ROAD SERVICE REVIEW

NARRANDERA SHIRE COUCNIL

Infrastructure Department- Works Section

2015/2016

Project Manager for this Project

Krishna Shrestha, Manager of Works

(CPeng Civil/Structural)

Table of Contents

Road Service Review 2016

1 Background

Council adopted its first **Asset Management Plan for Transport and Infrastructure** in April 2012. In the plan, a useful life for bitumen seal is taken as 12 years. Similarly the useful life of a gravel resheet is taken as 12 years. Council has also adopted standards for road maintenance and construction, which describe the service level and various dimensions for resheet and reseal of roads.

Initially, optimal hire rates of plant and machinery were computed, as this is an important parameter which determines budget consumption per day. Next optimised duration of work required to deliver various operational and capital works were determined. Thus, optimised unit rates for resheeting, reseal, maintenance grading, shoulder grading and table drain maintenance were obtained.

To meet existing standards and the Asset Management Plans, Council needs to allocate $3.3M per annum in capital renewal for local roads and related infrastructure. Additionally, to meet the current maintenance standard, $2.91M needs to be allocated for maintenance of local roads.

Without an additional R2R (Roads to Recovery) grant funding (2015 October), available funds for Capital renewal on local roads was $1.74M leaving a shortfall of$1.56M. This was increased to $ 2.33 M following the announcement of increase in R2R funding reducing the shortfall to approximately $1M. Similarly, the overall maintenance budget for local roads and road infrastructure is $1.80M, based onthe historical maintenance expenditure on roads, with minor fluctuations but allowing for CPI increase. The maintenance budget was unchanged in 2015/2016.

There is an obvious shortfall of $ 2.08 M (3.3+2.91-2.33-1.8) to meet the existing asset management plan and standards. If increasing the budget is not the option, the alternatives are reducing the asset volume and/or the level of service. This review examines the available options and recommends the most promising of these.

2 Executive Summary

This document provides a detailed assessment of Council's road infrastructure and provides recommendations to sustainably meet the minimum statutory obligation as the road authority for these assets. The following table represents key aspects where change is recommended.

Recommendation No.	Recommendation	Strategic Impact (Internal Corporate V External community)
A1	Road Classifications redefined	Community
A2 – A6	Maintained road dimension is reduced	Community
B1	Service level is reduced	Community

B2	Renewal frequency is recommended	Community
B3	Need to develop strong asset management strategy and plan	Community
B4	Total roadwork outlays are tailored to meet available funds	Community
B5	Wet weather road closure policy is introduced	Community
B6- B7	Need objective assessment of B Double and Road Train Route and Bridge Assessment	Community
C1	Possible staff structure alternatives	Corporate
C2-C6	Alternative work arrangement for increased production; minimum staff numbers required	Corporate
D1-D3	Continue using Otta Seal; lifecycle economy using local gravel at increased thickness	Community
D4	Strategic assessment to supply water for roadwork	Community
D5	Use of GPS tracking on Councils plants	Community & Corporate
D6- D7	Grader numbers to support the service; optimum plant hire rates	Community
D8	Embrace new technology	Community
D9	Detailed road hierarchy review	Community
D10	Better management of gravel procurement	Corporate
D11	Effective way to manage customer request	Community
D12	Need to develop bushfire mitigation strategy	Community & Corporate
D13-D14	Develop robust policy for effective governance	Community & Corporate
D15	Miscellaneous	Community & Corporate

It will take up to 4 years to implement recommendations proposed in this review.

3 Scope of Review

3.1 Purpose and Objectives

1) To make decisions on changes to enable improved cost control
2) To review service levels related to traffic volumes and road user groups

3) To make decisions to enable more efficient delivery of the service

3.2 Expected Deliverables

1) Cost savings of 2.5% for labour and materials and contracts (as required to meet Fit for the Future ratios)
2) A reviewed road hierarchy methodology and service level based on traffic volumes and road user group (Part A)
3) An updated roadworks manual
4) A review of the staff structure that supports this service and recommendations for improvements
5) Review of major items of road construction and maintenance plant and equipment utilised to deliver the service (Inclusion: graders, water carts, rollers, gravel trucks)
6) A cost benefit analysis relating traffic volumes as to whether it is more economical to seal a road or leave it unsealed

4 Review Team

A team comprising representatives from safety, traffic, finance, asset, road supervisor, front line field staff and a neighbouring Council had a structured series of meetings to discuss various challenges and address inefficiencies the roadworks teams face. Options were proposed to overcome those obstacles identified by the team.

The following is the Review Team, who visited roads of various class and gravel pits apart from having series of meetings.

