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# Warrumbungle Shire Council

## Asset Management Plan – Roads



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## Executive Summary

Warrumbungle Shire Council is currently the custodian of \$148 million (Written Down Value) of road assets and managing lifecycle costs, community expectations and statutory requirements of roads requires planning. This document communicates the process of managing road assets to ensure that service delivery is financially sustainable.

Annual financial statements report on financial sustainability of Council's road assets through three benchmark ratios; asset renewal ratio, infrastructure backlog ratio and maintenance ratio. Rather than roads as one general category, a hierarchy of roads will enable sustainability assessment of physical components as well as assessment of service levels. This plan categorises road assets into one of three categories; regional roads, rural local roads and urban local roads (town streets). The forecast asset renewal ratio for regional roads is 140%, for rural local roads it is 67% and for town streets it is 68%.

This planning document changes the hierarchical definition or classification of roads from the current categories of; Regional, Local 1, 2 and 3 to; Regional, Arterial, Distributor, Collector and Access. These classification changes to Council's road inventory better aligns with road classification systems used by neighbouring Council's and within the road industry generally.

The process of asset planning involves assessment and rating of road condition and this information is used to measure performance against service level targets. The condition assessment information is also used to calculate a financial worth of the roads at fair value.

The community level of service adopted in this plan is condition level 3 for all road categories except Access Roads where condition level 4 is adopted. The Plan adopts various technical levels of service that are used to calculate maintenance costs and renewal costs. For example maintenance grading frequency of once every 15 months is adopted for unsealed Arterial Roads and length of time between gravel resheeting on these roads is 15 years.

The last formal condition assessment of Council's roads was undertaken in 2015, where it was identified that the average condition of sealed road pavements is 2.49 and for unsealed roads it is 2.46, on a 1 to 5 rating scale. This plan sets out expected frequency of road inspection and assessment, which aligns with expectations in Council's Delivery Program.

The assumed useful life of road components used in this report are; 25 years for bitumen seal, 60 years for road base on Regional Roads, 80 year for road base on Local Roads. The earthworks component of road pavement is not depreciated and is therefore assumed to have unlimited life.

Council's capacity to achieve level of service targets and to achieve desired benchmark ratios is limited by its capacity to source revenue. There are four general revenue sources; the roads component of the Financial Assistance Grant (FAG) (\$2,546,964 for 2019/20), Council rates, Roads to Recovery (R2R) and State Government through various programs including the Block Grant administered by Roads & Maritime Services (RMS). The funding levels available each year from all four revenue sources for road maintenance and renewal works is relatively constant. Funding available for improvement works is dependent upon revenue from competitive grant programs. A summary of revenue sources and their application to various road and expenditure types is provided in Table 1.0. The amounts shown in Table 1.0 have been extracted from Council's budget for 2019/20.

**Table 1.0 Revenue sources available for various types of expenditure on roads\***

Road Classification & Expenditure Type	Revenue Sources (\$)		
	FAG & Rates	R2R	RMS/ State Gov Grants
Regional road maintenance	0	0	1,356,299
Regional road capital renewal	0	0	1,619,000
Regional road capital improvement	0	0	750,000
Local rural road maintenance	2,416,523	0	0
Local rural road capital renewal	200,000	1,400,000	0
Local rural road capital improvement	0	0	0
Local urban road maintenance	1,076,079	0	0
Local urban road capital renewal	292,194	0	0
Local urban road capital improvement	0	0	0
<b>TOTALS</b>	<b>3,984,796</b>	<b>1,400,000</b>	<b>3,725,299</b>

\* Revenue figures have been extracted from the 2019/20 budget.

This plan includes many appendices that contain information to support the process of asset planning for roads within the Shire. Information in some of these appendices such as road listings and classification will not change significantly over time. The Information contained in other appendices though, will change over time as more detailed data on road condition, service levels and unit costs is collected and analysed. In this regard, Section 9.0 outlines actions that will enable continuous improvement in planning for road services that are financially sustainable.

## 1.0: Introduction

This asset management plan communicates the actions required for management of road assets, compliance with regulatory requirements, and funding needed to provide the required levels of service. Roads within the Shire are classified as either; State Roads, Regional Roads, Local Rural Roads or Local Urban Roads (better known as town streets). Within the Local Roads Classification, roads are grouped into one of five categories depending upon relative importance of each road. Section 2 of this Plan describes in detail each of the categories as well as providing description and detail of Council's inventory of roads. Section 2.0 also outlines how the physical profile of a constructed road is broken down into components and used to assess financial value of the road.

Council's road network of 2,518km must be inspected to assess condition and to provide input into the road maintenance program. Condition assessment information is also used to calculate remaining useful life of various components of a road pavement. Collection and management of data does require significant resources. The benefits of data collection must be balanced by the cost associated with visual inspection and management of the data. Section 3.0 of this Plan details outcome expected from condition assessment and promotes a target regime of visual inspections.

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, technological changes, economic factors, agricultural practices and environmental awareness. These demand drivers exist within Warrumbungle Shire and they are described in more detail and how they impact on road asset management in Section 4.0.

The lifecycle stages of a road asset and what is involved in ensuring that a road is fit for purpose is described in Section 5.0. The various maintenance activities, whether planned or unplanned, are described in this section. The section also refers to Council's Delivery Program where service levels for both planned and unplanned activities are formalised. The road surface and the road base deteriorate over time and these components must be renewed to ensure that maximum possible life of the road asset is achieved. Section 5.0 describes renewal activities and the frequency at which seal and pavement components should technically be renewed. Renewal of road components is at the heart of an asset management plan as it determines what level of capital expenditure is required to achieve expected useful life of the road.

Identifying road assets that are critical to delivery of services is done through a process of risk assessment. Section 6.0 of the plan describes in general terms the process involved in assessing critical road assets, however this is done at a basic level and future editions will provide more detailed assessments.

Levels of service provided by road assets may be considered in terms of 'technical levels of service' or 'community levels of service'. The cost of maintaining and renewing a road is very much dependent upon adopted targets for service levels. Section 7.0 describes the various aspects of service levels and it also provides details on current targets.

Section 8.0 of this Plan summarises financial information in relation to service levels and differences between desired and actual budget allocations. This section also provides a link between the financial information in the Plan with financial information presented in Schedule 7 and Note 9(a) of the annual financial statements.

The Asset Management Plan for Roads must continue to evolve to ensure that service levels are meeting customer expectations within a financial framework that is sustainable in the long run.

In this regard the Plan must be reviewed and updated on an annual basis. Also, there are information gaps in this Plan which must be identified and incorporated into an improvement plan. Section 9.0 provides details of areas for improvement and it also provides monitoring and review procedures.

There has been a collective effort from staff to develop this Roads Asset Management Plan and many of the tables and data prepared in recent years by various staff members have been included in this Plan. This Plan has also been prepared with extensive use of information contained in pre set templates developed by the Institute of Public Works Engineering Australasia (IPWEA). Section 10 of this report provides a list of reference that have used in the development of this Plan.

This Roads Asset Management Plan makes extensive use of Appendices to provide supporting information. In particular a works program for renewal of road assets is provided in Appendix 9.

## 2.0: Asset Inventory - Roads

### 2.1 Asset Inventory

Roads within the Shire's road network are categorised as either:

- **State Roads** – State significant roads controlled by the RMS (not included in Council's AMP);
- **Regional Roads** – Major roads controlled and maintained by Council, but funded through RMS grant monies;
- **Local Roads (Rural)** - Roads controlled and maintained by Council with funding from general grants, rates revenue and R2R monies. Rural Local Roads are roads located outside the town speed limit zones.
- **Local Roads (Town Streets)** – Roads controlled and maintained by Council with funding from general grants, rates revenue and R2R monies. Town Streets are Local Roads located within the town speed limit zones of each town/village within the Shire.

These roads link the town centres, villages and outlying properties of the Shire and also link the residents of the Shire with population centres in neighbouring Local Government Areas (LGAs). These roads or assets provide invaluable transport and communications function and economic life of the Shire would be compromised if maintenance and renewal of these assets was not adequately funded.

A summary of Council's road asset inventory is provided in Table 2.1 below;

**Table 2.1 Council's Road Asset Inventory**

Category	Sealed Length	Unsealed Length	Total Length
<b>Regional Roads</b>			
- Regional Roads (rural)	376	-	376
- Regional Roads (town)	10	-	10
<b>Total Regional Road</b>	<b>386</b>	<b>-</b>	<b>386</b>
<b>Local Roads - Rural</b>			
- Arterial Roads	200	21	221
- Distributor Roads	208	526	734
- Collector Roads	64	532	596
- Access Roads	7	398	405
- Unformed Roads	-	30	30
<b>Total Local Roads - Rural</b>	<b>479</b>	<b>1,507</b>	<b>1,986</b>
<b>Local Roads - Town Streets</b>			
- State Roads – non traffic lanes	5	-	5
- Arterial Roads	8	-	8
- Distributor Roads	13	1	14
- Collector Roads	29	4	33
- Access Roads	55	28	83
- Unformed Roads	-	3	3
<b>Total Local Roads - Town Streets</b>	<b>110</b>	<b>36</b>	<b>146</b>
<b>Total Road Length</b>	<b>975</b>	<b>1,543</b>	<b>2,518</b>

All of Council's roads are captured in Council's Geographic Information System (GIS) and asset values are captured in Council's financial management information system (FMIS). The database of road features and historical maintenance records stored on Council's GIS is steadily growing in size. Staff use a mapping tool called 'Intramaps' to access the GIS database. The FMIS is used to capture information on expenditure and revenue on all Council assets including roads. The system currently used to capture this financial information is called 'Authority'. Finance staff also use a series of complex spreadsheets to account and report on asset value and depreciation. The linking of the three information systems within Council, that is, GIS, Authority and Spreadsheets, into one management system is seen as a method of more reliably reporting on road condition and valuation.

A map of Council's road network is provided in Appendix 1 and 2. The road network may also be viewed on Council's website.

### 2.1.1 State Roads

State Roads are the major arterial roads that pass through the Shire. These roads are controlled by Roads and Maritime Services (RMS) and are recognised as RMS assets. Details of State Roads within the Shire are provided in Table 2.2.

**Table 2.2 State Roads Details**

Category	Total KM	RMCC Lengths Km
Hwy 17 Newell Highway	91	2
Hwy 11 Oxley Highway	63	-
Hwy 27 Golden Highway	68	68
Hwy 18 Castlereagh Highway	58	58
MR 334 Coonabarabran Road	55	55
<b>Total</b>	<b>335</b>	<b>183</b>

As Warrumbungle Shire Council does not control State Roads, State Roads are not included in this Plan. It should be noted that Council does maintain and manage sections of the State Road network under RMCC contract on behalf of RMS.

