Asset Management Plan

Transport Infrastructure (Unsealed Roads)

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1. EXECUTIVE SUMMARY

Shoalhaven City Council provides approximately 1,671 Kilometres of roads that play a critical and important part in the Shoalhaven transport network and that supports the delivery of many services provided by the Council.

Approximately 341 Kilometres of these roads are unsealed or gravel roads and the effective management of these assets is essential for the provision of access to rural communities; the movement of primary produce to markets; movement within State Forests and defence training areas; haulage roads for the quarry and timber industries, recreational and tourist pursuits. It is to be noted that the length of unsealed road has decreased by about 14% since 2005 primarily due to the emphasis on road sealing in past programs.

The previous version of this Asset Management Plan (AMP) advised of significant funding shortfall especially with regard to renewal of the gravel pavement. However, it is considered that this shortfall is no longer applicable. This is primarily due to the recent significant reduction in the length of gravel roads, improvement in the condition of the network and a review of the Useful Life of the gravel pavement.

The estimated 2012/13 funding gap is now $210,000 for a Sustainable Level of Service and $106,000 for a Desirable Level of Service. Maintenance and Renewal funding levels are satisfactory to high and it is primarily with regard to the Desirable Level of Service for road sealing that funding is deficient.

The amount of resources available for gravel road maintenance has steadily declined. In 1988 Council operated 15 graders on maintenance & construction activities and in 2003 there were 5 graders. With a reducing length of gravel road a further reduction in graders should be considered.

This AMP is the continuation of an ongoing process to provide a sustainable approach to the management of this critical asset having regard to the inevitability of limited resources available to Council to continue to ensure the economic, environmental and social sustainability of the City.

The Plan recognises the continuous improvements that have been achieved by Council in the development of the City to date and the fact that the existing unsealed road network generally provides a satisfactory level of service to the community.

There are several issues relating to development consent conditions arising from this Plan and that will require further investigation and review. The more important aspects are –

- The traffic volume that triggers the need for the sealing of rural gravel roads is recommended as 100 vehicles per day (VPD). This is an increase from the previous criteria of 80VPD. This trigger if formally adopted could impact on the manner in which engineering/access consent conditions are specified for subdivisions and other development such as ‘Bed & Breakfasts’. The impact could be that the ‘developer’ needs to seal roads when the traffic generation from the proposed development causes the 100VPD trigger to be reached. This is a

different approach to having a Section 94 contributions plan with Council part funding the sealing.
- With regard to 'sacrificial seals', will Council still require a developer to upgrade the standard of the road pavement if a 'sacrificial seal' is already in place.

The Urban Road and Rural Road Sealing Strategies will need to be reviewed annually to account for completed works and adjust priorities due to changes in traffic volumes and extent of development. These will be considered incidental changes to the Plan and will not trigger the need for public exhibition.

1.1. The Purpose of the Plan

Shoalhaven City Council is committed to providing a quality road network for the benefit of residents and visitors.

This Asset Management Plan has been prepared to guide Council and the Community with regard to the strategies (and funding needs) to maintain the unsealed road network and to guide Council in the allocation of resources for sealing of the unsealed roads.

Unsealed roads play a critical and important part in the Shoalhaven transport network providing access to rural communities; the movement of primary produce to markets; movement within State Forests and defence training areas; haulage roads for the quarry and timber industries, recreational and tourist pursuits. Additionally, regular school bus services operate on many unsealed roads.

1.2. Asset Description

This Asset Management Plan covers all unsealed road pavements, within the City boundaries, that are part of the general public transport network and that are maintained by Council. It does not include gravel roads/access tracks within recreation reserves and that have a principal purpose of recreation reserve access.

The unsealed roads generally have an imported gravel pavement but some consist of natural in-situ pavements. Asset data is not available to detail the extent of imported and in-situ pavements.

Details of the road network are contained in the corporate asset register (Conquest) and data is regularly updated from works records and from details from subdivision plans.

The current network consists of –
- Urban – 9.82 Km
- Rural - 331.63 Km

It is to be noted that the lengths only includes roads that are regularly maintained by Council. There are also a number of council roads that are not regularly maintained but for which Council has a risk liability. These include, as example, the roads forming the Verons, Nebraska & Jerberra Estates. Information on the total length of this set of roads is currently not available.

1.3. Levels of Service

The past, current and recommended Levels of Service for activities to unsealed roads are shown in the following table.

Activity	Level of Service 2004/05	Level of Service adopted in 2008/09	Current Level of Service 2011/12	Desirable Level of Service	Sustainable Level of Service
Grade	1.8 times per on average	2 times per year on average	2.1 times per year on average	2 times per year on average	2 times per year on average
Gravel Resheet (incl. sacrificial seal)	Every 23 years on average	Every 22 years on average	Every 14.5 years on average	Every 15 years on average	Every 15 years on average
Urban Road Sealing	All within 22 years	All within 6 years	All within 30 years	All within 30 years	All within 30 years
Rural Road Sealing (>100 VPD)	All within 44 years	All within 15 years	All within 55 years	All within 20 years (100VPD)	All within 55 years (100VPD)

It is to be noted that it is recommended that the criteria for listing a gravel road in the Sealing Strategy be increased from 80VPD to 100VPD.

The perceptions of the community on the service levels provided by the road network normally relate to issues such as:-

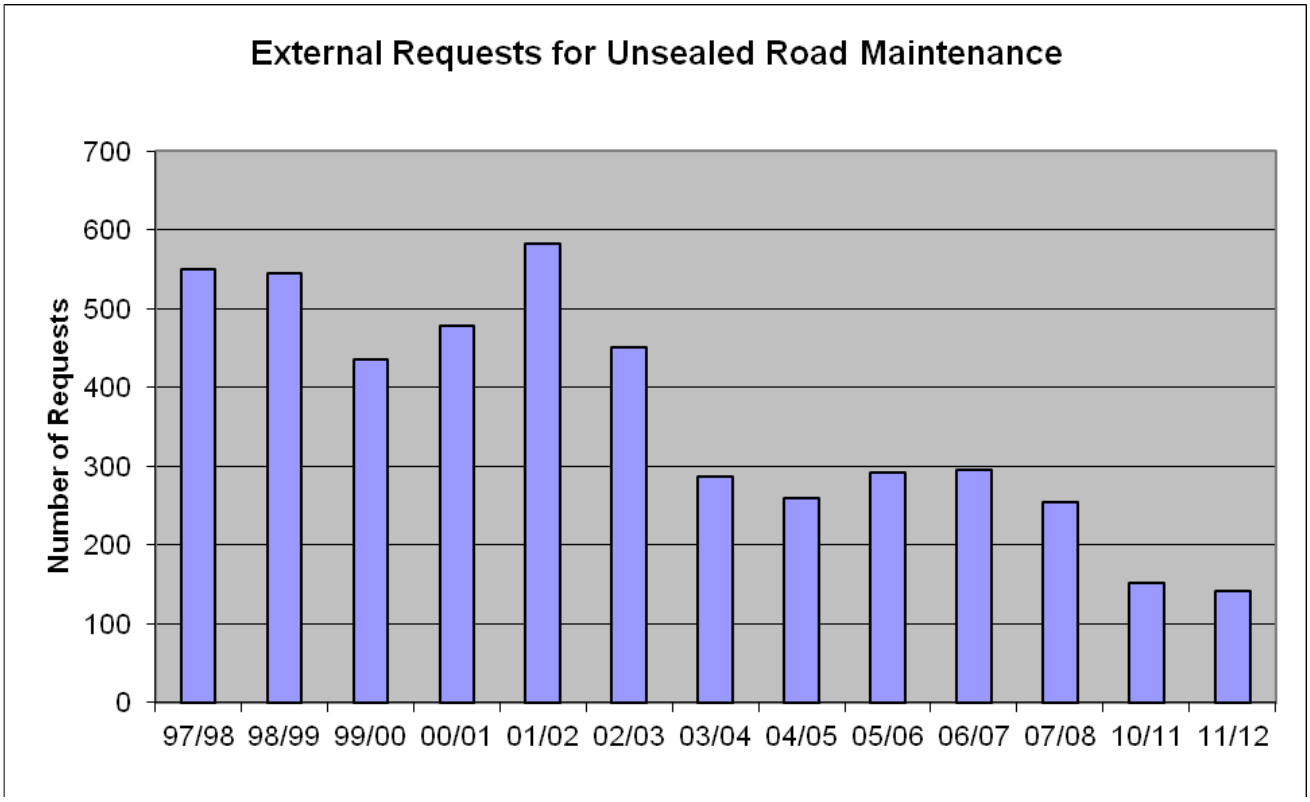
Accessibility/location,
Safety,
All weather access,
Dust hazards,
Travel times,
Ride quality, and
Visual/environmental attributes.

Measurable factors that directly contribute to the ability of the unsealed road to deliver an acceptable level of service typically include:

Quantity and condition of existing gravel pavement,
Climatic conditions,
Scouring and erosion potential,
Traffic volume and heavy vehicle usage,
Road gradient and alignment,
Drainage and most importantly
User satisfaction normally measured by number and type of service requests.

With regard to user satisfaction indications, the following table reinforces the importance of the role of gravel or unsealed roads in the perception of the community in Shoalhaven City. It

is to be noted that there has been a significant reduction over time in the number of requests for maintenance action.



1.4. Future Demand

There is an expectation with our changing demographics that residential access should be on a sealed pavement. However, Council has no obligation to seal gravel roads and in fact has an obligation to retain low volume roads as unsealed due to the lower whole of life cost. The current Policy is to only seal roads that have an average daily traffic of over 100 vehicles.

Expert opinion from the Australian Road Research Board suggests that the whole of life cost is lower for sealed roads at about 150 vehicles per day.

This would reduce the estimated cost for sealing rural roads from $16.7Million to $10.0Million. It is recommended that the criteria for 'qualifying' for inclusion in the Rural Road Sealing Strategy be increased to 100VPD as the *Sustainable Level of Service.*

The unsealed road network has reduced from 487 Km in 2005 to 397 Km in 2008 and to 341 Km in 2012. Over the past 4 years this is a decline of 14%. Funding levels are reducing and it is assumed in modelling that the network will reduce 2% per annum into the future.

1.5. Lifecycle Management Plan

The following annual programs form part of the Unsealed Road Service –

- Maintenance Grading

    - Grading is carried out on a needs basis in accordance with the Risk Management Procedure. An annual allowance is made for the placing of additional gravel to short sections as required.
- Gravel Resheeting (capital expenditure)
    - Annual program is developed based on recommendations from field staff as to the roads that require renewal of the gravel pavement
- Sacrificial Seal Program (capital expenditure)
    - Annual program is developed and comprises roads identified for gravel resheeting that meet the criteria of low traffic volume, being - no heavy vehicles, satisfactory existing formation & alignment, drainage & subgrade.
- Low Cost Seal Program (capital expenditure)
    - Annual program for the sealing of short sections of Urban Roads. Funding is not available every year
- Urban Road Sealing Program (capital expenditure)
    - Annual program is undertaken in accordance with adopted priorities (Urban Road Sealing Strategy – refer Attachment 1) and to available funds.
- Rural Road Sealing Program (capital expenditure)
    - Annual program is undertaken in accordance with adopted priorities (Rural Road Sealing Strategy – refer Attachment 1) and to available funds.

Maintenance
The main maintenance activities for unsealed roads are –

- Maintenance Grading
- Emergency response to significant pavement damage/deformation

The 2011/12 maintenance grading expenditure allowed for an average grading frequency (over all roads) of 3.9 times per annum. This is considered a high Level of Service and it is recommended that the average frequency be reduced to 2 times per annum as a Sustainable Level of Service. This would result in a reduction in expenditure from $1,197,000 per annum to $614,000 per annum.

Emergency response needs are difficult to predict as it is dependent on storms/weather. An annual allowance is made to cover such events and if required the budget can be amended.

Gravel Resheeting (Capital Renewal)
Gravel resurfacing is necessary on unsealed roads due to loss of pavement material resulting from degradation of stone; climatic conditions; scouring and erosion; traffic abrasion; maintenance practices and pavement material selection. The requirements for replacing gravel on the unsealed road network is determined by taking into account the annual traffic; annual rainfall; road gradient and the type of gravel used. Gravel resheeting is generally only targeted to rural roads as urban roads only require occasional gravel addition.