Andrew Pearson (Traffic Engineer)

Amanda Pearson (Administration Officer)

Bill Brew (Works Co-ordinator)

Rob Blake/Michelle Sleep (Finance)

Bruce McBean (Survey Assistant)

Michael Speed (Grader Operator)

Jock Wright (WHS Officer)

Emily Curie (Asset Representative)

Wayne Hodge (Road work supervisor)

Neighbouring Council Director of Technical Services David Webb -Lockhart Shire Council

5 Key Stakeholders

The followings were identified as key stakeholders who will be affected by outcome of this review

Internal Stakeholder

- IT Manager

- GIS Officer
- HR Officer
- Governance and Engagement Manager
- Asset Manager
- Plant and Workshop Manager

External Stakeholder

- Shire residents
- Traveling public
- Transport companies
- Farm owners
- School bus operators
- RMS
- Other Councils (adjacent)
- Visitors (tourists)

6 Identified Opportunities and Limitations

The following are the identified **opportunities**

1) Cost saving measures
2) Use of contractors
3) New technology to save costs
4) Selling of 1 grader to control costs
5) Current roads expenditure is significantly above the benchmark for Roads to Recovery funding
6) Increased efficiency
7) Shared services with other Shires

The following are the identified **limitations**

1) Staff resistance to changes
2) No common agreement within Council regarding service level, delivery methods and useful life of assets
3) Limited ability to build new assets with a focus on renewals
4) Insufficient data about the asset useful life e.g. the required frequency of resheet and reseal for roads with light traffic volume.

7 Linkage with other reviews

Detailed Review of Road Hierarchy

Review of Plant Utilization (items not in the scope of this review)

Review of Asset Management Plans

8 Relevance to Community Strategic Plan

3.1.2 Sustainable management of Council assets

3.4.2 Develop infrastructure that supports growth within our community.

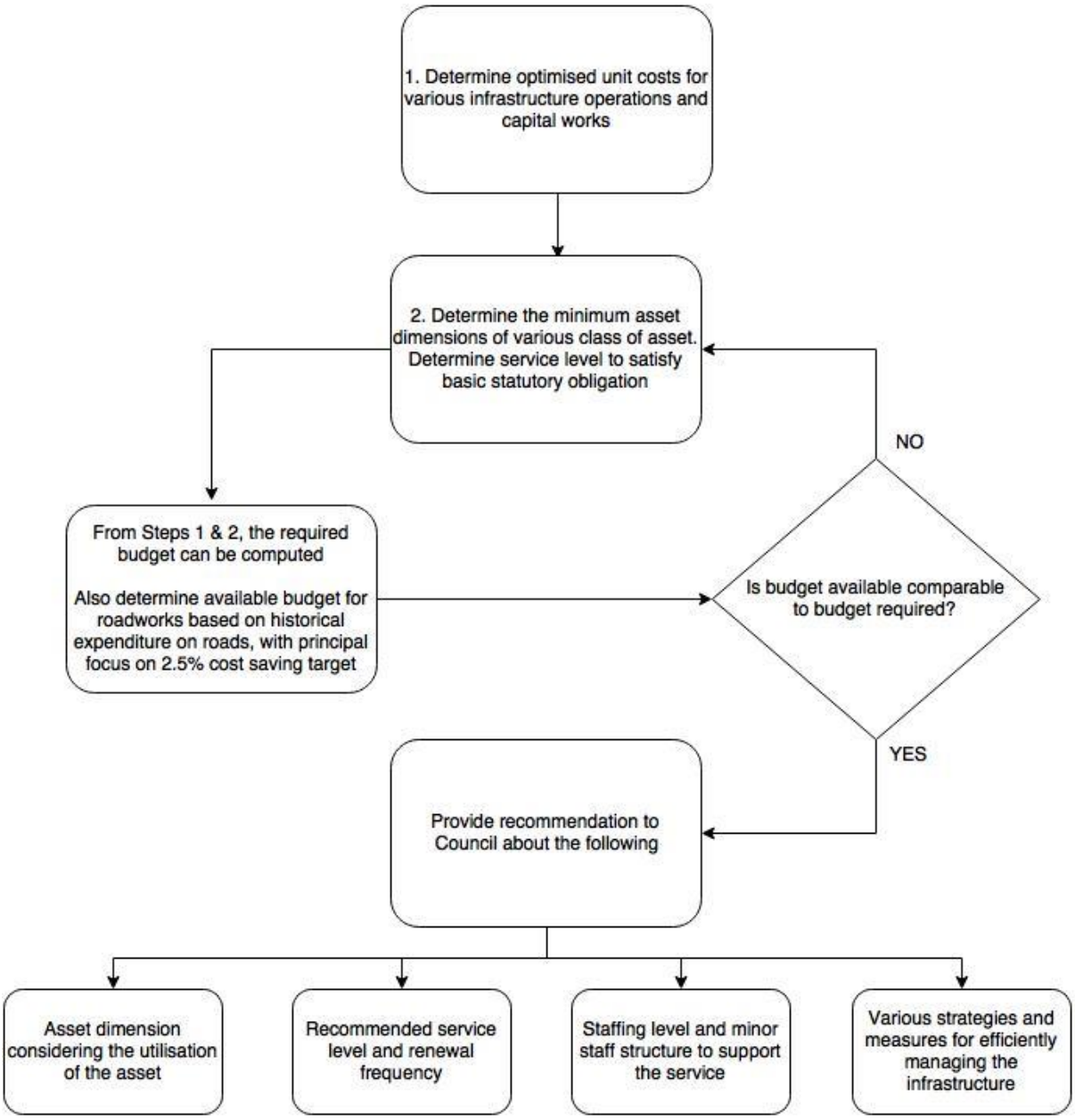
3.5.1 A road network that is safe for our farmers, our community and our visitors

9 Document summary

From the detailed analysis of work practice, network demand, staff structure and possible improvement in efficiency and productivity, four categories of recommendations are made which are supported by attachments.

