.

"Roadside" Any non-pavement area within the road reserve, including any median area.

"Segment" is generally a portion of a road that runs from intersection to intersection, or, change of material type. Means a predetermined length of a road described in the Council's road register.

"Through Carriageway" Comprises of traffic lanes (including shoulders and on road bicycle lanes) which form part of the road pavement, clearance to parking lanes, where provided, and medians.

"Two coat seal" A seal consisting of a bitumen layer with large aggregate followed by another layer of bitumen with a smaller aggregate creating an interlocking effect between the layers.

"Upgrade" Refers to works or activities to upgrade, refurbish or replace existing infrastructure of greater capacity or performance capability.

Road Anatomy

1 Road Pavement

The road pavement (or substructure) is the formation of compacted materials that provide structural strength for the road and provides support to the road surfacing materials (for a sealed road). The road pavement distributes traffic loads onto the natural ground beneath, also known as the subgrade. Failure of the road pavement creates an uneven driving surface thus creating hazards for road users.

Rehabilitation or repair of the road pavement is up to ten times more expensive per square metre than repairing and maintaining a road surface. The key to maintaining structural integrity of a road pavement is to protect the pavement from changes in moisture content. Most changes in moisture content of the road pavement are due to inundation of the road by flood, poor drainage or cracking of a degraded surface treatment. The road surface, kerb and channel (where located) and associated drainage all assist with the protection of the road pavement.

2 Road Surface

The road surface is the upper most wearing course of the constructed road. The material utilised depends on a number of factors but will generally be either asphalt, sprayed bituminous seal or a layer of compacted crushed rock or gravel and is applied above the compacted road pavement.

For a sealed road the road surface provides a wearing course for traffic and forms a durable waterproof covering protecting the pavement from water infiltration.

3 Kerb and Channel

Kerb and channel delineates the edge of the roadway and principally acts to divert stormwater from the road surface into the adjacent drainage system. Kerb and channel also provides a rigid edge to support flexible pavements. Where kerb and channel is not provided a table drain is generally constructed so water can be moved away from the road pavement. As the primary function of kerb and channel is to provide drainage the levels of service and maintenance requirements for kerb and channel are contained within the Drainage Asset Management Plan. This Road Asset Management Plan does not define or model kerb and channel requirements.

4 Road Shoulders

Road shoulders are used in areas where kerb and channel is not practical, this is generally in rural areas or on unsealed roads. A road shoulder provides a stopping area or additional road width on narrow sealed roads for the safe passing of vehicles. As with road pavements, road shoulders are constructed in a similar style, however the pavement depth may not be as deep. Road shoulders are generally not sealed.

5 Formation

Earthworks include the necessary excavation and formation work to prepare a base for the road pavement. Earthworks are considered to have an unlimited useful life once the road has been formed, however where road pavement failure has occurred, some stabilisation of the ground may be required as part of rehabilitation works to increase the base support for the road.