Lachlan Shire Council

TRANSPORT SERVICES – ROADS

Asset Management Plan

Scenario 2 Version 1

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1. EXECUTIVE SUMMARY

Context

Lachlan Shire is a large agricultural area serviced by several towns and villages with the longest council road network in NSW at 3,918km. The low density rural population generates low traffic volumes but high proportion of heavy vehicles. Population fell through drought, land aggregation, mechanisation and young people leaving for education and employment. With agriculture recovering and growth in light manufacturing and mining, numbers may stabilise.

Major issues facing the area include isolation, ageing population, floods and drought cycles. Access needs to be maintained for services, school buses, mail contractors, employment, social interaction and recreation to reduce the health impacts of isolation, and transporting agricultural, mining and manufacturing produce.

The road network is ageing, maintenance costs rising and some unsealed roads are impassable when wet.

Present funding cannot provide all users with access to high speed all weather roads, or to undertake new construction without affecting maintenance and renewal. Maximising benefits for the resources applied, suggests using most resources to achieve good service levels on higher priority roads, while the level of service for less trafficked roads declines.

Maintaining and renewing the sealed road network is critical to maximising all weather access, linking communities, linking producers with markets, and long useful lives are key to network sustainability. Higher classification roads with more traffic have potentially higher risk. Regional roads have adequate funding for maintenance and renewals.

However, local roads have a shortfall in funding of approximately $2M below the level of service needed to maintain and renew roads. The shortfall impacts mostly on lower classification (6 and 7) unsealed roads where the risk is lowest, unless another level of service is determined through community consultation. The result is that minor unsealed roads will decline in levels of service, rarely having gravel or full maintenance applied unless additional funding is provided. Despite this, they must still provide transport services with an acceptable level of risk.

This second generation Asset Management Plan for Roads, with updated data and assumptions suggests widening narrow sealed roads at the ends of their useful lives, rather than upgrade early.

This requires active gravel resheeting of shoulders, stabilising, edge patching and heavy patching as needed to manage risk and reach 60 or 80 years of useful life. This reduces the initial backlog and annual shortfall reported in the 2012 AMP and improves the sustainability index for road assets.

The Roads network comprises:

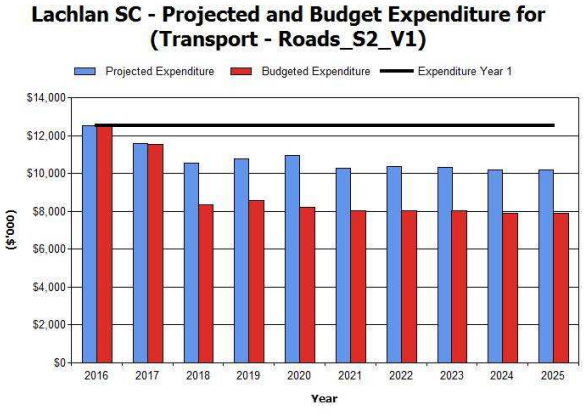
Asset category	Dimension
Sealed regional roads	548 km
Unsealed regional roads	83 km
Sealed local roads	373 km
Unsealed local roads	2,827 km
Urban streets	87 km
Roads total	**3,918 km**

These infrastructure assets have a replacement value of $334.2M.

What does it Cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan (AM Plan) includes operations, maintenance, renewal and upgrade of existing assets over the 10 year planning period is $107.7M or $10.8M on average per year.

Estimated available funding for this period is $89.0M or $8.9M on average per year which is 83% of the cost to provide the service. This is a funding shortfall of $1.9M on average per year. Projected expenditure required to provide services in the AM Plan compared with planned expenditure currently included in the Long Term Financial Plan are shown in the graph below.



What we will do

We plan to provide 'Transport Services – Roads' services within the 10 year planning period for the following:

- Operation, maintenance, renewal and upgrade of roads and ancillary assets to meet service levels set by Council in annual budgets.
- Major renewals and upgrades include the progressive widening of narrow seals as those roads are reconstructed when they reach the end of their useful lives, mainly regional roads initially.
- Transitioning from sealing roads to maintaining and renewing existing assets.
- Prioritise resources to class 3, 4 and 5 roads that carry most traffic, freight and produce, and to class 6 and 7 roads while they are school bus routes.
- Allow most class 6 and 7 unsealed roads to decline in level of service, with less frequent grading and little or no gravel, but still inspected to ensure that they are safe to travel on, even though at lower operating speeds and comfort.
- Invest in stabilising unsealed roads and sealed road shoulders to extend resheet cycles.

What we cannot do

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

- Grade all roads effectively within each year at desired frequencies.
- Gravel sheet or resheet all unsealed roads at desired frequencies.
- Expansion of the sealed roads network - not many new seals after 2015/16. The life cost of a sealed road can be 3 to 5 times the construction cost and be more costly than leaving it unsealed. Deciding to seal involves social, political, safety and economic factors, but ARRB advises it is generally justified if Average Annual Daily Traffic (AADT) is over 250 vehicles per day, but not if below 100 vpd.
- Provide all weather access to all landholdings.
- Provide full clear zones on all roadsides.

Managing the Risks

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

- Potential for motor vehicle accidents if the shoulders of narrow seals are poorly maintained.
- More unsealed roads not providing all-weather access or have increased risks when wet.
- Renewing roads too late and increasing the cost.
- Sealing low traffic roads reduces capacity to maintain and renew existing roads and increases long term maintenance and renewal costs.

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

- Maintaining each road as appropriate to its classification priority in the roads hierarchy and associated level of service and risk assessment. See **Appendix F Schedule 1: Roads Hierarchy**.
- Applying risk management principles to provide most resources to keep higher priority roads in good condition and provide at least safe access on minor roads within the limits of available resources. This includes regular inspections. See **Appendix A: Maintenance Response Levels of Service.**
- Progressively widen narrow sealed roads as they become due for reconstruction, with priority to arterial roads, bends, crests, potential high risk sites, accident history and distressed pavement.
- Having the physical resources to undertake works includes skilled labour, a modern and appropriate plant fleet, suitable gravel from licensed pits, resource sharing with other Councils and agencies, and outsourcing of peak load work specialist expertise, services and plant as needed.
- Progressively stabilising unsealed roads and sealed road shoulders to extend resheet cycles.

Confidence Levels

This AM Plan is based on mostly high level of confidence information.

The Next Steps

The actions resulting from this asset management plan are:

- Engage the community on service delivery and funding issues raised in this AMP.
- Improve asset information and knowledge
- Update the next generation AMP from community consultation, assessment of stabilising program and match with the Long Term Financial Plan.
- Promote the need for more funds to better manage the road assets, including seeking additional funding for reconstructing and widening narrow seals and for gravel resheeting.
- Review the classifications for each road segment.
- Adjust levels of service to fit available resources.
- Train staff to implement levels of service, and undertake inspections, risk assessments and condition assessments.

- Continue collecting and reviewing productivity data to update the modelling.

Questions you may have

What is this plan about?

This asset management plan covers the infrastructure assets that serve the Lachlan Shire Council community's transport needs. These assets include roads and footpaths throughout the community area that enable people to transport themselves and their produce. It fills in details behind the strategic outcome *"Efficient transport networks that meet community and business needs"* in the Lachlan Shire Draft Community Strategic Plan, 'Living Lachlan Style 2022'.

What is an Asset Management Plan?

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

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

Why is there a funding shortfall?

Most of the Council's road network was constructed from government grants, often provided and accepted without consideration of ongoing operations, maintenance and replacement needs.

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

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

Council is dependent on the generosity of higher levels of government for road funding through grants. Less than 4% is "own source" funding.

What options do we have?

Resolving the funding shortfall involves several steps:

1. Improving asset knowledge so that data accurately records the asset inventory, how assets are performing and when assets are not able to provide the required service levels,
2. Improving our efficiency in operating, maintaining, renewing and replacing existing assets to optimise life cycle costs,
3. Identifying and managing risks associated with providing services from infrastructure,
4. Making trade-offs between service levels and costs to ensure that the community receives the best return from infrastructure,
5. Identifying assets surplus to needs for disposal to make saving in future operations and maintenance costs,
6. Consulting with the community to ensure that transport services and costs meet community needs and are affordable,
7. Developing partnership with other bodies, where available to provide services,
8. Seeking additional funding from governments and other bodies to better reflect a 'whole of government' funding approach to infrastructure services.

What happens if we don't manage the shortfall?

It is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found or until alternative processes can start producing savings. For roads, the service level reduction may include:

1. More emphasis on risk management;
2. Reduced operating speeds;
3. Rougher roads and less comfortable ride;
4. Less grading for minor roads (class 6 and 7);
5. More dry maintenance grading and less grade, water and roll treatments (less attention to structural problems in many roads);
6. Loss of all-weather access for several unsealed roads, or poor accessibility in wet weather on soft and slippery unsealed roads, see photo below;
7. More inconvenience to travellers;
8. Higher vehicle operating costs from increased rolling resistance and vehicle damage;
9. Higher freight costs;
10. Returning failed seals to gravel
11. More customer complaints.

Not all weather access (SR10 before resheet/repairs).

What can we do?

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

Subject to community consultation, it is proposed to limit the damage from the funding shortfall by fully funding all activities except gravel resheeting of class 6 and 7 unsealed roads. These are minor roads in the road hierarchy and although their condition would be expected to decline, they would still be maintained for safety if not high speed travel or all weather access. They offer a lower risk than reducing maintenance and renewals expenditure on higher risk roads with more traffic as found in classes 3, 4 and 5 in the roads hierarchy.

The scale of the shortfall can be reduced over time by stabilising unsealed roads and the shoulders of narrow sealed roads. It could take 10 – 20 years to reach the full effect, but delaying now would increase the time frame.

The roads hierarchy has already guided the effort applied to the various road classifications which has improved the efficiency of resource utilisation.

Additional grant funds can be directed to the lower class roads as and when offered by governments, such as through the Roads to Recovery program.

What can you do?

We will be pleased to consider your thoughts on the issues raised in this asset management plan and suggestions on how we may change or reduce its mix of road services to ensure that the appropriate level of service can be provided to the community within available funding.

2. INTRODUCTION

2.1 Background

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

The asset management plan (AMP) follows the format for AM Plans recommended in Section 4.2.6 of the International Infrastructure Management Manual[1].

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

- Council's Asset Management Policy
- Asset Management Strategy
- LSC Community Strategic Plan "Living Lachlan Style" and updates
- LSC Management Plan
- LSC Delivery and Operation Plan 2014/2015 to 2018/2019
- LSC Road Condition Classification Methodology (*draft*)
- Roads 'Core' Infrastructure Risk Management Plan *(draft being prepared)*

This infrastructure assets covered by this asset management plan are shown in Table 2.1. These assets are used to provide transport services to the community.

Table 2.1: Assets covered by this Plan

Asset category	Dimension	Replacement Value
Sealed regional roads	548 km	To be determined
Unsealed regional roads	83 km	To be determined
Sealed local roads	373 km	To be determined
Unsealed local roads	2,827 km	To be determined
Urban streets	87 km	To be determined
Roads total	**3,918 km**	**$334.2M**

Note, revised replacement values to be broken down into components when asset register is updated for Fair Value.

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

Table 2.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Councillors	• Represent needs of community/shareholders, • Allocate resources to meet the organisation's objectives in providing services while managing risks, • Advocacy for more sustainable funding arrangements, • Ensure organisation is financial sustainable.
General Manager	• Allocate resources to enable informed decisions by Councillors to meet the organisation's objectives in providing services while managing risks, • Conduct community engagement to assess Community Levels of Service

[1] IPWEA, 2011, Sec 4.2.6, *Example of an Asset Management Plan Structure*, pp 4|24 – 27.

	• Ensure organisation is financial sustainable
Directors Infrastructure Services	• Allocate resources to gather information and assess needs to meet the organisation's objectives in providing services while managing risks.
Chief Financial Officer	• Provide accurate and current financial information to other stakeholders to enable sound budget management • Provide budget income input to asset management planning by functional area manager.
Manager Operations	• Arrange collection of asset data, • Collate roads income data, • Collate and assess the required expenditure outlays for maintenance, renewals and upgrade/new assets from various sources, • Develop renewals and upgrades programs, • Analyse effectiveness of implementing Levels of Service, • Analyse risks applying to the road assets, • Analyse road assets sustainability, • Update Roads Asset Management Plan, • Prepare Roads Risk Management Plan, • Provide input to budget process, linking AMP and LTFP outcomes, • Monitor programs and provide feedback to Director, General Manager and Councillors on progress of road programs and recommend any necessary changes to improve or ensure outcomes • Manage operational resources, • Provide material for informed advocacy for more funding, including participating in data collection surveys by industry bodies to assist collective advocacy.
Council operational staff	Undertake planned and reactive operational, maintenance activities Implement renewal and upgrade/new works in accordance with budget, LTFP, Community Strategic Plan, and resources allocated while managing operational risks Provide feedback on inspections, application and effectiveness of implementing Levels of Service
Community	Provide feedback to Council on the effectiveness of outcomes for periodic review of the Roads AMP.

Our organisational structure for service delivery from road infrastructure assets is summarised below,

General Manager – Community Strategic Plan and overall management

- Director Community Services and Governance – policy management, human resources, insurance, risk management, records management
- Chief Financial Officer – Long Term Financial Plan, Budget, current expenditures for monitoring costs, asset management
- Director Infrastructure Services – asset management registers and plans for all infrastructure except buildings
    - Manager Infrastructure – collection of data
    - Manager Operations – manage roads assets planning and operations and supporting functions including plant and quarries and collaborate on risk management.

- Middle managers and operational staff.

2.2 Goals and Objectives of Asset Management

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

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

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

2.3 Plan Framework

Key elements of the plan are

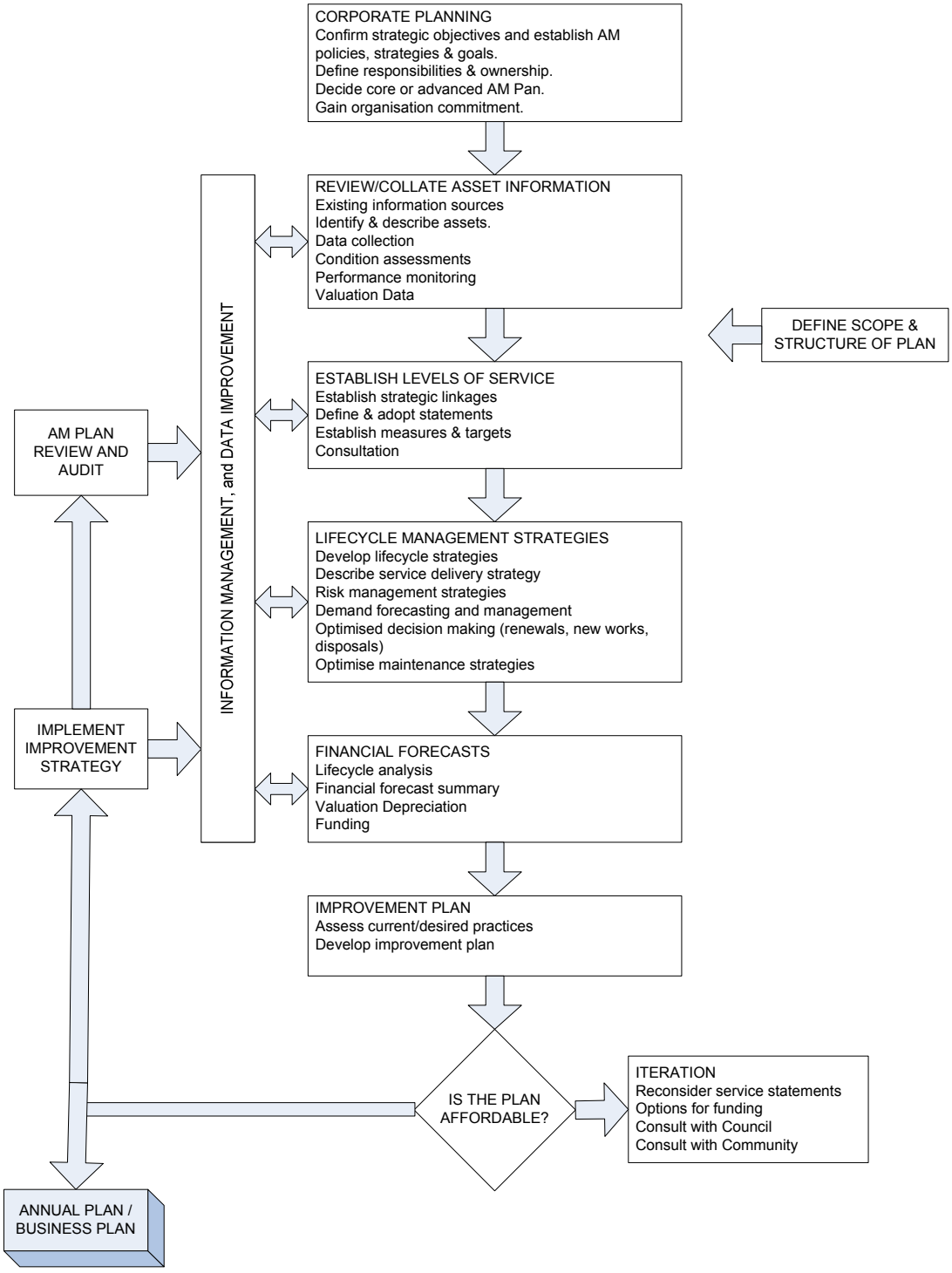
- Levels of service – specifies the services and levels of service to be provided by the organisation,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Life cycle management – how Council will manage its existing and future assets to provide defined levels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

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

[2] Based on IPWEA, 2011, IIMM, Sec 1.2 p 1|7.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11.



2.4 Core and Advanced Asset Management

This asset management plan is prepared as a 'core' asset management plan over a 20 year planning period in accordance with the International Infrastructure Management Manual[3]. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long term financial planning and reporting. Core asset management is a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this asset management plan will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels in a financially sustainable manner.

This plan is in the transitional phase with some advanced input from collected data that supports a higher level of confidence in optimising activities and programs to achieve the best possible outcomes for the funding available.

2.5 Community Consultation

This 'core' asset management plan is prepared to facilitate community consultation initially through feedback on public display of draft asset management plans prior to adoption by the Council. Future revisions of the asset management plan will incorporate further community consultation on service levels and costs of providing the service. This will assist the Council and the community in matching the level of service needed by the community, service risks and consequences with the community's ability and willingness to pay for the service.

A fairly general community consultation including a survey and a series of focus meetings was undertaken in early 2011 to start the process of developing a Community Strategic Plan for Lachlan Shire. Under the theme of LIVING LACHLAN STYLE 2022, people were asked:

1. What do you want life in Lachlan Shire to be like in ten years time?
2. How do you believe that can be achieved?
3. What role do you expect the Council to play in that process?

The feedback from that consultation was collated into a "Community Discussion Paper" and relevant parts are incorporated into this Plan.

Further community consultation in late 2011 produced a Lachlan Shire Draft Community Strategic Plan, 'Living Lachlan Style 2022'. It identifies "Our Preferred Future" with vision statements, values and future directions in broad terms. Section 2.2 discusses this further.

Unfortunately, roads got little mention in that process, so the Strategic Plan only expresses an abbreviated desire to maintain and improve the roads, to support other activities like agriculture. This does allow flexibility to develop an Asset Management Plan that focuses on the needs of the assets and the services provided without arbitrary constraints. As the process matures, there may be more strategic input from informed stakeholders.

Section 3.2 discusses more specific elements of community desires from earlier consultation in terms of Community Levels of Service.

Other community consultation undertaken since the First Roads Asset Management Plan was prepared in 2011/12, include:

- Draft Roads AMP advertised for comment – no feedback
- Repeated comments from locals and visitors that our roads are in better condition than our neighbours.
- Our regular "informants" don't come back at us often, so can we conclude that the roads are not too bad?
- Occasional letters from the community complimenting our work.

[3] IPWEA, 2011, IIMM.

- Middle management, supervisory staff members and road gangs pass on comments.
- Records system – telephone and over the counter comments and recent service requests via "Council Connect" - volume of complaints/requests has fallen.
- Upgrade requests have fallen, most of those that were on the table have been accommodated, and there has been some acceptance by Councilors on behalf of their constituents so far of the need to transition from new seals to a renewals and maintenance focus.

However, despite a lot of partial indicators being consistent, we still need to test the conclusions with community engagement specific to LoS on roads as part of the AMP update. In particular, the impact of reduced maintenance and renewals of minor roads will be gradual but eventually there may be more feedback as their condition deteriorates to a lower standard - still usable in dry weather but may be impassable in wet weather.

3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

Council has carried out research on customer expectations through a survey and focus meetings, which raised issues relevant to roads infrastructure. This will be further investigated in relation to defining levels of service for future updates of the asset management plan.

The organisation uses this information in developing its Strategic Plan (Community Strategic Plan "Living Lachlan Style") and in allocation of resources in the budget.

See Community Consultation above for information on customer research undertaken in recent years. We need to work harder at fleshing out assumptions made on limited customer feedback. However, for now, we have samples of issues summarised from the Community Discussion paper relevant to roads infrastructure as follows.

Comments on 'Vision for 2022' include references to '*a well maintained and modern transport system, safe roads', 'provides an overall level of service and maintains the road network for the benefit of all',* and *'works hard to improve the rural roads system'.*

Environmental issues include:

- '*Streetscapes and town entrances attractive and welcoming',*
- *'Redirect grain transport routes to remove dust from the town centre',* and
- *'Kerbing and guttering of streets'.*

Roads infrastructure issues include:

- *"Ensure that every person in the shire is able to use safe and reliable passages for roads and that every road receives at least an annual maintenance treatment"*
- *'Residents completing the surveys said they wanted transport, water and recreational facilities that would offer quality lifestyles for locals, visitors and would attract new residents to the shire'*
- Desired outcomes include: '*All shire residents enjoy a transport system that meets their needs and is safe for all travellers'* and all *'infrastructure assets are maintained and properly cared for'.*
- *'All residents recognised the importance of a good quality transport system based on regular and effective maintenance and a program to expand the sealed road network to include all major freight routes, school bus routes and roads within 20 kilometres of the towns within the ten year plan'.*

'Specific road projects identified include...

- *Heavy vehicle bypass for Condobolin to improve access to the silos and get the trucks out of the main town area*
- *Widen all roads to prevent verge deterioration.*
- *Remove dips in Forster Street Lake Cargelligo.*

- *More effective town bypass for heavy vehicles for Lake Cargelligo.*
- *Upgrade roads to Mt Tilga.*
- *Provide a sealed road route through the middle of the shire – SR 11, 1347, and 61N*.
- *Sealing the Albert to Melrose road (1347)*.
- *Extend the sealed road network – Landsdale Road, Bobadah Road, Melrose Road*.

Some people expressed desires for better urban streetscapes but others had the contradictory view that '*more rate money could be invested into the rural road system rather than in the towns'.*

Funding all of the desires is a significant issue to be further considered in the overall strategic context, but such preferences can be incorporated into the asset management plan.

In the meantime, some of these desires are already being addressed. Projects identified and since completed include:

- Sealing remaining gaps in MR57N (sealed road between Condobolin, Fifield and Tottenham).
- Several roads west of Tullamore and Fifield have been improved, including the school bus route.
- Sealing part of Brooks Lane .
- Sealing some lanes near Condobolin.
- Tottenham heavy vehicle bypass – Racecourse Road sealed.

Ongoing projects have included progressively:

- Widening of narrow sealed roads is undertaken as and when resources allow, particularly on regional roads, with current projects on MR231 Wyalong Road between Weja and Lake Cargelligo and other roads flagged in the LTFP (10 years budget).
- Repairing and maintaining shoulders on roads with narrow seals to reduce risk until they can be widened.

Submissions have been made for grants to improve sealed road connections within and beyond the shire including:

- MR61N Henry Parkes Way (Cobar Condobolin Road).
- SR1347 Albert Road (Melrose – Albert).
- SR1169 Bobadah Road.
- MR7514 Nyngan Road (Cockies Road in Bogan Shire).

Some desires need to be moderated, such as roads close to towns or some remote school bus routes that have very little traffic hardly justify sealing. They compete with other asset and service needs and there is a struggle for enough funds to maintain or renew the existing roads. The school bus routes list of roads is in **Appendix A Schedule A**.

A broad comment was *'Residents would like to see a coordinated approach to the maintenance of the many assets that Council controls leading to improved standards and longevity'.* Roads were recently grouped into precincts for better coordination of maintenance, renewals and construction works in conjunction with a works program. Process and equipment improvements are being made, such as to roadside slashing equipment and stabilising road subgrades.

3.2 Strategic and Corporate Goals

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

Our vision is:

For the Lachlan Shire to be a resilient community providing economic and social growth, through evolving, agricultural, business and mineral activities

Our mission is:

To engage the community, providing and delivering progressive services whilst implementing a long term strategic plan leading to the social and economic benefit of the community

Further, the Lachlan Shire Community Strategic Plan, 'Living Lachlan Style 2022' identified "*Our Preferred Future*" with the following visions:

> *Progressive, vibrant and prosperous communities*
>
> *Families come to stay and enjoy a relaxed, healthy way of life and strong community spirit*
>
> *Our natural environment of lakes, meandering waterways and red soil plains is rich in cultural heritage, abundant wildlife and unparalleled beauty*
>
> *Everything is possible, for all.*

The management of Council's road transportation assets must support these visions, in particular within *Progressive, vibrant and prosperous communities*, it includes:

> *The many towns, villages and settlement throughout Lachlan are alive and thriving with economic and community activities.*
>
> *Livelihoods are made through the produce and associated products of the land, the learning and experiences of the natural environment, and the ancient and recent cultural heritage found here.*

'Living Lachlan Style 2022' (updated to 2015) identifies 6 future directions to achieve the vision for 2022. One is to "Build and maintain community infrastructure and systems" and identifies the strategic outcome *"Efficient transport networks that meet community and business needs"*, which includes roads transportation.

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

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

Goal	Objective	How Goal and Objectives are addressed in AM Plan
Objective	**Strategy**	**How Objectives are addressed in AMP**
3.1 To raise awareness of the need for risk management within Council and the Shire	*3.1.1 To complete the development and implementation of a Enterprise Risk management Plan.*	Through inclusion of risk management principles in the AMP, with the process shown in more detail in Appendix A.
	3.1.2 To improve public safety and reduce risks to residents	*"Regular inspection program in place for all public assets".* Risk management procedure for roads is in Appendix A.
	Work with Roads and Maritime Services (former RTA) and the National Heavy Vehicle Regulator to ensure appropriate traffic management and road safety	Continue to liaise with Roads and Maritime Services through the local traffic committee to develop strategies for traffic management and road safety for inclusion in the asset management plan. Develop relationships with the National Heavy Vehicle Regulator and Roads & Maritime Services to ensure appropriate use of roads by higher productivity vehicles. Exercise route assessment, consent and refusal functions in relation to applications for road

		consents for heavy vehicles.
3.3 To ensure assets are maintained at a level that sustains a safe and healthy environment	*3.3.1 Develop and Implement an Asset Management Plan that details expected asset replacement and maintenance needs*	*"Complete fair value of roads, footpaths and bridges".* Continue to develop and maintain regular inspection of asset condition and defects and develop maintenance and capital works programs for inclusion in the AMP. A more detailed process of counting, measuring, condition assessment and valuing assets in the "fair value" program has been undertaken. This AMP uses updated asset register data to develop levels of service and impacts on sustainability for strategic discussion and community engagement.
3.6 To ensure that the shire transport system continues to meet the needs of the residents and the travelling public	*3.6.1 Develop and Implement project plans and works programs covering all major projects with staged milestones that can be appropriately reported on.*	*"Plans developed and implemented."* Continue development and implementation of processes for managing major projects and overall programs.
	3.6.2 Develop and implement a Rural Roads maintenance policy covering all roads in the Shire	*"Policy adopted by Council and implemented".* Draft policy material is incorporated into this AMP. It includes a Roads Hierarchy and related Levels of Service.
A high standard of infrastructure supporting economic development	Consult with and assist businesses and industry to meet their future infrastructure needs.	Through development of an integrated asset management plan covering road infrastructure services for business and industry.
	Ensure effective management of council owned infrastructure to support economic development	Minimise life cycle costs of infrastructure for asset users and ensure the AMP demand forecast model will identify the public infrastructure to be managed sustainably.
	Ensure a strategic regional approach and facilitate improvement to meet transport infrastructure demands	Continue to liaise with State Government, local government regional alliances and other stakeholders to ensure appropriate assets are provided to facilitate efficient transport function through the region. This includes all transport modes providing links to access regional, national and global markets. Consider life cycle costs with asset creation, operation and disposal. Incorporate demand projections into the AMP.

Note that Elements quoted from the Lachlan Shire Community Strategic Plan, 'Living Lachlan Style 2022' in Table 2.2 are shown in *italics*.

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

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Legislation	Requirement
Local Government Act	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
DLG Integrated Planning & Reporting Framework	Integration of various council planning activities into one strategic framework.
Roads Act	Sets out role, purpose, responsibilities and powers of road authorities including duty of care.
Work Health and Safety Act 2011	To secure the health, safety and welfare of persons at work, and for other purposes.
Threatened Species Conservation Act 1995	Protection of threatened and endangered native species of flora and fauna.
Environmental Planning and Assessment Act 1979	Development controls for land use planning, including requirement for development applications for new works and environmental assessments.
Native Vegetation Act 2003	Protection of native vegetation species.
Protection of the Environment Operations Act 1997	Protection of the environment from the impacts of pollution from operational activities.

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

3.4 Community Levels of Service

Service levels are defined service levels in two terms, customer levels of service and technical levels of service.

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

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

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

The organisation's current and expected community service levels are detailed in Tables 3.4 and 3.5. Table 3.4 shows the agreed expected community levels of service based on resource levels in the current long-term financial plan and community consultation/engagement.