10 Methodology of the service review

The flowchart depicts the methodology adopted in this review –



Summary of the flowchart:

Step 1: Optimised costs for various operational and capital works are computed utilising the efficiency and productivity measures already taken.

Step 2: Considering function and utilization of roads, minimum asset volume (length of roads, width) were determined. The major influencing parameters were analysed in this review while remaining minor details are recommended for further study. Additionally, service frequency e.g. maintenance grading, shoulder grading, table drain maintenance, reseal and resheet were chosen to meet the statutory requirement of the Council.

Step 3: Determine cost for maintenance and renewal for asset size chosen.

Step 4: Various iterations were undertaken comparing available funds, asset size (i.e. carriageway width) and service level to arrive at a recommendation allowing for budget availability, service level and asset dimensions

Step 5: Various other recommendations are presented to further improve efficiency and productivity, which will free up funds in the future. These can be utilized for improving service level or diverted to other area within the council

11 Recommendations

11.1 Category A: Asset Size (Road length, dimension and construction standard)

A1: Road classification current and future

A recommendation to perform hierarchy review of whole of Council's network is presented in recommendation D9.

Currently, Council's road class are defined as following (not including class 1 & 2 roads which are National and State roads):

- Class 3: Regional roads
- Class 4: Local Sealed Roads
- Class 5: Local Unsealed roads 8 m wide gravel road
- Class 6: Local Unsealed road 6 m wide gravel road
- Class 7: Local unsealed road < 6 m wide
- Class8: Unformed roads

A system of road classification based on function and use allows for a consistent treatment of all roads in a network, both in terms of the driver's expectations and the provision of a safe and economical network. The functional classification of a roadway identifies the relative importance of the mobility and access functions of that roadway, and should not be determined by surface type.

All Council local roads fall in Class 4 of Austroads construction, which have been further subdivided into four categories, 4A, 4B, 4C and 4D. Figure 1 and Table 1 present an amendment of road class type to meet the Austroads classification, and provide better asset management.

Table 1: Classification of various roads

Council's road class	Austroads class (Proposed class)	Description	Comment
4,5	4A	Roads for major movement between population centres and connection to adjacent areas	Sealed or unsealed 8 metre gravel width; if sealed 6 m seal width. Old Wagga road will be classified as class 4A, irrespective of whether it is sealed or unsealed
6	4B	Connection between local centres and link to primary network	7 metre total width and 5 metre gravel width
7	4C	Provides access to low use area or individual rural property sites and forest areas	4 metre gravel width and 6 metre total width
8	4D	Provides primarily for four-wheel drive vehicles. Mainly used for fire protection and recreational purpose	4 metre width track- no gravel

