Asset Management Plan

Roads & Transport

Adopted 06 September 2018

Amended March 2021

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TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

Context

Ballina Shire Council is located in the Northern Rivers of the Far North Coast of New South Wales. It covers an area of 485 km² with a shire population of 41,335 (as of 30th June 2013)

Council's Road & Transport infrastructure is arguably the most widely utilised and most visible of all of Councils asset groups. It also has the largest overall capital value.

The Road & Transport Service

The Road & Transport network comprises:

- Local (urban + rural) public road networks & associated infrastructure
- Local (urban + rural) public carpark networks & associated infrastructure
- Regional (urban + rural) public road networks & associated infrastructure
- BSC marine transport infrastructure, including wharves, jetties, pontoons, boat ramps and ferry infrastructure.

These infrastructure assets have a replacement value of $531,865,562

Note that the road & transport infrastructure from the Ballina Byron Gateway Airport, the Ballina Waste & Recycling Centre, Open Spaces Locations and Water & Wastewater sites do not form part of this AMP. These assets are defined within their respective Asset Management Plans.

What does it Cost?

The projected outlays necessary to provide the services covered by this Asset Management Plan includes operations, maintenance, renewal and upgrade of existing assets over the 10 year period.

Five costing model options have been developed for this AMP. Their major difference between them is how & when road pavements have their capital treatments applied.

Scenario 1: Current practices with the exception of adopting the recommendations of the 2015 wearing course analysis.

Road & Transport_S1_V1	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$207,610
10 year average LTFP budget	$20,761
10 year AM financial indicator	91%
10 year average funding shortfall	-$1,805

Scenario 2: Granular Pavement lifecycle modified to accommodate a 3 reseal cycle between capital works (as per the 2015 wearing course analysis) & a 100mm pavement rip & reshape treatment at the 2nd reseal

(pegged rate rise)

Road & Transport_S1_V2	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$219,843
10 year average LTFP budget	$21,984
10 year AM financial indicator	97%
10 year average funding shortfall	-$582

(proposed rate rise)

Road & Transport_S1_V2	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$225,229
10 year average LTFP budget	$22,523
10 year AM financial indicator	100%
10 year average funding shortfall	-$43

Scenario 3: as per Scenario 2 + stabilisation of sealed granular rural on replacement

Road & Transport_S3_V1	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$215,220
10 year average LTFP budget	$21,522
10 year AM financial indicator	95%
10 year average funding shortfall	-$1,044

Scenario 4: as per Scenario 2 + stabilisation of sealed granular urban & rural on replacement

Road & Transport_S4_V1	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$216,470
10 year average LTFP budget	$21,647
10 year AM financial indicator	95%
10 year average funding shortfall	-$919

Scenario 5: as per Scenario 2 + pathways & K&G are deemed non depreciable (other than on class 6 roads)

Road & Transport_S4_V1	
Executive Summary - What does it cost?	($000)
10 year total cost [O, M, R & U Expenditure]	$225,659
10 year average cost	$22,566
10 year total LTFP budget [O, M, R & U]	$213,570
10 year average LTFP budget	$21,357
10 year AM financial indicator	94%
10 year average funding shortfall	-$1,209

The preferred option is scenario 2 requires $22,566 k on average per year. The estimated available funding for this period is $21,984 k on average per year which is 94% of the cost to provide the service. This is a funding shortfall of -$582 k on average per year.

Alternatively, with the proposed rate rise, the available funding for scenario 2 for this period is $22,566 k on average per year which is 99.8% of the cost to provide the service. This is a funding shortfall of -$43 k on average per year.

What we will do

We plan to provide Road & Transport services for the following:

- Operation, maintenance, renewal and upgrade of Car parks, Local Roads, Regional Roads and marine transport assets and their associated infrastructure, to meet service levels set by Council in annual budgets.

- Construct the following major new projects as per the roads contribution plan 2015:

  → Hutley Drive Extension (Lennox Head)
  → Duplication of North Creek Bridge (Ballina)
  → Skennars Head Distributer (Skennars Head)
  → Ross Lane Upgrades (Newrybar)

- All within the 10 year planning period.

What we cannot do

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

- Provide asphalt road surfaces to local urban streets & local rural roads.

Managing the Risks

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

- Traffic accident + injury due to poor pavement condition
- Traffic accident + injury due to poor pavement geometry on unsealed roads
- Pedestrian fall on footpath trip point

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

- Maintenance & capital works programming
- Pavement & related assets condition assessments
- Re-alignment of roads with poor geometry

Confidence Levels

This AM Plan is based on Medium level of confidence information.

The Next Steps

The actions resulting from this asset management plan are:

- Development of maintenance scheduling within the Authority Asset System, through the incorporation of the 'reflect' maintenance databases and web site.
- Continuation of the condition assessment and road pavement condition data collection as detailed in section 5 of this document.
- Advance the integration of the road & transport integration to the GIS platform

Questions you may have

What is this plan about?

This asset management plan covers the infrastructure assets that serve Ballina Shire Council's community's Road & Transport needs. These assets include roads, bridges, foot & shared pathways, kerb & gutter, roundabouts & associated traffic calming devices, street lighting, street signage, roadside furniture and marine transport infrastructure.

What is an Asset Management Plan?

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

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

Why is there a funding shortfall?

Most of Council's Road & Transport network was constructed by developers and from government grants, often provided and accepted without consideration of ongoing operations, maintenance and replacement needs.

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

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

What options do we have?

Resolving the funding shortfall involves several steps:

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

What happens if we don't manage the shortfall?

It is likely that we will have to reduce service levels in some areas, unless new sources of revenue are found.

What can we do?

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

2. INTRODUCTION

2.1 Background

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

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

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

- Community Strategic Plan
- Delivery Program & Operational Plan
- Resourcing Strategy
- BSC S94 Roads Contribution Plan 2015
- BSC Infrastructure Risk Management Plan
- BSC Long Term Financial Plan

2.1.1 Road & Transport Asset Hierarchy Definitions

Assets within this AMP have been defined to fit within a series of road networks and their associated hierarchies. The road networks have been defined in 3 steps.

Segmentation:

Each road has been broken into a series of uniquely numbered 'uniform' segments. They are generally up to 3km in rural settings and up to 200m in urban areas (length of an urban block) Bridges, causeways and carparks are defined as individual segments.

Group Definitions:

Each segment is placed within a number of category 'group' definitions

- Local / Regional / Site Specific ('site specific' refers to roads within BSC maintained sites)
- Urban / Rural (this is further expanded by 'suburb' & 'rural locality')
- Sealed / Unsealed (this is further expanded by 'material types')

NAASRA Classes:

The NAASRA (National Association of Australian State Road Authorities) has developed a 9 level road hierarchy that is used throughout Australia. It is essentially a division by function and is defined as follows.

- N1 -Motorway (not used at BSC)
- N2 -Rural: distributers
- N3 -Rural: arterials
- N4 -Rural: local roads
- N5 -Rural: single use roads
- N6 -Urban: principal avenue

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

- N7 -Urban: distributer to local streets
- N8 -Urban: local streets
- N9 -Urban: local lanes
- NA -Other: used for 'site specific' road pavements AND carparks

2.1.2 Relationships to Road Segments

Pavement Profile

The pavement segment itself is separated into 3 components, each of which are defined as unique assets

- Formation (non-depreciable)
- Pavement
- Wearing course

Associated Assets

Associated or ancillary assets that lie within the road reserve of a specific segment are linked to that segment by asset ID to become a 'child' asset of the segment. These assets would include K&G, pathways, street lights, street signs, roundabouts, traffic medians, guard rail & bus shelters.

Non-associated Assets

Some assets cannot be directly linked to a road segment. These assets stand alone and include

- Wharves
- Jetties
- Pontoons
- Boat Ramps
- Ferry infrastructure
- Carparks

The infrastructure assets covered by this asset management plan are shown in Tables 2.1.1 – 2.1.4

Table 2.1.1: Assets covered by this Plan (Site Specific Carparks)

Asset Group	Length - m	Asset Sub-Group	UOM	Quantity	Replacement Value
Carpark -Access	33	Carpark -access	m2	274	$42,105
Carpark -Formation	3,660	Formation (non-depreciable)	m3	22,933	$1,031,985
Carpark -Furniture	131	Carpark -furniture	m	131	$14,097
Carpark -K&G	1,583	K&G	m	1,583	$131,385
Carpark -Lighting	-	Lighting	each	16	$104,000
Carpark -Paths	345	Paths	m2	517	$77,520
Carpark -Pavement	3,660	Pavement -granular (sealed)	m2	56,384	$4,638,910
Carpark -Street Signage	-	Signage	each	6	$2,100
Carpark -Traffic Calming	-	Traffic Medians	m2	114	$29,876
Carpark -Wearing Course	3,263	Wearing Course	m2	57,030	$810,476
TOTAL: Site Specific Carparks					**$6,882,454**

Table 2.1.2: Assets covered by this Plan (Local Roads)

Asset Group	Length - m	Asset Sub-Group	UOM	Quantity	Replacement Value
Urban: Bridges	15	Large Box Culvert	each	2	$736,468
Urban: Bridges	28	Steel Concrete Bridge	each	2	$581,832
Urban: Bridges [1]	217	Steel Concrete Bridge	each	1	$0
Urban: Furniture	-	Bus Shelters	each	34	$333,000
Urban: Furniture	592	Guard Rail -Barrier	m	592	$162,800
Urban: Furniture	-	Guard Rail -Terminals	each	6	$21,000
Urban: Furniture	-	Miscellaneous	item	1	$51,950
Urban: Kerb & Gutter	307,881	K&G	m	307,881	$29,240,495
Urban: Paths	98,234	Paths	m^2	194,404	$21,294,981
Urban: Paths [2]	682	Path Structures	each	14	$859,220
Urban: Road Signage	-	Road Signage	each	4,833	$1,716,200
Urban: Roads	-	Formation (non-depreciable)	m^3	879,561	$35,182,444
Urban: Roads	5,730	Pavement –concrete	m^2	57,183	$14,295,800
Urban: Roads	224,590	Pavement –granular (sealed)	m^2	2,304,218	$85,229,569
Urban: Roads	7,615	Pavement –granular	m^2	38,249	$1,529,976
Urban: Roads	73	Pavement –pavers	m^2	547	$136,725
Urban: Roads	20,884	Pavement –unformed	m^2	115,842	$0
Urban: Roads	224,929	Wearing Course	m^2	2,018,995	$29,292,167
Urban: Street Lights	-	Street Lights (non-	each	2,446	$0
Urban: Traffic Calming	-	Roundabouts	each	35	$8,298,665
Urban: Traffic Calming	-	Traffic Medians	m^2	15,063	$1,329,610
				Urban: sub-total	**$230,292,900**
Rural: Bridges	1,062	Steel Concrete Bridge	each	18	$22,341,451
Rural: Bridges	55	Timber Bridge	each	2	$786,634
Rural: Bridges	273	Large Box Culvert	each	12	$1,419,436
Rural: Traffic Calming	-	Roundabouts	each	1	$360,883
Rural: Traffic Calming	-	Traffic Medians	m^2	60	$6,578
Rural: Street Lights	-	(non-depreciable)	each	61	$0
Rural: Guard Rail	110	Barrier	m	110	$30,250
Rural: Kerb & Gutter	40,496	K&G	m	40,496	$3,847,120
Rural: Road Signage	-	Road Signage	each	1,487	$545,100
Rural: Paths	244	Paths	m^2	439	$48,348
Rural: Roads	-	Formation (non-depreciable)	m^3	1,708,991	$68,359,624
Rural: Roads	320	Pavement –concrete	m^2	2,112	$527,950
Rural: Roads	274,626	Pavement –granular (sealed)	m^2	2,153,128	$80,967,410
Rural: Roads	97,677	Pavement –granular	m^2	503,050	$20,122,012
Rural: Roads	274,761	Wearing Course	m^2	1,612,102	$10,027,614
Rural: Furniture	-	Bus Shelters	each	1	$7,500
				Rural: sub-total	**$209,397,908**
TOTAL: Local Roads					**$439,690,808**

1 –Missingham Bridge (Ballina East) is located on a local road –Hill Street, but is owned & Maintained by RMS

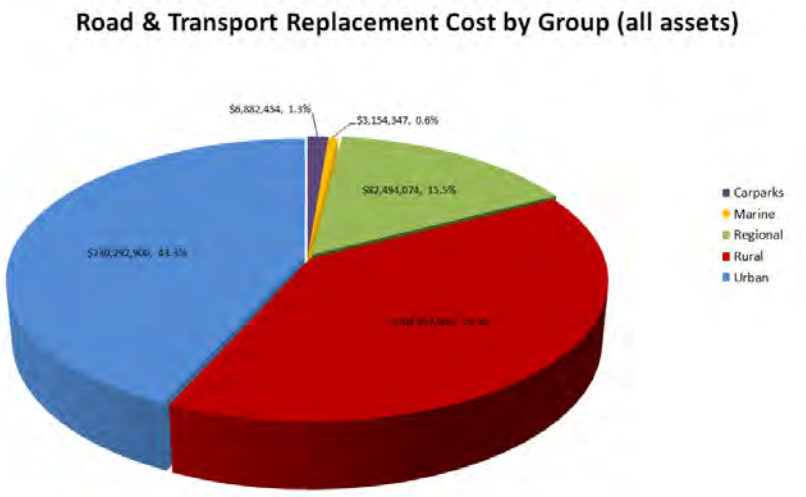
2 –includes 2 large foot-bridges & 12 small (mostly timber) structures

Table 2.1.3: Assets covered by this Plan (Regional Roads)

Asset Group	Length - m	Asset Sub-Group	UOM	Quantity	Replacement Value
Bridges	15	Large Box Culvert	each	1	$286,130
Bridges	583	Steel Concrete Bridge	each	11	$21,245,356
Furniture	-	Bus Shelters	each	14	$105,000
Furniture	2,619	Guard Rail -Barrier	m	2,619	$720,225
Furniture	-	Guard Rail -Terminals	each	42	$147,000
Kerb & Gutter	21,137	K&G	m	21,137	$2,006,515
Paths	12,326	Paths	m^2	26,183	$2,590,772
Road Signage	-	Road Signage	each	882	$308,700
Roads	-	Formation (non-depreciable)	m^3	261,812	$10,472,480
Roads	6,037	Pavement –concrete	m^2	51,414	$12,902,550
Roads	45,050	Pavement –granular	m^2	512,930	$23,086,058
Roads	44,966	Wearing Course	m^2	417,370	$4,087,917
Street Lights	-	Street Lights (non-depreciable)	each	249	$0
Traffic Calming	-	Roundabouts	each	10	$3,861,578
Traffic Calming	-	Traffic Medians	m^2	6,555	$673,794
TOTAL: Regional Roads					**$82,494,074**

Table 2.1.4: Assets covered by this Plan (Marine Transport Infrastructure)

Asset Group	Asset Sub-Group	UOM	Quantity	Replacement Value
Boat Ramp	Structure	each	15	$203,476
Boat Ramp	Pontoon	each	3	$29,022
Boat Ramp	Walkway	each	3	$33,624
Ferry	Boat	item	1	$570,000
Ferry	Access Ramps	each	4	$248,850
Ferry	Boom Gates	each	2	$15,000
Ferry	Guide Cables	m	610	$30,500
Wharf	Retaining Wall	m	265	$728,750
Wharf	Jetty Structure	each	3	$1,173,025
Wharf	Pontoon	each	3	$75,750
Wharf	Walkway	each	3	$46,350
TOTAL: Marine Infrastructure				**$3,154,347**

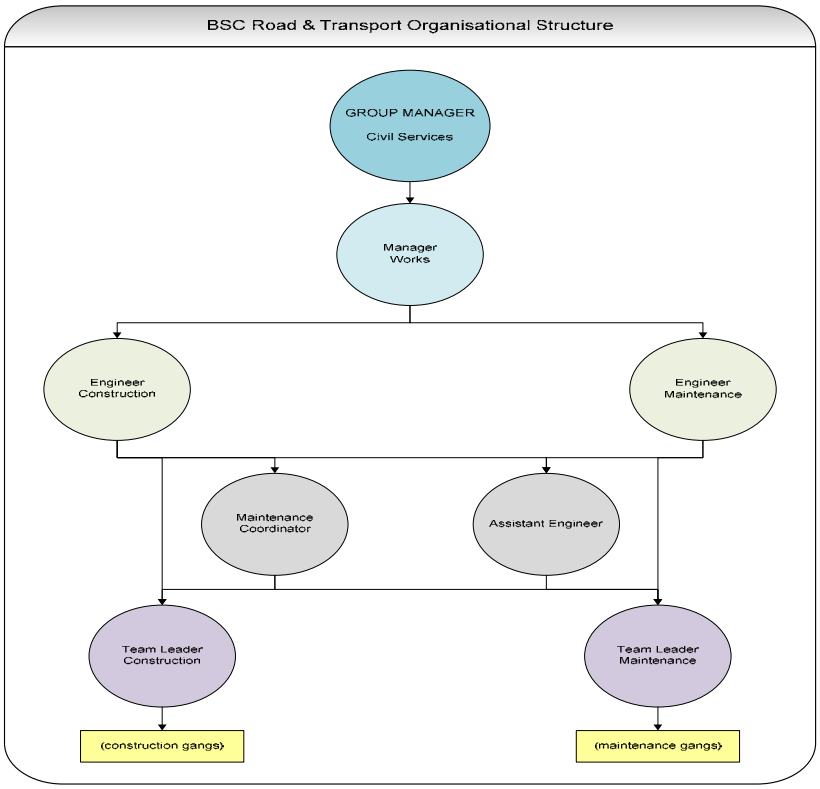


Key stakeholders in the preparation and implementation of this asset management plan are: Shown in Table 2.1.1.

Table 2.1.5: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Councillors	• Represent needs of community • Allocate resources to meet Council's objectives in providing services while managing risks, • Ensure Council is financial sustainable.
General Manager	Overall responsibility for delivering Council operations
Rate Payers	Will ultimately pay for any works undertaken
Road Users	Beneficiaries of Councils Local & Regional Road networks
Pedestrians	Beneficiaries of Councils Local & Regional footpath & shared path networks
NSW RMS	Funds the renewal & maintenance works on the regional road network

Our organisational structure for service delivery from infrastructure assets is detailed below.



2.2 Goals and Objectives of Asset Management

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

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

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

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

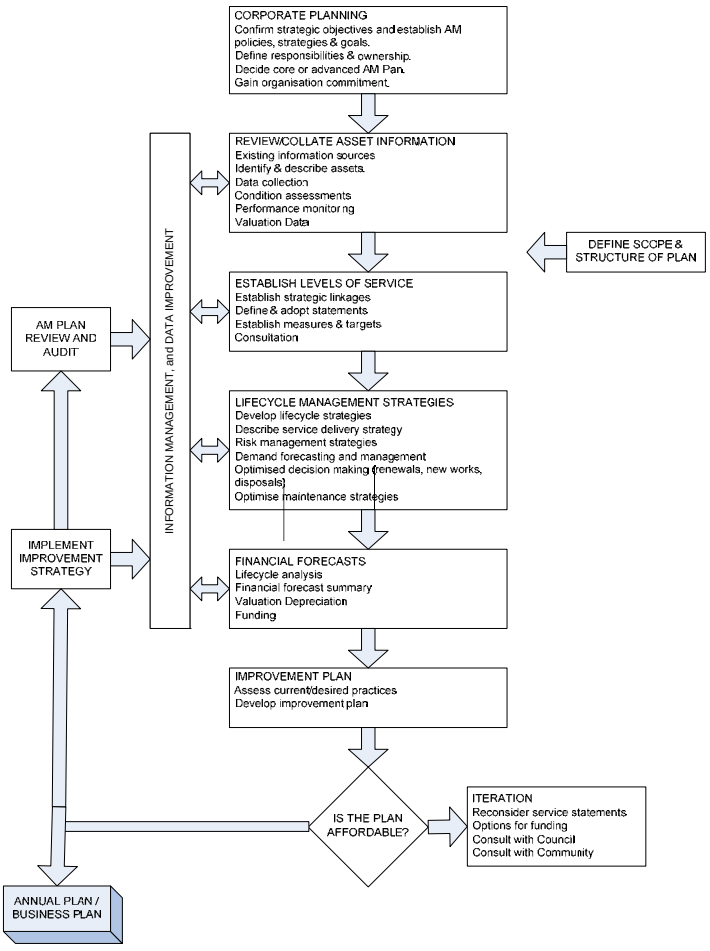
2.3 Plan Framework

Key elements of the plan are

- Levels of service – specifies 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 defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices,
- Monitoring – how the plan will be monitored to ensure it is meeting organisation's objectives,
- Asset management improvement plan.

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

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



fined below in figure 2.3.1

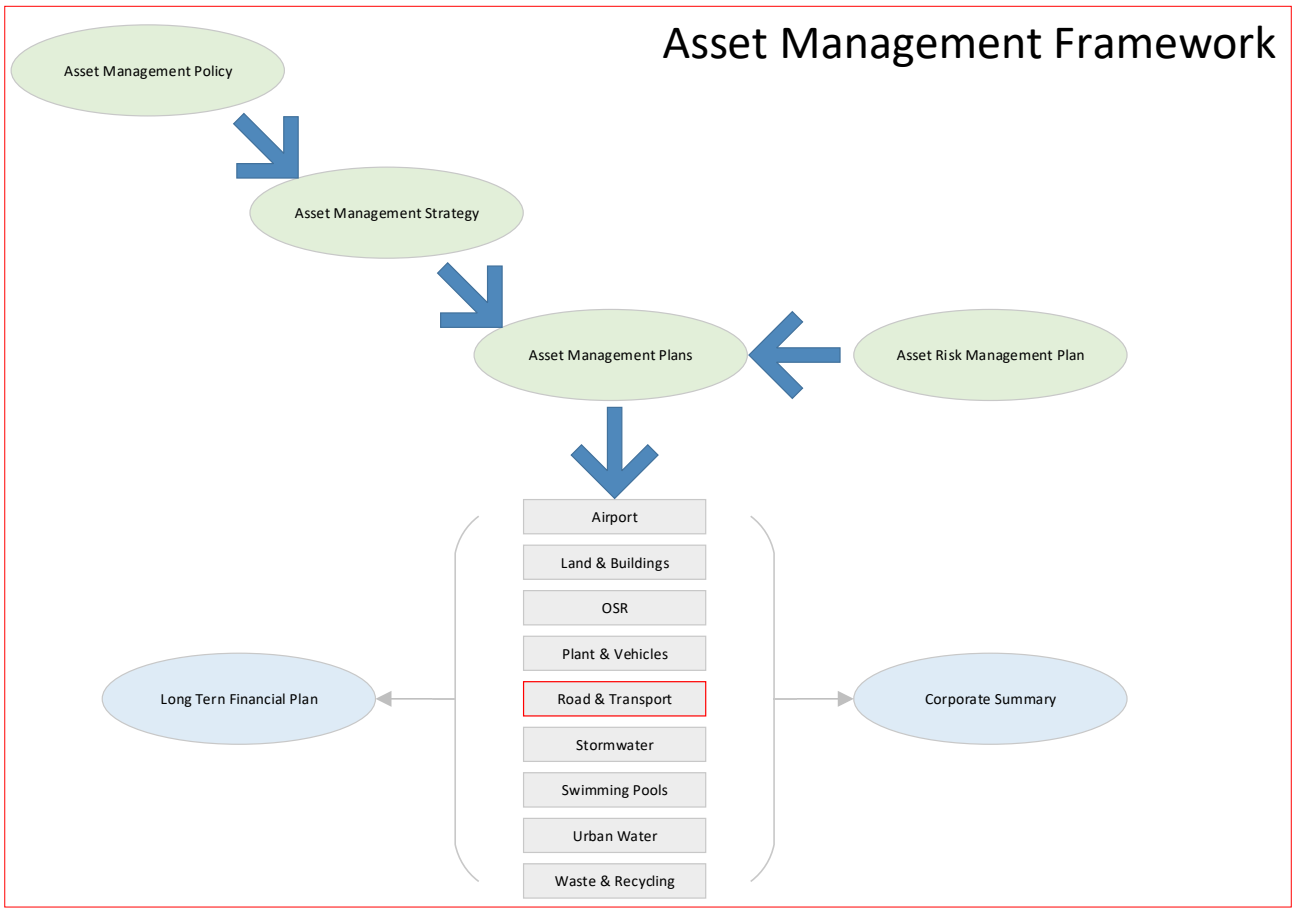


Fig 2.3.1: BSC Asset Management Framework

2.4 Core and Advanced Asset Management

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

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

2.5 Community Consultation

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

[3] IPWEA, 2011, IIMM.

3. LEVELS OF SERVICE

3.1 Customer Research and Expectations

3.1.1 Micromex Community Priorities & Satisfaction Survey

Ballina Shire Council sought to examine community attitudes and perceptions towards current and future services and facilities provided by Council. Key objectives of the research included:

- To assess and establish the community's priorities and satisfaction in relation to Council activities, services and facilities
- To identify the community's overall level of satisfaction with Council's performance

To facilitate this, Micromex Research was contracted to develop a survey template that enabled Council to effectively analyse attitudes and trends within the community.

Micromex Research, together with Ballina Shire Council, developed the questionnaire. The survey was conducted during the period 26 September – 8 October 2014 from 4:30pm to 8:30pm, Monday to Friday and from 10am to 4pm Saturday.

The survey area covered the Ballina Shire Council Government Area and the sample consisted of a total of 500 residents. The selection of respondents was by means of a computer based random selection process using the electronic White Pages. A sample size of 500 residents provides a maximum sampling error of plus or minus 4.4% at 95% confidence.

The sample was weighted by age to reflect the 2011 ABS census data. Similar Micromex surveys were conducted in 2008 and 2012.

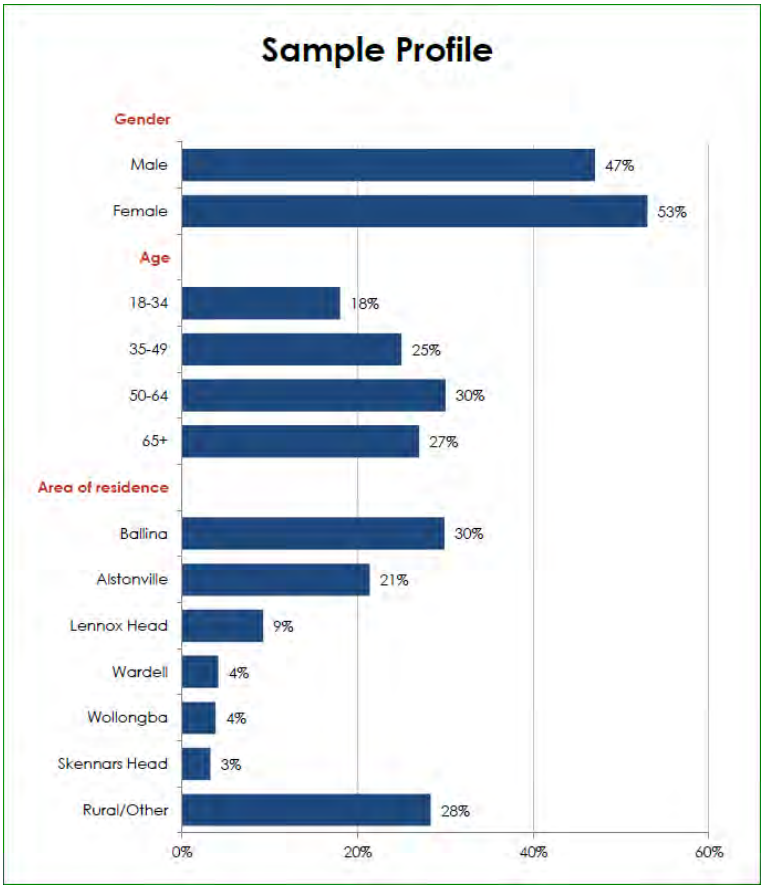
The data within this report was analysed using Q Professional. To identify the statistically significant differences between the groups of means, 'One-Way Anova tests' and 'Independent Samples T-tests' were used. 'Z Tests' were also used to determine statistically significant differences between column percentages.

The rating questions utilised a unipolar Scale of 1 to 5, where 1 was the lowest importance or satisfaction and 5 the highest importance or satisfaction, was used in all rating questions. This scale allowed for a mid-range position for those who had a divided or neutral opinion.
The 'mean' Rating scale is defined as:

- 0.00 – 1.99 'Very low' level of importance/satisfaction
- 2.00 – 2.49 'Low' level of importance/satisfaction
- 2.50 – 2.99 'Moderately low' level of importance/satisfaction
- 3.00 – 3.59 'Moderate' level of importance/satisfaction
- 3.60 – 3.89 'Moderately high' level of importance/satisfaction
- 3.90 – 4.19 'High' level of importance/satisfaction
- 4.20 – 4.49 'Very high' level of importance/satisfaction
- 4.50 – 5.00 'Extremely high' level of importance/satisfaction

Note: Only respondents who rated services/facilities a 4 or 5 in importance were asked to rate their satisfaction with that service/facility. All percentages are calculated to the nearest whole number and therefore the total may not exactly equal 100%.

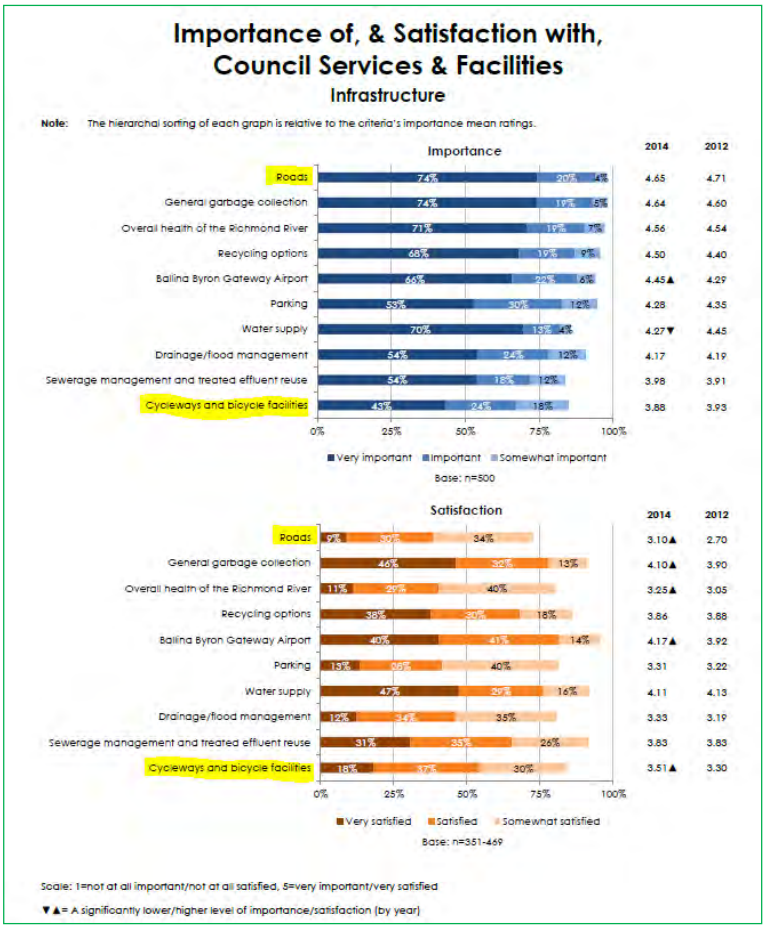
The sample size of 500 consisted of the following demographics.



Findings relating to Road & Transport Infrastructure

Importance & Satisfaction with Road Infrastructure

The mean importance rating for road infrastructure was 3.54 and mean satisfaction rating was 3.57, giving a performance gap of a negligible -0.03.



The performance gaps for Councils road & cycleway infrastructure have reduced since 2012, (23% for roads & 41% for cycle-ways). The tables below show the breakup of importance and satisfaction by locality and by age & gender.

	ROADS 2014 Community Survey			CYCLEWAYS 2014 Community Survey		
Sub-group	**Importance**	**Satisfaction**	**Performance Gap**	**Importance**	**Satisfaction**	**Performance Gap**
Alstonville	4.76	3.17	+1.59	3.74	3.35	+0.39
Ballina	4.51	3.29	+1.22	4.14	3.83	+0.31
Lennox Head	4.76	3.16	+1.60	4.31	3.34	+0.97
Skennars Head	4.58	3.40	+1.18	4.20	3.56	+0.64
Wardell	4.67	2.69	+1.98	3.65	3.37	+0.28
Wollongbar	4.64	3.40	+1.24	3.77	3.13	+0.64
Rural / Other	4.69	2.83	+1.86	3.58	3.32	+0.26
18-34	4.69	3.20	+1.49	3.68	3.71	-0.03
35-49	4.68	3.05	+1.63	4.13	3.42	+0.71
50-64	4.66	2.92	+1.74	3.95	3.36	+0.59
65+	4.59	3.29	+1.30	3.67	3.65	+0.02
Male	4.51	3.00	+1.51	3.72	3.38	+0.34
Female	4.78	3.19	+1.59	4.02	3.61	+0.41
Overall	**4.65**	**3.10**	**+1.55** (+2.01 - 2012)	**3.88**	**3.51**	**+0.37** (+0.63 - 2012)

3.2 Strategic and Corporate Goals

This asset management plan is prepared under the direction of Council's vision and values.

Our Vision

Serving the community of today while preparing for the challenges of tomorrow

Our Values

Our values describe the behaviour we expect from all people within Council.

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

3.3 Legislative Requirements

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

Table 3.3: Legislative Requirements

Legislation	Requirement
Local Government Act 1993	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery.
NSW Roads Act 1993	to confer certain functions (in particular, the function of carrying out road work) on the RMS and on other roads authorities, to provide for the distribution of the functions conferred by this Act between the RMS and other roads authorities to regulate the carrying out of various activities on public roads
Protection of the Environment Act 1997	Regulating pollution activities and issue of licenses as well as the monitoring of and reporting on waste output.
Environmental Planning & Assessment Act 1997 Environmental Planning & Assessment Regulation 2000	Encourages the proper management of natural and man-made resources, the orderly use of land, the provision of services and protection of the environment.
Catchment Management Authorities Act 2003	Promotes the coordination of activities within catchment areas. Council believes this Act has implications for the management of river quality and quantity.
Occupational Health & Safety Act 2011	Council's responsibility to ensure health, safety and welfare of employees and others at places of work

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

3.4 Community Levels of Service

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

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

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

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

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

Table 3.4: Community Level of Service

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Expected position in 10 years based on current LTFP
COMMUNITY OUTCOMES				
Provision of safe, reliable & efficient road & transport infrastructure to the residents and visitors of Ballina Shire				
COMMUNITY LEVELS OF SERVICE: Roads & Transport				
Quality	All Road & Transport assets are designed and constructed to appropriate design and construction standards	Inherited Assets: New developments have compliance with the design standards set in the 'Northern Rivers Development & Design Manual' (DA written requirements + checks performed during the DA process for compliance) Replacement / Renew Reconstruction & asset replacements are delivered based on RMS, AUSTROADS and Australian Standards as appropriate. (New Works audited for compliance, prior to construction)	100% conformance 100 % conformance	100% conformance 100% conformance Organisational Measure Confidence Level: HIGH
Quality	Pavement Noise is kept to a minimum Streets are regularly swept and are free of rubbish and storm litter	Surface aggregates are limited to maximum of 10mm in Urban areas Streets are swept according to schedule -NAASRA 6: Twice weekly -NAASRA 7: Weekly -NAASRA 8: Twice monthly -NAASRA 9: Once monthly	100% conformance	100% conformance 100% conformance Organisational Measure Confidence Level: HIGH
Function	Provision of a Safe Road & Transport network	Roads -Number of Accidents (first aid) -Number of Accidents (hospitalisation) -Number of Accidents (fatality) Bridges -Number of Accidents (first aid) -Number of Accidents (hospitalisation) -Number of Accidents (fatality) Footpath / Cycle-ways -Number of Accidents (first aid) -Number of Accidents (hospitalisation) K&G -Number of Accidents (first aid) -Number of Accidents (hospitalisation) Boat Ramps -Number of Accidents (first aid) -Number of Accidents (hospitalisation) Roundabouts -Number of Accidents (first aid) -Number of Accidents (hospitalisation) -Number of Accidents (fatality) Street Signage -Number of Accidents (first aid) -Number of Accidents (hospitalisation)	< 25 per annum < 15 per annum < 5 per annum < 20 per annum < 10 per annum < 5 per annum < 15 per annum < 5 per annum < 5 per annum < 1 per annum < 5 per annum < 1 per annum < 5 per annum < 5 per annum < 1 per annum < 2 per annum < 1 per annum	Organisational Measure Confidence Level: HIGH

Service Attribute	Service Objective	Performance Measure Process	Current Performance	Expected position in 10 years based on current LTFP
COMMUNITY OUTCOMES				
Provision of safe, reliable & efficient road & transport infrastructure to the residents and visitors of Ballina Shire				
COMMUNITY LEVELS OF SERVICE: Roads & Transport				
Function	Provision of a reliable & effective Road & Transport network	Roads -Number of Customer Complaints Bridges -Number of Customer Complaints Footpath / Cycle-ways -Number of Customer Complaints K&G -Number of Customer Complaints Boat Ramps -Number of Customer Complaints Roundabouts -Number of Customer Complaints Street Signage -Number of Customer Complaints Street Lights -Number of Customer Complaints	< 20 per year / 100 km < 20 per year < 20 per year / 100 km < 20 per year / 100 km < 20 per year < 20 per year 20 per year < 20 per year	< 10 per year Organisational Measure Confidence Level: MEDIUM
Capacity/ Utilisation	Availability of assets for public use	Roads -Number of unplanned closures -Number of unplanned delays Bridges -Number of unplanned closures -Number of unplanned delays Footpath / Cycle-ways -Number of unplanned closures Boat Ramps -Number of unplanned closures Street Lights -Number of unplanned failures	< 20 per year / 100 km < 20 per year / 100 km < 20 per year < 20 per year < 20 per year / 100 km < 20 per year < 20 per year	Organisational Measure Confidence Level: HIGH

3.5 Technical Levels of Service

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

Technical service measures are linked to annual budgets covering:

- Operations – the regular activities to provide services such as opening hours, cleansing, mowing grass, energy, inspections, etc.
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition (eg road patching, unsealed road grading, building and structure repairs),

- Renewal – the activities that return the service capability of an asset up to that which it had originally (eg frequency and cost of road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),
- Upgrade – the activities to provide a higher level of service (eg widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (eg a new library).

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

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

[4] IPWEA, 2011, IIMM, p 2.22

Table 3.5: Technical Levels of Service

Service Attribute	Service Objective	Activity Measure Process	Current Performance *		Desired for Optimum Lifecycle Cost **		Agreed Sustainable Position ***
TECHNICAL LEVELS OF SERVICE: Road & Transport Infrastructure							
Operations	Provision of suitable road safety programmes, assessments & education	Road Safety Expenses	Road Safety Direct Costs Road Safety Programs		Road Safety Direct Costs Road Safety Programs		
	Asset Inspection Programs to record existing condition for the preparation of maintenance schedules and defects register	Condition Assessments (inspection type & frequency)	Asset Condition Assessments		Asset Condition + Risk Assessments General: (1 to 5 condition rating) -Footpath & Shared Path -Kerb & Gutter -Bridges (by components) -Guard Rail Specialised Condition Data Collection -Road Pavement laser profilometry (sealed) -Road Pavement FWD (selected sealed roads) -Bridge Structural Loading Tests (>30 years)	 annual annual annual annual 5 years 5 years 5 years	
	Ferry & Water Transport	Boat Ramps Wharves, Jetties & Pontoons Burns Point Ferry	Boat Ramps –Contract Cleaning Security Ferry Operations Expenses Fuel		Boat Ramps –Contract Cleaning Security Ferry Operations Expenses Fuel		
	Provision of safe & functionally suitable road networks	-Regional Sealed Roads -Rural Sealed Roads -Rural Unsealed Roads -Urban Sealed Roads -Urban Unsealed Roads	Urban Roads Reserves Operations Urban Roads (sealed) Operations Urban Roads (unsealed) Operations Rural Roads Reserves Operations Rural Roads (sealed) Operations Rural Roads (unsealed) Operations Street Sweeping –General Street Sweeping –CBD Alstonville Street Sweeping –CBD Ballina		Urban Roads Reserves Operations Urban Roads (sealed) Operations Urban Roads (unsealed) Operations Rural Roads Reserves Operations Rural Roads (sealed) Operations Rural Roads (unsealed) Operations Street Sweeping –General Street Sweeping –CBD Alstonville Street Sweeping –CBD Ballina		
		Operations Budget =	$4,200,000 pa (approx.)		$4,200,000 pa (approx.)		$4,200,000 pa (approx.)
Maintenance	Provision of safe & well maintained marine assets	Boat Ramps	Boat Ramps –Maintenance		Boat Ramps –Maintenance		
		Wharves, Jetties & Pontoons	Maintenance & Repairs		Maintenance & Repairs		
		Burns Point Ferry	Annual Slippage & Overhaul		Annual Slippage & Overhaul		

Service Attribute	Service Objective	Activity Measure Process	Current Performance *	Desired for Optimum Lifecycle Cost **	Agreed Sustainable Position ***
TECHNICAL LEVELS OF SERVICE: Road & Transport Infrastructure					
	Provision of safe & well maintained regional road networks	Regional Roads	MR 545 Maintenance MR 7734 Maintenance MR 7735 Maintenance MR 695 Maintenance	MR 545 Maintenance MR 7734 Maintenance MR 7735 Maintenance MR 695 Maintenance	
	Provision of safe & well maintained local road networks	Urban Roads	Urban Roads Reserves Maintenance Roadside Maintenance The Coast Road Urban Roads Maintenance	Urban Roads Reserves Maintenance Roadside Maintenance The Coast Road Urban Roads Maintenance	
		Rural Roads –sealed	Rural Roads Reserves Maintenance Rural Roads (sealed) Maintenance	Rural Roads Reserves Maintenance Rural Roads (sealed) Maintenance	
		Rural Roads –unsealed	Rural Roads (unsealed) Maintenance	Rural Roads (unsealed) Maintenance	
		Bridges	Bridges Rural Sealed Maintenance	Bridges Rural Sealed Maintenance	
	Provision of safe & well maintained ancillary road asset networks	Road & Traffic Signs	Local Roads Signs	Local Roads Signs	
		Footpaths	Footpath + Shared Path Maintenance North Wall Lights	Footpath + Shared Path Maintenance North Wall Lights	
		Car Parking	Car Park Maintenance	Car Park Maintenance	
		Public Transport	Bus Shelters	Bus Shelters	
		Maintenance Budget =	$2,900,000 pa (approx.)	$2,900,000 pa (approx.)	$2,900,000 pa (approx.)
Renewal	To achieve the revised level of service as dictated by the community and available budgets (Marine Assets)	–Boat Ramps –Wharves + Jetties –Pontoons	Replacement = 30 to 50 years + condition 5 Replacement = 30 to 50 years + condition 5 Replacement = 30 to 50 years + condition 5	Replacement = 30 to 50 years + condition 5 Replacement = 30 to 50 years + condition 5 Replacement = 30 to 50 years + condition 5	
	To achieve the revised level of service as dictated by the community and available budgets (Roads, bridges & Ancillary Assets)	–Pavement (DGB20) –Pavement (DGB20) –Pavement (CON) –Wearing Course –K&G –Path –Bridge –Roundabout –Traffic Median –Signage	Replacement = 60 to 80 years + condition 5 Heavy Patch = (breakup -$ per sq.m) Replacement = 60 to 80 years + condition 5 Replacement = 15 to25 years + condition 5 Replacement = 60 to 80 years + condition 5 Replacement = 60 to 80 years + condition 5 Replacement = 30 to 80 years + condition 5 Replacement = 80 years + condition 5 Replacement = 80 years + condition 5 Replacement = 15 to25 years + condition 5	Replacement = 60 to 80 years + condition 5 Heavy Patch = (breakup -$ per sq.m) Replacement = 60 to 80 years + condition 5 Replacement = 15 to25 years + condition 5 Replacement = 60 to 80 years + condition 5 Replacement = 60 to 80 years + condition 5 Replacement = 30 to 80 years + condition 5 Replacement = 80 years + condition 5 Replacement = 80 years + condition 5 Replacement = 15 to25 years + condition 5	
		Renewal Budget =	$3 to 6 million pa (approx.)	$3 to 6 million pa (approx.)	$3 to 6 million pa (approx.)
Upgrade/New			Refer to BSC Roads Contribution Plan 2015	Refer to BSC Roads Contribution Plan 2015	
			Inherited Development Road & Transport Infrastructure	Inherited Development Road & Transport Infrastructure	
		Budget =	varies pa	varies pa	varies pa

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

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

4. FUTURE DEMAND

4.1 Demand Drivers

The primary drivers affecting demand in road & transport infrastructure is the expected population growth in the region and growth in traffic volumes. Secondary drivers include changes in demographics, land zoning, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors and agricultural practices.