In some urban areas, there is an overlap between State and Local Roads (e.g. Newell Hwy and John Street Coonabarabran). In these instances, the main carriageway is the responsibility of the RMS, with the ancillary lane and roadside parking falling under Council's responsibility. The RMS also has a shared interest in drainage and any other support services for the safe and efficient operation of the carriageway.

### 2.1.2 Regional Roads

Regional roads comprise the secondary arterial road network and provide the main links between the various towns of the Shire. Council is responsible for the maintenance and management of all regional roads within Warrumbungle Shire. Council does however receive funding assistance for these roads through various programs including the 'block grant' and the 'REPAIR' program.

There are seven regional roads within the Shire with a total length of 385km. Council's estimated replacement cost for the whole regional road network was \$87 million as at the end of the 2017/18 financial year. Note that there are no unsealed Regional Roads within the Shire. Table 2.3 provides details on road length for each of the 7 roads.



**Table 2.3 Regional Roads Details**

Road Number	Road Name	Km Rural	Km Urban	Total Km
MR129	Quirindi to Quambone	129	4	133
MR329	Kenebri Road	36	-	36
MR396	Warrumbungles Way	67	2	69
MR4053	Timor Road	23	-	23
MR55	Black Stump Way	86	3	89
MR618	Vinegaroy Road	21	1	22
MR7519	Forest Road	14	-	14
<b>Total</b>		<b>376</b>	<b>10</b>	<b>386</b>

### 2.1.3 Local Roads (Rural and Town Streets)

Local Roads are roads controlled and maintained by Council and include rural sealed and unsealed roads and sealed and unsealed town streets. Council maintains a total of 2,132 km of local roads including 589 km of sealed local roads (including 5km of state roads in towns where Council does not responsible for the trafficable lanes) and 1,543 km of unsealed local roads.

As at 30 June 2018 Council's local road network was valued at \$154 million (Estimated Replacement Cost) including rural sealed roads valued at \$73 million, rural unsealed roads valued at \$56 million and town streets valued at \$25 million.

#### Local Rural Roads

Local rural roads in the Shire generally feature lower traffic volumes and provide a lower service level than Regional Roads. In comparison to regional roads, the width of pavement and bitumen seal is less on sealed rural roads. Depending on the hierarchy of the rural local road, many roads have additional infrastructure installed to improve user safety and maintain the necessary service level of the road.

#### Town Streets

Town streets are all local roads within the town limits which are generally defined as the change of speed limit signs to 50 Km/hr or 80 - 100 Km/hr as you leave town. Sealed local roads in towns will often (but not always) feature kerb and gutters and roadside furniture and have an average pavement width of 10.7 metres. Unsealed roads within towns are generally laneways with limited traffic volume. Town streets on the local road network have the same hierarchy as rural roads and are segmented similar to rural roads.

### 2.1.4 Road Segmentation

All sealed rural roads are segmented into approximately 1.0 Km segments. A segment generally starts and finishes in the middle of an intersection or another identifiable item or road infrastructure component (e.g. culvert).

Town Streets regardless of whether they are sealed or unsealed are segmented into segments that coincide with the length of a town block. Segment markers are generally not used within town limits. Regional Road segments captured within the towns are dealt with in the Regional Roads section above.

Currently, there is very limited segmentation of unsealed rural roads and where it does occur they are defined by either intersections with other roads or named water courses. As a result, many segments on unsealed roads are in excess of 5km in length, which in turn limits the accuracy of periodic valuation inspections.

The benefit of more segmentation of roads is that levels of service and financial value can be determined with greater accuracy. However this benefit must be considered against the cost that comes with collecting and managing additional data.

## 2.2 Asset Hierarchy

A hierarchical categorisation of all roads has been undertaken that reflects the relative importance or priority of each road in relation to traffic volume, safety, economic and social benefits from the road. It is generally acknowledged that funding is limited and that it should be directed towards roads in proportion to their relative importance. That is service levels, both community and technical, will differ between roads of different classification.

The rationale behind the road hierarchy is to ensure that roads with higher traffic volumes, or have higher commercial or strategic importance are maintained and renewed more frequently. Higher order roads should also be maintained more frequently than roads at a lower order of importance.

Local rural roads within Warrumbungle Shire have traditionally been categorised as either 1, 2, 3. Category 1 roads are those roads where traffic volumes are highest or above 150 vehicles per day on average and they may also be used as a school bus route. Category 2 roads have less traffic but may be used as a link road between two roads of higher importance. Category 3 roads are generally roads with very low traffic movements and are generally 'no through' roads. This three level categorisation of local rural roads currently forms the basis of many targets and benchmarks within Council's Delivery Program and on road maps on Council's website.

This AMP introduces the concept of roads being categorised in accordance with one of six (6) categories as shown in Table 2.4. Further definition of each category can be made reference to objective facts and features of each road as shown in Table 2.5.

The categorisation shown in Tables 2.4 and 2.5 increases by one the number of categories for local rural roads. Council's road register will need to change to reflect the proposed hierarchical classification shown in Table 2.4. A Council resolution is required to enable changes to the road register.

**Table 2.4 Road Hierarchy**

No.	Description	Details
1	Regional Road	These are major arterial roads that provide highest traffic movements between regions, industrial, commercial and residential areas and are also declared as Regional Roads with a funding contribution by RMS
2	Local Arterial Road	These are major local arterial roads that provide linkage between areas of industrial, commercial, and residential importance and the regional road network. They also provide for traffic movements between areas and regions. In town these roads would generally include the CBD area of town.
3	Local Distributor Road	These roads provide connections between arterial parts of the network and the local collector network. They generally have key traffic generators on them for an area and/or are strategically important.
4	Local Collector Road	These roads provide access to the distributor/arterial network from local access roads. In an urban setting, these are the local town streets that feed traffic into residential roads, and individual major facilities. These roads generally do not have key traffic generators on them.

No.	Description	Details
5	Local Access Road	These roads provide access to individual properties in a rural setting. In an urban setting, these are local town streets that provide access to individual properties.
6	Un-Formed Local	These are unformed roads (tracks) and are not maintained by Council.

**Table 2.5 Factors Determining a Road's Place in the Road Hierarchy**

Factor
<b>Category 1 Criteria</b>
The road is a Regional Road
<b>Category 2 Criteria</b>
The road has significant Arterial Traffic (Min. > 100 AADT)
Average Annual Daily Traffic (AADT) is > 150
The road is part of the CBD area (Town Streets only)
The road is a continuation of a Regional Rd (Town Streets only)
<b>Category 3 Criteria</b>
The road is a designated School Bus Route
Average Annual Daily Traffic (AADT) is > 100
<b>Category 4 Criteria</b>
Average Annual Daily Traffic (AADT) is > 50
<b>Category 5 Criteria</b>
The road is Maintained by Council

If a road does not meet any of the above criteria then it would be classified as a Category 6 road (e.g. roads not maintained by Council / unformed roads).

### Unformed Roads

The unformed road category covers a range of different roads including:

- Previously constructed road pavements that Council no longer maintains;
- Basic earthen tracks (whether constructed or not) within road reserves not maintained by Council;
- Road Reserves used for other purposes (e.g. pedestrian access, tracks, etc.) not maintained by councils.

Unformed roads include road reserves that a vehicle may or may not physically be able to travel down. Roads in this category are not maintained by Council and are not addressed as part of this Asset Management Plan.

### Road Maps and Listings

There are maps and road listings in Appendices 1, 2, 3 & 4 that provide details on adopted road hierarchy.

## 2.3 Asset Components and Accounting Assumptions

For maintenance, valuation and asset management purposes, Council's road network is componentised into three separately identifiable components as shown in Table 2.6:

**Table 2.6 Road Components**

Component	Description
<b>Road Surface</b>	<ul style="list-style-type: none"> <li>This is the layer in contact with the traffic load;</li> <li>Generally consists of a sprayed bitumen and aggregate seal;</li> <li>Unsealed roads do not have a road seal.</li> </ul>
<b>Road Pavement</b>	<ul style="list-style-type: none"> <li>This is the pavement layer that sits below the road surface and generally consists of a base, subbase and subgrade;</li> <li>Regional Road average pavement depth from 200mm &gt;;</li> <li>Sealed Local Road average pavement depth from 150mm &gt;;</li> <li>Unsealed Local Roads average pavement depth from 100mm &gt;;</li> <li>All road pavements are flexible type pavements.</li> </ul>
<b>Earthworks</b>	<ul style="list-style-type: none"> <li>Earthworks are carried out to prepare the land for the construction of drainage, the road pavement and seal, and other structures;</li> <li>Earthworks typically include clearing the land and reshaping and aligning the land surface through cutting, filling, grading and compacting soil and rock to suit the type of road to be constructed (AASB Interpretation, 1055 – Earthworks, s.1);</li> <li>Earthworks have an unlimited useful life, and are the layer of earth that the road pavement and surface are placed on top of.</li> </ul>

For depreciation purposes road surface and pavement is further split into long life and short life components, to capture the differing useful lives of portions of each of these components. Details of accounting and valuation assumptions used for Council's road assets are provided in Table 2.7:

**Table 2.7 Useful Lives by Road Category and Component**

Road Cat	Length Km	Earthworks	Seal Short	Seal Long	Pavement Short	Pavement Long
<b>Sealed</b>						
Regional	386	Unlimited	25	60	60	Unlimited
Local arterial	200	Unlimited	25	80	80	Unlimited
Local distributor	208	Unlimited	25	100	100	Unlimited
Local collector	64	Unlimited	25	100	100	Unlimited
Local access	7	Unlimited	25	100	100	Unlimited
<b>Unsealed</b>						
Local arterial	21	Unlimited	N/A	N/A	15	Unlimited
Local distributor	526	Unlimited	N/A	N/A	15	Unlimited
Local collector	532	Unlimited	N/A	N/A	20	Unlimited
Local access	398	Unlimited	N/A	N/A	25	Unlimited
<b>Town Streets (Both Sealed and Unsealed)</b>						
Regional	10	Unlimited	25	60	60	Unlimited
Other than regional	146	Unlimited	25	100	100	Unlimited

### 2.3.1 Earthworks

Council's earthworks are all deemed to have an unlimited useful life per the requirements of AASB 1055.

### 2.3.2 Pavement – Sealed Roads

The pavement life for sealed roads ranges from 60 to 100 years per engineering standards and service levels associated with each road class. Pavement short life generally mirrors the pavement rehabilitation rate for the road class, and the value of this component per m2 should be roughly per the cost of pavement rehabilitation (per m2).