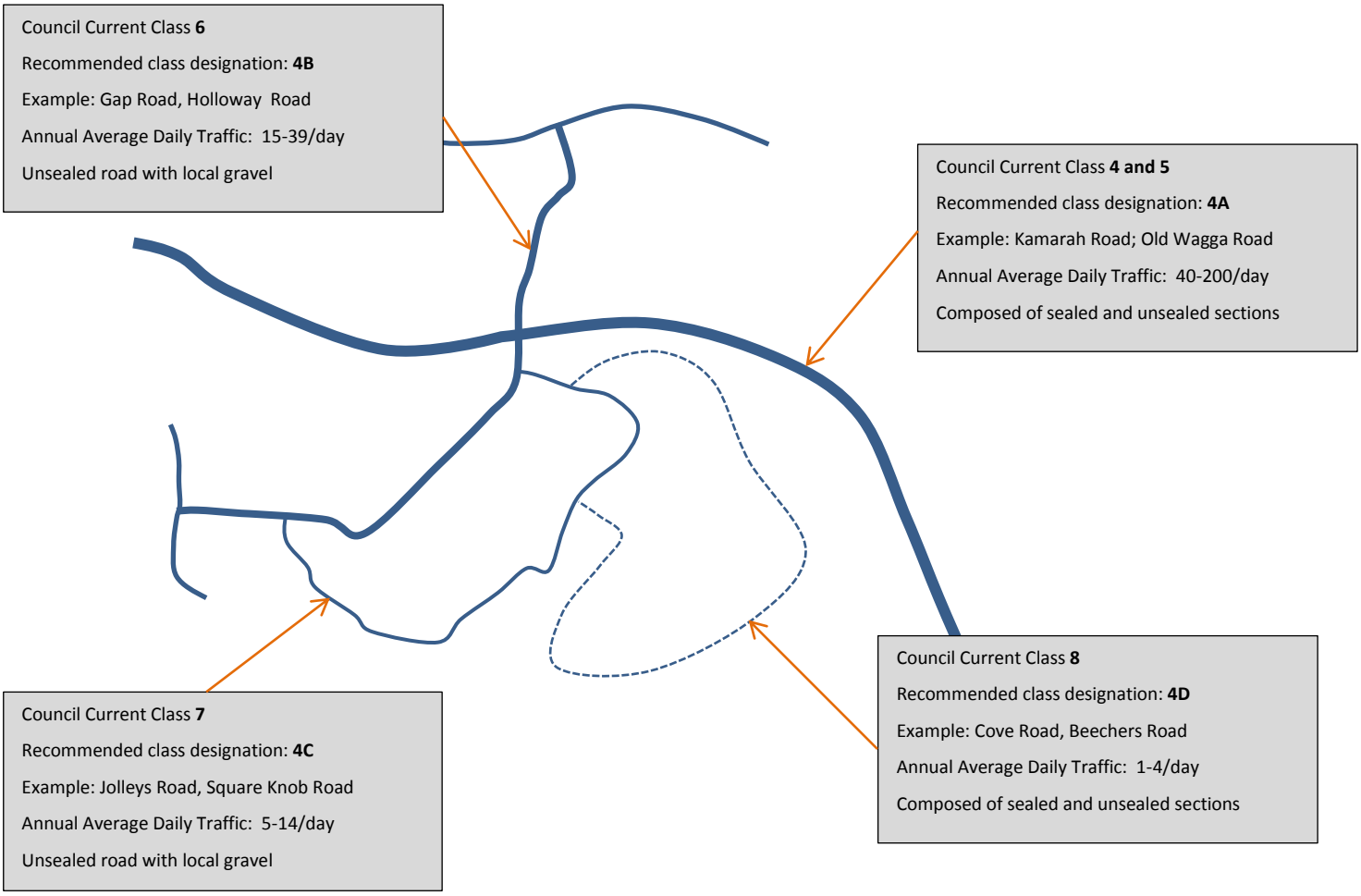


Fig 1: Schematic Diagram of Local Roads Classification System

The above classification transforms council's current road classification into 4 categories as shown the schematic diagram in Fig. 1.

Until a full scale road reclassification is carried out it is recommended that Council's roads be classified as 4A, 4B, 4C and 4D based on functional use of road network, which brings consistency with Austroads standard. At present, while discussing road matters with other stakeholders, we have to redefine what class 3, 4, 5, 6, 7 and 8 implies. Instead, using class 4A, 4B, 4C and 4D is part of a global classification.

Council's current road classification map is presented in Attachment 6.2

A2: Class 5 road dimension

At present class 5 roads are of 8 m gravel width plus 1 meter ungravelled shoulder on either side. It is recommended that class 5 roads are made of width 8 meters including 1 m ungravelled shoulder on either side.

Attachment 1 presents the construction standard of Class 5 roads.

A3: Class 6 road dimension

Currently, class 6 roads are of 8 m width including 2 meters ungravelled shoulder. For the traffic volume and utilization, it is recommended to limit total width of class 6 roads to 7 meters including 1 m ungravelled shoulder on either side.

Attachment 1 presents the construction standard of Class 6 roads.

A4: Class 7 road dimension

Class 7 roads are up to 6 meter wide gravel road at present. It is recommended that road width of this class of roads be limited to 5.5 meters including 1 m ungravelled shoulder on either side. This width should be sufficient for limited one way traffic with ungravelled shoulder for rare two way traffic.

Attachment 1 presents the construction standard of Class 7 roads.

A5: Class 8 road dimension

Most class 8 roads are unformed tracks. It is recommended that Council maintain 4 m width of track. From analysis of traffic data if the road is proven to be unused, it is also recommended to close some roads to reduce liability risk to council.

Attachment 1 presents the construction standard of Class 8 roads. (Class 8 roads are tracks.)

A6: Urban reseal

The review has identified that the majority of urban roads are wider than required for traffic flow and parking. Therefore, considering utilisation, it is recommended to seal the shoulder at alternate reseal cycle. The designated travelling lanes are recommended to be resealed in the usual reseal cycle.

It is recommended further assessment to determine required travelling lane widths considering the road usage statistics.

11.2 Category B: Service level and renewal frequency

B1: Grading, table drain and shoulder grading frequency

The current adopted service levels (i.e. the frequency of maintenance grading) for various classes of roads is as follows:

Current Road Class	Grading Interval(months)	Shoulder grading and Table drain maintenance interval(months)
4	N/A	24
5	3	24
6	6	24
7	12	24
8	24	24

The review shows that these service levels are not being met because of available funds. It is therefore considered that the service levels be reduced as follows:

Current Road Class	Grading Interval(months)	Shoulder grading and Table drain maintenance interval(months)
4	N/A	60
5	12	60
6	18	60
7	24	60
8	60	60

It is recommended that this minimum level of service is maintained to minimise ll risks to Council.

Attachment 1 presents the proposed service level for various classes of road in tabular form.