As new developments are established, new road & transport infrastructure will be required to accommodate the new residents.

4.2 Demand Forecast

There are two distinct groups of assets that need to be created in order for Council to accommodate demand from growth in the region.

- The road & transport infrastructure from new developments.
- The ancillary infrastructure required to support the new developments and the existing infrastructure due to increased loading.

The first group are (generally) constructed by developers at their cost, and handed to Council as inherited assets. Council bears the cost of maintaining and capital replacements of these assets.

The second group of assets is paid for in part by Council and through developer Section 94 contributions. The proposed programs of works are detailed in 'Ballina Council Road Contribution Plan 2010'

4.2.1 Developer Provided Assets

The demand for new infrastructure over a 20 year period has been estimated based on a series of reasonable assumptions on typical characteristics of new road developments. The predicted average population increase over the next 20 years is 2.10% pa. This equates to a population increase of 9,120 from 41,947 (2016) to 51,067 (2035) and a dwelling demand increase of 5,274 from 18,758 (2016) to 24,032 (2035). As growth rate is not uniform across all of Council, the shire has been broken into eleven regions with each having separate analysis to determine approximate type and quantity of new infrastructure required. It is based on the predicted population and average person per household for the next 20 years.

Existing asset quantity per meter of road is assumed to continue. Assumptions common for all regions are

- A new house has a street road frontage of 20 m
- Number of people per household in 2026 (ABS estimate): 2.37
- Linear decrease is assumed from 2.57 to 2.37 over 25 years
- Unoccupied dwelling filled by 2026 with annual occupancy in line with population increase.
- New households = total annual household increase – annual occupancy of existing dwellings
- The cost of future infrastructure is in today's (2015/16) dollars.

Ballina Island: Population in 2001: 7,151

- Projected population in 2016: 7,293
- Projected population in 2035: 7,804
- Projected annual population average growth rate: 0.34%
- Projected dwelling demand in 2016: 3,814
- Projected dwelling demand in 2035: 4,360
- Projected annual dwelling demand growth rate: 0.67%
- Average of 1.3 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 13%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 26

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.00	km	$0
Path	0.00	km	$0
Kerb & Gutter	0.00	km	$0
Signs	0.00	Each	$0

Table 4.2.1.01 – Ballina Island Predicted New Infrastructure

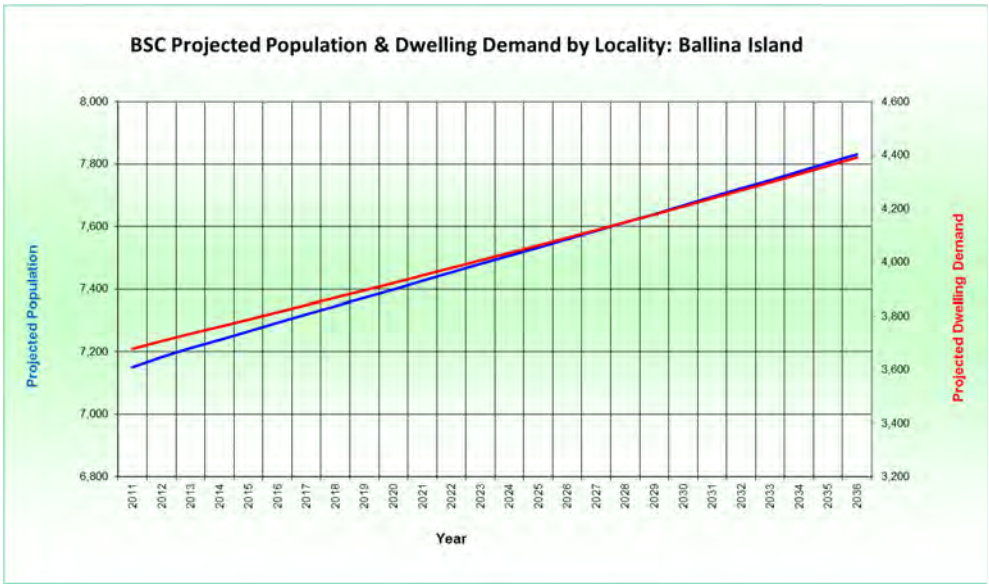


Figure 4.2.1.01 – Ballina Island Predicted Population Growth & Dwelling Demand

Ballina West assumptions: Population in 2001: 2,941

- Projected population in 2016: 3,040
- Projected population in 2035: 3,448
- Projected annual population average growth rate: 0.63%
- Projected dwelling demand in 2016: 1,427
- Projected dwelling demand in 2035: 1,842
- Projected annual dwelling demand growth rate: 1.28%
- Average of 1.3 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 5.8%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 26

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.00	km	$0
Path	0.00	km	$0
Kerb & Gutter	0.00	km	$0
Signs	0.00	Each	$0

Table 4.2.1.02 – Ballina West Predicted New Infrastructure

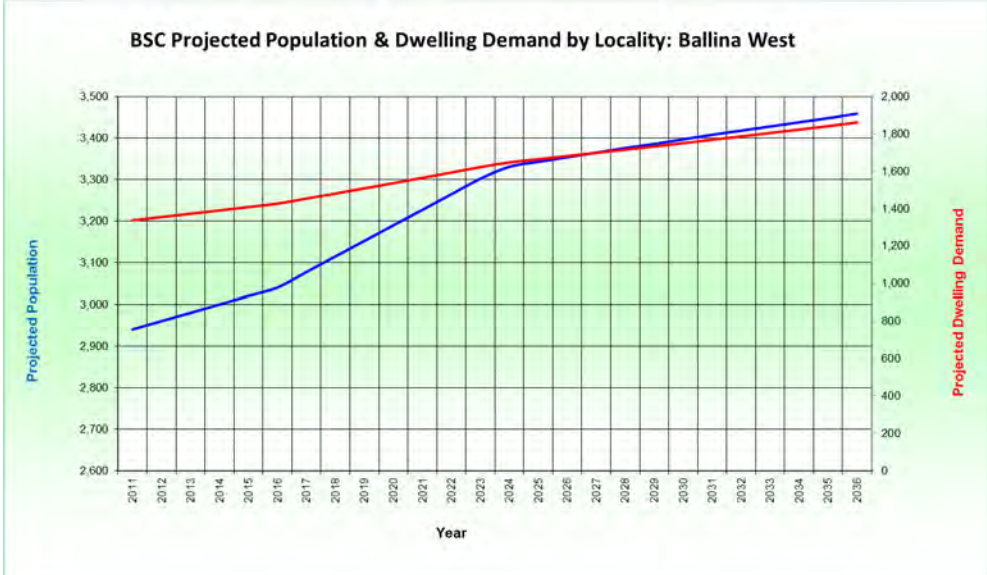


Figure 4.2.1.02 – Ballina West Predicted Population Growth & Dwelling Demand

Ballina North assumptions: Population in 2001: 1,140

- Projected population in 2016: 1,230
- Projected population in 2035: 1,922
- Projected annual population average growth rate: 2.26%
- Projected dwelling demand in 2016: 556
- Projected dwelling demand in 2035: 911
- Projected annual dwelling demand growth rate: 2.50%
- Average of 1.3 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 5.0%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 26

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.89	km	$284,288
Path	0.67	km	$111,938
Kerb & Gutter	1.55	km	$139,923
Signs	23.10	Each	$5,775

Table 4.2.1.03 – Ballina North Predicted New Infrastructure

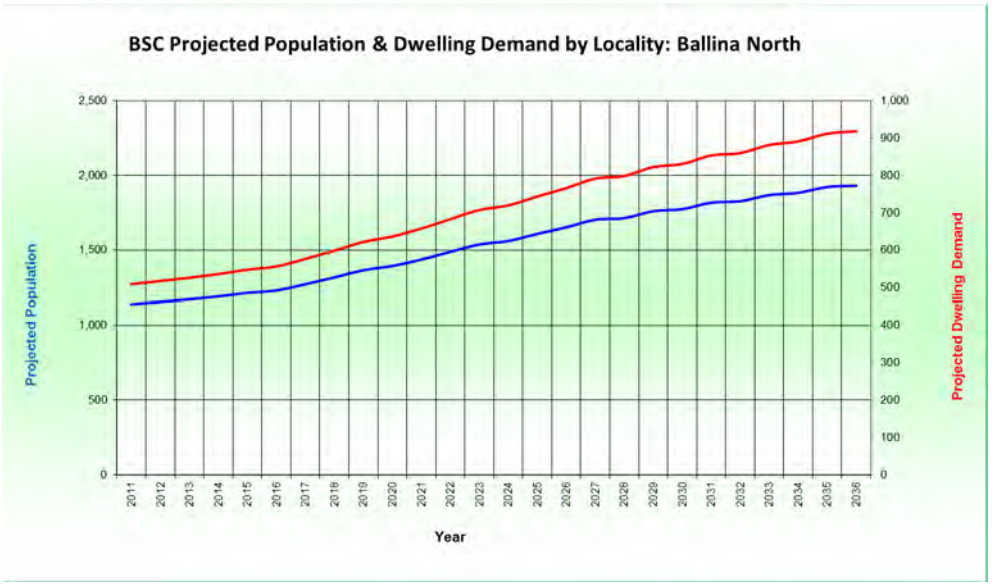


Figure 4.2.1.03 – Ballina North Predicted Population Growth & Dwelling Demand

Cumbalum Area assumptions: Population in 2011: 993

- Projected population in 2016: 1,535
- Projected population in 2035: 4,703
- Projected annual population average growth rate: 5.76%
- Projected dwelling demand in 2016: 540
- Projected dwelling demand in 2035: 1,942
- Projected annual dwelling demand growth rate: 6.61%
- Average of 1.05 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 29%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 26

Additional Infrastructure	Quantity	UOM	Value ($)
Road	3.50	km	$1,121,489
Path	2.63	km	$441,586
Kerb & Gutter	6.13	km	$551,983
Signs	91.12	Each	$22,780

Table 4.2.1.04 – Cumbalum Predicted New Infrastructure

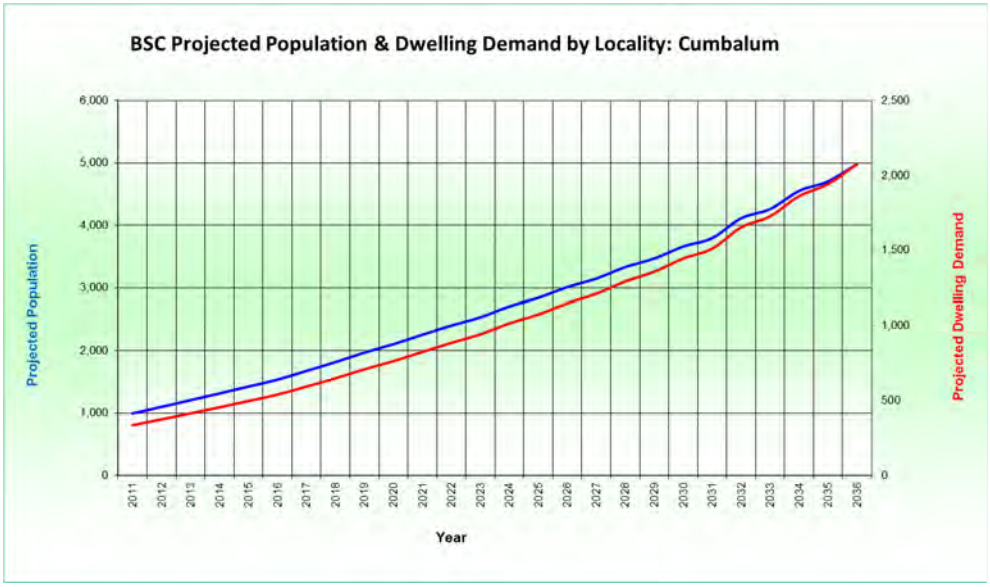


Figure 4.2.1.04 – Cumbalum Predicted Population Growth & Dwelling Demand

Ballina East assumptions: Population in 2011: 5,539

- Projected population in 2016: 5,461
- Projected population in 2035: 5,726
- Projected annual population average growth rate: 0.24%
- Projected dwelling demand in 2016: 2,687
- Projected dwelling demand in 2035: 3,076
- Projected annual dwelling demand growth rate: 0.68%
- Average of 1.3 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 8.1%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 26

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.39	km	$124,619
Path	0.35	km	$58,882
Kerb & Gutter	0.68	km	$61,336
Signs	10.13	Each	$2,531

Table 4.2.1.05 – Ballina East Predicted New Infrastructure

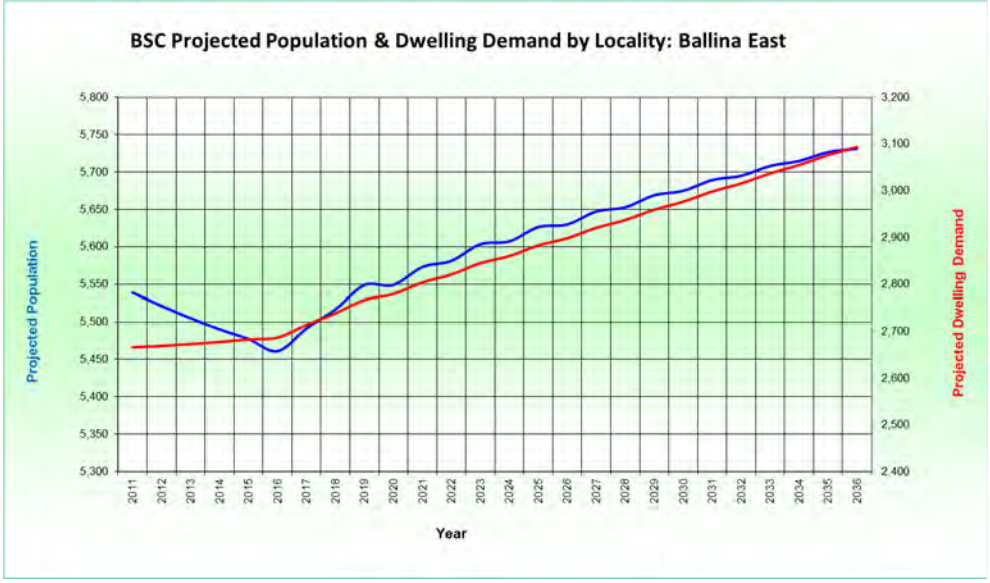


Figure 4.2.1.05 – Ballina East Predicted Population Growth & Dwelling Demand

Lennox Head assumptions: Population in 2011: 6,274

- Projected population in 2016: 6,477
- Projected population in 2035: 8,874
- Projected annual population average growth rate: 1.59%
- Projected dwelling demand in 2016: 2,755
- Projected dwelling demand in 2035: 3,840
- Projected annual dwelling demand growth rate: 1.68%
- Average of 1.1 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 11.2%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 16

Additional Infrastructure	Quantity	UOM	Value ($)
Road	2.71	km	$868,661
Path	2.04	km	$342,035
Kerb & Gutter	4.75	km	$427,544
Signs	43.43	Each	$10,858

Table 4.2.1.06 – Lennox Head Predicted New Infrastructure

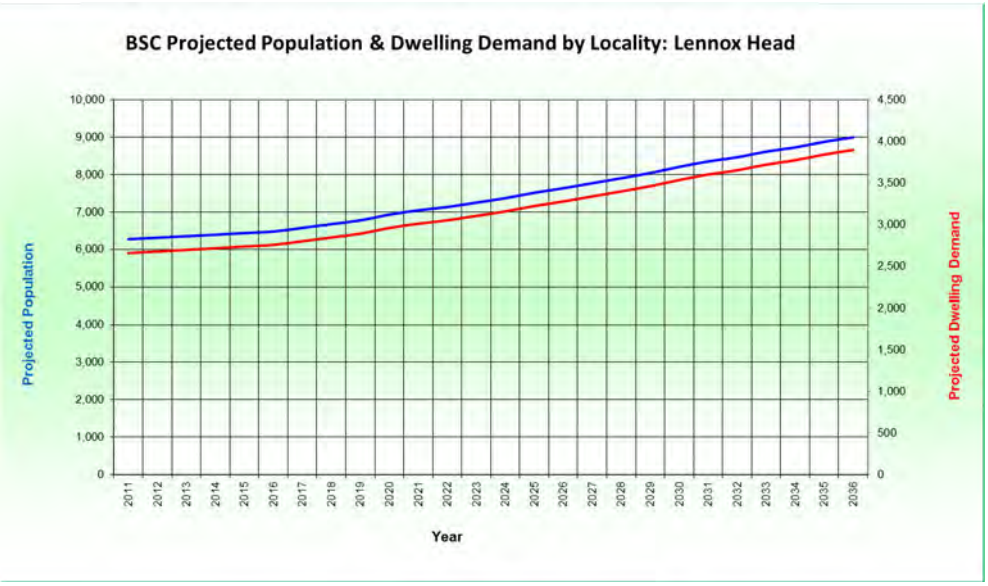


Figure 4.2.1.06 – Lennox Head Predicted Population Growth & Dwelling Demand

Skennars Head assumptions: Population in 2001: 1,149

- Projected population in 2016: 1,231
- Projected population in 2035: 1,873
- Projected annual population average growth rate: 2.12%
- Projected dwelling demand in 2016: 497
- Projected dwelling demand in 2035: 840
- Projected annual dwelling demand growth rate: 2.66%
- Average of 1.3 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 7.9%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 16

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.86	km	$274,595
Path	0.64	km	$108,122
Kerb & Gutter	1.50	km	$135,152
Signs	13.73	Each	$3,432

Table 4.2.1.07 – Skennars Head Predicted New Infrastructure

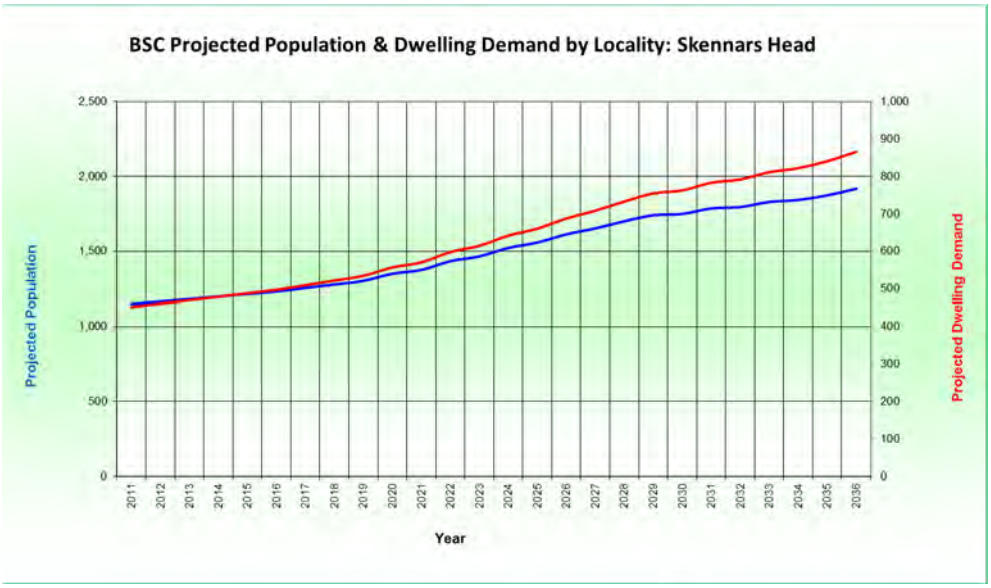


Figure 4.2.1.07 – Skennars Head Predicted Population Growth & Dwelling Demand

Alstonville assumptions: Population in 2011: 5,139

- Projected population in 2016: 5,175
- Projected population in 2035: 5,280
- Projected annual population average growth rate: 0.1%
- Projected dwelling demand in 2016: 2,317
- Projected dwelling demand in 2035: 2,433
- Projected annual dwelling demand growth rate: 0.24%
- Average of 1.1 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 6.5%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 17

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.29	km	$92,645
Path	0.22	km	$36,479
Kerb & Gutter	0.51	km	$45,599
Signs	4.92	Each	$1,230

Table 4.2.1.08 – Alstonville Predicted New Infrastructure

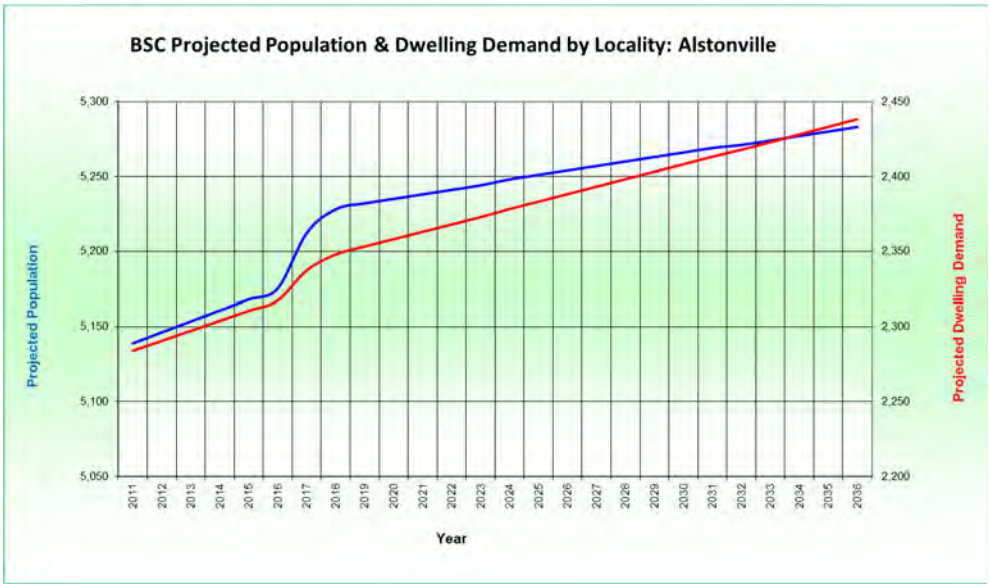


Figure 4.2.1.08 – Alstonville Predicted Population Growth & Dwelling Demand

Wollongbar assumptions: Population in 2011: 2,273

- Projected population in 2016: 2,304
- Projected population in 2035: 3,106
- Projected annual population average growth rate: 1.51%
- Projected dwelling demand in 2016: 886
- Projected dwelling demand in 2035: 1,334
- Projected annual dwelling demand growth rate: 2.07%
- Average of 1.01 residences per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 3.4%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 17

Additional Infrastructure	Quantity	UOM	Value ($)
Road	1.12	km	$358,531
Path	0.84	km	$141,172
Kerb & Gutter	1.96	km	$176,465
Signs	19.05	Each	$4,762

Table 4.2.1.09 – Wollongbar Predicted New Infrastructure

Figure 4.2.1.09 – Wollongbar Predicted Population Growth & Dwelling Demand

Wardell assumptions: Population in 2011: 781

- Projected population in 2016: 827
- Projected population in 2035: 1,134
- Projected annual population average growth rate: 1.59%
- Projected dwelling demand in 2016: 312
- Projected dwelling demand in 2035: 393
- Projected annual dwelling demand growth rate: 1.17%
- Average of 1 residence per property.
- New residences located on both sides of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 5.8%
- Ratio New K&G to New Road (m) = 175%
- Number of Signs per km of New Road = 12

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0.00	km	$0
Path	0.00	km	$0
Kerb & Gutter	0.00	km	$0
Signs	0.00	Each	$0

Table 4.2.1.10 – Wardell Predicted New Infrastructure

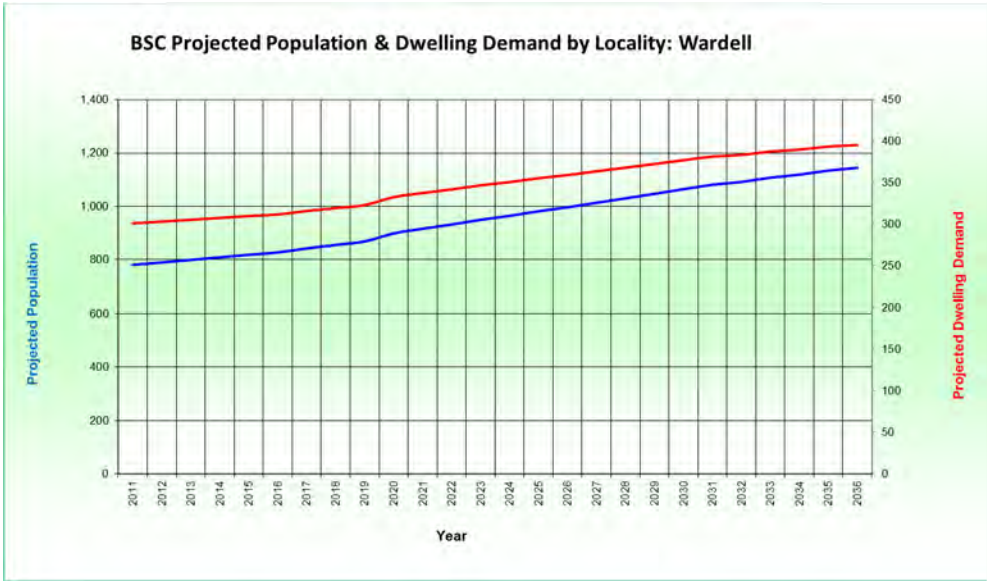


Figure 4.2.1.10 – Wardell Predicted Population Growth & Dwelling Demand

Rural Areas assumptions: Population in 2011: 7,367

- Projected population in 2016: 7,372
- Projected population in 2035: 7,196
- Projected annual population average growth rate: -0.12%
- Projected dwelling demand in 2016: 2,967
- Projected dwelling demand in 2035: 3,059
- Projected annual dwelling demand growth rate: 0.15%
- Average of 1 residence per property.
- New residences located on one side of road
- New roads expected to be flexible granular + 40mm asphalt wearing course
- Ratio New Path to New Road (sq.m) = 0.04%
- Ratio New K&G to New Road (m) = 15%
- Number of Signs per km of New Road = 5

Additional Infrastructure	Quantity	UOM	Value ($)
Road	0	km	$0
Path	0	km	$0
Kerb & Gutter	0	km	$0
Signs	0	Each	$0

Table 4.2.1.11 – Rural Areas Predicted New Infrastructure

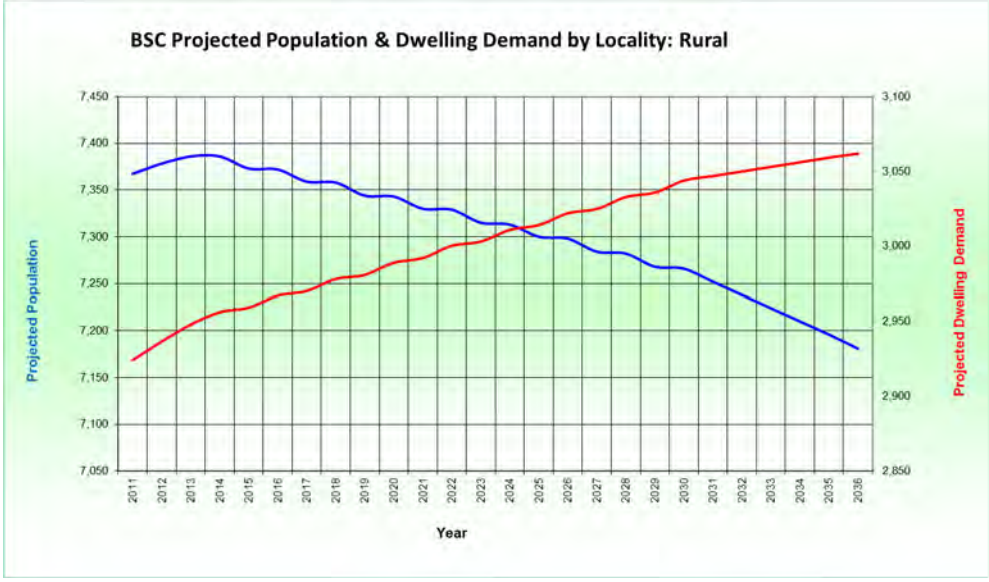


Figure 4.2.1.11 – Rural Predicted Population Growth & Dwelling Demand

4.2.2 Ballina Shire Council Roads Contribution Plan 2015

The Ballina Shire Roads Contribution Plan 2015 was developed by 'Newplan –Urban Planning Solutions' and sets out the relationship between the expected development in the region and the road infrastructure that is required to meet the demands of this development.

The report has based its findings through modelling

- Centers of population growth
- Population growth in these areas
- Housing demand and dwelling type permissible and expected
- Social demographics
- Available land area and land type
- Commercial & industrial growth
- Projected employment opportunities
- Linkages to existing road & transport networks
- Trip generations expected from this growth

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

4.3 Demand Impact on Assets

The impact of demand drivers that may affect future service delivery and utilisation of assets are shown in Table 4.3.1

Table 4.3.1: Demand Drivers, Projections and Impact on Services

Demand drivers	Present position	Projection	Impact on services
Population Growth	41,947 (approx.)	Uniform 1% increase per year to 2035 shire wide with several known local growth areas	Estimated • 10km of new road • 6km of new pathway • 17km of new K&G
Demographics (aging population)	Currently higher than state average % of residents aged 65+	Expected to continue	Impacts on road use patterns & public transport use and demand
Expectations from Residents			
Road Use (heavy vehicle routes)	Average 22.5 tonnes (net) per movement	NSW Transport planning to increase SCHMS mass limits	Increased damage factors & loads to pavements + increased maintenance costs to Council
Unit Costs for Road & Transport assets	Current unit rates	Possibility of sudden increase in road & transport construction & maintenance costs	Impacts on long term works program with given budget constraints

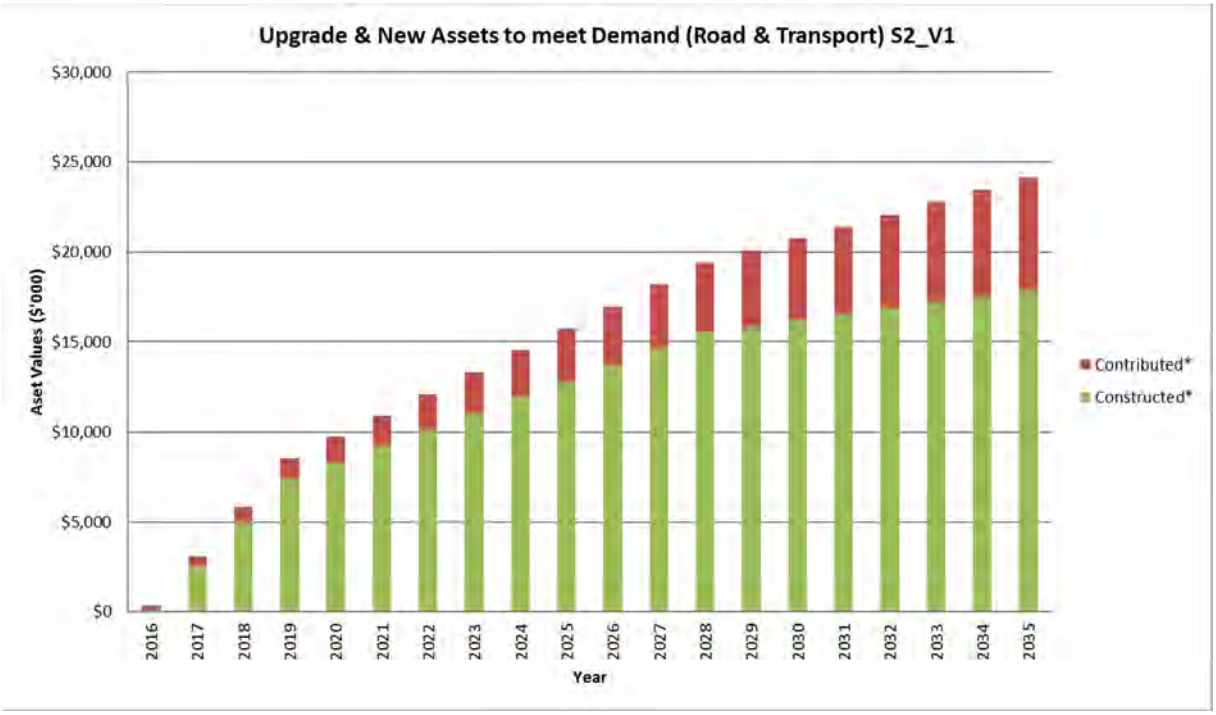
Project	Suburb	Proposed Works	Full Cost	BSC Contribution	Staging (years)	Year
1a	Ballina West	Western Arterial (WAR)	$31,669,625	$0	19 to 26	2028-2036
1a	Ballina West	Western Arterial (WAR) -Land Component	$754,220	$0	19 to 26	2028-2036
6	Ballina Island	Fisheries Creek Bridge to Tweed Street - Four Laning of Pacific Highway (F-T)	$3,886,480	$1,958,985	01 to 09	2011-2019
7	Ballina North	North Creek Road to Kerr Street - Four Laning of Pacific Highway (NCK)	$7,165,699	$102,038	01 to 09	2011-2019
9	Ballina West	Upgrade Fisheries Creek Bridge (FCB)	$5,343,910	$2,693,604	01 to 09	2011-2019
10	Ballina North	Duplication of North Creek Canal Bridge - Separate Two Lanes (NCB)	$4,007,933	$57,072	01 to 09	2011-2019
11	Ballina West	Fisheries Creek Bridge to southern Interchange of Bypass - Four Laning of Pacific Highway(PHI)	$9,582,603	$2,505,712	01 to 09	2011-2019
11	Ballina West	Other Pacific Highway Improvements (PHI) Land Component	$133,598	$34,934	01 to 09	2011-2019
12 to 14	Lennox Head	Hutley Drive Extension (HDE)	$15,303,017	$0	01 to 09	2011-2019
15	Ballina Island	Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$667,989	$0	10 to 18	2019-2028
16	Ballina Island	Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$607,263	$0	10 to 18	2019-2028
16	Ballina Island	Angels Beach Drive / Sheather Street -LILO (CLb) Land Component	$109,307	$0	10 to 18	2019-2028
18	Cumbalum	North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$19,432,402	$0	10 to 18	2019-2028
18	Cumbalum	North Creek Road and Bridge (7aU) - Land Component	$12,145	$0	10 to 18	2019-2028
20	Rural -Tintenbar	Ross Lane Improvements -West (RLW)	$4,683,750	$0	10 to 18	2019-2028
20	Rural -Tintenbar	Ross Lane Improvements -East (RLE)	$10,590,659	$5,450,452	10 to 18	2019-2028
20	Rural -Tintenbar	Ross Lane Improvements -East (RLE) -Land Component	$97,162	$50,004	10 to 18	2019-2028
21	Rural -Tintenbar	Tintenbar Road / Teven Road -Climbing Lanes (TTa)	$1,943,240	$1,320,733	19 to 26	2028-2036
21	Rural -Tintenbar	Tintenbar Road / Teven Road -Climbing Lanes (TRb)	$1,943,240	$1,320,733	19 to 26	2028-2036
21	Rural -Tintenbar	Tintenbar Road / Teven Road -Climbing Lanes (TRb) -Land Component	$1,214	$825	19 to 26	2028-2036
23	Ballina North	Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$157,888	$0	10 to 18	2019-2028
27	Lennox Head	Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$2,793,408	$794,069	10 to 18	2019-2028
28b	Ballina Island	River Street / Moon Street Roundabout	$1,165,944	$349,783	01 to 09	2011-2019
30	Ballina Island	Angels Beach Drive / bangalow Road Signals and Lane Extensions (3OI)	$896,480	$0	19 to 26	2028-2036
34a	Rural -Tintenbar	Cumbalum - Interchange, upgrade eastern roundabout	$761,098	$0	19 to 26	2028-2036
35	Rural -Tintenbar	Sandy Flat Road	$3,018,600	$0	10 to 18	2019-2028
37	Lennox Head	North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$3,360,045	$1,813,501	10 to 18	2019-2028
39	Ballina North	North Creek Rd - Tamarind Dr to Southern Cross Dr, 4 lane	$1,436,350	$0	19 to 26	2028-2036
40	Ballina North	Tamarind Dr, 4 lanes Cumbalum to North Ck Rd, 4.15 km	$10,627,536	$0	19 to 26	2028-2036
41	Ballina Island	Bangalow Rd, additional Lane, 200 m east from Angels Beach Dr	$1,249,000	$0	19 to 26	2028-2036
			$143,401,805	**$18,452,445**		

Table 4.3.2: BSC Roads Contribution Plan 2015 Capital Works (adopted by Council September 2015)

4.5 Asset Programs to meet Demand

The new assets required to meet growth will be acquired in part from land developments and constructed/acquired by Council. New assets constructed/acquired by Council are discussed in Section 5.5. The cumulative value of new contributed and constructed asset values are summarised in Figure 1.

Figure 1: Upgrade and New Assets to meet Demand (cumulative)



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

5. LIFECYCLE MANAGEMENT PLAN

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

5.1 Background Data

5.1.1 Physical parameters

The assets covered by this asset management plan are shown in Table 2.1. Each asset group has a diverse mix of asset age and condition profiles.

Traffic models for BSC road networks have been developed for 2014 with long term projections to 3036. These models have identified a single area (2014) of periodic traffic congestion and two areas (2036) of periodic traffic congestion that are of concern and are expected to expand and worsen with time with existing infrastructure. These areas are,

- 2014

    1. MR 695 River Drive, Ballina West + Ballina Island (Brampton Avenue to Henry Phillip Avenue)

- 2036

    1. MR 695 River Drive, Ballina West + Ballina Island (Keppel Street to Kerr Street)

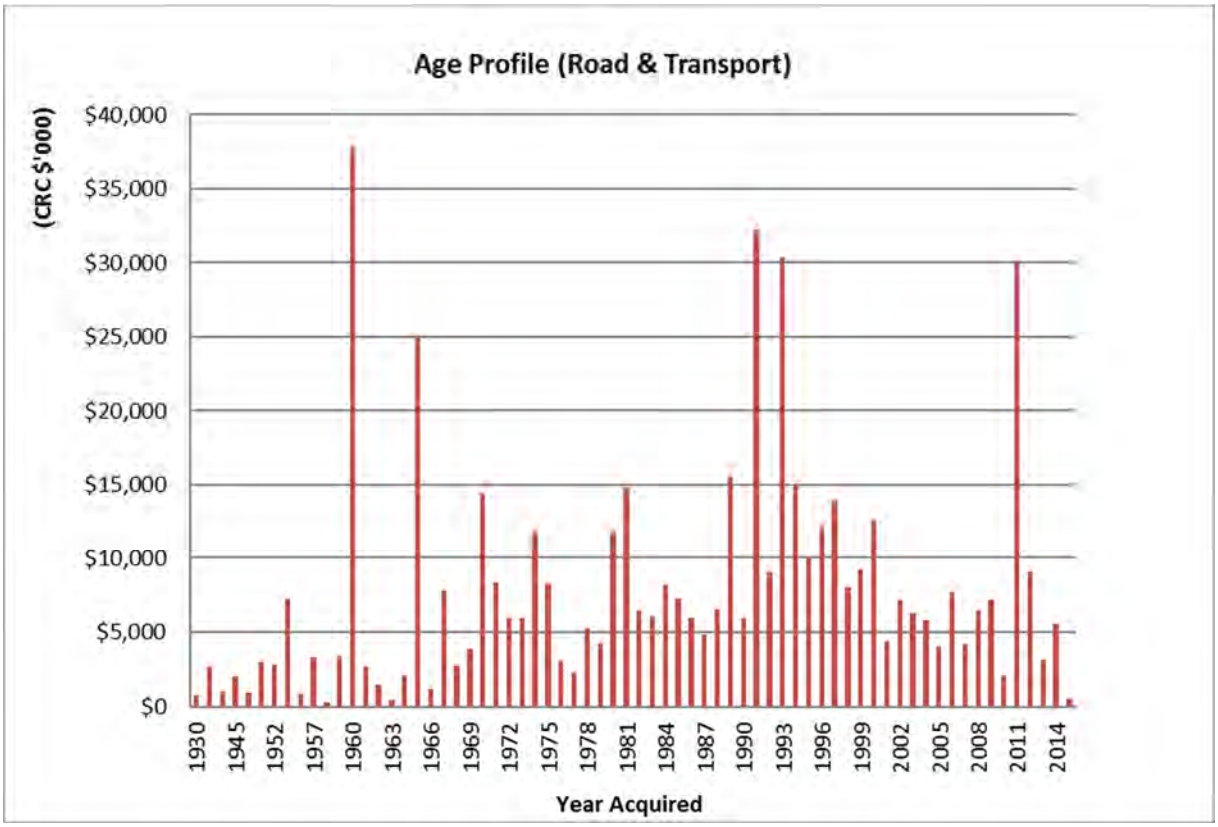
    2. MR 695 Tamarind Drive, Ballina Island + Ballina North (Kerr Street to North Creek Road)

Congestion at these two sites are to be addressed in project 5, 6, 7 & 10 of the Roads Contribution Plan 2010 (as amended)

Council inherits a small amount of new road & transport infrastructure each year from local developers. This leads to an overall increase in operations & maintenance costs.