Table 3.4: Community Level of Service

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Expected position in 10 years based on current LTFP
COMMUNITY OUTCOMES				
Goal 1 – Grow a resilient economy 1.3 An innovative, progressive and growing agricultural sector 1.3.1 Provide transport infrastructure needed to support agriculture • Complete road annual maintenance, renewals and improvements program Goal 3 – Build and maintain community infrastructure and systems 3.1 Efficient transport networks that meet community and business needs 3.1.1 Implement road maintenance, renewals and improvements in accordance with asset management plan • Complete annual maintenance, renewals and improvements program • Complete reconstruction and widening of segments as a progressive program				

COMMUNITY LEVELS OF SERVICE				
Quality	Roads are smooth, users able to travel safely, quickly and in reasonable comfort. Average operating speed for 2wd vehicle in normal conditions exceeds 80km/h. *'Transport facilities that would offer quality lifestyles for locals, visitors and would attract new residents to the shire'*	Customer service requests relating to roughness and tyre damage (*Measure TBC*)	Low level of customer service requests (declined from 4 years ago).	More customer service requests.
		Organisational measure % of roads in very good or good condition (1, 2) and poor or very poor condition (4, 5), and confidence levels. Condition rating undertaken with road asset data capture in 2013/14 for Fair Value report.	Sealed roads: 60.4% very good/good 5.1% poor/very poor Including 0.7% at condition 5. Unsealed roads: 27.5% very good/good 31.6% poor/very poor including 13.7% at condition 5. Confidence level high.	Sealed roads: 70% very good/good 5% poor/very poor Including no increase on 0.7% at condition 5. Unsealed roads: 30% at condition 5, 30% at condition 4, 40% at condition 1, 2, 3. Maintenance and renewals fully funded for sealed roads and class 3, 4 5 unsealed roads. Class 6 and 7 unsealed not fully funded. Confidence level medium
Function	Roads are accessible and able to perform their function of transporting people and produce.	Customer requests relating to service function - accessibility.	Few customer service requests relating to conditions precluding access.	Observe trend in no. of customer service requests. Expect no increase for fully funded activities, but probably more relating to difficulty of access on class 6 & 7 unsealed roads.
		Recorded vehicle crashes	Average approx. 1 fatality per year but not due to road conditions. Maintaining clear zones within resource limits to minimise risk. Establish Road Risk Ratings (RRR) target <11 (see Appendix A)	No increase in fatalities or serious injuries related to road conditions. No backlog of clear zone maintenance. RRR no worse.
		Gravelled and sealed all-weather roads maintained (see condition measures in Quality above).	All sealed roads open. Class 3, 4 and 5 unsealed roads are trafficable and open to light vehicles (excludes 3T load limits or flood	All sealed roads open. Class 3, 4 and 5 unsealed roads are trafficable and open to light vehicles (excludes 3T load limits or flood closures).

			closures). Class 6 and 7 unsealed roads trafficable in dry weather, accessible to light vehicles in wet with caution.	Some Class 6 and 7 unsealed roads may be trafficable at slow speeds in dry weather, but impassable in wet. This may be partly offset by the stabilising program.
		Road hierarchy used to prioritise unsealed roads maintenance and renewals.	All sealed roads are maintained, no closures except for riverine flooding or vehicle crashes. Minor unsealed (formed dry weather only) roads maintained to minimise frequency and duration of interruptions to service. Includes Class 6 and 7 roads (>50% of network). Dry grade only, if needed. Avoid over-servicing. No gravel resheeting but patch gravel if required for safety or significant loss of access. All accessible in dry weather.	All sealed roads are maintained, no closures except for riverine flooding or crashes. Gravel needs for stabilised roads are greatly reduced, freeing funds for minor roads or accelerate stabilising. Most Class 6 and 7 roads (>50% of network) maintenance graded only, if needed. Few will be gravelled and condition declines with more poor/very poor condition. More "dry weather only" signs have been installed. All accessible in dry weather.
		Minimise access restrictions in wet weather – weather dependent but balance accessibility against asset preservation and safety.	Wet weather road closures are limited to a 3T load limit to allow light vehicles while discouraging heavy vehicles that do more damage. Conditions vary so concessions are allowed on application for less affected roads. Few complaints. Some heavy vehicle operators contact us and abide by our requirements.	Wet weather road closures unchanged and few complaints (less on higher class roads and possibly more on minor unsealed roads. More heavy vehicle operators contact us and abide by our requirements.
		Length of sealed roads upgraded/widened when reconstructing to meet current route standards.	Widening approx. 4 to 6km of roads per year. Confidence level high.	Approx. 31km more narrow seals widened to modern route standards. Confidence level medium.
		Budget/resource constraints	Modelling of asset data (condition ratings, road hierarchy and productivity rates, etc) and Levels of Service (LoS) indicate $2M funding shortfall in normal budget years. Accuracy +/- $1M, medium confidence	Ongoing data collection and monitoring of effects should refine modelling and estimates of required or affordable LoS to determine if strategies are successful. E.g.: • Impact of stabilising, needing less gravel • Size of funding shortfall, reduced

			level (> 10% of normal budget).	from $2M? • Network decline limited to Class 6, 7 unsealed roads but not irretrievable. Confidence level medium
		Length of unsealed roads and sealed road shoulders stabilised to extend life, reduce renewals and reduce maintenance. As more roads are stabilised, the activities mix should change with more funds available to arrest the decline of minor roads.	Start stabilising program – initially 40 to 100km unsealed roads and 17km sealed road shoulders (both sides). Increase quantity as confidence grows. Confidence level low.	Stabilising if successful should cover 50% of unsealed roads (classes 3, 4, 5 and some 6, approx. 1500km). Next 10 years should see improvement I.e. minor roads condition declines and then should improve and maintenance budget may fall. Confidence level low.
		Shire wide access for heavy vehicles, minimal restrictions, to support increasing national and local productivity.	Type 2 (A Double) Road Train access allowed for General Mass Limit to whole Shire is extended to include all types to AB Triples (<57.5m) and Higher Mass Limit. Some exclusions and conditions to protect assets and community. Well received by truck operators. Shire wide area pre-approval with National Heavy Vehicle Regulator, awaiting gazettal. Confidence level high.	Shire wide area gazettal with National Heavy Vehicle Regulator streamlines the permit process for producers and transport operators. Includes all heavy vehicles up to and including AB Triples up to 57.5m and Higher Mass Limit. No complaints received by Council. Confidence level high.
	Expand sealed road network to include: • *Major freight routes* • *School bus routes* • *Roads within 20km of towns*.	Seal extended along arterial roads and other selected routes where justified by: • Traffic volume • Identified heavy freight routes • Concentrating heavy freight to minimise impacts elsewhere • Assessment as high risk • Regional interconnection priorities	Main north-south Hillston-Eumungerie link completed. Previously identified specific new seal projects have mostly been completed, with the last few in the current year program. Current projects adding 10km new seals. Refocusing onto renewals (reconstruction) and associated upgrade (widening) of narrow seals instead of new seals to better fit resources (available funds). Confidence level high	Continued focus on widening regional roads instead of new seals. Approx. 4 km new seals added. Minor roads near towns excluded due to funding shortfall. Confidence level medium.
	Heavy vehicle bypasses to grain silos.	Investigate options for heavy vehicle bypasses to minimise dust and	Tottenham – sealed Racecourse Road. Lake Cargelligo - part	Tottenham – Lansdale Road widened from Racecourse Road to

		noise impact on main towns, and report for strategic consideration	upgrade in 2015/16. Condobolin - large issues, in preliminary investigation stage	town. Lake Cargelligo heavy vehicle route – more widening. Condobolin – complete new intersection at railway crossing and deep cutting and widening of Maitland street. Confidence level medium.
Capacity/ Utilisation (similar to function)	Roads are accessible and able to perform their function of transporting people and produce with minimal interruption.	Customer Request management system (CRM) relating to usage and availability	Not tallied yet but is noticeable by counter, telephone and email activity that the level of customer requests has been low since flood damage repairs in 2013/14. Small spike in CSRs after heavy rain.	No increase, except for class 6,7 unsealed roads: • Dry weather, a little rougher but accessible • More roads affected by wet weather, may be impassable
		Traffic volume capacity is rarely an issue for roads built to carry large vehicles rather than high volumes of vehicles.	100% normal traffic capacity in dry weather. Some exclusions for heavy vehicles, but low impact. Load limit on Island Creek bridge.	100% normal traffic capacity in dry weather. Island Creek bridge replaced.
		Utilisation/availability impact by wet weather. This is a variable circumstance, including the effects of the EL Nino and La Nina cycles. 3T load limits to protect the assets and the users	Sealed roads affected briefly at causeways. Class 3, 4, 5 unsealed roads suitable for light vehicles when wet. Class 6, 7 unsealed roads constrained by wet weather. Occasional 3T load restrictions on unsealed roads after 25mm of rain over wide areas. Concessions available for heavy vehicles for roads where rain had less impact. (Minimise disruption to heavy vehicles and local productivity). Confidence level high	Sealed roads affected briefly at causeways. Class 3, 4, 5 unsealed roads suitable for light vehicles when wet. More class 6 and 7 unsealed roads affected by rain as condition declines. No change – still do 3T load restrictions and concessions when wet. Confidence level medium
		Utilisation impact by worn shoulders on narrow seal roads increasing risk for road users	Noticeable backlog, but locations not measured. Started shoulder resheeting program, over $1M p.a. to improve safety, so roads wait their turn for	Improved shoulders make narrow seals less risky for motorists and heavy vehicles in particular. Shoulder resheeting > $1M program should catch up with backlog and

			widening when they are reconstructed at the ends of their useful lives.	reduce risk to road users. Possibly reduce program and redirect funds.
			Seeing more 'higher productivity vehicles' such as B Triples taking over from smaller overloaded trucks carrying grain. Better tracking damages road shoulders less. On farm grain storage is spreading the transport activity over the year instead of peak periods during the grain harvest, so we are getting less roads trashed during the harvest.	More 'higher productivity vehicles' on the roads, but better quality so less wear on road shoulders from wandering trailers On farm storage spreads transport load over time. Less concentrated damage.
		Incidents of flash flooding and service interruptions due to washouts	Program of hardening causeways.	Continue hardening causeways.

3.5 Technical Levels of Service

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

Technical service measures are linked to annual budgets covering:

- Operations – the regular activities to provide services (e.g. street sweeping frequency, roadside slashing frequency, portion of technical and administrative salaries and office costs, etc).
- Maintenance – the activities necessary to retain an asset as near as practicable to its original condition (e.g. road patching, unsealed road grading, culvert repairs, etc).
- Renewal – the activities that return the service capability of an asset up to that which it had originally (e.g. frequency and cost of road resurfacing and pavement reconstruction, culvert replacement etc).
- Upgrade – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a culvert with a larger size), or a new service that did not exist previously (e.g. new road).

Technical Levels of Service have been developed with the following considerations in mind:

- Maintain each road consistently as appropriate to its priority in a roads hierarchy and associated level of service, risk assessment and available resources.
- Apply risk management principles in managing roads to provide at least safe access for all users and good access for the most people that can be afforded.
- Roads Hierarchy establishes classes of roads based on traffic volume and function in a local context, to prioritise the allocation of available resources.
- Establish a 'level of service' for each class within the roads hierarchy considering factors such as budget, traffic volume and type, safety, school bus routes, construction type, and location in relation to towns, dwellings and economic activity.
- The maintenance budget allows a school bus route to be better serviced without needing reclassification.

The “desirable” levels of service have been developed to maintain and renew the existing assets at their original level of service, that is, the necessary components in the mix. The network upgrades, i.e. mainly sealing and/or widening some roads, are the most discretionary component in the mix.

Service and asset managers plan, implement and control technical service levels to influence the customer service levels.[4]

Table 3.5 shows the technical level of service expected to be provided under this AM Plan. The agreed sustainable position in the table documents the position agreed by the Council following community consultation and trade-off of service levels performance, costs and risk within resources available in the long-term financial plan.

[4] IPWEA, 2011, IIMM, p 2.22

Table 3.5: Technical Levels of Service

Service Attribute	Service Objective	Activity Measure Process	Current Performance *	Desired for Optimum Lifecycle Cost **	Agreed Sustainable Position ***
TECHNICAL LEVELS OF SERVICE					
Operations	Roads meet users' needs	Condition & safety inspections	Ad hoc.	Planned 6 and 12 monthly and reactive inspections in accordance with **Risk Based Road Maintenance Prioritisation Procedure (RBRMPP).** See Appendix A.	To be determined through community consultation.
		Budget	Operational activities are not specifically identified in the budget, such as supervision and inspections. Some activities like street sweeping are budgeted. Others like spraying road shoulders to control vegetation have identifiable tasks but not yet collated for analysis.	Split up of specific operational activities to be determined.	To be determined through community consultation.
Maintenance	Respond to customer service requests	Reactive customer service requests completed within adopted times frames. See RBMPP below.	Not yet measured.	95%	To be determined through community consultation.
	Periodic planned inspections	RBRMPP implemented. See Appendix A.	RBRMPP not yet implemented. Inspections and defects resolution mostly good but not measured.	RBRMPP implemented. E.g. sites with Road Risk Rating > 11 are resolved within 24 hours.	To be determined through community consultation.
	Unsealed roads meet users' needs	Average grading frequency	See Appendix F Schedule 2 Table 5: GWR Maint grade Class 3 1 1 Class 4 1 1 Class 5 75% 1 Class 6 2% 1 Class 7 0 1? Better than expected in 2012 AMP for class 6, 7	GWR Maint grade Class 3 1 1 Class 4 1 1 Class 5 1 1 Class 6 2% 1 Class 7 1% 1 Or other mix, same cost.	To be determined through community consultation.
		Cost effectiveness	2015 productivity estimate: GWR $1,162/km Grade $214/km	CPI increase only.	To be determined through community consultation.

		Budget	Original budget: $1,947,812 # Extra: 329,445 Total: $2,277,257	$1,951,050	To be determined through community consultation.
	Sealed roads meet users' needs	Cost effectiveness	2015 productivity estimate: $371/km	Comparable with CPI increase	To be determined through community consultation.
		Budget	Local rural: $140,764 307,392 Urban: 247,768 Regional: 366,213 Original budget total: $769,865 # Extra local rural: 161,508 Revised Total: $921,373	$764,555	To be determined through community consultation.
		Total Maintenance Budget (including bridges, K&G, shoulder grading, etc not included separately above)	Original budget: $2,717,677 Extra: 490,953 Revised total: $3,198,630	$3,113,700	To be determined through community consultation.
Renewal	Unsealed roads meet users' needs	Resheeting of gravel roads, life/frequency (averages)	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 10 4 4 10 4 Local 3 14 10 4 20 16 5 25 20 6 0 0 7 0 0 Budgeted Total: 54 Extra grant funds will enable extra resheets in 2015/16 and 2016/17	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 10 4 4 10 4 Local 3 10 14 4 10 22 5 14 25 6 20 50 7 50 8 Total: 127 Class 7 patch gravelling boggy hot spots only.	To be determined through community consultation.
		Resheeting Budget	Regional: 0 Local: $1,205,804 Total: $1,205,804 Extra in 2015/16, local: 788,192 Revised total: $1,993,996 Significant funding shortfall. Commencing stabilising program.	Regional: 205,840 Local: $2,974,180 Total: $3,180,020 Regional roads resheeting for 2 roads is periodic, not every year. Stabilising program should be starting to reduce resheeting needs.	To be determined through community consultation.
	Sealed roads meet users' needs	Useful life of assets	Estimate based on a few requiring reconstruction early but most 40 – 50 years old roads are still in good condition.	Minimum requirement used for modelling. Funding gap reduces if a significant proportion of road segments have longer useful lives.	To be determined through community consultation.

			Local sealed roads: 80 years Regional sealed roads: 60 years +	Local sealed roads: 80 years Regional sealed roads: 60 years +	
		Reseal life/reseal frequency (averages)	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 20 27 4 20 0 Local 3 30 7 4 30 4 5 30 2 6 30 3 7 33 0 Total: 43	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 20 27 4 20 0 Local 3 33 7 4 33 4 5 33 2 6 33 3 7 33 0 Total: 43	To be determined through community consultation.
		Reseal Budget	Regional: $400,000 Local: 229,445 Total: $629,445 Regional reseals low in 2015/16, up to $503,000 next year then CPI	Regional: $479,140 Local: 223,850 Total: $702,990	To be determined through community consultation.
		Resheeting shoulders of sealed roads, life/frequency (averages)	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 10 54 Local 3 10 18 4 10 10 5 14 3 Total: 85 Commencing stabilising program.	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 10 54 Local 3 10 18 4 10 10 5 10 4 Total: 86 Plus periodic reseals in urban streets (total 87km). Stabilising program should be starting to reduce resheeting needs.	To be determined through community consultation.
		Shoulder resheet Budget	Regional: $471,000 Local: $361,508 Total: $832,508 Regional shoulder resheets increase from 2017/18 to required level with some catch up. For 2015/16 apply any savings elsewhere to shoulder resheets.	Regional: 631,410 Local: $368,100 Total: $999,510	To be determined through community consultation.
		Reconstruct narrow sealed roads at end of useful life (recent new seals have been wider)	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 60 12 Local 3 80 4 4 80 0 5 80 0	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 60 9 Local 3 80 2 4 80 2 5 80 1	To be determined through community consultation.

			6 80 0 Total: 16	6 80 1 Total: 15 Plus occasional reconstruction in urban streets (total 87km) not yet analysed.	
		Sealed road reconstruction budget	Regional: $1,340,600 Local: $555,600 Total: $1,896,200	Regional: $1,061,600 Local: $634,100 Total: $1,695,700 Reconstruction will fluctuate according to need as segments reach end of useful life. Some regional road segments may be early if fewer are due to even out the program and undertake widening to improve LoS. Some segments may have to wait longer if there is a large batch as a result of peaks and hollows in original construction activity.	To be determined through community consultation.
		Total Renewals Budget (including bridges, K&G, heavy patching, etc not shown separately above, and excluding upgrade component for widening seals)	$5,932,410	$6,678,250	To be determined through community consultation.
Upgrade/New	Sealed roads meet users' needs, with reduced risk	Upgrade component of widening narrow seals when reconstructed.	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 60 12 Local 3 80 4 4 80 0 5 80 0 6 80 0 Total: 16	Road Hierarchy Classification Freq, yrs Km/yr Regional 3 60 9 Local 3 80 2 4 80 2 5 80 1 6 80 1 Total: 15 Plus occasional reconstruction in urban streets (total 87km) not yet analysed.	To be determined through community consultation.
		New seals	Road Hierarchy Classification Km Regional 3 0 Local 3 8 4 1 5 1 6 0 Total: 10	Road Hierarchy Classification Km Regional 3 0 Local 3 0 4 0 5 0 6 0 Total: 0	To be determined through community consultation.
		Budget	Regional: $702,800	Regional: 0	To be determined through

			Local: $1,961,900 Total: $2,664,700 Regional roads - Hillston-Eumungerie link (MR57N Fifield Rd) completed in 2014. Local roads - completing last batch of new seals in 2015/16 including SR105 Wamboyne Rd, 3 tip access roads, Parkinsons Lane and parts of Nillsons Lane and Corinella Rd.	Local: 0 Total: $0 None proposed unless the funding model is radically changed. As it is, new seals require additional funds or reduction in Level of Service for maintenance and/or renewals.	community consultation.
		Budget Summary	Regional: $3,869,940 Local: $7,925,800 Total: $11,795,740	Regional: $3,271,200 Local: $6,944,000 Total: $10,215,200	To be determined through community consultation.
			All activities approximate full funding except class 6 and 7 unsealed local roads gravel resheets.	Desirable Level of Service to maintain and renew assets, but does not include new seals.	

Note: * *Current activities and costs (currently funded).*

** *Desired activities and costs to sustain current service levels and achieve minimum life cycle costs (not currently funded).*

*** *Activities and costs communicated and agreed with the community as being sustainable (funded position following trade-offs, managing risks and delivering agreed service levels).*

 # Extra Roads to Recovery funds in 2015/16 allowed extra allocations in some budget areas.

Inverse of frequency of treatment application is % of that class or network done in a year.

GWR is Grade, Water and Roll, i.e. heavy maintenance grade

4. FUTURE DEMAND

4.1 Demand Drivers

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

4.2 Demand Forecast

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

4.3 Demand Impact on Assets

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

Table 4.3: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Population	6748 people ABS 2013	To be determined from new census data. Expected to have stabilised somewhat or at worst the decline should have slowed.	The population number may not move much, but expectations for services tend to increase.
Demographics	Population is spread across 14,973 square kilometres, with most located in the towns and villages. Statistical population profile projected from the 2001 and 2006 census shows a declining population with an increasing proportion of aged and indigenous persons.	Trend to increasing proportion of aged and aboriginal persons is expected to continue. The impact of increased mining activity and post drought rebound in agricultural production is not yet measured, but may have stabilised the population numbers.	Increased pressure on aged care facilities, an aging work force particularly in agriculture and duplication of social and health services across the various towns increases the costs of those services. This adds to the competition for resources. Increased mining activity will increase pressure on some roads, but the extent is not yet known.
Seasonal factors	Good grain harvests resulted in seasonal peaks of heavy freight traffic, usually about October to December. The trend now is for larger trucks with more efficient load distribution and better trailer tracking that do less damage to roads. Combined with on farm grain storage spreading the transport over time, roads are not being wrecked by concentrated harvest traffic in light to average seasons. If there are concentrations of harvest trucks, Council refrains from undertaking major repairs on those roads during the harvest season (for safety), and limits to temporary repairs of severe damage.	Similar scope of seasonal peak freight patterns will depend on rainfalls. A big season may still see damage to roads, especially if it rains during the harvest.	Cumulative effect of damage if unable to effect full repairs each year, but the trend is for diminishing problems – unless the condition of roads declines, especially class 6 and 7 unsealed roads if they get little or no gravel.
Vehicle ownership	Significant number of larger 4wd	More vehicles travelling through	Increasing ownership of 4wd

Demand drivers	Present position	Projection	Impact on services
	vehicles and trucks service a large and productive agricultural area, that includes a large network of unsealed roads, with many roads in poor quality soils, &/or subject to frequent water damage.	the area as arterial roads are progressively sealed. Increasing freight volume and reliance on larger trucks for freighting agricultural produce, e.g. grain, stock, cotton.	vehicles improves accessibility in wet weather, but increased traffic on wet roads increases damage. Similarly heavy vehicles accelerate damage to roads, especially when wet.
Consumer preferences and expectations	Some people expect: • Sealing more roads • More grading and gravel resheeting unsealed roads • Repair roads immediately.	Continued expectation to seal more roads, but to grade, gravel resheet and repair roads in excess of capacity to do so.	Continued stretch on resources to meet all expectations. Some roads will be good quality, others will be increasingly problematical. Slow overall decline of local roads network – Rate depends on weather and funds provided to maintain and renew the assets. Applying funds to higher value assets and higher risk roads, enables full funding of all but class 6 and 7 unsealed roads which decline in level of service.
	548 km of sealed regional roads (2015). Completed sealing of Hillston-Eumungerie north south link. Instead of starting on sealing a lower traffic volume road, the focus has moved to reconstruction and progressively widening seals on regional roads, with assistance of RMS REPAIR grants.	Approx. 548 km of sealed regional roads in 2025. Focus on widening narrow seals with progressive reconstruction instead of sealing the remaining low volume regional roads, unless supported by additional funding to generate more inter-regional traffic.	Sealing MR57N Fifield Road saw heavy freight traffic grow. Less likely to see the same growth if extended to the remaining 2 unsealed regional roads. Regional roads sealing program uses RMS funds which can just cover maintenance and renewals.
	460 km of sealed Shire roads. Sealing last tranche of roads near towns. Have to cease extending local arterial road seals including SR230 (a secondary link between towns) to focus on maintenance and renewals or lose the network. The $2M overall budget shortfall at the desirable level of service affects local roads only as regional roads have adequate funds for maintenance and renewals.	Approx 470 km of sealed Shire (local) roads in 2025. If seal more Shire roads to satisfy community desires, mainly near towns – practical limit with existing funding is approx. 2 -3km per year if accept greater impact of network decline than planned.	Sealing more roads reduces the resources available to maintain the existing road network, so expect overall local road network deterioration unless more funds are injected. AMP suggests no more new seals, to minimise network decline.
	Most town streets are sealed. Now sealing and kerbing some remaining gravel streets on edges of towns, mainly in conjunction with development. Completed council subdivision	No immediate plans for Council to continue to seed development activity as the primary land subdivision	Development has benefits but the competition for funds impacts on the existing network.

Demand drivers	Present position	Projection	Impact on services
	developments – new assets.	developer.	
Economic factors	Small scale mining. Potential for more mining with various explorations underway. Some sectors may be still recovering from the long drought, with floods and shorter droughts following. There have been some good grain harvests.	Increased mining. Series of "good years" for farmers would increase grain and animal production. Increased vehicle activity supporting the agricultural and mining industries.	More traffic on some roads - passenger, light service and heavy freight vehicles. Increased freight on local roads. Negotiate infrastructure needs with major developers.
Farm aggregation and agricultural practices	Land ownership consolidation and increasing mechanisation. Increasing use of contractors with large equipment travelling local roads between jobs. Damage to guideposts. Inconvenience to road users although this is generally tolerated for the economic benefits. Large trucks freighting produce, wear of shoulders on narrow seal roads. However, trend toward larger truck combinations with straighter tracking trailers and on farm storage distributing the transport task over time has seen reduced damage more recently. More heavy truck movements with trend away from droving stock to road freight.	Economies of scale favour larger farming and contracting operations. Larger, heavier and wider farm machines to improve efficiency & cut costs operating costs, fewer farmers can purchase. More contract equipment travelling. Roads are getting older and some are nearing the end of their useful lives. Some are already showing signs of distress particularly those on poor soils such as gilgais or expansive clays in flood plains. Expect to have more roads failing, although not as many as thought in 2011 when preparing the first Roads AMP.. More and/or larger stock trucks.	Damage to road surfaces when implements drop blades or tynes, damage to signs and guide posts. Potential increase in road damage from truck loading, although better controls and better trucks are limiting axle loads. Increase new pavements of high growth routes (e.g. MR57N) by 50-100 mm to offset effect of increased loading on life. Larger trucks and farm machinery use shoulders to pass other vehicles, resulting in shoulder wear and increasing risk to road users. Narrow seals are fretting away at the edges. Need to maintain and renew shoulders and edges of seals on narrow sealed roads until they can be widened with scheduled reconstruction. Faster consumption of road life, measured by Equivalent Standard Axles (ESAs), but have no effective measure of this.
Increasing heavy freight load on roads and vehicle mass limits	Trend toward larger truck configurations to minimise overheads – road trains & B-Doubles replace rigids and semis. Whole Shire is accessible to Higher Productivity Vehicles (HPV) up to AB Triples and Higher Mass Limit (HML). Increasing mass limits for trucks, but still restricted to the same maximum axle loads, so may reduce the number of axles with fewer prime movers.	Trucks are getting bigger and more of them. Expect more HML trucks As roads age and become bumpier, the impacts of harsh suspensions in older trucks will likely increase. Newer trucks with road friendly suspensions may be easier on the roads despite bigger loads. Expect gazettal of Shire area pre-approval through National	Road pavement life measured in truck axles – more trucks means shorter pavement life. Fortunately (for the roads) seasonal production variations mitigate growth trends in some years. Council has been willing to accept potential for damage from bigger trucks to support higher productivity. Hence area pre-approval for HPVs and support for the Grain Harvest Management Scheme and

Demand drivers	Present position	Projection	Impact on services
	(HML) route to Condo silos approved in 2011 - MR61E, Molong St, Melrose St, Silos Road. Shire area pre-approval in place through National Heavy Vehicle Regulator (NHVR) for HPV up to AB Triples and HML, with a few exclusions and conditions to protect safety and amenity.	Heavy Vehicle Regulator (NHVR) for HPV up to AB Triples and HML, to streamline permit processing.	Livestock Loading Scheme which permit a small overload for better quality trucks.

4.4 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures.

Non-asset solutions focus on providing the required service without the need for the organisation to own the assets and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures[5]. Examples of non-asset solutions include providing services from existing infrastructure such as water for road works from dams on farms and travelling stock routes. Examples where Council does not own the assets include obtaining gravel from quarries on private land and engaging contractors to blast and crush the gravel.

Opportunities identified to date for demand management are shown in Table 4.4. Further opportunities will be developed in future revisions of this asset management plan.

Table 4.4: Demand Management Plan Summary

Demand Driver	Impact on Services	Demand Management Plan
Increasing heavy freight load on roads and vehicle mass limits	Council has been willing to accept potential for damage from bigger trucks to support higher productivity. Hence area pre-approval for HPVs and support for the Grain Harvest Management Scheme and Livestock Loading Scheme which permit a small overload for better quality trucks.	Identify main transport routes and focus on these for maintenance and renewals such as shoulder resheets and edge break patching to minimise risk until the seals are widened. Prioritise older narrow seals on higher volume freight routes for widening with reconstruction when they near the end of useful life. Upgrade bypass routes in towns for heavy vehicle access to silos, to minimise risk and loss of amenity to residents. Support higher productivity vehicles and programs encouraging moves to better quality vehicles to move freight, with better suspension systems, fewer axles than equivalent of smaller trucks, and straighter tracking trailers appearing so far to do less damage to roads.
Consumer preferences and expectations	Continued stretch on resources to meet expectations such as: • Sealing more roads • More grading and gravel resheeting unsealed roads • Repair roads immediately . Applying limited funds to higher	Community engagement: • Educate to make informed decisions • Determine levels of service within capacity to support Transition focus from new seals adding to future maintenance and renewals burden, to maintaining the network at as a higher level of service that can be achieved. Focus on maintenance and asset renewals. Resheet shoulders and repair edge breaks

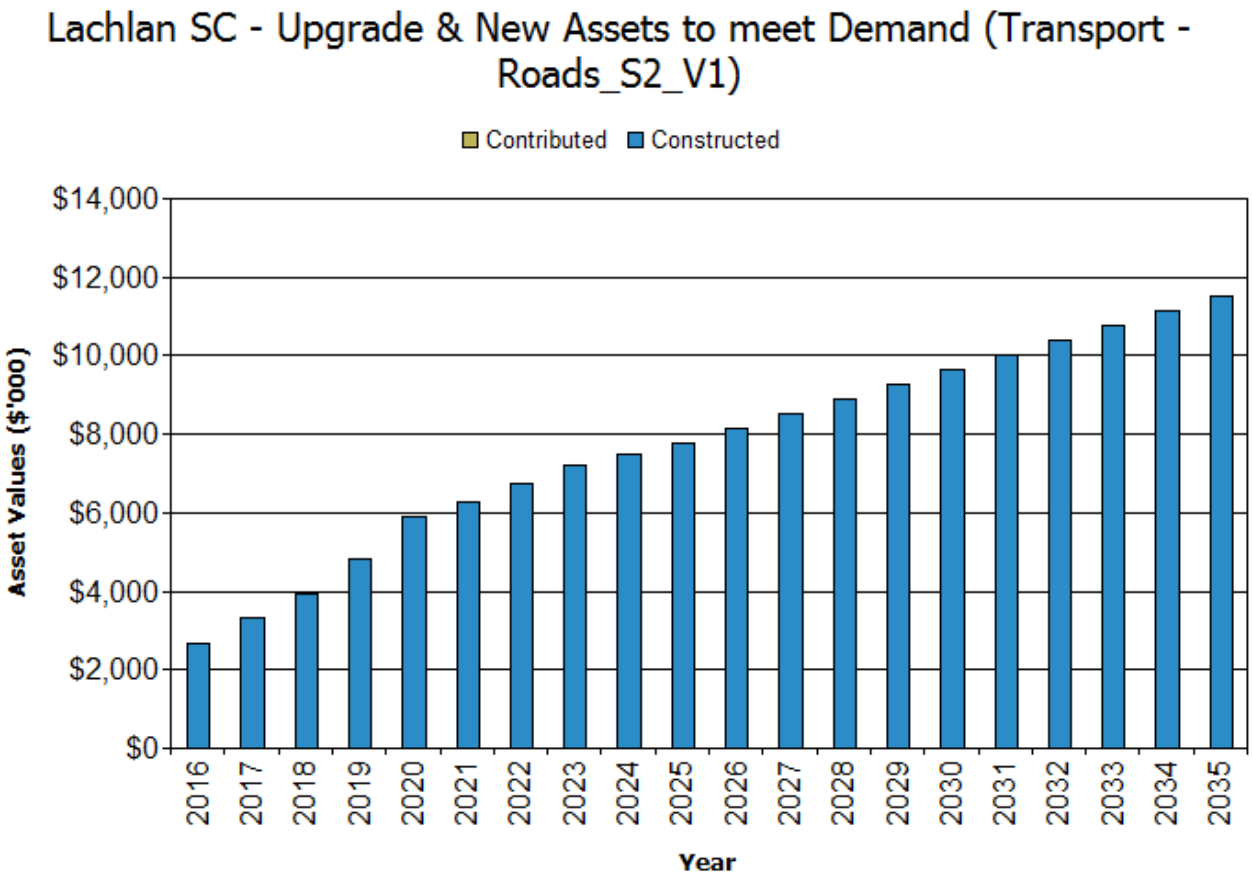
[5] IPWEA, 2011, IIMM, Table 3.4.1, p 3|58.