It is essential to maintain the provision of an adequate gravel pavement layer to allow for vehicle loading, provide for all weather usage and allow for maintenance grading. This is an essential component of gravel road maintenance. An annual program is developed based on remaining gravel depth, traffic volume, safety and customer satisfaction criteria. This is supplemented with an annual program for ‘Sacrificial Seals’ as indicated in this Asset Management Plan.

'Sacrificial' Sealing

The primary requirements to achieve customer satisfaction with the network condition are to

- Reduce dust nuisance – dust suppressant treatments are up to $2 per sqm and the treatment effectiveness is about 3 months. The only cost effective treatment is sealing.
- Improve traction, particularly in wet weather – a good quality gravel pavement will normally provide satisfactory service but there is still the risk of loose surface materials in dry weather and
- Improve pavement 'ride' – gravel pavement are subject to potholing and shoving and (generally) have a rougher ride than sealed pavements.

Accordingly, Council has instigated an annual 'Sacrificial' Seal Program which is an option that is currently used by a number of councils.

This option entails the application of a 10mm primer seal (single coat) to roads where the gravel pavement has been replenished under the annual Gravel Road Resheet Program. Roads suitable for this treatment are low traffic volume, nil or minimal heavy vehicles, no alignment or drainage issues and no subgrade problems. Treatment consists of placement of 100mm depth of pavement and a 10mm primer seal. The seal is expected to last up to 8 years and would then be ripped and reshaped (if required) and another primer seal applied.

The treatment has the following advantages –

- Dust suppression
- Lower whole of life cost
- Higher Service Level
- Customer satisfaction
- Less sediments into the environment (current loss about 40,000 tonnes per year) and
- ESD benefits due to reduced gravel use.

The useful life of gravel pavements is a function of several factors including traffic volume, heavy vehicles and drainage & grade.

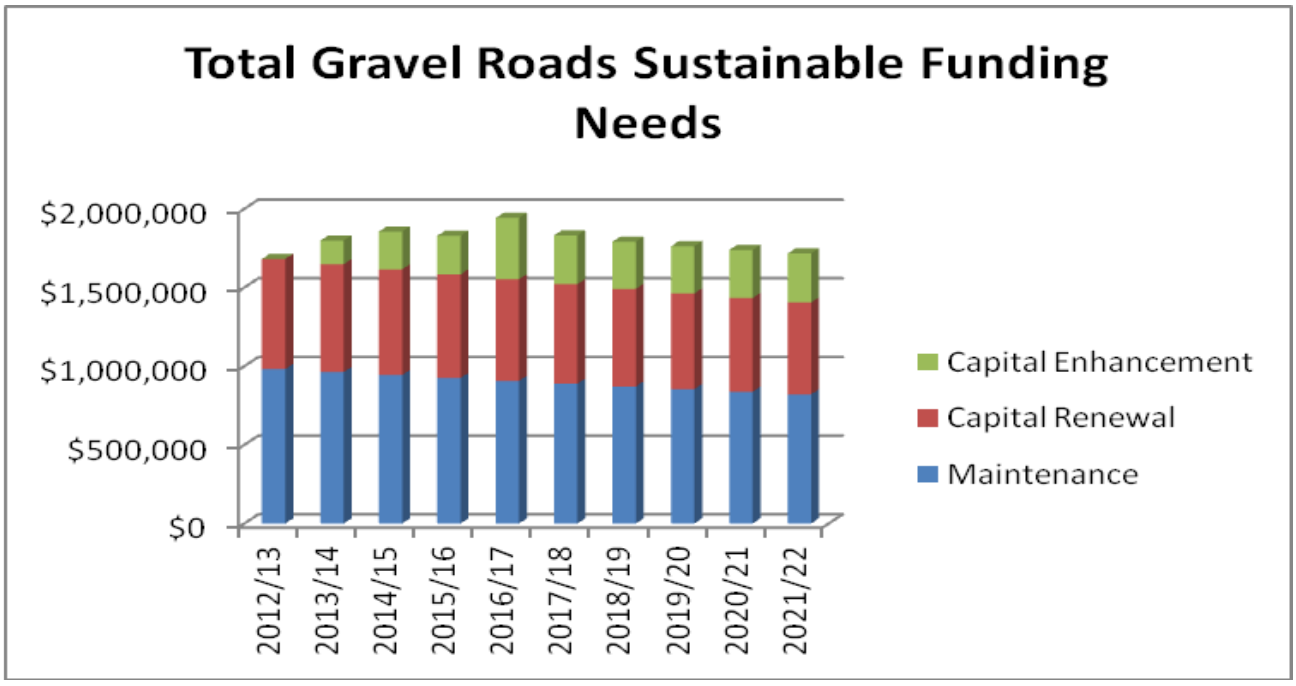
The original Unsealed Roads AMP recommended a Level of Service of an average interval between gravel resheeting of 6 years. This required annual funding of about $3Million. The current (2011/12) Level of Service is every 14.5 years.

Following the sealing of most of the high traffic volume roads, it is considered that the average frequency for gravel resheeting can be extended and a *Sustainable Level of Service* of an average of 15 years is recommended. This useful life has been modeled and it is predicted that an annual budget of $650,000 will give satisfactory long term network condition.

It is also recommended that an annual budget of $50,000 be allocated for Sacrificial Seals to give an annual total budget of $700,000.

1.6. Financial Summary

The recommended funding levels for Sustainable Level of Service are shown on the following chart.



The funding requirements for Sustainable Level of Service compared to current funding are shown in the following Table:

	Recommended Sustainable Level of Service	Required annual funding	Budget 2012/13 (average of 10 yr Fin Plan for capital items)	Annual Funding Shortfall
Maintenance				
Grading incl gravel allowance	2 times per year	$966,000	$1,174,000	($208,000)
Gravel resheeting	Every 15 years	$650,000	$560,500	$89,500
Low Cost & Sacrificial Seal		$50,000	$116,100	($66,100)
Other		$15,000	$40,000	($25,000)
Totals		$1,681,000	$1,890,600	($209,600)
Urban Road Sealing (Capital Works Program)	Within 30 years	$70,000 (average)	$70,000	$0
Rural Road Sealing (Capital Works Program)	Within 55 years	$183,000 (average)	$184,000	($1,000)
Grand Totals		$1,934,000	$2,144,600	($210,600)

The current funding levels meet Sustainable LoS for sealing of gravel roads and over-servicing for maintenance grading.

1.7. Asset Management Practices

1.8. Monitoring and Improvement Programme

The following actions are proposed to improve this Plan –

- Review the Useful Life of gravel pavements
    - *Roads Asset Manager by 30th June, 2014*

The following Key Performance Indicators will be used to gauge satisfactory outcomes from this Asset Management Plan and shall be measured as at 30th June each year –

- Length of (remaining) gravel road (urban & rural) as at end of period
- Number of customer requests/reports in the period and
- Number of public liability claims in the period.

All Asset Management Plans are reviewed on a 4 yearly cycle and all reviews are undertaken within 1 year of council elections. The Urban & Rural Sealing Strategies are reviewed annually in conjunction with the preparation of the draft Operations Plan.

1.9. Recommendations

The following actions are recommended –

- Review and consider the implementation of a regular cyclic grading schedule (based on an average of 2 times per annum) in conjunction with the review of the *Unsealed Road Risk Management Procedure*
    - *Roads Asset Manager and Asset Maintenance Manager by 31st January, 2014*
- When the above review is completed
    - Review the option to reduce the number of graders based on an average grading frequency of 2 times per annum
    - Consider a reduction in maintenance funding as of 2014/15
- Review development consent conditions to ensure that developers are responsible for the sealing of gravel roads if the development increases traffic volume above 100VPD.
- Consider the increasing of funds in the 10 Year Financial Plan for the sealing of rural gravel roads.
- In the review of the *Unsealed Road Risk Management Procedure* consider decreasing the response time for hazards from 12 months to 6 months.

2. INTRODUCTION

Shoalhaven City Council is committed to providing a quality road network for the benefit of residents and visitors.

This Asset Management Plan has been prepared to guide Council and the Community with regard to the strategies (and funding needs) to maintain the unsealed road network and to guide Council in the allocation of resources for sealing of the unsealed roads.

Unsealed roads play a critical and important part in the Shoalhaven transport network providing access to rural communities; the movement of primary produce to markets; movement within State Forests and defence training areas; haulage roads for the quarry and timber industries, recreational and tourist pursuits. Additionally, regular school bus services operate on many unsealed roads.

2.1. Background

This Plan relates to unsealed roads that form part of the Transport Network and these are (generally) contained within 'road reserves'. As at 30/06/2012 the total lengths of unsealed roads were:-

- Urban – 9.82 Km
- Rural - 331.63 Km

Unsealed roads/car parks to recreation areas and community buildings are not considered under this Plan.

The ***Community Strategic Plan*** includes the following 'Vision 2020' –

"We will work together in the Shoalhaven to foster a safe and attractive community for people to live, work, stay and play; where sustainable growth, development and environmental protection are managed to provide a unique and relaxed lifestyle."

Although not specifically mentioned, roads are essential for access and transport to cater for the above.

The relevant ***Strategies*** identified in the ***Community Strategic Plan*** are –

1.1.4 Maintain and improve road, cycling and pedestrian networks and associated infrastructure.

2.5.1 Ensure that the provision of community infrastructure and services meets best practice environmental standards and controls.

3.1.4 Maintain, renew and enhance existing infrastructure to support economic activity and investment.

The perceptions of the community on the service levels provided by the road network normally relate to issues such as:-

Accessibility/location,
Safety,
All weather access,
Dust hazards,
Travel times,
Ride quality, and
Visual/environmental attributes.

All of these perceptions can have impact on the satisfaction of criteria for the achievement of Environmental, Economic Community and Council's image/reputation objectives.

Service provision currently consists of the following activities and the Service is fully provided by the Council in-house workforce of the 'Asset Maintenance' Unit of the Works & Services Section –

- Routine Grading – reshaping & compacting existing gravel pavement; allowance included for minor gravel importing
- Gravel Resheeting – undertaken when existing gravel pavement has worn away and requires replenishment (typically placing of 100mm depth of pavement).
- Sacrificial Seal Program – undertaken as a maintenance activity to supplement the annual Gravel Resheeting Program. An annual allowance is made to place a single coat seal to selected roads that are due for Gravel Resheeting. Selected roads must meet certain criteria as detailed later in the Plan.
- Road Sealing Strategy (Urban & Rural) – Program adopted by Council as part of the annual *Delivery Program & Operational Plan*.
- Emergency & Other – during periods of storms, interim actions may be required to correct large scours, correct drainage or other actions to make safe roads. This can include hand placing of gravel to scours. Work to signage, guideposts and roadside vegetation is included in other asset plans.

2.2. Goals and Objectives of Asset Ownership

The objective of ownership of public roads is to provide safe, accessible public access to private property, provide access for business operations and access to Council and State recreational areas.

Ideally, the highest Level of Service is for all roads to be sealed. However, when traffic volumes are less than 100VPD the lowest cost surface option is gravel (reference Australian Road Research Board).

Shoalhaven Council has adopted a Policy of only considering road sealing for rural roads under the Capital Program when traffic volumes exceed 100 VPD. For urban roads Council Policy is to seal **all** roads.

Additionally, Council has also adopted a Policy of providing a 'dust suppressant' seal or 'Sacrificial' seal to low volume roads with adequate drainage and subgrade at the time of gravel resheeting.

Gravel Resheeting is the renewal of the gravel pavement at such time as the existing pavement has eroded/reduced to the extent of inadequate gravel for routine grading operations.

Hence, one of the primary objectives of Unsealed Road activities is to reduce the extent of unsealed roads in order to improve customer satisfaction and environmental outcomes.