The age profiles of the assets include in this AM Plan is shown in Figure 2.

Figure 2: Asset Age Profile –all assets



5.1.2 Asset capacity and performance

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

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

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
Eltham Road (10:053:085): Bridge 13	Aging timber bridge on a sharp bend + non-standard timber railing
Uralba Road (10:087:060): Bridge 44	Aging timber bridge, narrow pavement, no railing on a sharp bend
Chesworth Lane (10:099:010): Large Box Culvert 26	No Railing, narrow pavement + 1.5m drop
Tintenbar Road (00:7734:090): Bridge 29	Non-standard railing
Friday Hut Road (10:167:170): Bridge 40 -approaches	Very poor condition, sharp bend on bridge approach
South Ballina Beach Road (10:030:060): Large Box Culvert 56	Non-standard railing
River Drive (10:139:190): Bridge 57	No railing + 2m drop
River Drive (10:139:090): Large Box Culvert 59	Non-standard railing
River Drive (10:139:070): Large Box Culvert 60	Non-standard railing
Friday Hut Road (10:167:120): Large Box Culvert 65	No Railing, narrow pavement + 2.5m drop
Ballina Road (40:016:040)	Pavement Condition Index > 4 (3,203 sq.m)
Bugden Avenue (40:031:070)	Pavement Condition Index > 4 (6,413 sq.m)
Bugden Avenue (40:031:080)	Pavement Condition Index > 4 (339 sq.m)

Location	Service Deficiency
Lismore Road (40:016:100)	Pavement Condition Index > 4 (12,466 sq.m)
Lismore Road (40:016:110)	Pavement Condition Index > 4 (3,182 sq.m)
(10:200:020) CAUSEWAY 23	Pavement Roughness > 300 NRM (50 sq.m)
Gap Road (10:102:040)	Pavement Roughness > 300 NRM (837 sq.m)
Bonview Street (23:013:050)	Pavement Roughness > 300 NRM (474 sq.m)
Fishery Creek Road (21:025:020)	Pavement Roughness > 300 NRM (389 sq.m)
River Street (00:695:080) – Ballina West	Traffic currently at capacity during daily peak
River Street (00:695:090) – Ballina West	Traffic currently at capacity during daily peak
River Street (00:695:100) – Bridge 03	Traffic currently at capacity during daily peak
River Street (00:695:110) – Ballina Island	Traffic currently at capacity during daily peak

The above service deficiencies were identified from BSC Risk Management Plan 2015.

5.1.3 Asset condition

Road & Transport Condition data is collected either directly using a 1 to 5 scale by BSC staff or using specialized contractors and equipment to collect specific data types

Wearing Course

Data collected by suitably NATA qualified specialist contractors

Data sets Collected:

- Cracking by extent (%) over each road segment
- Existing patching by extent (%) over each segment
- Localised Surface Defects by extent (%) over each segment
- Surface Texture Defects by extent (%) over each segment
- Age (years) at time of testing

Frequency:

- Data is to be collected on a 5 year interval

Methodology:

- Step 1: data collected by contractor using laser profilometer vehicle.
- Step 2: convert values to 1 to 5 score (using BSC Classification Matrix & conversion equation)
- Step 3: multiply each score with corresponding weighting %
  - → Cracking (25%)
  - → Patching (10%)
  - → Localised Surface Defects (10%)
  - → Surface Texture Defects (5%)
  - → Age (50%)
- Step 4: seal condition index = S (defect score x weighting)

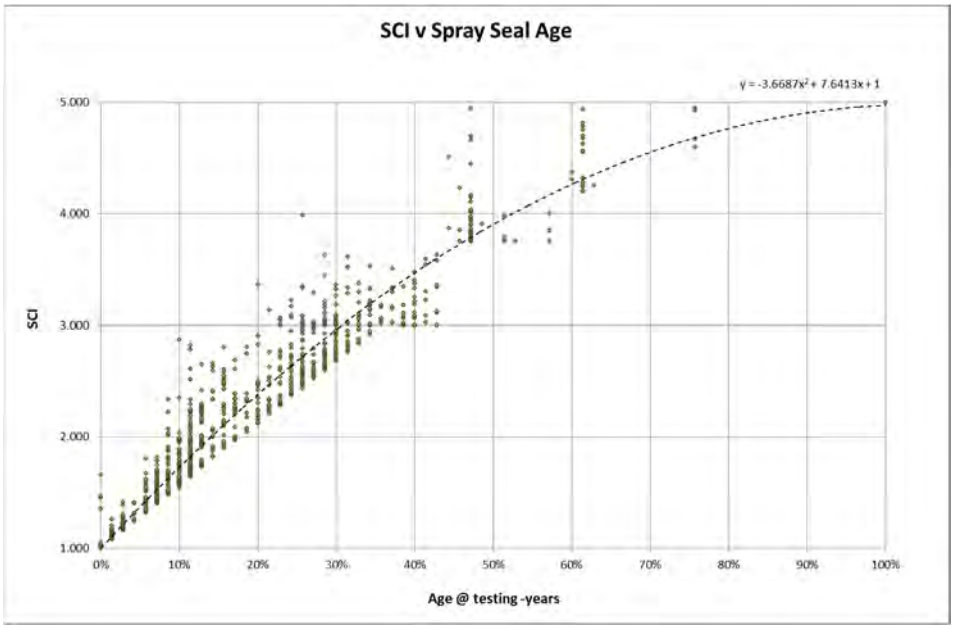


Figure 5.1.3.1 Seal Condition Index v Pavement Life extinguished (spray seal)

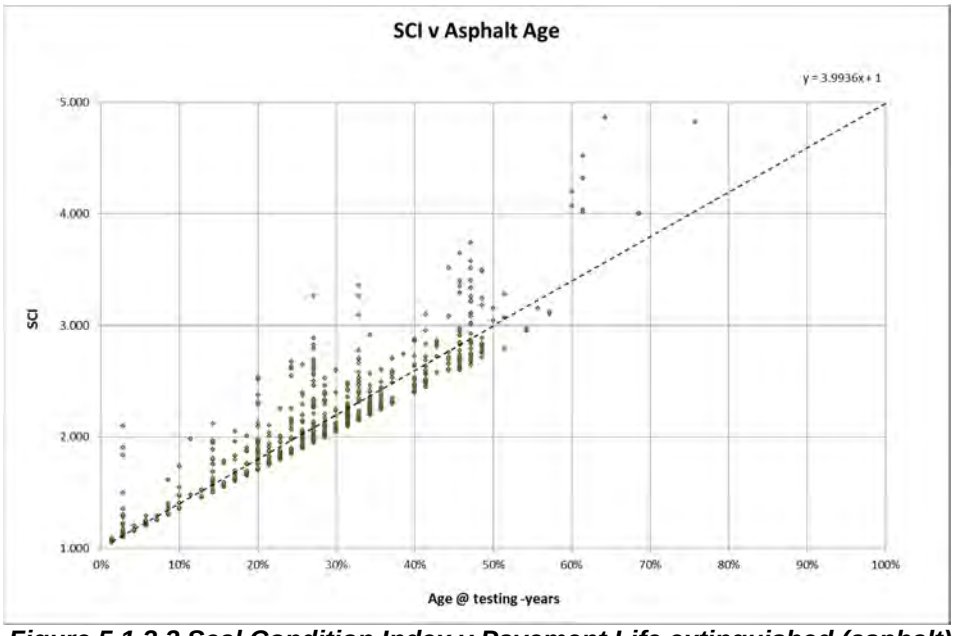


Figure 5.1.3.2 Seal Condition Index v Pavement Life extinguished (asphalt)

Pavement (sealed + rigid)

Data collected by suitably NATA qualified specialist contractors

Data sets Collected:

- Roughness mean + 1SD over each segment measured in NAASRA Roughness Counts
- Rutting mean +1SD over each segment measured in mm
- Cracking by extent (%) over each road segment
- Existing patching by extent (%) over each segment
- Localised Surface Defects by extent (%) over each segment
- Surface Texture Defects by extent (%) over each segment
- Age (years) at time of testing

Frequency:

- Data is to be collected on a 5 year interval

Methodology:

- Step 1: data collected by contractor using laser profilometer vehicle.
- Step 2: convert values to 1 to 5 score (using BSC Classification Matrix & conversion equation)
- Step 3: multiply each score with corresponding weighting %
  - → Roughness (47.5%)
  - → Rutting (10%)
  - → Cracking (2.5%)
  - → Patching (2.5%)
  - → Localised Surface Defects (2.5%)
  - → Age (35%)
- Step 4: pavement condition index = S (defect score x weighting)

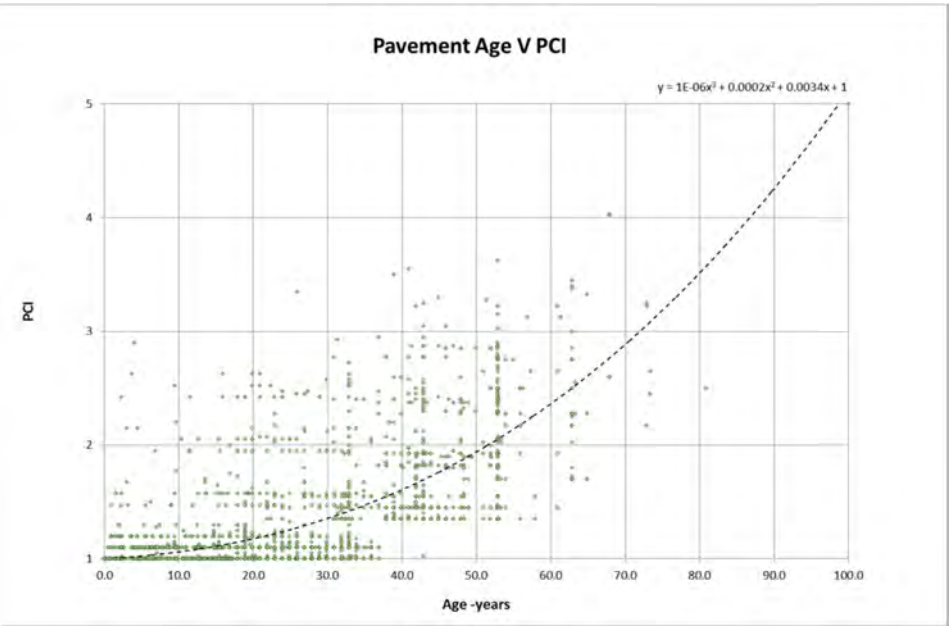
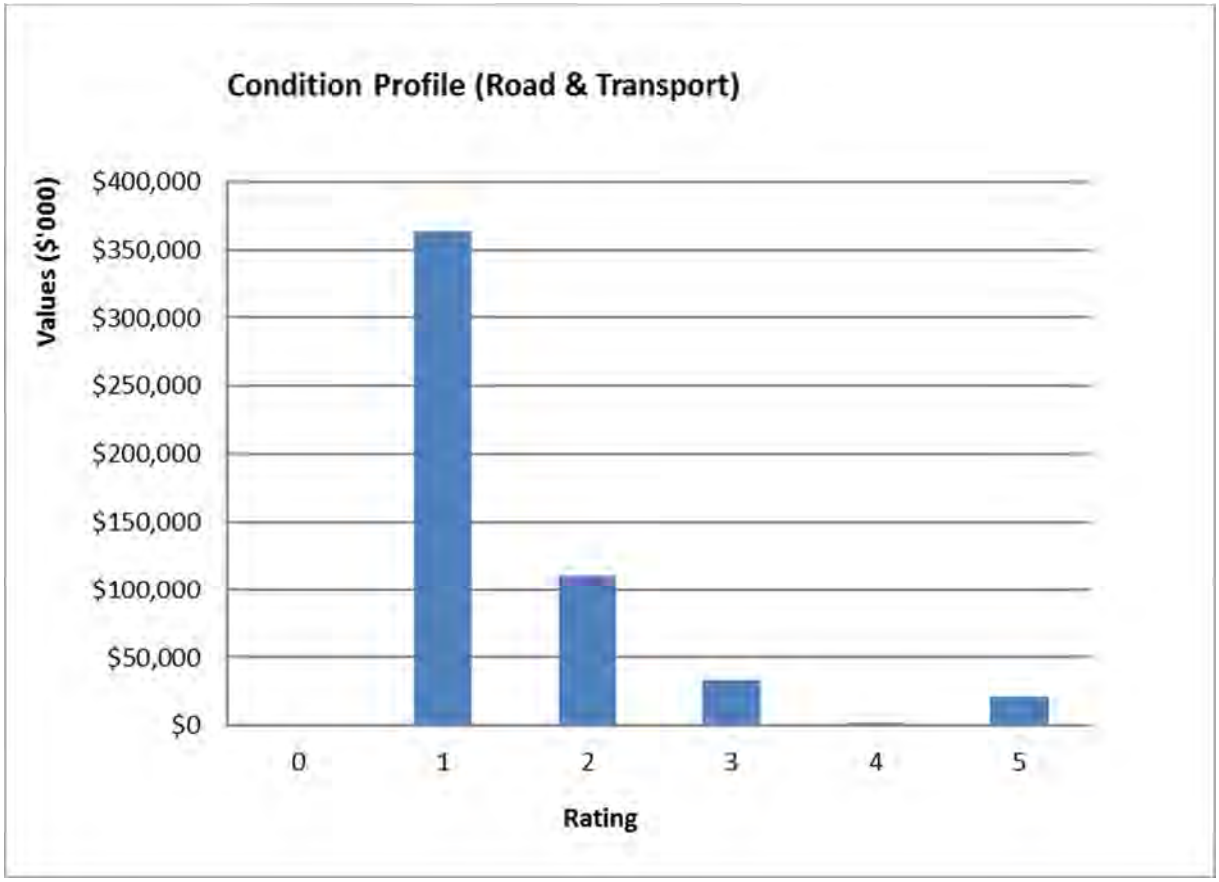


Figure 5.1.3.3 Pavement Condition Index v Pavement Life extinguished

Fig 3: Asset Condition Profile –all assets



Pavement (unsealed)

Desktop survey using age profiles. Condition of unsealed pavements changes to rapidly to be an effective modelling tool.

Data sets Collected:

- none

Frequency:

- Annual

Methodology:

- Step 1: determine theoretical % of life remaining of pavement segment using,

$$\%\ \text{life remaining} = \left[\frac{\text{design life} - \min(\text{design life}, age)}{\text{design life}}\right] \times 100$$

$$\text{if } age > \text{design life, then re-assess design lives}$$

- Step 2: convert values to 1 to 5 score (using BSC Classification Matrix)

→	remaining life	65 -100 %	theoretical condition 1
→	remaining life	35 – 65 %	theoretical condition 2
→	remaining life	10 – 35 %	theoretical condition 3
→	remaining life	5 – 10 %	theoretical condition 4
→	remaining life	0 – 5 %	theoretical condition 5

Bridges

1 to 5 condition assessments of bridge components performed as part of the defect inspection programs. Bridge score calculated from weighting component values.

Data sets Collected:

- 1 to 5 Condition rating of bridge components by BSC staff.
- Structural load testing by NATA qualified contractors

Frequency:

- Visual Condition (5 yearly) Defects (12 monthly)
- Load Testing (every 10 years after structure has reached visual condition 3)

Methodology:

- Bridge component assessment criteria. Generally the criteria with the worst score shall define the overall condition, but the use of the definitions will require some degree of subjective assessment.

Bridge Components (timber)

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracks / Splits	None or very fine	Some connected fine cracks	Number of cracked timbers	Significant severely cracked / split timbers	Extreme levels of split timbers
Decay (fungal rot)	No sign of rot or damp areas	Minimal signs in isolated areas	Moderate timber decay	Significant timber decay	Extensive timber decay.
Termites / Borers	No sign of insects	Negligible signs of (non-active) insect activity	Negligible signs of (active) insect activity	Significant insect activity.	Extensive active insect infestation. Structural capacity affected.
Loose joints or connections	No movement	Movement < 5mm	Movement < 10mm	Movement < 50mm	Movement > 50mm
Corrosion of metal components	Bolts & plates corrosion free	Discolouration of some metal components	Sporadic visible corrosion taking hold	Widespread corrosion on bolts & plates	Bolts & plates very heavily corroded
% defect effected	**0 %**	**1 to 10 %**	**10 to 20 %**	**> 20 %**	**> 20 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

Bridge Components (concrete)

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks	Number of cracked sections	Significant severely cracked sections	Extreme levels of cracking exposing reinforcing
Reinforcement Corrosion	None	Discolouration from water infiltration via open cracks	Sporadic visible corrosion taking hold on exposed reinforcing	Exposed reinforcing heavily corroded	Widespread exposed reinforcing heavily corroded
Spalling	None	Isolated minor cosmetic chipping	Isolated moderate (30mm max) chips size	Isolated loss of integrity, exposing reinforcement	Widespread loss of integrity, exposing reinforcement
% defect effected	**0 %**	**1 to 10 %**	**10 to 20 %**	**> 20 %**	**> 20 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

Bridge Components (steel)

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks	Moderate of cracked sections	Significant severely cracked sections	Extreme levels of cracked sections
Buckling	None	Very slight twisting of steel member	Visible distortion	Moderate buckling, load limit becomes necessary	Severe buckling of steel members, Bridge closure
Corrosion	None	Discolouration from oxidation	Sporadic visible corrosion taking hold	Widespread corrosion affecting structural strength	Widespread severe corrosion & loss of structural strength
% defect effected	**0 %**	**1 to 10 %**	**10 to 20 %**	**> 20 %**	**> 20 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

- Weighting:
  - → Decking (15%)
  - → Railing (5%)
  - → Columns / Piers (20%)
  - → Girders (20%)
  - → Corbels (10%)
  - → Abutments (15%)
  - → Headstock (10%)
  - → Age (5%)

- Bridge Score: = S (defect score x weighting)

Footpath / Shared Path

1 to 5 condition assessments of footpath & shared path segments performed as part of the defect inspection programs

Data sets Collected:

- 1 to 5 Condition rating of path segment by BSC staff.

Frequency:

- CBD Areas: Condition (3 yearly) Defects (3 monthly)
- Arterial Roads: Condition (5 yearly) Defects (6 monthly)
- Local Road System: Condition (5 yearly) Defects (12 monthly)

Methodology:

- Footpath & shared path assessment criteria. Generally the criteria with the worst score shall define the overall condition, but the use of the definitions will require some degree of subjective assessment.

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks	Interconnected moderate cracking over several slabs	Significant severely cracked slabs	Extreme levels of cracking over several slabs
Slipperiness	Slip free	Slightly slippery sections	Slippery sections	Very slippery sections	Extreme slipperiness
Evenness -within sections	Even Surface	Slightly uneven surface	Moderately uneven surface	Very uneven	Extremely uneven surface
Gaps -between sections	< 10 mm between sections	No-uniform gaps < 10 mm	No-uniform gaps 10 to 20 mm	No-uniform gaps 20 to 30 mm	Non-uniform gaps > 30 mm
Displacement - between sections	< 5 mm	5 to 10 mm	10 to 20 mm	20 to 30 mm	> 30 mm
Ponding	< 5 mm	5 to 10 mm	10 to 20 mm	20 to 30 mm	> 30 mm
% defect effected	**0 to 1 %**	**1 to 10 %**	**10 to 30 %**	**30 to 50 %**	**> 50 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

Kerb & Gutter

1 to 5 condition assessments of K&G & shared path segments performed as part of the defect inspection programs

Data sets Collected:

- 1 to 5 Condition rating of K&G segment by BSC staff.

Frequency:

- CBD Areas: Condition (3 yearly) Defects (18 monthly)
- Arterial Roads: Condition (5 yearly) Defects (30 monthly)
- Local Road System: Condition (5 yearly) Defects (30 monthly)

Methodology:

- Kerb & gutter assessment criteria. Generally the criteria with the worst score shall define the overall condition, but the use of the definitions will require some degree of subjective assessment.
-

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks in intervals	Block cracking typically 3 to 5mm width	Block cracking but still intact, typically > 5mm	Block cracking with displacement. Water infiltrating pavement.
Misalignment from lifting, settlement or rotation	None Present	Isolated < 5mm	5 to 15mm misalignments	15 to 50mm misalignments	> 50mm
Chipping / Spalling	None Present	Isolated minor cosmetic chipping	Isolated moderate (30mm max) chips size	Water infiltration evident	Major spalling. Water infiltration common
Ponding depth	None Present	Isolated < 5mm	10 to 20 mm	20 to 30 mm	> 30 mm deep Significant impact on pavement
% defect effected	**0 to 1 %**	**1 to 10 %**	**10 to 30 %**	**30 to 50 %**	**> 50 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

Marine Assets

1 to 5 condition assessments of boat ramps, wharves, jetties and pontoons performed as part of the defect inspection programs

Data sets Collected:

- 1 to 5 Condition rating of marine assets by BSC staff.

Frequency:

- Boat Ramps: Condition (5 yearly) Defects (12 monthly)
- Wharves, Jetties & Pontoons: Condition (5 yearly) Defects (12 monthly)

Methodology:

- Marine asset assessment criteria. Generally the criteria with the worst score shall define the overall condition, but the use of the definitions will require some degree of subjective assessment.

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks	Number of cracked sections	Significant severely cracked sections	Extreme levels of cracked sections
Slipperiness	Slip free	Slightly slippery surfaces	Slippery surfaces	Very slippery surfaces	Extreme slipperiness
Evenness -within sections	Even Surface	Slightly uneven surface	Moderately uneven surface	Very uneven	Extremely uneven surface
Gaps -between sections	< 10 mm between sections	No-uniform gaps < 10 mm	No-uniform gaps 10 to 20 mm	No-uniform gaps 20 to 30 mm	Non-uniform gaps > 30 mm
Displacement - between sections	< 5 mm	5 to 10 mm	10 to 20 mm	20 to 30 mm	> 30 mm
Chipping / Spalling	None Present	Isolated minor cosmetic chipping	Isolated moderate (30mm max) chips size	Water infiltration evident	Major spalling. Water infiltration common
% defect effected	**0 to 1 %**	**1 to 10 %**	**10 to 30 %**	**30 to 50 %**	**> 50 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

Ancillary

1 to 5 condition assessments of Guard Rail, Street Signage, Roundabouts and Traffic Medians performed as part of the defect inspection programs

Data sets Collected:

- 1 to 5 Condition rating of ancillary assets by BSC staff.

Frequency:

- Guard Rail: Condition (5 yearly) Defects (12 monthly)
- Street Signage: Condition (5 yearly) Defects (24 monthly)
- Traffic Calming Devices: Condition (10 yearly) Defects (N / A)

Methodology:

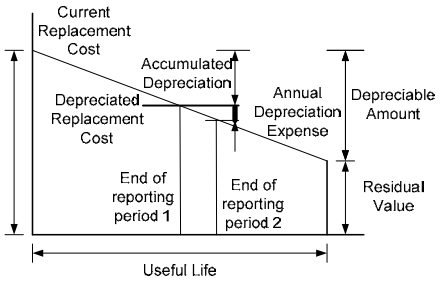
- Ancillary assessment criteria. Generally the criteria with the worst score shall define the overall condition, but the use of the definitions will require some degree of subjective assessment.
-

Criteria	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5
Cracking	None or very fine	Some fine cracks	Number of cracked sections	Significant severely cracked sections	Extreme levels of cracked sections
Displacement - between sections	< 5 mm	5 to 10 mm	10 to 20 mm	20 to 30 mm	> 30 mm
Reflectivity (signs)	As new	Minor loss of reflective surface	Moderate loss of reflective surface	Significant loss of reflective surface	Extreme loss of reflective surface
Buckling (Guard Rail)	As New	Very slight twisting of rail, terminal intact	Visible minor distortion, terminal intact	Moderate buckling, terminal intact	Severe buckling rail and or terminal damaged, replace
% effected	**0 to 1 %**	**1 to 10 %**	**10 to 30 %**	**30 to 50 %**	**> 50 %**
Overall Condition	**Very Good –as new**	**Good**	**Fair**	**Poor**	**Very Poor -replace**
Risk of Failure	Low risk	Median risk	Median risk	High risk	Very high risk
Action	None	treated under routine mtce	treated under planned mtce	require planned renewal	Immediate renewal required

5.1.4 Asset valuations

The value of assets recorded in the asset register as at 1st July 2014 covered by this asset management plan is shown below. Assets were last revalued at 1st July 2014. Assets are valued at fair value

Current Replacement Cost	$531,865,562
Depreciable Amount	$375,037,952
Depreciated Replacement Cost[5]	$439,010,883
Annual Depreciation Expense	$5,350,333



Useful lives were reviewed in 2015. The primary methodology behind this review was to maintain existing levels of service while *generally* keeping with the confines of Councils long term financial plan. The adopted useful lives have been compared against Councils previous figures as well as published figures from the Institute of Public Works Engineers Australia (IPWEA) & the Local Government Association (LGA)

Key assumptions made in preparing the valuations were:

- Road formation (earthworks) are non-depreciable
- Street lights are non-depreciable
- Unsealed (gravel) road pavements top 100mm is taken as depreciable, the sub-base and formation are non-depreciable

Major changes from previous valuations are due to

- Council has adopted a new sealed road resurfacing strategy (December 2014) that applies to existing sealed local & regional public roads.
  - → Pavement segments that currently possess a spray seal wearing course shall have a spray seal applied on replacement
  - → Pavement segments that currently possess an asphalt wearing course shall have a spray seal applied on replacement with the exception of NAASRA class 6 (urban principal avenue) & NAASRA Class 2 (rural distributer), both of which shall continue with an asphalt wearing course on replacement.
  - → The strategy also outlines wearing course design lives with respect to Councils adopted NAASRA road classification hierarchy.
  - → For further information on this strategy refer to page 75 of this document
- Sealed Pavement capital replacement strategy. This strategy compliments the road resurfacing strategy. Its purpose has been to modify the design lives and pavement treatment strategy over its lifetime while generally maintaining current service levels in regard to roughness and surface defects.
  - → The lifecycle design life, from initial inheritance from developers to full capital replacement, of all sealed pavements are to be defined by four wearing course design lives, as per the sealed road resurfacing strategy and Councils NAASRA road classification hierarchy.
  - → In order to maintain desired levels of road roughness and minor surface defects, the second reseal (lifecycle mid-point), shall be accompanied with a rip and reshape treatment applied to the top 100 to 150mm of existing pavement, which may include

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

the addition of small quantities new pavement material as required. The reshaping treatment is regarded as maintenance while the reseal component remains capital.

Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time. (refer to Report # 2 –NAMS3+)

Rate of Annual Asset Consumption (Depreciation/Depreciable Amount)	1.4%
Rate of Annual Asset Renewal (Capital renewal expenditure/Depreciable amount)	1.3%

In 2015/16 Council plans to renew assets at 94.1% of the rate they are being consumed and will be increasing its asset stock by 0.1% in the year.

5.1.5 Historical Data

Figure 5.15.1 below summarises the previous 4 years of budgeted operations, maintenance & capital expenditure over a number of road & transport sub-groups.

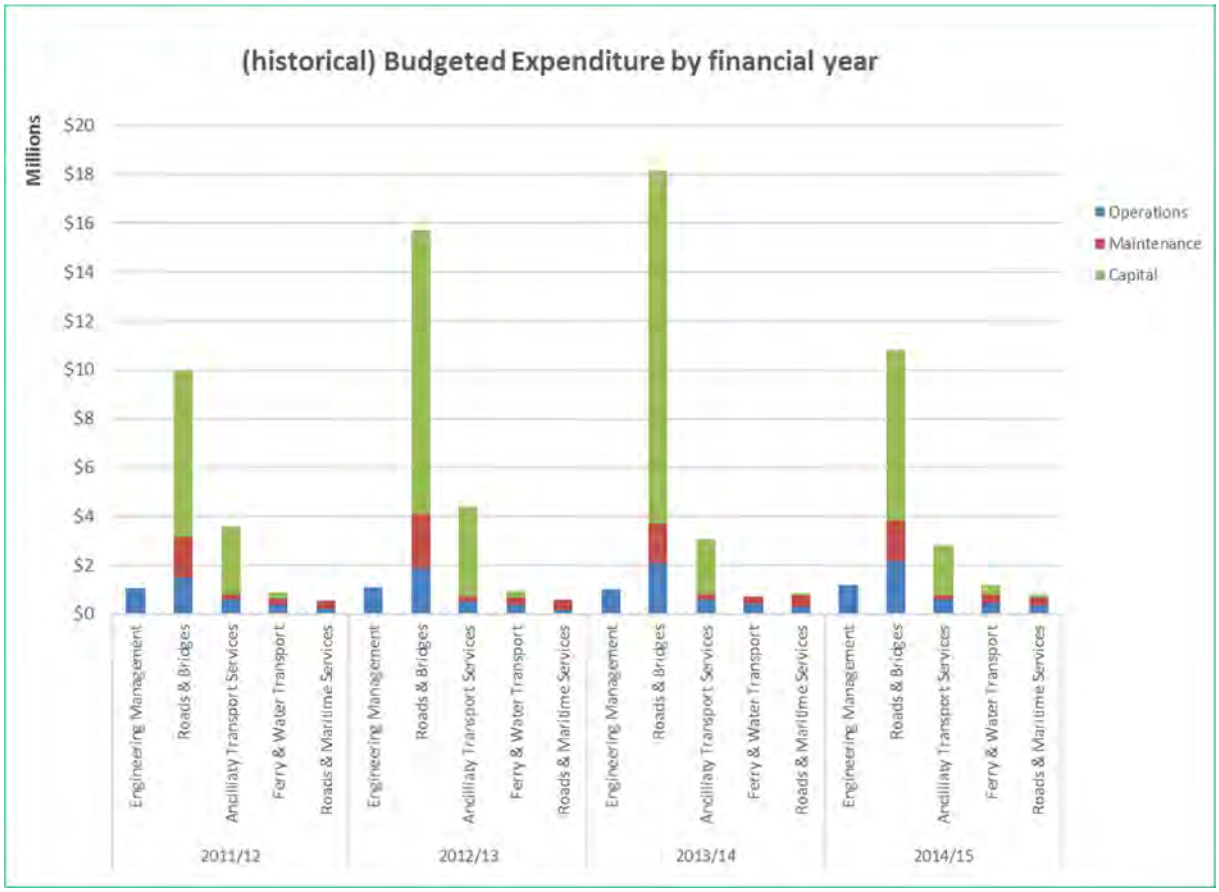


Fig 5.15.1: historical road & transport costings by sub-group & type

5.2 Infrastructure Risk Management Plan

An assessment of risks[6] associated with service delivery from infrastructure assets has identified critical risks that will result in loss or reduction in service from infrastructure assets or a 'financial shock' to Council. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

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

Table 5.2: Critical Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Eltham Road (10:053:085): Bridge 13	fatality due to bridge collapse	M	as above + perform load testing + load limit if required	Medium	-
Eltham Road (10:053:085): Bridge 13	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
Uralba Road (10:087:060): Bridge 44	fatality due to bridge collapse	M	as above + perform load testing + load limit if required	Medium	-
Uralba Road (10:087:060): Bridge 44	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Low	-
Chesworth Lane (10:099:010): Large Box Culvert 26	fatality from vehicle impact on bridge	M	install crash barrier railing	Medium	-
Tintenbar Road (00:7734:090): Bridge 29	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
Friday Hut Road (10:167:170): Bridge 40 -approaches	fatality from vehicle impact on bridge	H	pavement renewal	Medium	$26,000
South Ballina Beach Road (10:030:060): Large Box Culvert 56	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
River Drive (10:139:190): Bridge 57	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
River Drive (10:139:090): Large Box Culvert 59	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
River Drive (10:139:070): Large Box Culvert 60	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
Friday Hut Road (10:167:120): Large Box Culvert 65	fatality from vehicle impact on bridge	M	replace railing with crash barrier railing	Medium	-
Ballina Road (40:016:040)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Bugden Avenue (40:031:070)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-

[6] refer to BSC Infrastructure Risk Management Plan 2016

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Bugden Avenue (40:031:080)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Lismore Road (40:016:100)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Lismore Road (40:016:110)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
(10:200:020) CAUSEWAY 23	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Gap Road (10:102:040)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Bonview Street (23:013:050)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
Fishery Creek Road (21:025:020)	Accident / Collision (hospitalisation)	M	pavement renewal	Medium	-
River Street (00:695:080) – Ballina West	traffic volumes at capacity during peak flow	H	upgrade as per roads contribution plan 2010 (project # 6)	Medium	$250,000
River Street (00:695:090) – Ballina West	traffic volumes at capacity during peak flow	H	upgrade as per roads contribution plan 2010 (project # 6)	Medium	$250,000
River Street (00:695:100) – Bridge 03	traffic volumes at capacity during peak flow	H	upgrade as per roads contribution plan 2010 (project # 6)	Medium	$250,000
River Street (00:695:110) – Ballina Island	traffic volumes at capacity during peak flow	H	upgrade as per roads contribution plan 2010 (project # 6)	Medium	$250,000
Road Segment	Accident / Collision (fatality)	H	do nothing	Very High	$250,000
Road Segment	Accident / Collision (hospitalisation)	M	do nothing	Medium	-
High Traffic Footpath in CBD Areas	trip, falls by pedestrians	M	inspections & maintenance programs	Medium	-
Unsealed Road Segments incorporating bends	Accident / Collision (fatality)	M	maintenance grading + re-sheeting + speed restriction	Medium	-
Unsealed Road Segments incorporating bends	Accident / Collision (hospitalisation)	M	maintenance grading + re-sheeting + speed restriction	Medium	-
Sealed / Concrete Road Segment	Accident / Collision (fatality)	M	capital renewal	Medium	-
Sealed / Concrete Road Segment	Accident / Collision (hospitalisation)	M	capital renewal	Medium	-
Sealed / Concrete Road Segment	Accident / Collision (fatality)	M	capital realignment	Medium	-

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

5.3 Routine Operations and Maintenance Plan

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

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

5.3.1 Operations and Maintenance Plan

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

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

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

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

Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, replacing air conditioning units, etc. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Actual past maintenance expenditure is shown in Table 5.3.1.

Table 5.3.1.1: Operations & Maintenance Expenditure Trends

Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure
2011/12	Operations	Management (group total)	N / A	item	$2,025,400	$2,025,400	-	-	$2,025,400
		Boat ramps (contract cleaning)	Boat ramp network	each	$20,000	$1,333	-	-	$20,000
		Urban road reserves	Urban road reserve network	m	$50,900	$0.11	-	-	$50,900
		Urban sealed roads	Urban sealed road network	sq.m	$233,400	$0.10	-	-	$233,400
		Urban unsealed roads	Urban unsealed road network	sq.m	$3,800	$0.10	-	-	$3,800
		Rural road reserves	Rural road reserve network	m	$349,800	$0.47	-	-	$349,800
		Rural sealed roads	Rural sealed road network	sq.m	$94,200	$0.04	-	-	$94,200
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$12,600	$0.02	-	-	$12,600
		Street & Gutter –street sweeper	Urban + Rural K&G network	m	$222,200	$0.64	-	-	$222,200
		CBD cleaning program -Alstonville	Alstonville CBD	sq.m	$14,000	$3.40	-	-	$14,000
		CBD cleaning program -Ballina	Ballina CBD	sq.m	$300	$0.03	-	-	$300
		Loans + Interest on loans (all)	N / A	item	$486,700	$486,700	-	-	$486,700
		Street lighting -electricity	Street light network	each	$466,800	$168	-	-	$466,800
		Road & traffic signs	Urban + Rural street signage network	each	$15,300	$2.42	-	-	$15,300
		Footpaths	Urban + Rural footpath network	sq.m	$62,800	$1.35	-	-	$62,800
		Carparks	Urban + Rural carpark network	sq.m	$12,600	$0.22	-	-	$12,600
		Public transport	Public transport item	item	$0	$0.00	-	-	$0
		Wharves jetties & pontoons	Marine assets network	item	$8,800	$8,800	-	-	$8,800
		Ferry operations	Ferry	Item	$366,700	$366,700	-	-	$366,700
		Regional roads operations	Regional road network	sq.m	$210,600	$0.37	-	-	$210,600
	Maintenance	Boat ramps maintenance	Boat ramp network	each	$3,400	$227	-	-	$3,400
		Urban road reserves	Urban road reserve network	m	$2,700	$0.01	$300.0	$0.01	$3,000
		Urban sealed roads	Urban sealed road network	sq.m	$253,530	$0.12	$28,170.0	$0.12	$281,700
		Rural road reserves	Rural road reserve network	m	$68,940	$0.10	$7,660.0	$0.10	$76,600
		Rural sealed roads	Rural sealed road network	sq.m	$419,310	$0.22	$46,590.0	$0.22	$465,900
		S94 maintenance (heavy vehicle)	S94 item	item	$217,900	$217,900	-	-	$217,900
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$516,600	$1.06	$57,400.0	$1.06	$574,000
		Bridges rural	Rural bridge network	sq.m	$42,200	$7.27	-	-	$42,200
		Road & traffic signs	Urban + Rural street signage network	each	$108,400	$17.15	-	-	$108,400
		Footpaths	Urban + Rural footpath network	sq.m	$103,590	$2.47	$11,510.0	$2.47	$115,100
		Carparks	Urban + Rural carpark network	sq.m	$0	$0.00	-	-	$0
		Public transport	Public transport item	item	$4,800	$4,800	-	-	$4,800

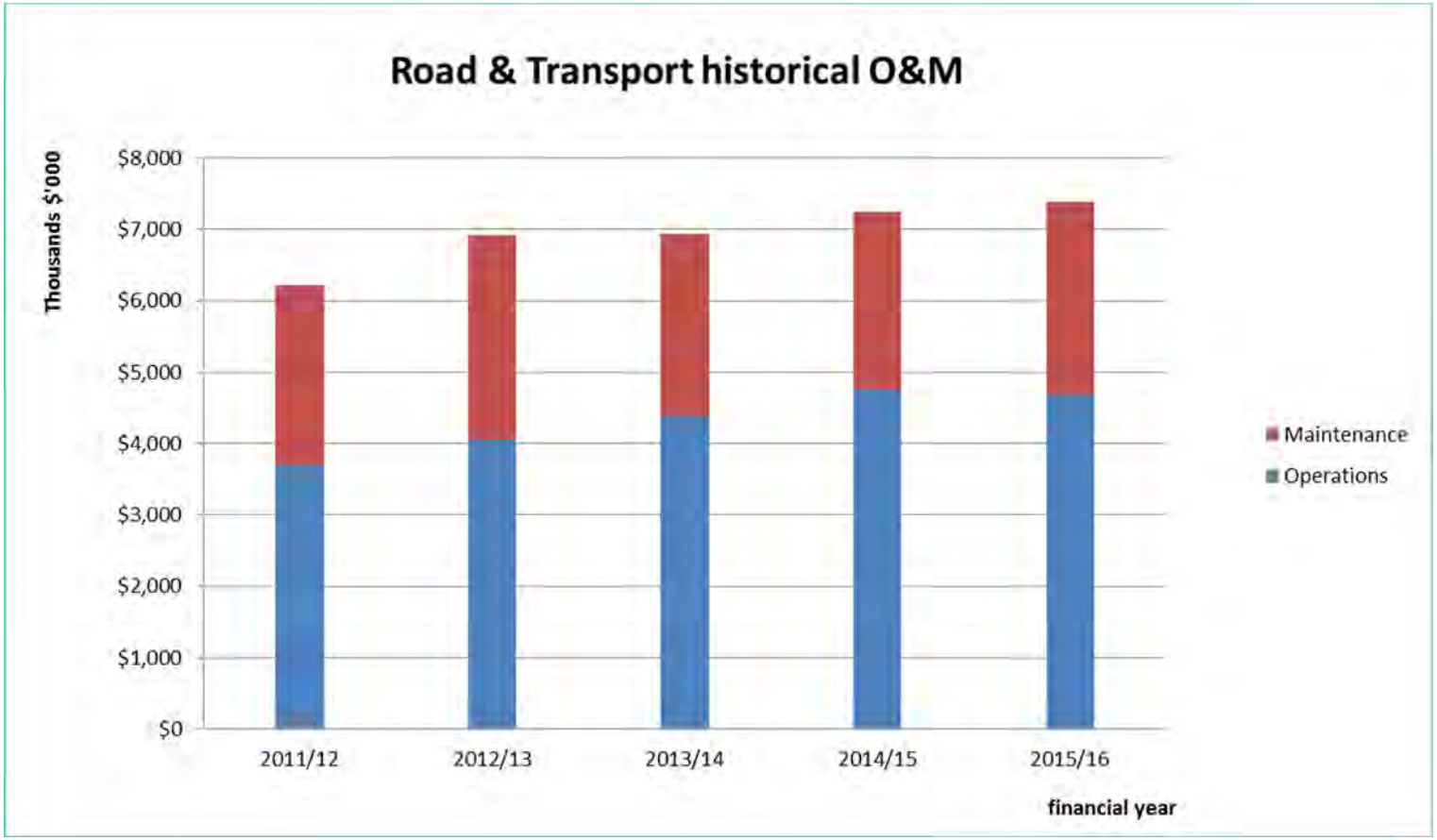
Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure
		Wharves jetties & pontoons	Marine assets network	item	$7,300	$7,300	-	-	$7,300
		Ferry annual slippage & overhaul	Ferry	item	$246,500	$246,500	-	-	$246,500
		Regional roads traffic facilities	Regional road network	item	$119,200	$119,200	-	-	$119,200
		Regional roads maintenance	Regional road network	sq.m	$206,190	$0.41	$22,910.0	$0.41	$229,100
2012/13	Operations	Management (group total)	N / A	item	$2,090,500	$2,090,500	-	-	$2,090,500
		Boat ramps (contract cleaning)	Boat ramp network	each	$18,400	$1,227	-	-	$18,400
		Urban road reserves	Urban road reserve network	m	$51,400	$0.11	-	-	$51,400
		Urban sealed roads	Urban sealed road network	sq.m	$193,400	$0.08	-	-	$193,400
		Urban unsealed roads	Urban unsealed road network	sq.m	$18,900	$0.49	-	-	$18,900
		Rural road reserves	Rural road reserve network	m	$514,700	$0.69	-	-	$514,700
		Rural sealed roads	Rural sealed road network	sq.m	$82,700	$0.04	-	-	$82,700
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$13,100	$0.02	-	-	$13,100
		Street & Gutter –street sweeper	Urban + Rural K&G network	m	$299,100	$0.86	-	-	$299,100
		CBD cleaning program -Alstonville	Alstonville CBD	sq.m	$31,300	$7.60	-	-	$31,300
		CBD cleaning program -Ballina	Ballina CBD	sq.m	$32,400	$3.10	-	-	$32,400
		Loans + Interest on loans (all)	N / A	item	$624,200	$624,200	-	-	$624,200
		Street lighting -electricity	Street light network	each	$406,700	$147	-	-	$406,700
		Road & traffic signs	Urban + Rural street signage network	each	$43,000	$6.80	-	-	$43,000
		Footpaths	Urban + Rural footpath network	sq.m	$26,300	$0.57	-	-	$26,300
		Carparks	Urban + Rural carpark network	sq.m	$21,400	$0.38	-	-	$21,400
		Public transport	Public transport item	item	$0	$0.00	-	-	$0
		Wharves jetties & pontoons	Marine assets network	item	$7,500	$7,500	-	-	$7,500
		Ferry operations	Ferry	Item	$369,300	$369,300	-	-	$369,300
		Regional roads operations	Regional road network	sq.m	$164,800	$0.29	-	-	$164,800
	Maintenance	Boat ramps maintenance	Boat ramp network	each	$10,500	$700	-	-	$10,500
		Urban road reserves	Urban road reserve network	m	$24,390	$0.06	$2,710.0	$0.06	$27,100
		Urban roads	Urban sealed road network	sq.m	$258,120	$0.12	$28,680.0	$0.12	$286,800
		Rural road reserves	Rural road reserve network	m	$83,340	$0.12	$9,260.0	$0.12	$92,600
		Rural sealed roads	Rural sealed road network	sq.m	$515,880	$0.27	$57,320.0	$0.27	$573,200
		S94 maintenance (heavy vehicle)	S94 item	item	$231,300	$231,300	-	-	$231,300
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$530,370	$1.09	$58,930.0	$1.09	$589,300
		Bridges rural	Rural bridge network	sq.m	$36,700	$6.33	-	-	$36,700
		Road & traffic signs	Urban + Rural street signage network	each	$96,300	$15.24	-	-	$96,300
		Footpaths	Urban + Rural footpath network	sq.m	$82,980	$1.98	$9,220.0	$1.98	$92,200

Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure
		Carparks	Urban + Rural carpark network	sq.m	$0	$0.00	-	-	$0
		Public transport	Public transport item	item	$12,800	$12,800	-	-	$12,800
		Wharves jetties & pontoons	Marine assets network	item	$9,700	$9,700	-	-	$9,700
		Ferry annual slippage & overhaul	Ferry	item	$243,700	$243,700	-	-	$243,700
		Regional roads traffic facilities	Regional road network	item	$127,300	$127,300	-	-	$127,300
		Regional roads maintenance	Regional road network	sq.m	$287,370	$0.57	$31,930.0	$0.57	$319,300
2013/14	Operations	Management (group total)	N / A	item	$1,926,300	$1,926,300	-	-	$1,926,300
		Boat ramps (contract cleaning)	Boat ramp network	each	$29,600	$1,973	-	-	$29,600
		Urban road reserves	Urban road reserve network	m	$100,800	$0.21	-	-	$100,800
		Urban sealed roads	Urban sealed road network	sq.m	$285,700	$0.12	-	-	$285,700
		Urban unsealed roads	Urban unsealed road network	sq.m	$5,000	$0.13	-	-	$5,000
		Rural road reserves	Rural road reserve network	m	$474,100	$0.64	-	-	$474,100
		Rural sealed roads	Rural sealed road network	sq.m	$135,000	$0.06	-	-	$135,000
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$14,500	$0.03	-	-	$14,500
		Street & Gutter –street sweeper	Urban + Rural K&G network	m	$258,200	$0.74	-	-	$258,200
		CBD cleaning program -Alstonville	Alstonville CBD	sq.m	$39,000	$9.47	-	-	$39,000
		CBD cleaning program -Ballina	Ballina CBD	sq.m	$38,100	$3.64	-	-	$38,100
		Loans + Interest on loans (all)	N / A	item	$747,000	$747,000	-	-	$747,000
		Street lighting -electricity	Street light network	each	$450,300	$162	-	-	$450,300
		Road & traffic signs	Urban + Rural street signage network	each	$15,100	$2.39	-	-	$15,100
		Footpaths	Urban + Rural footpath network	sq.m	$41,800	$0.90	-	-	$41,800
		Carparks	Urban + Rural carpark network	sq.m	$43,300	$0.77	-	-	$43,300
		Public transport	Public transport item	item	$0	$0.00	-	-	$0
		Wharves jetties & pontoons	Marine assets network	item	$10,500	$10,500	-	-	$10,500
		Ferry operations	Ferry	Item	$366,600	$366,600	-	-	$366,600
		Regional roads operations	Regional road network	sq.m	$292,400	$0.52	-	-	$292,400
	Maintenance	Boat ramps maintenance	Boat ramp network	each	$7,600	$507	-	-	$7,600
		Urban road reserves	Urban road reserve network	m	$5,310	$0.01	$590.0	$0.01	$5,900
		Urban roads	Urban sealed road network	sq.m	$200,430	$0.09	$22,270.0	$0.09	$222,700
		Rural road reserves	Rural road reserve network	m	$103,230	$0.15	$11,470.0	$0.15	$114,700
		Rural sealed roads	Rural sealed road network	sq.m	$513,000	$0.26	$57,000.0	$0.26	$570,000
		S94 maintenance (heavy vehicle)	S94 item	item	$39,500	$39,500	-	-	$39,500
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$514,260	$1.06	$57,140.0	$1.06	$571,400
		Bridges rural	Rural bridge network	sq.m	$14,800	$2.55	-	-	$14,800

Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure
		Road & traffic signs	Urban + Rural street signage network	each	$98,200	$15.54	-	-	$98,200
		Footpaths	Urban + Rural footpath network	sq.m	$134,100	$3.20	$14,900.0	$3.20	$149,000
		Carparks	Urban + Rural carpark network	sq.m	$0	$0.00	-	-	$0
		Public transport	Public transport item	item	$19,100	$19,100	-	-	$19,100
		Wharves jetties & pontoons	Marine assets network	item	$10,400	$10,400	-	-	$10,400
		Ferry annual slippage & overhaul	Ferry	item	$280,600	$280,600	-	-	$280,600
		Regional roads traffic facilities	Regional road network	item	$128,400	$128,400	-	-	$128,400
		Regional roads maintenance	Regional road network	sq.m	$296,100	$0.58	$32,900.0	$0.58	$329,000
2014/15	Operations	Management (group total)	N / A	item	$2,309,700	$2,309,700	-	-	$2,309,700
		Boat ramps (contract cleaning)	Boat ramp network	each	$31,000	$2,067	-	-	$31,000
		Urban road reserves	Urban road reserve network	m	$59,000	$0.12	-	-	$59,000
		Urban sealed roads	Urban sealed road network	sq.m	$306,000	$0.13	-	-	$306,000
		Urban unsealed roads	Urban unsealed road network	sq.m	$36,000	$0.94	-	-	$36,000
		Rural road reserves	Rural road reserve network	m	$320,000	$0.43	-	-	$320,000
		Rural sealed roads	Rural sealed road network	sq.m	$116,000	$0.05	-	-	$116,000
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$28,000	$0.05	-	-	$28,000
		Street & Gutter –street sweeper	Urban + Rural K&G network	m	$247,000	$0.71	-	-	$247,000
		CBD cleaning program -Alstonville	Alstonville CBD	sq.m	$32,000	$7.77	-	-	$32,000
		CBD cleaning program -Ballina	Ballina CBD	sq.m	$32,000	$3.06	-	-	$32,000
		Loans + Interest on loans (all)	N / A	item	$750,000	$750,000	-	-	$750,000
		Street lighting -electricity	Street light network	each	$462,000	$167	-	-	$462,000
		Road & traffic signs	Urban + Rural street signage network	each	$3,500	$0.55	-	-	$3,500
		Footpaths	Urban + Rural footpath network	sq.m	$33,000	$0.71	-	-	$33,000
		Carparks	Urban + Rural carpark network	sq.m	$47,500	$0.84	-	-	$47,500
		Public transport	Public transport item	item	$2,000	$2,000.00	-	-	$2,000
		Wharves jetties & pontoons	Marine assets network	item	$153,500	$153,500	-	-	$153,500
		Ferry operations	Ferry	Item	$382,200	$382,200	-	-	$382,200
		Regional roads operations	Regional road network	sq.m	$291,000	$0.52	-	-	$291,000
	Maintenance	Boat ramps maintenance	Boat ramp network	each	$6,000	$400	-	-	$6,000
		Urban road reserves	Urban road reserve network	m	$45,450	$0.11	$5,050.0	$0.11	$50,500
		Urban roads	Urban sealed road network	sq.m	$239,400	$0.11	$26,600.0	$0.11	$266,000
		Rural road reserves	Rural road reserve network	m	$139,500	$0.21	$15,500.0	$0.21	$155,000
		Rural sealed roads	Rural sealed road network	sq.m	$477,000	$0.25	$53,000.0	$0.25	$530,000
		S94 maintenance (heavy vehicle)	S94 item	item	$100,000	$100,000	-	-	$100,000

Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$553,500	$1.14	$61,500.0	$1.14	$615,000
		Bridges rural	Rural bridge network	sq.m	$20,000	$3.45	-	-	$20,000
		Road & traffic signs	Urban + Rural street signage network	each	$105,500	$16.69	-	-	$105,500
		Footpaths	Urban + Rural footpath network	sq.m	$105,300	$2.51	$11,700.0	$2.51	$117,000
		Carparks	Urban + Rural carpark network	sq.m	$6,000	$0.11	-	-	$6,000
		Public transport	Public transport item	item	$10,000	$10,000	-	-	$10,000
		Wharves jetties & pontoons	Marine assets network	item	$3,000	$3,000	-	-	$3,000
		Ferry annual slippage & overhaul	Ferry	item	$244,000	$244,000	-	-	$244,000
		Regional roads traffic facilities	Regional road network	item	$190,000	$190,000	-	-	$190,000
		Regional roads maintenance	Regional road network	sq.m	$405,900	$0.80	$45,100.0	$0.80	$451,000

Figure 5.3.1.1 – Historical O&M costs



Planned maintenance work is currently *estimated* at 92% of total maintenance expenditure.

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

Assessment and prioritisation of reactive maintenance is undertaken by Council staff using experience and judgement.

5.3.2 Operations and Maintenance Strategies

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

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

Table 5.3.2.1 summarises the *expected* operations & maintenance profiles over the 20 year scope of this document. It is envisaged that the operations & maintenance budgets (excluding CPI) will either,

→ Remain static.

→ Increase with the predicted growth of the asset base on a per unit basis.

→ Increase with a non-linear model that is a function of wearing course age (years)

Modelling Bituminous Maintenance Tasks (non-linear)

With the changes in capital replacement design lives and treatment options, a new long term bituminous maintenance model was developed that would service an expanded wearing course age profile while approximately maintaining the existing level of service.

This was achieved by

- Assuming that no bituminous maintenance is required for newly applied wearing course.
- Dividing the amount spent on bituminous maintenance for urban, rural and regional roads during 2014/15 by the quantity of respective wearing course
- Determine the ‘average age’ of each wearing course network in years
- Plot these points & use MS Excel trend line function to develop best fit curve.
- Apply the model for each wearing course segment over a 20 year period.

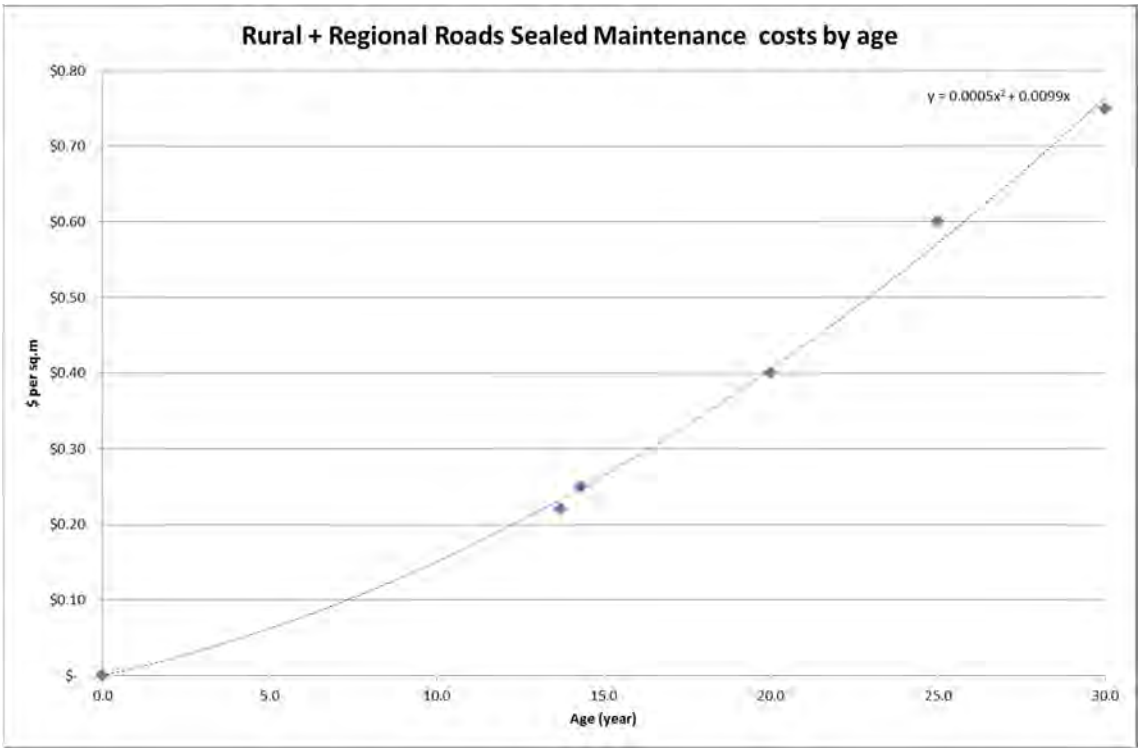


Figure 5.3.2.1: Bituminous Maintenance by wearing course age (Rural & Regional Roads)

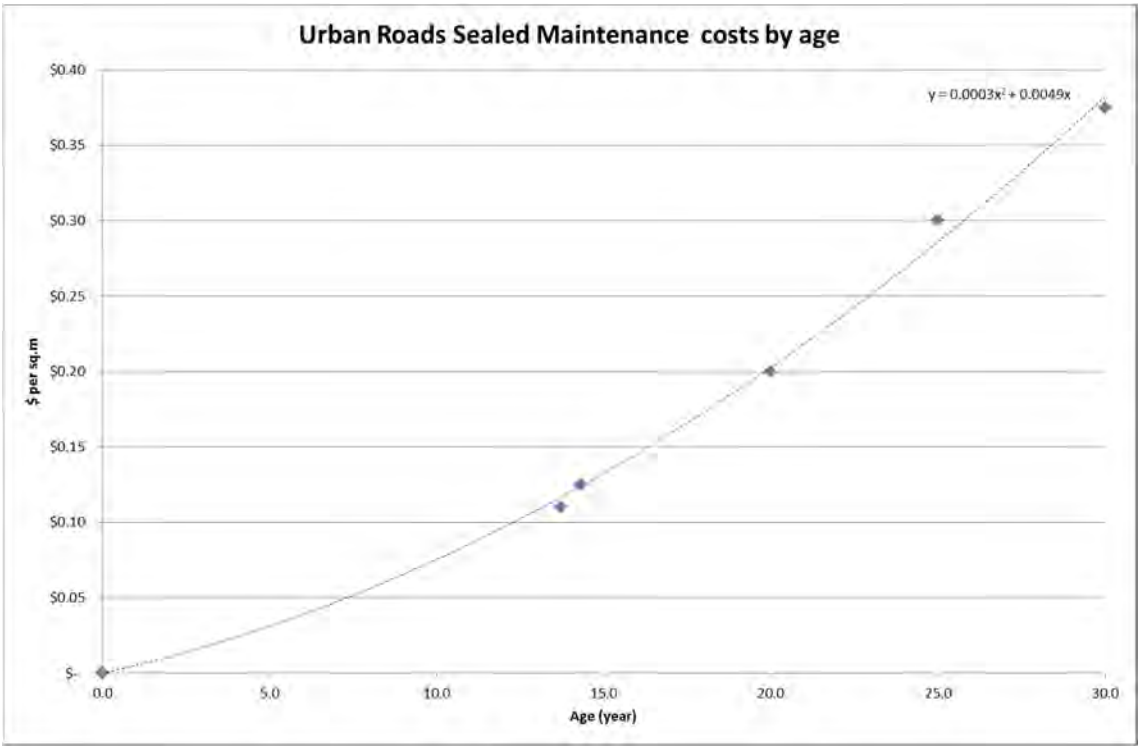


Figure 5.3.2.2: Bituminous Maintenance by wearing course age (Urban Roads)

Year	Group	Task	Measured Against	Unit of Measure	Planned		Unplanned		TOTAL	Future Growth Model (excluding CPI)
					Expenditure	$ / UOM	Expenditure	$ / UOM	Expenditure	
2014/15	Operations	Management (group total)	N / A	item	$2,309,700	$2,309,700	-	-	$2,309,700	Static
		Boat ramps (contract cleaning)	Boat ramp network	each	$31,000	$2,067	-	-	$31,000	Linear with additions / each
		Urban road reserves	Urban road reserve network	m	$59,000	$0.12	-	-	$59,000	Linear with additions / m
		Urban sealed roads	Urban sealed road network	sq.m	$306,000	$0.13	-	-	$306,000	Linear with additions / sq.m
		Urban unsealed roads	Urban unsealed road network	sq.m	$36,000	$0.94	-	-	$36,000	Linear with additions / sq.m
		Rural road reserves	Rural road reserve network	m	$320,000	$0.43	-	-	$320,000	Linear with additions / m
		Rural sealed roads	Rural sealed road network	sq.m	$116,000	$0.05	-	-	$116,000	Linear with additions / sq.m
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$28,000	$0.05	-	-	$28,000	Linear with additions / sq.m
		Street & Gutter –street sweeper	Urban + Rural K&G network	m	$247,000	$0.71	-	-	$247,000	Linear with additions / m
		CBD cleaning program -Alstonville	Alstonville CBD	sq.m	$32,000	$7.77	-	-	$32,000	Linear with additions / sq.m
		CBD cleaning program -Ballina	Ballina CBD	sq.m	$32,000	$3.06	-	-	$32,000	Linear with additions / sq.m
		Loans + Interest on loans (all)	N / A	item	$750,000	$750,000	-	-	$750,000	Varies year by year
		Street lighting -electricity	Street light network	each	$462,000	$167	-	-	$462,000	Linear with additions / each
		Road & traffic signs	Urban + Rural street signage network	each	$3,500	$0.55	-	-	$3,500	Linear with additions / each
		Footpaths	Urban + Rural footpath network	sq.m	$33,000	$0.71	-	-	$33,000	Linear with additions /sq.m
		Carparks	Urban + Rural carpark network	sq.m	$47,500	$0.84	-	-	$47,500	Linear with additions / sq.m
		Public transport	Public transport item	item	$2,000	$2,000	-	-	$2,000	Linear with additions / item
		Wharves jetties & pontoons	Marine assets network	item	$153,500	$153,500	-	-	$153,500	Linear with additions / item
		Ferry operations	Ferry	Item	$382,200	$382,200	-	-	$382,200	Static
		Regional roads operations	Regional road network	sq.m	$291,000	$0.52	-	-	$291,000	Linear with additions / sq.m
	Maintenance	Boat ramps maintenance	Boat ramp network	each	$6,000	$400	-	-	$6,000	Linear with additions / each
		Urban road reserves	Urban road reserve network	m	$45,450	$0.11	$5,050.0	$0.11	$50,500	Linear with additions / m
		Urban roads	Urban sealed road network	sq.m	$239,400	$0.11	$26,600.0	$0.11	$266,000	Non-linear bituminous profile
		Rural road reserves	Rural road reserve network	m	$139,500	$0.21	$15,500.0	$0.21	$155,000	Linear with additions / m
		Rural sealed roads	Rural sealed road network	sq.m	$477,000	$0.25	$53,000.0	$0.25	$530,000	Non-linear bituminous profile
		S94 maintenance (heavy vehicle)	S94 item	item	$100,000	$100,000	-	-	$100,000	Static
		Unsealed roads	Urban + Rural unsealed road network	sq.m	$553,500	$1.14	$61,500.0	$1.14	$615,000	Static
		Bridges rural	Rural bridge network	sq.m	$20,000	$3.45	-	-	$20,000	Linear with additions / sq.m
		Road & traffic signs	Urban + Rural street signage network	each	$105,500	$16.69	-	-	$105,500	Linear with additions / each
		Footpaths	Urban + Rural footpath network	sq.m	$105,300	$2.51	$11,700.0	$2.51	$117,000	Linear with additions / sq.m
		Carparks	Urban + Rural carpark network	sq.m	$6,000	$0.11	-	-	$6,000	Linear with additions / sq.m
		Public transport	Public transport item	item	$10,000	$10,000	-	-	$10,000	Linear with additions / each
		Wharves jetties & pontoons	Marine assets network	item	$3,000	$3,000	-	-	$3,000	Linear with additions / each
		Ferry annual slippage & overhaul	Ferry	item	$244,000	$244,000	-	-	$244,000	Static
		Regional roads traffic facilities	Regional road network	item	$190,000	$190,000	-	-	$190,000	Linear with additions / each
		Regional roads maintenance	Regional road network	sq.m	$405,900	$0.80	$45,100.0	$0.80	$451,000	Non-linear bituminous profile

Table 5.3.2.1: Operations & Maintenance Costing Models

Table 5.3.2.2: Asset Service Hierarchy

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	LEVEL 7
Transport Infrastructure Asset Class	Road Network	Road Name	Road Segment Name	Road Wearing Course Header	Road Wearing Course Section Item	-
				Road Pavement Header	Road Pavement Section Item	-
				Road Formation Header	Road Formation Item	-
				Road Kerb & Gutter Header	Road K&G Item	-
				Road Traffic Control Devices Header	Concrete Traffic Control Item	-
					Non Concrete Traffic Control Item	-
				Road Streetscape Header	Streetscape Item	-
				Road Furniture Header	Road Furniture Item	-
					Road Guard Rail Item	-
				Road Signs Header	Major Road Sign Item	-
					Minor Road Sign Item	-
				Path Header	Path Item	-
					Path Structure Item	-
				Major Culvert Name	Culvert Cell Item	-
					Culvert Headwall Item	-
					Culvert Base Item	-
				Road Lighting Header	Road Lighting Set Name	Road Lighting Item
						Road Lighting Pole Item
				Road Land Header	Road Land Item	-
			Bridge Name	Bridge Super Structure Header	Bridge Super Structure Item	-
				Bridge Sub Structure Header	Bridge Sub Structure Item	-
				Road Signs Header	Major Road Sign Item	-
					Minor Road Sign Item	-
				Path Header	Path Item	-
					Path Structure Item	-
				Road Wearing Course Header	Road Wearing Course Section Item	-
			Causeway Name	Road Pavement Section Item	-	-
				Road Formation Item	-	-
				Culvert Cell Item	-	-
				Minor Road Sign Item	-	-
	Car Parks Header	Car Park Name	Road Wearing Course Section Item	-	-	-
			Road Pavement Section Item	-	-	-
			Road Formation Item	-	-	-
			Road K&G Item	-	-	-
			Road Furniture Item	-	-	-
			Major Road Sign Item	-	-	-
			Minor Road Sign Item	-	-	-
			Road Land Item	Road Wearing Course Header	-	-

This can be seen graphically in section 7.1.6

Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery. Council's service hierarchy is shown below in Table 5.3.2.2

Critical Assets

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

Operations and maintenances activities may be targeted to mitigate critical assets failure and maintain service levels. These activities may include increased inspection frequency, higher maintenance intervention levels, etc. Critical assets failure modes and required operations and maintenance activities are detailed in Table 5.3.2.3

Table 5.3.2.3: Critical Assets and Service Level Objectives

Critical Assets	Critical Failure Mode	O&M Service Activities
Bridge 18: MR 545 -Angels Beach Drive, Ballina East	Operational	Inspections + load test
Bridge 62: MR 545 -Angels Beach Drive, Ballina East	Operational	Inspections + load test
Bridge 64: Silver Gull Drive, Ballina East	Operational	Inspections + load test
Bridge 61: MR 545 -Angels Beach Drive, Ballina Island	Operational	Inspections + load test
Bridge 24: Fishery Creek Road, Ballina West	Operational	Inspections + load test
Bridge 25: Cumbalum Road, Rural -Cumberlum	Operational	Inspections + load test
Large Box Culvert 19: Byron Street, Lennox Head	Operational	Inspections + load test
Bridge 66: Main Street, Alstonville	Operational	Inspections + load test
Bridge 43: Pearces Creek Road, Rural -Alstonvale	Operational	Inspections + load test
Bridge 49: Back Channel Road (Carlisle Street), Rural -Bagotville	Operational	Inspections + load test
Bridge 51: Bagotville Road, Rural -Bagotville	Operational	Inspections + load test
Large Box Culvert 14: Wardell Road, Rural -Bagotville	Operational	Inspections + load test
Bridge 40: Friday Hut Road, Rural -Brooklet	Operational	Inspections + load test
Large Box Culvert 48: Pimlico Road, Rural -Coolgardie	Operational	Inspections + load test
Bridge 17: Dalwood Road, Rural -Dalwood	Operational	Inspections + load test
Bridge 58: River Drive, Rural -Empire Vale	Operational	Inspections + load test
Large Box Culvert 59: River Drive, Rural -Empire Vale	Operational	Inspections + load test
Large Box Culvert 60: River Drive, Rural -Empire Vale	Operational	Inspections + load test
Bridge 57: River Drive, Rural -Empire Vale	Operational	Inspections + load test
Bridge 37: Tooheys Mill Road, Rural -Fernleigh	Operational	Inspections + load test
Large Box Culvert 65: Friday Hut Road, Rural -Knockrow	Operational	Inspections + load test
Bridge 20: MR 7735 -Ross Lane, Rural -Knockrow	Operational	Inspections + load test
Bridge 21: MR 7735 -Ross Lane, Rural -Knockrow	Operational	Inspections + load test
Large Box Culvert 54: Marom Creek Road, Rural -Marom Creek	Operational	Inspections + load test
Large Box Culvert 63: Marom Creek Road, Rural -Marom Creek	Operational	Inspections + load test
Bridge 55: Tucki Road, Rural -Marom Creek	Operational	Inspections + load test
Large Box Culvert 16: Dalwood Road, Rural -Meerschaum Vale	Operational	Inspections + load test
Large Box Culvert 52: Marom Creek Road, Rural -Meerschaum Vale	Operational	Inspections + load test
Bridge 15: Wardell Road, Rural -Meerschaum Vale	Operational	Inspections + load test
Bridge 13: Eltham Road, Rural -Pearces Creek	Operational	Inspections + load test

Critical Assets	Critical Failure Mode	O&M Service Activities
Bridge 35: Houghlahans Creek Road, Rural -Pearces Creek	Operational	Inspections + load test
Large Box Culvert 26: Chesworths Lane, Rural -Rous	Operational	Inspections + load test
Large Box Culvert 56: South Ballina Beach Road, Rural -South Ballina	Operational	Inspections + load test
Bridge 12: Eltham Road, Rural -Teven	Operational	Inspections + load test
Bridge 67: Eltham Road, Rural -Teven	Operational	Inspections + load test
Bridge 27: MR 7734 -Tintenbar Road, Rural -Teven	Operational	Inspections + load test
Bridge 30: MR 7734 -Tintenbar Road, Rural -Teven	Operational	Inspections + load test
Bridge 29: MR 7734 -Tintenbar Road, Rural -Teven	Operational	Inspections + load test
Bridge 09: Teven Road, Rural -Teven	Operational	Inspections + load test
Bridge 10: Teven Road, Rural -Teven	Operational	Inspections + load test
Large Box Culvert 11: Teven Road, Rural -Teven	Operational	Inspections + load test
Bridge 33: Houghlahans Creek Road, Rural -Tintenbar	Operational	Inspections + load test
Bridge 42: MR 7734 -Rifle Range Road, Rural -Tuckombil	Operational	Inspections + load test
Bridge 44: Uralba Road, Rural -Uralba	Operational	Inspections + load test
Bridge 01: Hill Street, Ballina East	Operational	Inspections + load test
Bridge 03: MR 695 -River Street, Ballina Island	Operational	Inspections + load test
Bridge 02: MR 695 -Tamarind Drive, Ballina Island	Operational	Inspections + load test
Bridge 08: Lismore Road, Alstonville	Operational	Inspections + load test
Large Box Culvert 22: Ballina Road, Alstonville	Operational	Inspections + load test
Bridge 68: Tamarind Drive, Rural -Tintenbar	Operational	Inspections + load test
Bridge 69: MR 695 -Tamarind Drive, Rural -Tintenbar	Operational	Inspections + load test
Causeway 38: Emigrant Crossing, Rural -Brooklet	Operational	Inspections
Causeway 53: Marom Creek Road, Rural -Marom Creek	Operational	Inspections
Causeway 41: Howards Road, Rural -Tuckombil	Operational	Inspections
Causeway 45: Lindendale Road, Rural -Rous	Operational	Inspections
Causeway 28: Friday Hut Road, Rural -Brooklet	Operational	Inspections
Causeway 32: Houghlahans Creek Road, Rural -Pearces Creek	Operational	Inspections
Causeway 34: Houghlahans Creek Road, Rural -Pearces Creek	Operational	Inspections
Causeway 31: Houghlahans Creek Road, Rural -Pearces Creek	Operational	Inspections
Causeway 23: Watsons Lane, Rural -Newrybar	Operational	Inspections
Causeway 36: Pearces Creek Hall Road, Rural -Pearces Creek	Operational	Inspections
Causeway 46: Boundary Road, Rural -Rous	Operational	Inspections
Urban (sealed) Segments incorporating intersections	Operational	Inspections, testing
Regional (sealed) Segments incorporating bends	Operational	Inspections, testing
Rural (sealed) Segments incorporating bends	Operational	Inspections, testing
Rural (unsealed) Segments incorporating bends	Operational	Inspections

Standards and specifications

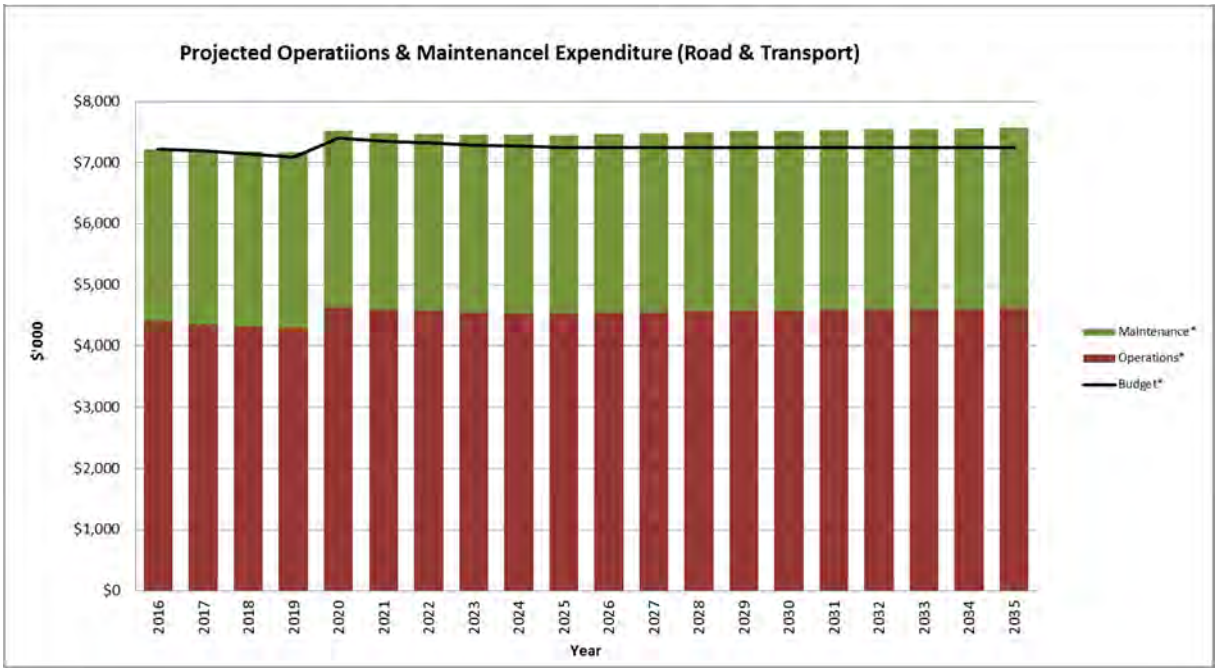
Maintenance work is carried out in accordance with the following Standards and Specifications.

- RMS Standard M1 General Network Management requirements
- RMS Standard M2 QA Specification
- RMS Standard M3 Routine Services
- RMS Standard M240 Shoulder Grading
- RMS Standard M430 Ferry Operation

5.3.3 Summary of future operations and maintenance expenditures

Future operations and maintenance expenditure is forecast to trend in line with the value of the asset stock as shown in Figure 4. Note that all costs are shown in current 2015/15 dollar values (ie real values).

Figure 4: Projected Operations and Maintenance Expenditure



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

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

5.4 Renewal/Replacement Plan

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

5.4.1 Renewal plan

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

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

Method 1 was used for this asset management plan.

The useful lives of assets used to develop projected asset renewal expenditures are shown in Table 5.4.1. Asset useful lives were last reviewed during February to April 2015.[7]

Table 5.4.1: Useful Lives of Assets

		Useful life –years (by NAASRA Class)								
Asset Category	**Asset (Sub) Category**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**	**N9**	**NA**
Regional Road Network	Bridge & Large Culvert	80	-	-	-	80	-	-	-	-
	Formation	200+	-	-	-	200+	-	-	-	-
	Furniture	20	-	-	-	20	-	-	-	-
	K&G	70	-	-	-	70	-	-	-	-
	Paths (concrete)	80	-	-	-	80	-	-	-	-
	Paths (asphalt)	60	-	-	-	60	-	-	-	-
	Pavement (granular sealed)	60	-	-	-	60	-	-	-	-
	Pavement (concrete)	80	-	-	-	80	-	-	-	-
	Traffic Calming	80	-	-	-	80	-	-	-	-
	Wearing Course (spray seal)	15	-	-	-	15	-	-	-	-
	Wearing Course (asphalt)	25	-	-	-	25	-	-	-	-
	Street Signage	25	-	-	-	20	-	-	-	-
	Street Light	20	-	-	-	20	-	-	-	-
Rural Road Network	Bridge & Large Culvert	80	80	80	80	-	-	-	-	-
	Formation	200+	200+	200+	200+	-	-	-	-	-
	Furniture	20	20	20	20	-	-	-	-	-
	K&G	70	80	90	100	-	-	-	-	-
	Paths (concrete)	60	70	80	90	-	-	-	-	-
	Paths (asphalt)	40	50	60	60	-	-	-	-	-
	Pavement (granular sealed)	60	70	80	90	-	-	-	-	-
	Pavement (granular unsealed)	200+	200+	200+	200+	-	-	-	-	-
	Pavement (concrete)	80	80	80	100	-	-	-	-	-
	Traffic Calming	80	80	90	100	-	-	-	-	-

[7] Roads & Transport Revaluation 2015

		Useful life –years (by NAASRA Class)								
Asset Category	**Asset (Sub) Category**	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**	**N8**	**N9**	**NA**
	Wearing Course (spray seal)	17	17	17	20	-	-	-	-	-
	Wearing Course (asphalt)	20	25	30	30	-	-	-	-	-
	Street Signage	20	20	20	20	-	-	-	-	-
	Street Light	20	20	20	20	-	-	-	-	-
Urban Road Network	Bridge & Large Culvert	-	-	-	-	60	70	80	100	-
	Formation	-	-	-	-	200+	200+	200+	200+	-
	Furniture	-	-	-	-	20	20	20	20	-
	K&G	-	-	-	-	70	80	90	100	-
	Lighting	-	-	-	-	20	20	20	20	-
	Paths (concrete)	-	-	-	-	60	70	80	90	-
	Paths (asphalt)	-	-	-	-	40	50	60	60	-
	Pavement (granular sealed)	-	-	-	-	60	70	80	90	-
	Pavement (granular unsealed)	-	-	-	-	200+	200+	200+	200+	-
	Pavement (concrete)	-	-	-	-	80	80	90	100	-
	Signage	-	-	-	-	20	20	20	20	-
	Traffic Calming	-	-	-	-	80	80	90	100	-
	Wearing Course (spray seal)	-	-	-	-	17	17	17	20	-
	Wearing Course (asphalt)	-	-	-	-	20	25	30	30	-
Public Car-park Network	Access	-	-	-	-	-	-	-	-	50
	Formation	-	-	-	-	-	-	-	-	200+
	Pavement (granular sealed)	-	-	-	-	-	-	-	-	60
	Wearing Course (spray seal)	-	-	-	-	-	-	-	-	15
	Wearing Course (asphalt)	-	-	-	-	-	-	-	-	30
	K&G	-	-	-	-	-	-	-	-	80
	Traffic Calming	-	-	-	-	-	-	-	-	80
	Lighting	-	-	-	-	-	-	-	-	20
	Signage	-	-	-	-	-	-	-	-	25
Marine Assets	Boat Ramp	-	-	-	-	-	-	-	-	40
	Wharf / Jetty	-	-	-	-	-	-	-	-	30
	Pontoon	-	-	-	-	-	-	-	-	30
	Ferry Ramps	-	-	-	-	-	-	-	-	60

5.4.2 Renewal and Replacement Strategies

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

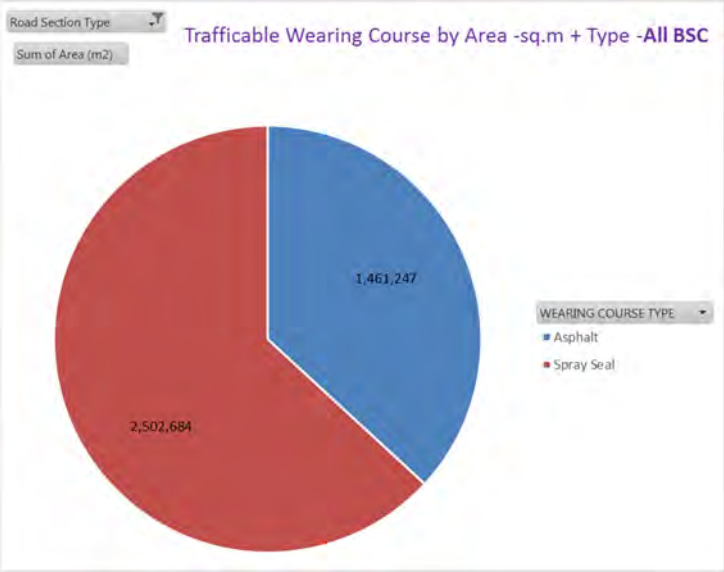
- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
    - the service delivery 'deficiency', present risk and optimum time for renewal/replacement,
    - the project objectives to rectify the deficiency,
    - the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
    - and evaluate the options against evaluation criteria adopted by Council, and
    - select the best option to be included in capital renewal programs,
- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible,
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council,

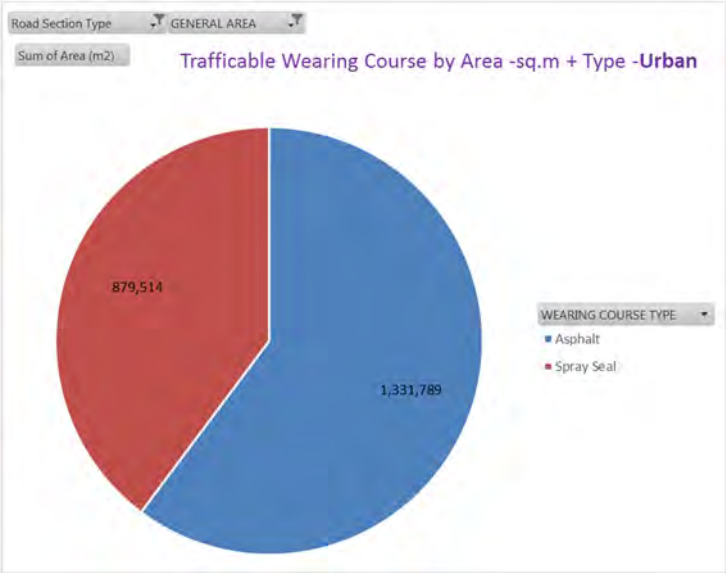
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs,
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required ,
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