B2: Resheet and reseal frequency

It is recommended for analysis purposes of required annual capital budget for various components of road infrastructure that Council adopt useful life information from JRA(Jeff Roorda and Associates) database. The recent RAMROC and REROC data assessment result the following:

Reseal:

JRA average reseal life is 17 years for council roads. RAMROC average is 19 years while REROC average is 15 years (the type of seal is not stated in the report. Use this configuration until better data is obtained: 10 mm prime seal, with 7 mm reseal, and then 7/10 continuing reseals)

Resheeting:

Both RAMROC and REROC resheeting averages are 16 years. In the benchmarking report, it doesn't state the work details. (Resheeting thickness, gravel type and rainfall region is not stated while providing asset useful life information. An assumption of 150 mm compacted thicknesses has been made).

It is identified that gaining greater confidence in useful life in financial modelling of infrastructure asset management is crucial. It is also recommended that further statistical and scientific analysis be carried out to determine the actual useful life of reseal, pavement and resheeting. It is clear that the information obtained from RAMROC and REROC is not based on scientific assessment.

B3: Develop a robust asset management strategy for transport infrastructure

It is recommended that Council allocate adequate resources to identify condition of assets and develop strategy to manage various infrastructure assets considering the rural environment. Obviously "off the shelf" asset management software won't be applicable for Narrandera Shire Council because most of them contain excessive details adding additional administrative costs. However, there are several existing middle level software products which can be utilised to manage assets. These are being considered by the Assets and Projects Team

The asset management system to be developed should be robust but flexible enough to deal with various demands of community. If there is 100 % condition rating available for all asset, the issue wouldn't be there. However, often the condition assessment especially for unsealed roads are based on visual inspection. We may develop a good 10 years resheeting plan, however, it is not commonly realised that 200+ meters of gravel patching at various locations may be more prudent than 3 km of continuous resheeting. The asset management plan should be robust enough to cater for these circumstances.

It is recommended that Council allocate resources towards developing an asset management system and process to foster the following -

- To identify council's strategic priorities among various transport and infrastructure items
- To determine 100 % condition rating of asset, which is a key preliminary step to identify what resources are actually required to maintain our asset at current standard
- To determine what network volume council has and what network volume can we sustain
- To develop a schedule to determine where will we be resheeting/resealing/upgrading in next 10 years, with a greater degree of confidence. To this end allowances have been made in the 2016/17 draft budget.

B4: Maintenance and capital budget size to meet statutory requirement of Council

Maintenance budget required for the Service level proposed in recommendation B1 has been estimated as follows:

Unsealed road maintenance budget (Rural):	$922,734
Maintenance cost for sealed local roads (Rural)	$276,299
Maintenance cost for regional roads	$ 169,284
Maintenance cost for urban roads	$715,128
Total minimum maintenance budget= **$2,083,445 ≈**	**$2.08 M**

Detailed of the above cost items are presented in Attachment 2

The Capital Budget required to maintain the reseal/resheet frequency according to RAMROC and REROC average, shown in recommendation B2is as follows:

Rural capital works including rese	$1,751,576
Urban capital works on reseal	$263,796
Kerb and Gutter Capital works	$80,873
Footpath Capital works	$14,508
Traffic devices, drainage and Bridges	$259,506
Total capital budget required $2,370,259≈	**$2.37 M**

Detailed analysis of various capital budgets is presented in Attachment 3

Parametric analysis is carried out to compute required capital budget for various situations.

Scenario 1 (Attachment 3.1): No change on asset dimension; useful life as per adopted Asset Management Plan (AMP)

Scenario 2(Attachment 3.2): No change on asset dimension; useful life as per RAMROC/REROC average

Scenario 3(Attachment 3.3): Asset dimension as per A2, A3,A4 and A5 recommendation; useful life as per adopted AMP

Scenario 4(Attachment 3.4): Asset dimension as per A2, A3,A4 and A5 recommendation; useful life as per RAMREROC average

Scenario 4 is recommended

Total annual budget (maintenance + Capital) required is **$4.45 M**

The total available funds assumed based on 2015/2016 approved budget and 2.5 % reduction in Council's own source budget is $4.132 M (available budget is 93% of the required budget)

Attachment 4 provides a preliminary analysis of required capital and maintenance budget, which provides a quick check of the analysis based on asset register.

B5: Develop Road Closure Policy for wet weather

It is recommended that Council adopt a road closure policy which allows closing roads when wet, particularly unsealed roads. This curtails the maintenance cost greatly.

A draft wet weather road closure policy is attached in Attachment 5

B6: B Double and Road- Trains route assessment

Currently 95 % of our council's unsealed roads are B-double routes. Route assessment need to be undertaken, so that conditions can be put on roads if there is no alternative to allowing B-double.

Similarly, there is growing demand for high performance vehicles and Road Trains on Council's road. A detailed route assessment is needed on strategic routes.

As it is obvious from the map in Attachment 6.1, a route is allowed for road trains not based on the actual route assessment, but based on region. For example: East of Narrandera, Ardlethan and West Wyalong, most of the areas are not gazetted for road trains.

Council needs to do further research to develop a procedure for gazetting a road for Road Trains or other High Performance Vehicle, which will make a balance of need for local economy and damage on the road.

Attachment 6.2 lists maps of council's road asset.

B7: Bridge assessment

Council's bridges and culverts structural assessment needs to be undertaken as soon as practicable. The outcome of these assessments will determine the most economic way of managing bridges. If the capacity is lower and can't take a B-Double, then we may need to lower the load limit. If it is a major freight route, we may look into finding funding sources to renew or upgrade bridges.