The pavement long life component is deemed to have an unlimited useful life as it is analogous to earthworks. The value of the long life portion of the road pavement component should mirror the difference between the cost of constructing a new road pavement and the cost of pavement rehabilitation.

### 2.3.3 Pavement – Unsealed Roads

Council's unsealed pavement life is assumed to be between 15 - 25 years. Pavements on unsealed roads are deemed to have a shorter life than pavements on sealed roads as the pavement is the wear course of the road and is totally exposed to the elements and traffic.

Unsealed roads are deemed to have an unlimited pavement long life and the only capital works Council does on unsealed roads is gravel re-sheeting, the value of which is captured in the short life component.

### 2.3.4 Seal Life

Council's seal short life is generally 25 years per engineering standards and service levels associated with each road class. The value of the short life component of the seal mirrors the reseal cost per Council's renewals program.

The useful life of the seal long life component of each road is per the pavement short life component for that particular road, as the long life portion of a seal will only be replaced at the time of pavement replacement.

Council's unit rates for the measurement of replacement costs are detailed in Table 8. It should be noted that seal short life costs are per Council's reseal costs per m2, with pavement short life costs for unsealed roads also tying back to Council's current re-sheeting rate per m2.

**Table 2.8 Unit Rates by Component (2015 Data)**

Component	Total Cost m <sup>2</sup> *	Short Life Cost*	Long Life Cost*	Short Life %	Long Life %
Earthworks - Rural	\$4.50	-	\$4.50	-	100 %
Earthworks - Town	\$4.75	-	\$4.75	-	100 %
Pavement (Sealed Roads) - Regional	\$19.40	\$11.64	\$7.76	60 %	40 %
Pavement (Sealed Roads) - Local	\$12.00	\$7.20	\$4.80	60 %	40 %
Pavement (Sealed Roads) – Streets	\$12.60	\$7.56	\$5.04	60 %	40 %
Pavement (Unsealed Roads) – Rural	\$6.40	\$3.84	\$2.56	60 %	40 %
Pavement (Unsealed Roads) – Streets	\$6.80	\$4.08	\$2.72	60 %	40 %
Seal - Rural	\$8.60	\$4.30	\$4.30	50 %	50 %
Seal – Town Streets	\$9.00	\$4.50	\$4.50	50 %	50 %

\* Unit rates calculated in 2015.

## 3.0: Condition Assessment

### 3.1 Condition Ranking

The condition of Council's road network must be assessed on a regular basis to determine the need for preventative or remedial maintenance action. Condition data is also used to inform the community about service levels and to make decisions about affordability of maintaining roads at a particular condition. Condition assessment data may also be used to predict remaining useful life of pavement components.

The method of ranking condition used in this Plan is in accordance with guidelines by NSW Office of Local Government through their 'Integrated Planning and Reporting Manual' for local government. A 1 to 5 ranking scale is used and a description of the scale is provided in Table 3.1.

**Table 3.1 Condition Ratings (from IP&R Manual)**

Level	Condition	Description
1	Excellent / Very Good	New or as new condition. Only planned cyclic inspection and routine maintenance required.
2	Good	Good condition with minor defects. Minor routine maintenance along with planned cyclic inspection and maintenance.
3	Satisfactory	Average / fair condition with some significant defects requiring regular maintenance on top of planned cyclic inspections and maintenance.
4	Poor	Poor condition with asset requiring significant renewal / rehabilitation, or higher levels of inspection and substantial maintenance to keep the asset serviceable.
5	Very Poor	Very poor condition. Asset physically unsound and/or beyond rehabilitation. Renewal required.

A slightly more detailed description of each rating level for road segments is provided in Tables 3.2 and 3.3. These tables also provide an estimate of remaining useful life. The trigger points for action are also illustrated in Figure 5.1 in Section 5.0.

**Table 3.2 Condition Grading Table for Sealed Road Pavement Assets (Structure and Serviceability)** (Source – IPWEA Practice Note 9 2015)

Grade	Condition	Description	Response	Residual Life (ie. Estimated % Asset Design Life Remaining)
0	Not Rated			
1	Very Good	<p>Structural: Sound physical condition. Insignificant deterioration. Asset likely to perform adequately without major work for 20 years or more.</p> <p>Serviceability: No or insignificant surface defects apparent. Routine maintenance only required.</p>	No immediate action required. Maintain standard programmed condition assessment.	60% to 100%
2	Good	<p>Structural: Acceptable physical condition; minor deterioration / minor defects evident.</p> <p>Serviceability: Minor increase in pavement roughness counts. Some minor surface defects apparent.</p> <p>Negligible short term failure risk but potential for deterioration in long-term (15 years plus). Only minor work required (if any).</p>	No immediate action required other than possible routine maintenance. Maintain standard programmed condition assessment.	35% to 60%
3	Fair or Moderate	<p>Structural: Moderate to significant deterioration evident; Minor components or isolated sections of the asset need replacement or repair now but not affecting short term structural integrity.</p> <p>Serviceability: Moderate increase of pavement roughness but asset still functions safely at adequate level of service.</p> <p>Failure unlikely within next 10 years but further deterioration likely and major replacement likely within next 5 to 15 years.</p> <p>Work required but asset is still serviceable.</p>	Take action as appropriate to address defects and if necessary, routine patching, crack filling, rejuvenation. Monitor with programmed condition assessment for rehabilitation and/or renewal in medium term.	20% to 35%
4	Poor	<p>Structural: Serious deterioration and significant defects evident affecting structural integrity.</p> <p>Serviceability: Significant increase in pavement roughness. Substantial work required in short term to keep asset serviceable.</p>	Take immediate action as appropriate to address the defects. Immediately undertake risk assessment and further investigate options.	10% to 20%

Grade	Condition	Description	Response	Residual Life (ie. Estimated % Asset Design Life Remaining)
		<p>Failure likely in short to medium term. Likely need to replace most or all of asset within short term (possibly next 2 years).</p> <p>No immediate risk to health or safety but works required within 2 to 5 years to ensure asset remains safe.</p>	Schedule appropriate action – rehabilitation or renewal in short term.	
5	Very Poor	<p>Structural: Failed or failure imminent. Immediate need to replace most or all of asset.</p> <p>Serviceability: Large increase in pavement roughness and surface defects. Increase in road user costs and a deterioration in the safe performance of the asset.</p> <p>Major work or replacement required urgently.</p>	Take immediate action as appropriate to address the defects. Immediately undertake risk assessment and further investigate options. Schedule appropriate action – immediate rehabilitation or renewal.	0% to 10%

**Note:** The Residual Life estimate numbers in Table 3.2 are broad estimates and actual numbers for individual users need to be determined by reference to local data.

**Table 3.3 Condition Grading Table for Unsealed Road Pavement Assets (Structure and Serviceability)** (Source – IPWEA Practice Note 9 2015)

Grade	Condition	Description	Response	Residual Life (ie. Estimated % Asset Design Life Remaining)
0	Not Rated			
1	Very Good	<p>Structural: Sound physical condition. Insignificant deterioration. Asset likely to perform adequately without gravel resheeting work for typically 12 years or more. (<i>Austrroads Guide to Pavement Technology Part 6: Unsealed Pavements 2009 8.3 Resheeting (Wearing Course Replacement)</i>).</p> <p>Serviceability: No or insignificant surface defects apparent. Routine maintenance only required.</p>	No immediate action required. Routine patrol grading to be maintained. Maintain standard programmed condition assessment	60% to 100%
2	Good	Structural: Acceptable physical condition; minor deterioration / minor defects evident.	No immediate action required other than possible routine maintenance and patrol grading.	35% to 60%



Grade	Condition	Description	Response	Residual Life (ie. Estimated % Asset Design Life Remaining)
		<p>Serviceability: Minor increase in pavement roughness counts. Some minor surface defects apparent. Driveability still good.</p> <p>Negligible short term failure risk but potential for deterioration in medium term (typically 10 years plus). Only routine patrol grading required.</p>	Maintain standard programmed condition assessment.	
3	Fair or Moderate	<p>Structural: Moderate to significant localised deterioration evident; Minor components or isolated sections of the asset need replacement or repair now but not affecting short term structural integrity.</p> <p>Serviceability: Moderate increase of pavement roughness but asset still functions safely at adequate level of service.</p> <p>Failure unlikely within the short term but further deterioration likely and major replacement likely within next 5 to 10 years.</p> <p>Significant maintenance grading and reshaping required but asset is still serviceable.</p>	Take action as appropriate to address defects and if necessary, major maintenance grading and shape correction. Monitor with programmed condition assessment for rehabilitation and/or renewal in medium term.	20% to 35%
4	Poor	<p>Structural: Serious deterioration and significant defects evident affecting structural integrity.</p> <p>Serviceability: Significant increase in pavement roughness. Substantial work required in short term to keep asset serviceable.</p> <p>Failure likely in short to medium term. Poor driveability.</p> <p>Likely need to carry out gravel resheeting within the next 1 to 2 years.</p> <p>No immediate risk to health or safety but works required within 1 to 2 years to ensure asset remains safe.</p>	Take immediate action as appropriate to address the defects. Immediately undertake risk assessment and further investigate options. Schedule appropriate action – rehabilitation or renewal in short term.	10% to 20%

Grade	Condition	Description	Response	Residual Life (ie. Estimated % Asset Design Life Remaining)
5	Very Poor	<p>Structural: Failed or failure imminent. Immediate need to replace most or all of asset.</p> <p>Serviceability: Large increase in pavement roughness and surface defects. Increase in road user costs and a deterioration in the safe performance of the asset. Very poor driveability.</p> <p>Major work including reshaping and gravel resheeting required urgently.</p>	Take immediate action as appropriate to address the defects. Immediately undertake risk assessment and further investigate options. Schedule appropriate action – immediate rehabilitation or renewal.	0% to 10%

**Note:** The Residual Life estimate numbers in Table 3.3 are broad estimates and actual numbers for individual users need to be determined by reference to local data.