Demand Driver	Impact on Services	Demand Management Plan
	value assets and higher risk roads, enables full funding of all but class 6 and 7 unsealed roads which will decline in level of service. Rate of decline depends on weather and extra funds provided to maintain and renew the assets.	on narrow seals to extend service life, with minimum risk until widened with reconstruction at end of useful life.

4.5 Asset Programs to meet Demand

The new assets required to meet growth will be acquired free of cost from a slow rate of land developments and constructed/acquired by the organisation with a more aggressive program of widening seals in conjunction with reconstruction of narrow sealed segments. New assets constructed/acquired by the organisation are discussed in Section 5.5. The cumulative value of new contributed and constructed asset values are summarised in Figure 1.

Figure 1: Upgrade and New Assets to meet Demand



Acquiring these new assets will commit the organisation to fund ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs in Section 5.

The new assets are largely widening of narrow seals to meet current route standards, including improving safety.

5. LIFECYCLE MANAGEMENT PLAN

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

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this asset management plan are shown in Table 2.1., which indicates the lengths of sealed regional roads, unsealed regional roads, sealed local roads, unsealed local roads and urban streets comprising the network.

The roads comprise 1,00km of sealed regional and local roads with mostly narrow seals, and 3,000km of mostly local unsealed roads in varying condition. The roads are broken up into segments of fairly homogeneous dimensional and condition character and components being seal, pavement (base), sub-base in a few cases of reconstructed roads, and earth formation. Culverts are included in the 'per kilometre' current replacement cost calculations, but will eventually be separately identified once their data collection is completed. Footpaths, kerb and gutter, bridges and traffic facilities such as signage are included in the Transport Services – Other asset management plan.

Council's road transport assets are located throughout an area of approximately 15,000 sq. km and various operating environments. Rainfall varies between seasons from drought to floods, and in intensity and duration between areas. Subgrades and pavement materials vary in quality. Long distances affect the servicing of the assets, including travel times and the cost of hauling materials. Traffic types vary, including heavy freight vehicles, agricultural plant and light vehicles in and between urban areas. Seasonal variations occur in heavy vehicle use and consequent damage.

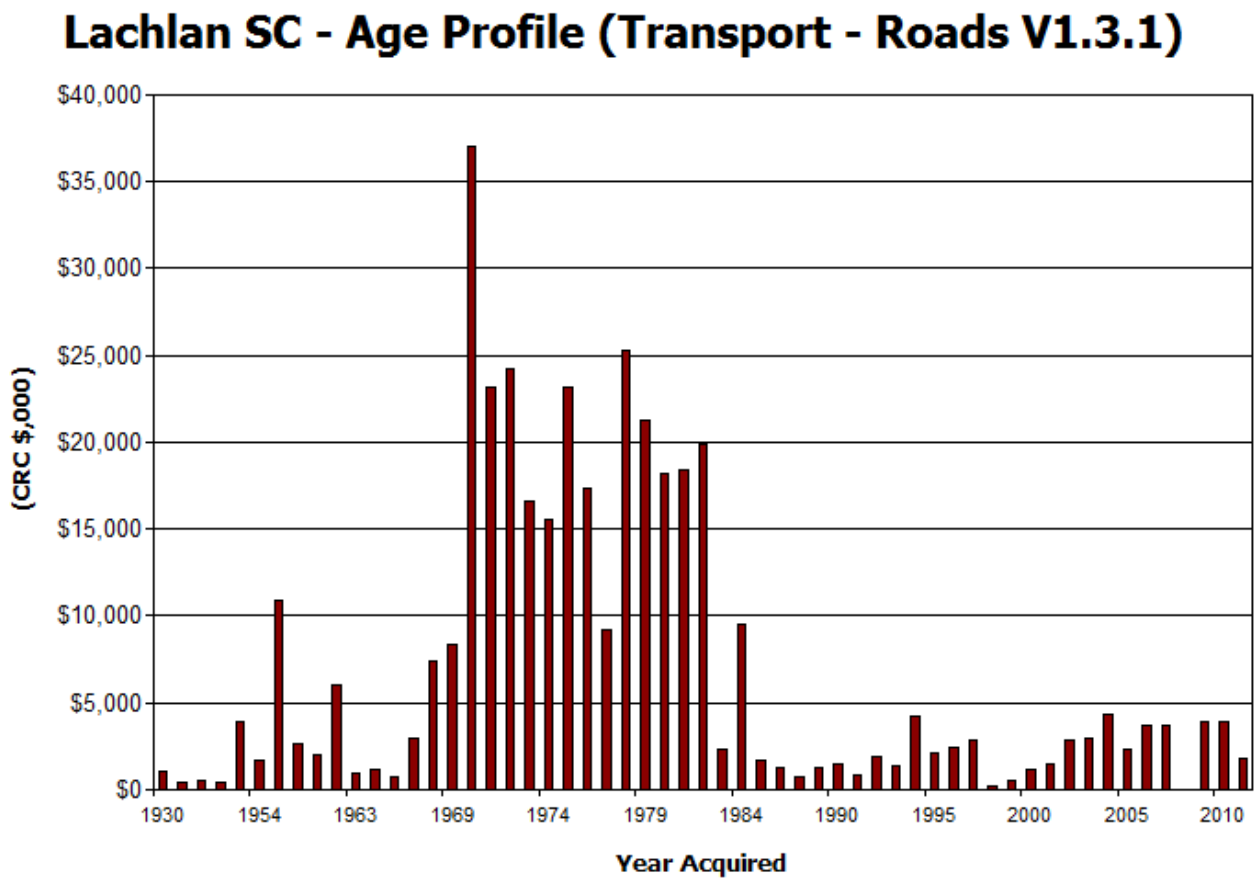
The age profile of the assets was not used in the Method 3 approach, used to produce the current graphs. However, Method 3 uses life cycle data and estimates of the scale and cost of required activities derived in the asset register.

Age data had some indirect influence, including over assessments of likely useful lives. Having many seals around mid-life and very few older than 50 years or at condition 5, means that there is little or no reconstruction backlog, and the foreseeable Long Term Financial Plan period of 10 years should not see a large increase in condition 5 segments.

Accordingly, sealed road renewals can be programmed with low expectation of major surprises as long as they are maintained adequately. Reconstructions may not be required at the assumed annual quantity for a few years, allowing funds to be directed to other needs. Hopefully when more seal reconstructions are needed, probably from around 2040, other activities can be reduced to offset the costs. These should include reductions gravel resheeting and gravel shoulder resheeting if the stabilising program is successful. Shoulder resheeting should also gradually reduce as the proportion of widened seals increases.

The age profile has not been updated from the original 2012 AMP yet, but is considered a fair representation which indicates future trends. It is included in this AM Plan, shown in Figure 2.

Figure 2: Asset Age Profile



Age information varies in quality. Acquisition dates come from records, estimates and interviews of former staff. Future revisions of the AMP will improve the age profile. It is known as of 1961 that few roads were formed or gravelled, no local rural roads were sealed and the only sealed regional road was MR61E between Condobolin and Parkes. Some town streets were sealed in the 1950's - Bathurst St. Condobolin, Foster St. Lake Cargelligo and Cargelligo St. Tullibigeal. Research into records will smooth the age profile spread, but is unlikely to radically alter the general indication that most assets were acquired in the 1970s and 1980s.

Most sealed roads originally had 3.6m wide seals. Some are being progressively widened for safety as traffic increased greatly. Some previous widenings are still too narrow and are now failing with cracking and outer wheel path rutting.

Plans showing the Roads assets are mainly kept in the Geographic Information System (GIS) with cadaster (boundary mapping) and aerial photograph imagery. There are various Shire Road Maps based on the GIS, such as the draft Road Hierarchy Map. Some constructed roads have engineering drawings in the archives. The archived drawings have recently been recorded in the TRIM records management system to facilitate future access.

5.1.2 Asset capacity and performance

The organisation's services are generally provided to meet design standards where these are available.

Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
Unsealed road network	Although generally described by users as good compared to some other shires, approximately 60% of the unsealed road network does not provide all weather access, depending on the severity of storms.

	Complaints during and after rain include roads being slippery, boggy, washed out, flooded, impassable, etc. Problems occur where roads are on reactive soils ("black soil", red loam) and/or where there is little or no gravel. School buses skidding or bogging, and rough, dusty or wet harvest routes generate passionate complaints. Many unsealed roads lack adequate pavement or drainage to shed water - formations worn low, centre rutting, poor crossfalls, no gravel, poor quality materials, windrows/silt/vegetation blocking drainage, storms washing out causeways, etc. Most unsealed roads are usually only "maintenance graded" by a grader only. This treatment is superficial unless done soon after rain, but is adequate for low traffic. A grade, water, roll and gravelling can only be rarely allocated to correct structural deficiencies on minor roads. The normal operating speed of 2wd and heavy vehicles can fall significantly on roads affected by wet weather and/or seasonal heavy traffic (with dust problems when dry).
Sealed road network	Narrow seals on older roads have hazards and high maintenance issues with edge drop, edge fretting, outer wheel path rutting, deformation, particularly on gilgai terrain, worn shoulders, potholing. Periodic repairs are needed but constrained by available resources to catch up and then keep up with deficiencies emerging from inspections or complaints. Many of the older culverts are nearing the ends of their useful lives early due to concrete cancer. Community expectation is to increase the sealed roads network (see community levels of service in 3.3) but resources arestretched to maintain and renew the existing road network.
Road signage	Emergency services and visitors have trouble finding some properties, and postal rules are not tolerant of confusing addresses. Road name signs had been lacking, missing, damaged or confusing, but new signs were recently installed across the Shire, displaying both road numbers and names as part of the Rural Addressing project. Once a few road names have been clarified and confirmed, posts with property address numbers will be installed at all primary access driveways.

The above service deficiencies were identified from council service requests, correspondence, councillor's questions and meetings, field inspections and community consultation. They are summarised in Table 5.1.2 in general terms. The asset register identifies road segments and components more exhaustively using condition assessments and has been used as a guide in selecting segments for renewals.

5.1.3 Asset condition

Condition is monitored by periodic inspections and periodic condition rating via photographic records of the all or part of the network to update the condition ratings for each road segment and component in the asset register, generally aligned with Fair Value Reporting every 4 years.

Spot checking indicates high confidence in condition ratings, easily checked against photos taken at 1 sec intervals along roads without having to revisit the roads.

The condition profile of our assets is shown in Figure 3.

Fig 3: Asset Condition Profile

Not yet available – requires Method 1 process input to NAMS.PLUS 3.

Condition assessments have been undertaken and recorded on the asset register for Special Schedule 7 purposes, but not yet been applied to NAMS.PLUS 3 for processing in Method 1. Some indications of current condition are shown in the Community Level of Service table – mostly condition 3 or above and a small amount at condition 5. Note that the method of calculating % is may change from a proportion of Written Down Value to a proportion of Current Replacement Cost for a more accurate reflection of condition.

Condition is measured using a 1 – 5 grading system[6] as detailed in Table 5.1.3.

Table 5.1.3: Simple Condition Grading Model

Condition Grading	Description of Condition

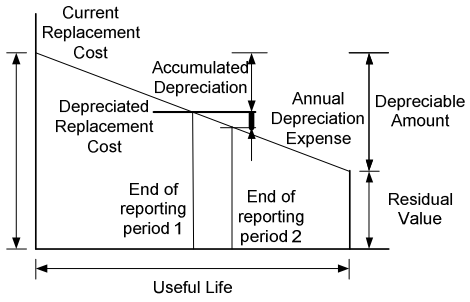
[6] IPWEA, 2011, IIMM, Sec 2.5.4, p 2|79.

1	**Very Good**: only planned maintenance required
2	**Good**: minor maintenance required plus planned maintenance
3	**Fair**: significant maintenance required
4	**Poor**: significant renewal/rehabilitation required
5	**Very Poor**: physically unsound and/or beyond rehabilitation (but still able to be used to provide service for a short period)

5.1.4 Asset valuations

The value of assets recorded in the asset register as at 2015 covered by this asset management plan is shown below. Assets were last revalued at June 2014. Assets are valued at fair value at cost to replace service capacity.

Current Replacement Cost	$334,206,000
Depreciable Amount	$334,206,000
Depreciated Replacement Cost[7]	$303,716,000
Annual Depreciation Expense	$4,750,000



Useful lives were reviewed in April 2014 by

- Obtaining approximate age data from the retired engineer who built most of the older assets – accuracy within 5 years is considered acceptable until Council minutes can be inspected.
- Comparing ages against condition data in the asset register and developing a series of sliding scales for seal and pavement, to adjust the age for condition. E.g. a 50 years old sealed road at condition 3 will likely last 80 years or more, but a 50 years old road at condition 5 needs to be replaced by say age 55 and preferably sooner if funds allow.
- Applying the "does this feel right based on experience" check when looking at a sample of roads to verify that the spreadsheet was producing reasonable answers. Generally the first AMP was over conservative in assuming 40 years life for sealed roads, with some segments failing at that age and few roads being older. However, several roads at condition 3 are now continuing well past 40 without obvious decline and are likely to reach 60 or 80 years.

Key assumptions made in preparing the valuations were:

- Costs of similar works have been collated and averages applied to estimating,
- Local road lives of 80 years.
- Regional road lives of 60 years, as they have more traffic, but also providing a buffer to allow for relatively young bridges when they get older

Major changes from previous valuations are due to:

- Improved accuracy of data, particularly segment and component dimensions, more costing data to improve averages,
- More considered assessment of useful life condition with more experience of managing the assets,

[7] Also reported as Written Down Current Replacement Cost (WDCRC).

- Acknowledging industry guide of road formations not depreciating (material generally left in place with reconstruction or other renewal involving a new or modified pavement above, especially for rural roads),
- External review by acknowledged industry expert, Jeff Roorda Associates.

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

Rate of Annual Asset Consumption (Depreciation/Depreciable Amount)	1.42%
Rate of Annual Asset Renewal (Capital renewal exp/Depreciable amount)	0.5% average over first 10 years

In 2015/16 the organisation plans to renew assets at 131.1% of the rate they are being consumed and will be increasing its asset stock by 0.5% in the year.

5.1.5 Historical Data

Age data is available in Council minutes, but this is a major task to extract for a small improvement in age data. Adjustments for condition can be more significant in many cases.

Application of the roads hierarchy in the original AMP has produced a gradual awareness of the need to adequately service higher classification roads and not over-service minor roads as we had been. This has produced better results for the higher class roads without unduly impacting on minor roads, so far.

Historical financial (budget) data reflects similar spending levels but with different priorities. There has been more focus on sealing roads and recently on reconstructing and widening narrow seals. The shoulders of sealed roads received less focus. Unsealed roads have a chequered history, with overall conditional and functionality affected by weather and climate factors such as drought and floods. The relevance of the old financial data is low.

It should be noted that even the preliminary spreadsheet modelling with minimal data input undertaken before the first AMP indicated an annual shortfall of approximately $2m for arresting overall network decline. The first AMP showed a shortfall of $6.5M, but was limited by the lack of data that could be input to the NAMS.PLUS program and some overly conservative assumptions. Little has changed in the 5 years since the earlier spreadsheeting, other than to refine the modelling and applying better informed prioritising to bring the AMP back to the initial estimate of the shortfall.

5.2 Infrastructure Risk Management Plan

An assessment of risks[8] associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a 'financial shock' to the organisation. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

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

Table 5.2: Critical Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs

[8] Refer to the Organisation's Infrastructure Risk Management Plan

Narrow sealed roads with worn shoulders and significant edge break	Vehicle crash	Very High	Inspect seal edges & shoulders, and mark locations for tarpatcher. Ongoing increase edge patching. Increase shoulder resheeting, prioritise by condition, risk assessment and road hierarchy classification. Stabilise shoulder material to reduce wear. Program widening when reconstructing narrow seals.	Medium	Included in maintenance. Approx. $1,000,000 p.a. Included. Approx. $423,000 p.a.
Steep or sharp shoulders and verges, narrow clear zone	Errant vehicle due to driver fatigue or other cause leading to vehicle crash if insufficient space to recover control.	High	Expand verge and shoulder maintenance to maintain clear zone up to 5m from edge of road where possible, particularly on higher classification roads. Upgrade steep or sharp drop off shoulder and verge areas with shallower slopes where possible.	Low	Included in maintenance until it can be separately costed and assessed.
Island Creek bridge	Bridge collapse (white ants)	High	Replace bridge	Low	$297,000
Unsealed road network	Loss of all-weather access	High	Apply road hierarchy, and ensure heavy maintenance grading and gravel resheets on higher class 3, 4 and 5 roads and maintenance grade class 6 and 7 without gravel resheets where risk is lower. Progressively add stabilising agent(s).	Medium	$2,281 per year

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

5.3 Routine Operations and Maintenance Plan

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

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

5.3.1 Operations and Maintenance Plan

Operations activities affect service levels including quality and function through street sweeping and grass mowing frequency, intensity and spacing of street lights and cleaning frequency.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating, e.g. road patching but excluding rehabilitation or renewal. Maintenance may be classified into reactive, planned and specific maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management or supervisory directions.

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

Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including small heavy patches, culvert repairs, causeway repairs, minor reseals with the tarpatcher unit, minor patch gravelling, etc. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Actual past maintenance expenditure is shown in Table 5.3.1.

Table 5.3.1: Maintenance Expenditure Trends

Year	Maintenance Expenditure	
	Planned and Specific	Unplanned
2012/13	$2,419,109 *	N/A
2013/14	$3,187,048 * #	N/A
2014/15	$2,896,000	N/A

Note * excludes flood damage grant funded repairs
includes extra maintenance allocation.

Planned and unplanned maintenance work is currently combined and not able to be split.

Maintenance expenditure levels are considered to be adequate to meet projected service levels, at or slightly above current service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified and service consequences highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

Assessment and prioritisation of reactive maintenance is undertaken by Council staff using experience and judgement. This is effective at low levels of customer service requests, however, it is intended to transition at least in part to having reactive maintenance carried out in accordance with response levels of service detailed in Appendix A.

Maintenance has been budgeted higher in 2015/16 to accommodate stabilising in conjunction with heavy maintenance grading.

Maintenance is generally considered to be adequately funded due to being given priority over capital upgrades.

Hardening causeways and stabilising are expected to reduce maintenance requirements on treated roads, allowing maintenance to gradually focus more on remaining untreated roads.

5.3.2 Operations and Maintenance Strategies

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

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

- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

Asset hierarchy

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

The organisation's service hierarchy is shown is Table 5.3.2. *(little changed from original AMP).*

Table 5.3.2: Asset Service Hierarchy

Service Hierarchy	Service Level Objective
	Note – all LSC roads are double road train and B-Triple accessible, unrestricted for General Mass Limit (GML), and area pre-approved through National Heavy Vehicle Regulator (NHVR) to AB Triples and Concessional Mass Limits (CML) and Higher Mass Limits (HML), with a few exclusions for safety and amenity, unless specifically load limited, or roads are closed to heavy vehicles due to rain.
Class 2 – State Arterial LSC responsible outside centre traffic lanes	Provide safe, smooth and all weather access. Sealed parking lanes in Denison St and Station St. HML on MR61E Henry Parkes Way & Station St.
Class 3 – Regional & Local Arterial	Sealed – provide safe, smooth and all weather access, 2 lane width, 100 km/h design speed. Unsealed gravel sheeted – provide safe, comfortable and all weather access in all but severe conditions, periodic gravel resheets, 2 lane width, 100km/hr design speed, sealed causeways.
Class 4 – Regional & Local Sub-Arterial	Sealed – provide safe, smooth and all weather access, 2 lane width, 80-100 km/h design speed. Unsealed gravel sheeted – provide safe, comfortable and all weather access in all but severe conditions, periodic gravel resheets, 2 lane width, 70-100km/hr design speed, sealed causeways.
Class 5 – Local Distributor	Sealed – provide safe, smooth and all weather access, 1 or 2 lane width seal, 100 km/h design speed. Unsealed gravel sheeted – provide safe, comfortable and all weather access in all but severe conditions, periodic gravel resheets, 2 lane width, 70-100km/hr design speed. Unsealed formed (natural material) – provide safe access in most conditions, may be closed or require caution when wet, ride comfort and speed may be reduced, patch gravel high risk hazards or limited top up of worn formations, 2 lanes width, 70-100km/hr design speed when dry. Seal causeways where practicable to reduce repetitive damage.
Class 6 – Local Collector (or Minor Road)	Sealed – provide safe, smooth and all weather access, 1 lane seal, mainly minor urban streets and lanes. Unsealed gravel sheeted – provide safe access in most conditions, may be closed or require caution when wet, ride comfort and speed may be reduced, may not be gravel resheeted even where previously gravelled, no new gravel sheeting, patch gravel high risk hazards, 1 lane width with shoulders for passing, 70-100km/hr design speed, bridge load limit on SR88 & SR215. Unsealed formed – provide safe access in most conditions, may be closed or require caution when wet, ride comfort and speed may be reduced, no general gravel sheeting, patch gravel high risk hazards only, 1 lane width with shoulders for passing, 70-100km/hr design speed in dry weather. Unsealed – seal causeways where practicable to reduce repetitive damage.
Class 7 – Local Access (property access, minor single lane roads)	Sealed – provide safe smooth access – mainly minor urban streets, lanes and rural causeways, 1 lane seal, 50 km/h design speed. Unsealed gravel sheeted – provide safe access in most conditions, may be closed or require caution when wet, ride comfort and speed may be reduced, gravel resheet unlikely and only where previously gravelled, no new gravel sheeting, patch gravel high risk hazards only, 1 lane width with shoulders for passing, 70-100km/hr design speed.

	Unsealed – formed – provide safe access in most conditions, may be closed or require caution when wet, ride comfort and speed may be reduced, patch gravel high risk hazards only, no general gravel sheeting, 1 lane width with shoulders for passing, 70-100km/hr design speed. Unsealed – unformed track – provide safe access in dry weather, ride comfort and speed may be reduced, no gravel, drainage or formation, variable alignment and width. Unsealed – seal causeways where practicable to reduce repetitive damage.

Critical Assets

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

Operations and maintenances activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc. Critical assets failure modes and required operations and maintenance activities are detailed in Table 5.3.2.1.

Table 5.3.2.1: Critical Assets and Service Level Objectives

Critical Assets	Critical Failure Mode	Operations & Maintenance Activities
Sealed road shoulders	Worn shoulders and edges of seal on narrow sealed roads potentially contributing to vehicle crashes (low history but can result in serious injury or death.	Inspect seal edges & shoulders, and mark locations for tarpatcher. Ongoing increase in edge patching. Increase shoulder resheeting, prioritise by condition, risk assessment and road hierarchy classification. Program widening when reconstructing narrow seals.
Sealed roads verge maintenance	Drivers unable to recover in time or with enough clear space to attempt recovery of control if vehicle leaves the road – potential contribution by uneven or steep slopes in shoulder and/or verge .	Expand verge and shoulder maintenance to maintain clear zone up to 5m from edge of road where possible, particularly on higher classification roads. Shoulder and verge slopes – upgrade shape. Shoulders – stabilise to reduce wear.
Sealed roads	Rough surfaces potentially contributing to vehicle crashes if not adequately maintained or renewed. Loss of seal if not adequately maintained or renewed.	Inspect seals and mark locations for tarpatcher. Undertake seal maintenance before defects become major. Provide adequate funds and program reseals.
Unsealed roads	Rough surfaces (potholes, ruts, corrugations, washouts, etc, and soft surfaces (slippery, boggy, etc) potentially contributing to vehicle crashes or loss of access.	Regular inspection, reactive maintenance, routine/planned maintenance grading and heavy maintenance grading (grade, water and roll), stabilising and gravel resheeting as much as can afforded with limited resources. See Appendix A: Maintenance Response Levels of Service

Standards and specifications

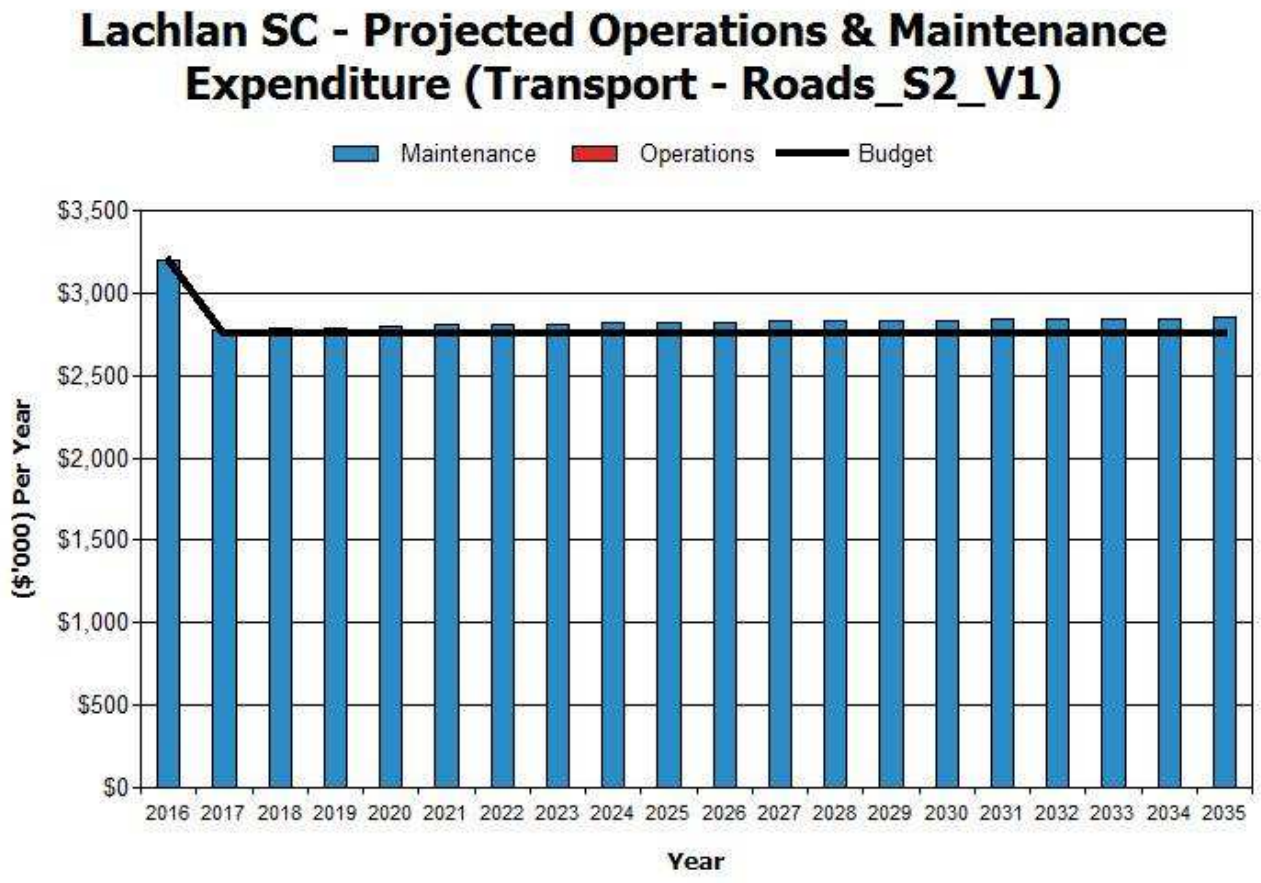
Maintenance work is carried out in accordance with the following Standards and Specifications.

- Roads and Maritime Services (formerly RTA) adapted for local use.
- Australian Road Research Board (ARRB) Unsealed Roads Manual (partial implementation so far).
- ARRB Sealed Roads Manual (partial implementation so far).

5.3.3 Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2015 dollar values (I.e. real values).

Figure 4: Projected Operations and Maintenance Expenditure



Some operational activities are not included, such as street sweeping.

Traffic facilities are also excluded for now as they don't relate to the road carriageway and need more analysis of how to apportion costs between maintenance, renewals and upgrades/new assets. At approx. $130,000 per year it is a self-contained area, not affecting the projections vs budget balance.

Extra maintenance is scheduled in Year 1 as a result of additional grant funds to help kick start the stabilising program. Year 2 and later may see a similar reallocation to maintenance for stabilising, depending on how the program is assessed (whether capital improvement undertaken with maintenance?).

Maintenance notionally increases slightly over time with the influence of increasing sealed areas by widening narrow seals. However, those widenings should not be high maintenance early in their life, especially without vehicles chopping up the shoulder areas. There may be other offsetting factors emerge that do require a slight increase in the maintenance budget in line with the graph.

Deferred maintenance, ie works that are identified for maintenance and unable to be funded are to be included in the risk assessment and analysis in the infrastructure risk management plan.

Maintenance is funded from the operating budget where available. This is further discussed in Section 6.2.

5.4 Renewal/Replacement Plan

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

5.4.1 Renewal plan

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

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

Method 3 was used for this asset management plan. However, the renewals plan and other elements have been derived from the roads asset register, so that Method 1 when used (when the register is formatted a little differently to fit the NANMS.PLUS 3 expenditure template).

The useful lives of assets used to develop projected asset renewal expenditures are shown in Table 5.4.1. Asset useful lives were last reviewed on April 2014.[9]

Table 5.4.1: Useful Lives of Assets

Asset (Sub)Category	Useful life
Regional road seals and pavements	60 years
Local road seals and pavements	80 years
Formation	N/A (usually incorporated into reconstruction)
Culverts – old	Same as road (replaced during road reconstruction), sometimes less based on condition assessments of older thin walled culverts.
Culverts new	Same as new road or 80 years.

5.4.2 Renewal and Replacement Strategies

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

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
    - the service delivery 'deficiency', present risk and optimum time for renewal/replacement,
    - the project objectives to rectify the deficiency,
    - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
    - and evaluate the options against evaluation criteria adopted by the organisation, and
    - select the best option to be included in capital renewal programs,

[9] Refer to *Asset Report – Transport Infrastructure* prepared in 2013 for Fair Value project included Review of Useful Life of Assets

- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible, generally made possible by incorporating the old seal, pavement and formation into the new sub-base and formation subgrade.
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council/Board,
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs,
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required ,
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

Renewal ranking criteria

Asset renewal and replacement is typically undertaken to either:

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

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

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

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

Table 5.4.2: Renewal and Replacement Priority Ranking Criteria

Criteria	Weighting
Fit with strategic longer-term plan objectives	20%
Percentage of useful life (adjusted for condition)	50%
Traffic & pedestrian usage, road hierarchy	20%
No. service requests	10%
Total	**100%**

Renewal and replacement standards

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

- Roads and Maritime Services (formerly RTA) adapted for local use.
- Australian Road Research Board (ARRB) Unsealed Roads Manual (partial implementation so far).
- ARRB Sealed Roads Manual (partial implementation so far).