2.3. Plan Framework

The key guiding documents for this AMP are:

Council's *Asset Management Policy*

The policy is used as a base of principles and requirements to create an AMP that is in accordance with the organisation's strategic plan. (2011, International Infrastructure Management Manual)

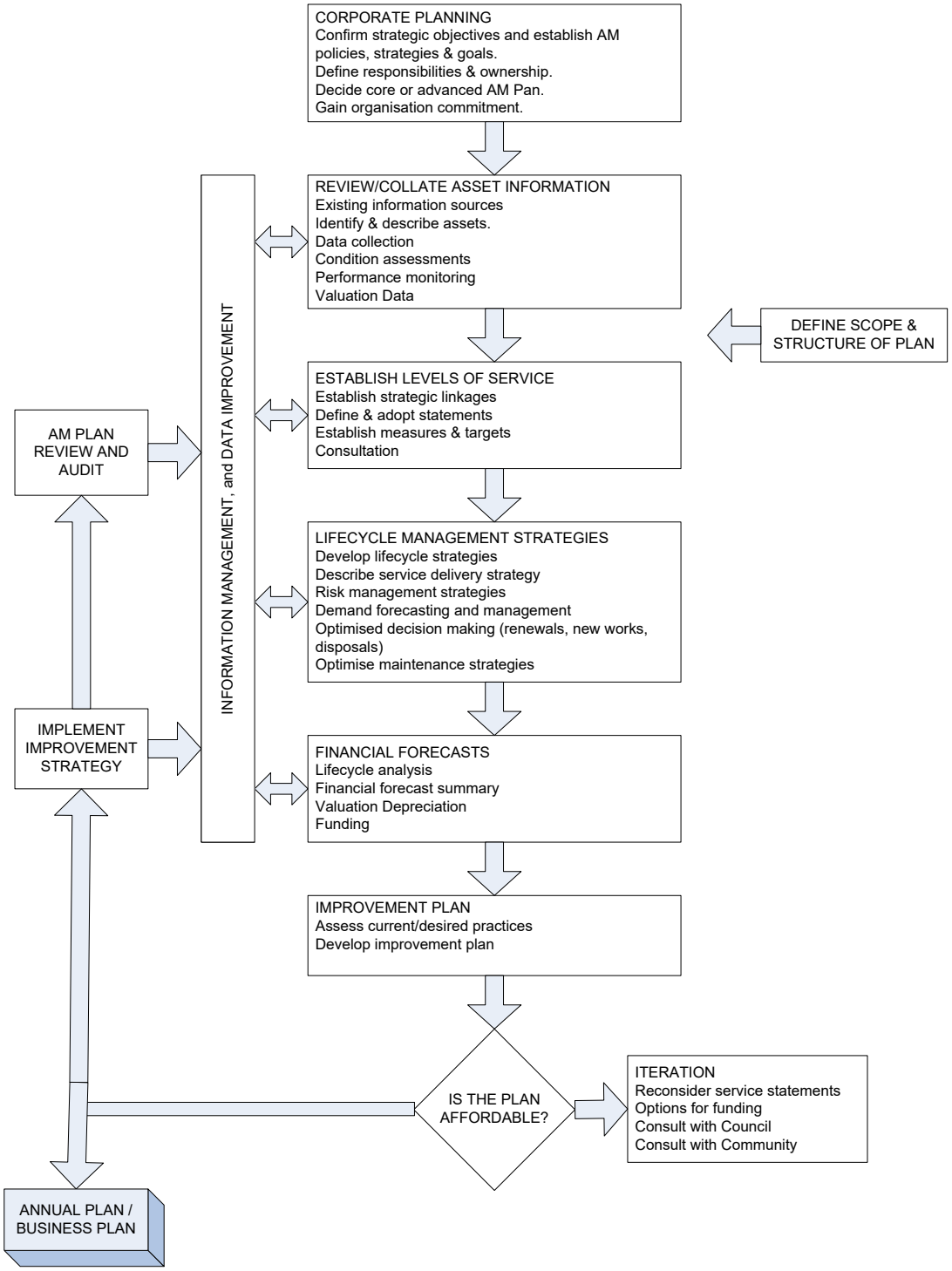
Council's *Asset Management Strategy*

A strategy for asset management covering development and implementation of plans and programs for asset creation, operation, maintenance, rehabilitation/replacement, disposal and performance monitoring to ensure desired level of service and other operational objectives are achieved at optimum cost.

The basic key elements of the AMP consist of:

- Level of service – specifying the services and levels of service to be provided by Council
- 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 the required services
- Financial summary – what funds are required to provide the services
- Plan Improvement and Monitoring – how the plan will be monitored to ensure it is meeting Council's objectives

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



Road Map for preparing an Asset Management Plan
Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11.

2.4. Core and Advanced AM

This Asset Management Plan is considered to be at a level between Core and Advanced. Further review/investigation is required to refine the actual useful life of the local gravel pavements. However, this Plan is considered to be adequate for corporate purposes.

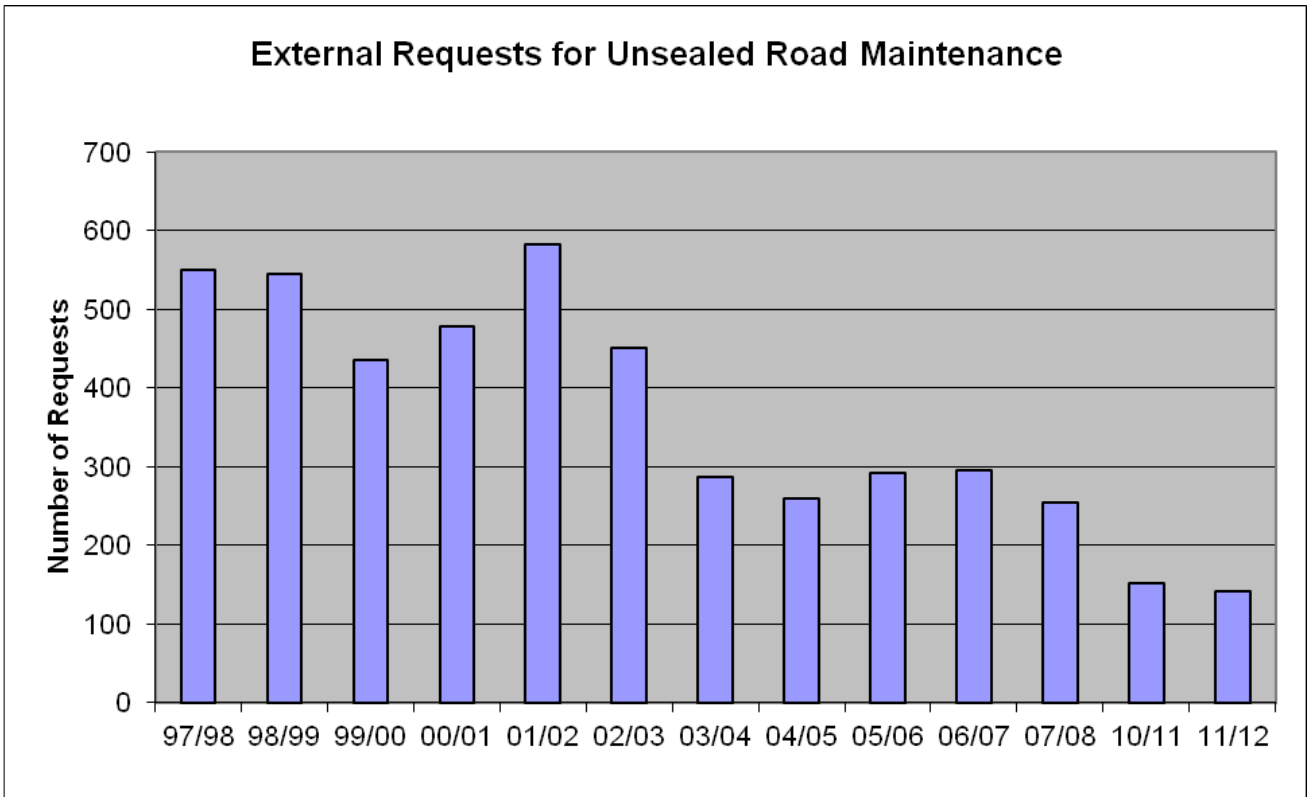
3. LEVELS OF SERVICE

3.1. Customer Research and Expectations

The original Asset Management Plan (January, 2006) was on public exhibition and formally adopted by Council. The revised Plan (April, 2009) was not placed on public exhibition; however, Council had reviewed the road sealing strategies in 2008.

The draft Capital Programs are placed on exhibition annually as part of the *Delivery Program & Operational Plan*.

The following chart shows the number of requests for unsealed road maintenance received by Council. It is to be noted that requests have reduced and this is likely due to the increased sealing program undertaken. It is considered that the overall condition of the unsealed road network is now 'satisfactory' and increases to 'Level of Service' are not required.



3.2. Strategic and Corporate Goals

Council's ***Asset Management Policy*** *includes the following –*

OBJECTIVES

- *Manage Shoalhaven City Council's infrastructure assets to best meet a balance between short-term and long-term community needs and resource restraints*
- *Provide an equitable approach to the planning, delivery, operation, renewal and disposal of infrastructure assets*
- *Ensure that a lifecycle approach is taken for all decisions on infrastructure assets*

- *Ensure that the community is involved in determining appropriate 'levels of service' (quality & quantity) for physical assets and services*
- *Ensure that assets are managed in accordance with relevant legislation and adopted policies*
- *Maintain a suite of AMPs that adequately describe to the community the plans in place for the management of infrastructure assets, and that guide Council's staff in this management*

PROVISIONS

Individual AMPs are to be developed for –

Bridges & Culverts
Bus Shelters
Car Parks – Commercial
Sealed Roads
Unsealed Roads
Stormwater Drainage
Kerb & Gutter
Footpaths & Cycleways
Streetscapes/CBD's
Traffic Facilities
Tennis & Netball
Walking Tracks
Aquatic Facilities
Administrative Buildings
Public Buildings
Cemeteries
Flood Mitigation Structures
Waterways Infrastructure (Boating Facilities)
Coastal Areas

- *Council recognises that the preference is to allocate resources to maintain and renew existing assets.*
- *Council recognises the need to maintain its asset base and will target a long term asset sustainability index (actual replacement/renewal budget versus required funding as per AMPs) averaging 90-95% for each of the asset types above.*
- *An Asset Management Strategy is to be developed to guide the development and review of AMPs and to specify appropriate 'levels of service' for inclusion in AMPs.*
- *There will be community consultation in the development of appropriate 'levels of service' and asset performance shall be measured against these levels.*
- *The management of Council's assets shall be overseen by the Asset Management Planning Committee.*
- *Risk management, environment and sustainability will be considered in the development of asset strategies.*
- *Asset acquisition shall include consideration of the 'whole of life cost' of the new asset including initial capital cost, operation, maintenance, rehabilitation and disposal costs.*
- *Annual operation/maintenance budgets shall include an allowance for additional costs arising from addition of new assets through development, acquisition, dedication or leasing and/or licencing as well as an allowance to cover cost increases in line with indices relevant to each asset class.*
- *Adequate resources shall be provided to undertake regular agreed levels of inspections to identify hazards and asset condition.*

- *Utilisation and operating/maintenance costs shall be monitored to ensure that costs do not outweigh the benefits derived.*
- *Minimum utilisation measures shall be determined for all building structures to determine surplus building assets.*

*Council's **Asset Management Strategy** includes the following –*

Objectives

There are three main outcomes of an Asset Management Strategy (AMS). These are:

- *aligning Council's asset base, and its associated levels of service, with the objectives contained in the Community Strategic Plan (CSP),*
- *improving Council's Asset Management practices, and*
- *Assist in addressing improved long term sustainability of assets for future generations.*

As the AMS is aligned with the CSP, it adopts its minimum timeframe of 10 years. This alignment is also consistent with the Long Term Financial Plan and the Asset Management Plans. However, it also has a view to sustainability beyond the 10 year timeframe.

Approach

Although there was significant community engagement in developing CSP objectives and strategies, there were insufficient detailed discussions and feedback on the levels of service the community desires or will tolerate for each category of assets.

The agreed levels of service are important as they influence all asset management decisions. The community needs to be aware of resourcing, environmental and other constraints before agreement can be reached on sustainable levels of service.

Most current Asset Management Plans (AMPs) contain Levels of Service (LOS) based on historic operational and risk management needs and budgets. Although some community consultation has occurred on these AMPs, primarily by advertising drafts and considering feedback from community groups, community engagement has not occurred to set levels of service.