### 3.2 Data Collection Program

The frequency of road inspections is dependent upon a number of factors including; purpose of the inspection, road category, road surface and likelihood and consequence of failure. Inspection frequency is also very much also dependent upon available resources and available systems for capture and management of information. The benefit of capturing condition data either for the purpose of informing maintenance programs or for Remaining Useful Life (RUL) calculations must be offset by the significant cost associated with collecting and managing asset condition data. Expected frequency of road inspection details are provided in Tables 3.5 to 3.8

**Table 3.5 Inspection Frequency – Sealed Roads  
(day time)**

Category	Purpose & Inspection Frequency (months)	
	Maintenance & Safety	Condition Ranking (RUL)
Regional Roads	3	24
Local Rural Roads		
Arterial	6	24
Distributor	6	36
Collector	12	60
Access	12	60

**Table 3.6 Inspection Frequency – Unsealed Roads  
(day time)**

Category	Purpose & Inspection Frequency (months)	
	Maintenance & Safety	Condition Ranking (RUL)
Local Rural Roads		
Arterial	12	24
Distributor	12	24
Collector	24	24
Access	24	24

**Table 3.7 Inspection Frequency - Town Streets**  
(day & night times)

Category	Purpose & Inspection Frequency (months)	
	Maintenance & Safety	Condition Ranking (RUL)
Town Streets	12	60

**Table 3.8 Inspection Frequency Sealed Rural Roads**  
(night time – maintenance & safety only)

Purpose of Inspection	Frequency (months)
Regional Roads	24
Local Rural Roads	
Arterial	36
Distributor	36
Collector	36
Access	36

Points to note include:

- A night inspection of a road reduces the need for a day inspection of the same road during this period (e.g. A regional road gets 1 inspection every 3 months);
- Consideration should be given to additional inspections before and after major events that generate considerable traffic volumes for a short period and may impact on the roads physical structure or environment;
- Inspections shall be done on all roads that have been affected by a major weather or environmental event within the month after the event is complete;
- Inspections shall be done on any segment of road within 48 hours of notification of an accident/incident.

### 3.2.1 Types of Inspections

#### Day Time Safety Inspections and Condition Data Capture

A safety inspection involves assessing the condition of the road and the local environment for which the road passes through for compliance with current operating standards, as well as to capture road condition data and maintenance request information. Council's standard for inspections will be to conduct this inspection when the road is inspected for annual condition rating, programmed works or done as a Customer Request.

#### Night Time Performance Condition Data Capture

The primary focus of night time inspection is to assess the road environment for safe night operation. This involves conducting a systematic review of the whole road environment including roadside furniture and noting areas where there are deficiencies.

#### Post Incident Inspections

Once Council has been notified of an incident on the road network, an inspection of the local area and the effected assets should be undertaken to record the condition of assets, what repair work is required and to capture data for potential insurance claims.

### 3.2.2 Inspection Data Capture

Council’s condition data capture methodology is based on the Austroads “A Guide to the Visual Assessment of Pavement Condition” and IPWEA “Condition Assessment & Asset Performance Guidelines – Road Pavements Visual Assessment” document. The data captured is used to provide clear and logical assessment data on each segment. This information then informs Council’s capital works program and backlog assessment.

### 3.2.3 Annual Asset Management Data Set

The capture of asset data is a continuous process for asset management purposes. Council will collate an asset condition data set as at 31 December each year which will be captured into Council’s GIS. This data is Council’s “Annual Asset Assessment Data Set” and will be used in providing a program for budgets and asset management priorities annually.

### 3.2.4 Road Count Program

Council currently has eight traffic counters which are placed out at pre-determined locations across the road network to capture traffic data by segment. Collected data provides a range of information including (AADT), classes of vehicles, vehicle speed and weight.

Traffic data is used predominately for grant applications, road design, road safety assessments, asset management planning and road network performance monitoring.

The capture of traffic data is a continuous process. Council will capture all traffic data for the year on 31 December against each road segment (where data was captured) in Council’s GIS.

#### Traffic Counter Program

Traffic counters are used primarily on the sealed road network due to inherent issues with use on gravel roads. Traffic counters are only able to collect data on one road in both directions at any one time. Traffic counters will also be used to capture information on major events that generate considerable traffic volumes within the Shire. Details of Council’s road count program can be found in the following table:

**Table 3.9 Council’s Road Count Program**

Category	Length (km)	Frequency	Capture time
<b>Regional Roads</b>			
Regional (Rural)	386	7 locations per year	Total 4 wks per location
<b>Local Roads (sealed)</b>			
2 Arterial	200	9 locations per year	Total 4 wks per location
3 Distributor	208	13 locations per year	Total 4 wks per location
4 Collector	64	6 locations per year	Total 4 wks per location
5 Access	7	As Requested	Total 4 wks per location
<b>Town Streets (sealed)</b>			
2 Arterial	8	1 location per year	Total 4 wks per location
3 Distributor	13	1 location per year	Total 4 wks per location
4 Collector	29	1 location per year	Total 4 wks per location
5 Access	55	As Requested	Total 4 wks per location

## 4.0: Future Demand – Road Assets

### 4.1 Factors Affecting Demand for Services

#### 4.1.1 Demographic Trends

As is the case with the majority of rural inland local government areas, the population of Warrumbungle Shire Council has been declining steadily for several years as a result of outward migration from the Shire (especially amongst young adults). The demand for road assets is expected to remain relatively constant over the coming years due to this trend, and Council forecasts that there will be limited demand for expansion of the network in the near future as a result of demographic trends.

#### 4.1.2 Vehicle Based Tourism is Strong in the Shire

The Shire has a wealth of tourism opportunities for vehicle based tourists from overnight to extended stays, and with the increasing numbers of caravans and campers on our roads, it is forecast that there will be increased demand for services from tourism related travelers, which may affect specific roads that provide access to tourism sites. Further research on the impact of tourism on road asset demand (and possible impact on Council's road hierarchy and service levels) will be required in the future.

#### 4.1.3 The Potential Impact of Intensive Industry

The Shire is well positioned to host the development of intensive industries such as intensive agriculture (e.g. feedlots, green houses, etc.), mining, and power generation (e.g. solar or wind farm, etc.). These developments are generally high generators of vehicle movements and can place significant pressure on the road network. Intensive industries may also increase demand for the upgrade of Council's road network (e.g. sealing of road infrastructure leading to intensive industry sites).

#### 4.1.4 Transport Requirements of the Agricultural Sector

Increases in the size of farm machinery as well as increased weight of loads in the transport sector have placed additional pressure on Council's road assets in recent years. It is expected that the trend to higher weight of loads will continue into the future.

### 4.2 Factors Affecting Supply of Services

The factors that could affect the supply of road related service going forward include:

#### **Funding Uncertainties**

Warrumbungle Shire Council is highly reliant on grant funding (approximately 50% of total revenue), with its own source revenue limited by rate pegging. If at any stage grant revenue was to be reduced, Council would not be able to continue to provide its current level of services without resorting to increased rates.

#### **Council's Asset Backlog**

Council deems road assets in less than average condition (conditions 4 -5) as not meeting Council's service level and requiring renewal over the next four years. These assets form part of Council's asset backlog, and Council should be concentrating funding on ensuring that these roads are brought up to Council's agreed service level.

### **Technological Change**

One of the future challenges for the community is the potential of disruptive technologies and the unknown affect these technologies will have on our road network and service level expectations. With advances in driverless technologies, intelligent communication systems and drone technology just to name a few trends, it is likely that Council's supply of road "services" will be disrupted in ways that we have not even thought of yet. This will be a challenge for those who will be reviewing this document in years to come.

### **Natural Disasters**

Council's road network is often subject to significant damage from natural disasters, mostly from floods and fires. Maintaining these roads after an event places considerable strain on Council resources both financial and physical, often delaying Council's planned maintenance program and capital program. Some funding is often available from other levels of government to deal with such disasters, but funding is not always adequate to compensate for the damage caused by the natural disaster event.

### **Staff and Resources Shortages**

As with financial constraints on the provision of road related services, difficulties in the recruiting and retaining of staff has been a challenge for Council in recent years. Council as a western rural Council often faces challenges in filling technical positions. When technical or managerial positions are vacant it can affect Council's ability to provide some of the services expected by the community. The increased technical and administrative burdens faced by councils are also an issue with increased statutory requirements often diverting staff from their day to day work providing services to the community.

## 5.0: Lifecycle Management Plan

### 5.1 Road Management Activities

As a large rural Council that is responsible for an extensive asset network, effective asset management is critical to Warrumbungle Shire Council's operations. Central to asset management is the concept of asset lifecycles and asset lifecycle management.

There are four key phases of an asset's lifecycle, namely asset acquisition, asset operations and maintenance, asset renewal and asset disposal. Each asset lifecycle has an associated cost, and these lifecycle costs can be split into recurrent and capital expenditure.

Recurrent expenditure includes both planned and unplanned maintenance activities. Capital expenditure activities can be categorised as either capital renewal or capital expansion activities. All expenditure activity is coded in Council's financial management system to enable monitoring of expenditure against budget allocations.

### 5.2 Road Maintenance

Routine maintenance is the regular on-going work that is necessary to keep assets operating to ensure they reach their useful life. It includes work on an asset where a portion may fail and need immediate repair to make it operational again. Maintenance can be either planned or unplanned (reactive) in nature.

Planned maintenance refers to maintenance that is defined and managed through a maintenance management system, with different planned maintenance programs identified for each asset class and road hierarchy. Planned maintenance (unlike unplanned maintenance) can be reliably measured as targets or service levels that are incorporated in Council's Delivery Program.

Individual road segments of a similar hierarchy and asset category are prioritized within the planned maintenance program based on road condition assessment, local factors (including environmental) and the condition rating of each road segment.

Road maintenance activities that are generally planned in nature include:

- Council's grading program (excluding unplanned grading post an event etc.);
- Council's road slashing program;
- Council's street sweeping program;
- Council's line marking program.

A description of planned maintenance activities is provided in Table 4.1. Service levels have been developed that indicate the frequency at which each of the planned maintenance activities is undertaken and details of these service levels are provided in Appendix 7.

A significant proportion of Council's budget for road maintenance is directed towards activities that cannot be planned in terms of frequency of works. A description of these unplanned maintenance activities is also provided in Table 5.1.

As with planned maintenance, Council must set service levels (in this case intervention levels) to provide guidance on when Council should intervene to address maintenance issues. For example, not all pot holes need to be addressed immediately. Details of intervention levels adopted by Council through the Delivery Program are provided in Appendix 8.

**Table 5.1: Maintenance and Operating Activities**

Activity	Description
<b>Unplanned</b>	
Pavement Maintenance	Involves the repair of surface damage such as pot holes or other surfacing/pavement damage.
Guideposts, Signs	Involves repair or replacement of guideposts and signs.
Vegetation Control	Removal of unsafe trees and other vegetation from the road corridor.
Drainage Maintenance	Clearing of table drains, mitre drains and catch drains and repairs to drain blocks. Includes works on subsoil drainage, culverts and drainage structures.
Incident Response	Emergency Call Out.
Asset Inspections	Routine inspection and asset conditioning (both planned and unplanned in nature).
<b>Planned</b>	
Grading of unsealed roads	Grading of unsealed roads involves the reshaping and compacting of the existing gravel pavement on the road. Unsealed roads are graded at different rates depending on the road class.
Mowing & Slashing and Vegetation Control	Involves weed spraying, mowing or slashing road reserves to reduce grass height for fire break, improved site distance and visual appearance. <b>(Operational)</b>
Street Sweeping	Involves cleaning town streets. This task is operational in nature (per slashing above), <b>(Operational)</b> .
Line Marking	Involves re-doing line-markings on sealed roads.