Council has applied funding to conduct structural assessment of 10 significant bridges in 2015/2016 Fixing Country Roads funding scheme. Should these funding not approved, council should keep on looking assessment of these bridges to ensure that these bridges are safe for B-Doubles at HML (Higher Mass Limit)

11.3 Category C: Staffing Levels and effective utilization of staff

C1: Possible structure alternatives

To satisfy one of the deliverables of this review staff and plant resources are to be reviewed. It should be noted the outcome is not intended to be an increase in either staff or plant costs but better utilisation of both to realise increased value from operations.

A better alignment of Staff structures and staff grading strategy to deliver the service is required, this includes;

- Increased responsibility for Grader Operators for project control
- Two supervisor structure under Works Co-ordinator
- The Urban maintenance team to be supported by a Ganger
- Team leader and ganger grades reviewed to reflect levels of responsibility.
- .

Grader operators increased responsibilitiesbe amended to include the following:

a) For maintenance works, Grader Operator will be in charge of job sites. They will look after all aspect of job sites including signage, quality and safety,

b) For construction works, after Team Leader arranges all signage and job scope is defined, it will be the Grader Operator's responsibility to manage the site.

The proposed structure is in Attachment 7

It is recommended that a Wyatt assessment be conducted to develop relativity between various positions depending on skill required and work involved, which is presented in Attachment 8.

C2: Start and finish at job sites

For road construction and maintenance works there are efficiency gains to be made by starting and finishing work on the job instead of at Councils Depot.

Mandatory arrangement to start work at job site and finish at job site for road construction and maintenance crew (grader, trucks, water cart and roller operator crew) is therefore also recommended.

Having staff required to start and finish at the job site at usual work times would involve:

- Travel allowance to be paid to staff as per the award
- The arrangement is applicable only for Maintenance grading crew, Construction Crew and Gravel Gang

Cost benefit analysis is included in Attachment 9.1

A detailed analysis of travel allowance is presented in Attachment 9.2

C3: Training/self-managed staff

The Manager of Works is working towards developing a cohesive and inclusive team; however there is more work needed to be undertaken to complete this project. Continuous training and improvement should be the focus for better production and efficiency, and to create a positive image to the community. Once the positive image starts to establish, it will motivate staff further which foster desire to make a difference to all individual staff resulting in a self-managed strong internally motivated team.

C4: Variable working hours during summer and winter

Maxim utilisation of plant and machinery is the key to generating better return on dollars invested. This can be achieved partially using the starting and finishing at job sites methodology, which is recommended in C2. To further maximise the production utilising the fixed cost of Council's plant asset, it is beneficial to look into developing flexible working hours during summer and winter. During summer, staff could work longer hours and acrue time in lieu, which they can utilise in winter time.

Staff could work longer hours during summer and reduce working hour during winter. Further assessment of Local Government Award system is necessary to implement this system.

C5: Staff numbers to support the service

The staff numbers presented in staff structure C1 is the basic minimum to ensure -

- All R2R and Block Grant and RMCC contract works are completed

- Road maintenance is completed as per the maintenance grading frequency defined in recommendation B1
- Waste collection services in town streets are completed as per the current schedule
- Street Sweeping works are completed as per the schedule defined
- Jet patching and various sign maintenance, slashing, fire trail works are completed in a timely manner

C6: Look into 4 day longer hour service with relief grader operator

Given that our plant costs are fixed especially for roadwork machines, it is necessary to identify the best way to maximise the plant utilization. Recommendation C2 and C4 will improve the utilization. However, while staff are on RDO, the grader sits idle. To utilise grader while staff are on RDO, the following could be examined –

- Staggered RDO of staff
- More relief grader operators
- 9.5 hours/day of work for road crews and work only 8 days a fortnight

These arrangements don't contradict with Local Government State Award 2014; however staff need to be fully consulted before implementing. If this system is implemented the utilization of graders will be higher which will reduce plant hire rates and increase productivity.

11.4 Category D: Various other efficiency measures

D1: Extend the seal using Otta seal starting from High volume local roads

Based on traffic data collected so far, roads with traffic volumes above 35 vehicles per day are categorised as high traffic volume, in the scale of high, medium and low. The maintenance cost of this category of road is considerably higher compared to medium and low traffic volume local roads. It is recommended to extend the seal on this category of road, gradually.

Attachment 10.1 depicts how Otta seal is advantageous to conventional seal for low volume roads. Supporting spreadsheet to visualise the effect of extending the seal, especially for class 4A roads (class 4 and class 5 current class) are analysed in Attachment 10.2

D2: Thicker gravel depth during resheeting

Contrary to current practice of putting 75 mm compacted gravel, provide 175 mm loose gravel (which is equivalent to 125 mm of compacted depth. This arrangement is cost effective considering the lifecycle cost assessment of unsealed roads. Usually, the number of passes required for 75 mm compacted gravel depth and that of 140 mm are very similar. Traffic control and other costs are the same. Therefore, we can significantly extend the useful life of unsealed roads for a marginal increase in the capital investment.