The approach to establish LOS will be to:

- *Assume current levels remain until changes are discussed with the community and adopted by the Council for each asset category*
- *Commence the LOS community engagement for asset categories with the most significant financial impacts such as roads assets and aquatics assets*
- *Some asset types may not require or benefit from community engagement where there are overriding legislative safety requirements that determine LOS*
- *Define a LOS at the lowest financially feasible and environmentally practical levels for each asset category, consistent with CSP objectives. These will be known as the Sustainable Levels of Service (SLOS).*
- *Assets will then be maintained in a condition to meet the SLOS for that asset category*

It is important to note that the SLOS condition is NOT the same as the Division of Local Government defined 'satisfactory standard' LOS or 'GOOD condition'. These could be described as the desirable condition of assets whereas the SLOS condition is a minimum acceptable level. (Reference the DLG's Planning and Reporting Guidelines for Local Government in NSW (2010)).

A key challenge to all councils is the very large 'gap' between the current condition of their assets and the condition required to deliver the DLG's GOOD condition. In fact, the gap, both in terms of clawing back the backlog of renewal and maintenance, and continuing to fund to adequate levels, is arguably too large to bridge without extreme changes.

In response to this, a key component of this strategy is to define SLOS condition as well as the DLG defined GOOD condition, to use this as a medium term target, and to report to the community accordingly.

Hence, a key outcome for all AMPs will be the definition of SLOS and the adjusting of funding levels to match these Levels of Service. Funding of the SLOS for operating, maintenance and capital renewal will be the higher priority and this may result in the reduction of funds for capital enhancement and new.

3.3. Legislative Requirements

Changes to the Local Government Act require Councils to consider asset management as part of their Resourcing Strategies. Guidelines issued by the NSW Division of Local Government (DLG) are referenced in the legislation and Councils must comply with these.

The DLG has the following requirements with regard to asset management –

- Each Council must account for and plan for all of the existing assets under its ownership, and any new asset solutions proposed in its Community Strategic Plan and Delivery Program.
- Each Council must prepare an *Asset Management Strategy* and Asset Management Plan/s to support the Community Strategic Plan and Delivery Program.
- The *Asset Management Strategy* and Plan/s must be for a minimum timeframe of 10 years.
- The *Asset Management Strategy* must include a council endorsed Asset Management Policy.
- The *Asset Management Strategy* must identify assets that are critical to the council's operations and outline risk management strategies for these assets.
- The *Asset Management Strategy* must include specific actions required to improve council's asset management capability and projected resource requirements and timeframes.
- The Asset Management Plan/s must encompass all the assets under a council's control.
- The Asset Management Plan/s must identify asset service standards.
- The Asset Management Plan/s must contain long term projections of asset maintenance, rehabilitation and replacement costs.

With regard to 'Unsealed Roads', there are no specific legislative requirements that impact on LOS.

However, unsealed roads do impact on the environment by –

- Windblown dust
- Storm erosion and subsequent waterbourne sediments and
- High use of non-renewable quarry products for pavement renewal

Accordingly, the strategy of the provision of 'Sacrificial Seals' is aimed at reducing environment impacts by addressing the above 3 environmental impacts.

Other relevant legislative requirements are contained in –

- National Asset Management Framework Legislation 2010 and
- DLG Integrated Planning NSW

3.4. Current Level of Service

The adopted (2008/09) and current Levels of Service for activities to unsealed roads are shown in the following table.

Activity	Level of Service adopted in 2008/09	Current Level of Service 2011/12
Grade	2 times per year on average	2.1 times per year on average
Gravel Resheet (incl. sacrificial seal)	Every 22 years on average	Every 14.5 years on average
Urban Road Sealing	All within 6 years	All within 30 years
Rural Road Sealing (>80 VPD)	All within 15 years	All within 55 years

It is to be noted that the Targets for road sealing have not been achieved and the timeframe to achieve the current adopted sealing strategies and been significantly extended.

This is despite Council allocating additional funds for rural road sealing. However, Council have departed from the previously adopted Strategies and have opted in the past 2 years to seal low volume rural roads as 'Sacrificial Seals'.

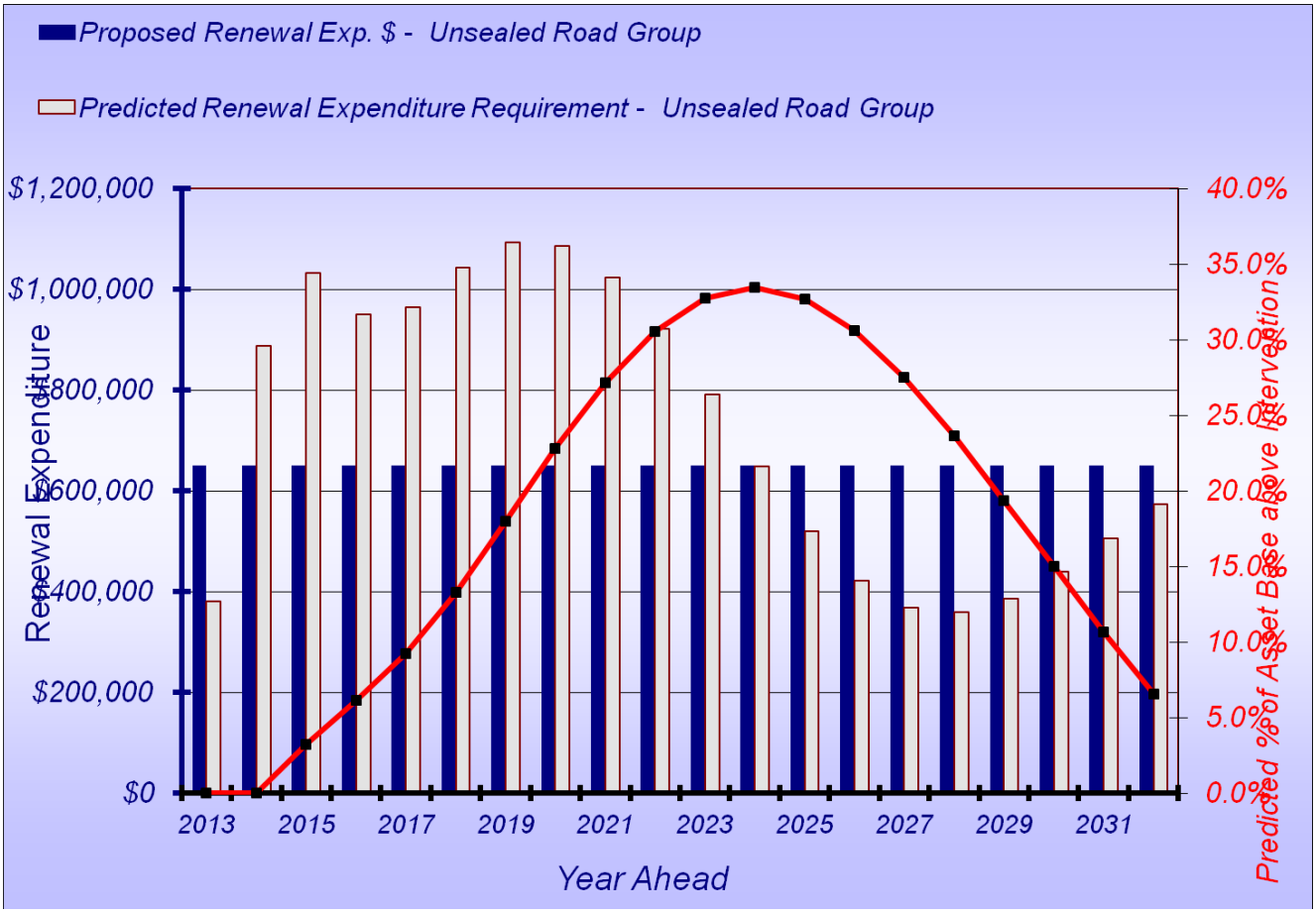
This road sealing option is a cheaper rate and hence significant bitumen has been laid. However, progress on reducing the adopted sealing strategies (for higher traffic volume roads) has been delayed.

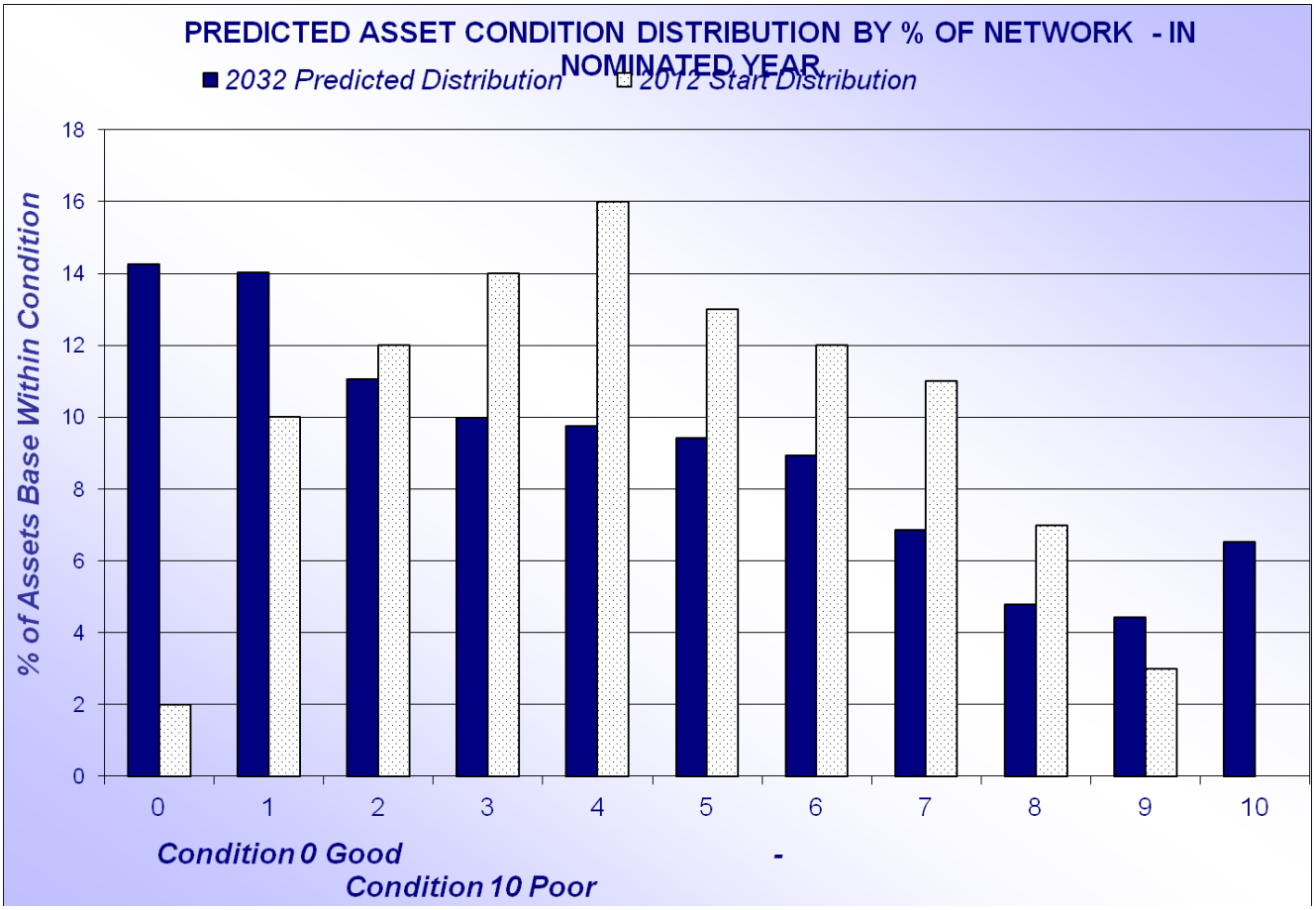
Nevertheless, the current Level of Service provided by the unsealed road network is considered satisfactory. Access is available in all weather conditions and overall pavement condition is reasonable. This is supported by the data of annual 'customer requests' for maintenance action. This has reduced from about 450 per annum to 150 per annum over the past 10 years.

3.5. Desired Level of Service

The 'Moloney Financial (Asset) Modelling' software has been used to review various scenarios with regard to frequency of gravel resheeting and funding for gravel resheeting.

Based on a "useful life" of 15 years for the gravel pavement, funding of $650,000 per annum and an initial asset condition of 'above average', the following long term network condition was predicted –





Although, this funding level is likely to result in a drop in overall network condition (out of 10) from Condition 4.5 to Condition 6 over the next 10 years, it is predicted that the network condition will then improve to Condition 4 over the subsequent 10 years. This is considered to be a satisfactory and sustainable scenario for the remaining unsealed roads that are primarily of low traffic volume.