It should be noted that although Council does have a planned maintenance program for grading, grading activities can be unplanned in nature, and when unsealed roads meet a certain intervention point then there may be grading required (which is unplanned) to ensure that the road segment in question is brought up to the appropriate condition for its road hierarchy.

The full cost of grading of unsealed roads is captured in planned maintenance even though there is an unplanned component to this work. The same applies for vegetation control which is currently captured under mowing and vegetation control.

Asset inspections include both a planned and an unplanned component, but have been included under unplanned maintenance for the purpose of this AMP.

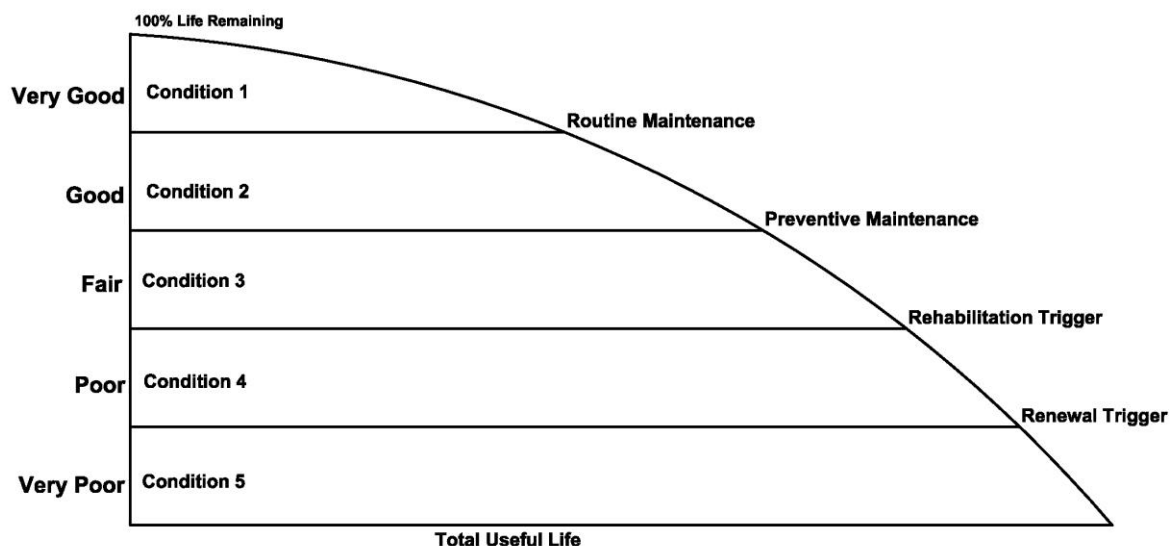
### 5.3 Asset Renewal and Replacement

Asset renewal refers to capital expenditure that renews an existing asset to its original condition and returns the life/service potential of the asset to that which it had originally. A description of road renewal and replacement activities is provided in Table 5.2.

Renewals are typically undertaken to either ensure the reliability of the existing infrastructure to deliver the services they were installed for (e.g. to replace a bridge that is about to collapse), or to ensure that infrastructure is of sufficient quality to meet service requirements (e.g. to reseal a road to reduce roughness).



Asset renewals are planned in nature, and Council has developed an asset renewal plan that ensures that assets (or asset components) are replaced in a timely manner. The relationship between remaining useful life, asset condition and trigger points for renewal is illustrated in Figure 5.1.



**Typical Asset Degradation Curve ( $Y=1-X^2$ )**

Figure 5.1 Illustration of relationship between remaining useful life, asset condition and trigger points for asset maintenance and renewal (source: IPWEA Practice Note 9 2015).

Timely asset renewals reduce the whole of lifecycle cost for the asset in question, and effective asset renewal planning is the basis of any effective Asset Management Plan. Renewals data for each road class / road hierarchy combination is shown in Table 5.3

It should be noted that pavement rehabilitation on sealed roads also results in the replacement of the seal component of the road in question, and therefore the total re-seals figure in the table below also includes the cost of replacing the short life seal component on pavement rehabilitation jobs. The cost of replacing the long life seal component is included in the pavement rehabilitation cost.

**Table 5.2 Description of Capital Renewal and Replacement Activities**

Activity	Description
Reseals	Involves either: removal and replacement of the existent seal (surfacing) of the road with a new seal; or placement of additional aggregate and bitumen onto an existing seal to renew its useful life. The end result of this activity is the replacement of an existent surfacing asset with a new asset.
Pavement Rehabilitation	Involves removing and or stabilising the existent pavement and replacing it with a new re-shaped pavement. Pavement rehabilitation is carried out to repair the pavement shape of a road. The end result of this activity is the replacement of an existent pavement asset with a new asset.
Gravel Re-Sheeting	Gravel re-sheeting involves replenishment of the gravel pavement on unsealed roads by placing roughly a depth of 100mm (compacted) of gravel pavement on the unsealed road when the existing pavement has worn away.
Heavy Patching	A repair method on the existing pavement where the majority of the existing material is removed and replaced with a superior material and put back down.

**Table 5.3 Road Asset Renewal Costs Based on Adopted Technical Service Levels**

Road Hierarchy Category	Length Km	Service Level	Average Width	Cost per M <sup>2</sup>	Annual Cost per Service Level
<b>Reseals</b>					
1 Regional (All)	386	25	6.9	\$4.30	\$458,105
2 Arterial	200	25	5.75	\$4.30	\$197,800
3 Distributor	208	25	5.75	\$4.30	\$205,712
4 Collector	64	25	5.75	\$4.30	\$63,296
5 Access	7	25	5.75	\$4.30	\$6,923
Town Streets (Local)	110	25	9	\$4.30	\$170,280
<b>Total Reseals</b>	<b>975</b>				<b>\$1,102,116</b>
<b>Pavement Rehab</b>					
1 Regional (All)	386	60	6.9	\$20.24	\$898,454
2 Arterial	200	80	5.75	\$15.80	\$227,125
3 Distributor	208	100	5.75	\$15.80	\$188,968
4 Collector	64	100	5.75	\$15.80	\$58,144
5 Access	7	100	5.75	\$15.80	\$6,360
Town Streets (Local)	110	100	9	\$15.80	\$156,420
<b>Total Rehab</b>	<b>975</b>				<b>\$1,535,470</b>
<b>Gravel Re-sheeting</b>					
2 Arterial	21	15	5.5	\$3.20	\$24,640
3 Distributor	526	15	5.5	\$3.20	\$617,173
4 Collector	532	20	5.5	\$3.20	\$468,160
5 Access	398	25	5.5	\$3.20	\$280,192
Town Streets (Local)	36	25	4.5	\$3.20	\$20,736
<b>Total Re-sheeting</b>	<b>1,513</b>				<b>\$1,410,901</b>

\* Unit rates from 2015.

Council’s annual delivery program for both bitumen resealing (sealed roads) and gravel re-sheeting (unsealed roads) is annually updated from roads condition data. As more asset data is collected, these programs are targeted to suit the changing needs of the road network environment.

## 5.4. New and Upgraded Assets

New works are those that create a new asset that did not previously exist, or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. A description of asset upgrade and improvement activities is provided in Table 5.5

There is a demand for creation of new and upgraded road assets, this is tempered by the knowledge that available funds must first be directed to maintaining and renewing existing road assets.

Council has developed a framework for the prioritisation of the capital budget towards capital renewals (as detailed in Council’s Capital Funds Allocation Strategic Policy). In accordance with this policy, capital expansion projects (upgrades and improvements) over \$200k are not included in Council’s capital program unless at least one of the following criteria is met:

- The project is a 50% or greater capital grant (or approved community) funded project; or
- The project will reduce Council’s long term costs and there is a detailed cost benefit analysis showing why the capital works would reduce Council’s cost base; or
- The projects are detailed as a specific deliverable as part of a Special Rates Variation application

Details of desired road asset improvements/upgrades over the next ten years are provided in Section 8.0.

**Table 5.4: Capital Expansion and Upgrade Activities**

Activity	Details
Road Re-alignment	Involves improvement to either the vertical or horizontal alignment of a road.
Pavement and/or Shoulder Widening	Involves widening the area of shoulder pavement in order to place wider seal on the pavement on a segment of road.
New Road Seals	Sealing of unsealed roads involves the placement of bitumen spray seal and aggregate on top of the final gravel pavement.
New Road Construction	Construction of a completely new road.

## 5.5 Asset Disposal Plan

Council envisages two scenarios under which a road asset within Warrumbungle Shire would be disposed:

- When a road asset is transferred to a private entity, and no longer maintained by Council;

- When a road or a component of a road asset is deemed redundant and no longer maintained, e.g. a seal on a low category road is disposed of and the road downgraded to an unsealed road.

For the purpose of this AMP, no redundant assets requiring decommissioning and disposal are anticipated.

## 6.0: Risk Management and Critical Assets

### 6.1. Risk Management Plan

As prescribed in the Warrumbungle Shire Council Risk Management Policy risk management is about the systematic identification, analysis, evaluation, control and monitoring of risks associated with Council activities. This Roads Asset Management Plan establishes the risk management plan through Councils policy, procedures and processes that provide a simple, systematic and readily usable approach to the maintenance of Council roads and road related infrastructures in line with AS/NSW ISO 31000:2009 Risk management - Principles and guidelines.

#### 6.1.1 Risk Management Process

Council applies risk management in a systematic and consistent way across all areas of Council's functions and operations. To achieve this, Council will use the risk management and methodology outlined in AS/NZS ISO 31000:2009 – Risk Management – Principles and standards, which comprises the following steps:

- **Communication and Consultation**  
Communicate and consult with internal and external stakeholders as appropriate at each stage of the risk management process.
- **Establish the Context**  
Establish the strategic, organisational and risk management context in which the rest of the process will take place. Criteria against which risk will be evaluated should be established and the structure of the analysis identified.  
  