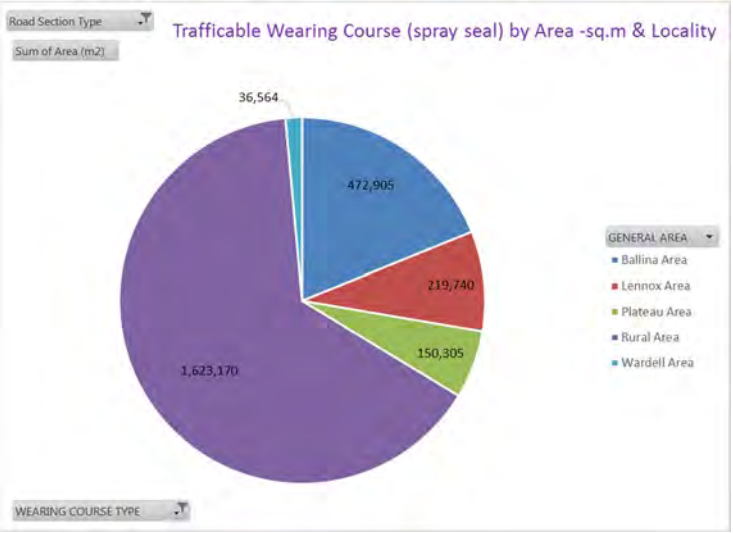
A: Wearing Course

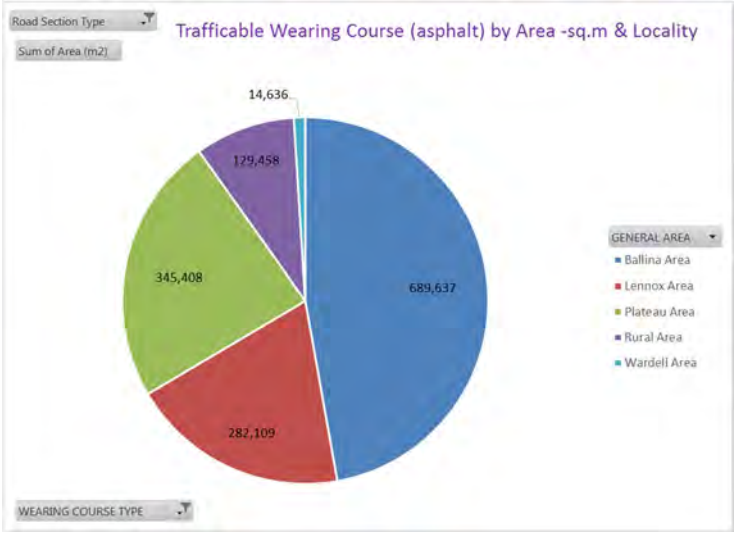
Current Wearing Course Summary


Road Section Type
Sum of Area (m2)
Wearing Coures Area by Type & Location
Spray Seal
Asphalt
WEARING COURSE TYPE
GENERAL AREA
Wardell Area
Rural Area
Plateau Area
Lennox Area
Ballina Area
0
500,000
1,000,000
1,500,000
2,000,000
area sq.m


Road Section Type
Sum of Area (m2)
Trafficable Wearing Course by Area -sq.m + Type -All BSC
1,461,247
2,502,684
WEARING COURSE TYPE
Asphalt
Spray Seal


Road Section Type
GENERAL AREA
Sum of Area (m2)
Trafficable Wearing Course by Area -sq.m + Type -Urban
879,514
1,331,789
WEARING COURSE TYPE
Asphalt
Spray Seal


Road Section Type
Sum of Area (m2)
Trafficable Wearing Course (spray seal) by Area -sq.m & Locality
36,564
472,905
219,740
150,305
1,623,170
GENERAL AREA
Ballina Area
Lennox Area
Plateau Area
Rural Area
Wardell Area
WEARING COURSE TYPE


Road Section Type
Sum of Area (m2)
Trafficable Wearing Course (asphalt) by Area -sq.m & Locality
14,636
129,458
345,408
689,637
282,109
GENERAL AREA
Ballina Area
Lennox Area
Plateau Area
Rural Area
Wardell Area
WEARING COURSE TYPE

Unit Rates & Design Lives (by NAASRA Class) Summary

Spray Seals

NAARSA Class	description	Unit cost –$ per sq.m	Design Life -years
2	2 -Rural: distributer	$5	17
3	3 -Rural: arterial	$5	20
4	4 -Rural: local roads	$5	25
5	5 -Rural: single use road	$5	30
6	6 -Urban: principal avenue	$5	17
7	7 -Urban: distributer to local streets	$5	20
8	8 -Urban: local streets	$5	25
9	9 -Urban: local lanes	$5	30

Asphalt

NAARSA Class	description	Unit cost –$ per sq.m	Design Life -years
2	2 -Rural: distributer	$20	30
3	3 -Rural: arterial	$20	35
4	4 -Rural: local roads	$20	40
5	5 -Rural: single use road	$20	40
6	6 -Urban: principal avenue	$20	30
7	7 -Urban: distributer to local streets	$20	35
8	8 -Urban: local streets	$20	40
9	9 -Urban: local lanes	$20	40

Works Effects Assumptions

Reconstruction

- Resets Roughness to 50 NRM counts
- Resets Cracking to 0%
- Resets patching to 0%
- Resets surface defects to 0%
- Resets rutting to 0 mm
- Pavement Life = 60 years

Asphalt Overlay (wearing course)

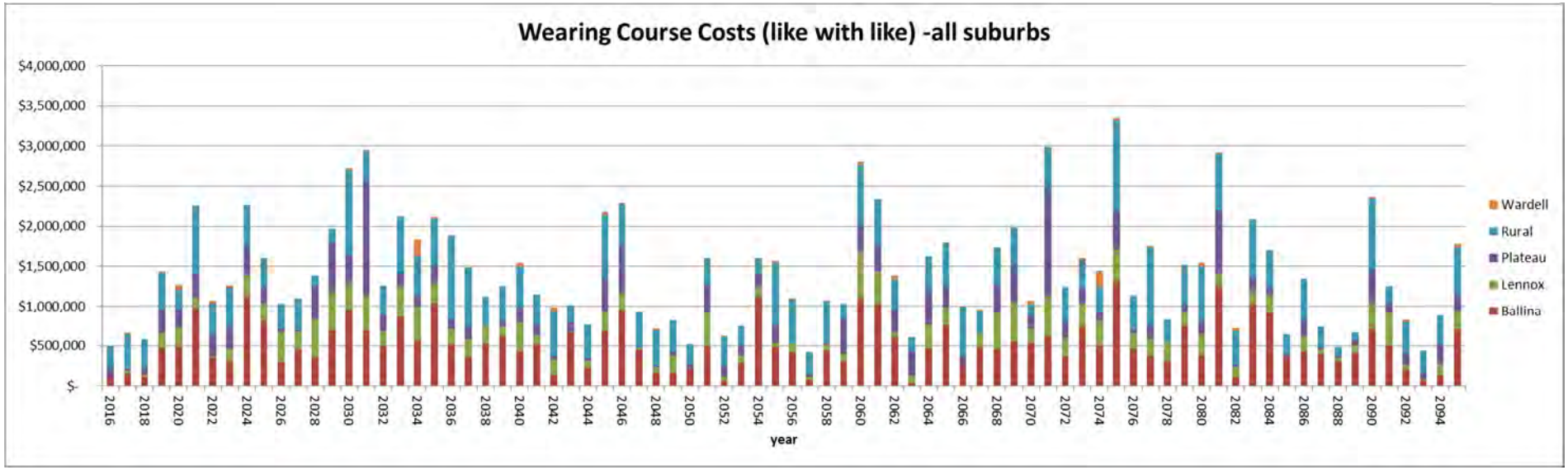
- Reduces Roughness by 20 NRM counts
- Resets Cracking to 0%
- Resets surface defects to 0%
- Resets rutting to 0 mm

Spray Seal (wearing course)

- Reduces Roughness by 5 NRM counts
- Resets Cracking to 0%
- Resets surface defects to 0%

Financial Analysis (80 years)

Scenario 1: Current Wearing Course breakup (replace like with Like)

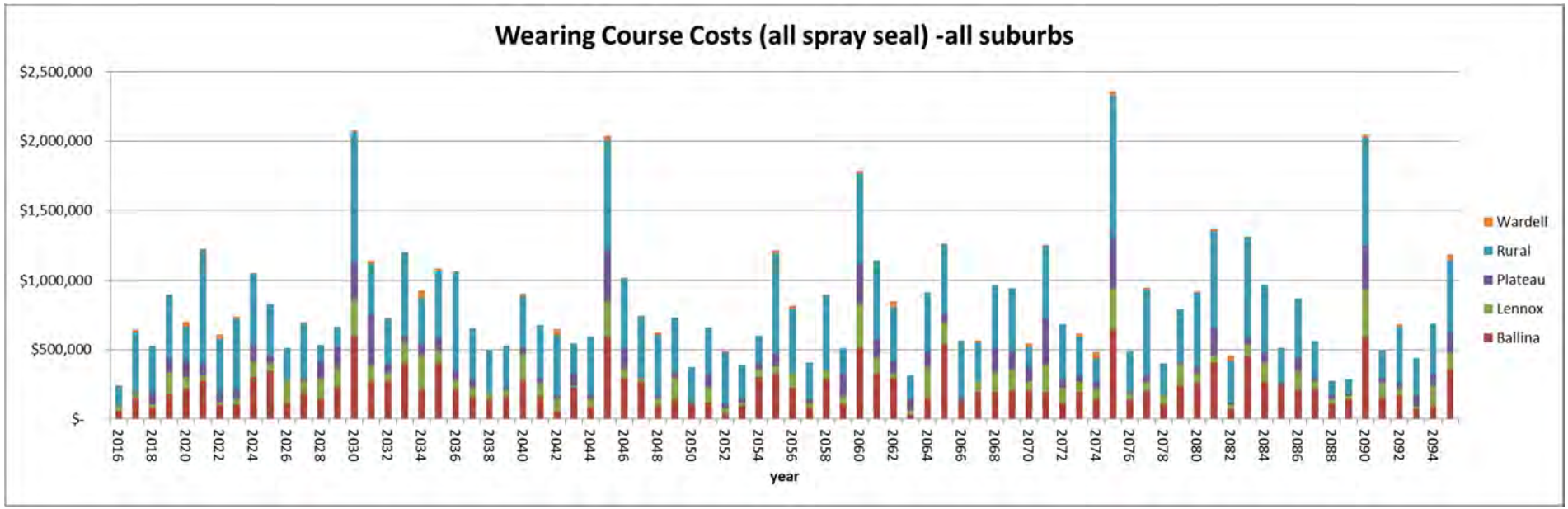


Scenario 1: Current Wearing Course breakup (replace like with Like) -10 year projection

Row Labels	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Sum of 2021	Sum of 2022	Sum of 2023	Sum of 2024	Sum of 2025
Ballina Area	**$ 98,742.00**	**$ 153,507.50**	**$ 114,402.00**	**$ 470,936.00**	**$ 485,421.00**	**$ 978,523.90**	**$ 355,764.00**	**$ 304,682.50**	**$ 1,121,407.00**	**$ 808,307.50**
Ballina East	$ 7,222.00	$ 128,448.00	$ 16,412.50	$ 199,864.00	$ 38,592.00	$ 687,150.00	$ 2,907.00	$ 71,451.00	$ 590,598.00	$ 303,617.00
Ballina Island	$ 24,958.00	$ 21,495.50	$ 93,623.00	$ 132,584.00	$ 253,678.00	$ 77,878.00	$ 202,091.00	$ 219,880.00	$ 340,525.00	$ 476,630.50
Ballina North	$ 8,708.00	$ 3,564.00	$ 4,366.50	$ -	$ 20,342.00	$ -	$ -	$ -	$ -	$ 28,060.00
Ballina West	$ 37,590.00	$ -	$ -	$ 138,488.00	$ 5,913.00	$ 213,495.90	$ 150,766.00	$ 13,351.50	$ 190,284.00	$ -
Rural -Cumberlum	$ 20,264.00	$ -	$ -	$ -	$ 166,896.00	$ -	$ -	$ -	$ -	$ -
Lennox Area	**$ -**	**$ 37,839.00**	**$ 25,511.00**	**$ 192,861.50**	**$ 249,043.00**	**$ 127,120.00**	**$ 24,282.00**	**$ 149,814.00**	**$ 258,071.50**	**$ 223,882.00**
Lennox Head	$ -	$ 37,839.00	$ 25,511.00	$ 115,189.00	$ 142,652.00	$ 6,360.00	$ -	$ 98,560.00	$ 187,988.00	$ -
Lennox Heights	$ -	$ -	$ -	$ 45,994.00	$ 106,391.00	$ 119,374.00	$ 17,480.00	$ 51,254.00	$ 20,448.00	$ 174,106.00
Skennars Head	$ -	$ -	$ -	$ 31,678.50	$ -	$ 1,386.00	$ 6,802.00	$ -	$ 49,635.50	$ 49,776.00
Plateau Area	**$ 134,880.00**	**$ 20,160.00**	**$ 94,899.00**	**$ 303,738.00**	**$ 236,916.00**	**$ 312,872.00**	**$ 263,468.00**	**$ 271,140.00**	**$ 375,348.00**	**$ 199,256.00**
Alstonville	$ -	$ 13,860.00	$ 75,507.00	$ 135,546.00	$ 236,916.00	$ 174,800.00	$ 73,268.00	$ 118,300.00	$ 200,852.00	$ 199,256.00
Wollongbar	$ 134,880.00	$ 6,300.00	$ 19,392.00	$ 168,192.00	$ -	$ 138,072.00	$ 190,200.00	$ 152,840.00	$ 174,496.00	$ -
Rural Area	**$ 256,964.00**	**$ 427,080.50**	**$ 342,679.00**	**$ 465,918.00**	**$ 239,401.50**	**$ 828,357.50**	**$ 389,529.50**	**$ 511,006.00**	**$ 511,969.50**	**$ 368,835.50**
Rural -Alstonvale	$ 126,319.00	$ 41,030.00	$ 21,655.00	$ 43,772.00	$ -	$ 198,620.00	$ 12,600.00	$ -	$ 6,993.00	$ 6,188.00
Rural -Bagotville	$ -	$ 3,577.00	$ -	$ -	$ -	$ 64,960.00	$ 36,082.00	$ 69,264.00	$ -	$ 48,748.00
Rural -Brooklet	$ 23,503.00	$ 13,566.00	$ -	$ -	$ -	$ 11,395.00	$ 32,649.00	$ -	$ -	$ 11,395.00
Rural -Coolgardie	$ -	$ -	$ 2,886.00	$ -	$ -	$ 41,124.00	$ -	$ -	$ -	$ 25,524.50
Rural -Dalwood	$ -	$ -	$ -	$ 13,356.00	$ -	$ 85,974.00	$ -	$ 97,321.50	$ -	$ -
Rural -Empire Vale	$ -	$ -	$ -	$ 18,125.00	$ 28,359.00	$ 22,712.00	$ -	$ 55,612.00	$ 36,662.00	$ -
Rural -Fernleigh	$ 4,294.00	$ 96,045.00	$ -	$ -	$ -	$ 11,727.00	$ 65,913.00	$ -	$ 61,060.00	$ 33,514.00
Rural -Keith Hall	$ -	$ -	$ -	$ 44,250.00	$ -	$ 9,292.50	$ -	$ 4,911.50	$ -	$ -
Rural -Knockrow	$ -	$ 14,000.00	$ -	$ 63,990.00	$ 8,265.00	$ 5,486.00	$ 60,696.00	$ 47,485.00	$ 64,080.00	$ -
Rural -Lynwood	$ -	$ -	$ -	$ 53,019.00	$ 12,325.00	$ 19,085.50	$ -	$ -	$ -	$ -
Rural -Marom Creek	$ -	$ -	$ 27,471.00	$ -	$ 11,942.00	$ 71,286.00	$ -	$ -	$ 30,523.50	$ 62,764.00
Rural -McLeans Ridges	$ 31,698.00	$ -	$ -	$ -	$ 14,496.00	$ -	$ -	$ -	$ -	$ -
Rural -Meerschaum Vale	$ -	$ 47,173.50	$ 40,600.00	$ 35,406.00	$ 26,062.50	$ 29,051.00	$ 14,800.00	$ 62,639.50	$ 46,400.00	$ -
Rural -Newrybar	$ -	$ -	$ 40,964.00	$ 31,996.00	$ -	$ 51,050.00	$ 10,818.00	$ 4,480.00	$ -	$ -
Rural -Patches Beach	$ 31,808.00	$ -	$ 70,065.00	$ 13,932.00	$ 25,298.00	$ -	$ -	$ 50,625.00	$ -	$ -
Rural -Pearces Creek	$ -	$ 6,441.00	$ 41,131.50	$ -	$ -	$ -	$ 2,352.00	$ -	$ 108,180.00	$ 57,798.00
Rural -Pimlico	$ -	$ 25,418.00	$ 15,105.00	$ 22,610.00	$ 35,788.50	$ -	$ 32,474.00	$ -	$ 27,231.00	$ -
Rural -Rous	$ -	$ -	$ 1,025.00	$ -	$ 6,945.00	$ -	$ 52,582.00	$ 68,643.00	$ 23,010.00	$ 49,475.00
Rural -Rous Mill	$ -	$ -	$ -	$ -	$ -	$ 7,238.00	$ -	$ -	$ -	$ -
Rural -South Ballina	$ -	$ -	$ -	$ -	$ 41,422.50	$ 22,837.50	$ -	$ -	$ -	$ 33,950.00
Rural -Teven	$ -	$ 107,464.00	$ 61,460.00	$ 30,640.00	$ 13,336.00	$ 102,951.00	$ 68,563.50	$ -	$ 81,601.00	$ 39,479.00
Rural -Tintenbar	$ 20,580.00	$ 22,400.00	$ -	$ 46,500.00	$ 15,162.00	$ -	$ -	$ 40,104.50	$ -	$ -
Rural -Tuckombil	$ 9,795.00	$ 49,966.00	$ -	$ -	$ -	$ -	$ -	$ 9,920.00	$ 26,229.00	$ -
Rural -Uralba	$ 8,967.00	$ -	$ 20,316.50	$ 48,322.00	$ -	$ 73,568.00	$ -	$ -	$ -	$ -
Wardell Area	**$ -**	**$ 21,495.00**	**$ -**	**$ -**	**$ 55,676.00**	**$ 1,512.00**	**$ 34,149.50**	**$ 20,792.00**	**$ -**	**$ -**
Wardell	$ -	$ 21,495.00	$ -	$ -	$ 55,676.00	$ 1,512.00	$ 34,149.50	$ 20,792.00	$ -	$ -
Grand Total	**$ 490,586.00**	**$ 660,082.00**	**$ 577,491.00**	**$ 1,433,453.50**	**$ 1,266,457.50**	**$ 2,248,385.40**	**$ 1,067,193.00**	**$ 1,257,434.50**	**$ 2,266,796.00**	**$ 1,600,281.00**

Financial Analysis (80 years)

Scenario 2: All Public Road Surfaces remain or revert to Spray Seal

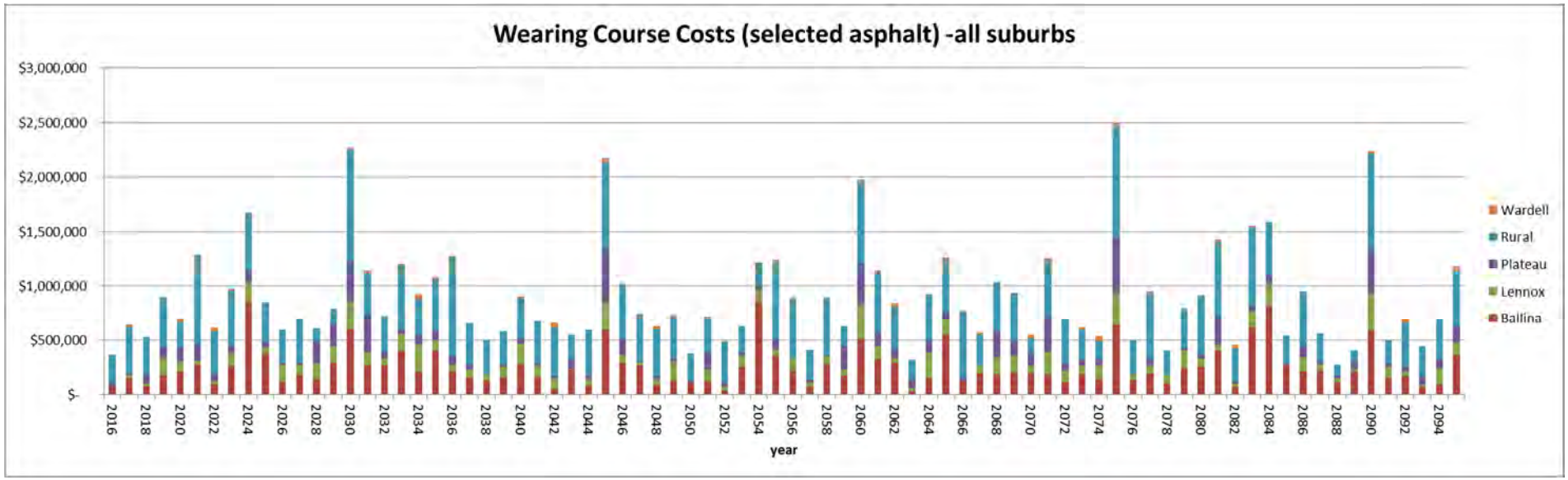


Scenario 2: All Public Road Surfaces remain or revert to Spray Seal -10 year projection

Row Labels	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Sum of 2021	Sum of 2022	Sum of 2023	Sum of 2024	Sum of 2025
Ballina Area	**$ 70,549.50**	**$ 152,688.50**	**$ 79,722.00**	**$ 178,314.50**	**$ 218,541.00**	**$ 273,418.90**	**$ 98,310.00**	**$ 102,929.50**	**$ 300,272.50**	**$ 346,979.50**
Ballina East	$ 7,222.00	$ 127,629.00	$ 16,412.50	$ 107,333.50	$ 20,203.50	$ 173,650.50	$ 2,907.00	$ 32,781.00	$ 150,852.00	$ 79,488.50
Ballina Island	$ 24,958.00	$ 21,495.50	$ 58,943.00	$ 36,359.00	$ 130,358.50	$ 35,461.00	$ 57,711.50	$ 56,797.00	$ 101,849.50	$ 239,431.00
Ballina North	$ 8,708.00	$ 3,564.00	$ 4,366.50	$ -	$ 20,342.00	$ -	$ -	$ -	$ -	$ 28,060.00
Ballina West	$ 9,397.50	$ -	$ -	$ 34,622.00	$ 5,913.00	$ 64,307.40	$ 37,691.50	$ 13,351.50	$ 47,571.00	$ -
Rural -Cumberlum	$ 20,264.00	$ -	$ -	$ -	$ 41,724.00	$ -	$ -	$ -	$ -	$ -
Lennox Area	**$ -**	**$ 32,010.00**	**$ 25,511.00**	**$ 158,366.00**	**$ 84,802.00**	**$ 37,589.50**	**$ 24,282.00**	**$ 37,453.50**	**$ 119,834.50**	**$ 55,970.50**
Lennox Head	$ -	$ 32,010.00	$ 25,511.00	$ 115,189.00	$ 50,243.00	$ 6,360.00	$ -	$ 24,640.00	$ 65,087.00	$ -
Lennox Heights	$ -	$ -	$ -	$ 11,498.50	$ 34,559.00	$ 29,843.50	$ 17,480.00	$ 12,813.50	$ 5,112.00	$ 43,526.50
Skennars Head	$ -	$ -	$ -	$ 31,678.50	$ -	$ 1,386.00	$ 6,802.00	$ -	$ 49,635.50	$ 12,444.00
Plateau Area	**$ 33,720.00**	**$ 9,765.00**	**$ 80,355.00**	**$ 97,584.00**	**$ 122,265.00**	**$ 78,218.00**	**$ 65,867.00**	**$ 67,785.00**	**$ 122,424.00**	**$ 52,355.00**
Alstonville	$ -	$ 3,465.00	$ 75,507.00	$ 55,536.00	$ 122,265.00	$ 43,700.00	$ 18,317.00	$ 29,575.00	$ 78,800.00	$ 52,355.00
Wollongbar	$ 33,720.00	$ 6,300.00	$ 4,848.00	$ 42,048.00	$ -	$ 34,518.00	$ 47,550.00	$ 38,210.00	$ 43,624.00	$ -
Rural Area	**$ 256,964.00**	**$ 427,080.50**	**$ 342,679.00**	**$ 465,918.00**	**$ 239,401.50**	**$ 828,357.50**	**$ 389,529.50**	**$ 511,006.00**	**$ 511,969.50**	**$ 368,835.50**
Rural -Alstonvale	$ 126,319.00	$ 41,030.00	$ 21,655.00	$ 43,772.00	$ -	$ 198,620.00	$ 12,600.00	$ -	$ 6,993.00	$ 6,188.00
Rural -Bagotville	$ -	$ 3,577.00	$ -	$ -	$ -	$ 64,960.00	$ 36,082.00	$ 69,264.00	$ -	$ 48,748.00
Rural -Brooklet	$ 23,503.00	$ 13,566.00	$ -	$ -	$ -	$ 11,395.00	$ 32,649.00	$ -	$ -	$ 11,395.00
Rural -Coolgardie	$ -	$ -	$ 2,886.00	$ -	$ -	$ 41,124.00	$ -	$ -	$ -	$ 25,524.50
Rural -Dalwood	$ -	$ -	$ -	$ 13,356.00	$ -	$ 85,974.00	$ -	$ 97,321.50	$ -	$ -
Rural -Empire Vale	$ -	$ -	$ -	$ 18,125.00	$ 28,359.00	$ 22,712.00	$ -	$ 55,612.00	$ 36,662.00	$ -
Rural -Fernleigh	$ 4,294.00	$ 96,045.00	$ -	$ -	$ -	$ 11,727.00	$ 65,913.00	$ -	$ 61,060.00	$ 33,514.00
Rural -Keith Hall	$ -	$ -	$ -	$ 44,250.00	$ -	$ 9,292.50	$ -	$ 4,911.50	$ -	$ -
Rural -Knockrow	$ -	$ 14,000.00	$ -	$ 63,990.00	$ 8,265.00	$ 5,486.00	$ 60,696.00	$ 47,485.00	$ 64,080.00	$ -
Rural -Lynwood	$ -	$ -	$ -	$ 53,019.00	$ 12,325.00	$ 19,085.50	$ -	$ -	$ -	$ -
Rural -Marom Creek	$ -	$ -	$ 27,471.00	$ -	$ 11,942.00	$ 71,286.00	$ -	$ -	$ 30,523.50	$ 62,764.00
Rural -McLeans Ridges	$ 31,698.00	$ -	$ -	$ -	$ 14,496.00	$ -	$ -	$ -	$ -	$ -
Rural -Meerschaum Vale	$ -	$ 47,173.50	$ 40,600.00	$ 35,406.00	$ 26,062.50	$ 29,051.00	$ 14,800.00	$ 62,639.50	$ 46,400.00	$ -
Rural -Newrybar	$ -	$ -	$ 40,964.00	$ 31,996.00	$ -	$ 51,050.00	$ 10,818.00	$ 4,480.00	$ -	$ -
Rural -Patches Beach	$ 31,808.00	$ -	$ 70,065.00	$ 13,932.00	$ 25,298.00	$ -	$ -	$ 50,625.00	$ -	$ -
Rural -Pearces Creek	$ -	$ 6,441.00	$ 41,131.50	$ -	$ -	$ -	$ 2,352.00	$ -	$ 108,180.00	$ 57,798.00
Rural -Pimlico	$ -	$ 25,418.00	$ 15,105.00	$ 22,610.00	$ 35,788.50	$ -	$ 32,474.00	$ -	$ 27,231.00	$ -
Rural -Rous	$ -	$ -	$ 1,025.00	$ -	$ 6,945.00	$ -	$ 52,582.00	$ 68,643.00	$ 23,010.00	$ 49,475.00
Rural -Rous Mill	$ -	$ -	$ -	$ -	$ -	$ 7,238.00	$ -	$ -	$ -	$ -
Rural -South Ballina	$ -	$ -	$ -	$ -	$ 41,422.50	$ 22,837.50	$ -	$ -	$ -	$ 33,950.00
Rural -Teven	$ -	$ 107,464.00	$ 61,460.00	$ 30,640.00	$ 13,336.00	$ 102,951.00	$ 68,563.50	$ -	$ 81,601.00	$ 39,479.00
Rural -Tintenbar	$ 20,580.00	$ 22,400.00	$ -	$ 46,500.00	$ 15,162.00	$ -	$ -	$ 40,104.50	$ -	$ -
Rural -Tuckombil	$ 9,795.00	$ 49,966.00	$ -	$ -	$ -	$ -	$ -	$ 9,920.00	$ 26,229.00	$ -
Rural -Uralba	$ 8,967.00	$ -	$ 20,316.50	$ 48,322.00	$ -	$ 73,568.00	$ -	$ -	$ -	$ -
Wardell Area	**$ -**	**$ 21,495.00**	**$ -**	**$ -**	**$ 32,585.00**	**$ 1,512.00**	**$ 34,149.50**	**$ 20,792.00**	**$ -**	**$ -**
Wardell	$ -	$ 21,495.00	$ -	$ -	$ 32,585.00	$ 1,512.00	$ 34,149.50	$ 20,792.00	$ -	$ -
Grand Total	**$ 361,233.50**	**$ 643,039.00**	**$ 528,267.00**	**$ 900,182.50**	**$ 697,594.50**	**$ 1,219,095.90**	**$ 612,138.00**	**$ 739,966.00**	**$ 1,054,500.50**	**$ 824,140.50**

Financial Analysis (80 years)

Scenario 3: Scenario 2 + selected roads remain in AC due to traffic considerations & aesthetics



Scenario 3: Scenario 2 + selected roads remain in AC due to traffic considerations & aesthetics -10 year projection

Row Labels	Sum of 2016	Sum of 2017	Sum of 2018	Sum of 2019	Sum of 2020	Sum of 2021	Sum of 2022	Sum of 2023	Sum of 2024	Sum of 2025
Ballina Area	**$ 70,549.50**	**$ 152,688.50**	**$ 79,722.00**	**$ 178,314.50**	**$ 218,541.00**	**$ 273,418.90**	**$ 98,310.00**	**$ 266,012.50**	**$ 853,442.50**	**$ 374,489.50**
Ballina East	$ 7,222.00	$ 127,629.00	$ 16,412.50	$ 107,333.50	$ 20,203.50	$ 173,650.50	$ 2,907.00	$ 32,781.00	$ 520,617.00	$ 106,998.50
Ballina Island	$ 24,958.00	$ 21,495.50	$ 58,943.00	$ 36,359.00	$ 130,358.50	$ 35,461.00	$ 57,711.50	$ 219,880.00	$ 285,254.50	$ 239,431.00
Ballina North	$ 8,708.00	$ 3,564.00	$ 4,366.50	$ -	$ 20,342.00	$ -	$ -	$ -	$ -	$ 28,060.00
Ballina West	$ 9,397.50	$ -	$ -	$ 34,622.00	$ 5,913.00	$ 64,307.40	$ 37,691.50	$ 13,351.50	$ 47,571.00	$ -
Rural -Cumberlum	$ 20,264.00	$ -	$ -	$ -	$ 41,724.00	$ -	$ -	$ -	$ -	$ -
Lennox Area	**$ -**	**$ 32,010.00**	**$ 25,511.00**	**$ 158,366.00**	**$ 84,802.00**	**$ 37,589.50**	**$ 24,282.00**	**$ 111,373.50**	**$ 182,494.00**	**$ 55,970.50**
Lennox Head	$ -	$ 32,010.00	$ 25,511.00	$ 115,189.00	$ 50,243.00	$ 6,360.00	$ -	$ 98,560.00	$ 127,746.50	$ -
Lennox Heights	$ -	$ -	$ -	$ 11,498.50	$ 34,559.00	$ 29,843.50	$ 17,480.00	$ 12,813.50	$ 5,112.00	$ 43,526.50
Skennars Head	$ -	$ -	$ -	$ 31,678.50	$ -	$ 1,386.00	$ 6,802.00	$ -	$ 49,635.50	$ 12,444.00
Plateau Area	**$ 33,720.00**	**$ 9,765.00**	**$ 80,355.00**	**$ 97,584.00**	**$ 122,265.00**	**$ 141,743.00**	**$ 65,867.00**	**$ 67,785.00**	**$ 122,424.00**	**$ 54,203.00**
Alstonville	$ -	$ 3,465.00	$ 75,507.00	$ 55,536.00	$ 122,265.00	$ 43,700.00	$ 18,317.00	$ 29,575.00	$ 78,800.00	$ 54,203.00
Wollongbar	$ 33,720.00	$ 6,300.00	$ 4,848.00	$ 42,048.00	$ -	$ 98,043.00	$ 47,550.00	$ 38,210.00	$ 43,624.00	$ -
Rural Area	**$ 256,964.00**	**$ 427,080.50**	**$ 342,679.00**	**$ 465,918.00**	**$ 239,401.50**	**$ 828,357.50**	**$ 389,529.50**	**$ 511,006.00**	**$ 511,969.50**	**$ 368,835.50**
Rural -Alstonvale	$ 126,319.00	$ 41,030.00	$ 21,655.00	$ 43,772.00	$ -	$ 198,620.00	$ 12,600.00	$ -	$ 6,993.00	$ 6,188.00
Rural -Bagotville	$ -	$ 3,577.00	$ -	$ -	$ -	$ 64,960.00	$ 36,082.00	$ 69,264.00	$ -	$ 48,748.00
Rural -Brooklet	$ 23,503.00	$ 13,566.00	$ -	$ -	$ -	$ 11,395.00	$ 32,649.00	$ -	$ -	$ 11,395.00
Rural -Coolgardie	$ -	$ -	$ 2,886.00	$ -	$ -	$ 41,124.00	$ -	$ -	$ -	$ 25,524.50
Rural -Dalwood	$ -	$ -	$ -	$ 13,356.00	$ -	$ 85,974.00	$ -	$ 97,321.50	$ -	$ -
Rural -Empire Vale	$ -	$ -	$ -	$ 18,125.00	$ 28,359.00	$ 22,712.00	$ -	$ 55,612.00	$ 36,662.00	$ -
Rural -Fernleigh	$ 4,294.00	$ 96,045.00	$ -	$ -	$ -	$ 11,727.00	$ 65,913.00	$ -	$ 61,060.00	$ 33,514.00
Rural -Keith Hall	$ -	$ -	$ -	$ 44,250.00	$ -	$ 9,292.50	$ -	$ 4,911.50	$ -	$ -
Rural -Knockrow	$ -	$ 14,000.00	$ -	$ 63,990.00	$ 8,265.00	$ 5,486.00	$ 60,696.00	$ 47,485.00	$ 64,080.00	$ -
Rural -Lynwood	$ -	$ -	$ -	$ 53,019.00	$ 12,325.00	$ 19,085.50	$ -	$ -	$ -	$ -
Rural -Marom Creek	$ -	$ -	$ 27,471.00	$ -	$ 11,942.00	$ 71,286.00	$ -	$ -	$ 30,523.50	$ 62,764.00
Rural -McLeans Ridges	$ 31,698.00	$ -	$ -	$ -	$ 14,496.00	$ -	$ -	$ -	$ -	$ -
Rural -Meerschaum Vale	$ -	$ 47,173.50	$ 40,600.00	$ 35,406.00	$ 26,062.50	$ 29,051.00	$ 14,800.00	$ 62,639.50	$ 46,400.00	$ -
Rural -Newrybar	$ -	$ -	$ 40,964.00	$ 31,996.00	$ -	$ 51,050.00	$ 10,818.00	$ 4,480.00	$ -	$ -
Rural -Patches Beach	$ 31,808.00	$ -	$ 70,065.00	$ 13,932.00	$ 25,298.00	$ -	$ -	$ 50,625.00	$ -	$ -
Rural -Pearces Creek	$ -	$ 6,441.00	$ 41,131.50	$ -	$ -	$ -	$ 2,352.00	$ -	$ 108,180.00	$ 57,798.00
Rural -Pimlico	$ -	$ 25,418.00	$ 15,105.00	$ 22,610.00	$ 35,788.50	$ -	$ 32,474.00	$ -	$ 27,231.00	$ -
Rural -Rous	$ -	$ -	$ 1,025.00	$ -	$ 6,945.00	$ -	$ 52,582.00	$ 68,643.00	$ 23,010.00	$ 49,475.00
Rural -Rous Mill	$ -	$ -	$ -	$ -	$ -	$ 7,238.00	$ -	$ -	$ -	$ -
Rural -South Ballina	$ -	$ -	$ -	$ -	$ 41,422.50	$ 22,837.50	$ -	$ -	$ -	$ 33,950.00
Rural -Teven	$ -	$ 107,464.00	$ 61,460.00	$ 30,640.00	$ 13,336.00	$ 102,951.00	$ 68,563.50	$ -	$ 81,601.00	$ 39,479.00
Rural -Tintenbar	$ 20,580.00	$ 22,400.00	$ -	$ 46,500.00	$ 15,162.00	$ -	$ -	$ 40,104.50	$ -	$ -
Rural -Tuckombil	$ 9,795.00	$ 49,966.00	$ -	$ -	$ -	$ -	$ -	$ 9,920.00	$ 26,229.00	$ -
Rural -Uralba	$ 8,967.00	$ -	$ 20,316.50	$ 48,322.00	$ -	$ 73,568.00	$ -	$ -	$ -	$ -
Wardell Area	**$ -**	**$ 21,495.00**	**$ -**	**$ -**	**$ 32,585.00**	**$ 1,512.00**	**$ 34,149.50**	**$ 20,792.00**	**$ -**	**$ -**
Wardell	$ -	$ 21,495.00	$ -	$ -	$ 32,585.00	$ 1,512.00	$ 34,149.50	$ 20,792.00	$ -	$ -
Grand Total	**$ 361,233.50**	**$ 643,039.00**	**$ 528,267.00**	**$ 900,182.50**	**$ 697,594.50**	**$ 1,282,620.90**	**$ 612,138.00**	**$ 976,969.00**	**$ 1,670,330.00**	**$ 853,498.50**

Network (condition) Analysis (80 years)

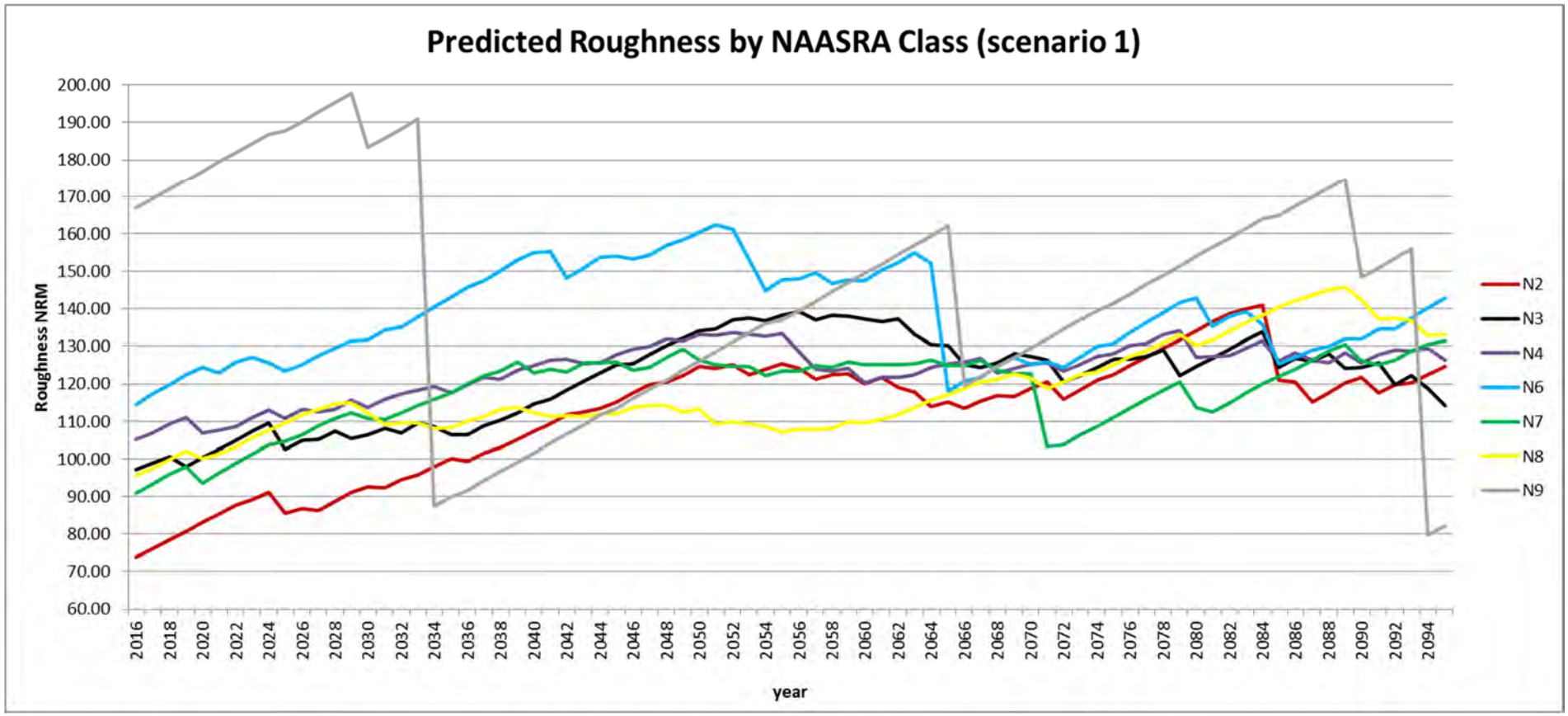
Modelled Roughness over an 80 year period, based on assumptions as shown on page 3, for 3 scenarios as described above.