[10] IPWEA, 2011, IIMM, Sec 3.4.4, p 3|60.
[11] Based on IPWEA, 2011, IIMM, Sec 3.4.5, p 3|66.

Many of our renewal projects are reconstruction and widening on existing alignments that require minimal or no design input. In such cases there is an option to use 'low-cost' renewal methods where practical, to restore the service potential or future economic benefits of the asset, at a cost less than replacement cost.

Examples of low cost renewal (assuming minimal horizontal or vertical alignment changes) include:

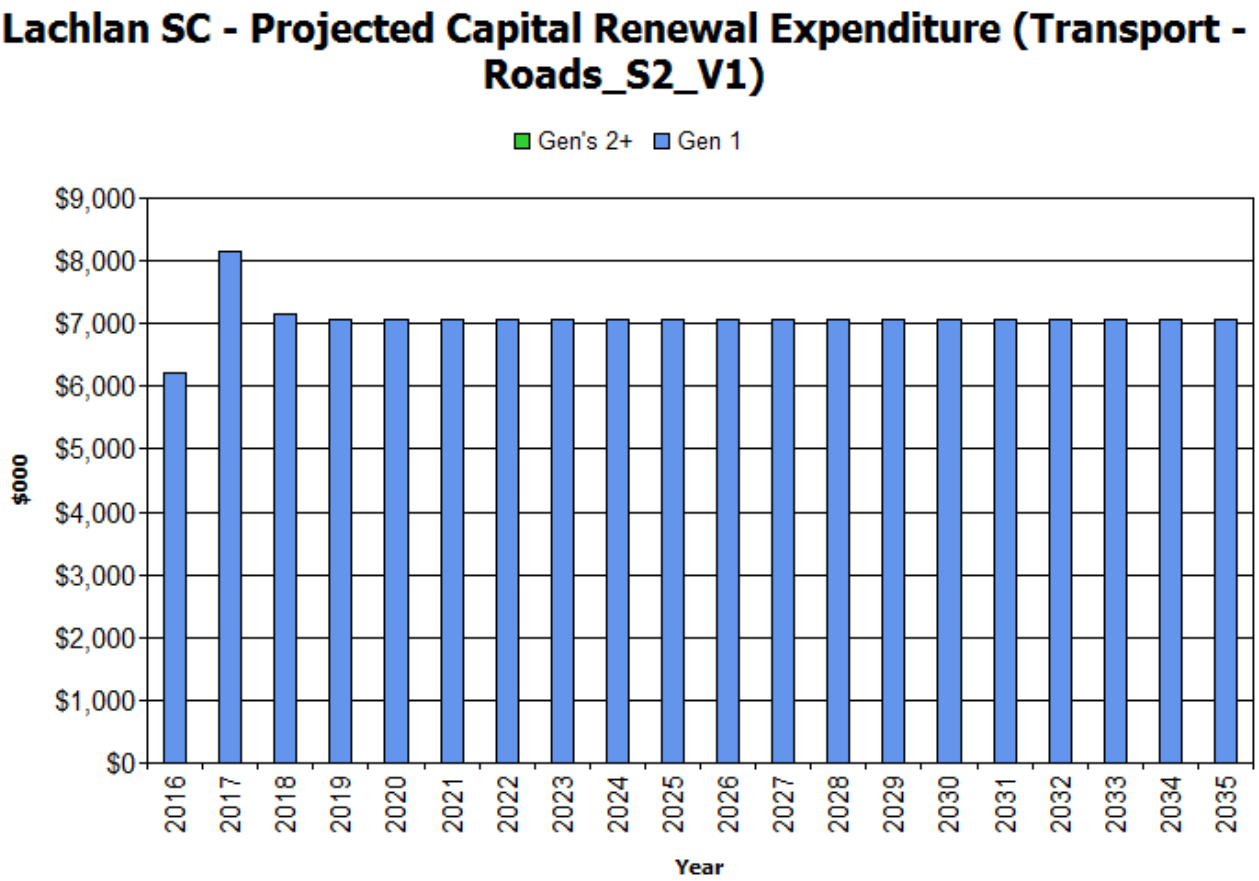
- Sealed road - stabilise the existing pavement, possibly with additional fresh gravel, reform pavement and seal.
- Sealed road - rip, add fresh gravel, stabilise if necessary, reform pavement and seal.
- Sealed road – reconstruct failing edge strips if extra seal width is not required and the original centre 3.6m seal is not stressed – box out and add gravel and/or stabilise the edge strips – non-preferred as the cost is near that of full width reconstruction and widening.
- Unsealed road – gravel resheet, possibly with shape correction to improve drainage.
- Stabilising unsealed roads and shoulders of narrow sealed roads.

5.4.3 Summary of future renewal and replacement expenditure

Projected future renewal and replacement expenditures are forecast to increase over time as the asset stock increases from growth. The expenditure is summarised in Fig 5. Note that all amounts are shown in real values.

The projected capital renewal and replacement program is shown in Appendix B.

Fig 5: Projected Capital Renewal and Replacement Expenditure



After some initial ups and downs while there is additional Roads to Recovery funding, the graph settles into a steady annual renewal program. This is an improvement over the higher range and more variable situation of the original

AMP which showed renewals between $7m to $13M, partly due to the age and shorter useful life data being used. When smoothed out it had approximately $1.5M higher expenditures projections on average.

With few condition 5 segments, it is considered that the renewals are at a manageable level for the next 10 tears,

Deferred renewal and replacement, ie those assets identified for renewal and/or replacement and not scheduled in capital works programs are to be included in the risk analysis process in the risk management plan.

Renewals and replacement expenditure in the organisation's capital works program will be accommodated in the long term financial plan as best it can. At present there is a fairly consistent funding shortfall expected from 2018. This is further discussed in Section 6.2.

Roads rarely collapse exactly on the due date, and even at condition 5 they have enough life left to wait their turn for renewal. No road segments are unusable, so making that the definition for condition 5 would be largely redundant. Therefore, any bumps appearing in the graph later, can be smoothed out by using an average over the 10 years of this planning period.

5.5 Creation/Acquisition/Upgrade Plan

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

5.5.1 Selection criteria

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

Table 5.5.1: Upgrade/New Assets Priority Ranking Criteria

Criteria	Weighting
Fit with strategic longer-term plan objectives	30%
Cost benefit analysis (if available)	20%
Traffic & pedestrian usage (links to road hierarchy)	30%
No. service requests	20%
Total	**100%**

5.5.2 Capital Investment Strategies

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

- Planning and scheduling capital upgrade and new projects to deliver the defined level of service in the most efficient manner,
- Undertake project scoping for all capital upgrade/new projects to identify:
    - the service delivery 'deficiency', present risk and required timeline for delivery of the upgrade/new asset,
    - the project objectives to rectify the deficiency including value management for major projects,
    - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
    - management of risks associated with alternative options,
    - and evaluate the options against evaluation criteria adopted by Council, and

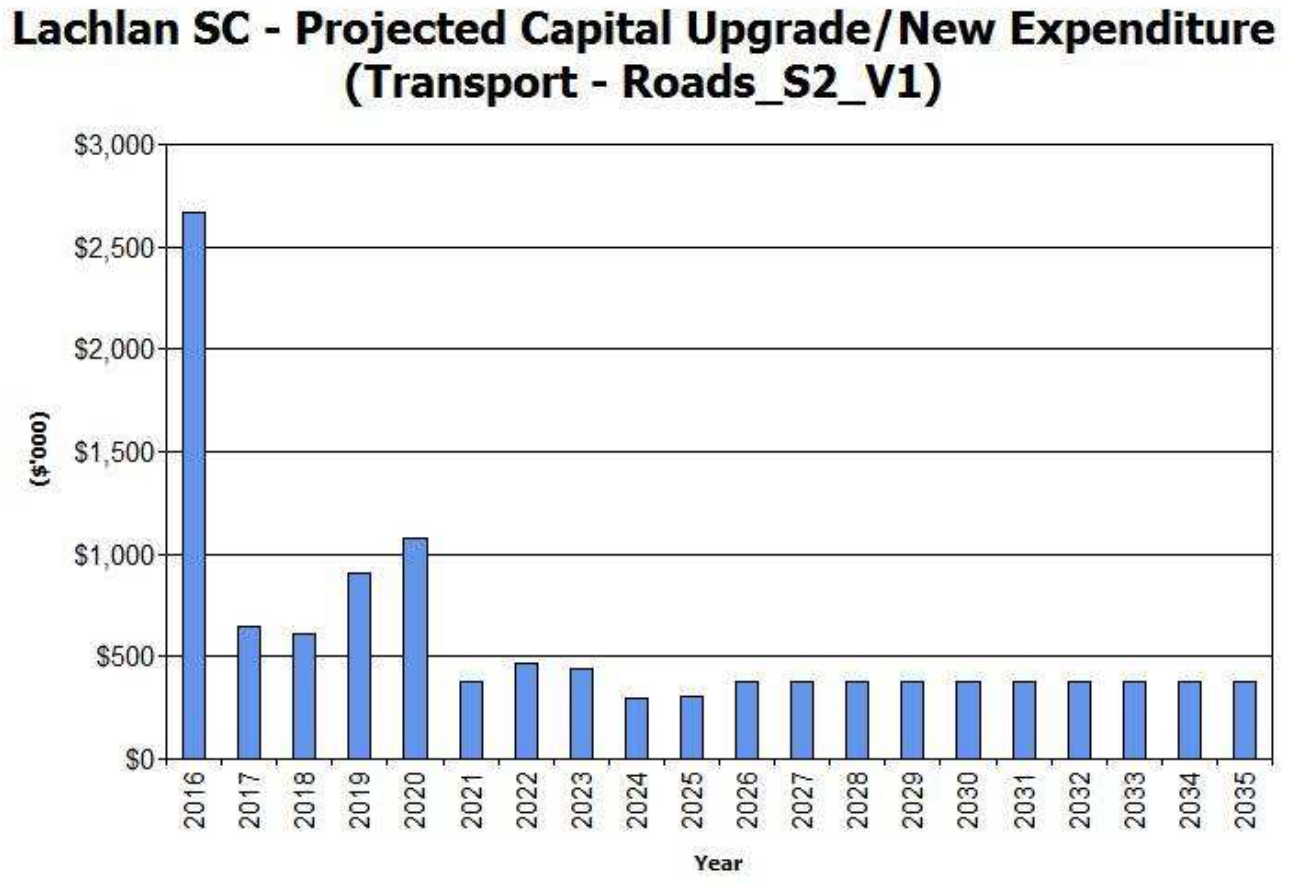
- select the best option to be included in capital upgrade/new programs,
- Review current and required skills base and implement training and development to meet required construction and project management needs,
- Review management of capital project management activities to ensure Council is obtaining best value for resources used.

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

5.5.3 Summary of future upgrade/new assets expenditure

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

Fig 6: Projected Capital Upgrade/New Asset Expenditure



After the initial spike and variations in expenditure from known extra grant and "own source" funds, the ongoing situation indicates the scale of upgrades for widening narrow seals involved with reconstruction of narrow seal segments. 2016 shows a large spike from new seals which complete the current batch of expectations using additional grant funds. After this spike, Council is expected to follow the intended transition to a maintenance and renewals focus instead of new seals. Occasional 'new seals' are still showing in the early part of the program, but will be reviewed. The ongoing upgrades of approximately $400,000 per year are the widening component in conjunction with reconstruction of narrow seals.

Expenditure on new assets and services in the organisation's capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2.

5.6 Disposal Plan

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

Where cashflow projections from asset disposals are not available, these will be developed in future revisions of this asset management plan. Generally existing road seals and pavements are incorporated into the reconstruction and widening on the old formation.

Table 5.6: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Expenditure	Operations & Maintenance Annual Savings
N/A				

5.7 Service Consequences and Risks

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

Scenario 1 - What we would like to do based on asset register data – higher Level of Service, desirable for the asset

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

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

The development of scenario 1 and scenario 2 AM Plans provides the tools for discussion with the Council and community on trade-offs between what we would like to do (scenario 1) and what we should be doing with existing budgets (scenario 2) by balancing changes in services and service levels with affordability and acceptance of the service and risk consequences of the trade-off position (scenario 3). Scenario 2 is tailored to fit the available budget and is what the current LTFP is modelled on. This basically leaves gravel resheeting approximately $2M short each year if there are no additional funds provided such as in 2015/16 and 2016/17 from Roads to Recovery.

5.7.1 What we cannot do

Unless community consultation suggests a change in direction, the LTFP covers the required operations and maintenance activities and all capital projects that are proposed to be undertaken within the next 10 years, with the exception of:

- $2M of gravel resheeting ($1.2M resheeting is included, for class 3, 4 and 5 unsealed roads only), unless there are additional funds provided such as in 2015/16 and 2016/17 from Roads to Recovery. The scale of the shortfall should reduce when the cumulative impact of stabilising starts to take effect.

5.7.2 Service consequences

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

- Reduction in condition of class 6 and 7 unsealed road segments and consequent reduction in level of service, unless or until the stabilising program can start having an impact on reducing costs for higher class unsealed roads and the shoulders on narrow sealed roads.

5.7.3 Risk consequences

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

- Vehicle crashes potentially involving worn shoulders and edge break on narrow seals.
- Driver fatigue leading to vehicle crash if insufficient space to recover control.
- Vehicle damage from edge drops or oncoming traffic throwing stones

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

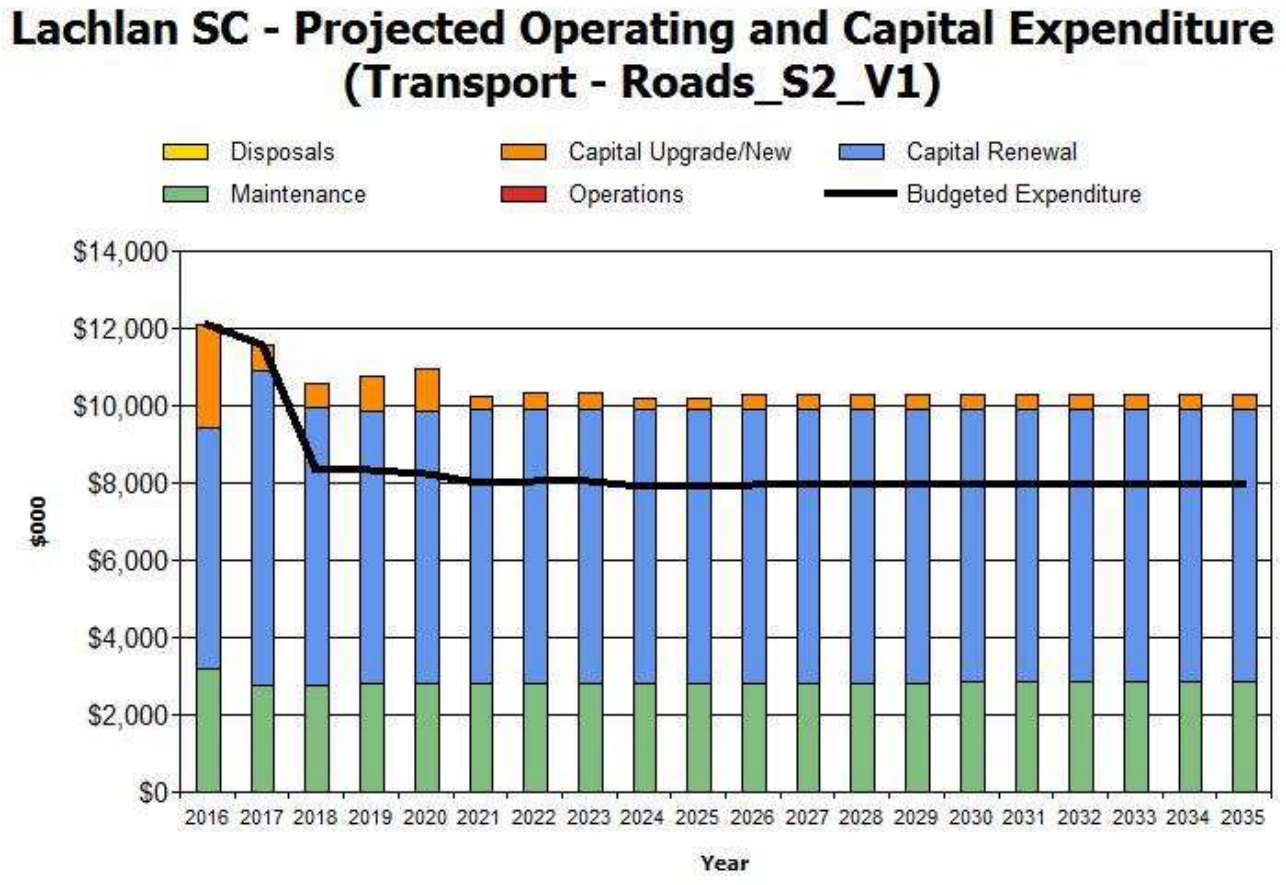
6. FINANCIAL SUMMARY

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

6.1 Financial Statements and Projections

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

Fig 7: Projected Operating and Capital Expenditure



After the initial fully funded two years, there is slightly more than $2M annual shortfall as the budget falls to the normal minimum level. This reflects the shortfall assigned to gravel resheeting class 6 and 7 roads that enables all other activities to be fully funded.

6.1.1 Sustainability of service delivery

There are four key indicators for service delivery sustainability that have been considered in the analysis of the services provided by this asset category, these being the asset renewal funding ratio, long term life cycle costs/expenditures and medium term projected/budgeted expenditures over 5 and 10 years of the planning period.

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[12] 76%

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years, Council is forecasting that it will have 76% of the funds required for the optimal renewal and replacement of its assets.

Long term - Life Cycle Cost

Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the asset life cycle. Life cycle costs include operations and maintenance expenditure and asset consumption (depreciation expense). The life cycle cost for the services covered in this asset management plan is $7,593,000 per year (average operations and maintenance expenditure plus depreciation expense projected over 10 years).

Life cycle costs can be compared to life cycle expenditure to give an initial indicator of affordability of projected service levels when considered with age profiles. Life cycle expenditure includes operations, maintenance and capital renewal expenditure. Life cycle expenditure will vary depending on the timing of asset renewals. The life cycle expenditure over the 10 year planning period is $8,140,000 per year (average operations and maintenance plus capital renewal budgeted expenditure in LTFP over 10 years).

A shortfall between life cycle cost and life cycle expenditure is the life cycle gap. The life cycle gap for services covered by this asset management plan is -$546,000 per year (-ve = gap, +ve = surplus).

Life cycle expenditure is 107% of life cycle costs.

The life cycle costs and life cycle expenditure comparison highlights any difference between present outlays and the average cost of providing the service over the long term. If the life cycle expenditure is less than that life cycle cost, it is most likely that outlays will need to be increased or cuts in services made in the future. Life cycle indicators are better than the 10 years LTFP indicators, so there is a good chance of improvement once initial transitions in focus start to bear fruit, e.g. stabilising and extending sealed road lives by focusing on shoulder areas.

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

Medium term – 10 year financial planning period

This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

These projected expenditures may be compared to budgeted expenditures in the 10 year period to identify any funding shortfall. In a core asset management plan, a gap is generally due to increasing asset renewals for ageing assets.

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[12] AIFMG, 2012, Version 1.3, Financial Sustainability Indicator 4, Sec 2.6, p 2.16

The projected operations, maintenance and capital renewal expenditure required over the 10 year planning period is $9,950,000 on average per year.

Estimated (budget) operations, maintenance and capital renewal funding is $8,140,000 on average per year giving a 10 year funding shortfall of -$1,810,000 per year. This indicates that Council expects to have 82% of the projected expenditures needed to provide the services documented in the asset management plan.

Medium Term – 5 year financial planning period

The projected operations, maintenance and capital renewal expenditure required over the first 5 years of the planning period is $10,008,000 on average per year.

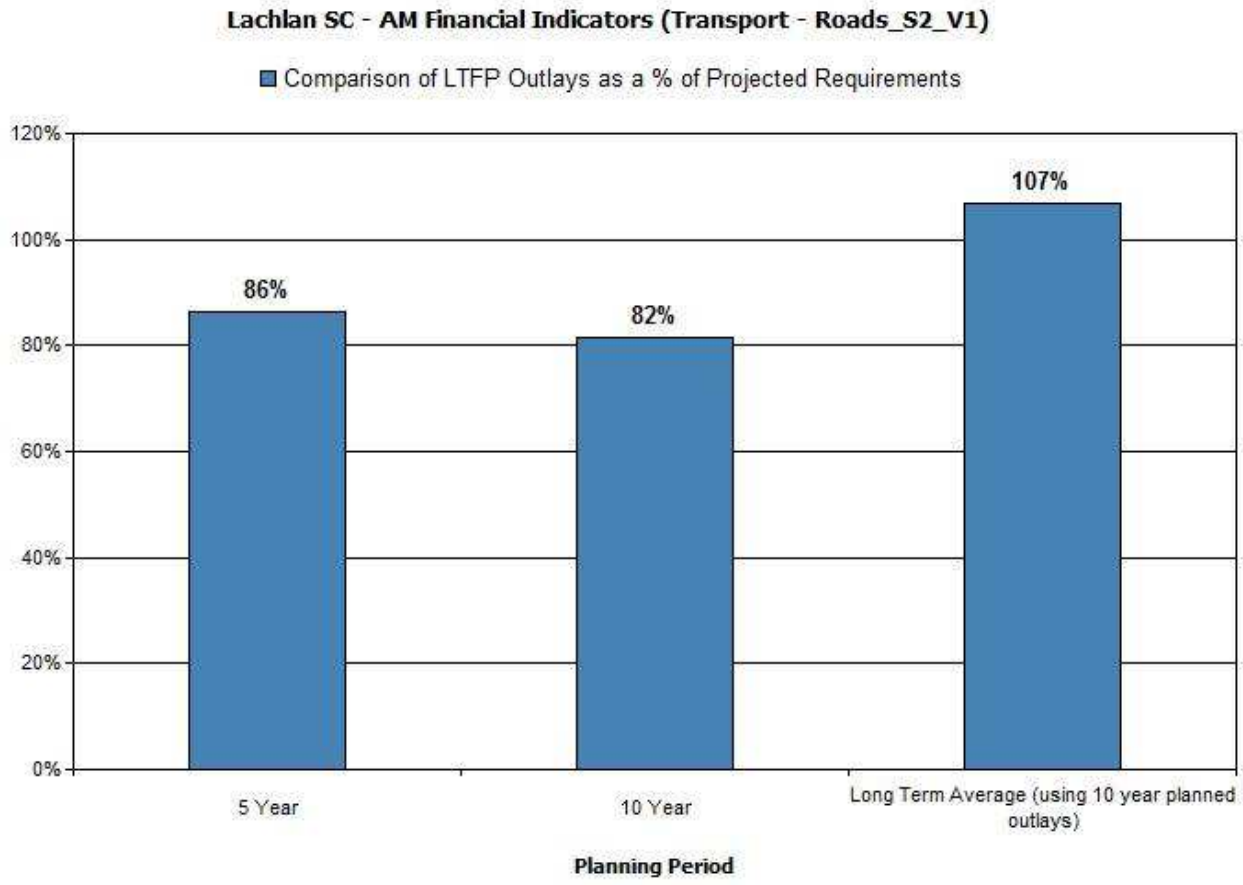
Estimated (budget) operations, maintenance and capital renewal funding is $8,680,000 on average per year giving a 5 year funding shortfall of -$1,328,000. This indicates that Council expects to have 87% of projected expenditures required to provide the services shown in this asset management plan.

The 5 years term is stronger than the 10 years term due to the influence of additional Roads to Recovery funding allowing the first two years to be fully funded (2015/16 and 2016/17).

Asset management financial indicators

Figure 7A shows the asset management financial indicators over the 10 year planning period and for the long term life cycle.

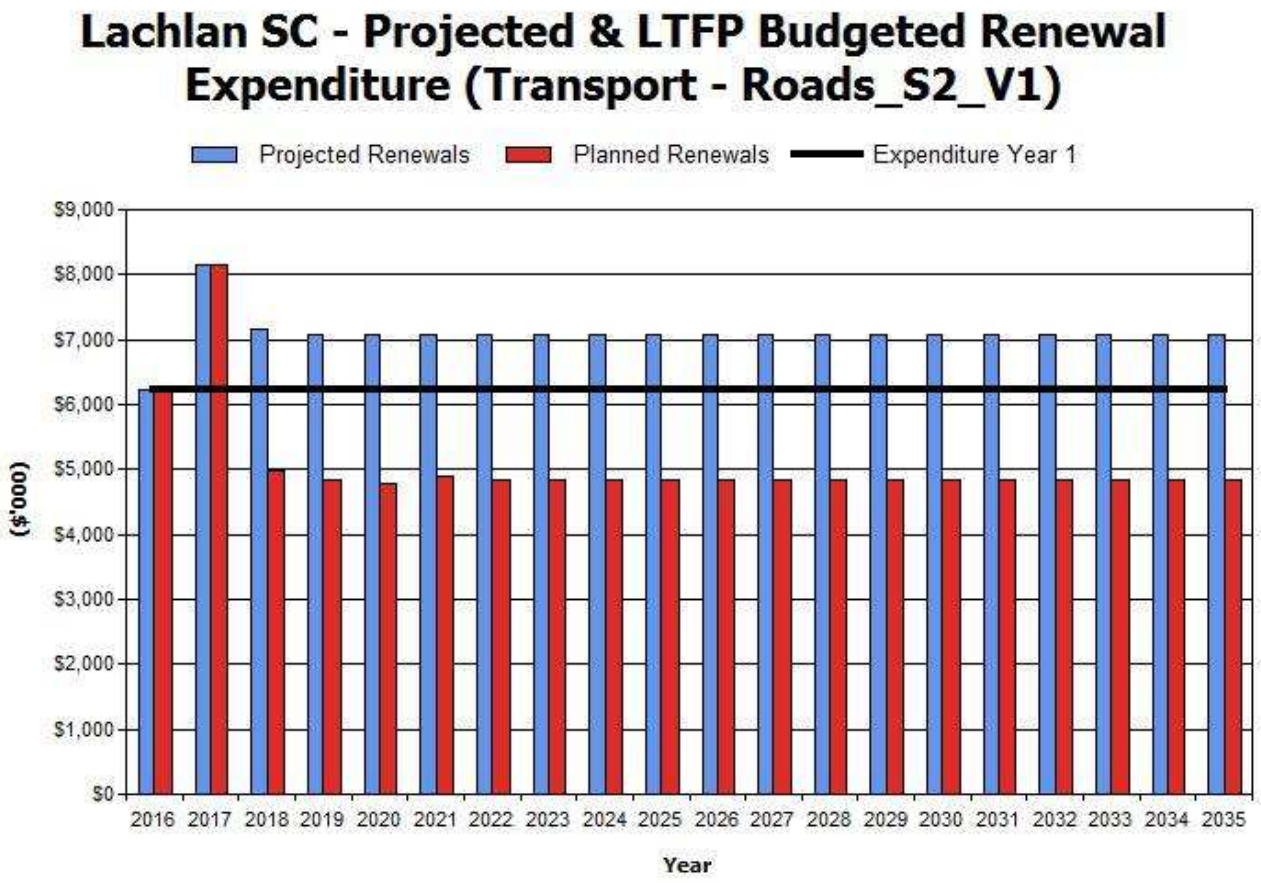
Figure 7A: Asset Management Financial Indicators



Providing services from infrastructure in a sustainable manner requires the matching and managing of service levels, risks, projected expenditures and financing to achieve a financial indicator of approximately 1.0 for the first years of the asset management plan and ideally over the 10 year life of the Long Term Financial Plan.

Figure 8 shows the projected asset renewal and replacement expenditure over the 20 years of the AM Plan. The projected asset renewal and replacement expenditure is compared to renewal and replacement expenditure in the capital works program, which is accommodated in the long term financial plan

Figure 8: Projected and LTFP Budgeted Renewal Expenditure



The budget line is inflated by the additional Roads to Recovery funding in Year 1. The longer term picture is best seen from Year 3, 2018.

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

Table 6.1.1: Projected and LTFP Budgeted Renewals and Financing Shortfall

Year	Projected Renewals ($000)	LTFP Renewal Budget ($000)	Renewal Financing Shortfall ($000) (-ve Gap, +ve Surplus)	Cumulative Shortfall ($000) (-ve Gap, +ve Surplus)
2016	$ 6,229	$ 6,229	0	0
2017	$ 8,145	$ 8,145	0	0

2018	$ 7,154	$ 4,984	-$ 2,170	-$ 2,170
2019	$ 7,077	$ 5,039	-$ 2,038	-$ 4,208
2020	$ 7,077	$ 4,784	-$ 2,293	-$ 6,501
2021	$ 7,077	$ 4,884	-$ 2,193	-$ 8,694
2022	$ 7,077	$ 4,834	-$ 2,243	-$ 10,937
2023	$ 7,077	$ 4,834	-$ 2,243	-$ 13,180
2024	$ 7,077	$ 4,834	-$ 2,243	-$ 15,423
2025	$ 7,077	$ 4,834	-$ 2,243	-$ 17,666
2026	$ 7,077	$ 4,834	-$ 2,243	-$ 19,909
2027	$ 7,077	$ 4,834	-$ 2,243	-$ 22,152
2028	$ 7,077	$ 4,834	-$ 2,243	-$ 24,395
2029	$ 7,077	$ 4,834	-$ 2,243	-$ 26,638
2030	$ 7,077	$ 4,834	-$ 2,243	-$ 28,881
2031	$ 7,077	$ 4,834	-$ 2,243	$ 31,124
2032	$ 7,077	$ 4,834	-$ 2,243	-$ 33,367
2033	$ 7,077	$ 4,834	-$ 2,243	-$ 35,610
2034	$ 7,077	$ 4,834	-$ 2,243	-$ 37,853
2035	$ 7,077	$ 4,834	-$ 2,243	-$ 40,096

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

Providing services in a sustainable manner requires matching of projected asset renewal and replacement expenditure to meet agreed service levels with **the corresponding** capital works program accommodated in the long term financial plan (LTFP).

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

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

NAMS.PLUS 3 modelling and separate spreadsheet modelling of the asset register both indicate an annual funding shortfall of approximately $2M at the assumed desirable Level of Service.

Spreadsheet modelling further indicates that a Level of Service aimed at fitting the budget and maintaining and renewing the assets with highest value and associated risk can be tolerated in the short term. It would accommodate all activities with the exception of gravel resheeting approximately 60% of the local unsealed roads. Those roads would miss out on gravel and heavy maintenance grading (grade, water and roll in local parlance).

Risk would be minimised by fully servicing the higher classification unsealed local roads (classes 3, 4 and 5 in the road hierarchy) while the minor roads of classes 6 and 7 (approx. 60% of the network) receive minimum service. That is, the brunt of the shortfall would fall on class 6 and 7 minor roads, where the low traffic volume roads pose less risk.

This problem should reduce once the benefits of widespread stabilising start to take effect. Until then, it is difficult to model expenditures which will come from the existing budget when it won't cause difficulties with the other activities. Gradually, resheeting should reduce to make way for more stabilising, accelerating the transition.