This includes the organisation's internal and external environment.
- **Risk Assessment**  
Risk assessment is the overall process of risk identification, risk analysis and risk evaluation.
  - **Risk Identification**  
Identify what, why and how things can arise as the basis for further analysis.
  - **Risk Analysis**  
Determine the existing controls and analyse risks in terms of consequence and likelihood in the context of those controls. The analysis should consider the range of potential consequences and how likely those consequences may occur. Consequence and likelihood may be combined to produce an estimated risk level.
  - **Risk Evaluation**  
Compare estimated levels of risk against the pre-established criteria. This enables risks to be ranked so as to identify management priorities. If the level of risk established is low, then risk may fall into an acceptable category and treatment may not be required. This is also known as risk appetite.
- **Risk Treatment**  
Accept and monitor low-priority risks. For other risks, develop and implement a specific management plan which includes consideration of funding.

- Monitor and Review**  
 Monitor and review the performance of the risk management system and changes which might affect it.

### Risk Analysis & Evaluation

Insignificant	Minor	Moderate	Major	Critical
<b>Health &amp; Safety</b>				
<input type="checkbox"/> Health First aid treatment or injury only. <input type="checkbox"/> Low level soreness or small amount of pain & Safety	<input type="checkbox"/> Medical treatment injury <input type="checkbox"/> Restricted work injury <input type="checkbox"/> Presented to hospital (no overnight stay).	<input type="checkbox"/> Single Lost Time Injury <input type="checkbox"/> Short term hospitalisation (< 7 days) <input type="checkbox"/> Reversible impairment to human health	<input type="checkbox"/> Multiple Lost Time Injuries <input type="checkbox"/> Extended hospital stay (> 7 days) <input type="checkbox"/> Permanent disability < 30% <input type="checkbox"/> Serious long-term health issue	<input type="checkbox"/> Permanent disability >30% <input type="checkbox"/> One or more fatalities
<b>Environment</b>				
<input type="checkbox"/> No or very low environmental impact. <input type="checkbox"/> Impact confined to a small area.	<input type="checkbox"/> Low environmental impact. <input type="checkbox"/> Rapid clean-up by internal staff or contractors. <input type="checkbox"/> Impact contained to area already impacted by operations.	<input type="checkbox"/> Moderate environmental impact. <input type="checkbox"/> Clean-up by internal staff or contractors. <input type="checkbox"/> Impact confined 1km of operation	<input type="checkbox"/> Major environmental impact. <input type="checkbox"/> Considerable clean-up effort required by internal staff and external contractors. <input type="checkbox"/> Impact may extend across shire boundary or into waterway	<input type="checkbox"/> Severe environmental impact. <input type="checkbox"/> Likely species destruction and long recover period. <input type="checkbox"/> Extensive clean-up using external resources. <input type="checkbox"/> Impact on a regional scale.
<b>Community/External Relations</b>				
<input type="checkbox"/> Isolated complaint received. <input type="checkbox"/> No media coverage. <input type="checkbox"/> No damage to reputation or relationships with stakeholders.	<input type="checkbox"/> Multiple or sporadic complaints received. <input type="checkbox"/> No media coverage. <input type="checkbox"/> Short-term damage with relationship with one or more stakeholders but no damage to reputation.	<input type="checkbox"/> Repeated or serious rate of complaints. <input type="checkbox"/> Local media interest and coverage. <input type="checkbox"/> Reversible damage with stakeholders and to reputation.	<input type="checkbox"/> Ongoing complaints from local groups, Non Government Organisations or regulators. <input type="checkbox"/> Regional/national media interests. <input type="checkbox"/> Protests by external stakeholders. <input type="checkbox"/> Local or regional damage to reputation.	<input type="checkbox"/> High level concern from community, regulators, stakeholders and/or stakeholders. <input type="checkbox"/> Adverse national or international media coverage. <input type="checkbox"/> International damage to reputation.
<b>Legal</b>				
<input type="checkbox"/> Legal Questionable or minor non-conformance with operating condition. <input type="checkbox"/> No fine or prosecution. <input type="checkbox"/> Unlikely to attract regulatory interest. <input type="checkbox"/> Easy to resolve	<input type="checkbox"/> Non-compliance with operating conditions. <input type="checkbox"/> Could attach low level administrative response from regulator <input type="checkbox"/> No court appearance required	<input type="checkbox"/> Breach of local or national law with potential prosecution by regulator. <input type="checkbox"/> Continuing occurrence of minor breach	<input type="checkbox"/> Major breach of local or national law. <input type="checkbox"/> Prosecution or penalties by regulator likely. <input type="checkbox"/> Short term threat to operations continuing. <input type="checkbox"/> Civil action initiated	<input type="checkbox"/> Significant breach of national or international law with potential goal sentence. <input type="checkbox"/> Operations suspended or cease (short or long term) <input type="checkbox"/> Licenses withdrawn or revoked. <input type="checkbox"/> Class action initiated
<b>Operational/Cost</b>				
<input type="checkbox"/> Minor impact, easily corrected with no loss of production. <input type="checkbox"/> <\$1000	<input type="checkbox"/> Minor damage to equipment or infrastructure with minimal loss of production (<1day). <input type="checkbox"/> \$1,000 - \$10,000	<input type="checkbox"/> Damage to equipment or infrastructure causes production to cease <1 week. <input type="checkbox"/> \$10,000 - \$50,000	<input type="checkbox"/> Damage to equipment or infrastructure causes production to cease <1 month <input type="checkbox"/> \$50,000 - \$100,000	<input type="checkbox"/> Damage to equipment or infrastructure causes production to cease >1 month. <input type="checkbox"/> >\$100,000

The risk analysis & evaluation process uses a qualitative assessment of risk likelihood and severity of risk consequences to derive a risk rating. The qualitative descriptors for each assessment are shown below.

**Table 6.1 Likelihood of Risks**

Likelihood	How Likely are the Consequences?	Frequency
Almost Certain	Expected to occur in most circumstances	Daily or continuous
Likely	Will probably occur in most circumstances	Weekly
Possible	Might occur occasionally	Monthly
Unlikely	Could happen some time	Annually
Rare	May happen only in exceptional circumstances	Decade

### Risk Assessment

The risk assessment process compares the likelihood of a risk event occurring against the consequences of that event occurring. In the risk rating table below, a risk event with a likelihood of 'Possible' and a consequence of 'Major' has a risk rating of 'High (H)'. This rating is used to develop a typical risk treatment for identified risks generated from road asset network.

Table 6.2 Consequence of Risks

RISK MATRIX	CONSEQUENCES				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	High (11)	High (16)	Extreme (20)	Extreme (23)	Extreme (25)
Likely	Moderate (7)	High (12)	High (17)	Extreme (21)	Extreme (24)
Possible	Low (4)	Moderate (8)	High (13)	Extreme (18)	Extreme (22)
Unlikely	Low (2)	Low (5)	Moderate (9)	High (14)	Extreme (19)
Rare	Low (1)	Low (3)	Moderate (6)	High (10)	High (15)

### Risk Treatment Actions

The risk rating is used to determine risk treatments. Risk treatments can range from *immediate corrective action* (such as stopping or preventing the use of that road asset) for 'Very High' risks to *manage by routine procedures* for 'Low' risks. An event with a 'High Risk' rating will require '*Prioritised action*'. This may include actions such as reducing the likelihood of the event occurring by physical methods (limiting usage to within the asset's capacity, increasing monitoring and maintenance practices, etc), reducing consequences (limiting travel speed, preparing response plans, etc) and sharing the risk with others (insuring the organisation against the risk).

ACTION and TIME FRAME	
<b>Extreme</b>	<b>IMMEDIATELY STOP PROCESS, notify Supervisor immediately. If hazard identified as breach of existing procedures, take remedial action. If the hazard is not as a result of a breach, initiate immediate action to reduce the risk level to as low as possible before any further work is undertaken. Any solution must be in writing and follow the hierarchy of control – TCP, SWMS</b>
<b>High</b>	<b>TAKE IMMEDIATE ACTION, notify Supervisor immediately. If the hazard is a breach of existing procedures, take remedial action. If the hazard is not a result of a breach, identify a solution which would reduce the risk level to as low as possible. Any solution must be in writing.</b>
<b>Moderate</b>	<b>If the hazard is a breach of existing procedures, take remedial action. If the hazard is not a result of a breach, identify a solution which would reduce the risk level to as low as possible. A written solution must be generated as soon as practicable. If no action is taken, there must be a regular (AT LEAST MONTHLY) risk assessment carried out to ensure that there is no increase in risk.</b>
<b>Low</b>	<b>If the hazard identified can be quickly eliminated, do so. If large costs or time is involved, do what is possible to reduce risk further. Custom and practice may continue and procedures need not be written.</b>

### **Risk Treatment Process**

The treatment of risk involves identifying the range of options for treating risk, evaluating those options, preparing risk treatment plans and implementing those plans. Treatment options include those that eliminate risk, reduce the likelihood of the risk event occurring, reducing the consequences should the risk event occur and sharing of the risk with others in the community. The method of assessment of risk treatment options can range from an assessment by a local group of stakeholders and practitioners experienced in operation and management of the road asset service to detailed risk cost and risk reduction cost-benefit analysis.

The risk treatment plans identify the following for each non-acceptable risk:

1. Proposed actions
2. Responsibility
3. Resource requirement/budget
4. Timing and target
5. Reporting and monitoring required.

### **6.2 Critical Assets**

The International Infrastructure Management Manual defines critical assets as assets that have a high consequence of failure, but not necessarily a high probability of failure. Critical assets are also defined in this manual as those assets that are most important for the delivery of required service and/or have the highest consequence of failure. By identifying critical assets and critical failure modes, Council can target and refine investigative activities, maintenance plans and capital expenditure plans at the critical areas.

Council has developed the following criteria to assess whether a particular road within its network meets the definition of a critical asset. Any road that meets one or more of these criteria is deemed critical:

- Shire Fire Breaks (generally State, Regional and local arterial roads);
- Single Road Access (e.g. fire or flood);
- Evacuation Roads (e.g. fire or flood);
- Access to airstrips;
- Access to Council Infrastructure (e.g. sewer, water and dump facilities, etc.);
- Access to critical authority assets (towers, exchanges, railway & gas facilities, etc.);
- Access into neighboring Shires.



## 7.0: Level of Service

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

### 7.1 Customer Levels of Service

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

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

<b>Quality</b>	How good is the service ... <i>what is the condition or quality of the service?</i>
<b>Function</b>	Is it suitable for its intended purpose .... <i>Is it the right service?</i>
<b>Capacity / Use</b>	Is the service over or under used ... <i>do we need more or less of these assets?</i>

Council has developed service levels as part of its Delivery Program. The Delivery Program and performance against targets are reviewed by Council on a quarterly basis.

Organisational measures are measures of fact related to the service delivery outcome e.g. number of occasions when service is not available, condition %'s of Very Poor, Poor/Average/Good, Very good. These Organisational measures provide a balance in comparison to the customer perception that may be more subjective. Council's Delivery Program also contains organisation measures.