Selected Roads for Scenario 3 (replacement of selected Roads –like with like)

- Ballina Street (30:028) -Lennox
- Bugden Avenue (40:031) -Alstonville
- Main Street (40:001) -Alstonville
- River Street (20:013) -Ballina Island
- Bentinck Street (20:018) -Ballina Island
- MR 545 - Angels Beach Drive (MR 545)
- MR 545 - Bangalow Road (MR 545)
- MR 545 - Byron Bay Road (MR 545)
- MR 545 - The Coast Road (MR 545)
- MR 695 – River Street (MR 695)
- MR 695 – Kerr Street (MR 695)
- MR 695 - Tamarind Drive (MR 695)
- MR 7734 - Rifle Range Road (MR 7734)
- MR 7734 - Teven Road (MR 7734)
- MR 7734 - Tintenbar Road (MR 7734)
- MR 7735 - Ross Lane (MR 7735)

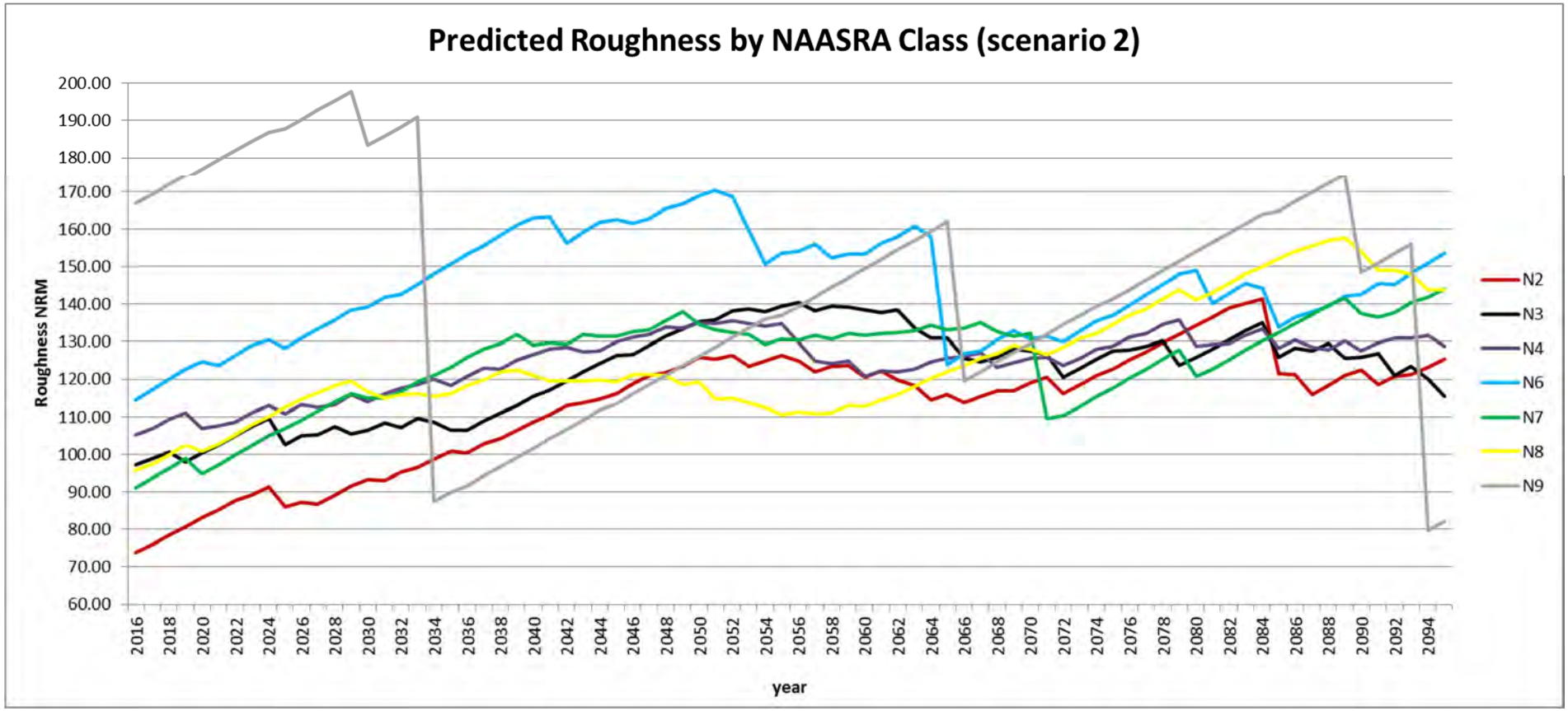
Network Analysis (80 years)

Scenario 1: Current Wearing Course breakup (replace like with Like)



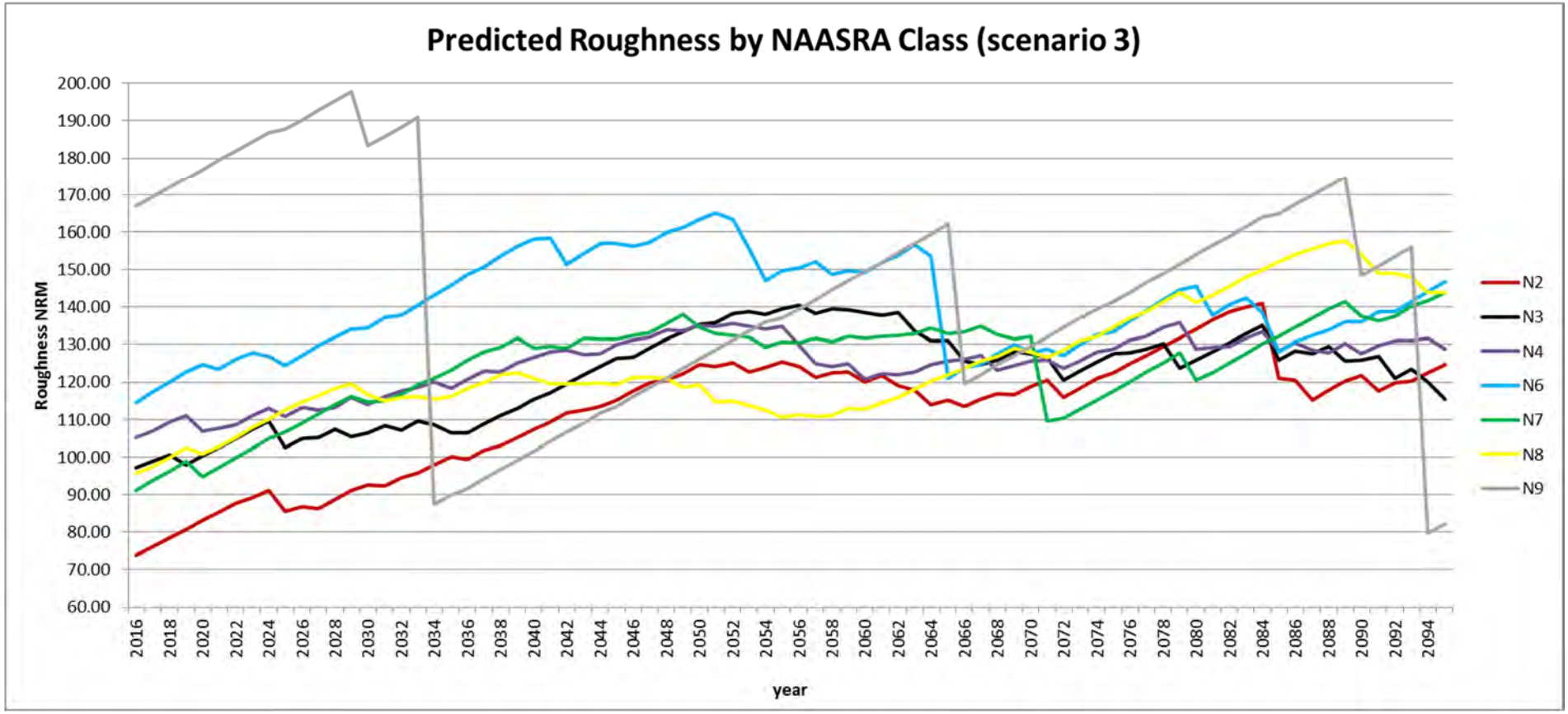
Network Analysis (80 years)

Scenario 2: All Public Road Surfaces remain or revert to Spray Seal



Network Analysis (80 years)

Scenario 3: Scenario 2 + selected roads remain in AC due to traffic & aesthetics



Findings

There seems to be considerable savings to be made for scenario 2 & 3. Looking over a 10 year period it can be shown that:

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	10 Year Total	10 Year Average
Scenario 1 -like with like	$ 490,586	$ 660,082	$ 577,491	$ 1,433,454	$ 1,266,458	$ 2,248,385	$ 1,067,193	$ 1,257,435	$ 2,266,796	$ 1,600,281	$ 12,868,160	$ 1,286,816
Scenario 2 -all spray seals	$ 361,234	$ 643,039	$ 528,267	$ 900,183	$ 697,595	$ 1,219,096	$ 612,138	$ 739,966	$ 1,054,501	$ 824,141	$ 7,580,157	$ 758,016
Scenario 3 -selected asphalt	$ 361,234	$ 643,039	$ 528,267	$ 900,183	$ 697,595	$ 1,282,621	$ 612,138	$ 976,969	$ 1,670,330	$ 853,499	$ 8,525,873	$ 852,587
Savings (1 to 2)	$ 129,353	$ 17,043	$ 49,224	$ 533,271	$ 568,863	$ 1,029,290	$ 455,055	$ 517,469	$ 1,212,296	$ 776,141	$ 5,288,003	$ 528,800
Savings (1 to 3)	$ 129,353	$ 17,043	$ 49,224	$ 533,271	$ 568,863	$ 965,765	$ 455,055	$ 280,466	$ 596,466	$ 746,783	$ 4,342,287	$ 434,229

The reduction in network health (based on roughness) is most apparent in those networks that have a large existing proportion of asphalt wearing courses, these being

- NAASRA Class 6
- NAASRA Class 7
- NAASRA Class 8

NAASRA Class	Scenario	2015	2025	2035	2045	2055	2065	2075	2085	2095
N2	1	71.4	85.6	100.2	115.1	125.3	115.3	122.5	121.0	124.6
N2	2	71.4	86.0	100.9	116.3	126.3	115.9	122.7	121.5	125.5
N2	3	71.4	85.6	100.2	115.1	125.3	115.3	122.5	121.0	124.6
N3	1	96.3	102.5	106.3	125.2	138.3	130.3	126.6	124.5	114.2
N3	2	96.3	102.5	106.3	126.3	139.5	131.0	127.5	125.8	115.4
N3	3	96.3	102.5	106.3	126.3	139.5	131.0	127.5	125.8	115.4
N4	1	102.7	110.8	117.6	127.9	133.3	125.4	127.9	126.1	126.5
N4	2	102.7	110.8	118.4	129.9	134.8	125.7	128.8	128.2	128.6
N4	3	102.7	110.8	118.4	129.9	134.8	125.7	128.8	128.2	128.6
N6	1	111.8	123.4	143.2	154.0	147.6	118.2	130.7	125.4	142.8
N6	2	111.8	128.3	150.7	162.5	153.4	124.0	137.0	133.8	153.5
N6	3	111.8	124.5	145.8	157.0	149.7	121.1	133.4	128.0	146.8
N7	1	88.2	104.8	117.6	125.9	123.4	124.9	110.9	121.8	131.5
N7	2	88.4	106.8	123.3	131.5	130.7	133.0	117.7	132.3	144.0
N7	3	88.4	106.8	123.3	131.3	130.7	133.0	117.5	132.1	143.8
N8	1	93.2	109.6	108.3	112.0	107.1	117.0	125.1	140.3	133.0
N8	2	93.2	112.5	116.2	119.3	110.6	121.9	134.6	152.0	143.8
N8	3	93.2	112.5	116.2	119.3	110.6	121.9	134.6	152.0	143.8
N9	1	164.4	187.8	89.9	113.6	136.9	161.9	141.4	164.8	82.2
N9	2	164.4	187.8	89.9	113.6	136.9	161.9	141.4	164.8	82.2
N9	3	164.4	187.8	89.9	113.6	136.9	161.9	141.4	164.8	82.2

The effect of roughness on other NAASRA Classes is minimal.

Renewal ranking criteria

Asset renewal and replacement is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (eg replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (eg roughness of a road).[8]

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

- Have a high consequence of failure,
- Have a high utilisation and subsequent impact on users would be greatest,
- The total value represents the greatest net value to Council,
- Have the highest average age relative to their expected lives,
- Are identified in the AM Plan as key cost factors,
- Have high operational or maintenance costs, and
- Where replacement with modern equivalent assets would yield material savings.[9]

The ranking criteria used to determine priority of identified renewal and replacement proposals is detailed in Table 5.4.2, 5.4.3 & 5.4.4

Table 5.4.2: Renewal and Replacement Priority Ranking Criteria – Treatment Classification Matrix

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

Ballina Shire Council: CLASSIFICATION MATRIX

ROUGHNESS (NRN)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 80	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
80 to 90	Redesign	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
90 to 120	Redesign	Redesign	No Treatment	No Treatment	No Treatment	Redesign	No Treatment	No Treatment
120 to 130	Redesign	Redesign	Redesign	Redesign	No Treatment	Redesign	No Treatment	No Treatment
130 to 150	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	No Treatment	No Treatment
150 to 200	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	No Treatment
200 to 250	Structural Redesign	Structural Redesign	Redesign	Redesign	Redesign	Structural Redesign	Redesign	Redesign
250 to 400	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Redesign
> 400	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction	Reconstruction

RUT DEPTH (mm)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 10	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
10 to 12	Redesign	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
12 to 15	Redesign	Redesign	No Treatment	No Treatment	No Treatment	Redesign	No Treatment	No Treatment
15 to 20	Redesign	Redesign	Redesign	Redesign	No Treatment	Redesign	No Treatment	No Treatment
> 20	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	No Treatment

ENV. CRACKING (%)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 5	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
5 to 15	ReSealing	ReSealing	Crack Sealing	Crack Sealing	Crack Sealing	Crack Sealing	Crack Sealing	Crack Sealing
15 to 100	ReSealing	ReSealing	ReSealing	ReSealing	ReSealing	ReSealing	ReSealing	ReSealing

STR. CRACKING (%)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 5	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
5 to 15	Heavy Patch	Heavy Patch	Heavy Patch	No Treatment	No Treatment	Heavy Patch	No Treatment	No Treatment
15 to 30	Redesign	Redesign	Redesign	Heavy Patch	Heavy Patch	Heavy Patch	Heavy Patch	Heavy Patch
30 to 100	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign

POTHOLES (%)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 0.5	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
0.5 to 2	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	No Treatment	No Treatment
2 to 4	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching	Pothole Patching
4 to 6	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Pothole Patching	Pothole Patching
6 to 100	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign	Redesign

RAVELLING (%)	NAASRA CLASS 2	NAASRA CLASS 3	NAASRA CLASS 4	NAASRA CLASS 5	NAASRA CLASS 6	NAASRA CLASS 7	NAASRA CLASS 8	NAASRA CLASS 9
0 to 10	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment
10 to 25	Re-Sealing	Re-Sealing	No Treatment	No Treatment	No Treatment	Re-Sealing	No Treatment	No Treatment
25 to 40	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	No Treatment
40 to 100	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	Re-Sealing	ReSealing

Table 5.4.3: Renewal and Replacement Priority Ranking Criteria – Treatment Options

TREATMENT OPTIONS

Classification	Description
A	No Treatment
B	Crack Sealing
C	Heavy Patching
D	Pothole Patching
E	Reseal
F	Redesign
G	Structural Redesign
H	Reconstruction

Treatment ID	Treatment	Classification
1	Do Nothing	A
2	Crack Sealing	B
3	Heavy Patching	C
4	Routine	D
5	Pothole Patching	D
6	Reseal 7-mm	E
7	Reseal 10-mm	E
8	Reseal 14-mm	E
9	Reseal 20/10-mm	E
10	Rubber Reseal 10-mm	E
11	Slurry Seal	E
12	AC Overlay	E
13	Granular Overlay	F
14	Rip & Reseal	F
15	Imp. Roll & Gran Overlay	F
16	Granular Overlay 1m	F
17	Granular Overlay 2m	F
18	Granular Overlay 3m	F
19	Imp. Roll & Gran Overlay 1m	F
20	Imp. Roll & Gran Overlay 2m	F
21	Imp. Roll & Gran Overlay 3m	F
22	Insitu Stabilisation	G
23	Insitu Stabilis 1m	G
24	Insitu Stabilis 2m	G
25	Insitu Stabilis 3m	G
26	Reconstruction UB	H
27	Reconstruction AC	H
28	Reconstruction UB 1m	H
29	Reconstruction UB 2m	H
30	Reconstruction UB 3m	H

Table 5.4.4: Renewal and Replacement Priority Ranking Criteria – Treatment Resolution Matrix

Ballina SHIRE COUNCIL: RESOLUTION MATRIX

NAASRA Class	Treatment Classification	Surface Type	Minimum Seal Age	Granular Overlay Thickness	Roughness	Rut Depth	Geographic Class	Maximum Seal Age	Urban Class	Environmental Cracking	Structural Cracking	Treatment Number	Treatment
2 to 9	No Treatment							> Maximum	Urban			9	Reseal 10mm
									Rural			10	Reseal 14mm
									Regional			10	Reseal 14mm
									Classified			10	Reseal 14mm
								< Maximum				2	Do Nothing
	Crack Seal											5	Crack Seal
	Heavy Patching											7	Heavy Pacthing
	Pothole Patching											6	Pothole Patching
	Reseal	Seal	> Minimum						Urban	<=20		9	Reseal 10mm
										> 20		12	Rubber Reseal 10mm
									Rural	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
									Regional	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
									Classified	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
			< Minimum									2	Do Nothing
		AC										14	AC Overlay

NAASRA Class	Treatment Classification	Surface Type	Minimum Seal Age	Granular Overlay Thickness	Roughness	Rut Depth	Geographic Class	Maximum Seal Age	Urban Class	Environmental Cracking	Structural Cracking	Treatment Number	Treatment
2 to 9	Redesign		< Minimum									2	Do Nothing
			> Minimum	<50	< NAASRA trigger	< NAASRA trigger			Urban	<=20		9	Reseal 10mm
										> 20		12	Rubber Reseal 10mm
									Rural	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
									Regional	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
									Classified	<=20		10	Reseal 14mm
										> 20		12	Rubber Reseal 10mm
						> NAASRA trigger			Urban		<=40	13	Slurry Seal
											> 40	14	AC Overlay
									Rural			18	Rip and Reseal
									Regional			18	Rip and Reseal
									Classified			18	Rip and Reseal
					> NAASRA trigger						< 40	18	Rip and Reseal
											> 40	14	AC Overlay
				50 - 200			Urban - Flood - No Widening					19	Insitu Stabilisation
							Urban - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - Flood - No Widening					19	Insitu Stabilisation
							Rural - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Urban - No Flood - No Widening					19	Insitu Stabilisation
							Urban - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - No Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - No Flood - No Widening					15	Granular Overlay
							Rural - No Flood - 1m Widening					21	Granular Overlay 1m
							Rural - No Flood - 2m Widening					22	Granular Overlay 2m
							Rural - No Flood - 3m Widening					23	Granular Overlay 3m
				200-300			Urban - Flood - No Widening					19	Insitu Stabilisation
							Urban - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - Flood - No Widening					19	Insitu Stabilisation
							Rural - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Urban - No Flood - No Widening					19	Insitu Stabilisation
							Urban - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - No Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - No Flood - No Widening					19	Insitu Stabilisation
							Rural - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - No Flood - 3m Widening					29	Insitu Stabilisation 3m
				> 300			Urban - Flood - No Widening					16	Reconstruction UB
							Urban - Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - Flood - 3m Widening					26	Reconstruction UB 3m
							Urban - No Flood - No Widening					16	Reconstruction UB
							Urban - No Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - No Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - No Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - Flood - No Widening					16	Reconstruction UB
							Rural - Flood - 1m Widening					24	Reconstruction UB 1m
							Rural - Flood - 2m Widening					25	Reconstruction UB 2m
							Rural - Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - No Flood - No Widening					20	Impact Roll & Gran Overlay
							Rural - No Flood - 1m Widening					30	Impact Roll & Gran Overlay 1m
							Rural - No Flood - 2m Widening					31	Impact Roll & Gran Overlay 2m
							Rural - No Flood - 3m Widening					32	Impact Roll & Gran Overlay 3m
2 to 9	Structural Redesign			< 200			Urban - Flood - No Widening					19	Insitu Stabilisation
							Urban - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - Flood - No Widening					19	Insitu Stabilisation
							Rural - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Urban - No Flood - No Widening					19	Insitu Stabilisation
							Urban - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - No Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - No Flood - No Widening					15	Granular Overlay
							Rural - No Flood - 1m Widening					21	Granular Overlay 1m
							Rural - No Flood - 2m Widening					22	Granular Overlay 2m
							Rural - No Flood - 3m Widening					23	Granular Overlay 3m
				200-300			Urban - Flood - No Widening					19	Insitu Stabilisation
							Urban - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - Flood - No Widening					19	Insitu Stabilisation
							Rural - Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - Flood - 3m Widening					29	Insitu Stabilisation 3m
							Urban - No Flood - No Widening					19	Insitu Stabilisation
							Urban - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Urban - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Urban - No Flood - 3m Widening					29	Insitu Stabilisation 3m
							Rural - No Flood - No Widening					19	Insitu Stabilisation
							Rural - No Flood - 1m Widening					27	Insitu Stabilisation 1m
							Rural - No Flood - 2m Widening					28	Insitu Stabilisation 2m
							Rural - No Flood - 3m Widening					29	Insitu Stabilisation 3m
				> 300			Urban - Flood - No Widening					16	Reconstruction UB
							Urban - Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - Flood - 3m Widening					26	Reconstruction UB 3m
							Urban - No Flood - No Widening					16	Reconstruction UB
							Urban - No Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - No Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - No Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - Flood - No Widening					16	Reconstruction UB
							Rural - Flood - 1m Widening					24	Reconstruction UB 1m
							Rural - Flood - 2m Widening					25	Reconstruction UB 2m
							Rural - Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - No Flood - No Widening					20	Impact Roll & Gran Overlay
							Rural - No Flood - 1m Widening					30	Impact Roll & Gran Overlay 1m
							Rural - No Flood - 2m Widening					31	Impact Roll & Gran Overlay 2m
							Rural - No Flood - 3m Widening					32	Impact Roll & Gran Overlay 3m

NAASRA Class	Treatment Classification	Surface Type	Minimum Seal Age	Granular Overlay Thickness	Roughness	Rut Depth	Geographic Class	Maximum Seal Age	Urban Class	Environmental Cracking	Structural Cracking	Treatment Number	Treatment
2 to 9	Reconstruction						Urban - Flood - No Widening					16	Reconstruction UB
							Urban - Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - Flood - 3m Widening					26	Reconstruction UB 3m
							Urban - No Flood - No Widening					16	Reconstruction UB
							Urban - No Flood - 1m Widening					24	Reconstruction UB 1m
							Urban - No Flood - 2m Widening					25	Reconstruction UB 2m
							Urban - No Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - Flood - No Widening					16	Reconstruction UB
							Rural - Flood - 1m Widening					24	Reconstruction UB 1m
							Rural - Flood - 2m Widening					25	Reconstruction UB 2m
							Rural - Flood - 3m Widening					26	Reconstruction UB 3m
							Rural - No Flood - No Widening					20	Impact Roll & Gran Overlay
							Rural - No Flood - 1m Widening					30	Impact Roll & Gran Overlay 1m
							Rural - No Flood - 2m Widening					31	Impact Roll & Gran Overlay 2m
							Rural - No Flood - 3m Widening					32	Impact Roll & Gran Overlay 3m

Renewal and replacement standards

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

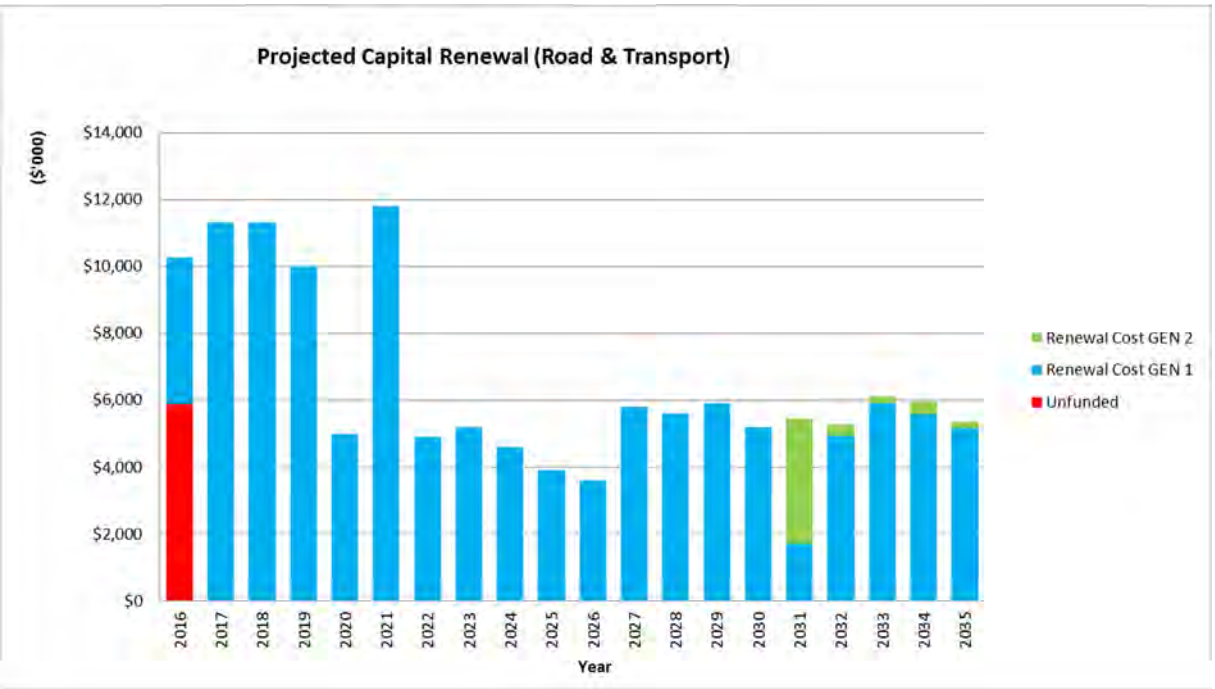
- RMS Standard R44 Earthworks
- RMS Standard R106 Sprayed Bituminous Surfacing (cutback bitumen)
- RMS Standard R107 Sprayed Bituminous Surfacing (polymer modified binder)
- RMS Standard R15 Kerb & Gutter
- RMS Standard R71 Construction of Unbound & Modified Pavement Course
- RMS Standard R83 Concrete Pavement Base
- RMS Standard M250 Heavy Patching (flexible pavement)
- Northern Rivers Development & Design Manual

5.4.3 Summary of future renewal and replacement expenditure

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

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

Figure 5: Projected Capital Renewal and Replacement Expenditure



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

Renewals and replacement expenditure in Council's capital works program will be accommodated in the long term financial plan. This is further discussed in Section 6.2.

5.5 Creation/Acquisition/Upgrade Plan

New works are those works that create a new asset that did not previously exist, or works which upgrade or improve an existing asset beyond its existing capacity. They result from growth, social or environmental needs (BSC Road Contributions Plan 2010) or may also be acquired at no cost to Council from land development. These assets from growth are considered in Sections 4.2 & 4.3

5.5.1 Selection criteria

New assets and upgrade/expansion of existing assets are identified from a prioritised series of projects outlined in the Ballina Council Roads Contribution Plan 2010 and have been determined from detailed analysis of the regions predicted traffic models, land use, demographics, strategic & community plans and social planning. The timing of the works are based on the expected future developments and expansion of existing. The Road Contributions Plan will need to be reviewed on a regular basis to ensure the models are current.

5.5.2 Capital Investment Strategies

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

- Planning and scheduling capital upgrade and new projects to deliver the defined level of service in the most efficient manner,
- Undertake project scoping for all capital upgrade/new projects to identify:
    - the service delivery 'deficiency', present risk and required timeline for delivery of the upgrade/new asset,

- the project objectives to rectify the deficiency including value management for major projects,
- the range of options, estimated capital and life cycle costs for each options that could address the service deficiency,
- management of risks associated with alternative options,
- and evaluate the options against evaluation criteria adopted by Council, and
- select the best option to be included in capital upgrade/new programs,

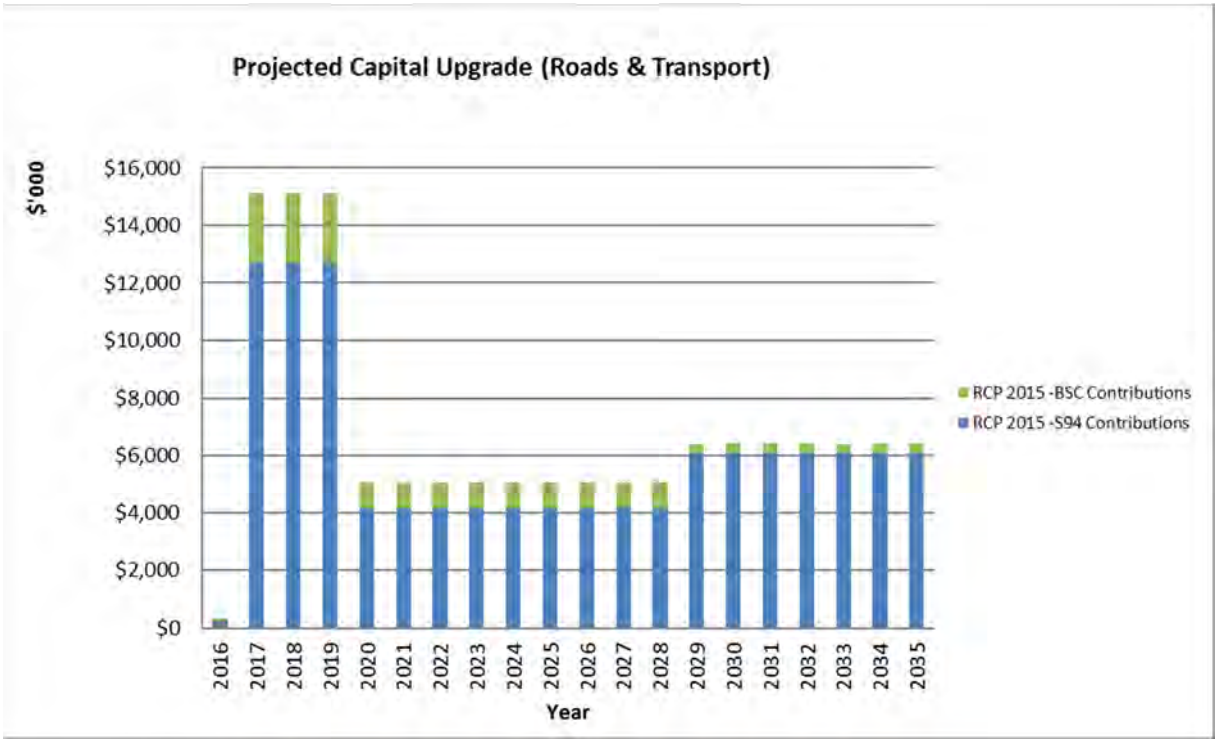
- Review current and required skills base and implement training and development to meet required construction and project management needs,
- Review management of capital project management activities to ensure Council is obtaining best value for resources used.

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

5.5.3 Summary of future upgrade/new assets expenditure

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

Fig 6: Projected Capital Upgrade/New Asset Expenditure (Roads Contribution Plan 2015)



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

5.6 Disposal Plan

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

Where cash-flow projections from asset disposals are not available, these will be developed in future revisions of this asset management plan.

Table 5.6: Assets Identified for Disposal

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

5.7 Service Consequences and Risks

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

Scenario 1 - What we would like to do based on asset register data

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

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

The development of scenario 1 and scenario 2 AM Plans provides the tools for discussion with Council and community on trade-offs between what we would like to do (scenario 1) and what we should be doing with existing budgets (scenario 2) by balancing changes in services and service levels with affordability and acceptance of the service and risk consequences of the trade-off position (scenario 3).

5.7.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Pavement resealing to the same level of service across all groups in the pavement hierarchy
- Pavement rehabilitation to the same level of service across all groups in the pavement hierarchy
- Replace existing asphalt wearing courses with asphalt on NAASRA classes 3,4,5,7,8 & 9. These wearing courses shall be replaced with spray seals

5.7.2 Service consequences

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

- A lower level of service for the minor road classes
- The option to adopt pavement stabilisation is available
- Wearing course aesthetics & traffic noise levels shall reduce on replacement

5.7.3 Risk consequences

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

- The increase in the use of spray seal treatments will add to the contractors exposure to hot (180^{o}C) bitumen
- The reduction in the use of asphalt wearing course treatments will increase the incidence of surface potholes

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

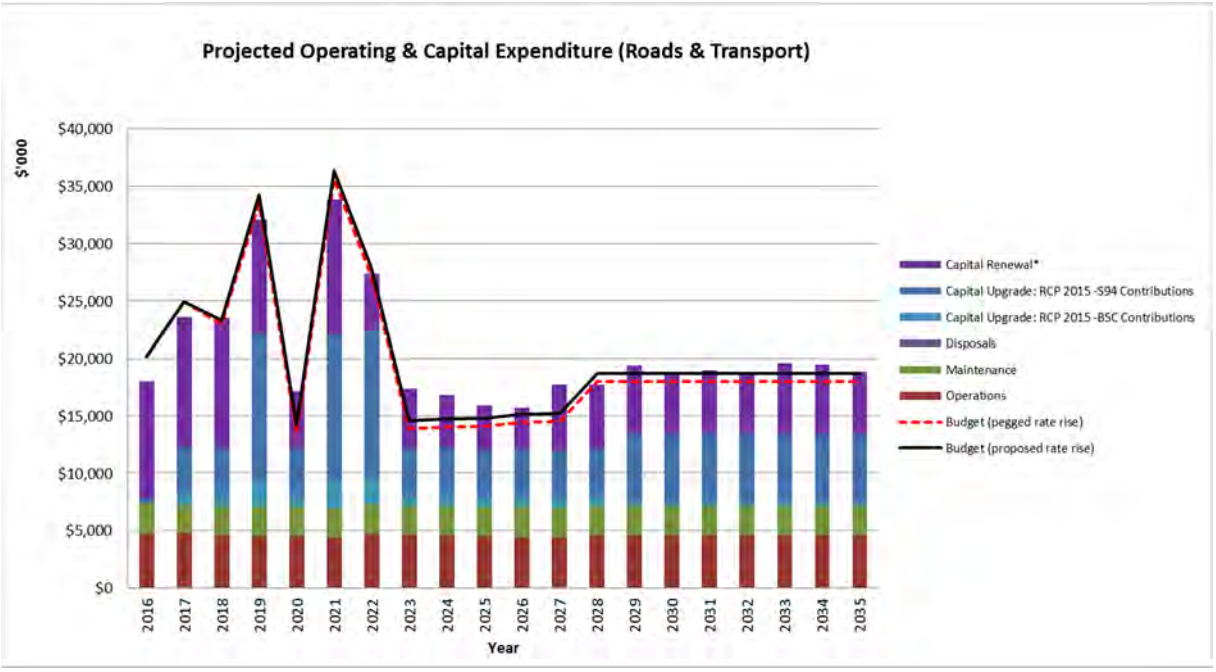
6. FINANCIAL SUMMARY

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

6.1 Financial Statements and Projections

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

Fig 7: Projected Operating and Capital Expenditure



6.1.1 Sustainability of service delivery

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

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[10] = 95% (pegged rate rise) & 100% (proposed rate rise)

The Asset Renewal Funding Ratio is the most important indicator and reveals that over the next 10 years, Council is forecasting that it will have 95% of the funds required for the optimal renewal and replacement of its assets. Alternatively Asset Renewal Funding Ratio = 100% with proposed rate rise

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

Long term - Life Cycle Cost

- Life cycle costs (or whole of life costs) are the average costs that are required to sustain the service levels over the longest asset life. Life cycle costs include operations and maintenance expenditure and asset consumption (depreciation expense).
- The expected 10 year life cycle expenditure is $13,046k per year (10-year average operations, maintenance and depreciation expense).
- The 10 year life cycle budget is $14,953k (10-year average budgeted operations, maintenance and capital renewal expenditure). This value will heavily depend on the timing of asset renewals.
- The difference between the average 10 year lifecycle budget and the average 10 year lifecycle expenditure gives an indication to the sustainability. The life cycle gap for services covered by this asset management plan is +$1,907 per year
- Life cycle expenditure is 115% of life cycle costs giving a life cycle sustainability index of 1.15
- The life cycle costs and life cycle expenditure comparison highlights any difference between present outlays and the *average* cost of providing the service over the long term. If the life cycle expenditure is less than that life cycle budget, it is most likely that outlays will need to be increased or cuts in services made in the future.

Medium term – 10 year financial planning period

- This asset management plan identifies the projected operations, maintenance and capital renewal expenditures required to provide an agreed level of service to the community over a 10-year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.
- These projected expenditures may be compared to budgeted expenditures in the 10-year period to identify any funding shortfall. In a core asset management plan, a gap is generally due to increasing asset renewals for ageing assets.
- 10-year average operations, maintenance and capital renewal expenditure required over the first 10-year planning period is $14,953k per year.
- Pegged rate rise
    - → 10 year average operations, maintenance and capital renewal budget is $14,372k per year
    - → This gives a 10-year funding deficit of -$582k per year and a 10-year sustainability indicator of 96%.
- Proposed rate rise
    - → 10 year average operations, maintenance and capital renewal budget is $14,910k per year
    - → This gives a 10-year funding deficit of -$43k per year and a 10-year sustainability indicator of 100%.

Medium Term – 5 year financial planning period

- 5-year average operations, maintenance and capital renewal expenditure required over the first 5 years of the planning period is $16,733k per year.
- Pegged rate rise
    - → 5-year average operations, maintenance and capital renewal budget is $16,880k per year
    - → This gives a 5-year funding surplus of +$147k.per year and a 5-year sustainability indicator of 101%
- Proposed rate rise
    - → 5 year average operations, maintenance and capital renewal budget is $17,244k per year
    - → This gives a 5-year funding deficit of +$512k per year and a 5-year sustainability indicator of 103%.

Asset management financial indicators

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

Figure 7A: Asset Management Financial Indicators *(pegged rate rise)*

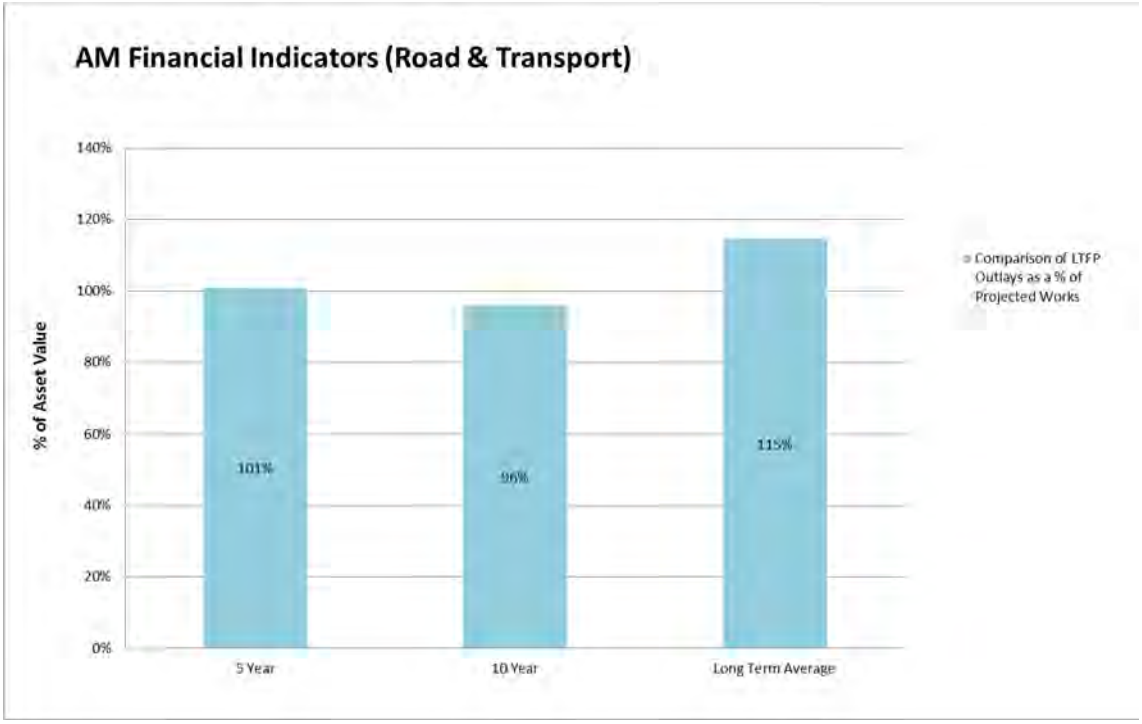
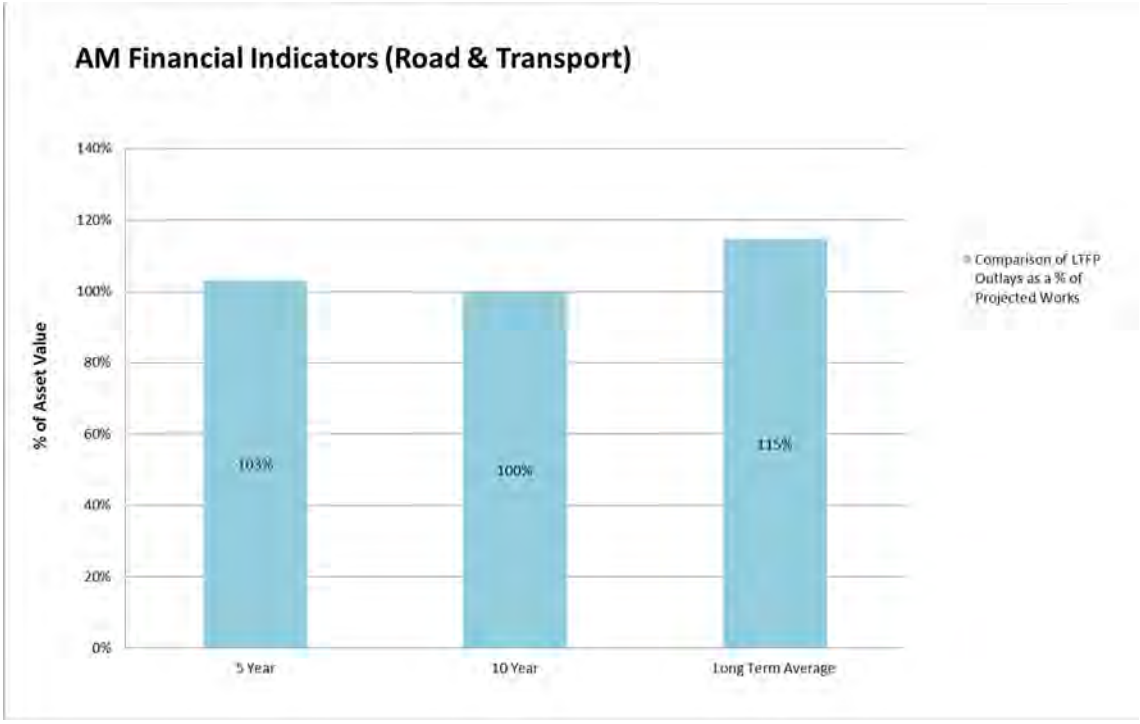


Figure 7A: Asset Management Financial Indicators *(proposed rate rise)*



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

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

Figure 8: Projected and LTFP Budgeted Renewal Expenditure

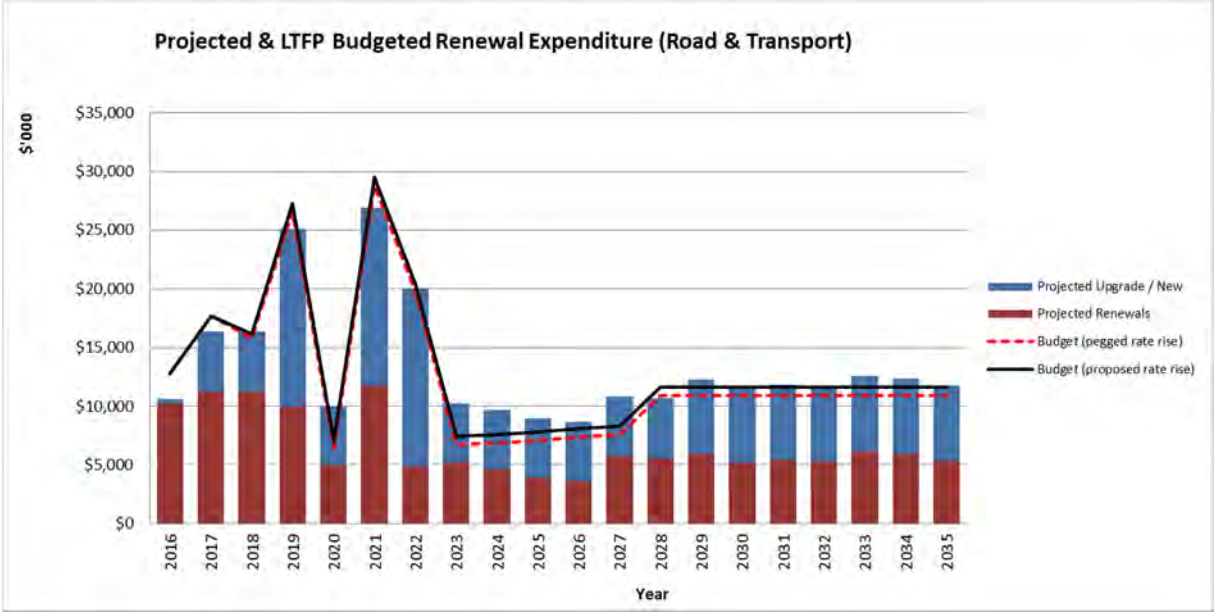


Table 6.1.1 shows the shortfall between projected renewal and replacement expenditures and expenditure accommodated in long term financial plan. Budget expenditures accommodated in the long term financial plan or extrapolated from current budgets are shown in Appendix D.