The assumption of preserving the higher usage, higher risk roads at higher Levels of Service, at the expense of low volume minor roads, has to be tested with community engagement. That may result in a different approach to providing the required level of service at a projected expenditure that is fully accommodated in the organisation's long-term financial plan.

6.1.2 Projected expenditures for long term financial plan

Table 6.1.2 shows the projected expenditures for the 10 year long term financial plan.

Expenditure projections are in2015 real values.

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

Year	Operations ($000)	Maintenance ($000)	Projected Capital Renewal ($000)	Capital Upgrade/ New ($000)	Disposals ($000)
2016	$0	$3,199	$6,229	$3,095	$0
2017	$0	$2,781	$8,145	$648	$0
2018	$0	$2,786	$7,154	$614	$0
2019	$0	$2,791	$7,077	$906	$0
2020	$0	$2,799	$7,077	$1,079	$0
2021	$0	$2,808	$7,077	$375	$0
2022	$0	$2,811	$7,077	$464	$0
2023	$0	$2,815	$7,077	$440	$0
2024	$0	$2,819	$7,077	$294	$0
2025	$0	$2,821	$7,077	$304	$0
2026	$0	$2,824	$7,077	$375	$0
2027	$0	$2,827	$7,077	$375	$0
2028	$0	$2,830	$7,077	$375	$0
2029	$0	$2,833	$7,077	$375	$0
2030	$0	$2,836	$7,077	$375	$0
2031	$0	$2,840	$7,077	$375	$0
2032	$0	$2,843	$7,077	$375	$0
2033	$0	$2,846	$7,077	$375	$0
2034	$0	$2,849	$7,077	$375	$0
2035	$0	$2,852	$7,077	$375	$0

6.2 Funding Strategy

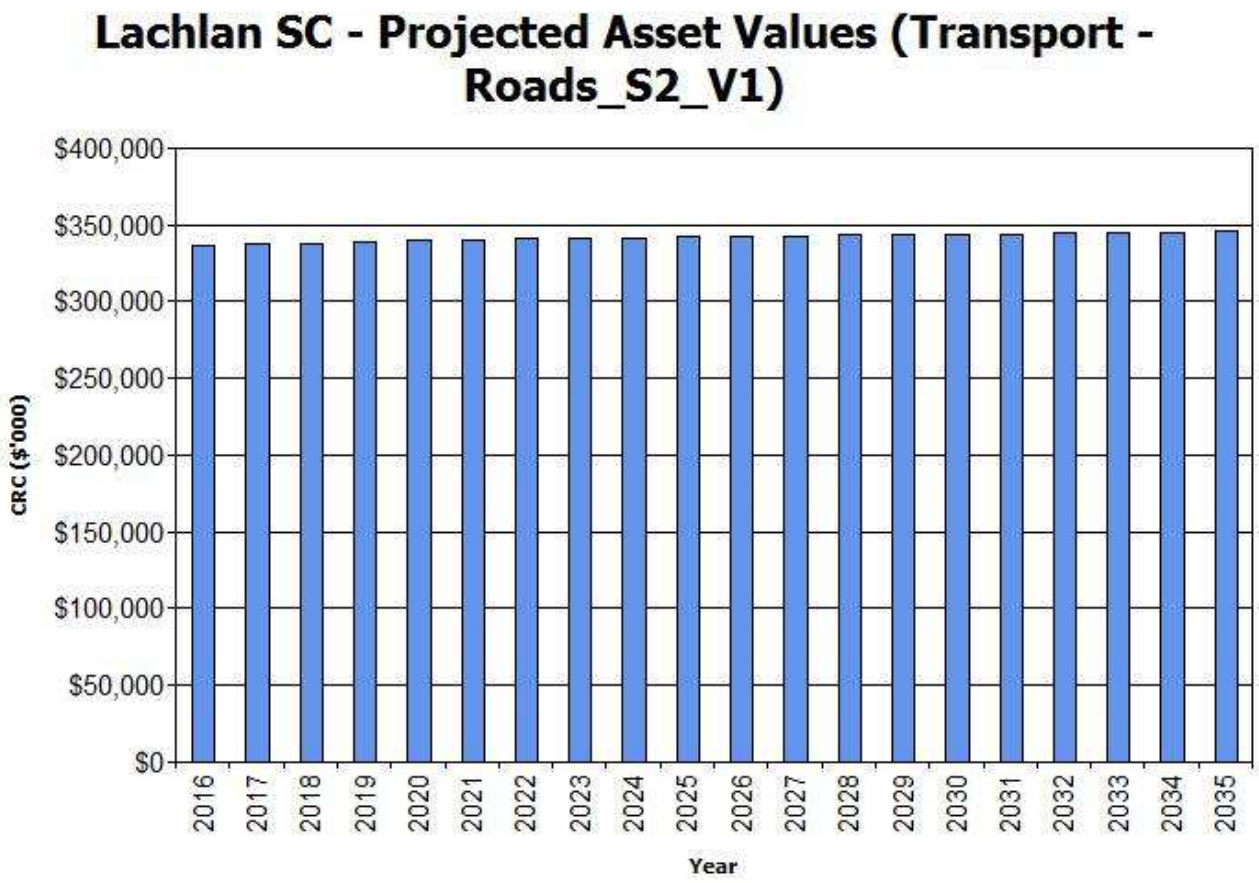
After reviewing service levels, as appropriate to ensure ongoing financial sustainability projected expenditures identified in Section 6.1.2 will be accommodated in the Council's 10 year long term financial plan.

Chiefly this involves adopting approximately $2M shortfall in gravel resheeting, with class 6 and 7 minor roads missing out on gravel and heavy maintenance, to balance the budget and projected expenditures. It minimises risk to road users and the assets, preserving the higher usage, higher risk roads at higher Levels of Service. This has to be tested with community engagement. If the initial large scale trials prove as successful as expected, the benefits of stabilising should be realised over the long term.

6.3 Valuation Forecasts

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

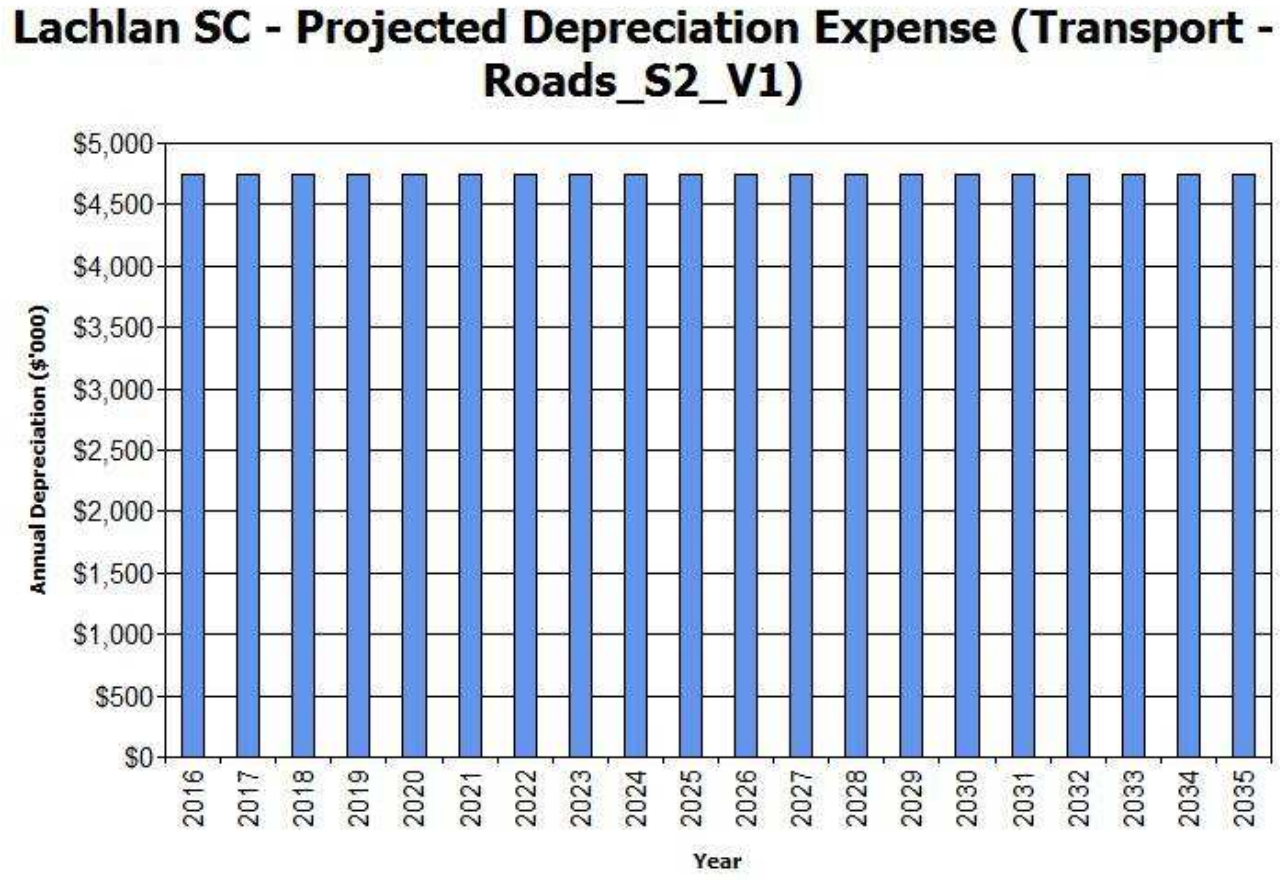
Figure 9: Projected Asset Values



Asset values in terms of current replacement cost increase slowly as seals are widened gradually.

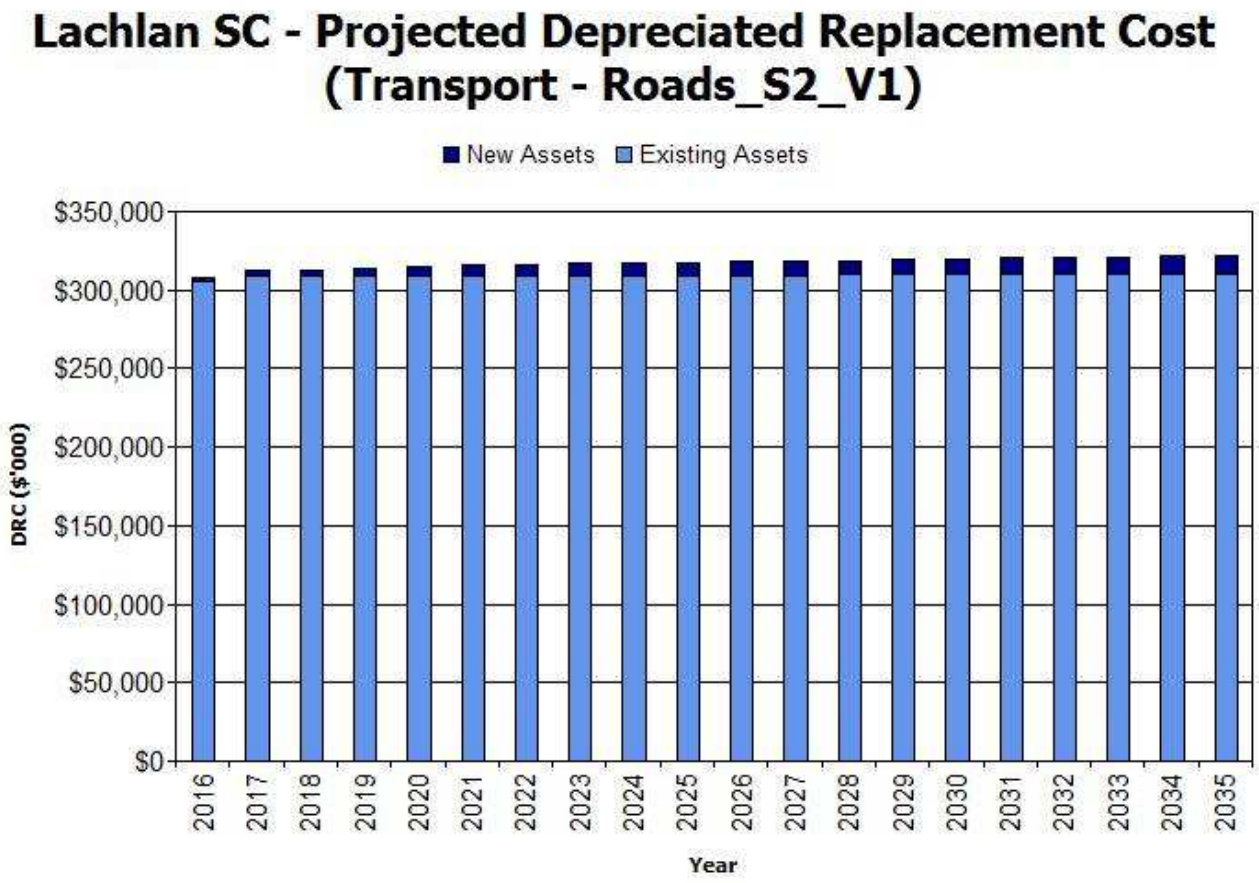
Depreciation expense values are forecast in line with asset values as shown in Figure 10.

Figure 10: Projected Depreciation Expense



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

Figure 11: Projected Depreciated Replacement Cost



New assets being depreciated are some initial new seals and then mainly the widening (upgrade) component of reconstructing narrow seals.

6.4 Key Assumptions made in Financial Forecasts

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

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

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

Key Assumptions	Risks of Change to Assumptions
All road asset activities are fully funded within the expected budget except that from 2017/18 the shortfall in funding will focus on not gravelling class 6 and 7 unsealed roads to minimise risk.	Budget may change (increase, not decrease significantly) or activities may cost more than estimated (more likely).
Assumed that class 6 and 7 roads missing out on gravel and heavy maintenance grading is of a risk and less problematical than cutting back other activities to address the annual shortfall.	Community consultation may come up with different views.
Assumed that the initial stabilising program will be successful and able to be continued indefinitely to produce savings from long gravel resheet cycles and less maintenance from reduced loss of material under traffic.	If stabilising is less effective than expected, the funding shortfall cannot be reduced without significant lowering of Level of Service in some maintenance or renewal activities and faster decline of the network.
Budget projections are as known to Council from funding	Budget may increase if additional grant funds are provided.

sources and inputted to the LTFP within a range of approximately +/-1%.	
Expenditure projections (needed by assets) are based on spreadsheet modelling of the asset register with good quality data. Confidence range pprox.. +/- 5%	Low – no intent to revisit such a large activity until the next review.
The cost estimates are partly based on the scale of treatment and productivity projections suggested by local operating knowledge, consensus by several staff members with experience of road maintenance and construction	Inherent variability between colleagues.
Cost estimates based on over 4 years of actual cost data for similar projects, with averages or typical rates drawn form sometimes wide variation of costs – applied knowledge of projects to assign a range of cost estimates based largely on terrain difficulty. Medium to high confidence.	Variations will occur due to different environmental conditions for each project.
The acquisition year for each road segment is known in some cases, or estimated from anecdotal information and interviews with former staff.	Research into records for asset management will improve the accuracy if ever attempted (searching through council minute books). Any change would be an improvement.
Sealed roads in practice are varying from previous assumptions (40 years) of their useful lives. Many look set to reach 60 or 80 years useful life.	Assumptions may change with acquisition of time series data tracking condition of the segments.
Modest growth is assumed for heavy vehicles in the absence of data on mining, industry or other commercial growth – a large increase would shorten asset life. New roads have slightly thicker pavements to allow for more vehicles and heavier trucks, although axle loads should not be much heavier. Reconstructions have the same new thickness placed over the old material that has been spread and compacted as a new subbase.	Changing traffic patterns and size may alter the assumptions and consequences.
Some activities were under-funded, e.g. shoulder resheets, gravel resheets (except flood damage grant years), widening narrow seals before shift in priorities since the original AMP. Some change from the original AMP to (assumed) better tailored costs and budgets for activities and gradual shift in focus from new seals to renewals and protecting narrow seals to ensure long lives.	Community consultation may provide more or different input on considerations.
Previously thought that a higher level of service is desirable, based on spikes in complaints after rain. However, it was a one off spike over several months from drought breaking rain making unsealed roads boggy. Since repairing those roads, occasional rain events sometimes cause small spikes in customer service requests. Current assumption is that the level of customer service requests is low.	Drought and rain can conspire to change conditions quickly.
The Roads to Recovery program is assumed to continue at roughly the same base level.	The program has been legislated to continue, but the amounts are subject to political whim.
Earlier single coat seals required a reseal within 6 to 12 years, but subsequent cycles are 20 years. Reseal cycles for single double seals (2 coats of aggregate of different sizes on a single bitumen layer) since the early 1990s are around 20 years. 20 years cycles are now assumed for all sealed roads. Exceptions can and do occur, where for various reasons a seal can crack, bleed bitumen or strip aggregate early. These problems have reduced by leaving the loose aggregate in place longer to bond with the bitumen before sweeping.	Technology change and/or specification changes to minimise risk may impose less efficient or more costly requirements.
Asset components such as kerb & gutter, signs, linemarking, etc. are absorbed into the overall road costs, rather than separately itemised yet (as they will be with Advanced Asset Management).	Costs may vary from assumptions.
Useful lives for determining the likely reconstruction time are based mainly age, on pavement life and condition.	Most assets should follow predictable ageing paths, but some will have short or long useful lives depending on their environment.

The formation lasts longer and does not depreciate. It is used again when the road is reconstructed.	Industry standard, not likely to change.

6.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale[13] in accordance with Table 6.5.

Table 6.5: Data Confidence Grading System

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

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

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

Data	Confidence Assessment	Comment
Demand drivers	Medium	Not yet specific, add more data
Growth projections	High	Population numbers are roughly stagnant with rural aggregation and mechanisation
Operations expenditures	N/A	Not split out from other asset service activities
Maintenance expenditures	High	Generally fits needs each year, favourable comparisons with neighbours.
Projected Renewal exps. - Asset values	Medium	Used updated figures from consultant Geoff Roorda, but requires review and applied to road asset register for more exhaustive calculations.
- Asset residual values	Medium – Work in progress	Formation not depreciated as life exceeds the pavement when included with reconstructed pavement.
- Asset useful lives	High	Good age and condition data
- Condition modelling	High	Good condition data (led to Method 3, but Method 1 not used.
- Network renewals	High for initial tranche	Based on low level of condition 5 segments reported in asset register
- Defect repairs	High	1 bridge known.
Upgrade/New expenditures	High	Spreadsheet modelling used feedback from staff including productivity of plant and work activities
Disposal expenditures	High	None planned. May take over more

Over all data sources the data confidence is assessed as medium to high confidence level for data used in the preparation of this AM Plan, with some areas for improvement.

[13] IPWEA, 2011, IIMM, Table 2.4.6, p 2|59.

7. PLAN IMPROVEMENT AND MONITORING

7.1 Status of Asset Management Practices

7.1.1 Accounting and financial systems

Council uses the Civica "Authority" financial management system, which is fairly comprehensive, although the asset management module has not been activated.

Council also uses BIS overlaying Authority for easier interrogation of project budgets.

Accountabilities for financial systems

A new position of Chief Financial Officer has been created to bring more focus at a senior level to the financial management functions.

Council is also subject to external audit at least annually for submission of annual financial statements. Standards are controlled by an external body which sets the guidelines – the Auditing and Assurance Standards Board (AUASB), a statutory agency of the Australian Government.

Accounting standards and regulations

Council operates under the Local Government Act 1993 and related Regulations and Directives from the Office of Local Government, including those specifically relating to accounting and financial requirements, plus the Australian Accounting Standards and the auditing requirements.

Audit requirements impact on some aspects of how assets are assessed, including residual values.

Capital/maintenance threshold

Council's capital threshold policy specifies a $10,000 limit for expenditure that is expensed. Expenditure of over $10,000 on an asset is to be classed as capital expenditure and capitalised against the asset, particularly where identified as a project in the Management Plan. However, maintenance activities can exceed $10,000 on a long road or to repair damage such as from floods or storms. The capital threshold for roads may have to be reviewed. (Ref. LSC General Purpose Financial Statements for the year ended 30 June 2011, Page 18).

This is quoted from the common clause in the original suite of Asset Management Plans and may have been updated since. This can be checked. There has been more acceptance of disparate thresholds for different assets and circumstances, which may require a more defined listing of exceptions.

Required changes to accounting financial systems arising from this AM Plan

Changes to accounting and financial systems identified as a result of preparation of the original asset management plan included:

- Identification of capital expenditures as renewal and upgrade/new – largely completed but is occasionally refined as anomalies are found,
- Development of a single corporate asset register – initiated as a module of Civica Authority commenced but stalled, however, the process clarified some issues across functional areas,
- Linking of the customer service system to the corporate asset register to link requests to asset records – new Customer records management system is used but not yet linked.
- Improved project cost accounting to record costs against the asset component and develop valuation unit rates – progressively improving with most "Authority' Works Orders now having a comprehensive list of tasks to enable estimating of components and has been used for unit rates for roads,
- Review the capital threshold for road assets – this was initially done at the time of the original Roads AMP preparation.

Changes to accounting and financial systems identified as a result of preparation of this asset management plan are:

- Development of suitably functional links between asset register and financial system,
- Linking of the customer service system to the corporate asset register to link requests to asset records,
- Check for an updated review the capital threshold for road assets.

7.1.2 Asset management system

This is largely unchanged since the original Roads AMP. Council uses Excel spreadsheets for asset management data collection, registers and analysis. Roads data include a set of photographs taken at one second intervals along all 3198km of Council's roads which sits independently on the same server which is dedicated to asset management. The photos provide an easy to use means of cross referencing or verifying asset register data. Condition ratings from the photos are recorded on the asset register.

Council has purchased the Civica Authority AMS asset management module for asset management. However, implementation has stalled. It would require a substantial effort to modify practices and set up the appropriate systems to achieve the intended level of sophistication.

Council uses NAMS.PLUS 3 for analysing asset data and preparing asset management plans. The National Asset Management System (NAMS) is managed through the Institute of Public Works Engineers Australia by Jeff Roorda Associates. Basic modelling of the available data initially at the "core" level has advanced part way toward the "advanced" level. It will be an iterative process as more data is available to fully reach the advanced level.

Council uses the MapInfo Geographic Information System (GIS) and Exponare interface as its own system, but with update data swapped from the Lands Department. It is planned to gradually integrate asset information into layers of the GIS.

Asset registers

Asset data is held in summary form in the financial asset register supported by spreadsheet technical asset registers for major asset classes. The roads asset register was established in the 1990's and used for the original Roads AMP.

The roads register was replaced in 2014 with newly collected asset data, including dimensions and condition assessment for "fair valuation" and ongoing asset management requirements. Differential GPS equipment is used to improve the accuracy and speed of data of collection In some instances.

Linkage from asset management to financial system

Linkage from the asset management system, principally the asset register on Excel spreadsheet, to the to the financial systems is a manual process if and when required. The proposed integration via a module in Civica Authority stalled and other methods may be appraised.

The asset register is supported by the photographic record of the roads. The cameras was set up to display a series of + + + as a "water mark" across each photo. The calibration against a real pegged out road environment allows the widths of road elements to be scaled of the photos by counting + + + + spaced at 1m intervals and estimating increments between. Checking the asset register against the photos in many cases indicate a reasonably high level of confidence in the measured widths. There are variations between photos at 30, or 50m, etc, spacings, but the recorded width is the average or typical figure for the segment.

Spreadsheet calculations using the asset register data enabled the LTFP for 10 years to be prepared for the roads budget, with focus on necessary areas such as condition 5 roads (sealed and unsealed).

Accountabilities for asset management system and data maintenance

The Manager Infrastructure is responsible for the asset management systems and associated data. The Manager Operations and Works Manager are responsible for managing the operational aspects of constructing, renewing and maintaining the road assets.

Required changes to asset management system arising from this AM Plan

Changes to asset management systems identified as a result of preparation of this asset management plan are:

- Review accuracy and currency of asset data, ongoing iterative process,
- Develop suitably functional links between asset register and financial system,
- Link the customer service system to the asset register(s), to link customer requests to asset records,
- Check for an updated review the capital threshold for road assets.
- Review effectiveness of works costing and improve project cost accounting to record costs against the asset component and develop valuation unit rates
- Investigate a maintenance management system to improve works planning and cost recording that will link to Civica Authority,

7.2 Improvement Plan

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

Table 7.2: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Table 2.1: Assets covered by this Plan – calculate and insert break up of current replacement costs when asset register is ready for updating for Fair Value	Mgr Operations	Staff time	30 Nov 2015
2	Undertake community engagement to complete Table 3.4 Community Levels of Service, including review and condense.	Mgr Operations	Staff time	31 Mar 2016
3	Insert Figure 3 Condition Profile of our Assets when the risk register has been updated and the NAMS.PLUS 3 Expenditure Template has been uploaded via Method 1.	Mgr Operations	Staff time	30 Mar 2016
4	Complete the Roads Infrastructure Risk Register and Roads Infrastructure Risk Management Plan	Mgr Operations	Staff time	30 Nov 2015
6	Complete Table 5.3.2.1: Critical Assets and Service Level Objectives	Mgr Operations	Staff time	30 Nov 2015
7	Expand consideration of urban streets throughout	Mgr Operations	Staff time	30 Mar 2016
8	Implement inspection and assessment process in Appendix A and monitor for feedback to next AMP	Mgr Operations	Staff time	30 Mar 2016
9	Review accuracy and currency of asset data, ongoing iterative process	Mgr Infrastructure Mgr Operations	Staff time	30 Sept 2015 Ongoing
10	Develop suitably functional links between asset register, financial, customer service and records management systems	Mgr Infrastructure Mgr Operations Info Services Mgr Chief Financial officer	Staff time	Ongoing
11	Check for an updated review of the capital threshold for road assets	Mgr Operations Chief Financial Officer	Staff time	30 Sept 2015
12	Review effectiveness of works costing and improve project cost accounting to record costs against the asset component and develop valuation unit rates	Mgr Operations Chief Financial Officer	Staff time	31 Mar 2016
13	Investigate a maintenance management system to improve works planning and cost recording that will link to Civica Authority	Mgr Infrastructure Mgr Operations Info Services Mgr Chief Financial officer	Staff time	31 Mar 2016
14	Review the road hierarchy classifications assigned to each road segment and adjust schedule in Appendix G.	Mgr Operations	Staff time	30 Sept 2015
15	Train staff to implement levels of service, undertake inspections, risk assessments and condition assessments	Mgr Operations	Staff time	31 Mar 2016
16	Continue collecting and reviewing productivity data to update the modelling	Mgr Operations	Staff time	31 Mar 2016
17	Monitor the effectiveness of stabilising unsealed roads	Mgr Operations	Staff time	31 Mar 2016

	and sealed road shoulders, to assess whether assumed benefits will accrue or not. Reassess strategies as experience and operational data builds up.	Works staff		Ongoing.

7.3 Monitoring and Review Procedures

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

The AM Plan will be updated annually to ensure it represents the current service level, asset values, projected operations, maintenance, capital renewal and replacement, capital upgrade/new and asset disposal expenditures and projected expenditure values incorporated into the organisation's long term financial plan.

The AM Plan has a life of 4 years (Council election cycle) and is due for complete revision and updating within nine months of each Council election.

7.4 Performance Measures

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

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

8. REFERENCES

IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.

IPWEA, 2009, 'Australian Infrastructure Financial Management Guidelines', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMG.

IPWEA, 2011, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM

Lachlan Shire Council, 2012, Transport Services – Roads Asset Management Plan, Condobolin, www.lachlan.nsw.gov.au

9. APPENDICES

Appendix A Maintenance Response Levels of Service

Appendix B Projected 10 year Capital Renewal and Replacement Works Program

Appendix C Projected 10 year Capital Upgrade/New Works Program

Appendix D LTFP Budgeted Expenditures Accommodated in AM Plan

Appendix E Abbreviations

Appendix F Glossary

Appendix G Roads Hierarchy and Levels of Service

Appendix A Maintenance Response Levels of Service

The council's maintenance response levels of service are contained within the draft reproduced below:

Lachlan Shire Council: Risk Based Road Maintenance Prioritisation Procedure

1. PURPOSE

This procedure documents the process for identifying defects and hazards, assessing risk, setting priorities and nominates the target timeframe for repairs on Council roads, subject to the capacity of the roads maintenance budget and resources availability.

2. OBJECTIVE

The objective is to make the best use of resources in maintaining council roads in a safe and trafficable condition commensurate with their adopted level of service. This is achieved through a system of inspections to identify where maintenance is needed, and a systematic risk based prioritisation process to schedule the required maintenance work.

3. DEFINITIONS

Risk Management is the systematic application of management policies, procedures and practices to the tasks of identifying, analysing, assessing, treating and monitoring risks. It is based on Australian Standard AS/NZ 4360: 1996 Risk Management.

4. ISSUES

The Roads Act 1993 imposes a legal responsibility on Council for maintaining and repairing the road network. Council's insurer and the duty of care also impose an obligation to ensure that the road network is as safe as possible for the road user.

Roads vary considerably in their construction and the environment in which they are required to function, so maintenance and repair requirements also vary.

The main concerns for users on Council roads are defects, which can limit access to roads or compromise user safety. Environmental issues include erosion and siltation.

A system for maintaining and repairing roads should reduce the likelihood of an error, vehicle accident, injury or damage occurring. Minimising risk with limited resources involves setting priorities in dealing with hazards, partly in proportion to traffic volumes.

This procedure addresses the process of determining the types of hazards that require consideration for repair and within what time frame the repair should be undertaken. This is subject to the limitations of Council's annual budget, strategic priorities and the Levels of Service nominated in the Roads Policy for each class of road.