### 7.2 Technical Levels of Service

#### Technical Levels of Service

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

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

- Operations – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc.
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs),
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),
- Upgrade / New – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).

It is the task of asset managers to implement and control technical service levels to influence the customer service levels.

Council has detailed its community and technical levels of service in the following 3 tables.

**Table 7.1 Unsealed Roads Service Level (Includes Unsealed Town Streets)**

Road Hierarchy	KM	Community Level of Service		Technical Level of Service	
		Minimum Driving Speed	Minimum Condition Level	Grading	Re-Sheeting
2 Arterial	21	60 – 70km per hr	3	Once every 15 months	Once every 15 Years
3 Distributor	527	60 – 70km per hr	3	Once every 15 months	Once every 15 Years
4 Collector	536	60 – 70km per hr	3	Once every 3 years	Once every 20 Years
5 Access	426	50 – 60km per hr	4	Once every 5 years	Once every 25 Years
	<b>1,510</b>				

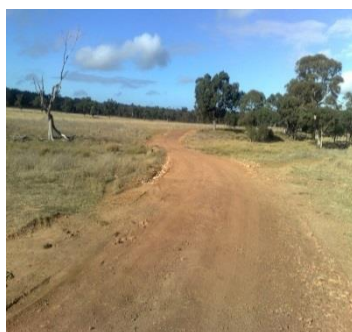
**Condition Level 3:** Moderate to significant deterioration evident; minor components or isolated lengths of the asset need replacement or repair now but not effecting short term structural integrity. Moderate increase of pavement roughness but asset still functions safely at adequate level of service.

**Condition Level 4:** Serious deterioration and significant defects evident effecting structural integrity. Significant increase in pavement roughness.

**Condition 1**



**Condition 2**



**Condition 3**



**Condition 4**



**Condition 5**



Table 7.2 Rural Sealed Roads Service Level (Pavement and Seal)

Road Hierarchy Category	KM	Community Level of Service	Technical Level of Service				
			Minimum Condition Level	Reseals	Pavement Rehab	Patching	Slashing
1 Regional	376	3	25 Years	60 Years	7 days	Twice yearly x 2	7 days
2 Arterial	200	3	25 Years	80 Years	7 days	Yearly x1	7 days
3 Distributor	208	3	25 Years	100 Years	14 days	Yearly x1	14 days
4 Collector	64	3	25 Years	100 Years	28 days	-	28 days
5 Access	7	4	25 Years	100 Years	60 days	-	60 days
	<b>855</b>						

**Condition Level 3:** Moderate to significant deterioration evident; minor components or isolated lengths of the asset need replacement or repair now but not effecting short term structural integrity. Moderate increase of pavement roughness but asset still functions safely at adequate level of service.

**Condition Level 4:** Serious deterioration and significant defects evident effecting structural integrity. Significant increase in pavement roughness.

- **Pothole Intervention Level for Patching Level of Service** = > 30mm depth and / or >150mm diameter
- **Edge break Intervention Level for Edge Break Treatment** = > 50mm depth and encroaching on carriageway

Condition 1



Condition 2



Condition 3



Condition 4



Condition 5



Table 7.3 Urban Roads Sealed Service Level (Pavement and Seal)

Road Hierarchy Category	KM	Community Level of Service	Technical Level of Service				
			Minimum Condition Level	Reseals	Pavement Rehab	Patching	Slashing
1 Regional	10	3	25 Years	60 Years	7 days	Weekly in summer	Coonabarabran – Mon, Wed, Fri (full day) + Sat Morning 3 hrs Dunedoo & Coolah every 2nd week 1 day Baradine, Binnaway & Mendooran every 3rd week 0.5 days
2 Arterial	8	3	25 Years	100 Years	7 days	4 times per year	
3 Distributor	13	3	25 Years	100 Years	14 days	2 times per year	
4 Collector	29	3	25 Years	100 Years	28 days	2 times per year	
5 Access	55	4	25 Years	100 Years	28 days	-	
	<b>110</b>						

**Condition Level 3:** Moderate to significant deterioration evident; minor components or isolated lengths of the asset need replacement or repair now but not effecting short term structural integrity. Moderate increase of pavement roughness but asset still functions safely at adequate level of service.

**Condition Level 4:** Serious deterioration and significant defects evident effecting structural integrity. Significant increase in pavement roughness.

- **Pothole Intervention Level for Patching Level of Service** = > 30mm depth and / or >150mm diameter
- **Slashing Intervention Level** = Grass Height > 300mm towns

Condition 1



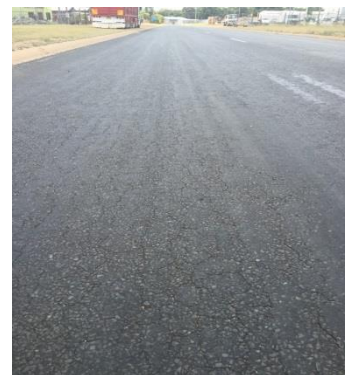
Condition 2



Condition 3



Condition 4



Condition 5



## 8.0: Financial Summary

### 8.1 Financial Summary

The annual set of Financial Statements produced by Council includes 'Special Schedule 7', which is a report on the financial performance of Council's infrastructure assets. This schedule includes four indicator ratios which are used to benchmark the financial performance of Council's infrastructure assets. They are used to assess Council's ability to maintain and renew infrastructure assets and they provide a measure of financial sustainability

#### 1. Asset renewal ratio

$$\frac{\text{Asset renewals}}{\text{Depreciation, amortisation and impairment}}$$

The asset renewal ratio indicates whether or not sufficient funds are available for optimum renewal and replacement of assets. The benchmark ratio is greater or equal to 100%

#### 2. Infrastructure backlog ratio

$$\frac{\text{Estimated cost to bring assets to a satisfactory standard}}{\text{Net carrying amount of infrastructure assets}}$$

This ratio shows what proportion the infrastructure backlog is against the total value of Council's road assets. The benchmark is less than 2%

#### 3. Asset maintenance ratio

$$\frac{\text{Actual asset maintenance}}{\text{Required asset maintenance}}$$

This ratio compares actual versus required annual asset maintenance. A ratio above 100% indicates that enough funds have been invested to stop the infrastructure backlog from growing. The benchmark is greater than 100%.

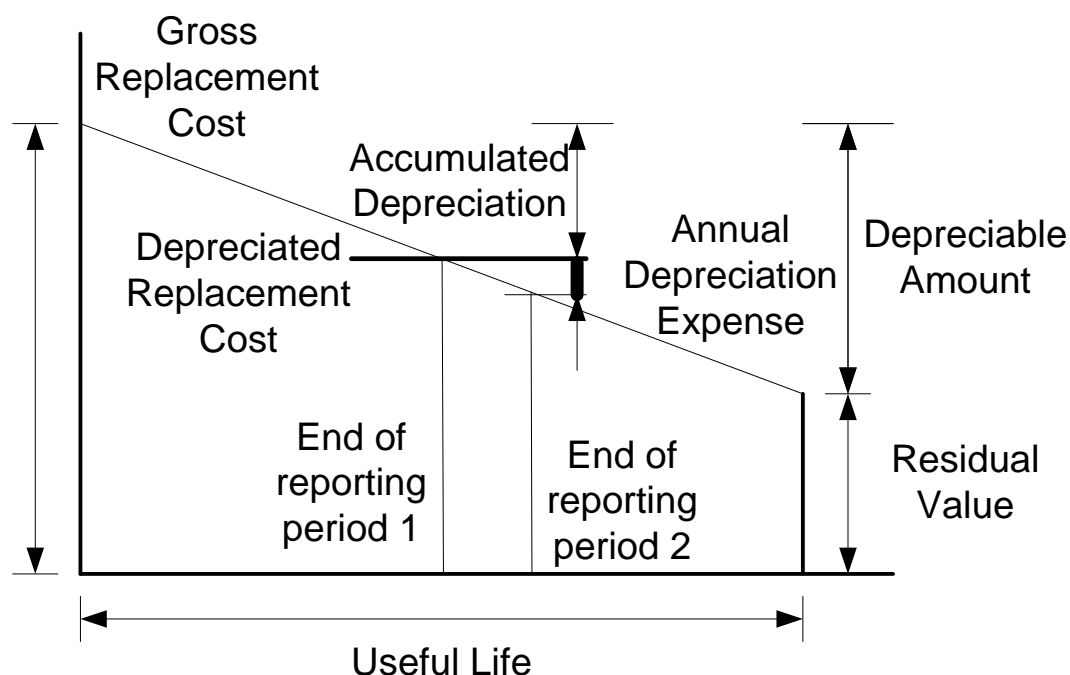
#### 4. Cost to bring assets to agreed service level

$$\frac{\text{Estimated cost to bring assets to an agreed service level set by Council}}{\text{Gross replacement cost}}$$

This ratio reflects the actual value of identified renewal works needing to be delivered in the future, calculated at a point in time, being the end of each financial year.

Special Schedule 7 and Note 9(a) in the Financial Statements refers to depreciation and other life cycle costs which may be best described by reference to the Figure 8.1 – Accounting for Infrastructure.

Figure 8.1 – Accounting for Infrastructure



The financial information on road assets presented in previous sections of this plan relate to the following road types:

- Regional Roads;
- Local Roads – Sealed;
- Local Roads – Unsealed;
- Town Streets.

The best available estimate of the value of these four categories of road assets is shown in Table 8.1. These road assets are valued at fair value.

Table 8.1 Fair Value Estimates of Road Assets

	Regional Roads (\$'000)	Local Rural Roads – Sealed (\$'000)	Local Rural Roads – Unsealed (\$'000)	Town Streets (\$'000)
Gross replacement cost	86,749	72,531	56,326	25,391
Depreciable amount	TBC	TBC	TBC	TBC
Depreciated replacement cost (Note 1)	70,781	58,306	38,776	19,343
Annual average asset consumption (depreciation)	1,158	1,074	1,415	428

\* Information extracted from Financial Statements for 2017/18

Note 1: Also reported as Written Down Value, Carrying or Net Book Value.