Table 6.1.1: Projected and LTFP Budgeted Renewals and Financing Shortfall *(pegged rate rise)*

Year	Projected Renewals ($000)	LTFP Renewal Budget ($000)	Renewal Financing Shortfall ($000) (-ve Gap, +ve Surplus)	Cumulative Shortfall ($000) (-ve Gap, +ve Surplus)
2016	$10,250	$12,464	$2,214	$2,214
2017	$11,300	$12,624	$1,324	$3,538
2018	$11,300	$10,737	-$563	$2,975
2019	$10,000	$11,405	$1,405	$4,380
2020	$4,990	$1,346	-$3,644	$737
2021	$11,800	$13,624	$1,824	$2,561
2022	$4,900	$4,673	-$227	$2,334
2023	$5,200	$1,701	-$3,499	-$1,165
2024	$4,600	$1,798	-$2,802	-$3,967
2025	$3,900	$2,050	-$1,850	-$5,817
2026	$3,600	$2,333	-$1,267	-$7,084
2027	$5,800	$2,530	-$3,270	-$10,354
2028	$5,600	$5,837	$237	-$10,117
2029	$5,900	$4,486	-$1,414	-$11,531
2030	$5,200	$4,486	-$714	-$12,245

Table 6.1.1: Projected and LTFP Budgeted Renewals and Financing Shortfall *(proposed rate rise)*

Year	Projected Renewals ($000)	LTFP Renewal Budget ($000)	Renewal Financing Shortfall ($000) (-ve Gap, +ve Surplus)	Cumulative Shortfall ($000) (-ve Gap, +ve Surplus)
2016	$10,250	$12,464	$2,214	$2,214
2017	$11,300	$12,624	$1,324	$3,538
2018	$11,300	$11,132	-$168	$3,370
2019	$10,000	$12,118	$2,118	$5,488
2020	$4,990	$2,059	-$2,931	$2,558
2021	$11,800	$14,337	$2,537	$5,095
2022	$4,900	$5,386	$486	$5,581
2023	$5,200	$2,414	-$2,786	$2,795
2024	$4,600	$2,511	-$2,089	$706
2025	$3,900	$2,763	-$1,137	-$431
2026	$3,600	$3,046	-$554	-$985
2027	$5,800	$3,243	-$2,557	-$3,542
2028	$5,600	$6,550	$950	-$2,592
2029	$5,900	$5,199	-$701	-$3,293
2030	$5,200	$5,199	-$1	-$3,294

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

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

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

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

6.1.2 Projected expenditures for long term financial plan

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

Expenditure projections are in 2015 real values.

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

Year	Operations ($000)	Maintenance ($000)	Projected Capital Renewal ($000)	Capital Upgrade/ New ($000)	Disposals ($000)
2016	$4,693	$2,700	$10,250	$350	$0
2017	$4,754	$2,450	$11,300	$5,059	$0
2018	$4,570	$2,588	$11,300	$5,059	$0
2019	$4,484	$2,490	$10,000	$15,141	$0
2020	$4,502	$2,592	$4,990	$5,059	$0
2021	$4,420	$2,494	$11,800	$15,141	$0
2022	$4,695	$2,598	$4,900	$15,141	$0
2023	$4,619	$2,498	$5,200	$5,059	$0
2024	$4,552	$2,604	$4,600	$5,059	$0
2025	$4,487	$2,502	$3,900	$5,059	$0

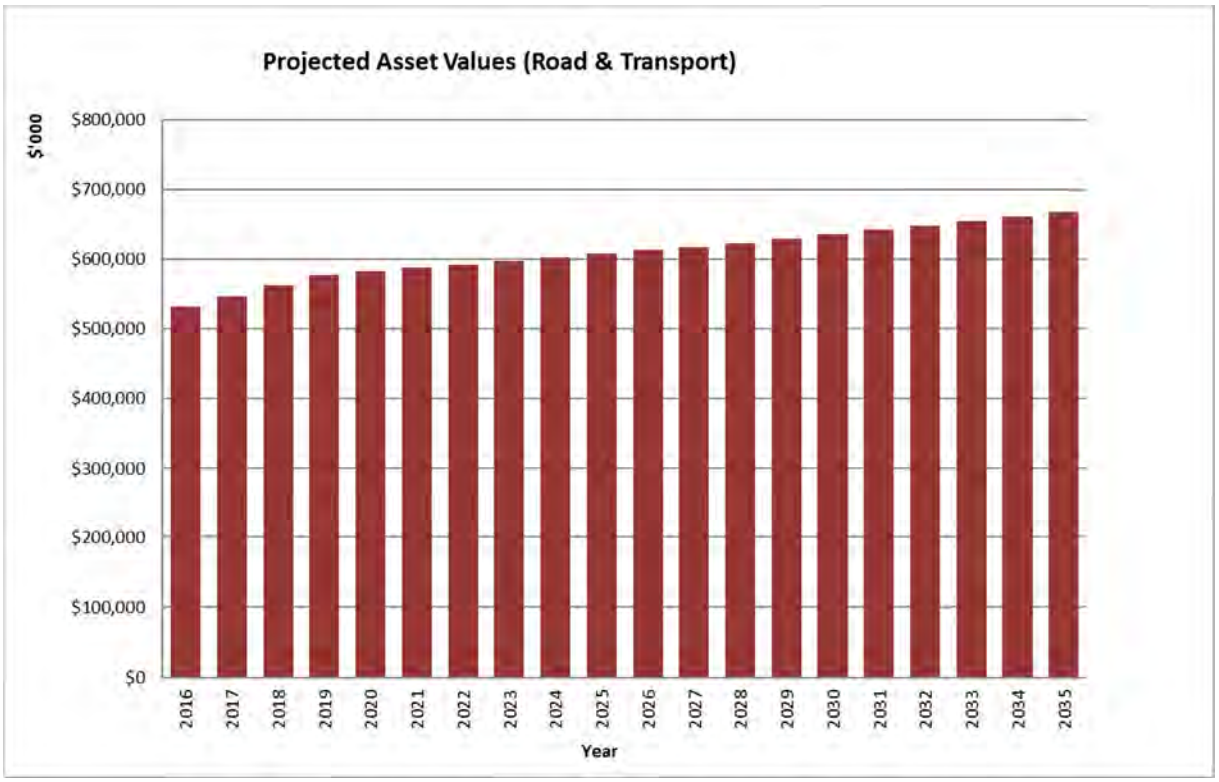
6.2 Funding Strategy

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

6.3 Valuation Forecasts

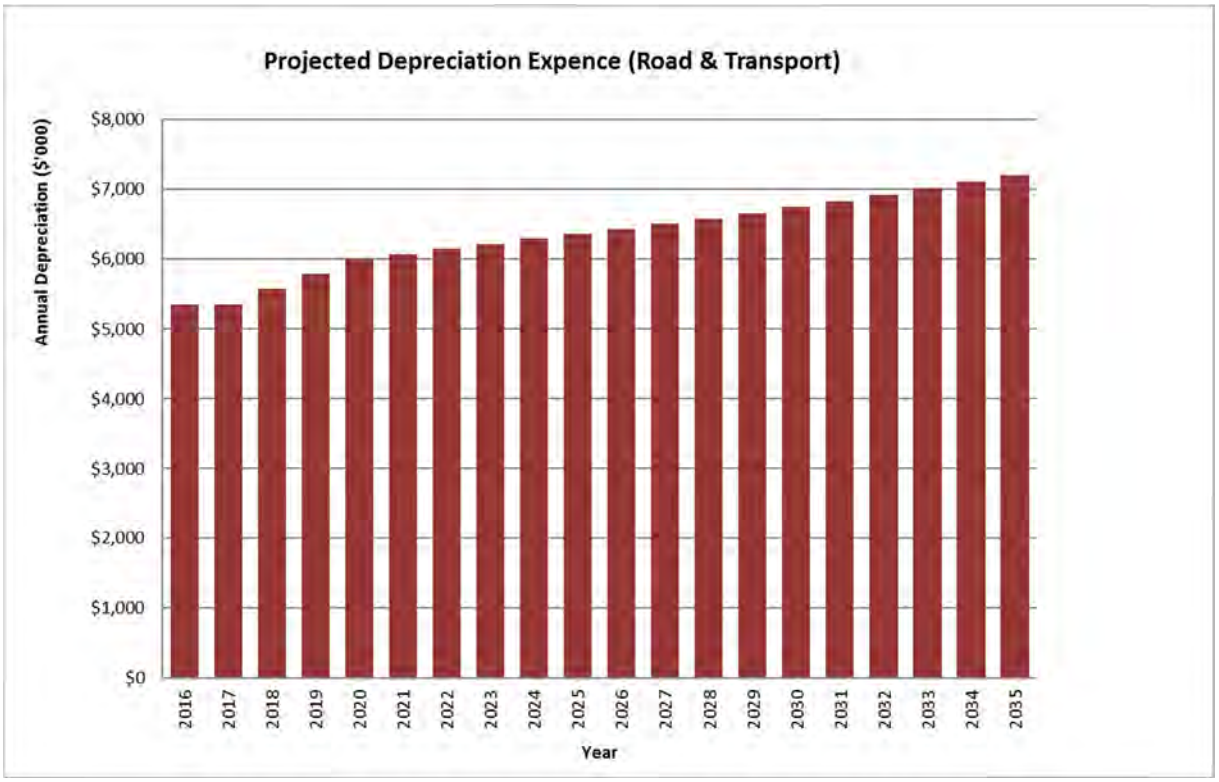
Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council. Figure 9 shows the projected replacement cost asset values over the planning period in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

Figure 9: Projected Asset Values



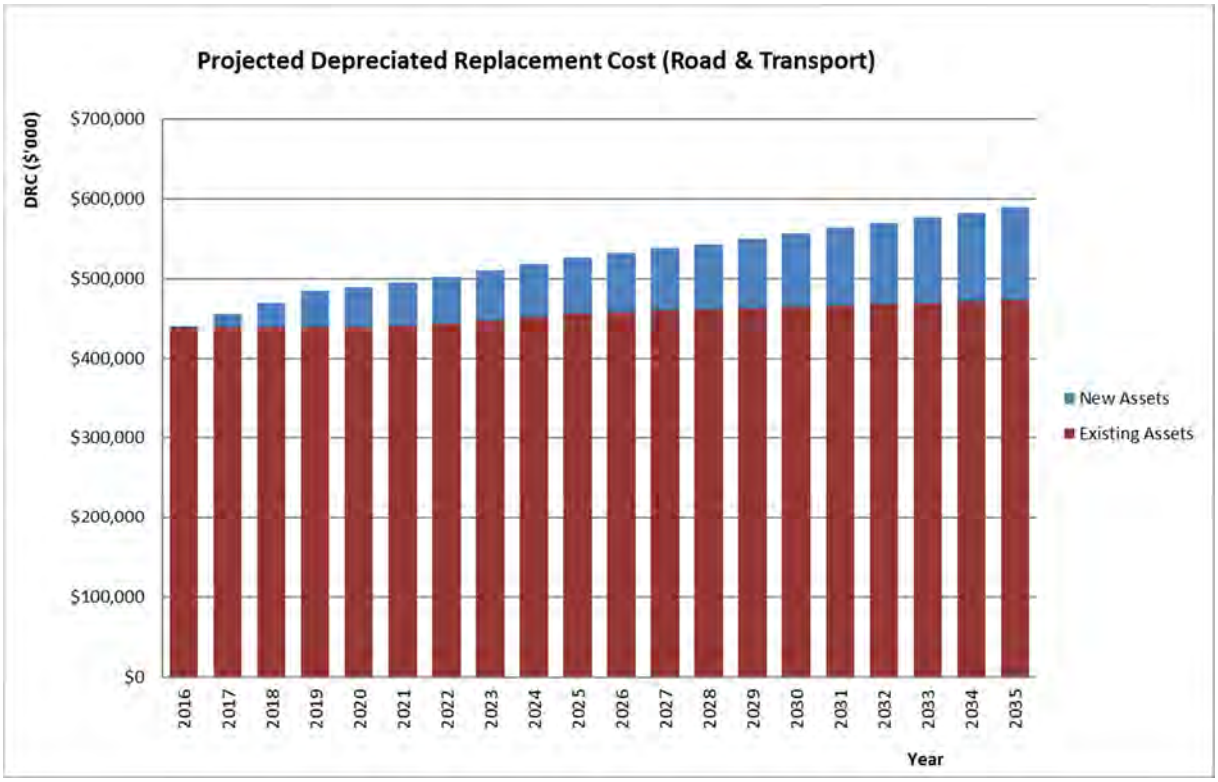
Depreciation expense values are forecast in line with asset values as shown in Figure 10.

Figure 10: Projected Depreciation Expense



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

Figure 11: Projected Depreciated Replacement Cost



6.4 Key Assumptions made in Financial Forecasts

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

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

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

Key Assumptions	Risks of Change to Assumptions
Operational & maintenance expenditure is based on historical expenditure and assumes there will no significant change in this level of service	Low
The operational & maintenance costs associated with new assets created over the 20 year term of this document has been based on existing O&M expenditure per unit asset of existing	Low
That there will be no major technological change that creates dramatic changes the road & transport industry in terms of unit cost and treatment process.	Low
All works are undertaken to relevant RMS, Austroads & Northern Rivers design guidelines	Medium to High
The Roads Contribution Plan 2015 is able to be fully funded over the 20 year term of this document	Medium to high
The useful lives & unit costs remain valid over the 5 year period to the next revaluation (with annual CPI)	Medium

6.5 Forecast Reliability and Confidence

The expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale[11] in accordance with Table 6.5.

Table 6.5: Data Confidence Grading System

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

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

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

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

Data	Confidence Assessment	Comment
Demand drivers	A Highly reliable	RCP 2015 based on detailed analysis
Growth projections	B Reliable	Based on population models developed by Strategic Services
Operations expenditures	B Reliable	Based on current expenditure
Maintenance expenditures	C Uncertain	Based on current expenditure, models to be refined
Projected renewal expense. - Asset values	B Reliable	Revaluation performed in 2015
- Asset residual values	A Highly reliable	Residual values have been removed from Road & Transport
- Asset useful lives	B Reliable	Revaluation performed in 2015
- Condition modelling	C Uncertain	Will be refined as more data is collected
- Network renewals	B Reliable	Models refined as more project data is collated
- Defect repairs	B Reliable	Defects identified & programmed in Reflect database
Upgrade/New expenditures	B Reliable	RCP 2015 based on detailed analysis + strategic models
Disposal expenditures	E Unknown	Disposals are very rare in Road & Transport

Over all data sources the data confidence is assessed as medium confidence level for data used in the preparation of this AM Plan.

7. PLAN IMPROVEMENT AND MONITORING

7.1 Status of Asset Management Practices

7.1.1 Accounting and financial systems

The accounting & financial system used by Ballina Council is Authority v6.9. The financial applications are designed to interact seamlessly with the broader Authority Enterprise Application Suite that incorporates Asset & Infrastructure Management, Customer Request Management, integration with TRIM (electronic documents & records management system), Land Information, Human Resources, Payroll, and Executive Management software applications.

The Authority application is designed specifically for Local Government and the inherent single database design eliminates duplication of data throughout the enterprise application.

- General Ledger
- Accounts Payable
- Purchasing and online requisitioning
- Payroll
- Plant & Fleet Management

7.1.2 Accountabilities for accounting & financial systems

Module	Task	Officer
Budget	Draft	Finance Manager + Line Managers
	Review	Finance Manager + Line Managers
	Finalise	Finance Manager + Line Managers
	Approval + adopt	Council
General Ledger	Establish	Finance Manager
	Finalise	Finance Manager
End of Quarter Process	Capitalise	Accountant + Asset Engineer
	Depreciation	Accountant + Asset Engineer
	Review control accounts	Accountant
End of Year Process	Indexation	Accountant + Asset Engineer
	Roll Over	Accountant + Asset Engineer
	Revaluations	Accountant + Asset Engineer

7.1.3 Accounting standards and regulations

- AAS27 - Australian Accounting Standard
- AASB101 - Presentation of Financial Statements
- AASB116 - Property Plant & Equipment
- AASB13 - Fair Value Measurement

7.1.4 Capital/maintenance threshold

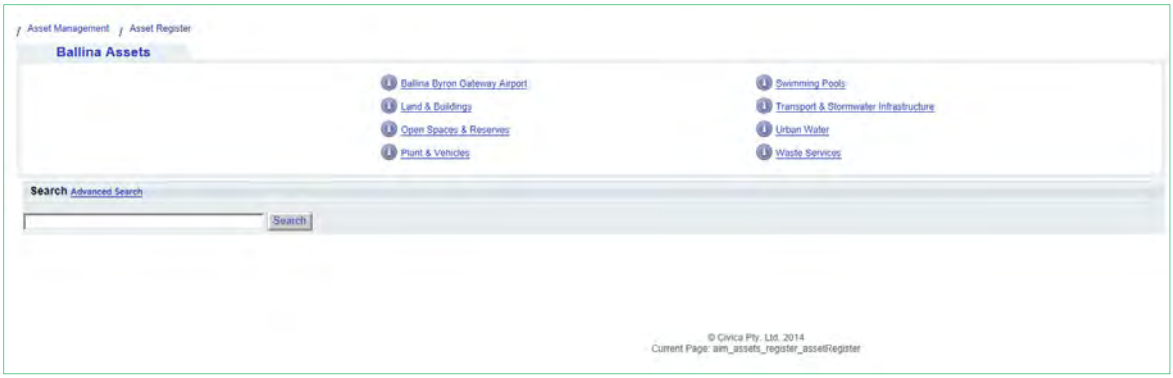
The Capital / maintenance threshold for plant & equipment assets is $5,000 and for $10,000 for built structures, water and stormwater reticulation assets.

7.1.5 Asset Management System

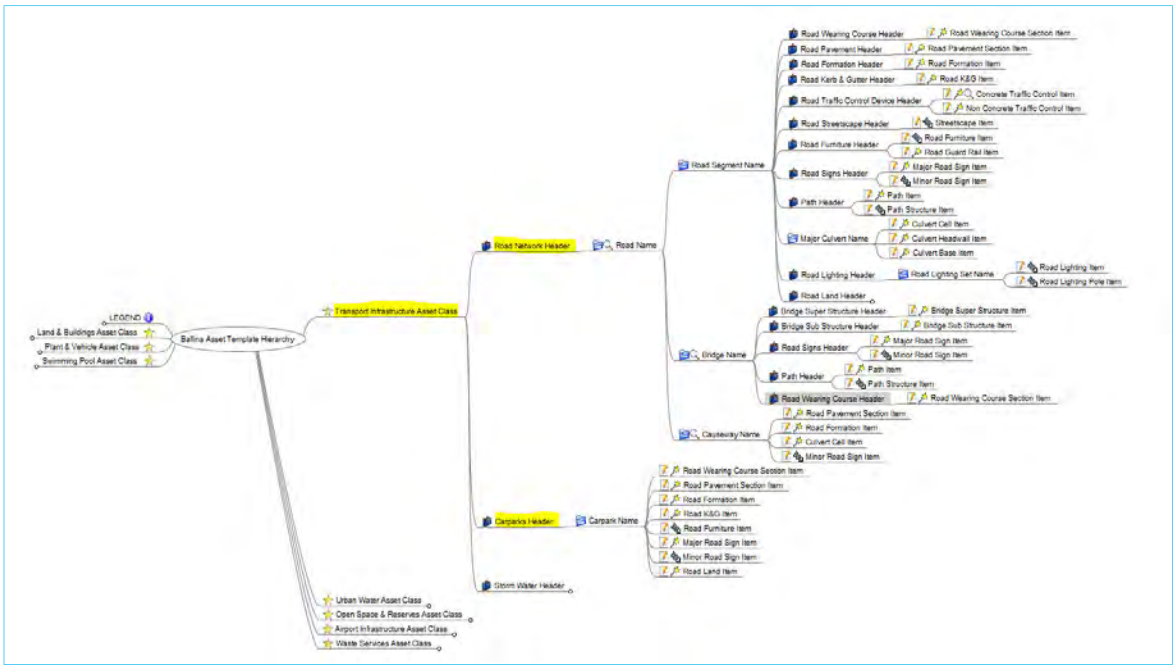
Ballina Council has adopted the Authority Asset Management (AM) System. It allows real time integration to Authority Financials, Customer Request Management, TRIM & GIS.

7.1.6 Asset Registers

The asset register exists within Authority and is accessible by all staff with at a minimum of an 'enquiry' user role assigned to their Authority account. There are currently 8 asset main groups, which includes 'Transport & Storm water infrastructure', and data is organized is a user friendly 'parent, child, sibling' format. Users may drill down through the levels by clicking on the blue hyperlink text or click on the icon to view attribute information.

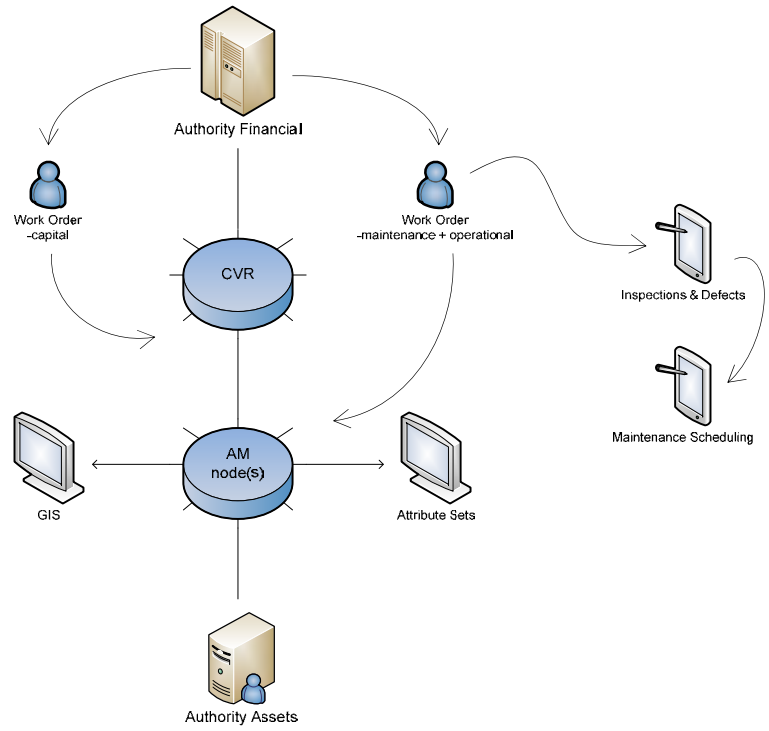


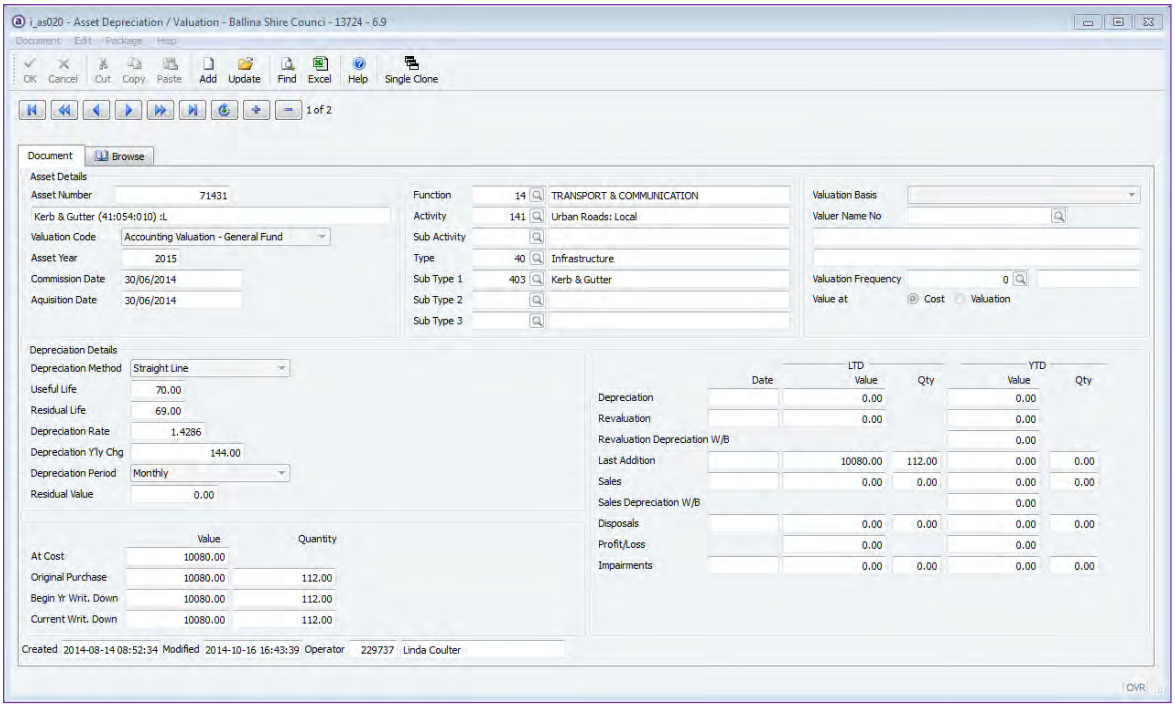
The Road & Transport asset hierarchy is summarised below.


LEGEND
Land & Buildings Asset Class
Plant & Vehicle Asset Class
Swimming Pool Asset Class
Ballina Asset Template Hierarchy
Transport Infrastructure Asset Class
Road Network Header
Road Name
Road Segment Name
Road Wearing Course Header
Road Wearing Course Section Item
Road Pavement Header
Road Pavement Section Item
Road Formation Header
Road Formation Item
Road Kerb & Gutter Header
Road K&G Item
Road Traffic Control Device Header
Concrete Traffic Control Item
Non Concrete Traffic Control Item
Road Streetscape Header
Streetscape Item
Road Furniture Header
Road Furniture Item
Road Guard Rail Item
Road Signs Header
Major Road Sign Item
Minor Road Sign Item
Path Header
Path Item
Path Structure Item
Major Culvert Name
Culvert Cell Item
Culvert Headwall Item
Culvert Base Item
Road Lighting Header
Road Lighting Set Name
Road Lighting Item
Road Lighting Pole Item
Road Land Header
Bridge Name
Bridge Super Structure Header
Bridge Super Structure Item
Bridge Sub Structure Header
Bridge Sub Structure Item
Road Signs Header
Major Road Sign Item
Minor Road Sign Item
Path Header
Path Item
Path Structure Item
Road Wearing Course Header
Road Wearing Course Section Item
Causeway Name
Road Pavement Section Item
Road Formation Item
Culvert Cell Item
Minor Road Sign Item
Carparks Header
Carpark Name
Road Wearing Course Section Item
Road Pavement Section Item
Road Formation Item
Road K&G Item
Road Furniture Item
Major Road Sign Item
Minor Road Sign Item
Road Land Item
Storm Water Header
Urban Water Asset Class
Open Space & Reserves Asset Class
Airport Infrastructure Asset Class
Waste Services Asset Class

7.1.7 Linkage from Asset Management to Financial System

The Asset Management and the Financial System are linked through the CVR (capital value record)





The CVR contains financial information for a single asset (cloned CVR) or for a group of similar assets (linked CVR). This information includes

- CVR id number
- Funding source (General, Water or Sewer)
- Commission date
- Depreciation method
- Useful Life (years)
- Residual life (years)
- Depreciation rate (%)
- Residual Value
- Replacement cost
- Written down value
- Revaluation information
- Function / Activity / Sub-activity / Type / Sub-type allocations & related control accounts.

The historical information is retained each year when the end of financial year rollover is performed for all assets. This historical data can be displayed within the CVR record. Historical CVR information is locked from any form of updating. Each CVR id number is unique and is never reused, even after asset disposal.

The key to the linkages between Authority Assets & Authority Finance, GIS & the Plant System is the development of linkage rules assigned to the Asset Templates. These rules define where an asset fits within the asset hierarchy, which CVR clone template it should copy along with itself to create a new Asset-CVR pair and which attribute information sets are made available to the new asset.

7.1.8 Accountabilities for Asset Management System and Data Maintenance

Module	Task	Officer
Asset hierarchy	Add / refine rules	Asset Engineer
Asset Creation	Define + load	Asset Engineer
Attribute Sets	Definition	Asset Engineer + advice from relevant line manager
	Setup + loading	Asset Engineer
	Updating	Section asset officer -noting guidelines set by Asset Engineer
Document & Files	Linking from TRIM	Section asset officer -noting guidelines set by Asset Engineer
Work Orders	Task definition	Asset Engineer + advice from Finance Manager
	Setup	Asset Engineer
	Open	Asset Engineer + Finance Officer
	Close	Asset Engineer + Finance Officer
	Capitalise	Asset Engineer + Accountant
Data review / refine	Useful Life	Asset Engineer –audited
	Unit Rates	Asset Engineer –audited
	Treatment Costs	Asset Engineer –audited

7.2 Improvement Plan

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

Table 7.2: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1	Collection of attribute information as per attribute sets	Assets	5 days	Dec 2016
2	Links to GIS	Assets + GIS	20 days	Dec 2016
3	Development of Maintenance & Operational Work Orders	Assets	20 days	June 2017
4	Development of Maintenance Scheduling	Assets	20 days	June 2017
5	Development of Inspect & Defect Programming	Assets	40 days	June 2017
6				
7				
8				
9				
10				

7.3 Monitoring and Review Procedures

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

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

The AM Plan has a life of 4 years and is due for complete revision and updating on February 2019.

7.4 Performance Measures

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

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

8. REFERENCES

Ballina Council, Community Strategic Plan 2013-2023

Ballina Council, Resourcing Strategy

Ballina Council, Delivery Program & Operational Plan 2014/15 – 2017/18

Ballina Council, Long Term Financial Plan 2014/15 – 2023/24

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

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

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

9. APPENDICES

Appendix A Projected 10 year Capital Upgrade/New Works Program

Appendix B LTFP Budgeted Expenditures Accommodated in AM Plan

Appendix C Critical analysis of Sealed vs Un-sealed Road maintenance (2018)

Appendix D Optimisation of existing budgets to maximise network health (2018)

Appendix E Unsealed road assessment & scoring system for seal upgrade (2018)

Appendix F Network effect: movement of capital renewal to dust-sealing (2018)

Appendix G Optimisation of spray seal design lives (2018)

Appendix H Abbreviations

Appendix I Glossary

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

10 year Projected Capital Upgrade/New Program from Councils Roads Contribution Plan 2015

NAMS.PLUS3 Asset Management Form 2C Upgrade/New Plan

IPWEA INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA JRA

Ballina SC
Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan 2016**

Year	Item No.	Capital Upgrade and New Projects	Estimate ($000)	Running total ($000)
2016	1	RCP 2015 Project 28b: River Street / Moon Street Roundabout	$350	$350
2016	2			
2016	3			
2016	4			
2016	5			
2016	6			
2016	7			
2016	8			
2016	9			
2016	10			
2016	**Total Projected Capital Upgrade/New Plan**		**$350**	

Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan 2017**

2017	1	RCP 2015 Project 6: Fisheries Creek Bridge to Tweed Street - Four Laning of Pacific Highway (F-T)	$1,295	$1,295
2017	2	RCP 2015 Project 7: North Creek Road to Kerr Street - Four Laning of Pacific Highway (NCK)	$2,389	$3,684
2017	3	RCP 2015 Project 9: Upgrade Fisheries Creek Bridge (FCB)	$1,781	$5,465
2017	4	RCP 2015 Project 10: Duplication of North Creek Canal Bridge - Separate Two Lanes (NCB)	$1,336	$6,801
2017	5	RCP 2015 Project 11: Fisheries Creek Bridge to southern Interchange of Bypass - 4 Laning of SH10	$3,194	$9,996
2017	6	RCP 2015 Project 11: Other Pacific Highway Improvements (PHI) Land Component	$45	$10,040
2017	7	RCP 2015 Project 12 to 14: Hutley Drive Extension (HDE)	$5,101	$15,141
2017	8			
2017	9			
2017	10			
2017	**Total Projected Capital Upgrade/New Plan**		**$15,141**	

Ballina SC
Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan 2018**

Year	Item No.	Capital Upgrade and New Projects	Estimate ($000)	Running total ($000)
2018	1	RCP 2015 Project 6: Fisheries Creek Bridge to Tweed Street - Four Laning of Pacific Highway (F-T)	$1,295	$1,295
2018	2	RCP 2015 Project 7: North Creek Road to Kerr Street - Four Laning of Pacific Highway (NCK)	$2,389	$3,684
2018	3	RCP 2015 Project 9: Upgrade Fisheries Creek Bridge (FCB)	$1,781	$5,465
2018	4	RCP 2015 Project 10: Duplication of North Creek Canal Bridge - Separate Two Lanes (NCB)	$1,336	$6,801
2018	5	RCP 2015 Project 11: Fisheries Creek Bridge to southern Interchange of Bypass - 4 Laning of SH10	$3,194	$9,996
2018	6	RCP 2015 Project 11: Other Pacific Highway Improvements (PHI) Land Component	$45	$10,040
2018	7	RCP 2015 Project 12 to 14: Hutley Drive Extension (HDE)	$5,101	$15,141
2018	8			
2018	9			
2018	10			
2018	**Total Projected Capital Upgrade/New Plan**		**$15,141**	

Road & Transport_S2_V1		Projected Capital Upgrade/New Plan		2019
2019	1	RCP 2015 Project 6: Fisheries Creek Bridge to Tweed Street - Four Laning of Pacific Highway (F-T)	$1,295	$1,295
2019	2	RCP 2015 Project 7: North Creek Road to Kerr Street - Four Laning of Pacific Highway (NCK)	$2,389	$3,684
2019	3	RCP 2015 Project 9: Upgrade Fisheries Creek Bridge (FCB)	$1,781	$5,465
2019	4	RCP 2015 Project 10: Duplication of North Creek Canal Bridge - Separate Two Lanes (NCB)	$1,336	$6,801
2019	5	RCP 2015 Project 11: Fisheries Creek Bridge to southern Interchange of Bypass - 4 Laning of SH10	$3,194	$9,996
2019	6	RCP 2015 Project 11: Other Pacific Highway Improvements (PHI) Land Component	$45	$10,040
2019	7	RCP 2015 Project 12 to 14: Hutley Drive Extension (HDE)	$5,101	$15,141
2019	8			
2019	9			
2019	10			
2019	**Total Projected Capital Upgrade/New Plan**		**$15,141**	

Ballina SC

Road & Transport_S2_V1		Projected Capital Upgrade/New Plan		2020
Year	**Item No.**	**Capital Upgrade and New Projects**	**Estimate ($000)**	**Running total ($000)**
2020	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2020	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2020	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2020	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2020	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2020	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2020	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2020	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2020	9			
2020	10			
2020	**Total Projected Capital Upgrade/New Plan**		**$5,059**	

Road & Transport_S2_V1		Projected Capital Upgrade/New Plan		2021
2021	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2021	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2021	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2021	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2021	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2021	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2021	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2021	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2021	9			
2021	10			
2021	**Total Projected Capital Upgrade/New Plan**		**$5,059**	

Ballina SC
Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan** **2022**

Year	Item No.	Capital Upgrade and New Projects	Estimate ($000)	Running total ($000)
2022	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2022	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2022	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2022	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2022	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2022	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2022	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2022	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2022	9			
2022	10			
2022	**Total Projected Capital Upgrade/New Plan**		**$5,059**	

Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan** **2023**

2023	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2023	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2023	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2023	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2023	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2023	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2023	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2023	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2023	9			
2023	10			
2023	**Total Projected Capital Upgrade/New Plan**		**$5,059**	

Ballina SC
Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan** **2024**

Year	Item No.	Capital Upgrade and New Projects	Estimate ($000)	Running total ($000)
2024	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2024	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2024	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2024	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2024	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2024	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2024	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2024	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2024	9			
2024	10			
2024	**Total Projected Capital Upgrade/New Plan**		**$5,059**	

Road & Transport_S2_V1 **Projected Capital Upgrade/New Plan** **2025**

2025	1	RCP 2015 Project 15: Bangalow Road / Hogan Street - new Left In / Left Out (Cla)	$74	$74
2025	2	RCP 2015 Project 16: Angels Beach Drive / Sheather Street -new Left In / Left Out (CLb)	$80	$154
2025	3	RCP 2015 Project 18: North Creek Road and Bridge (7aU) - or Skennars Head Distributor	$2,161	$2,314
2025	4	RCP 2015 Project 20: Ross Lane Improvements -West (RLW) & East (RLE)	$1,708	$4,022
2025	5	RCP 2015 Project 23: Pacific Highway to Southern Cross Drive - Right Turn Ban (PSI)	$18	$4,040
2025	6	RCP 2015 Project 27: Traffic Calming - North Creek Road / Reservoir Road / Hutley Drive	$310	$4,350
2025	7	RCP 2015 Project 35: Sandy Flat Road	$335	$4,686
2025	8	RCP 2015 Project 37: North Creek Road - Northern 350m joining Hutley Dr & Byron Bay Rd	$373	$5,059
2025	9			
2025	10			
2025	**Total Projected Capital Upgrade/New Plan**		**$5,059**	
				Average/yr
	Total 10 year program		**$76,127**	$7,613

Appendix B Budgeted Expenditures Accommodated in LTFP

BSC 10 year Budgeted Expenditures from Long Term Financial Plan

NAMS.PLUS3 Asset Management **Ballina SC**

Road & Transport_S2_V1 **Asset Management Plan**

IPWEA INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA JRA

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

Road & Transport

Asset values at start of planning period

Current replacement cost	$531,866 (000)	Calc CRC from Asset Register	$531,866 (000)
Depreciable amount	$375,038 (000)	This is a check for you.	
Depreciated replacement cost	$439,011 (000)		
Annual depreciation expense	$5,350 (000)		

Operations and Maintenance Costs for New Assets

	% of asset value
Additional operations costs	0.86%
Additional maintenance	0.48%
Additional depreciation	1.43%

Planned renewal budget (information only)

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

Planned Expenditures from LTFP

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

Financial year ending	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	$000	$000	$000	$000	$000	$000	$000	$000	$000	$000
Expenditure Outlays included in Long Term Financial Plan (in current $ values)										
Operations										
Operations **budget**	$3,477	$3,512	$3,298	$3,213	$3,231	$3,149	$3,424	$3,347	$3,280	$3,215
Management **budget**	$1,216	$1,241	$1,272	$1,272	$1,272	$1,272	$1,272	$1,272	$1,272	$1,272
AM systems **budget**	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total operations	$4,693	$4,753	$4,570	$4,485	$4,503	$4,421	$4,696	$4,619	$4,552	$4,487
Maintenance										
Reactive maintenance **budget**	$201	$200	$203	$203	$203	$203	$203	$203	$203	$203
Planned maintenance **budget**	$2,499	$2,250	$2,385	$2,287	$2,389	$2,291	$2,395	$2,295	$2,401	$2,299
Specific maintenance items **budget**										
Total maintenance	$2,700	$2,450	$2,588	$2,490	$2,592	$2,494	$2,598	$2,498	$2,604	$2,502
Capital										
Planned renewal **budget**	$12,464	$12,624	$10,737	$11,405	$1,346	$13,624	$4,673	$1,701	$1,798	$2,050
Planned upgrade/new **budget**	$350	$5,059	$5,059	$15,141	$5,059	$15,141	$15,141	$5,059	$5,059	$5,059
Non-growth contributed asset value	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Asset Disposals										
Est Cost to dispose of assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Carrying value (DRC) of disposed assets	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Additional Expenditure Outlays Requirements (e.g from Infrastructure Risk Management Plan)

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

Forecasts for Capital Renewal using Methods 2 & 3 (Form 2A & 2B) & Capital Upgrade (Form 2C)

	2016 $000	2017 $000	2018 $000	2019 $000	2020 $000	2021 $000	2022 $000	2023 $000	2024 $000	2025 $000
Forecast Capital Renewal from Forms 2A & 2B	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Forecast Capital Upgrade from Form 2C	$350	$15,141	$15,141	$15,141	$5,059	$5,059	$5,059	$5,059	$5,059	$5,059

Appendix C Critical analysis of Sealed vs Un-sealed Road maintenance (2018)

This analysis had its origins in the financial viability to upgrade and seal Houghlahan's Creek Road, and expanded to a general look at the unsealed road network.

Procedure,

- The actual cost to maintain our unsealed road network was collated from several years of data and the cost per square meter determined.
- This list was ranked from most expensive to least expensive, and the 28 historically most expensive set aside for further analysis.
- The short-listed roads were assessed by council engineers for suitability for sealing, noting terrain and estimates were created for necessary upgrade works.
- The costs to continue to maintain each candidate road as an unsealed road was established over a 40 year period.
- The costs to upgrade and then to maintain each candidate road as a sealed road (using councils sealed maintenance models) was also established over a 40 year period.
- The 2 long term financial scenarios was then compared and the time to 'financial viability was determined for each candidate road.
- The 28 candidate individual results were then collated to a single chart for a global overview.