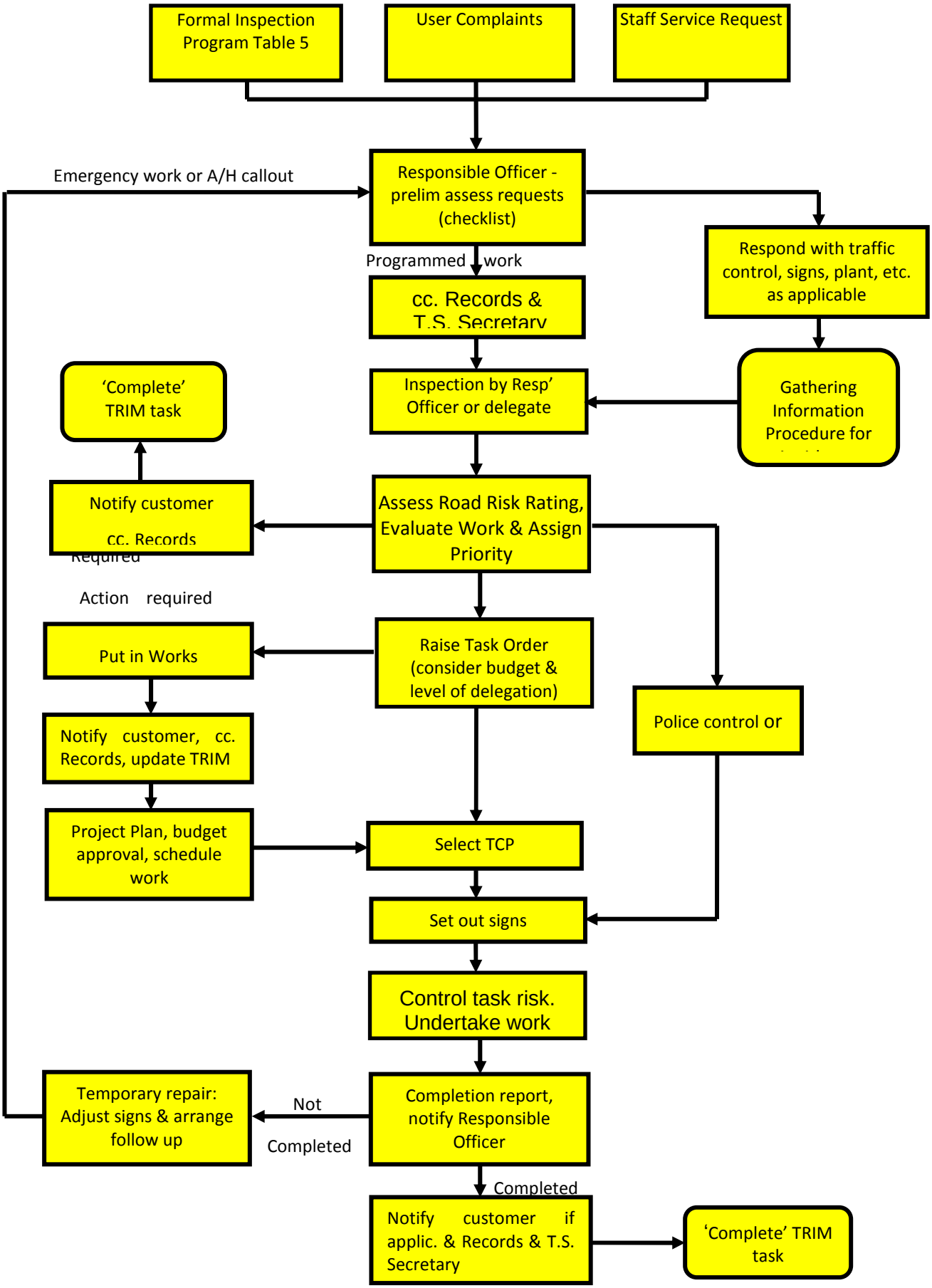
In 2015 Lachlan Shire manages a road network of approximately 3,918 km comprising:

Urban Roads		87 km
Local Roads	Sealed	373 km
	Unsealed	2,827 km
Regional Roads	Sealed	548 km
	Unsealed	83 km
	Council total	**3,918 km**
State Road	Sealed	26 km under RMS contract

Note that these lengths are based on historical data and will be updated.

Figure 1 is a typical flowchart showing the process for inspection, risk assessment, repair and maintenance of roads.

Figure 1. Typical Maintenance and Repair Flowchart.



5. INSPECTIONS

The first step in a risk management program is determining what can happen, why and how. This is the systematic identification of hazards within the road network which is described in Councils' "Road Register" (as required by the Roads Act 1993 and complying with AAS-27).

Inspections are a formal and sometimes independent assessment of roads, looking for defects or hazards that may require repair and maintenance. They are carried out by knowledgeable and skilled personnel applying standards and safety principles.

Levels of Service nominate maintenance and rehabilitation frequencies for each class of road, but are flexible in using inspections to determine whether maintenance:

- Can be deferred or needs to be brought forward,
- Can be reduced in scope, or a heavier treatment may be required.

Inspections therefore should guide and coordinate with maintenance activities. This may require more inspections ahead of maintenance crews to make best use of the resources, to do what is necessary.

Generally, many roads will have informal inspections through the observation of staff members travelling to, during and from work tasks, as well as in response to customer complaints. Additional inspections may be undertaken after storm events.

The three major types of inspection are:

- Formal (planned on a network basis, initiated within Council or by RMS),
- Complaint from road user,
- Service report from Council employees.

The Responsible Officer for programmed inspections or for individual complaint based inspections is normally the Works Manager. It may be a more senior officer if there is a potential difficulty with the budget, delegation, scope of work, non-routine complexity or report to higher authority for authorisation, e.g. Council meeting.

An overseer may be the Responsible Officer for routine tasks, after hours callout or is nearby and can respond quickly – it is important for the organisation to be responsive.

Depending on the nature of the issue, an Overseer initially acting as the Responsible Officer may then pass responsibility to a superior as and when available.

The Responsible Officer (RO) will undertake inspections, or arrange for inspections to be carried out by an Overseer or other staff member experienced in road maintenance activities. The process is then generally as follows:

1. The inspecting officer shall identify and record details of any defect and hazards present using the "Inspection Form" and associated guidelines.
2. If possible, the inspecting officer will evaluate and determine a Road Risk Rating (RRR) for each defect.
3. The RO may review the RRR if done by a delegate or if not, will assign the RRR.
4. The RO will compile a priority list of defects from inspections in accordance with Table 5 and liaise with the Overseers to program the works according to priority, to ensure that response times are met, or record reasons for deferral.
5. The Overseer shall notify the RO when work is completed and the date of completion.
6. The RO shall ensure that the documentation is completed and records are retained in accordance with council policy and procedures.

It may be necessary to respond and carry out urgent works to mitigate risk. A Service Request is still required for follow up as needed and for record keeping purposes.

In responding to an incident, guidance is provided in the Gathering Information Procedure, which will assist in taking the correct actions and collecting information appropriate to the incident. There are incident procedure flow charts, an investigation procedure flow chart and check lists.

Formal Inspections

The periodic gathering of information enables the road network condition to be gauged and to allocate resources to ensure the road network is in the best possible condition for the resources available.

Formal inspections aim to identify assets with defects and their location and severity. Defects may impact on asset life and they may be hazards for users. The information is used to determine risks, priorities and work schedules.

For Formal Inspections, the Responsible Officer will program inspections in accordance with the road hierarchy - see **Table 1** for the desired frequencies.

Table 1 - Inspection Frequencies for Road Classes

Road Class	**2**	**3**	**4**	**5**	**6**	**7**
	State Road	**Arterial**	**Sub- Arterial**	**Distributor**	**Collector**	**Access**
Inspection Frequency	RMS Contract	6 Monthly	6 Monthly	Yearly	Yearly	Yearly

Complaints or Service Requests from Road Users

Complaints from road users are a valuable source of knowledge about the state of the road network between inspections.

Details are taken and each complaint is registered in accordance with Council's complaints handling procedure.

Each complaint is then assigned to a Responsible Officer for investigation. Once inspected and evaluated, the RRR assigned in accordance with **Table 5** will determine how it fits into the works program.

If the priority of the defect is Low or No activity, then the complainant shall be advised within 7 days of receiving the complaint.

Service Requests from Employees.

A service request generated by Council staff members is handled as any other complaint. It may arise from various activities such as:

- Travelling the road network – staff encouraged to report any defects observed,
- Involvement in special events that involve roads,
- Severe weather events such as storms, or emergencies such as road crashes.

6. EVALUATION

Once information is collected it is evaluated with risk ratings based on a set of criteria:

- Location of defect within the road reserve – see **Table 2**
- Road hierarchy (level of service) and pavement type – see **Table 3**
- Hazard type and severity – see **Table 4**
- Rural School Bus Route – 2 points (weighting for rural roads only, **Schedule A**)

Each identified hazard is rated with a numerical value for each criterion that best matches the situation, using the descriptions in each of Tables 2, 3 and 4.

The Road Risk Rating (RRR) is calculated by summing the location, hierarchy and hazard criteria ratings, and adding 2 points for a rural school bus route if applicable, i.e.:

Road Risk Rating = location + hierarchy + hazard (+ bus route 2 points if applicable)

Table 2 - Rating for Damage Location within the Road

Rating	Description
1	Verge or median.
2	Shoulder.
3	Parking Lane.
4	Traffic lane.
5	Total carriage way.

Table 3 - Rating for Road Hierarchy, urban and rural roads

CLASS	DESCRIPTION	SEALED	UNSEALED (GRAVEL)	FORMED (NATURAL)	UNFORMED
	URBAN				
2	State Road	13			
3	Arterial	13	12	11	
4	Sub-Arterial	10	9	8	
5	Distributor	7	6	5	
6	Collector	5	4	3	
7	Local Access	3	2	1	
	RURAL				
2	State Roads	9			
3	Arterial	8	7	6	
4	Sub-Arterial	7	6	5	
5	Distributor	6	5	4	
6	Collector	5	4	3	
7	Local Access	4	3	2	1

Table 4 - Hazard Types and Severities

DESCRIPTION	RATING				
	5	4	3	2	1
OBSTRUCTIONS AND SUBSTANCES ON ROAD					
Object on Road					
Small sized object with a maximum dimension < 100mm			X		
Medium sized object with a maximum dimension 100 – 200mm		X			
Large sized object with a maximum dimension > 200mm	X				
Spilled materials on roads					
Small spills of fine material					X

Moderate spills of granular materials				X	
Large spills of fine granular material or small spills of oil, wet clay or other slippery substance.			X		
Moderate spills of oil, wet clay or other slippery substance.		X			
Large spills of oil, wet clay or other slippery substance	X				
FLEXIBLE PAVEMENTS (e.g. sprayed bitumen seal, asphalt)					
Pot Holes and De-lamination					
Small pot hole of diameter < 100mm and depth < 50mm			X		
Moderate pothole of diameter 100 – 200mm and depth 50 – 100mm		X			
Large pothole of diameter > 200mm and depth > 100mm	X				
Shoving/failures					
Failure < 1.5 m^2 and depth < 15mm					X
Failure > 1.5 m^2 and depth < 15mm				X	
Failure < 1.5 m^2 and depth 15 – 50mm			X		
Failure < 1.5 m^2 and depth > 50mm or > 1.5 m^2 and depth 15 – 50mm		X			
Failure > 1.5 m^2 and depth > 50mm	X				
Rutting					
Small, rut length < 4 m and depth < 15mm					X
Small, rut length > 4 m and depth < 15mm				X	
Moderate, rut length < 4 m and depth 15 – 50mm			X		
Moderate, rut length < 4 m and depth 15 – 50 mm or length < 4 m and depth > 50mm		X			
Heavy, rut length > 4 m and depth > 50mm	X				
Edge Drop					
Small, length < 5 m and depth < 15mm					X
Small, length > 5 m and depth < 15mm				X	
Moderate, length < 5 m and depth 15 – 50mm			X		
Moderate, length > 4 m and depth 15 – 50 mm or length < 5 m and depth > 50mm		X			
Heavy, length > 5 m and depth of > 50mm	X				
RIGID PAVEMENTS (e.g. concrete)					
Spalling of Longitudinal Joints					
Small, length < 5 m and depth < 15mm					X
Small, length > 5 m and depth < 15mm				X	
Small, length < 5 m and depth 15 – 30mm			X		
Moderate, length > 5 m & depth 15 – 30 mm or length < 5 m & depth > 30mm		X			
Heavy, spalling of length > 5 m and depth > 30mm	X				
Faulting of Longitudinal Joints					

Small, length < 5 m and depth of < 15mm					**X**
Small, length > 5 m and depth of < 15mm				**X**	
Small, length < 5 m and depth 15 – 30mm			**X**		
Moderate, length > 5 m and depth 15 – 30 mm or length < 5 m and depth > 30mm		**X**			
Heavy, length > 5 m and depth of > 30mm	**X**				
UNSEALED ROADS (e.g. graveled)					
Cross-Sectional Shape					
Correct Shape, good cross fall & distinct sharp crown, high formation, table drains work well					**X**
Slightly out of Shape, some cross fall to drains, round or flat crown above natural surface, table drains hold some water, drainage mostly works & easily corrected				**X**	
Moderately out of Shape, some drainage problems - flat (no fall to drains), little or no crown, some centre line potholes, table drains blocked or hold water, requires significant repairs			**X**		
Substantially out of Shape, below natural surface, water held on road, third wheel rut in centre, flat or slightly inverted centre, table drains scouring or silting, drainage ineffective & causes some damage, major correction required		**X**			
Totally out of Shape, below natural surface, water ponding long term, substantial centre rutting, potholes and soft patches, inverted centre, severe scouring or silting of table drains and mitre drains - poor drainage causes substantial damage, reconstruction required	**X**				
Road Surface					
Surface free of loose or slippery material, no corrugations or potholes, vehicle operating speed exceeds 80 km/hr					**X**
Small sections loose or slippery, or some bull dust, rutting, corrugations or potholes, where vehicle speed may be below 80km/hr				**X**	
Moderate sections soft, loose or slippery, significant bull dust, rutting, corrugations or potholes – 2WD vehicle experiences some difficulty, generally below 80 km/hr operating speed			**X**		
Substantial sections soft, loose, slippery, bull dust, corrugations or potholes - wet weather access difficult or nearly impassable for 2WD, accessible to 4WD vehicles,		**X**			
Impassable to 2WD and difficult for 4WD vehicle due to soft, loose or slippery material, corrugations, potholes, bull dust, or boggy, dry weather operating speed below 50 km/hr	**X**				
Traffic facilities - signage and roadside furniture					
Signs in place, good condition. Furniture in good condition and appropriately placed.				**X**	
Signs in place, reasonable condition. Furniture in fair condition and appropriately placed.			**X**		
Signs in place, poor condition, some are inappropriate. Furniture condition is fair but too close to road.		**X**			
Signs missing. Furniture in dangerous condition and location.	**X**				

A low classification road may rate highly for location and hazard, if so, deal with the immediate hazard and consider poor general condition for programming of routine maintenance.

7. CONTROL

Risk exposure requires control measures to lessen the exposure to risk, such as:

- Temporary barriers, warning signs and lights to alert road users of a potential hazard,
- Temporary emergency repair,
- Permanent repair,
- Permanent warning signs or lights to alert road users to a potential hazard,
- Planning and allocating resources for long term renewal or upgrade, or
- Programmed maintenance, whether routine or brought forward.

Table 5 indicates the priority, control measure and response time as a level of service related to the Road Risk Rating.

Table 5

Road Risk Action Response for Council Roads

Road Risk Rating	Priority	Control Mechanism	Response Time
4	No Activity	No action required	-
5 - 6	Low	Program into maintenance works	As resources permit
7 - 10	Medium	Program into maintenance works	Within 15 working days and as resources permit
11 - 13	High	Inspect & mitigate risk (minimum of signage) Effect repair	Within 24 hours Within 3 working days
14 +	Urgent	Inspect & mitigate risk (minimum of signage) Effect repair	Within 4 hours Within 24 hours

8. INITIAL ASSESSMENT OF ROAD RISK RATING FOR CUSTOMER COMPLAINTS

The Council staff member that is first contacted should collect enough relevant information to make an initial assessment of who is the most appropriate person to handle the contact as the "Responsible Officer". The aim is to minimise the number of transfers and to assist in being responsive to the customer's needs.

The Responsible Officer for most road maintenance and repairs activities is the Works Manager, but other Technical Services staff members can take on the role and collect information and initiate appropriate preliminary response actions. The more complex issues or those with potentially more serious consequences for expense, injury, damage or liability claims would be passed to the Manager Operations or the Director or other manager for decision, authorisation or follow up. This flexibility is to ensure that a response is not delayed by the absence of one or two people.

Gathering information for purposes such as investigation is covered in more detail in the gathering Information procedure. The following checklist is a starting point for gathering information on the complaint, request or advice of a defect or hazard.

1. What is your name, and address or telephone number (if follow up information is necessary or to acknowledge receipt – consider the requirements of the *Government Information (Public Access) Act 2009 (GIPA))*
2. What is the number or name of the road that is damaged?
3. Where along the road is the problem – where is it near?
4. Where is the damage located on the road? Is it on the:
    a. Verge
    b. Table drain or gutter
    c. Shoulder
    d. Parking lane
    e. A traffic lane, or
    f. Total carriageway?
5. Describe the hazard:
    a. Object on the road
    b. Material on the road
    c. Potholes in the road
    d. Drop at edge of the bitumen
    e. Loose or boggy surface

f. Damaged or missing sign
g. Damaged or missing furniture (seats, etc)?

The Responsible Officer can then make a preliminary assessment of the Road Risk Rating and priority for action – see **Table 5**.

If the RRR is potentially 14 or more, it warrants immediate response to inspect, make a more detailed assessment and effect any measures that are necessary to control or mitigate risk for the public. A preliminary RRR of 11 - 13 may still require an immediate inspection to more accurately scope the problem. If there is a reasonable likelihood of injury or damage as consequences, it is better to err on the side of caution in the initial response.

9. REFERENCES

1. Australian Standard AS/NZ 4360:1995 Risk Management
2. Statewide Roads Best Practice Manual
3. Local Government Act, 1993
4. Roads Act, 1993
5. AUSROADS - Guide to Visual Assessments of Pavements
6. Roads & Traffic Authority NSW ROCOND 90 Road Condition Manual, 1990
7. LSC General Purpose Financial Statements for the year ended 30 June 2011.

10. SCHEDULE A – RURAL SCHOOL BUS ROUTES

(As at 2010, subject to amendment when the council is notified of changes to school bus routes)

Road No.	Road Name
MR 231	Lake Cargelligo - Wyalong Road
MR 347	Albert - Trangie Road
MR 371	Rankins Springs Road
MR 377	Lachlan Valley Way
MR 411	Lachlan Valley Way
MR 423	Lachlan Valley Way
MR 501	Lachlan Valley Way
MR 57N	The Bogan Way
MR 57S	The Gipps Way
MR 61E	Henry Parkes Way (Parkes Road)
MR 61N	Henry Parkes Way (Cobar Road or Nymagee Road)
MR 7513	Condobolin - Lake Cargelligo Road
MR 7521	Kiacatoo Road
10	Albert - Tottenham Road
1006	Begargo - Brotheroney Road
101	Corinella Road
1029	Four Corners - Palesthan Road
105	Burcher - Wamboyne Road
11	Tottenham - Mairavaile - Mineral Hill Road
1139	Weja - Washpool Road
1151	Melrose - Gillenbine Road
1169	Bobadah Road
1187	Condobolin - Tallebung Road
120	Tullibigeal - Crown Camp Road
133	Tyacks Road
1347	Melrose – Albert Road
135	Wardry Bus Road
137	Nolls Road
138	Tullibigeal - Yaddra Road
140	Borapine School Bus Road
144	Wagambegal - Tullibigeal Road
145	Curriba - Tullibigeal Road
146	Curriba Road
147	Yalgogrin Road

Road No.	Road Name
149	Burgooney Road
151	Sansons Road
163	Murphys Road
164	Towers Road
185	Yelkin Road
20	McColls Road
208	Uabba Road
23	Four Corners - Middlefield Road
230	Lachlan Valley Way
25	Tullamore - Kerriwah Road
3	Tabratong Crossing Road
30	Needlewood Bus Road
301	Kelvin Grove Bus Road
323	Micabil - Gulgo Road
34	Fifield - Wilmatha Road
39	Kerriwah - Sarsfield Road
40	Four Corners - Sarsfield Road
41	Boona Mount - Tullamore Road
42	Gobondery Road
43	Fifield - Tullamore Road
44	Morgandale Road
45	Boona Range Road
49	Gobondery Road
5	Tottenham - Landsdale - Mudall Road
59	North River Road
64	Fifield - Carlisle Road
67	Fifield - Yarrabandi Road
74	Derriwong - Mount Derriwong Road
79	Halls Road
91	Condobolin - Marsden Road
94	Cadow Road
97	Driftway Road

Appendix B Projected 10 year Capital Renewal and Replacement Works Program

Lachlan SC - Desired Capital Renewal Works Program - Transport - Roads S2V1

Year	Item	Network Renewal Projects Description	Estimate ($000)
2016	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
	8	Move some resheets to Yr2	-1,145
2016		**Total**	**5,932**
2017	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
	8	Extra resheets	1,068
2017		**Total**	**8,145**
2018	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
	8	Extra resheets	77
2018		**Total**	**7,154**
2019	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2019		**Total**	**7,077**

Year	Item	Description	Estimate ($000)
2020	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2020		**Total**	**7,077**
2021	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2021		**Total**	**7,077**
2022	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2022		**Total**	**7,077**
2023	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2023		**Total**	**7,077**
2024	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2024		**Total**	**7,077**

Year	Item	Description	**Estimate** ($000)
2025	1	Reseals	703
	2	Shoulder resheets	1,000
	3	Reconstruct narrow seals	1,696
	4	Unsealed rural road resheets	3,478
	5	Kerb & gutter reconstruction	20
	6	Heavy patches	100
	7	Replace culverts	80
2025		**Total**	**7,077**

Appendix C Projected Upgrade/Exp/New 10 year Capital Works Program

Year	Item	Capital Upgrade and New Projects Description	Estimate ($000)
2016	1	Seal SR105 Wamboyne Road	700
	2	Seal Tottenham Tip access road	150
	3	Seal bridge to causeway SR101 Corinella Road	60
	4	Seal SR214 Nillsons Lane across swamp	100
	5	Seal lake Cargelligo Tip access road	220
	6	Additional cost to widen with reconstructions	1,135
	7	Cost of stabiliser as upgrade component of heavy maintenance grade	300
	8	Tullibigeal Drainage roads component (FAG from 2014/15)	50
	9	Seal Condobolin Tip road ((FAG from 2014/15)	180
	10	Bores and tanks program for water (FAG from 2014/15)	200
2016		**Total**	3,095
2017	1	Additional cost to widen with reconstructions	648
2017		**Total**	648
2018	1	Additional cost to widen with reconstructions	614
2018		**Total**	614
2019	1	Seal Narrandera St Lake Cargelligo (truck bypass)	150
	2	Additional cost to widen with reconstructions	756
2019		**Total**	906
2020	1	Seal SR 231 Curlew Road (part)	400
		Additional cost to widen with reconstructions	679
2020		**Total**	**1,079**
2021	1	Additional cost to widen with reconstructions	375
2021		**Total**	**375**
2022	1	Additional cost to widen with reconstructions	464
2022		**Total**	**464**
2023	1	Additional cost to widen with reconstructions	440
2023		**Total**	**440**
2024	1	Additional cost to widen with reconstructions	294
2024		**Total**	**294**
2025	1	Additional cost to widen with reconstructions	304
2025		**Total**	**304**

Appendix D Budgeted Expenditures Accommodated in LTFP

NAMS.PLUS3 Asset Management **Lachlan SC**

Transport - Roads_S2_V1 — Asset Management Plan

First year of expenditure projections **2016** (financial yr ending)

Transport - Roads

Asset values at start of planning period

Current replacement cost	$334,206	(000)	Calc CRC from Asset Register: $0 (000)
Depreciable amount	$334,206	(000)	This is a check for you.
Depreciated replacement cost	$303,716	(000)	
Annual depreciation expense	$4,750	(000)	

Operations and Maintenance Costs for New Assets

	% of asset value
Additional operations costs	0.00%
Additional maintenance	0.84%
Additional depreciation	1.42%

Planned renewal budget (information only)

You may use these values calculated from your data or overwrite the links.

Planned Expenditures from LTFP

20 Year Expenditure Projections Note: Enter all values in current **2016** values

Financial year ending	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
	$000	$000	$000	$000	$000	$000	$000	$000	$000	$000
Expenditure Outlays included in Long Term Financial Plan (in current $ values)										
Operations										
Operations **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Management **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
AM systems **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total operations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Maintenance										
Reactive maintenance **budget**	$3,199	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755
Planned maintenance **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Specific maintenance items **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total maintenance	$3,199	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755	$2,755
Capital										
Planned renewal **budget**	$6,229	$8,145	$4,984	$5,039	$4,784	$4,884	$4,834	$4,834	$4,834	$4,834
Planned upgrade/new **budget**	$3,095	$648	$614	$756	$679	$375	$464	$440	$294	$304
Non-growth contributed asset value	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Asset Disposals										
Est Cost to dispose of assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Carrying value (DRC) of disposed assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)										
Additional Expenditure Outlays required and not included above	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000	2021 $000	2022 $000	2023 $000	2024 $000	2025 $000
Operations	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Maintenance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Renewal	to be incorporated into Forms 2 & 2.1 (where Method 1 is used) OR Form 2B Defect Repairs (where Method 2 or 3 is used)									
Capital Upgrade	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
User Comments #2										

Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)										
	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000	2021 $000	2022 $000	2023 $000	2024 $000	2025 $000
Forecast Capital Renewal from Forms 2A & 2B	$6,229	$8,145	$7,154	$7,077	$7,077	$7,077	$7,077	$7,077	$7,077	$7,077
Forecast Capital Upgrade from Form 2C	$3,095	$648	$614	$906	$1,079	$375	$464	$440	$294	$304

Appendix E Abbreviations

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

Appendix F Glossary

Annual service cost (ASC)

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

Asset

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

Asset category

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

Asset class

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

Asset condition assessment

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

Asset hierarchy

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

Asset management (AM)

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

Asset renewal funding ratio

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

Average annual asset consumption (AAAC)*

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

Borrowings

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

Capital expenditure

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

Capital expenditure - expansion

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

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

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

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

Capital funding
Funding to pay for capital expenditure.

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

Capital investment expenditure
See capital expenditure definition

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

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

Class of assets
See asset class definition

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

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

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

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

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

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

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

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

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

Economic life
See useful life definition.

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

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

Fair value
The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arms length transaction.

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

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

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

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

Investment property
Property held to earn rentals or for capital appreciation or both, rather than for:
(a) use in the production or supply of goods or services or for administrative purposes; or
(b) sale in the ordinary course of business.

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

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

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

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

Loans / borrowings
See borrowings.

Maintenance
All actions necessary for retaining an asset as near as practicable to an appropriate service condition, including regular ongoing day-to-day work necessary to keep assets operating, eg road patching but excluding rehabilitation or renewal. It is operating expenditure required to ensure that the asset reaches its expected useful life.

- **Planned maintenance**
  Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.
- **Reactive maintenance**
  Unplanned repair work that is carried out in response to service requests and management/ supervisory directions.
- **Specific maintenance**
  Maintenance work to repair components or replace sub-components that needs to be identified as a specific maintenance item in the maintenance budget.
- **Unplanned maintenance**
  Corrective work required in the short-term to restore an asset to working condition so it can continue to deliver the required service or to maintain its level of security and integrity.

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

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

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

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

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

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

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

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

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

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

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

Pavement management system (PMS)
A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

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

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

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

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

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

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

Recurrent funding
Funding to pay for recurrent expenditure.

Rehabilitation
See capital renewal expenditure definition above.

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

Renewal
See capital renewal expenditure definition above.

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

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

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

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

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

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

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

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

Sub-component
Smaller individual parts that make up a component part.

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

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

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

Source: IPWEA, 2009, Glossary

Additional and modified glossary items shown *

Appendix G Roads Hierarchy and Levels of Service

1. PURPOSE

Levels of service are established to clarify expectations and provide guidance for managing each Council road in a condition that is safe and trafficable, as appropriate to the usage, weather and available resources by:

1. Identifying all roads under council control;
2. Developing an asset management system to collect and record data and program timely renewal or disposal;
3. Establishing procedures to manage risk including inspections, hazard identification and risk rating;
4. Establishing a "Lachlan Shire Roads Hierarchy" of road classifications;
5. Establishing a "level of service" appropriate to the road hierarchy classification, for each road segment;
6. Prioritising road works and resources for maximum benefit to the most users.

2. BACKGROUND – RECOGNISING THE OPERATING FRAMEWORK

Factors influencing the levels of service achievable for roads include:

1) Insufficient funds – not all roads can be high speed, all weather roads. To find a sustainable balance, consider:

   a. Maximising benefits for resources used implies prioritising and levels of service proportional to usage, but still need to ensure minor roads are at least trafficable in most weather conditions, even if not at high speed;
   b. Requirements for maintenance, periodic renewal (reseals and gravel resheeting) and reconstruction;
   c. Duty of care - road user safety;
   d. Users desiring 100(+) km/hr operating speeds, not realizing the higher maintenance and crash/injury costs;
   e. Desire to seal roads, to improve access and reduce vehicle operating costs, but road life cycle costs increase and new construction reduces the funds available for maintenance and renewal;
   f. Roads competing with other functional areas for funds.

2) Prioritising the use of resources is affected by variables such as:

   a. Government legislation, policies and grant funding;
   b. Council's strategic directions, policies and budgets;
   c. Weather, economic activity and demographic patterns - affect harvests, traffic volumes, school bus routes;
   d. Management of risk (the level of 'risk acceptance' or 'risk aversion').

3) Road user expectations often exceed recommended best practice. E.g. the Australian Roads Research Board (ARRB) Unsealed Roads Manual suggests:

   a) Narrower roads generally and single lane roads for up to 150 vehicles per day (most roads in this area);
   b) No formation widths of 6 – 8m as they end up with 3 ruts - water trapped in centre rut shortens gravel life;
   c) Normal dry weather operating speed of 70-80km/hr for unsealed roads in this region.

4) Road durability needs good drainage – water resistant top layer; formation with cross fall, crown and height to shed water; and effective table drains, culverts and causeways.

5) The Roads Act 1993 and Council's public liability insurer require roads to be maintained as safe and trafficable.

6) Roads and Maritime Services (RMS) research indicates that a "clear zone" up to 5 – 6m off the road reduces the number and severity of motor vehicle crashes. Drivers have more space to see hazards or recover from an error.

7) Speed is an aggravating factor in all crashes, the biggest factor in a third of fatal collisions and a small increase disproportionately raises the death and serious injury rate.

8) Rehabilitation is more cost effective when distress first appears - too late to repair when structural failure occurs.

9) Initial construction accounts for about 20-30% of lifetime costs. For low traffic volumes, sealed roads generally cost more over their lifetime than unsealed roads. Sealing a road needs to be justified by higher usage.

3. OPERATIONAL STRATEGIES TO MANAGE ROADS

1) Maintain each road at a level of service appropriate to its priority, risk assessment and available resources.

2) Update the Roads Asset Register, identifying all roads under council control;

3) Apply risk management principles to provide safe access for users, although access will vary in quality.

4) Establish a Roads Hierarchy with classes of roads based on traffic volume and function in a local context, to prioritise the allocation of available resources. **Schedule 1 Roads Hierarchy** lists roads by their classification.

5) Establish a level of service for each class in the roads hierarchy considering budget, traffic, safety, bus routes, construction type and relationship to towns, dwellings and economic activity. See **Schedule 2 – Levels of Service**.

6) Having the physical resources to undertake works includes skilled labour, a modern and appropriate plant fleet, suitable gravel from licensed pits, resource sharing, and outsourcing of peak load work and specialist needs.

7) Adapt and apply new technologies and "best practice", such as from the Australian Road Research Board (ARRB).

8) Consider the life cycle costs to construct and maintain a road against the need to maintain existing assets and extend their useful life. A new seal involves social, political, safety and economic factors. ARRB advises it is generally justified if Average Annual Daily Traffic (AADT) is over 250 vehicles per day, but not if below 100 vpd.

4. ROADS HIERARCHY

A roads hierarchy establishes classes of Council Roads that have associated levels of service based on traffic volume and function. It incorporates national classifications but with lower traffic volumes in the local context for each class:

a. Class 2 – State Arterial (Council is responsible outside the central traffic lanes);
b. Class 3 – Regional & Local Arterial;
c. Class 4 – Regional & Local Sub-Arterial;
d. Class 5 – Local Distributor;
e. Class 6 – Local Collector (or Minor Road);
f. Class 7 – Local Access (property access, minor single lane roads).