Accordingly, it is considered that a satisfactory (Good) Level of Service is –

- Grading - 2.0 times per annum on average
- Gravel Resheeting (pavement renewal) - every 15 years
- Sacrificial Seal - $50,000 per annum
- Urban Road Sealing - all within 30 years
- Rural Road Sealing - all (> 100VPD) within 20 years

4. FUTURE DEMANDS

4.1. Demand Drivers

There is an expectation with our changing demographics that residential access should be on a sealed pavement. However, Council has no obligation to seal gravel roads and in fact has an obligation to retain low volume roads as unsealed due to the lower whole of life cost. The current Policy is to only seal roads that have an average daily traffic of over 80 vehicles.

Expert opinion from the Australian Road Research Board suggests that the whole of life cost is lower for sealed roads at about 150 vehicles per day. There is scope to review the sealing Policy from 80VPD to say 100VPD.

This would reduce the estimated cost for sealing rural roads from $16.7Million to $10.0Million. It is recommended that the criteria for 'qualifying' for inclusion in the Rural Road Sealing Strategy be increased to 100VPD as the *Sustainable Level of Service.*

4.2. Demand Forecasts

Occasionally, Council accepts responsibility for short sections of unsealed road arising from small scale development or similar reasons. However, overall the extent of the unsealed road network is declining due to the road sealing program including 'low cost seals' and 'sacrificial seals', as detailed later in the Plan.

The unsealed road network has reduced from 487 Km in 2005 to 397 Km in 2008 and to 341 Km in 2012. Over the past 4 years this is a decline of 14%. Funding levels are reducing and it is assumed in modelling that the network will reduce 2% per annum into the future

Apart from sealing, other enhancement needs (such as widening or drainage improvements) are identified arising from customer requests or staff observations. These works are generally minor and are funded from current maintenance budgets or, if significant, are referred for capital funding. The need for these works is intermittent and future funding needs cannot be estimated.

There is a trend for increasing customer expectations as to the standard of gravel roads and also for roads to be sealed. However, as evidenced from 'customer requests' (as detailed elsewhere) there is a reduction in the number of customers with these expectations.

4.3. Demand Impacts on Assets

There is no demand for new unsealed road assets. However, there is occasionally a request for Council to assume maintenance responsibility for existing roads. The existing roads could be Crown Roads or roads that by consent condition are the responsibility of property owner(s) to maintain. These requests are considered by Council on their merit.

4.4. Demand Management Plan

Demand for maintenance is determined by the *Unsealed Road Risk Management Procedure.* This procedure details inspection frequencies, intervention levels and response times.

The priorities for sealing of gravel roads are detailed in the Strategies that form part of this Plan. These strategies are regularly reviewed by Council.

4.5. Asset Programmes to Meet Demand

The following annual programs form part of the Unsealed Road Service –

- Maintenance Grading
    - Grading is carried out on a needs basis in accordance with the Risk Management Procedure. An annual allowance is made for the placing of additional gravel to short sections as required.
- Gravel Resheeting (capital expenditure)
    - Annual program is developed based on recommendations from field staff as to the roads that require renewal of the gravel pavement
- Sacrificial Seal Program (capital expenditure)
    - Annual program is developed and comprises roads identified for gravel resheeting that meet the criteria of low traffic volume, being - no heavy vehicles, satisfactory existing formation & alignment, drainage & subgrade.
- Low Cost Seal Program (capital expenditure)
    - Annual program for the sealing of short sections of Urban Roads. Funding is not available every year
- Urban Road Sealing Program (capital expenditure)
    - Annual program is undertaken in accordance with adopted priorities (Urban Road Sealing Strategy) and to available funds.
- Rural Road Sealing Program (capital expenditure)
    - Annual program is undertaken in accordance with adopted priorities (Rural Road Sealing Strategy) and to available funds.

5. LIFECYCLE MANAGEMENT PLAN

5.1. Background Data

5.1.1. Physical Parameters

The current network consists of –

- Urban – 9.82 Km
- Rural - 331.63 Km

The full list of roads is included at Attachment 1 (Road Sealing Strategies).

5.1.2. Asset Capacity / Performance

All roads are considered to fulfil their required needs and satisfy capacity/demand. A future management action is to designate a required standard for each road and then determine resources to close any demand gap.

5.1.3. Asset Condition

Condition data for individual roads is not recorded as this information is not considered sustainable to maintain. However, the overall network condition is considered to be 'Above Average'.

5.1.4. Asset Valuations

The details from the recent asset valuation (2009/10) are –

- Current Replacement Cost $21,958,431
- Accumulated Depreciation $10,979,215
- Depreciated Replacement Cost $10,979,215
- Annual Depreciation $2,195,843

These figures were based on a Useful Life of 10 years and all roads being in 'Good' Condition. It is intended to review these assumptions and it is to be noted that this Plan assumes a 15 year Useful Life and 'Above Average' or 'Very Good' Condition.

5.1.5. Historical Data

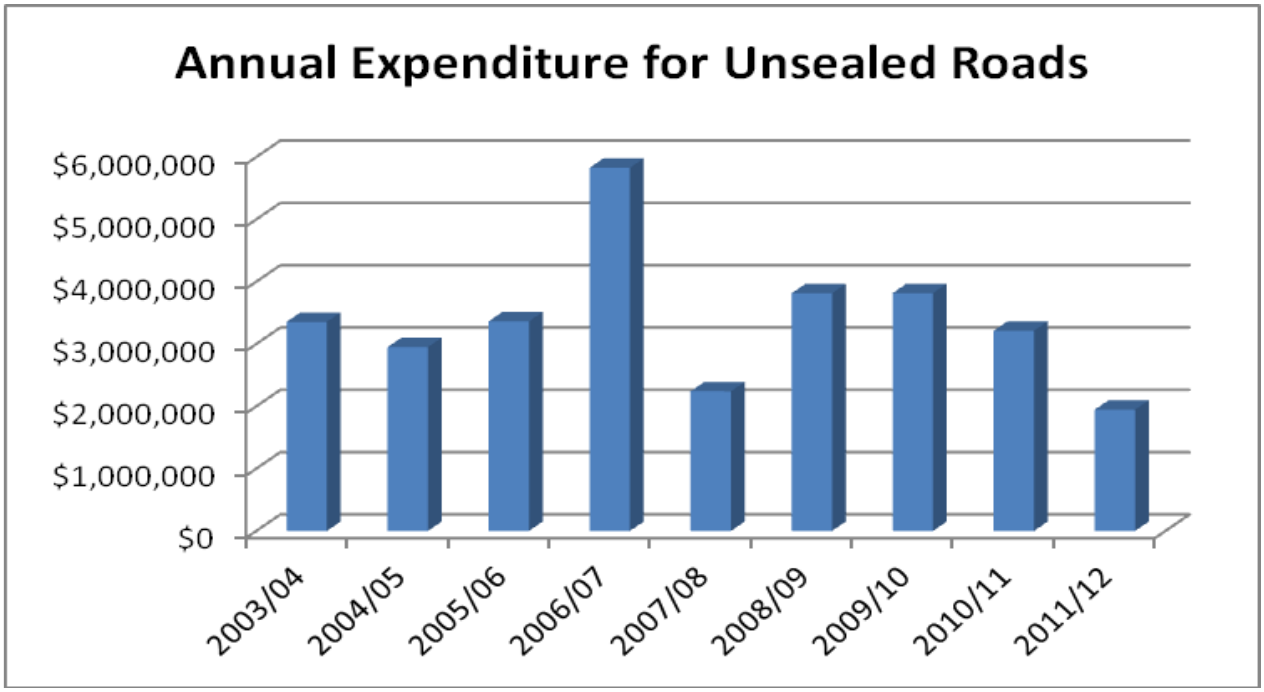
The following table summarises changes to road lengths –

Year	Length (Km)
2005	487
2008	397
2012	341

The following table shows the past expenditure history –

Activity	2011/12	2010/11	2009/10	2008/09	2007/08	2006/07	2005/06	2004/05	2003/04
Road Grade	$1,133,300	$1,188,300	$947,100	$1,086,000	$984,500	$955,000	$1,107,200	$1,028,400	$1,016,400
Re-gravel program	$428,700	$458,900	$318,200	$500,000	$635,000	$674,300	$693,400	$844,000	$1,100,000
Other	$7,400	$28,900	$5,200	$19,000	$19,000	$16,000	$61,000	$6,000	$6,000
Total Maintenance	**$1,569,400**	**$1,676,100**	**$1,270,500**	**$1,605,000**	**$1,638,500**	**$1,645,300**	**$1,861,600**	**$1,878,400**	**$2,122,400**
Low Cost Seal	$228,200	$24,700	$271,800	$240,000	$210,000	$198,000	$456,400	$462,000	$200,000
Sacrificial Seal	$0	$752,100	$241,000	$410,000	$332,000	$299,000	$351,600	$0	$0
Urban Road Sealing	$0	$50,800	$351,900	$467,500	$0	$0	$0	$0	$0
Rural Road Sealing	$148,000	$708,100	$1,681,700	$1,091,400	$60,900	$3,685,600	$693,500	$609,900	$1,032,100
Total Capital	**$376,200**	**$1,535,700**	**$2,546,400**	**$2,208,900**	**$602,900**	**$4,182,600**	**$1,501,500**	**$1,071,900**	**$1,232,100**
Grand Total	**$1,945,600**	**$3,211,800**	**$3,816,900**	**$3,813,900**	**$2,241,400**	**$5,827,900**	**$3,363,100**	**$2,950,300**	**$3,354,500**

The following chart indicates changes in overall funding level for Unsealed Roads.



5.2. Infrastructure Risk Management Plan

The current Unsealed Roads Risk Management Procedure is being used to determine the need for grading or other corrective action. The adopted procedure includes the following –

Hazard/Risk Identification Inspection Interval	Distribution of Inspections
12 Monthly	1 in any 12 month period

Table 1 – Inspection Intervals

Hazard Code	Hazard Description	Recording Level
1400	Pot holes	300mm in diameter and deeper than 75mm
1430	Slippery Surface	No gravel or gravel with excessive fine particles
1450	Corrugations	30mm high and more than 10 metres In length along the centreline
1480	Loose Material	50 mm deep in windrows or Objects over 75mm
1490	Scour/Rock Outcrop	50mm in height or depth
1591	Tree Obstruction	Overhanging onto road past edge of formation

Table 2 Minimum Recording Levels

Road Hierarchy Category	Pot Holes	Slippery Surface	Corrugations	Loose Material	Scour/Rock Outcrop
Local	One year	One year	One year	One year	One year

Table 3 – Maximum Response Times

The Risk Management Procedure also states the reliance on the reporting of hazards by the public. Reported hazards are inspected and listed for corrective action in accordance with the Risk Management Procedure. If extreme risk hazards are identified a more immediate response will be undertaken.

It is considered that ‘Response Times’ should be reviewed with a suggested target of a ‘Maximum Response Time’ of 6 months. This needs to be considered separately when reviewing the ‘Risk Management Procedure’.

There are a number of council roads that are not maintained on a regular basis by council but that provide access to private dwellings. These roads are not inspected on a regular basis by council but council still has an obligation to make safe any known hazards.

This aspect needs to be considered in the review of the *Unsealed Road Risk Management Procedure.* It is suggested that upon reporting by the public the road(s) be inspected to determine the risk level of the reported hazard and to then take appropriate action to reduce/mitigate the risk.

5.3. Routine Operations and Maintenance Plan

The main maintenance activities for unsealed roads are –

- Maintenance Grading
- Emergency response to significant pavement damage/deformation

The 2011/12 maintenance grading expenditure allowed for an average grading frequency (over all roads) of 2.1 times per annum. This is considered a satisfactory and sustainable Level of Service and it is recommended that the target frequency be 2 times per annum. It is also recommended that an annual allowance of $100,000 be included for the placement of gravel to isolated eroded sections in conjunction with grading operations.

Emergency response needs are difficult to predict as it is dependent on storms/weather. An annual allowance is made to cover such events and if required the budget can be amended.

5.3.1. Operations and Maintenance Plan

Maintenance Grading is undertaken to correct loss in pavement shape and correct hazards such as potholes, rutting and pavement scours. Placement of additional gravel may be required to enable isolated correct shaping of the existing gravel pavement but not over long lengths which is classified as ‘gravel resheeting’.