Table 8.2 Annual Service Level Costs

Road Hierarchy Category	Length Km	Service Level	Average Width	Cost per M <sup>2</sup>	Annual Cost per Service Level	Budget Allocation 2019/2020
<b>Reseals</b>						
1 Regional	386	25	6.9	\$4.30	\$458,105	\$650,000
2 Arterial	200	25	5.75	\$4.30	\$197,800	\$450,000
3 Distributor	208	25	5.75	\$4.30	\$205,712	
4 Collector	64	25	5.75	\$4.30	\$63,296	
5 Access	7	25	5.75	\$4.30	\$6,923	
Town Streets (all)	110	25	9	\$4.30	\$170,280	\$207,194
<b>Total Reseals</b>	<b>975</b>				<b>\$1,102,116</b>	<b>\$1,307,194</b>
<b>Pavement Rehab</b>						
1 Regional	386	60	6.9	\$20.24	\$898,454	\$969,000
2 Arterial	200	80	5.75	\$15.80	\$227,125	\$400,000
3 Distributor	208	100	5.75	\$15.80	\$188,968	
4 Collector	64	100	5.75	\$15.80	\$58,144	
5 Access	7	100	5.75	\$15.80	\$6,360	
Town Streets (all)	110	100	9	\$15.80	\$156,420	\$85,000
<b>Total Rehab</b>	<b>975</b>				<b>\$1,535,470</b>	<b>\$1,454,000</b>
<b>Gravel Re-sheeting</b>						
2 Arterial;	21	15	5.5	\$3.20	\$24,640	\$750,000
3 Distributor	526	15	5.5	\$3.20	\$617,173	
4 Collector	532	20	5.5	\$3.20	\$468,160	
5 Access	398	25	5.5	\$3.20	\$280,192	
Town Streets (all)	36	25	4.5	\$3.20	\$20,736	\$0
<b>Total Re-sheeting</b>	<b>1513</b>				<b>\$1,410,901</b>	<b>\$750,000</b>

\*\* TBC

Table 8.3 Difference between Annual Budget Allocation and Service Level Cost

Activity	Regional Roads (\$)	Sealed Rural Roads(\$)	Unsealed Rural Roads(\$)	Town Streets (\$)
<b>Road Maintenance</b>				
Required Maintenance	1,074,766	635,748	1,805,787	828,130
Current Budget Allocation	1,341,166	600,522	1,819,656	828,130
<b>Maintenance – (Underfunded) / Overfunded</b>	<b>-266,400</b>	<b>35,226</b>	<b>-13,869</b>	<b>0</b>
<b>Road Surface - bitumen</b>				
Required Renewal	458,105	473,731	NA	170,280
Current Budget Allocation	650,000	450,000	NA	207,194
<b>Renewals Surfacing – (Underfunded) / Overfunded</b>	<b>191,895</b>	<b>-23,731</b>		<b>36,914</b>
<b>Road Pavement</b>				
Required Renewal	898,454	480,597	1,410,901	156,420
Current Budget Allocation	969,000	474,500	750,000	85,000
<b>Renewals Pavement – (Underfunded) / Overfunded</b>	<b>70,546</b>	<b>-6,097</b>	<b>-660,901</b>	<b>-71,420</b>

**Table 8.4 - Annual Road Renewals Ratio (Asset Renewal /Depreciation)**

Benchmark Ratio  $\geq$  100%

Item	Regional Roads (\$)	Local Rural Roads (Sealed + Unsealed) (\$)	Town Streets (\$)
Depreciation expense (17/18)	1,154,644	2,491,975	428,174
Budget renewal allocation (19/20)	1,619,000	1,600,000	292,194
Ratio	140%	64%	68%

**Table 8.5 Infrastructure Backlog Ratio (cost to bring to satisfactory standard / net carrying amount)**

Benchmark Ratio  $<$  2%

	Regional Roads (\$)	Local Rural Roads – Sealed (\$)	Local Rural Roads – Unsealed (\$)	Town Streets (\$)
Cost to bring to satisfactory standard	131,720	31,636	223,941	0
Net carrying amount	70,781,184	58,306,432	38,776,341	19,342,461
Ratio	0.19%	0.05%	0.58%	0%

**Table 8.6 Asset Maintenance Ratio (actual asset maintenance / required asset maintenance)**

Benchmark Ratio  $>$  100%

	Regional Roads (\$)	Local Rural Roads (\$)	Town Streets (\$)
Actual maintenance expenditure (2019/20 budget allocation)	1,341,166	2,420,178	828,130
Required maintenance expenditure	1,074,766	2,441,535	828,130
Ratio	125%	99%	100%

*Note: Required expenditure based on budget on combination of target service levels and budget allocations for 2019/20.*

**Table 8.7 Cost to Bring Assets to Agreed Service Level**

	Regional Roads (\$)	Local Rural Roads – Sealed (\$)	Local Rural Roads – Unsealed (\$)	Town Streets (\$)
Cost to bring assets to an agreed service level	1,343,821	28,941	1,770,265	Info not available
Gross replacement cost	86,749,258	72,532,009	56,325,943	25,390,517
Ratio	1.55%	0.04%	3.14%	NA



## 9.0: Plan Improvement and Monitoring

Item No	Item	Description	Date for Completion
1	Functional road classification system	<p>It is generally accepted that service level targets for a road with high volumes of traffic should be different to targets for a road with very low volumes of traffic. There is simply not enough funding available to maintain all roads at the same level of service. A hierarchical road classification system will enable service level targets to be developed that match the economic and social potential provided by each road.</p> <p>It is proposed to formally adopt a road network classification system based on the following five (5) categories; Regional, Arterial, Distributor, Collector &amp; Access. Currently the road network is based on a three (3) category system simply called Category 1, 2 &amp; 3 and service levels for these roads have been adopted by Council through the Delivery Program.</p> <p>A separate report to Council on the road classification system proposed in this Plan along with proposed service levels will allow formal adoption of the system.</p> <p><b>Action:</b> Report to Council on the road classification system. Include in the same report service level targets for planned maintenance activities and intervention levels for unplanned maintenance activities.</p>	December 2019
2	Asset componentisation – road segments on sealed local roads.	<p>Each road within the network of regional roads has been broken down into lineal segments. Each segment is around 1km in length. Physical markers are in place to enable field identification of road segments and to correctly allocate expenditure. The network of sealed local roads has been segmented however there are no physical markers in place.</p> <p><b>Action:</b> Install segment markers on the sealed local rural road network.</p>	March 2020
3	Condition assessment	<p>Condition assessment information is used to inform the public about levels of service, the information is also used to calculate remaining useful life and annual depreciation expense. It is important that condition assessment methodology can be consistently applied to ensure that rating information is reliable.</p>	August 2020

Item No	Item	Description	Date for Completion
		<p>The methodology should be reviewed and staff providing with appropriate training. Also, an independent audit should be undertaken by a separate assessor to confirm reliability of results.</p> <p><b>Action:</b> Review and update condition rating scales and include in revised version of AMP Roads</p>	
4	Cost of renewal activities	<p>The calculation of renewal costs is dependent upon unit rates being derived for roadworks associated with pavement renewal. It is important therefore that unit rate costs are accurate and up to date.</p> <p><b>Action:</b> Capture and report on unit rate data for the following roadwork activities; bitumen reseals, pavement rehabilitation and gravel resheeting. Include updated information in revised version of AMP Roads.</p>	August 2020
5	Remaining useful life	<p>This Roads AMP makes assumptions on useful life of various components of a road. For bitumen seals, the assumed useful life is 25years. For sealed road pavements the useful life is assumed to be 60 years for Regional Roads and 80 years for Local Rural Roads. For unsealed roads the useful life assumptions are; 15 years for arterial and distributor roads, 20 years for collector roads and 25 years for access roads. The assumptions about useful life affect depreciation calculations and it is necessary from time to time to review these assumptions. There are records within Council that provide information on when road renewal works were undertaken, however there is considerable effort involved in collating these historical records.</p> <p><b>Action:</b> Review the history of road construction and rehabilitation and analyse life expectancy of the following road components; bitumen seals, sealed road pavements and unsealed road pavements. The results of the analysis are to be included in a revised version of the AMP Roads.</p>	August 2021

Item No	Item	Description	Date for Completion
6	Community consultation on service levels	<p>Council's current Delivery Program provides several indicators that the community (all road users) may use to assess the level of service being provided by the roads. Community consultation provides an opportunity for Council to communicate the cost of providing varying levels of service, it also provides the community with an opportunity to give feedback on expected service levels.</p> <p><b>Action:</b> Inform and consult with the community on acceptable levels of road condition and on expected levels of road maintenance.</p>	May 2020
7	Mapping of proposed work locations	<p>Currently the location of works, in the works program, is presented in form of an 'asset identification number'. A more effective method is to present the work locations on a map.</p> <p><b>Action:</b> Publication of a map showing the location of projects in the four (4) year works program for roadworks associated with pavement renewal and pavement upgrades.</p>	April 2020
8	Asset management information system	<p>Currently the information used to report on financial and physical performance of assets is captured and managed by a variety of spreadsheets. The spreadsheets are operated by various staff members and they are not linked or integrated. The geographical information system is evolving and is being used to map location of assets, however there is no integration between GIS and spreadsheets used in managing assets. Computer programs that centralise and integrate asset information in one database are available and commonly used by Councils.</p> <p><b>Action.</b> Implement an integrated asset and financial information system</p>	July 2020

## 10.0: References

- **Condition Assessment & Asset Performance Guidelines - Road Pavements (Visual Assessment)**, Practice Note 9, 2015, Institute of Public Works Engineering Australia, Sydney, National Asset Management Support Group, Australia (NAMS.AU)
- **Levels of Service & Community Engagement – Levels of Service**, Practice Note 8, 2014, Institute of Public Works Engineering Australia, Sydney, National Asset Management Support Group, Australia (NAMS.AU)
- **Long Term Financial Planning**, Practice Note 6, 2012, Institute of Public Works Engineering Australia, Sydney, National Asset Management Strategy Group Australia (NAMS.AU)
- **International Infrastructure Management Manual**, Version 4.0, 2011, National Asset Management Support Group, Australia (NAMS.AU), ISBN No: 0 473 10685 X
- **Integrated Planning and Reporting Manual for Local Government in NSW – Planning a Sustainable Future**, NSW Government, Office of Premier & Cabinet, Division of Local Government, March 2013
- **Unsealed Road Manual – Guidelines to Good Practice**, Australian Road Research Board Limited, May 1993, ISBN 0 861910 598 1 Report
- **Western Queensland Best Practice Guidelines**, Technical Notes & Supporting Data, Queensland Government Department of Main Roads - May 2000 Amendment 1, No 2004
- **Best Practice Manual – Roads – Version 5**, Statewide Mutual (Corporate Document), August 2012
- **A Guide to the Visual Assessment of Pavement Condition**, Austroads, 1987, ISBN 0 85588 198 4
- **RMS Construction and Maintenance Specification M2 (RTA) 2008**, NSW Government Department of Roads and Martine Services
- **RMS Construction and Maintenance Specification M3 (RTA) 2015**, NSW Government Department of Roads and Martine Services
- **Oranasoft, Asset Management Resource Kit**