D3: Open more gravel pits and explore gravel suitable for Otta seal

In last two and half years the works team have been able to utilise gravel from 12 different places around the shire, which has the following benefit:

1. Lower cost of gravel
2. Lower carting costs

3. Limited damage on road due to gravel haulage truck as haulage distance will be reduced substantially
4. Independence and skill development in gravel mining

It is recommended that Council continue exploring more gravel pits for resheeting works.

To maximise the outcome from implementation of recommendation D1, it is also recommended that council invest resources to find suitable gravels for Otta seal. These resources might include…..?

Attachment 11 provides the specification used by ADB (Asian Development Bank) funded projects for Otta sealing, and the closeness of various gravel sources around Narrandera. The content of fines (very small particles) is excessive for the Strontian pit gravel; removal of fines could be costly. Therefore, council should search for a suitable gravel pit from which gravel can be extracted for Otta seals at minimal cost.

D4: Invest on improving efficiently supplying water for roadworks

Currently, it takes about 25-30 minutes to fill the water tank and at times the water tank has to travel considerable distance to find a suitable place (on firm dry ground) to pump water from the river or irrigation channel. The following could be investigated to improve the process -

1) Purchase pump/trailer arrangement which can supply water to water tank at higher discharge compare to the inbuilt pump of water tank
2) Put gravel pads at strategic locations of Channel bank and rivers so that water can be fetched conveniently
3) Develop a goodwill relation with farm property owners with in-kind works so that water can be obtained from their dams, which will produce win-win solution
4) Locate strategic places where there is scarcity of water, and do deep boring for convenient supply of water

D5: Use of GPS tracking system on council's plants

Use GPS tracking and starting times producing fortnightly production figure and display at depot so that staff can self-monitor their weekly performance. For example a grader may do 30 hours a machine hour in one week, while the next week 28 hours and third week 35 hours. A bar chart on a depot board around meal room will definitely help staff to benchmark themselves.

D6: Quantity and type of major plant to efficiently deliver the service

a) Keep all 4 graders until announcement is made about Roads to Recovery funding 2019-2024 years. As the average R2R funding for 2015-2019 is $ 1,244,881/year, all our 4 graders can be easily utilised
b) Investigate options for High performance vehicles for gravel cartage. Currently 2 trucks and trailer, and 2 loaders arrangement is sufficient. Utilise council's plant wherever possible
c) The Jet patcher unit is proving a good investment. It is necessary to increase the utilization of this plant to justify it economic viability. This can be arranged through managing staff numbers, and relief arrangement, so that Jet patch unit works throughout the year
d) Keep second water cart and complete required recruitment of water cart operator

D7: Plant hires rates (internal hire)

A detailed analysis of plant hire rates has been conducted. The current plant hire rate is sufficient to recoup various costs for capital purchase as well as other ancillary costs.

A detailed analysis of major plant is presented in Attachment 12

As shown from the detailed analysis of hire rates, the current hire rates are appropriate, with yearly CPI increases. Out of 212 days of actual working days, if our graders are working for 180 days a year, the required cost will be recouped from the existing hire rates. The analysis suggests a similar case for Tip trucks.

D8: Embrace new technology

D2.1: Smart phone for Supervisors

Smart phones for all supervisors- this enables efficient communication leading to productivity and efficiency. For example: if there is a small culvert collapse, work supervisor can send a photo to works coordinator instantly rather than works co-ordinator needing to go to site for decision making

D2.2: Use REFLECT for defect recording and accomplishments

D2.3: Use Plant Assessor or similar software products to collect various plant faults, prestart check related information

D2.4: Collect road sections needing capital works in REFLECT

D2.5: Find areas where drones can be utilised for rural supervision in future

D2.6: Use geological maps to identify gravel sources close to roads

D2.7: Make TRIM customer request information available in tablets or smartphones for supervisor for convenient action

D9: Perform detail road hierarchy review

It is recommended develop a revised road hierarchy. Due to time and resource constraints, a framework is set from this review to carry out this work. Attachment 7 depicts the framework.

Attachment 13 presents the framework to be based on for detailed road hierarchy review.

D10: Account for gravel as a stock item, with similar arrangement to Emulsion at present

a) Estimate the amount of gravel required for a financial year from each pit, specify crushing or pushing depending on the gravel hardness. Call for tender for gravel supply for each financial year before end of April
b) Use hourly work arrangement only for pit maintenance and clearing overburden
c) Collect all costs for gravel pushing as a store item and charge the total cost to each job. Remainder of gravel will be transferred to new financial year

This arrangement will help to reduce procurement cost and better accounting for each project. This arrangement also opens an avenue of sale of gravel.

D11: Effective management of Customer Requests

It is recommended to implement the following system for effective customer service management.