Grading priority is determined by considering the following factors and the need is determined in accordance with the ‘Gravel Roads Risk Management Procedure’: -

- Traffic volume
- Condition
- Complaints received, and
- Past experience with the road section (Knowledge of the maintenance staff.)

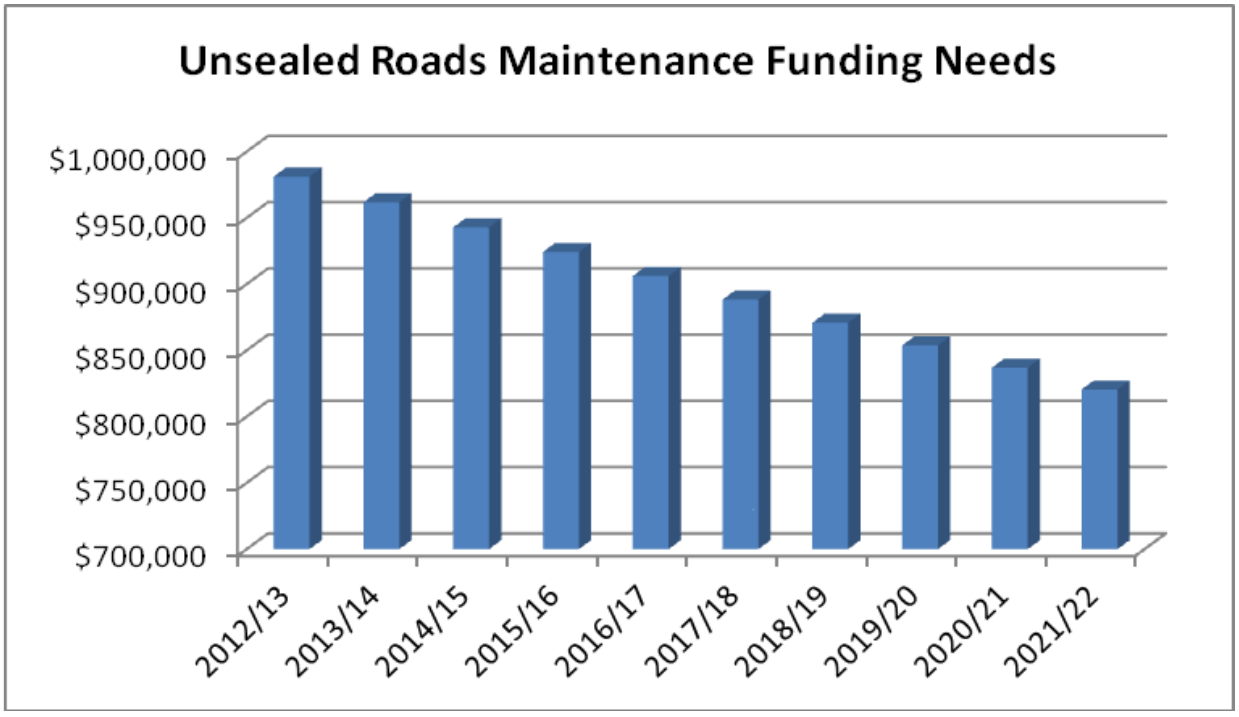
5.3.2. Operations and Maintenance Strategies

Consideration has been given to the introduction of a “Grading Schedule” that will deliver a fixed schedule for grading of each road with the frequency being based on the above factors. However, implementation was not undertaken due to the poor overall network condition at the time.

This aspect should now be reviewed and it is considered that the current network condition and the reduction in the extent of the network now make it viable to introduce a fixed grading schedule. This should be considered as part of a review of the *Unsealed Roads Risk Management Procedure.*

5.3.3. Summary of Future Costs

Based on the Sustainable (and Satisfactory) Level of Service of an average grading frequency of 2 times per year and an annual reduction of 2% in the network length, the required funding levels are shown in the following chart –



This funding level is the current funding level and hence there will be no deferred maintenance.

5.4. Renewal / Replacement Plan

Renewal activities comprise of the following -

- Gravel resheeting and
- 'Sacrificial' sealing (applies to rural roads only of less than 80 vehicles per day traffic volume). This is an adjunct to the Gravel Resheeting Program.

Gravel Resheeting

Gravel resurfacing is necessary on unsealed roads due to loss of pavement material resulting from degradation of stone; climatic conditions; scouring and erosion; traffic abrasion; maintenance practices and pavement material selection. The requirements for replacing gravel on the unsealed road network is determined by taking into account the annual traffic; annual rainfall; road gradient and the type of gravel used. Gravel resheeting is generally only targeted to rural roads as urban roads only require occasional gravel addition.

It is essential to maintain the provision of an adequate gravel pavement layer to allow for vehicle loading, provide for all weather usage and allow for maintenance grading. This is an essential component of gravel road maintenance. An annual program is developed based on remaining gravel depth, traffic volume, safety and customer satisfaction criteria. This is supplemented with an annual program for 'Sacrificial Seals' as indicated in this Asset Management Plan.

'Sacrificial' Sealing

The primary requirements to achieve customer satisfaction with the network condition are to

- Reduce dust nuisance – dust suppressant treatments are up to $2 per sqm and the treatment effectiveness is about 3 months. The only cost effective treatment is sealing.

- Improve traction, particularly in wet weather – a good quality gravel pavement will normally provide satisfactory service but there is still the risk of loose surface materials in dry weather and
- Improve pavement 'ride' – gravel pavement are subject to potholing and shoving and (generally) have a rougher ride than sealed pavements.

Accordingly, Council has instigated an annual 'Sacrificial' Seal Program which is an option that is currently used by a number of councils.

This option entails the application of a 10mm primer seal (single coat) to roads where the gravel pavement has been replenished under the annual Gravel Road Resheet Program. Roads suitable for this treatment are low traffic volume, nil or minimal heavy vehicles, no alignment or drainage issues and no subgrade problems. Treatment consists of placement of 100mm depth of pavement and a 10mm primer seal. The seal is expected to last up to 8 years and would then be ripped and reshaped (if required) and another primer seal applied.

The treatment has the following advantages –

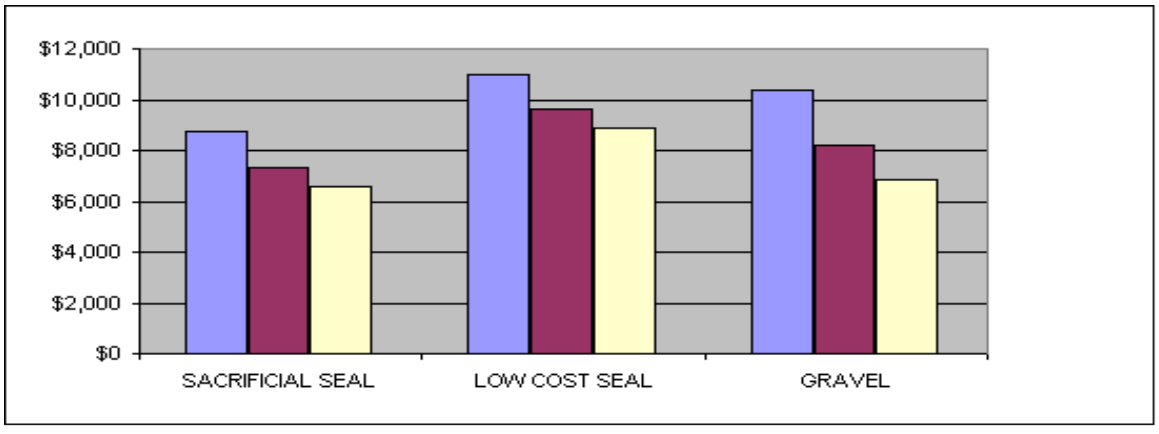
- Dust suppression
- Lower whole of life cost
- Higher Service Level
- Customer satisfaction
- Less sediments into the environment (current loss about 40,000 tonnes per year) and
- ESD benefits due to reduced gravel use.

The following table shows the Whole of Life Costs for gravel pavement, Low Cost Seal and Sacrificial Seal.

SUMMARY OF GRAVEL ROAD TREATMENT OPTIONS

PRESENT WORTH COSTS FOR 100x5 METRE SECTION OF ROAD

DISCOUNT RATE	SACRIFICIAL SEAL	LOW COST SEAL	GRAVEL
7%	$8,727	$10,980	$10,387
10%	$7,349	$9,617	$8,171
13%	$6,552	$8,886	$6,838



Sacrificial seal will only be applicable for low traffic roads with no regular heavy vehicles. Local conditions such as drainage and subgrade will need to be considered.
Note that urban roads typically will be regularly used by garbage collection vehicles and as such will not be considered for sacrificial seal treatment.

5.4.1. Renewal Plan

The useful life of gravel pavements is a function of several factors including traffic volume, heavy vehicles and drainage & grade.

The original Unsealed Roads AMP recommended a Level of Service of an average interval between gravel resheeting of 6 years. This required annual funding of about $3Million. The current (2011/12) Level of Service is every 14.5 years.

Following the sealing of most of the high traffic volume roads, it is considered that the average frequency for gravel resheeting can be extended and a *Sustainable Level of Service* of an average of 15 years is recommended. This useful life has been modeled and it is predicted that an annual budget of $650,000 will give satisfactory long term network condition.

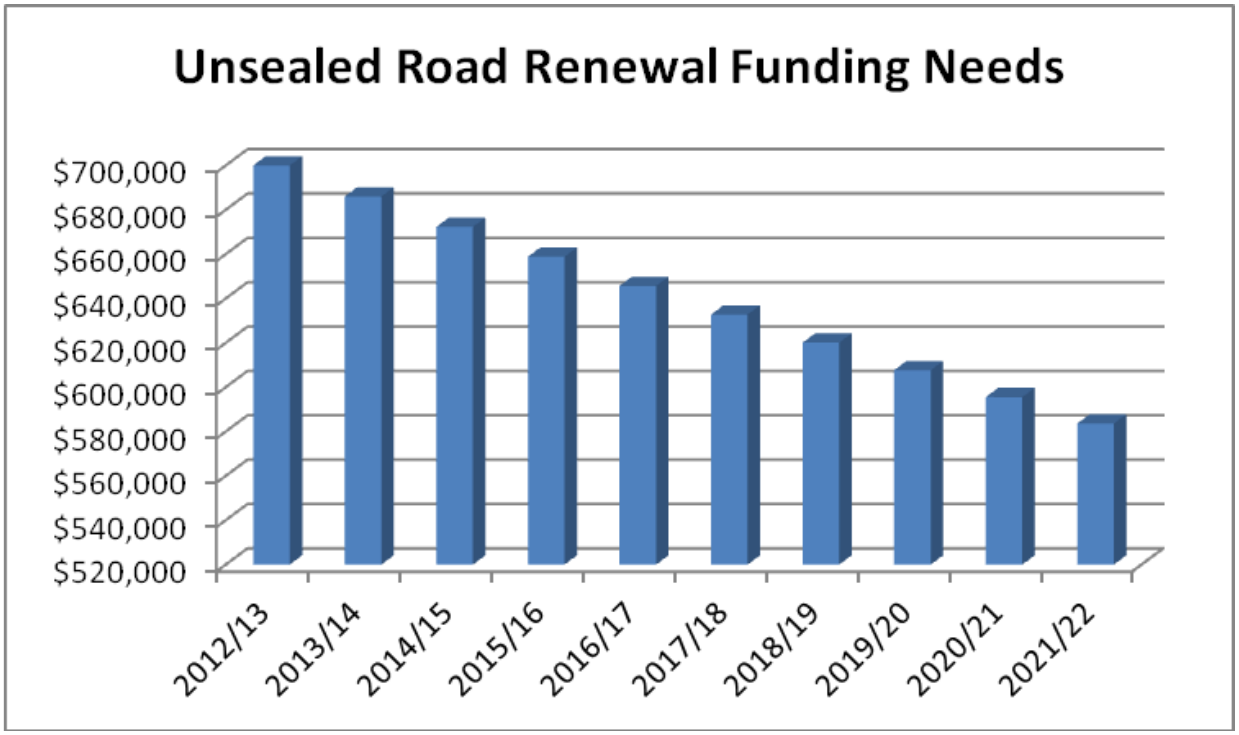
It is also recommended that an annual budget of $50,000 be allocated for Sacrificial Seals to give an annual total budget of $700,000.