Schedule 1 – Road Hierarchy lists roads by their classification. The Schedule can be modified if a road is assessed as under or over serviced in relation to its function, traffic volume data and development of asset management systems.

Class 2 State Road - MR61E Henry Parkes Way (Parkes Road) and Denison St.

The traffic lanes are a State Road, maintained by the council as a contractor to Roads and Maritime Services which manages the roads. The parking lanes, kerbs, verges and footway where applicable are managed by the council.

Class 3 Arterial Roads (Regional & Local)

Arterial roads connect urban areas or funnel traffic from rural districts to towns. Most carry seasonal heavy freight. In urban areas, they are the busiest streets in and near commercial districts. User expectations are high. Most are sealed.

Class 4 Sub-Arterial Roads (Regional & Local)

Sub-arterial roads provide links between arterial roads or feed from districts to arterial roads. Usage is high in the local context, including through traffic. Most are unsealed and can be damaged by storms or seasonal grain traffic.

Class 5 Local Distributor Roads

Distributor roads link local areas to arterial and sub-arterial roads. Usage is medium in the local context, servicing several landholdings and some through traffic. Most are unsealed and can be damaged by storms or seasonal traffic.

Class 6 Local Collector (Minor) Roads

Local Collector (Minor) roads service a few dwellings, shops or farms. Traffic is low, mainly local with little through traffic but possibly seasonal freight traffic. Few rural roads are sealed. Some are graveled. Most are formed from natural in-situ materials of varying quality.

Class 7 Local Access Roads

Rural Local Access roads are dead ends or minor through roads servicing few or no dwellings, with a little local traffic, and may have "public gates" (and grids) at property boundaries. Wet weather may affect access. They may be:

- Graveled or "unsealed", although unlikely to be gravel resheeted again unless specifically budgeted,
- Formed only, with raised formation &/or table drains, but no imported gravel other than for isolated repairs,
- Unformed – little used roads that were cleared or graded without forming a crown or drainage to shed water, and may have an occasional maintenance grade to enable dry weather access at low speed.

Urban Local Access streets are generally a very low traffic volume urban street such as a short cul de sac, minor street with little through traffic, or a rear service lane. Most streets are sealed but several lanes are not.

With limited maintenance, the level of service may be minimum trafficable with low ride comfort and 50km/hr speed.

Disused Roads - "Roads" not maintained by Council.

These named "roads" are no longer in public use as council roads or under council control.

Crown Roads

Council is not responsible for and should not maintain Crown Roads. If a road maintained by council is found to be a Crown Road, a resolution to convert it to a Council Road may be considered if required for general public access.

Private Roads

Council cannot maintain private roads unless incidental to maintaining council access to gravel pits and water supplies (with landholder agreement), or undertaken as contracted sundry debtor "private works".

5. LEVELS OF SERVICE GENERALLY

Levels of service define council's intentions for each class of road, in the context of the roads hierarchy, prioritising works, allocating resources, managing risk (road safety), Council's strategic directions and road user expectations.

Table 1 summarises target levels of service as "nominal" frequencies for maintenance and renewal treatments, as flexible guidelines to keep the network in as good a condition as the budget and weather allow. Table 1 applies mainly to rural roads, as most urban streets are sealed. **Schedule 2 – Levels of Service** has more details for each road class.

Table 1 - Level of Service and Summary of Desired Treatment Frequencies

Class (Priority)	Roads Hierarchy Classification	Traffic volume range, vehicles/day AADT	Unsealed dry weather operating speed range km/hr	Maint grade & GWR ave freq, years	Gravel resheet ave freq, years	Reseal ave freq years,
2	State Arterial	Parking lanes	N/A	N/A	N/A	20
3	Regional/Local Arterial	45 +	64 - 80+	2 per yr	5-10	20
4	Reg/Local Sub-Arterial	23 – 44	50 - 70+	1 -2 /yr	10-15	20
5	Local Distributor	11 – 22	50 - 70+	1 per yr	15-20	20
6	Local Collector	5 – 10	50 - 70+	1-2 yrs*	Maybe 20	30?
7	Local Access	0 – 4	50 - 70+	2-4 yrs*	Maybe	N/A
7	Local Access	0 - 4 formed	50+	2-4 yrs*	No	N/A
7	Local Access	Unformed	<50	1% if nec	No	N/A

Note * 2-4 years frequency means a road is graded every 2 to 4 years, or the worst 25-50% are graded each year.

Factors that may change nominal treatment frequencies and preferences or the overall levels of service include:

a. Excessive unscheduled works constraining routine maintenance, e.g. due to wet seasons, storms, drought;
b. Topography and soil types vary throughout the Shire, from soft red and "black" soils to natural gravels;
c. Funds allocated and the physical resources available (i.e. budgets);
d. Grain harvest, school bus and medical access routes may require extra attention, subject to inspection;
e. Identified hazards of high risk, through a process of inspections and Road Risk Ratings (RRR).

Inspections may indicate a better use of resources by deferring or advancing routine maintenance, changing the scope to a lighter or heavier treatment, or undertaking reactive maintenance. That is, to **do only what is necessary**. E.g.:

a. Dry grading a road may increase windblown material loss, or holes reappear – it may be best left alone,
b. The road may need grading more often, or it may need drainage repairs to reduce ongoing problems,
c. If not so wet as to cause more damage, rain may allow a light rip, grade and roll without needing a water cart.

Levels of service will evolve as Asset Management data and systems develop. They may be amended in response to risk assessments, budgets, new strategic directions and evolving maintenance practices and technology.

6. LEVELS OF SERVICE - SEALED ROAD TREATMENTS

Sealed roads are expensive to replace, irrespective of road classification. To maintain or improve safety and durability of sealed roads to maximise the useful service life and minimise long term maintenance and rehabilitation costs:

a. Program regular patching and reseals as a priority to maintain condition and water barrier integrity;
b. Reseal as needed - longer cycles if in good condition, or shorter after several wet years or heavy traffic.
c. Periodically repair table drains, mitre drains and catch drains;
d. Inspect and periodically repair soft, damaged or worn down shoulders;
e. Inspect culverts and kerb & gutter - clean, repair, replace or upgrade as necessary;
f. Provide clear zones for sight distance and vehicle run-off recovery space where practicable;
g. Generally aim for road alignment and geometry design speed of 100km/hr, for two lane roads;
h. Progressively widen narrow seals. Reconstruct full width if possible to reduce the risk of early outer wheel path failure, but a deep edge strip treatment may be viable if the centre pavement is not distressed. Prioritise higher classifications, locations with high risk or crash history, and crests and bends with poor sight distances;

7. LEVELS OF SERVICE - UNSEALED ROAD TREATMENTS

Unsealed roads treatment will depend on the road classification and prevailing conditions, and are defined as follows.

A **maintenance grade** is a **dry grade** without roller and water cart. It may temporarily repair a high use road, but is most appropriate on low usage roads and where there are no deep potholes, corrugations or ruts. It may involve cutting a high crown to fill wheel ruts, spreading or brushing off a loose windrow, and reforming drainage. Disturbing the surface could accelerate material loss, so grade only where needed.

A **maintenance "grade, water and roll" (GWR)** is the minimum treatment for potholes, ruts or corrugations. It can be a general treatment on higher priority roads or used sparingly for localised high risk defects on minor roads. Ripping must be deeper than the holes to avoid them quickly reforming. Repair the formation crown and crossfalls to shed water if practicable. Repair drainage, including causeways, table drains and mitre drains.

An occasional **heavy GWR**:

a. May be needed to reduce a high risk rating.
b. If dry weather operating speeds fall to the intervention level of the lower speed in Table 1.
c. Involves additional shape correction such as raising the formation, correcting width, some patch gravel resheeting or recovering gravel off verges, or modifying causeways and drainage paths.
d. May reduce ongoing maintenance, but
e. Is slow, expensive and probably limited to structural defects on higher priority roads, or very localised on lower classes (with Director or Manager approval).

A **gravel resheet** is normally 100mmm compacted thickness. If limited by funding to a thinner layer, the life is shortened. Ideally, expansive clays ("black soil") or red loams that quickly swallow gravel would have thicker resheets.

A "**patch gravel resheet"** treats "hotspots", such as causeways, or washed out, boggy, slippery or bare patches.

A road that misses out on gravel sheeting must still be maintained in a trafficable condition, even if at low speed. This may require patch gravelling of local soft spots, installing a culvert, or causeway hardening if it can be funded.

Consider where practicable for maintaining accessibility, safety, durability and to minimise long term costs:

a. Programmed inspection of all roads and culverts to assess condition, risk and appropriate treatment.

b. **Grade where necessary.** Do not grade a low classification road if it is trafficable - bypass and monitor.

c. Prioritise resources to higher classification roads for maintenance, drainage improvements and resheeting.

d. Improve or rehabilitate drainage if it will reduce future repetitive or costly damage or if flooding closes roads:
    i. Raise the crown, upgrade culverts or remove road edge windrows, to allow roads to shed water;
    ii. If eroding, clear and widen drainage paths and consider hardening vulnerable causeways;
    iii. If silting, clear or reshape obstructions at the road and/or in the downstream channel;
    iv. If near waterways, may need approvals and a Review of Environmental Factors (REF);
    v. If possible, construct retarding basins that also store some water for roadworks.

e. Unsealed roads are mostly accessible, but may become damaged or impassable from storms, flooding or seasonal harvest traffic. Damage may temporarily affect accessibility, operating speed and ride quality:

i. Class 3, 4 and 5 roads - keep formation shape and pavement in good condition to aid drainage, minimise scope of likely repairs and minimise duration or frequency of non-serviceable periods;
ii. Repairs on class 6 and 7 roads may be delayed until after higher priority roads or flooding subsides or until routine scheduled maintenance occurs. Use warning signs until accessible for repairs, or make temporary repairs to restore access with reduced operating speeds and ride quality/comfort. Program GWR or patch gravel of localised structural damage when a GWR team is nearby;
iii. School bus routes have higher priority within their class for repairs, but access cannot be guaranteed during or soon after rain events, until the road dries enough for Council plant to gain access.

f. Some specific measures to reduce risks for road users could include where practicable:
i. Transition crowns to a one way cross fall at bends, two lanes wide,
ii. Widen narrow roads, at least over crests and at tight bends,
iii. Clear zones for sight distance and vehicle run-off recovery space,
iv. Program grading and resheeting if possible to avoid conflict with heavy use by grain trucks.

g. Programmed gravel resheeting, normally only on roads that were previously graveled:
i. Requires good quality materials to last a full cycle,
ii. Depends on the budget, usually grant funded,
iii. Requires more gravel pits if possible to reduce haul distances,
iv. Include a small allowance in maintenance for patch gravel repairs of small localised defects.
v. Consider topping up flood damage repairs to add value.

h. Regular programmed maintenance:
i. "Precincts" are established to manage maintenance grading operations.
ii. Reduce gravel loss, e.g. spray weeds in shoulders ahead of grading, grade only if/where necessary.
iii. Allocation of maintenance treatments varies according to road classifications, e.g. more GWR on class 3 roads, but limited on class 6 or 7 to isolated hazards or drainage problems.
iv. If a dry maintenance grade in lieu of a GWR will suffice, it will allow extra grading elsewhere.
v. Some non-scheduled maintenance to repair damage or reduce risk can be accommodated.

8. ROAD WIDTHS

The width of each road is a component of its level of service. Factors to consider include road safety, risk management, volume and type of traffic, construction cost, maintenance cost and user expectations or desires.

ARRB suggests a single lane for traffic below 150 vehicles per day. Most LSC roads are under 50 vpd, they are long, carry wide loads and road trains, link communities and users need space to minimise animal strikes. A threshold for 2 lanes of approximately 20 vpd is better related to function. In classes 5, 6 and 7, two lanes may be retained for long roads and through traffic. Narrowing to one lane (with shoulders for passing) should be considered for short, dead end or little used roads to reduce maintenance costs. **Table 2** shows target widths for each road classification.

Table 2 - Rural road widths for new construction or reconstruction

Class		Lane(s), unsealed	Unsealed width incl shoulders, m	Lanes, sealed	Seal width, m	Sealed road formation width, m
3	Regional Arterial	2	8.5	2	8.0	10.0
3	Local Arterial	2	8.5	2	7.2	8.5
4	Local Sub-Arterial	2	8.5	2	7.2	8.5
5	Local Distributor	2	8.5	1 or 2	4.0 or 7.2	6.0 or 8.5
6	Local Collector	1	6.0	1	4.0 #	6.0#
7	Local Access (to properties)	1	6.0	1	4.0 #	6.0#

Seal generally not warranted on Class 6 or 7 rural roads except causeways or to rectify specific problems.

Additional width at crests, bends and causeways aids wider tracking, avoiding animals, passing and sight distances.

9. RISK MANAGEMENT AND INTERVENTION LEVELS

Apply risk management principles in managing roads to provide:

a. Good access for the most people that can be afforded, with priority to higher classification roads, but

b. Safe and trafficable access for minor roads, even if not at desired speeds until scheduled maintenance occurs.

Elements that contribute to managing risk or making roads as safe as practicable within resource constraints include:

a. Develop or review procedures to minimise risk – including to inspect, identify hazards, assess risks, apply intervention standards, program maintenance, apply repair standards, check works and document actions.

b. Incorporate as far as practicable a "safer system approach" as promoted by the RTA, to:

   i. Minimise the probability that a road user will make an error,
   ii. If an error is made, minimise the probability of a crash,
   iii. If a crash occurs, minimise the severity of the injury.

c. Minimise driver confusion and errors by providing simple, consistent messages:

   i. Avoid sudden changes in conditions along a road if practicable,
   ii. Simplify decisions - limit the information to be processed,
   iii. Provide adequate sight distance with appropriate road alignment and clear zones,
   iv. Use standard signs, well spaced with short messages,
   v. Replace missing, faded and damaged signs, or remove redundant fixed and temporary road signs.

f. Where practicable, establish and maintain a roadside clear zone through shoulders, table drains and verges:

   i. Within 5.0m from the edge of the carriageway,
   ii. Control high vegetation and regrowth that can obstruct sight distances to other vehicles, objects and animals, subject to consideration of threatened species impacts,
   iii. With shallow slopes where practicable for vehicle run-off recovery,
   iv. Priority to higher classification roads – more funds, more traffic, faster traffic and higher risk.

h. Widen narrow seals on higher traffic volume roads, considering aspects such as crash history (including "unofficial" feedback from landholders on unreported crashes), shoulder wear and pavement condition.

i. Other persons or entities cannot undertake work on council roads unless they have appropriate contracts or permits (with conditions), excepting landholders maintaining their verges, driveways and culverts.

The **Risk Based Road Maintenance Prioritisation Procedure** in **Appendix A** aims to manage risks as follows:

a. A flowchart summarises the inspection, assessment, prioritising and treatment processes for defects;
b. Based on Statewide Roads Best Practice Manual and AS/NZS 4360: 1996 Risk Management;
c. A "Road Risk Rating" determined by road classification and the position, severity or size of a defect or hazard;
d. Road Risk Ratings are a tool for prioritising remedial works considering the weather and available resources, whether urgent, programmed, wait for routine maintenance, mitigate and repair later, or do nothing;
e. Establishes appropriate intervention levels, or threshold values above which repairs are to be undertaken within times nominated for the road class, such as for bitumen patching, edge break and edge drop;
f. Complements the routine maintenance and planned renewal programs, by focusing on inspections, thresholds for intervention, risk assessments and repairs of defects, and documenting those processes.

Management of risks is also covered in various ways through complementary policies and procedures, such as:

- Occupational Health & Safety Act and regulations (and new Workplace Health & Safety Act from 2012),
- Gathering Information Risk Management Policy (adopted April 2007);
- Gathering Information Procedure *(draft),*
- Contractor Management Policy *(draft to be adopted)* and Contractor Management Procedure *(draft);*
- Risk Management Policy *(draft being developed)*;
- Road Maintenance Risk Management Policy (adopted April 2007);
- The LSC Road Condition Classification Methodology (*draft*) is based on RTA's ROCOND 90 – Road Condition Manual, and ARRB Unsealed Roads Manual – Guidelines to Good Practice, Chapter 6 Asset Management
- LSC Job Specific Site Risk Assessment Procedure (*draft to be adopted*),
- Site inductions and plant and equipment inductions,
- LSC and equipment manufacturer/supplier Safe Work Method Statements,
- Material Safety Data Sheets (MSDS),
- Providing and maintaining plant and equipment that is fit for purpose,
- LSC training program,
- CENTROC OH&S Induction,

- WorkCover OH&S General Induction for Construction Work in NSW (white card) and Work Activity Induction.

SCHEDULE 1 – ROADS HIERARCHY

Table S1.1 lists the rural roads as assigned to Road Hierarchy Classifications (2011) based on counted and estimated traffic volumes *(currently being reviewed with traffic counts and updated version to be included in the adopted AMP)*.

Road No	Road Name	Length Sealed	Length Unsealed	Length Formed	Length Unformed	Length Natural	Total Length	Bus Route 2010	Traff vol	% Trucks
Class 3	**REGIONAL ROADS**									
MR 231	Wyalong Road	20.04					20.04		157.7	20.6
MR 231	Wyalong Road (SR149 to L/C)	25.47					25.47	B	374.7	32.1
MR 231	Wyalong Road (SR147 to 145)	6.57					6.57	B		
MR 231	Wyalong Rd (SR1029 to 164)	2.45					2.45	B		
MR 347	Dandaloo Road	14.37					14.37		162.5	15.6
MR 347	Dandaloo Rd (57N to Albert)	2.3					2.3	B	260.6	24.1
MR 371	Rankins Springs Rd (L/C to 1006)	27.91					27.91		205.1	49.0
MR 371	Rankins Springs Rd (1006 to b'dary)	1.53					1.53	B		
MR 377	Lachlan Valley Way	4					4		345.1	13.8
MR 377	Lachlan Valley Way	40.19					40.19	B	251.6	39.0
MR 423	Lachlan Valley Way	11.83					11.83	B	325.1	45.0
MR 501	Hillston Road	8.43					8.43			
MR 501	Hillston Road (SR208 to L/C)	20.77					20.77	B	146.0	12.0
MR 57 N	The Bogan Way	32.84					32.84			
MR 57 N	Fifield Road	14.97	7.74				22.71		126.0	29.0
MR 57 N	Fifield Road (MR61E to SR74)	17.13					17.13	B	121.5	28.7
MR 57 N	Fifield Road (SR67 to Fifield)	12.6					12.6	B	71.7	27.8
MR 57 N	Fifield Road (Fifield to Tull)	9.13	16.3				25.43	B	61.8	17.9
MR 57 N	The Bogan Way (Tull to SR26)	13.07					13.07	B	98.4	17.4
MR 57 N	The Bogan Way (1347 to Tott)	19.27					19.27	B	361.4	21.5
MR 57 N	The Bogan Way (Tott to SR3)	1.2					1.2	B	280.8	41.2
MR 57 S	The Gipps Way	16					16		364.9	41.2
MR 57 S	The Gipps Way	42.76					42.76	B	201.9	30.2
MR 61 E	Henry Parkes Way	6.17					6.17		507.4	27.5
MR 61 E	Henry Parkes Way (74 to Condo)	19.72					19.72	B	650.0	51.6
MR 61 N	Henry Parkes Way	57.21					57.21	B	354.4	42.3
MR 61 N	Henry Parkes Way		6.8				6.8			
MR 61 N	Henry Parkes Way		22.68				22.68	B	139.3	33.7
MR 7513	Lake Cargelligo Road	52.84					52.84			
MR 7513	Lake Cargelligo Rd (L/C to 230)	7.33					7.33	B	420.8	13.8
MR 7513	Lake Cargelligo Rd (138 to 137)	14.8					14.8	B	232.3	24.1
MR 7513	Lake Cargelligo Rd 1139 to 1139	1.91					1.91	B		
MR 7521	Kiacatoo Road	7.65					7.65		225.4	21.4
MR 7521	Kiacatoo Rd (Condo to SR59)	44.4					44.4	B	146.0	12.5
	Total	**576.86**	**53.52**	**0**	**0**	**0**	**630.38**			
Class 3	**LOCAL ROADS**									
SR 1029	Tullibigeal Rd (7513 to Tulli)	13.11					13.11	B	171.7	13.6
SR 103	Lake Cowal Rd (Bena St to 91)	2.07	6.71				8.78		76.4	12.1
SR 103	Lake Cowal Rd (91 to Bound)			4.67			4.67		333.3	21.7
SR 105	Wamboyne Road (108 to 103)		6.52				6.52	B	66.8	6.3
SR 106	Fitzgerald Road		6.87				6.87		59.3	44.2
SR 1169	Bobadah Road	8.46					8.46	B	161.7	53.1
SR 1187	Palisthan Road	1.6					1.60			
SR 1187	Palisthan Rd (SR53 to Condo)	40.63					40.63	B	123.9	13.2
SR 164	Tullibigeal Road	2.85					2.85	B	203.2	13.8
SR 185	Yelkin Road	13					13	B	57.1	11.7
SR 186	Booth Road			6.62			6.62		79.4	6.0
SR 223	Blackers Road		0.81				0.81		49.4	42.5
SR 230	Lachlan Valley Way	3	20.92				23.92			
SR 230	Lachlan Valley Way 7513 to 411		13.76				13.76	B	131.8	10.1

SR 230	Lachlan Valley Way (59 to 57S)	9.63	35.92				45.55	B	56.2	19.1
SR 3	Tabratong Crossing Road	15.81					15.81	B	121.9	30.4
SR 340	Silos Road	1.08	0.26				1.34			
SR 341	Jones Lane		4.38				4.38		92.6	7.4
SR 342	Worthington Lane		1.51				1.51			
SR 343	Willis Lane		2.01				2.01			
SR 344	Browns Lane		1.83				1.83			
SR 347	Gum Bend Road	3.5					3.5		139.2	3.6
SR 37	Yambora Rd	7.7	9.2				16.9		45.1	7.2
SR 376	Willow Bend Road	2.01					2.01			
SR 379	Alagala Road	0.52					0.52			
SR 5	Lansdale Road	14.28					14.28	B	58.0	12.3
SR5	Landsdale Road		14.86				14.86			
SR 59	North River Road	4.772					4.772	B	59.6	12.7
SR 60	Springvale Road	20.7					20.7		48.8	5.8
SR 64	Platina Road	9.93					9.93	B	61.1	19.5
SR 85	North Forbes Road	9.8	8.59				18.39		605.0	5.6
SR 90	Grassmere Road	20.11	8.35	6.65			35.11		53.1	20.5
	Total	**204.56**	**142.50**	**17.94**	**0**	**0**	**365.00**			
Class 4	**REGIONAL ROADS**									
MR 7514	Nyngan Road		40.29				40.29		34.4	15.7
	Total	**0**	**40.29**	**0**	**0**	**0**	**40.29**			
Class 4	**LOCAL ROADS**									
SR 101	Corinella Road		11.84				11.84	B	30.8	31.3
SR 11	Moira Vale Rd (1169 to SR10)	4.92					4.92	B		
SR 1145	Burcher Road	10.05					10.05		27.9	7.5
SR 1169	Bobadah Road		13.08				13.08	B		
SR 120	Merribogie Rd (1139 to Tulli)	9.86					9.86	B	15.9	15.1
SR 124	Crown Camp Road	0.57		10			10.57		39.7	6.0
SR1347	Albert Road		17.28	25			42.28		48.0	42.5
SR 1347	Albert Rd (SR25 to MR57N)		12.72				12.72	B	52.5	20.0
SR 1411	Lachlan Valley Way	0.4	4.39				4.79	B	33.4	19.9
SR 185	Yelkin Road	6.01	5.75				11.76	B	57.1	11.7
SR 199	Bootoowa Road		20	11.22			31.22			
SR 20	Braalghy Road			9.59			9.59	B	13.6	46.4
SR 23	Jumble Plains Road			21.52			21.52		25.8	22.4
SR 23	Jumble Plains Road		5	9.38			14.38	B	25.0	27.3
SR 25	Kerriwah Road			4.66			4.66		19.1	13.8
SR 25	Kerriwah Road (1347 to SR10)	13.05					13.05	B		
SR 25	Kerriwah Road (MR57N to 23)	3.29	5.83	10.34			19.46	B	28.7	8.7
SR 257	Racecourse Road		3.15				3.15			
SR 34	Wilmatha Rd (SR41 to SR23)		5				5	B	22.1	21.9
SR 34	Wilmatha Road		11.93	14.93			26.86		44.8	31.3
SR 34	Wilmatha Rd (SR23 to SR20)		8.07				8.07	B	29.0	26.1
SR 345	Forest Lane		3.74				3.74			
SR 346	Airport Road		4.32				4.32			
SR 39	Sarsfield Road (SR23 to SR23)			3.8			3.8	B	16.9	17.9
SR 41	Red Heart Rd (SR60 to SR34)			5			5		22.9	25.9
SR 44	Melrose Plains Rd (60 to 34)		8.07				8.07	B	118.9	39.2
SR 45	Boona Road (SR44 to Condo)	21.09	6.79	16.46			44.34	B	36.0	5.5
SR 45	Boona Road		15.9				15.9			
SR60	Springvale Road	14.51	5.38				19.89			
SR 78	The Troffs Road			13.55			13.55		34.7	10.6
SR 91	Marsden Road		16.51				16.51			
SR 91	Marsden Rd (MR377 to SR97)		7.84	5			12.84	B	17.6	42.1
SR 91	Marsden Road			5			5	B		
	Total	**83.75**	**192.59**	**165.45**	**0**	**0**	**441.79**			

Class 5	**LOCAL ROADS**									
SR 10	Meadowview Rd (11 to Tott)	2.44					2.44	B		
SR 10	Meadowview Road	0.46	9.33				9.79		21.4	15.4
SR 10	Meadowview Rd (SR25 to 11)	10.48					10.48	B		
SR 100	Scrubby Lane		6.72	12.37			19.09			
SR 1006	Begargo Rd (MR371 to SR185)		6.72				6.72	B		
SR 1006	Brotherony Rd (MR231 to SR144)		6.68				6.68	B	12.2	28.6
SR 1029	Tullibigeal Road			25.04			25.04			
SR 1029	Tullibigeal Road (7513 to 135)		7.19				7.19	B		
SR 1029	Sims Road		3.65				3.65			
SR 1029	Kikoira Rd (SR146 to MR231)	12.44					12.44	B		
SR 1029	Kikoira Road	4.64					4.64			
SR 11	Moira Vale Road (SR1347 to SR49)		13.81				13.81		22.3	28.2
SR 11	Moira Vale Road (49 to 1169)		21.54				21.54	B		
SR11	Moira Vale Road	11.16					11.16			
SR 1139	Weja Road		5	6.18			11.18		20.5	43.9
SR 1139	Weja Rd (SR135 to MR7513)			9.7			9.7	B		
SR 1139	Weja Rd (MR7513 to SR120)			12.76			12.76	B	22.4	33.0
SR 1144	Weelah Road	8.05					8.05		26.1	16.2
SR 1169	Bobadah Road			19.58			19.58	B		
SR 1187	Palisthan Road		18.93				18.93			
SR 120	Merribogie Road (SR1139 to SR123)		5	6.18			11.18			
SR 124	Crown Camp Road		21.98				21.98			
SR 144	Burgooney Rd (1006 to Tulli)	3.8					3.8	B	19.9	36.2
SR 153	Gormans Hill Road			11.4			11.4		13.1	19.3
SR 189	Sheet of Water Road	2.25					2.25			
SR 194	North Uabba Road	4.12					4.12			
SR 213	Pillinger Drive	0.97					0.97			
SR 214	Nillsons Lane		1.93				1.93			
SR 255	Tottenham Tip Road		2.09				2.09			
SR 277	Golf Club Road	0.81					0.81			
SR 30	Mooney Ln (323 to MR7521)			*10.17*			*10.17*	B	15.8	34.3
SR 338	Hassans Lane			2.82			2.82			
SR 339	Oppy Lane			0.81			0.81			
SR 349	Potts Lane		1.46				1.46		17.3	1.4
SR 35	Larkins Road		13.94				13.94			
SR 41	Red Heart Road			15.11			15.11		15.3	6.8
SR 41	Red Heart Rd (SR34 to SR301)		9.84				9.84	B	7.0	18.2
SR 53	Mumbil Tank Road		37.59	7.34			44.93			
SR 56	Bimbella Road		21.5	10.16			31.66			
SR 67	Wilga Ridge Road (inc. SR63)		15				15	B	14.1	21.8
SR 71	Condobolin Road	5.31	8.95				14.26		22.4	11.5
SR 74	Derriwong Road	2.86	11.37				14.23	B	13.3	21.7
	Total	**69.79**	**250.22**	**149.62**	**0**	**0**	**469.63**			
Class 6	**LOCAL ROADS**									
SR 1006	Brotherony Road		18.63	33.28			51.91			
SR 1006	Begargo Road			18.65			18.65			
SR 102	Clargo Road		12.14				12.14			
SR 1029	Glenderry Rd (1187 to SR56)		3	6.9			9.9			
SR 1029	Kiargathur Rd (56 to MR7521)		6.61	0.79			7.4			
SR 107	Deans Road			4.39			4.39			
SR 108	Fosters Lane		10.14	7.26			17.4			
SR 109	Ungarie Road			13.85			13.85			
SR 110	Euglo Trig Road		5.79	4.68			10.47			
SR 112	Barrons Road			3.52			3.52			
SR 113	Selems Road		5.15				5.15			
SR 114	Sandy Camp Road		7.93				7.93			
SR 114 A	Barbers Road			2.47			2.47			