- All customer service requests be distributed directly to operational staff.
- A spreadsheet is presented in Attachment 14 to facilitate proper allocation of request. This marries with the Customer Service Review recommendations.
- All maintenance type of work are to be distributed to team leader/supervisors for action, and for information to be passed onto Manager Works
- Strategic and capital type of works are to be assigned for action to Manager Works
- Refresher training on TRIM to supervisors
- Computer trainings to supervisors
- Investigate into TRIM apps so that customer request can be accessible in mobile phones

D12: Bushfire mitigation related works

Currently, there is no separate budget for various bushfire mitigation works apart from statutory contribution to MIA Bushfire Mitigation Authority. Council undertakes various bushfire mitigation works, for example: slashing of roads for fire cut off, grading of fire trail etc.

It is recommended the following:

- Define strategic roads for slashing works to mitigate fire risk.
- Develop fire trail register
- Based on the above two items, we can determine budget required for various prevention works against bushfire

D13: Policy development, review, updates

It is recommended that the department give priority in developing various policieswhich is the key for better governance. If there is a clear policy on various issues and that is communicated to supervisory staffs and customer service staff, a big fraction of customer requests can be curtailed from reaching to middle management or senior management level. This allows managers to focus on key strategic priorities. The following are some policies which need to be developed.

- Driveway for private or business entrances- if damaged who will be responsible?
- Dust sealing
- Urban laneway management
- If culvert is to be installed to private property on the road reserve to allow all weather entrance to the rural property owner- the responsibility in cost sharing

D14: Customer expectation survey

Understanding the expectation of customers is considered outside the scope of this review. It is recommended that a customer survey be conducted outlining community expectation and their willingness to pay for better road quality.

D15: Miscellaneous

There are several other small items which might be considered to assess whether there is the possibility to simplify the process/system to add efficiency -

- Time sheets - is there any alternatives?
- We have been booking odometer when we travel 3 km.. Then the recorded item is transferred to finance system. Is there better way to reduce administrative costs?
- There is J/C for each item we colour print. The administrative cost is more than the cost of the printing itself. Is there a better way?
- Plant fault reports, pre start checks, is there better way?
- Security system at depot, do we really need security? Is there an alternative?
- Purchase orders for all small/big items- are there other alternatives?
- Ways to increase communication between teams for better efficiencies. Can we delay replacement of grader/water cart/trucks? What is the economic replacement frequency?
- Maximising Councils ability to attract grants i.e. Fixing Country roads Grant, that will supplement own source income and current grant funding. Review of administrative works being undertaken by Supervisors based at the Depot.
- Use of drone for surveillience
- Resource sharing with neighbouring Council
- Detailed research about actual useful life of reseal and resheet in rural environment

These are a few of the various items which we can analyse in depth which could possibly lead a way for better production. It is recommended to spend resources for further analysis on above items.

12 Assumptions

Unit costs for various maintenance and capital operations

The following cost assumptions were made to determine the maintenance and capital budget size for unsealed road and sealed road network

Maintenance grading $ 927/km @ $1854/day, 2 km /day
Shoulder grading 618/km @ $1854/day,3 km/day
Table drain maintenance 618/km @ $1854/day, 3km/day
Sealed local road maintenance cost @ $747/km/year (Excludes: shoulder grading, signabe, tree maintenance and culvert maintenance)
Sign/tree/culverts maintenance for seal/unsealed road @ $10/year/km
Unit cost for resheeting $5/m2 using local uncrushed gravel
Unit cost for sealing with 20 mm Otta seal $ 4/m2
Unit cost for 10 mm spray seal $ 4/m2
Gravel unit cost $ 3.5/tonnes or $5.6 /$m^3$ loose (pushed gravel)
Crushed gravel $9/tonnes or $14.4/$m^3$ loose

Minimum Budget available

Available budget considering 2.5 % reduction in Council source funds

Average roads to recovering funding amount $1,244,881/year

Council sourced funding total in 2015/2016 = $2,961,700

With 2.5 % reduction, on council source funds the budget available is = $2,887,658

Total available budget is $4.132 M

Attachment 15 depicts the breakdown of available budget.

13 Implementation Plan

One to four years Implementation Plan will be prepared and will be presented to the Executive Leadership Team within two months following by agreement in principal to the recommendations.

15 Attachments

The following are attachments to support above recommendations.

Attachment 1: Road Hierarchy standard

Attachment 2: Maintenance cost for road transport infrastructure

Attachment 3: Capital budget require for road transport infrastructure

Attachment 4: Preleminary analysis – a quick check of rigorous analysis in Attachment 3

Attachment 5: A draft road closure policy

Attachment 6: B double and road train route regional vs NSC B double/road train route

Attachment 6.1: Regional B double and road train map

Attachment 6.2: Map of NSC road asset

Attachment 7: Proposed new staff structure

Attachment 8: Proposed staffs for Wyatt Review

Attachment 9: Benefit of travel allowance

Attachment 9.1: Cost benefit-travel allowance

Attachment 9.2: Detailed analysis of travel allowance

Attachment 10: Otta Seal benefits

Attachment 10.1: Otta seal cost effectiveness- detail analysis

Attachment 10.2: Summary –cost benefit analysis Otta Seal

Attachment 11: ADB specification vs Strontian pit gravel for Otta Seal

Attachment 12: Detailed analysis of heavy plants hire rates

Attachment 13: Framework for detail road hierarchy review

Attachment 14: Customer request action assignment guide

Attachment 15: Breakdown of projected budget