5.4.2. Renewal Strategies

The roads to be gravel resheeted each year will be selected from roads recommended by the area maintenance engineers and priority will be given to those with no or minimal gravel pavement and subsequent slippery surface. Where suitable the roads will also be considered for a ‘Sacrificial’ seal.

5.4.3. Summary of Future Costs

A summary of future Gravel Resheeting (including sacrificial Seal) costs are shown on the following chart. Costs are based on a 2% per annum reduction in road length with an initial gravel resheeting budget of $650,000 as predicted by the ‘Moloney (Asset) Financial Modelling’ software..



5.5. Creation / Acquisition / Augmentation Plan

Urban Road Sealing Strategy
Council has adopted a priority rating method for sealing of urban roads and a copy of the revised resultant Strategy is shown at Attachment 1. The attached Strategy includes 5.26 Km of urban roads and the estimated costs are –

- Low Cost Seal (short sections) – 0.32Km - $69,000 (estimated sealing cost)
- Full Design – 4.95Km - $2,058,000 (estimated sealing cost)

The current 10 Year Financial Plan indicates that about $700,000 will be available for sealing of Urban Roads over the next 10 years. At this funding rate it will be about 30 years before all urban roads are sealed. However, after 10 years it is expected that only (very) low traffic volume roads will not be sealed. There are minimal community requests for the sealing of urban roads and, hence, a 30 year timeframe to seal all urban roads will be recommended as the *Sustainable Level of Service.* It is also considered that this is the desirable (Good) Level of Service.

Rural Road Sealing Strategy
The current Policy for the sealing of rural road is that roads will be listed for consideration for sealing when the traffic volume exceeds 80 vehicles per day. The ranking method for prioritizing roads for sealing was adopted by Council about 10 years ago and rankings are reviewed as required by staff and confirmed when reviewing this Plan.

Following the completion of higher priority projects over the past few years there has been a reduction in requests for maintenance and/or sealing of unsealed rural roads.

Expert opinion from the Australian Road Research Board suggests that the whole of life cost is lower for sealed roads over gravel roads at about 150 vehicles per day. Hence, there is scope to review the sealing Policy from 80VPD to say 100VPD.

This would reduce the estimated cost for sealing rural roads from $16.7Million to $10.1Million. It is recommended that the criteria for 'qualifying' for inclusion in the Rural Road Sealing Strategy be increased to 100VPD as the *Sustainable Level of Service.*

The Rural Road Sealing Strategy (>100 VPD) (refer Attachment 1) includes 28.2 km of road at a total pre-design estimate of $10.1Million. The current 10 Year Financial Plan includes $1.84Million for the sealing of rural roads over the next 10 years. Hence, current funding indicates that it will be about 55 years before all rural roads (>100VPD) will be sealed. It is considered that this is unsatisfactory but Sustainable and it is considered that a Desirable (Good) Level of Service is within 20 years.
.
The extent to which the above can be achieved will depend on detailed estimates and continuation of available funding. Additionally, as population growth occurs it is expected that over time further roads will meet the criteria of >100VPD and will need to be included in the Rural Road Sealing Strategy.

5.5.1. Selection Criteria

The criteria for the selection of priorities for the sealing of gravel roads is indicated in Attachment 1.

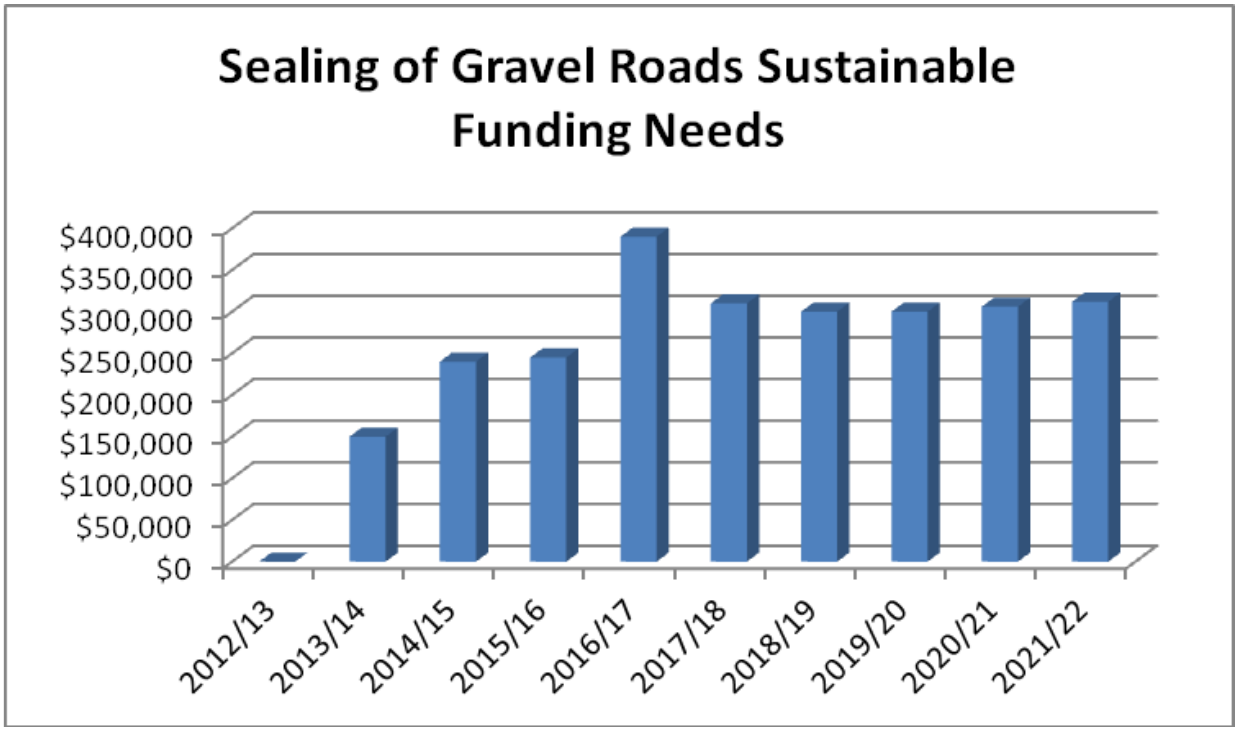
5.5.2. Capital Investment Strategies

The current process is that a design brief is prepared by the Infrastructure Planning Section and forwarded to the Works & Services Section for the undertaking of works by either contract or council workforce. The design brief is based on previous discussions with the public and known capacity requirements.

5.5.3. Summary of Future Costs

The current 10 Year Financial Plan funding predictions are $2.28Million over the next 10 years. The current predicted funding is satisfactory for Urban Roads. However, it is considered that funding should be increased to an average of about $500,000 per annum for Rural Roads to achieve Desirable Level of Service..

Funding as indicated in the 10 Year Financial Plan and which is sufficient for a Sustainable Level of Service is shown on the following chart.



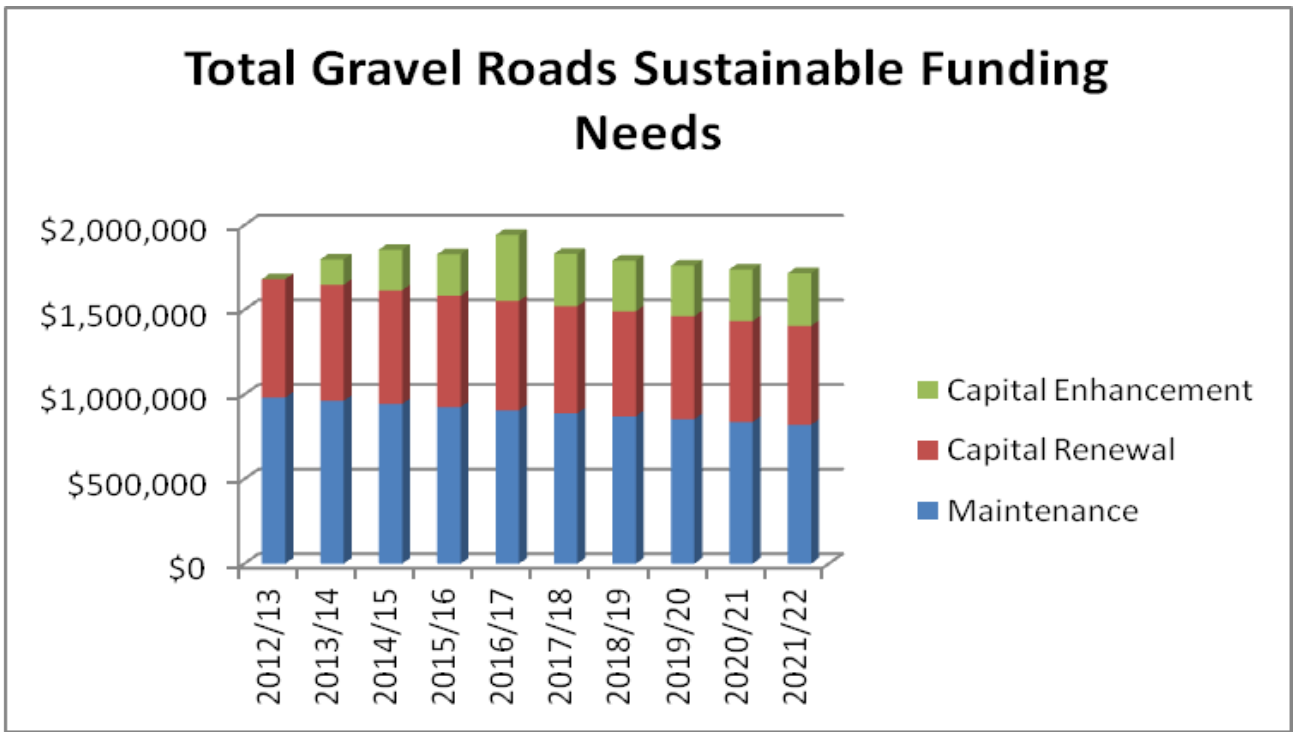
5.6. Disposal Plan

It is not expected that any existing unsealed roads will be sold or otherwise decommissioned.

6. FINANCIAL SUMMARY

6.1. Financial Statements and Projections

The funding levels to achieve a Sustainable Level of Service are shown in the following chart.



The funding requirements for 'Recommended' Sustainable Level of Service compared to current funding are shown in the following Table:

	Recommended Sustainable Level of Service	Required annual funding	Budget 2012/13 (average of 10 yr Fin Plan for capital items)	Annual Funding Shortfall
Maintenance				
Grading incl gravel allowance	2 times per year	$966,000	$1,174,000	($208,000)
Gravel resheeting	Every 15 years	$650,000	$560,500	$89,500
Low Cost & Sacrificial Seal		$50,000	$116,100	($66,100)
Other		$15,000	$40,000	($25,000)
Totals		$1,681,000	$1,890,600	($209,600)
Urban Road Sealing (Capital Works Program)	Within 30 years	$70,000 (average)	$70,000	$0
Rural Road Sealing (Capital Works Program)	Within 55 years	$183,000 (average)	$184,000	($1,000)
Grand Totals		$1,934,000	$2,144,600	($210,600)

The funding requirements to achieve a desirable (Good) Level of Service are shown in the following table.

	Desirable Level of Service	**Required annual funding**	**Budget 2012/13 (average of 10 yr Fin Plan for capital items)**	**Annual Funding Shortfall**
Maintenance				
Grading incl gravel allowance	2 times per year	$966,000	$1,174,000	($208,000)
Gravel resheeting	Every 15 years	$650,000	$560,500	$89,500
Low Cost & Sacrificial Seal		$50,000	$116,100	($66,100)
Other		$15,000	$40,000	($25,000)
Totals		$1,681,000	$1,890,600	($209,600)
Urban Road Sealing (Capital Works Program)	Within 30 years	$70,000 (average)	$70,000	$0
Rural Road Sealing (Capital Works Program)	Within 20 years	$500,000 (average)	$184,000	$316,000
Grand Totals		$2,052,000	$2,144,600	$106,400

The current funding levels meet Sustainable Levels of Service for sealing/capital but there is over-servicing in maintenance (grading). The current funding levels only require an additional $100,000 to meet Desirable (Good) Levels of Service – this is primarily additional funds for sealing of Rural Roads.

6.2. Funding Strategy

It is expected that funding will be in accordance with the adopted 10 Year Financial Plan. Funding for maintenance could be reduced and funding diverted to other services such as Sealed Roads.