SR 1144	Weelah Road		11.87	5			16.87			
SR 115	Elsmore Road		6.3				6.3			
SR 1151	Kadungle Road		2.73	8			10.73			
SR 1151	Back Tullamore Rd (Fif' to SR34)		7.27				7.27	B		
SR 119	Gulgo Road		6.63				6.63			
SR 12	Meryula Road			10			10			
SR 121	Camp Road		3.76	10.4			14.16			
SR 123	Stidwells Lane			9.5			9.5			
SR 127	Wilga Plains Road			8.94			8.94			
SR 128	Wilga Road			3.4			3.4			
SR 129	Bahrs Road			8.13			8.13			
SR 13	Millridge Road			19.76			19.76			
SR 130	West Milby Road			15.44			15.44			
SR 131	Hodges Road			6.08			6.08			
SR 133	Whymarks Lane			5.4			5.4	B		
SR 134	Toliman Road			10.14			10.14			
SR 135	Wardry Bus Rd			5.1			5.1	B		
SR 137A	Nolls Rd			2.99			2.99			
SR 137	Bygalorie Rd (SR161 to MR7513)			9.91			9.91	B		
SR 137	Wongalea Rd (SR120 to 161)		5	1.95			6.95	B		
SR 138	Yaddra Road		17.94	9.85			27.79			
SR 138	Yaddra Road (SR140 to 7513)			2.73			2.73	B		
SR 139	Borapine Road			4.93			4.93			
SR 14	Tigers Creek Road			1.76			1.76			
SR 140	Singh Road (SR138 to SR163)		3.94				3.94	B		
SR 142	Yarran Road			15.67			15.67			
SR 144	Burgooney Road		7.62	5			12.62			
SR 144	Burgooney Rd (1006 to Tulli)		11.64				11.64	B		
SR 145	Imries Lane			9.37			9.37			
SR 145	Imries Lane (MR321 to 146)			6.41			6.41	B		
SR 147	Four Corners Road			10.39			10.39			
SR 147	Four Corners Rd (231 to 151)			5.27			5.27	B		
SR 148	Halls Road			10.34			10.34			
SR 149	Gubbata Road			15.46			15.46	B		
SR 15	Belmore Road		5.23	6.04			11.27			
SR 150	Slant Road			12.84			12.84			
SR 151	Mudda Rocks Road			5.01			5.01			
SR 151	Mudda Rocks Rd (147 to 149)			4.33			4.33	B		
SR 152	Thomas Lane			9			9			
SR 154	Tuggerabach Road		5	10.88			15.88			
SR 155	Monument Flats Road			5.22			5.22			
SR 158	Thulloo Road			7.75			7.75			
SR 16	Kaludah Road			7.7			10.7			
SR 161	Bygalore Road			10			10			
SR 163	Murphys Road			3.94			3.94			
SR 163	Murphys Road (SR133 to 140)			2.42			2.42	B		
SR 169	Carruthers Road			5.48			5.48			
SR 18	Hillside Road		4.93	1.56			6.49			
SR 180	O'Reillys Road			6.08			6.08			
SR 181	Wargambegal Road		2.88	9.05			11.93			
SR 182	Recreation Road			12.96			12.96			
SR 188	Gleesons Road			9.35			9.35			
SR 189	Sheet of Water Road		5.92	0.92			6.84			
SR 19	Middlefield Road		5.96	15.61			21.57		8.1	6.3
SR 190	Wilgadale Road		2.2	25.72			27.92			
SR 191	Chanters Road			3.3			3.3			
SR 192	Trigalong River Road			8.44			8.44			
SR 193	River Road			11.72			11.72			
SR 197	Crawfords Road			5.96			5.96			
SR 2	Burdenda Road			8.04			8.04		10.7	9.0

SR 200	Morris Lane			7.09			7.09			
SR 201	Keeleys Lane			12.44			12.44			
SR 203	Alexanders Lane			3.35			3.35			
SR 204	Bartholomews Lane			6.3			6.3			
SR 205	Naradhan Road			5.94			5.94			
SR 206	Mt Daylight Road		6				6			
SR 208	Brewer Lane		3.33	3.4			6.73			
SR 208	Brewer Lane (SR204 to MR501)		14.47				14.47	B		
SR 212	Hoopers Road		3.02				3.02			
SR 215	McInnes Road			0.48			0.48			
SR 225	Andersons Road			1.43			1.43			
SR 250	Hadleigh Downs Road			4.1			4.1			
SR 251	Queens Plains Road			6.44			6.44			
SR 252	Lone Wilga Road			11.45			11.45			
SR 253	Strudwicks Road			3.4			3.4			
SR 261	Bulbodney Creek Road			8.6			8.6			
SR 263	Tarbolton Road			2.58			2.58			
SR 267	Adams Road			4.83			4.83			
SR 270	Cadara Road			3.22			3.22			
SR 273	Malcom Mawson Drive	0.4					0.4			
SR 274	Lunaria Lane			6.17			6.17			
SR 28	East Woodlands Road		5.5				5.5			
SR 301	Hockey Road (inc. SR40)			5.27			5.27	B		
SR 302	Gooma Road			6.69			6.69			
SR 318	Bonny Doon Lane		1.24	11.68			12.92			
SR 321	Craig End Lane		4.17	12.55			16.72			
SR 326	Watsons Road		5.4	7.4			12.8			
SR 333	Rosedale Road			17.23			17.23			
SR 334	Wylona Road			2.74			2.74			
SR 337	Glenlee Road		2.45				2.45			
SR 346	Airport Road			1.26			1.26			
SR 358	Berrys Road			6.1			6.1			
SR 36	Lorraine Lane		4.1				4.1			
SR 39	Sarsfield Road			15.63			15.63			
SR 4	Currawong Road			10.16			10.16		4.9	51.5
SR 40	Hockey Road (SR37 to SR301)			3.35			3.35	B		
SR 408	Deacons Road		11.27				11.27			
SR 42	Cinnati Lane		1.28	3.52			4.8			
SR 42	Gobondery Rd (SR43 to Boundary)		3.52				3.52	B		
SR 43	Back Tullamore Road		1				1			
SR 43	Back Tullamore Rd (42 to 1151)		6.55				6.55	B		
SR 44	Melrose Plains Rd (1347 to 57N)		27.83	9.48			37.31		10.1	14.0
SR 50	Vermont Hill Road			41.04			41.04			
SR 51	Eremeran Road			12.29			12.29			
SR 54	Tinda Tank Road			24.54			24.54			
SR 55	Needlewood Road			22.85			22.85			
SR 58	Mowabla Road		0.89	24.23			25.12		33.2	26.7
SR 62	Carlisle Road		7.23	15			22.23		12.4	19.0
SR 63	Wilga Ridge Road (inc. R67)		0.71	10			10.71			
SR 66	Ootha Road (SR70A - SR67)		6.41	10			16.41			
SR 66	Bloomfield Road (SR67 - 78)		3.59	4.15			7.74			
SR 7	Carolina Mine Road		4.13				4.13		6.5	0.0
SR 70	Burando Road			18.19			18.19			
SR 73	Reynella Road			6.26			6.26		9.9	15.0
SR 76	Timmins Lane			17.2			17.2		6.0	0.0
SR 79	Gillenbine Road			8.51			8.51			
SR 79	Gillenbine Road (SR67 to 71)		4.72	1.49			6.21	B		
SR 88	Fairholme Road		4.88				4.88		6.4	21.4
SR 92	Longingettin Road		2.42				2.42			
SR 94	Diggers Road	0.4					0.40	B		

SR 97	Driftway Road		3.07				3.07			
SR 97	Driftway Road (SR91 to 94)		6.93				6.93	B		
	Total	**0.8**	**335.32**	**962.46**	**0**	**0**	**1,298.58**			
Class 7	**LOCAL ROADS**									
SR 1	Wonga Road		6.96				6.96		4.1	37.9
SR 1	Wonga Road			3.8			3.8			
SR 107	Deans Road				4.36		4.36			
SR 108	Fosters Lane					7.68	7.68			
SR 111	Shephards Road				5.36	2.17	7.53			
SR 112	Barrons Road					8.07	8.07			
SR 1139	Weja Road					22.99	22.99			
SR 116	Wilkins Lane		3.4			0.54	3.94			
SR 117	Bogandillon Rd				2.09		2.09			
SR 118	Devlins Lane			8.46			8.46			
SR 119	Gulgo Road					0.63	0.63			
SR 12	Meryula Road				6.84		6.84			
SR 122	Wallaces Road			7.18			7.18			
SR 125	Pellows Road			4.39			4.39			
SR 126	Clarries Lane			17.99	7.37		25.36			
SR131	Hodges Road					5.83	5.83			
SR137A	Nolls Road					2.29	2.29			
SR 14	Tigers Creek Road				9.69		9.69			
SR 140	Singh Road			2.84			2.84			
SR 141	Kynota Road			7.29	3.63		10.92			
SR 143	Fife Road					18.2	18.2			
SR 146	Glasgows Lane (145 to 1029)			4.82			4.82	B		
SR 148	Halls Road					2.8	2.8			
SR 15	Belmore Road				4.03		4.03			
SR 155	Monument Flats Road					2.51	2.51			
SR 156	Banool Road			5.07		3.28	8.35			
SR 157	Hillgrove Road			2.13		4	6.13			
SR 160	Sunnyside Road			5	4.66		9.66			
SR 162	Ugalong Road			2.62		12.84	15.46			
SR 165	Bryants Road		1.61				1.61			
SR 166	Burkes Lane			0.69	7.36		8.05			
SR 167	Brotheroney Rd				0.25		0.25			
SR 170	Thomlinsons Road			1.89			1.89			
SR 171	*Phillips Road*			4.51			*4.51*			
SR 172	Inverheln Road			2.47	1.8		4.27			
SR 173	Block Road			2.17			2.17			
SR 175	Wilga South Road					11.13	11.13			
SR 176	Salters Road			1.37	1.37		2.74			
SR 177	Trig Hill Road			3.23			3.23			
SR 179	Kings Lane			4.7			4.7			
SR 183	Killawarra Road			5.5	5.5	5.5	16.50			
SR 184	Cargelligo Road				7.73		7.73			
SR 187	Skipworth Road			1		3.22	4.22			
SR 188	Gleesons Road					3.05	3.05			
SR 193	River Road					20.45	20.45			
SR 194	North Uabba Road		13.95				13.95			
SR 195	Elwins Road			1.63			1.63			
SR 198	Fairs Road		4.5	1.74		5.03	11.27			
SR 201	Keeleys Lane			4.2			4.2			
SR 202	Quinanes Lane				3.06		3.06			
SR 204	Bartholomews Lane			3			3			
SR 207	Kynwoor Road			8.01			8.01			
SR 209	Orrs Road			4.36			4.36			
SR 21	Boree Road			5		4.9	9.90			
SR 210	Harts Lane			3.92			3.92			

SR 215	McInnes Road					1.13	1.13			
SR 218	Kellys Road		2.34				2.34			
SR 220	Smiths Road			0.97			0.97			
SR 222	Erin Vale Road			0.89			0.89			
SR 224	Goldings Lane			1.38	5.06		6.44			
SR 225	Andersons Road					0.99	0.99			
SR 227	Korrawong Lane			2.84			2.84			
SR 254	Native Dog Road					12.25	12.25			
SR 256	Bolams Road			1.41			1.41			
SR 258	Williamsons Road					3.75	3.75			
SR 259	Simpsons Road					3.12	3.12			
SR 26	Yethera Road			4.9	18.4		23.3			
SR 260	Masons Road					5.15	5.15			
SR 261	Bulbodney Creek Road					4.17	4.17			
SR 262	Bushome Road			6.54	7.41		13.95			
SR 265	Johnsons Road				2.42		2.42			
SR 266	Tabratong Forest Road		4.4	1.4			5.8			
SR 268	Linton Lane			5.23			5.23			
SR 269	Yarrangrove Road				1.61		1.61			
SR 27	Radfords Road				9.8		9.8			
SR 271	Curran Park Road				9.18		9.18			
SR 272	Logans Road			2.49			2.49			
SR 273	Malcom Mawson Drive					0.52	0.52			
SR 275	Thompsons Road			1.25		2.05	3.30			
SR 276	Avoca Road		1.30	3.17			4.47			
SR 278	Bilgola Road			0.85		1.65	2.5			
SR 29	Cajildry Road		2.8	3		3.38	9.18			
SR 303	Gleninga Road			6.57			6.57			
SR 304	Wyoming Road			6.95			6.95			
SR 305	Bensons Road			4.63	4.35		8.98			
SR 306	Kirks Road			5			5			
SR 307	Gilgais Road			1.7		5.22	6.92			
SR 308	Moonbah Lane			5.15			5.15			
SR 309	Walkers Hill Road		1.54		5.3		6.84			
SR 31	O'Days Road		2.33				2.33			
SR 310	Mayamley Mine Road				3.05		3.05			
SR 311	Mogille Road				9.66		9.66			
SR 313	Red Heart Road					3.54	3.54			
SR 314	Fisks Road					1.13	1.13			
SR 316	Baratta Road					2.09	2.09			
SR 317	Micabil Road				0.65	1.12	1.77			
SR 319	Mount Tilga Road		2.8				2.8			
SR 32	Rose Hill Road			2.49		4.48	6.97			
SR 320	Emu Plains Road					1.61	1.61			
SR 321	Craig End Lane				10.1		10.1			
SR 322	Woolshed Hill Road					4.19	4.19			
SR 323	Micabil-Gulgo Road					13.85	13.85			
SR 324	Stuckeys Road					1.77	1.77			
SR 325	Kiacatoo Siding Road			0.48			0.48			
SR 327	Kiagarthur Road					11.59	11.59			
SR 328	Fifield-Coffey Road					5.96	5.96			
SR 329	Boona Tank Rd (out of road reserve)				1.3		1.3			
SR 33	Pietchs Road			2.11			2.11			
SR 330	Mamie Road					5.14	5.14			
SR 331	Carpina Road					2.1	2.1			
SR 332	Bakers Road					8.53	8.53			
SR 334	Wylona Road				4.73		4.73			
SR 335	Stewarts Lane			5.64			5.64			
SR 336	Earls Road			5.83			5.83			
SR 348	Aerodrome Road				0.85		0.85			

SR 351	Baxters Road			3			3			
SR 352	Gubondery Tank Road				1.31		1.31			
SR 354	Basett's Road			2.42			2.42			
SR 356	Dunneil Road		3.93				3.93			
SR 357	Clemsons Lane			1.26			1.26			
SR 359	Negang - Cowal Forest Road			1.77			1.77			
SR 36	Lorraine Lane				1.86		1.86			
SR 360	Sunrise Lane			10.45			10.45			
SR 361	Shanklin Lane		3.22				3.22			
SR 362	Quades Road					2.74	2.74			
SR 363	Pattons Road					1.61	1.61			
SR 364	Murrumbogie Lane			3.24			3.24			
SR 365	Harrisons Road			1.2	1.2		2.4			
SR 366	Ticehursts Road			2.74			2.74			
SR 367	Derriwong Trig Road		2.42				2.42			
SR 368	Reakes Road		0.8				0.8			
SR 369	Boymirri Road			0.63			0.63			
SR 370	Williams Road			1.61			1.61			
SR 371	Newlands Pit Road					1.23	1.23			
SR 372	Woods Road		3.1				3.1			
SR 373	Hopes Road			2			2			
SR 375	L'Estrange Road		1.4				1.4			
SR 377	Waitohi Lane		1.31				1.31			
SR 378	Stock Bridge Road		0.37				0.37			
SR 38	Wattle View Lane				7.73		7.73			
SR 4	Currawong Road				4.38	11.67	16.05			
SR 40	Hockey Road (inc. SR301)				11.15		11.15			
SR 401	Murrays Road					3.73	3.73			
SR 402	Cornells Road			9.67			9.67			
SR 403	Worlands Road			4.95			4.95			
SR 404	Norris Road				0.16		0.16			
SR 406	Hills Road			3.01			3.01			
SR 407	Swansons Road			1.96			1.96			
SR 409	Delladale Lane			4.56			4.56			
SR 410	Bena Cemetery Road			1.11			1.11			
SR 411	Schultz Road			0.81			0.81			
SR 412	Millview Road		1.31				1.31			
SR 415	Denise Drive			6.4			6.4			
SR 44	Melrose Plains Rd (57N to 79)		18.35				18.35		4.4	20.5
SR 46	Boona West Road		3.07	7.75	1.65	5.36	17.83			
SR 47	Mineral Hill Road		4.51				4.51		55.7	16.4
SR 49	Myamley Road				6.77		6.77			
SR 49	Myamley Road (From SR11)		13.67		4.95		18.62	B		
SR 52	Tinda Trig Road			3.22			3.22			
SR 54 A	Arundel Road			10	4.1	6.54	20.64			
SR 55	Needlewood Road					5	5			
SR 57	Bimbella-Miabil Road					9.82	9.82			
SR 6	Billandary Road			5.5			5.5			
SR 60A	Lara Lane			8.04			8.04			
SR 61	Esmore Lane			1.5		1.72	3.22			
SR 63	Mines Road (off MR57N)			1.58		10.25	11.83			
SR 65	Euligal Lane			3.5			3.5			
SR 68	Sebastopol Rd			2.3		7.2	9.5			
SR 69	Mathews Road			5.5			5.5			
SR 7	Carolina Mine Road			2		4.53	6.53			
SR 72	Inglewood Rd				14.65	8.32	22.97			
SR 75	Ridgelands Road			4.83			4.83			
SR 77	Goobang Creek Road		1.45				1.45			
SR 8	Tottenham-Dandaloo Road					23.71	23.71			
SR 80	Byong Road			9.24			9.24			

SR 81	Currs Rd			1.29			1.29			
SR 82	Grassdale Lane			0.69	2.37		3.06			
SR 83	Blowes Road				0.95		0.95			
SR 84	Dawsons Rd			1.13			1.13			
SR 86	Gunnings Road			1.13			1.13			
SR 87	Hubbards Road		1	1.48			2.48			
SR 88	Fairholme Road			5.85			5.85			
SR 89	Avondale Road		1.15		6.62		7.77			
SR 9	Tottenham Settlement Road				8.05		8.05			
SR 93	Bandalong Road			0.88			0.88			
SR 94	Diggers Road		8.24				8.24	B		
SR 95	Cookaburragong Road		5.1	8.52			13.62			
SR 96	Ludlows Lane			5.09			5.09			
SR 98	Manna Forest Road		5	7.38			12.38			
SR 99	Weelah Road				2.9		2.9			
	Total	**0**	**129.75**	**372.62**	**249.77**	**361.02**	**1,113.16**			
	Roads Not Maintained?									
SR 159	Woodfords Rd						3.28			
SR 168	Irelands Rd						2.87			
SR 17	Glenoma Road						5.96			
SR 216	Haase Road						4.99			
SR 217	Kemptons Road						2.05			
SR 219	Wargambegal Siding Road						2.15			
SR 22	Russ Road						3.38			
SR 24	Tullamore-Middlefield Road						6.44			
SR 264	Bellevue Road						0.81			
SR 312	Turners Road						0			
SR 315	Gulgo Road						0			
SR 355	Research Station Road						3.06			
SR 374	Ridleys Road						0			
SR 6	Billandry Rd after 2nd bend from Nth						7.34			
	Total (of those with measures)						**42.33**			

Some lengths may differ from other reporting, but the data in the AMP is all based on the one spreadsheet. Some lengths have been updated from the 1990's asset register and more will occur as the asset register is updated for the fair valuation in 2012 and beyond. Some road types will change over time due to construction or to updates from inspections, or if graveled roads revert to formed roads.

SCHEDULE 2 – LEVELS OF SERVICE

1. General Background

Levels of Service in the Asset Management Plan are more specifically defined in this Schedule for each road class.

Council has a duty of care to ensure that roads are safe to use and trafficable in most conditions, even if not at high speed for minor roads. This involves assessment of need, risk and best use of funds.

Regional roads are reasonably well funded for maintenance, renewal, incremental widening and some new seals.

However, many local roads will not meet the expectations of all users, particularly those with low traffic volumes, but the available funds are not sufficient to meet all desires.

The planned level of service is tailored to the available funds in the 2011/12 budget and approximates the lowest model reported to the March 2011 Technical Services Committee, model number 8 (abbreviated to "Model 8", see later). This results in a continued and unavoidable slow decline in the overall road network. This situation cannot be halted or reversed without significant additional funds for maintenance and renewal of the assets.

Flood damage grants are intended to return roads to their previous condition. They are offered on a pro rate basis relating to prior condition and claims are usually cut back on assessment. Some of a road may be improved by focusing funds on those parts, but overall it is not upgraded and the network continues to decline. The flood damage repairs may use most of the council's gravel resheeting capacity. Therefore, in those years, gravel resheeting allocations may be reduced and maintenance funds directed to more grading or drainage work.

In years without flood damage work, the road treatments need to maximise use of grader capacity, but include enough structural repairs with the addition of water, compaction and gravel.

Scheduled gravel resheeting on local roads usually comprises specific grant funded projects.

Allowing for some patch gravelling fixes small problems encountered during maintenance grading, but reduces the funds available for grading – a balance is required.

Maintenance grading is useful on minor roads and for temporary repairs and promotes the visibility of council's activities. It does not repair structural defects in the roads, so they continue to deteriorate.

Some more costly and slower grade, water and roll (GWR) operations must be programmed to address structural problems. The graders are more effective but cover less ground and may appear less visible to the public.

Of necessity, not all roads can be graded end to end each year. Attempting to grade every road usually leaves higher priority roads underserviced. Sometimes a dry maintenance grade can make a road in fair condition worse.

Generally only those sections of roads in need will be graded, if conditions are appropriate, allowing the graders to move around the network more quickly and effectively.

The program has flexibility to be amended if inspections reveal that particular roads are in better or worse condition than assumed for the nominal apportionment of funds at the start of the year. However, the additions and reductions need to balance. Each request affects somewhere else. It needs careful monitoring and management.

More specific aspects of the levels of service related to the classes of roads in the road hierarchy are as follows.

2. Class 2 State Road (MR61E Parkes Road and Dennison St, excluding centre traffic lanes)

Inspect regularly and manage medium to high risks immediately upon notification. Refer a low risk hazard to the next programmed visit.

Reseal parking lanes and sealed shoulders every 15 years (or as determined by inspection) and carry out bitumen patching to maintain water barrier integrity and condition generally.

The Dennison Street parking lanes have significant pedestrian usage, particularly near commercial premises, which requires control of trip hazards.

3. Classes 3 to 7

Table S2.1 below indicates the current technical or operational levels of service for road classifications 3 to 7. They are being trialled in conjunction with spreadsheet modelling of the 2011/12 budget.

Table S2.1 – Technical or Operational Levels of Service for Roads in Classes 3 to 7

Roads Hierarchy:	Class 3	Class 4	Class 5	Class 6	Class 7
Maintenance Priority	Highest	Medium to high.	Medium.	Low.	Lowest. Rare on unformed roads.
Risk management	Mitigate medium to high risks immediately upon reporting or notification. Refer low risk hazards to the next programmed visit	Mitigate medium to high risks immediately upon reporting or notification. Refer low risk hazards to the next programmed visit.	Mitigate medium to high risks immediately upon reporting or notification. Refer low risk hazards to the next programmed visit.	Repair isolated hazards if they are a medium or high risk. Otherwise install warning signs or make temporary repair and leave for a programmed maintenance visit.	Repair isolated hazards if they are a medium or high risk. Otherwise install warning signs or make temporary repair and leave for a programmed maintenance visit.
Clear zone for safety	High priority 5m where practicable	High priority 5m where practicable	Medium to high priority 5m where practicable	Medium priority – up to 5m desirable if practicable & low cost, limit vegetation & habitat loss	Low priority – up to 5m desirable if practicable & low cost. Limit vegetation & habitat loss
SEALED	**ROADS**			Minimal. Some urban streets and rural causeways.	Minimal. Some urban streets and rural causeways.
Average reseal frequency	20 years	20 years	20 years	20 years subject to inspection and need, if applicable.	20 years subject to inspection and need, if applicable.
Design speed for sealed rural roads	100 km/hr	100 km/hr	Prefer 100 km/hr. Maybe 80 km/hr for reconstruction	80 - 100 km/hr if applicable.	80 km/hr if applicable.
Width – sealed rural roads	2 lanes. Local roads 7.2m seal, 8.5m wide formation. Regional roads 8.0m wide seal on 10.0m formation.	2 lanes, 7.2m seal on 8.5m formation. Consider 8.0m seal on 10.0m formation for regional roads if likely to move up to class 3. Widen narrow roads if possible.	1 or 2 lanes. Most 1 lane seal roads unlikely to change – need adequate shoulders for passing. Opportunistic widening to 2 lanes, 7.2m seal, 8.5m formation e.g. top up grant, or needs reconstruction, or at crests and bends. New construction - unlikely.	If any, 1 lane, 4.0m seal with shoulders for passing on 6.0m formation. Narrow rural roads - minimal length in class, general widening is unlikely. Maybe widen at crests or bends, if assessed as high risk.	If any: 1 lane, 4.0m seal with shoulders for passing on 6.0m formation. Narrow rural roads - minimal length in class, general widening is unlikely. Maybe widen at crests or bends, if assessed as high risk.
UNSEALED	**ROADS**				
Width (formation	2 lanes. 7.0m gravel on	2 lanes. 7.0m gravel on	2 lanes. 7.0m gravel on	1 lane. 6.0m wide formation.	1 lane. 6.0m wide formation.

includes shoulders)	8.5m formation.	8.5m formation.	8.5m formation	May reduce wider roads to 1 lane. If retain 2 lanes, 8.5m formation. If graveled, maximum 4.0m width (5.0m on poor soil).	Reduce roads to 1 lane if possible. If retain 2 lanes, 8.5m formation. If graveled, maximum 4.0m width.
Extent of gravel	All unsealed roads have been gravelled. Repair crown to shed water. **Regular** gravel resheeting.	Approx half graveled. Repair crown to shed water. **Regular** gravel resheet on previously graveled roads. Roads formed from natural gravels - unlikely to be graveled except localised repairs or to rebuild worn formation or to improve drainage.	Approx 2/3 roads are graveled & 1/3 are formed from natural gravels. Repair crown to shed water. **Some** expectation of gravel resheeting if previously graveled. If formed but not previously graveled, it is unlikely to be graveled except for localised patch gravel repairs to reduce risk.	Largest class. Most roads comprise natural materials of varying quality, with little or no gravel. If possible, form a high crown to shed water. Unlikely to import material to raise low formations. Maybe flooded for periods if not accessible to grader - dig pump sump? **Low** expectation of gravel sheeting or resheeting, whether previously graveled or not. May patch gravel some localised problems?	Most roads comprise natural materials of varying quality, with little or no gravel. If possible, form a high crown to shed water. Unlikely to import material to raise low formations. Maybe flooded for periods if not accessible to grader - dig pump sump? **No** expectation of gravel sheeting or resheeting, whether previously graveled or not. May patch gravel some localised problems?
Accessibility	May be impassable briefly when very wet. Keep shape and pavement in good condition to aid drainage and minimise duration & frequency of non-serviceable periods.	May be impassable briefly when very wet. Keep shape and pavement in good condition to aid drainage and minimise duration or frequency of non-serviceable periods.	Trafficable in all but very wet conditions. Use limited GWR budget to improve or retain good shape and pavement to aid drainage and minimise duration or frequency of non-serviceable periods. Condition more variable than higher classes.	Trafficable in dry conditions, not necessarily at desired speeds or comfort level. May be impassable when wet and until the road dries out. Prioritise repairs if grain haul or bus route. Condition more variable than higher classes. Refuse requests to upgrade except to improve access for serious medical cases or school bus.	Trafficable in dry conditions, not necessarily at desired speeds or comfort level. May be impassable when wet and until the road dries out. Condition more variable than higher classes. Refuse requests to upgrade except to improve access for serious medical cases or school bus.
Repair storm damage	High priority, repair as soon as conditions allow access for plant.	High priority, repair as soon as conditions allow access for plant.	Repair when accessible. Repairs may be temporary until higher priority roads completed.	May delay repairs until after higher priority roads – if so, need warning signs &/or temp repairs to restore access.	May delay repairs until after higher priority roads – if so, need warning signs &/or temp repairs to restore access.

Upgrade drainage, cut future costs	High priority	High priority	Desirable.	Maybe if repairs costly & frequent. Limited funds.	Maybe if repairs costly & frequent. Limited funds.
Formal inspection	At least 2 per year	At least 2 per year	At least 2 per year	At least 1 per year	At least 1 per year
Regular programmed gravel resheeting	Highest priority - aim to resheet each road every 5-10 years on average, (i.e. 10-20% of roads)	High priority - aim to resheet each road every 10 years on average, (i.e. 10% of roads)	Medium to high priority - aim to resheet each road every 15 years on average, (i.e. 7% of roads)	Low priority. Resheet previously graveled roads **if** funded, or opportunity arises from additional external funds. 20 years average cycle or 5% of existing graveled roads if possible. Formed roads (not graveled) – no gravel sheeting, unless to rebuild worn down natural gravels to fix drainage and is budgeted.	Unlikely. Low priority. Resheet previously graveled roads **if** funded, or opportunity arises from additional external funds. 20 years average cycle or 5% of existing graveled roads if possible. Formed roads (not graveled) – no gravel sheeting, unless to rebuild worn down natural gravels to fix drainage and is budgeted.
Patch gravelling maintenance	Highest priority. Patch gravel with GWR between resheets	High priority. Patch gravel with GWR between resheets	Medium priority. Patch gravel with patch GWR between resheets.	Medium priority. Occasional repair to maintain access, not necessarily high speed.	Low priority. Occasional repair to maintain access, not necessarily high speed.
Normal dry weather operating speeds for most vehicles in reasonable comfort	ARRB national "best practice" standard 64-80 km/hr. Users desire 100 km/hr.	ARRB national "best practice" standard 50-70 km/hr. Users desire 100km/hr.	ARRB national "best practice" standard 50-70 km/hr. Users desire 100 km/hr.	ARRB national "best practice" standard 50-70 km/hr. Users desire 100 km/hr.	ARRB national "best practice" standard 50-70 km/hr. Users desire 100 km/hr.
Programmed light maintenance grade (dry grade)	None scheduled but may replace one GWR to reallocate saving.	1 per year. Alternate with programmed GWR.	1 per year, subject to inspection for maximum 90% coverage of class.	1 per year, subject to inspection for maximum 75% coverage of class. Only grade the worst sections – e.g. dry weather speed for light vehicles falls to 50 km/hr. Annual coverage 100% unlikely, generally 50-100% or 1-2 years average between visits.	1 per year, subject to inspection for maximum 33% coverage of class. Only grade the worst sections – e.g. dry weather speed for light vehicles falls below 50 km/hr. Annual coverage 100% unlikely, generally 25-50% or 2-4 years average between visits.

				Bypass segments if surface is stable and trafficable, e.g. partly grassed, no high spots, no deep potholes, corrugations or wheel ruts.	Bypass segments if surface is stable and trafficable, e.g. partly grassed, no high spots, no deep potholes, corrugations or wheel ruts.
Unscheduled light maint' grade	Emergency only & offset by savings elsewhere	Emergency only & offset by savings elsewhere	Emergency only & offset by savings elsewhere	Emergency only & offset by savings elsewhere	Emergency only & offset by savings elsewhere
Programmed light GWR	2 per year	1 per year	No.	No.	No.
Unscheduled light maintenance grade, water and roll (GWR)	Yes but offset cost. Priority to harvest & bus routes?	Yes but offset cost. Priority to harvest & bus routes?	Yes - occasional GWR of problem spots up to 10% of the class. If necessary, do temporary repair with maintenance grade & program GWR repair when GWR team in area. Priority to harvest & bus routes?	GWR small problem spots up to 1% of class per year: • If dry weather speed for light vehicles drops below 50 km/hr. • E.g. bull dust, causeways, bog holes, harvest/bus routes & poor quality natural soils. • Do temp repair & program GWR when team in area.	GWR small problem spots up to 1% of class per year: • If dry weather speed for light vehicles drops below 50 km/hr. • E.g. bull dust, causeways, bog holes, harvest/bus routes & poor quality natural soils. • Do temp repair & program GWR when team in area.
Heavy maintenance grade, water and roll (GWR)	Up to 10% of roads during light GWR. Repair damage. Rehabilitate sections where normal dry weather operating speed for most vehicles drops below 64 km/hr. May involve patch resheeting.	None budgeted. Offset cost elsewhere. Repair damage during scheduled light GWR. Rehabilitate sections where dry weather speed for most vehicles drops below 64 km/hr. May involve patch resheeting.	None budgeted. Offset cost elsewhere. Minimal heavy repairs during light GWR patch repairs, if severe damage or sections where normal dry weather operating speed for most vehicles drops below 50 km/hr. May involve patch resheeting.	No. Consider emergency repair if essential, but need large savings to offset high cost. 1 km heavy GWR equals 11km of maintenance grade.	No.