It is recommended that this be further considered when reviewing the Unsealed Roads Risk Management Procedure; in particular, to consider and confirm a cyclic grading schedule.

6.3. Valuation Forecasts

At the last valuation, the annual depreciation was listed as $2,195,843. However, subsequent modelling using ‘Moloney Financial Modeller’ indicates annual renewal funding of $650,000 is required. This is largely due to the different Useful Lives of 10 years for valuations and 15 years for modelling undertaken for this Plan. Additionally, the network condition is now considered to be improved since the valuation.

The Useful Life needs to be further investigated prior to the next re-valuation.

6.4. Key Assumptions Made in Financial Forecasts?

The key assumptions are –

- Gravel Pavement Useful Life 15 years
- Gravel Resheeting unit rate $10/sqm
- Grading unit rate $1,270/Km

• Urban Road sealing unit rate	$540,000/Km for K&G both sides $500,000/Km for K&G one side $360,000/Km for no K&G
• Rural Road sealing rate	$380,000/Km for full design $320,000/Km for basic design

6.5. Forecast Reliability and Confidence

The current data on gravel roads is limited to length, width and traffic classification. It has been assumed that the overall network condition is in 'above average' condition.

Further investigations will be undertaken to improve this data.

7. PLAN IMPROVEMENT AND MONITORING

7.1. Status of AM Practices

7.2. Improvement Programme

The following actions are proposed –

- Review and consider the implementation of a regular cyclic grading schedule in conjunction with the review of the *Unsealed Road Risk Management Procedure*
  - *Roads Asset Manager by 31st January, 2013*
- Review the Useful Life of gravel pavements
  - *Roads Asset Manager by 30th June, 2013*

7.3. Monitoring and Review Procedures

This Plan shall be reviewed every four years following Council elections.

7.4. Performance Measures

The following Key Performance Indicators will be used to gauge satisfactory outcomes from this Asset Management Plan and shall be measured as at 30th June each year –

- Length of (remaining) gravel road (urban & rural) as at end of period
- Number of customer requests/reports in the period and
- Number of public liability claims in the period.

8. REFERENCES

None listed

9. APPENDICES

None listed

10. REVIEW

All Asset Management Plans are reviewed on a 4 yearly cycle and all reviews are undertaken within 1 year of council elections. The Urban & Rural Sealing Strategies are reviewed annually in conjunction with the preparation of the draft Operations Plan.

Attachment 1 – Urban and Rural Road Sealing Strategies

PRIORITY LIST - SEALING OF URBAN ROADS - October, 2012

(SCORE = SUM OF ALL FACTORS)

UNIT COSTS: $540,000 /km (Construct K&G both sides)
$500,000 /km (Construct K&G 1 side)
$360,000 /km (BASIC Design Reqd)

LOCALITY	DESCRIPTION	LENGTH (LM)	WIDTH	AREA	AADT	EXTENT OF SILTATION (Max 100)	LAND SENSITIVITY (Max 100)	DEVELOPMENT %	OTHER FUNDING %	LONGITUDINAL GRADE (0,50,100)	SCORE	K&G REQD (No, 1, or 2 sides)	ESTIMATE
WORRIGEE	Surface - OLD SOUTHERN SERVICE RD - ch.0.304 to ch.0.596	292	6.2	1,810	100	25	0	60	0	50	235	1	$146,000
HYAMS BEACH	Surface - ILLOWRA LN - ch 0.000 to ch 0.381	380	4	1,524	80	25	20	60	0	25	210		$136,800
TOMERONG	Surface - TOMERONG ST - ch 0.107 to Ch 0.306	200	4	796	20	50	30	25	0	50	175	2	$108,000
CALLALA BAY	Surface - MARINE PDE - ch.0.448 to ch.0.704	256	6.2	1,587	120	0	0	50	0	0	170		$92,160
SOUTH NOWRA	Surface - THE LINKS RD - ch 0.100 to ch 1.270	1170	4.6	5,382	80	0	0	70	0	0	150		$421,200
BASIN VIEW	Surface - BROMPTON RD - ch 0.000 to ch 0.180	180	5	900	20	10	20	100	0	0	150		$64,800
HUSKISSON	Surface - WINNIMA LN - ch 0.000 to ch 0.216	215	3.2	560	70	0	20	50	0	0	140	1	$107,500
HUSKISSON	Surface - UNNAMED LN (OFF HAWKE ST) - ch 0.000 to ch 0.069	69	4	276	60	0	0	80	0	0	140	2	$37,260
BERRINGER LAKE	Surface - DONNELLY ST - ch.0.08 to ch.0.251	170	6.2	1,054	50	10	20	50	0	0	130	1	$85,000
FISHERMANS PARADISE	Surface - FISHERMANS PARADISE RD - ch 1.269 to ch 1.381	112	3	336	10	0	0	50	0	50	110		$40,320
BASIN VIEW	Surface - THE WOOL SERVICE RD - ch 0.000 to ch 0.109	109	3.5	382	40	0	0	50	0	0	90	1	$54,500
LAKE CONJOLA	Surface - EVANS ST (LAKE CONJOLA) - ch 0.312 to ch 0.405	93	3.5	326	30	0	10	50	0	0	90		$33,480
HUSKISSON	Surface - UNNAMED LN OFF BOWEN NEAR CURRUM. - ch.0.03 to ch.0.212	182	6.2	1,128	40	0	0	10	0	25	75	1	$91,000
CULBURRA BEACH	Surface - THE MARINA ACCESS RD - ch 0.00 to ch 0.068	68	3	204	25	0	0	50	0	0	75		$24,480
BERRY	Surface - ALBANY ST (STH) - ch 0.687 to ch 1.015	328	2.9	951	20	0	0	50	0	0	70		$118,080
CULBURRA BEACH	Surface - WEST CRES - ch 1.008 to ch 1.172	164	3	492	10	0	40	20	0	0	70		$59,040
WORRIGEE	Surface - OLD SOUTHERN RD - ch.3.289 to ch.3.570	281	15	2,810	10	0	0	5	50	0	65	2	$151,740
HUSKISSON	Surface - UNNAMED LANE OFF JERVIS ST NR BEACH - ch.0 to CH.0.11	110	3.5	385	20	0	0	20	0	0	40		$39,600
HUSKISSON	Surface - KENT LN - ch 0.000 to ch 0.234	234	3.5	819	10	0	0	5	0	25	40	2	$126,360
TOMERONG	Surface - WILLIAM BRYCE RD - ch 0.426 to ch 0.760	334	3	1,002	10	0	20	0	0	0	30		$120,240
		4,947											**$2,057,560**
Cul-de-sacs & short sections													
CULBURRA BEACH	Surface - ALLERTON AVE - ch.0.237 to ch.0.261	24	3	111									$4,440
CALLALA BAY	Surface - BOORAWINE TCE - ch.0 to ch.0.014	14	6.2	87									$3,472
CULBURRA BEACH	Surface - PARK ST - ch 0.335 to ch 0.390	55	3.5	193									$7,700
CULBURRA BEACH	Surface - THE MARINA ACCESS RD - ch 0.773 to ch 0.839	30	2.9	87									$3,480
VINCENTIA	Surface - ELIZABETH DR - ch 5.015 to ch 5.056	40	6.7	275									$10,988
CUDMIRRAH	Surface - GOONAWARRA DR - ch.0.756 to ch.0.782	26	6.2	161									$6,448
SANCTUARY POINT	Surface - GREVILLE AVE SERVICE RD - ch 0.000 to ch 0.018	18	8.2	148									$5,904
SANCTUARY POINT	Surface - GREVILLE AVE SERVICE RD - ch 0.018 to ch 0.060 - (CUL DE SAC)	42		217									$8,680
TOMERONG	Surface - MCGUIRES WAY - ch 0.426 to ch 0.449 (CUL DE SAC)	23		147									$5,880
ST GEORGES BASIN	Surface - WATERPARK RD (NTH) - ch 0.405 to ch 0.420	15	5	75									$3,000
CULBURRA BEACH	Surface - WEST CRES - ch 0.913 to ch 0.940 - (CUL DE SAC)	30		235									$9,400
		317											**$69,392**

PRIORITY LIST - SEALING OF RURAL ROADS (>100vpd)

(SCORE = SUM OF ALL FACTORS)

unit cost: $380,000 /km (FULL Design)
$320,000 /km (BASIC Design)

LOCALITY	DESCRIPTION	LENGTH	WIDTH	AREA	DESIGN FULL/BASIC	AADT	SCHOOL BUS ROUTE SCORE (0 or 100)	DUST SCORE (Max 100)	EXTENT OF SILTATION (Max 100)	LAND SENSITIVITY (Max 100)	TOURISM (Max 100)	OTHER FUNDING	LONGITUDINAL GRADE (Max 100)	SCORE	ESTIMATE
Rural Roads Basin	Surface - EVELYN RD - ch 1.307 to ch 1.531	224	5.5	1,232	B	120	100	50	25	15	0	5	25	340	$71,680
Rural Roads Basin	Surface - EVELYN RD - ch 1.537 to ch 1.924	387	5.9	2,283	F	120	100	50	25	10	0	5	25	335	$147,060
Rural Roads Basin	Surface - PARNELL RD - ch 1.470 to ch 1.961	490	6.6	3,241	F	115	100	50	10	15	0	5	10	305	$186,200
Rural Roads Basin	Surface - PARNELL RD - ch 1.961 to ch 2.811	850	6.6	5,610	F	100	100	50	25	15	0	5	10	305	$323,000
Rural Roads Southern	Surface - WHEELBARROW RD - ch.1.376 to ch.5.012	3636	7	25,452	F	180	0	0	25	20	25	0	25	275	$1,381,680
North Nowra	Surface - ILLAROO RD - ch 12.551 to ch 12.717	166	5	830	F	150	0	25	25	25	0	0	50	275	$63,080
North Nowra	Surface - ILLAROO RD - ch 12.865 to ch 13.865	1000	4.2	4,200	F	140	0	25	25	25	0	0	50	265	$380,000
Rural Roads Southern	Surface - OLD BERRARA RD - ch 0.000 to ch 1.800	1800	4.2	7,560	B	115	0	25	50	25	25	0	25	265	$576,000
Rural Roads Southern	Surface - WOODBURN RD - ch 3.000 to ch 3.074	74	8.2	607	F	110	0	0	25	25	25	5	50	240	$28,120
Rural Roads Southern	Surface - WOODBURN RD - ch 3.074 to ch 5.0	1926	4.5	8,667	F	110	0	0	25	25	25	5	50	240	$731,880
Rural Roads Southern	Surface - WOODBURN RD - ch 5.0 to ch 6.654	1654	4.5	7,443	B	110	0	0	25	25	25	0	50	235	$529,280
Rural Roads Central	Surface - HAMES RD - ch 0.300 to ch 1.240	940	6.2	5,828	B	130	0	50	25	0	0	0	25	230	$300,800
Rural Roads Northern	Surface - BARFIELD RD - ch.0.15 to ch.0.897	747	5.2	3,884	B	105	0	25	25	25	0	0	50	230	$239,040
North Nowra	Surface - ILLAROO RD - ch 13.865 to ch 14.365	500	4.2	2,100	F	100	0	25	25	25	0	0	50	225	$190,000
Rural Roads Northern	Surface - TOOLIJOOA RD - ch 0.313 to ch 1.980	1667	5	8,335	B	150	0	20	50	0	0	0	0	220	$533,440
Rural Roads Central	Surface - PARMA RD - ch.6.375 to ch.8.667	2292	6.2	14,210	B	140	0	75	0	0	0	0	0	215	$733,440
Rural Roads Northern	Surface - SPOTTED GUM DR - ch 0.119 to ch 0.821	702	5	3,570	F	100	0	25	0	0	0	80	0	205	$266,760
Rural Roads Basin	Surface - TURPENTINE RD - ch 4.661 to ch 8.791	4130	7	28,910	F	150	0	0	0	0	25	0	0	175	$1,569,400
Rural Roads Basin	Surface - TURPENTINE RD - ch 8.909 to ch 12.884	3975	7	27,825	F	150	0	0	0	0	25	0	0	175	$1,510,500
Rural Roads Central	Surface - HAMES RD - ch 1.763 to ch 2.763	1000	5.5	5,500	B	100	0	25	25	0	0	0	25	175	$320,000
		28.16	**Km**												**$10,081,360**