The results are tabulated below.

The second part of the analysis was to incorporate a new wearing course treatment to the capital sealing program and noting the effects on the expected long term finances. The product in question was an asphalt rejuvenation chemical that extended the life of asphalt wearing courses by 5 to 8 years.

The results are tabulated below.

1. Proposed Dust Sealing of selected Granular Unsealed roads

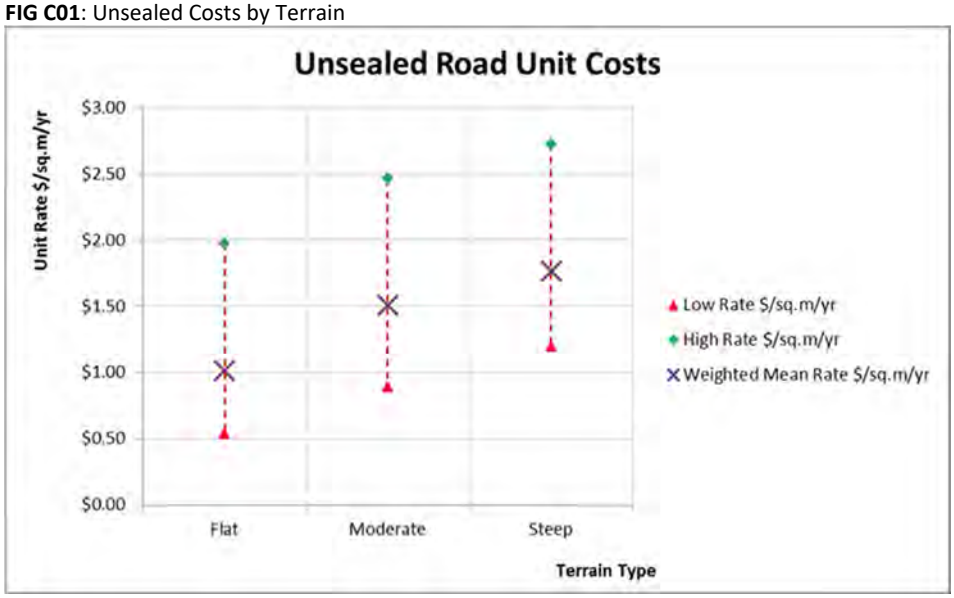
From a list of 74 unsealed roads, Alex had shortlisted 28 candidate unsealed roads (based on the historical high gravel re-sheeting & maintenance costs)

Road	Length (m)	Width (m)	Area (m2)	Terrain	Av Cost to Maintain as Unsealed	Annual Un-sealed Cost	SEAL Width (m)	SEAL Area (m2)	Seal Cost	Upgrade + Widen Cost	TOTAL Seal Upgrade Cost	Year Break EVEN (15 year seal cycle)	Year Break EVEN (20 year seal cycle)
Converys Lane (10:080)	519	3.6	1868.4	Steep	$2.72	$5,088.42	4.5	2335.5	$14,758	$84,150.80	$98,908.53	25	27
Scanlon Lane (10:036)	670	3.8	2546	Moderate	$2.46	$6,269.73	4.5	3015	$18,189	$47,245.33	$65,434.07	11	11
Houghlahans Creek Road (10:170)	2491	3.8	9465.8	Steep	$2.33	$22,054.31	4.5	11209.5	$228,708	$179,454.27	$408,162.16	26	27
Ingrams Road (10:056)	701	3.6	2523.6	Moderate	$2.29	$5,771.14	4.5	3154.5	$19,030	$55,119.87	$74,150.18	20	21
Leadbeatters Lane (10:072)	1341	4.6	6168.6	Steep	$2.19	$13,510.09	4.6	6168.6	$25,689	$30,000.00	$55,689.13	5	5
Whites Lane (10:096)	2368	3.7	8761.6	Moderate	$2.16	$18,912.94	4.5	10656	$41,180	$166,324.53	$207,504.65	18	13
Rishworths Lane (10:014)	988	4.2	4149.6	Moderate	$2.16	$8,951.71	4.5	4446	$20,579	$47,520.53	$68,099.96	9	9
Shaws Lane (10:069)	780	4.1	3198	Steep	$2.14	$6,838.30	4.5	3510	$21,175	$70,076.00	$91,250.95	20	21
Laws Lane (10:107)	537	3.3	1772.1	Moderate	$2.12	$3,756.12	4.5	2416.5	$15,270	$47,721.20	$62,990.76	26	27
Grays Lane (10:094)	340	3.1	1054	Moderate	$2.09	$2,204.12	4.5	1530	$10,753	$31,481.33	$42,234.56	35	41
Alstonvale Road (10:076)	572	5	2860	Moderate	$2.09	$5,964.65	5.0	2860	$17,254	$15,000.00	$32,253.67	7	7
Chesworths Lane (10:099)	1436	4.2	6031.2	Moderate	$2.06	$12,420.90	4.5	6462	$26,911	$62,965.07	$89,876.07	8	8
Weis Lane (10:097)	848	3.7	3137.6	Moderate	$2.06	$6,454.62	4.5	3816	$23,021	$65,389.87	$88,410.84	21	23
Phillips Road (10:007)	1019	3	3057	Steep	$2.01	$6,139.71	4.5	4585.5	$21,225	$84,264.67	$105,489.80	33	32
Cumbalum Road (10:041)	1726	4.1	7076.6	Flat	$1.98	$13,979.43	4.5	7767	$32,346	$38,892.53	$71,238.20	6	6
Martins Lane -east (10:023)	1108	4	4432	Steep	$1.96	$8,698.67	4.5	4986	$23,079	$37,785.33	$60,864.28	8	8
Howards Road (10:070)	1368	3.9	5335.2	Moderate	$1.96	$10,435.23	4.5	6156	$25,637	$58,958.40	$84,595.06	9	9
Sandy Flat Road (10:046)	2004	4.4	8817.6	Moderate	$1.94	$17,134.84	4.5	9018	$34,850	$46,299.20	$81,149.26	5	5
Eyears Road (10:078)	844	3.5	2954	Flat	$1.92	$5,663.68	4.5	3798	$22,912	$58,325.33	$81,237.72	22	25
Fosters Lane (10:115)	595	3.2	1904	Steep	$1.91	$3,645.55	4.5	2677.5	$16,919	$61,611.33	$78,530.12	39	44
Behs Lane (10:091)	543	3.4	1846.2	Steep	$1.83	$3,382.82	4.5	2443.5	$15,440	$37,980.40	$53,420.57	31	29
Victoria Park Road (10:051)	806	3.2	2579.2	Moderate	$1.79	$4,605.84	4.5	3627	$21,881	$60,481.07	$82,361.85	35	42
Gap Road (10:102)	2591	3.5	9068.5	Steep	$1.71	$15,495.98	4.5	11659.5	$43,564	$216,204.67	$259,768.93	34	29
Newports Lane (10:088)	752	3.2	2406.4	Moderate	$1.64	$3,944.44	4.5	3384	$20,415	$56,931.47	$77,346.29	47	47
UNL off Pacific Parade to Camp Drew (30:014)	1609	6.7	10780.3	Flat	$1.56	$16,853.15	6.7	10780.3	$41,660	$45,000.00	$86,660.47	6	6
Hill Street (10:045)	500	3.2	1600	Steep	$1.53	$2,444.72	4.5	2250	$14,217	$40,366.67	$54,584.14	52	53
Coolgardie Road (10:149)	2391	3.7	8846.7	Steep	$1.52	$13,422.99	4.5	10759.5	$41,580	$174,784.40	$216,364.49	32	39
O'Keefes Lane (10:151)	350	4.6	1610	Flat	$1.51	$2,436.18	4.6	1610	$10,173	$7,500.00	$17,673.39	9	9

TABLE C01

The full list of 74 Roads can be grouped by terrain and it would appear that this factor has an influence our historical costs in both rage and weighted mean unit rates.

FIG C01: Unsealed Costs by Terrain

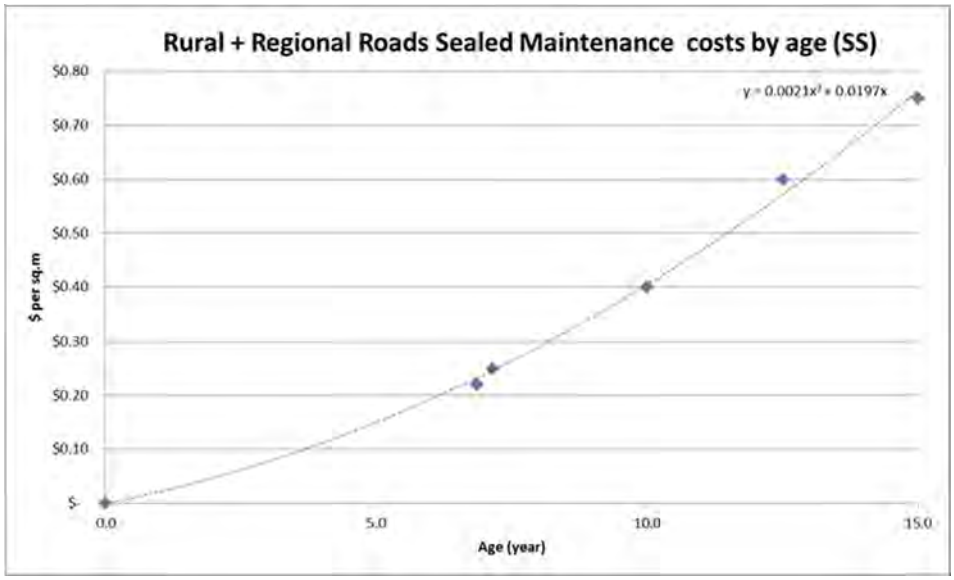


Row Labels	Sum of SEAL Area (m2)	Sum of TOTAL Seal Upgrade Cost	Sum of Upgrade Cost per sq.m
Flat	23,955	$256,809.78	$10.72
Moderate	60,541	$1,056,407.22	$17.45
Steep	62,585	$1,483,033.10	$23.70
Grand Total	**147,081**	**$2,796,250.10**	**$19.01**

As expected the unit cost to upgrade the pavements is also a function of terrain .

The capital & maintenance costs were compared over 60 years for both unsealed & sealed scenarios for each of the 28 candidate pavements. The sealed maintenance profile was as per the current profiles.

FIG C02: Maintenance Profile



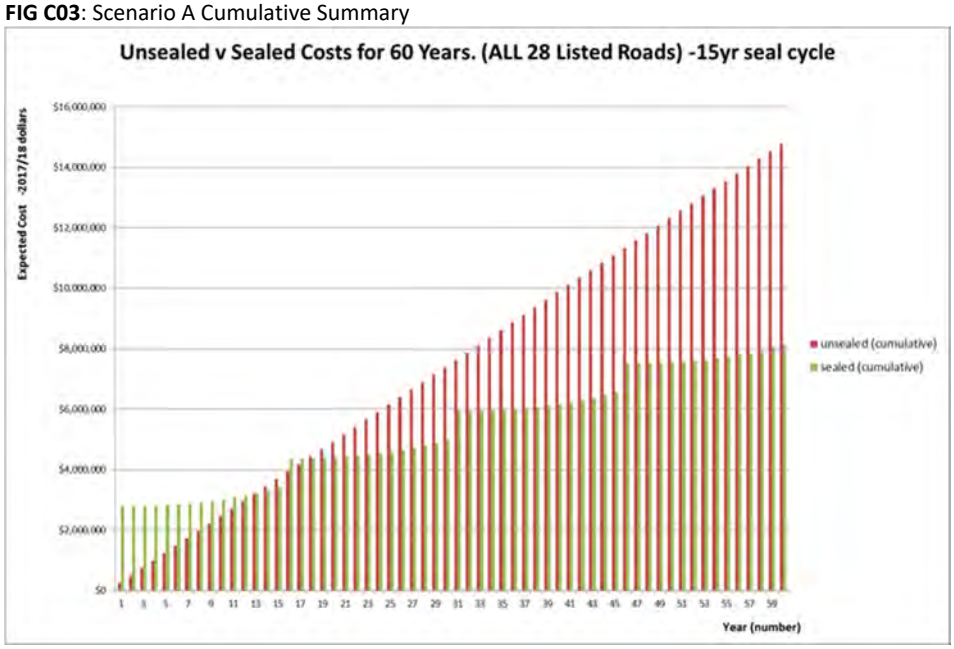
Also, as the seals are generally for low traffic rural pavements where local aesthetics may not be an issue I ran 2 analyses.

- Scenario A: Spray Seal Life = 15 years.
- Scenario B: Spray Seal Life = 20 years.

The maintenance costs were calculated by integrating the above (FIG B) over 0 to 15 years & 0 to 20 years

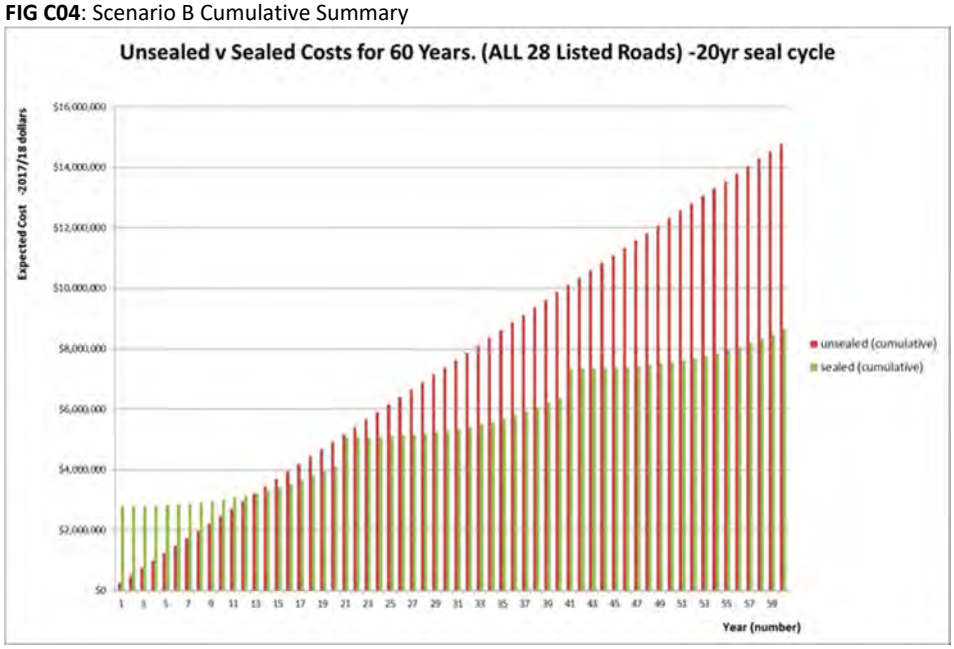
Rather than copy all 64 individual road charts I have only included the 2 summary that show the cumulative totals for all 28 roads. Note that some of the roads take 50 years to break even.

FIG C03: Scenario A Cumulative Summary



Long term saving (on average) is $111,000 per year over 60 years (break even @ 18 years)

FIG C04: Scenario B Cumulative Summary



Long term saving (on average) is $103,000 per year over 60 years (break even @ 14 years)

There appears to be a cost saving in the long term but it will involve a large upfront capital expense to upgrade the 28 candidate pavements.

2. Bituminous Rejuvenation of Wearing Course (NEW Treatment)

The Cost for the supply & spray of PreserveX Asphalt Rejuvenation product @ $3.71 per sq.m. The product extends the life of an asphalt by 5 to 8 years and can used up to 2 times during the life of a standard 40mm AC wearing course. This is because the in-situ asphalt is softened with a solvent and the treatment then applied @ approx. 1.1 litres per sq.m. The high unit cost is due partly to the need to keep the road under traffic control while the process is run.

This cost per sq.m per year of additional life makes it less cost effective on those AC wearing courses that are flagged to have a spray seal, however a good case can be made to use this treatment on roads where AC will be renewed with AC. Here we would be paying between $0.47 to $0.74 per sq.m to extend the AC wearing course by 1 year, as opposed to renewing with AC at a cost of $1.00 per sq.m per year.

The AC replacement (@ $1.00 per sq.m per year of life) can be put off by 10 to 15 years (if treated twice – say @ AC age 15 then 30 years) at approx. 2/3 of the unit cost.

The Charts below show the development of each modification to the capital profile.

FIG C05: Raw unmodified Wearing Course Renewal (ALL sealed Roads) –NO modifications to Backlog, Design Lives or Rejuvenation Treatment ($1,960,110 per year)

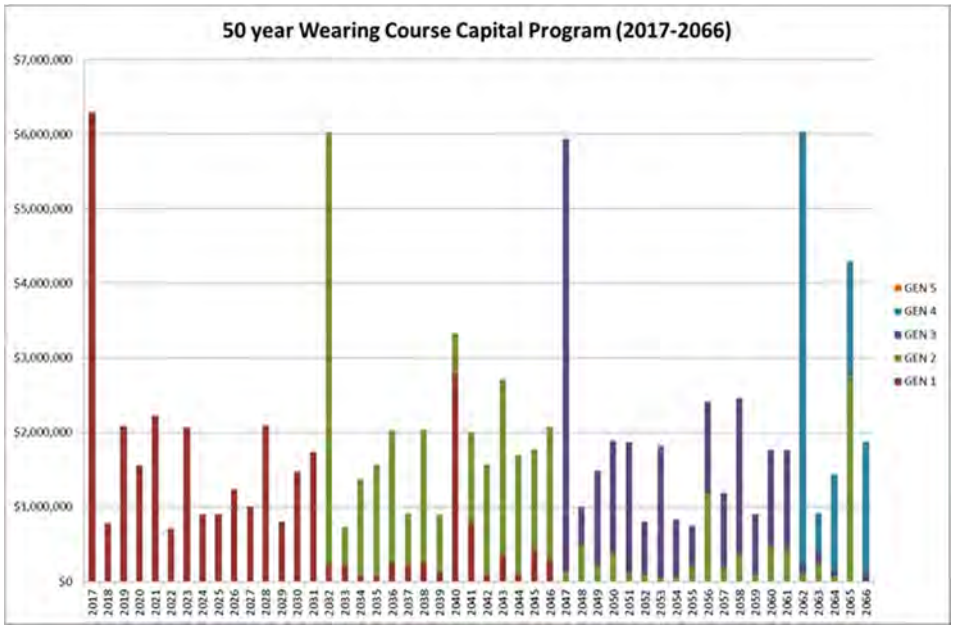


FIG C06: Wearing Course Renewal (ALL sealed Roads) + Backlog Distribution –NO modifications to Design Lives or Rejuvenation Treatment ($1,892,014 per year)

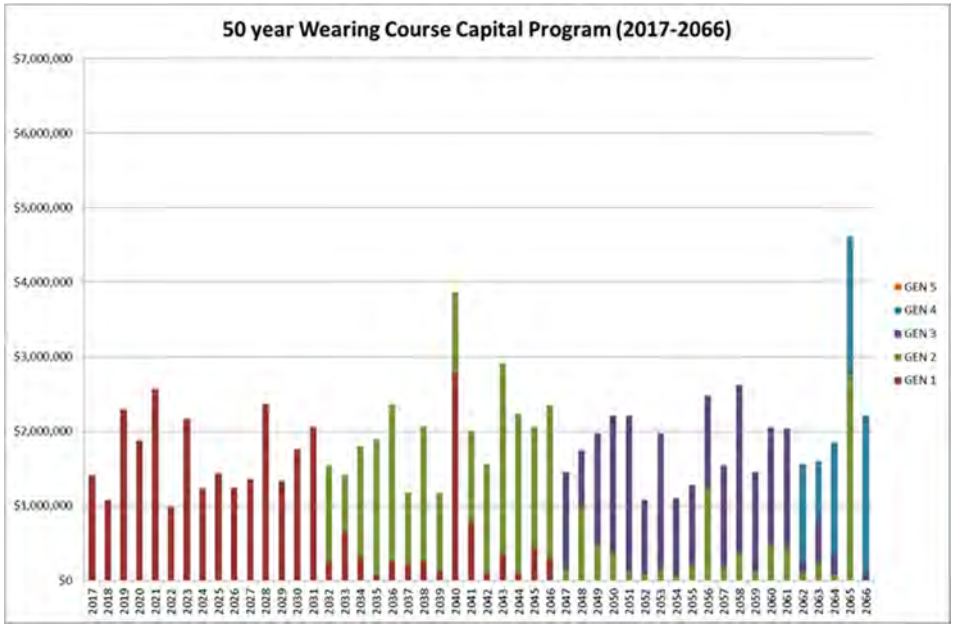


FIG C07: Wearing Course Renewal (ALL sealed Roads) + Backlog Distribution & Design Life modification–NO Rejuvenation Treatment ($1,674,312 per year)

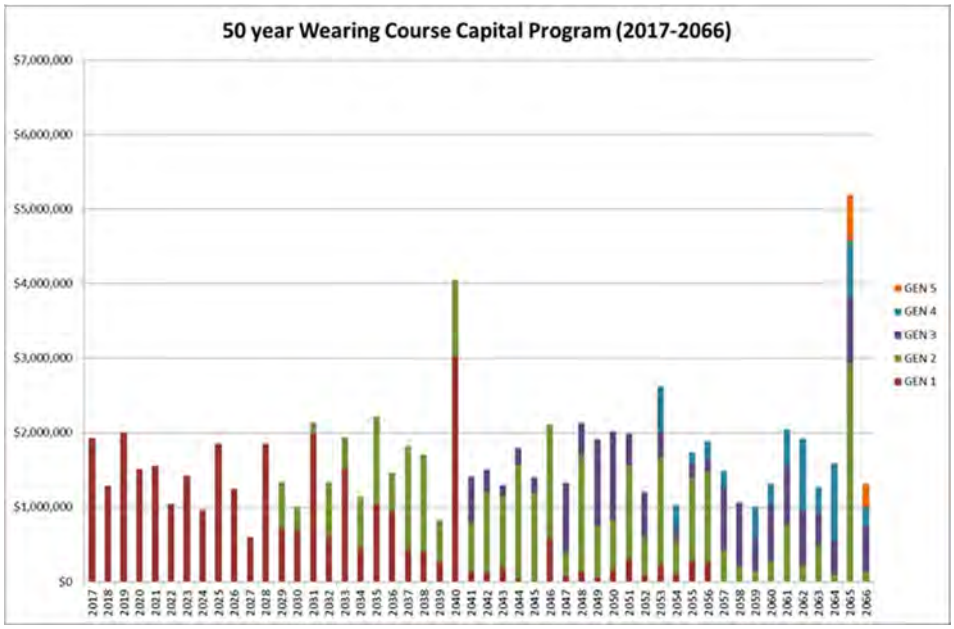
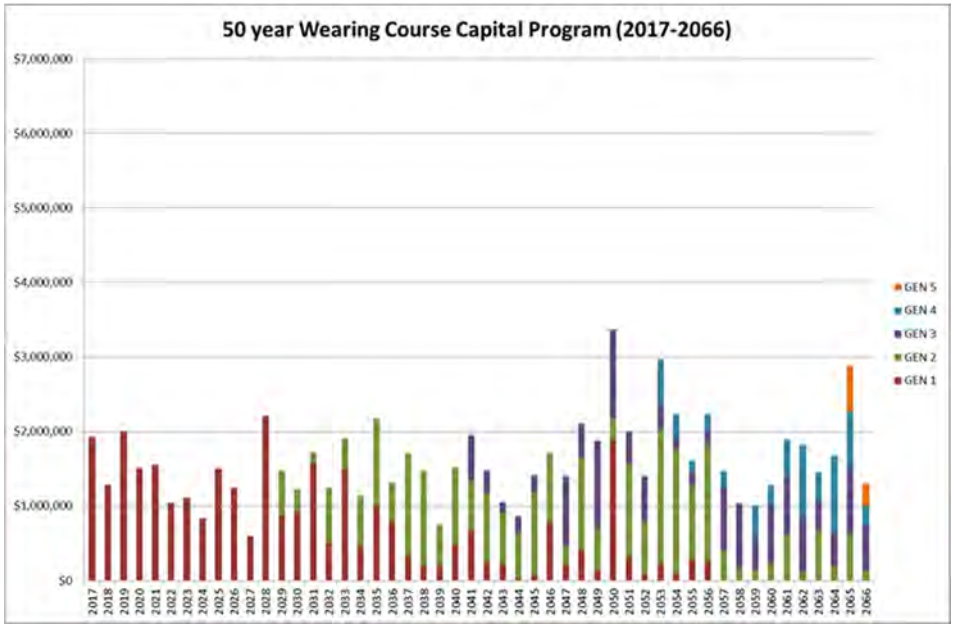


FIG C08: Wearing Course Renewal (ALL sealed Roads) + Backlog Distribution & Design Life modification + Rejuvenation Treatment ($1,598,573 per year)



Appendix D Optimisation of existing budgets to maximise network health (2018)

What does a roughness analysis at the network level tell us..?

The network level analysis lets us look above the detail of individual areas of concern and paint a picture of how the network as a whole is behaving.

A network average of say 115 NRM does not say that there are not bad areas in need of immediate treatment; just that 'on the whole' the network health is looking reasonable good at the moment

It is important to note that a network analysis does not replace a segment by segment analysis and ideally both analyses are needed to manage the networks.

Segment analysis – useful in 3 year works programming
Network analysis – useful in long term works projections as per level of service,

for example, we may want to know the approximate 20 year capital spending to keep network roughness <120 NRM

How was the network roughness charts determined..?

The network roughness is determined by weighting each individual road segment roughness by its area (as a percentage of the network area)

This can be represented by the simplified 3 segment network below.

Road Segment	Segment Area (sq.m)	Road Roughness (NRM)	% area to network
A	50	180	12.5%
B	250	100	62.5%
C	100	90	25%
	400		**100%**

Here each segment contributes a weighted percentage to the network average roughness which is determined as follows.

(180 x 0.125) + (100 x 0.625) + (90 x 0.25) = **107.5 NRM**

If all road segments were of the same area, then the weighted network average would be equal to the average of all roughness values, as each segment would have the same weighting.

This same process has been used over our 2,360 road segments, for each year of the analysis, for

- Local: Urban Road network - % based on local: urban network area
- Local: Rural Road network - % based on local: rural network area
- Regional: Urban Road network - % based on regional: urban network area
- Regional: Rural Road network - % based on regional: rural network area
- All Roads - % based on all road network areas

SCENARIO's

- BASE Case # 1: Existing Expenditure % breakup (without SRV)
- BASE Case # 2: Existing Expenditure % breakup (with SRV)
- SCENARIO Case # 1: as for B2, BUT allow for dust seal on sites that break even in < 10 years
- SCENARIO Case # 2: as for S1, BUT channel (ALL) SRV to reseals
- **SCENARIO Case # 3: as for S2, BUT channel SRV to (17-year cycle) Reseals & Rest to Reconstruction**
- SCENARIO Case # 4: as for S3, BUT transfer additional Capital Reconstruction money to Heavy Patch
- SCENARIO Case # 5: as for S3, BUT transfer additional Capital Reconstruction money to Maintenance
- SCENARIO Case # 6: as for S3, BUT maximise Capital Reconstruction (no Heavy Patch)

ASSUMPTIONS

A number of assumptions have been made around the effect of treatments & ongoing deterioration of individual road segments. A sensitivity analysis was performed for each scenario by altering the assumptions by ±5%.

As unsealed roads are treated on an annual frequency, they have been removed from the network health analysis and the assumptions not applicable for these segments. The assumptions & sensitivity parameters are tabulated below.

TARGET	Treatment	Effect on Roughness	NRM (reset)	NRM (change)	NRM (change) increase mtce by 50%
	Capital Reconstruction	Resets to as NEW	50	-	
	Reseal (Spray Seal)	Reduces	-	-5	
	Reseal (asphalt)	Reduces	-	-20	
	Heavy Patch	Reduces	-	-10	-15
	Bituminious Maintenance	Reduces / Maintains	-	-1	-1.1
	Sealed Roads (Rural)	(normal deterioration -NRM per Year)	-	3.3	
	Sealed Roads (Urban)	(normal deterioration -NRM per Year)	-	3.3	
	Un-Sealed Roads Overlay	Resets to as NEW	-	-	
	Unsealed Roads (Rural)	(normal deterioration -NRM per Year)	-	0	
	Unsealed Roads (Urban)	(normal deterioration -NRM per Year)	-	0	
	Rigid	(normal deterioration -NRM per Year)	-	1.3	

TARGET -5%	Treatment	Effect on Roughness	NRM (reset)	NRM (change)	NRM (change) increase mtce by 50%
	Capital Reconstruction	Resets to as NEW	47.5	-	
	Reseal (Spray Seal)	Reduces	-	-4.75	
	Reseal (asphalt)	Reduces	-	-19.00	
	Heavy Patch	Reduces	-	-9.50	-14.25
	Bituminious Maintenance	Reduces / Maintains	-	-0.95	-1.05
	Sealed Roads (Rural)	(normal deterioration -NRM per Year)	-	3.17	
	Sealed Roads (Urban)	(normal deterioration -NRM per Year)	-	3.17	
	Un-Sealed Roads Overlay	Resets to as NEW	-	-	
	Unsealed Roads (Rural)	(normal deterioration -NRM per Year)	-	0	
	Unsealed Roads (Urban)	(normal deterioration -NRM per Year)	-	0	
	Rigid	(normal deterioration -NRM per Year)	-	1.19	

TARGET +5%	Treatment	Effect on Roughness	NRM (reset)	NRM (change)	NRM (change) increase mtce by 50%
	Capital Reconstruction	Resets to as NEW	52.5	-	
	Reseal (Spray Seal)	Reduces	-	-5.25	
	Reseal (asphalt)	Reduces	-	-21.00	
	Heavy Patch	Reduces	-	-10.50	-15.75
	Bituminious Maintenance	Reduces / Maintains	-	-1.05	-1.16
	Sealed Roads (Rural)	(normal deterioration -NRM per Year)	-	3.50	
	Sealed Roads (Urban)	(normal deterioration -NRM per Year)	-	3.50	
	Un-Sealed Roads Overlay	Resets to as NEW	-	-	
	Unsealed Roads (Rural)	(normal deterioration -NRM per Year)	-	0	
	Unsealed Roads (Urban)	(normal deterioration -NRM per Year)	-	0	
	Rigid	(normal deterioration -NRM per Year)	-	1.31	

SCENARIO Case # 3: as for S2, BUT channel SRV to (17year cycle) Reseals & Rest to Recon

10 year average Budget = $10,987,690

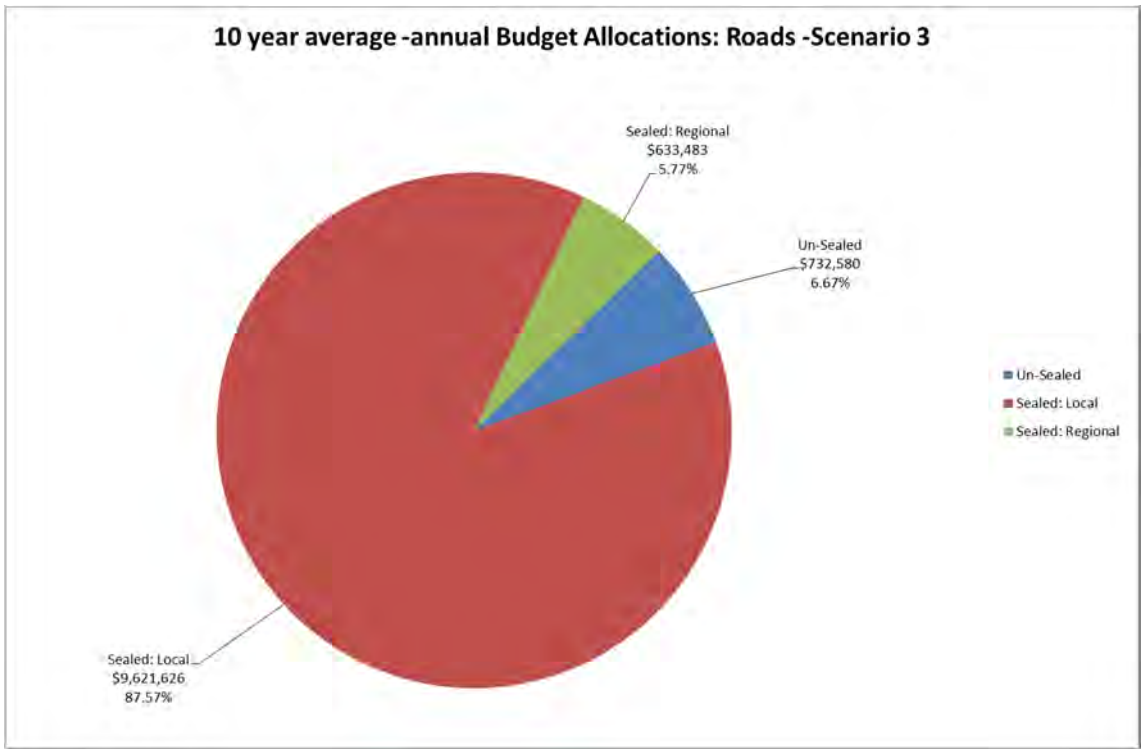
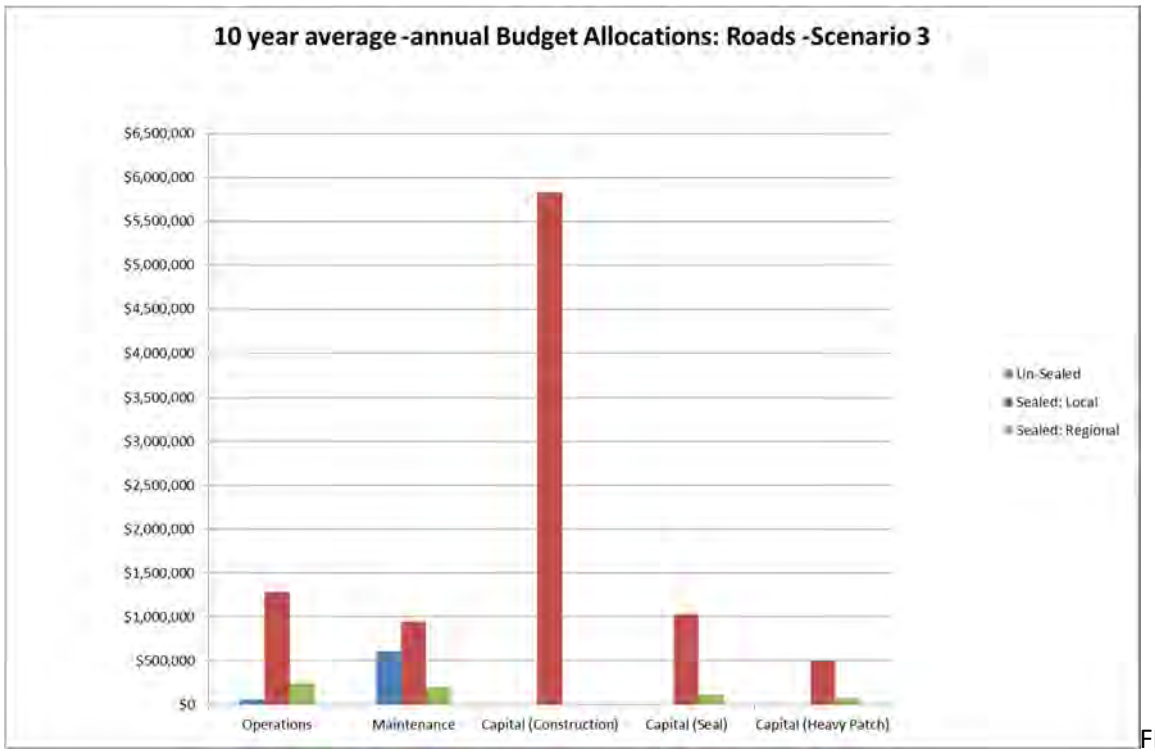


Figure D01: S3 10 Year Average Budget



FIG

Figure D02: S3 10 Year Average Budget

The budgeted 10 year average (without SRV) = $10,108,020 per year
The budgeted 10 year average (with SRV) = $10,987,690 per year

The Cost profiles and the 10 –year average budgets were taken from the LTFP that related to road pavements & wearing courses only. They did also not include Capital budgeted for New Works.

They did not include LTFP budgets from ancilliary transport, or ferry operations, so they do not represent the total Road & Transport LTFP budgets.

Items included for the 10 year averages were,

ROADS AND BRIDGES

LEDGER ACCOUNT	NETWORK	BUDGET ITEMS	AMP	INCOME	OPERATIONS	MAINTENANCE	CAPITAL	TOTAL	2017/18	%	2018/19	2019/20	2020/21	2021/22	2022/23
															ESTIMATED
		OPERATING EXPENSES													
		Urban Roads - Maintenance and Repairs													
32108.3471.0401	Sealed -Local	Urban Roads Reserves Operations	Road & Transport	0%	100%	0%	0%	100%	$65,000	11	$65,000	$66,700	$68,400	$70,200	$72,000
32109.3475.0401	Sealed -Local	Urban Roads Reserves Maintenance	Road & Transport	0%	0%	100%	0%	100%	$34,000	34	$34,000	$34,900	$35,800	$36,700	$37,700
32109.3030.0401	Sealed -Local	Roadside Maintenance Coast Road	Road & Transport	0%	0%	100%	0%	100%	$22,000	15	$22,000	$22,600	$23,200	$23,800	$24,400
32110.3234.0401	Sealed -Local	Urban Roads Operations	Road & Transport	0%	100%	0%	0%	100%	$345,000	9	$345,000	$353,700	$362,600	$371,700	$381,000
32110.3228.0401	Un-Sealed	Urban Unseal Operations	Road & Transport	0%	100%	0%	0%	100%	$30,000	400	$30,000	$30,800	$31,600	$32,400	$33,300
32111.3464.0401	Sealed -Local	Urban Roads Maintenance	Road & Transport	0%	0%	100%	0%	100%	$281,000	(2)	$281,000	$288,100	$295,400	$302,800	$310,400
32258.2302.0401	Sealed -Local	Ballina Bypass Works	Road & Transport	0%	0%	100%	0%	100%	$0	0	$0	$0	$0	$0	$0
		Sealed Rural Roads - Maintenance													
32112.3471.0401	Sealed -Local	Rural Road Reserves Operations	Road & Transport	0%	100%	0%	0%	100%	$435,000	5	$435,000	$445,900	$457,100	$468,600	$480,400
32113.3476.0401	Sealed -Local	Rural Road Reserves Maintenance	Road & Transport	0%	0%	100%	0%	100%	$61,000	(28)	$61,000	$62,600	$64,200	$65,900	$67,600
32114.3460.0401	Sealed -Local	Rural Road Sealed Operations	Road & Transport	0%	100%	0%	0%	100%	$125,000	(12)	$125,000	$128,200	$131,500	$134,800	$138,200
32115.3464.0401	Sealed -Local	Rural Road Sealed Maintenance	Road & Transport	0%	0%	100%	0%	100%	$625,000	0	$625,000	$640,700	$656,800	$673,300	$690,200
		Storm Damage													
32127.8398.0401/32125.3302	Sealed -Local	Natural Disasters	Road & Transport	0%	25%	50%	25%	100%	$0	(100)	$0	$0	$0	$0	$0
		Unsealed Rural Roads - Maintenance													
32118.3460.0401	Un-Sealed	Gravel Roads Operations	Road & Transport	0%	100%	0%	0%	100%	$30,000	105	$30,000	$30,800	$31,600	$32,400	$33,300
32119.3468.0401	Un-Sealed	Gravel Roads Maintenance	Road & Transport	0%	0%	100%	0%	100%	$656,000	19	$656,000	$672,400	$689,300	$706,600	$724,300
		Bridges													
32120.3270.0401		Bridges Rural Sealed	Road & Transport	0%	0%	100%	0%	100%	$22,000	(33)	$22,000	$22,600	$23,200	$23,800	$24,400
		Street Cleaning													
32116.3232.0401	Sealed -Local	Street and Gutter - Street Sweeper	Road & Transport	0%	100%	0%	0%	100%	$298,000	8	$305,500	$313,200	$321,100	$329,200	$337,500
32116.3238.0401	Sealed -Local	Main Street - Cleaning - Alstonville	Road & Transport	0%	100%	0%	0%	100%	$39,000	34	$40,000	$41,000	$42,100	$43,200	$44,300
32116.3239.0401	Sealed -Local	Main Street - Cleaning - Ballina	Road & Transport	0%	100%	0%	0%	100%	$70,000	22	$71,800	$73,600	$75,500	$77,400	$79,400
		Debt Servicing													
32110.0945.0700		Interest on Loans - Urban Roads	Road & Transport	0%	100%	0%	0%	100%	$230,400	(8)	$202,600	$173,400	$143,200	$443,700	$393,000
32120.0945.0700		Interest on Loans - Teven Bridges	Road & Transport	0%	100%	0%	0%	100%	$63,900	(7)	$56,600	$49,200	$41,500	$33,300	$25,000
		Non-Cash Expenses													
32110.0680.0747		Depreciation - Roads and Bridges	Road & Transport	0%	-	-	-	-	$4,915,400	(12)	$5,013,800	$5,114,100	$5,216,400	$5,320,800	$5,427,300
32110.0683.0703		Unwinding of Interest Free Loan NPV	Road & Transport	0%	100%	0%	0%	100%	$71,900	(21)	$51,000	$28,100	$0	$0	$0
32110.0690.0802		Loss on Disposal of Infrastructure Assets	Road & Transport	0%	50%	0%	50%	100%	$0	(100)	$0	$0	$0	$0	$0
		Total Operating Expenses							**$8,419,600**	**(29)**	**$8,472,300**	**$8,592,600**	**$8,710,500**	**$9,190,600**	**$9,323,700**
		Operating Result - Surplus / (Deficit)							**-$7,472,100**	**(27)**	**-$7,940,300**	**-$7,926,400**	**-$8,039,600**	**-$8,515,100**	**-$8,643,300**
		Add Back Depreciation							$4,915,400	(12)	$5,013,800	$5,114,100	$5,216,400	$5,320,800	$5,427,300
		Add Back Unwinding of Interest Free Loan NPV							$71,900	(21)	$51,000	$28,100	$0	$0	$0
		Add Back Loss on Disposal of Infra Assets							$0	(100)	$0	$0	$0	$0	$0
		Cash Result - Surplus / (Deficit)							**-$2,484,800**	**37**	**-$2,875,500**	**-$2,784,200**	**-$2,823,200**	**-$3,194,300**	**-$3,216,000**
		Capital Movements													
		Less Loan Principal Repayments							$1,049,300	3	$1,084,400	$1,170,300	$804,600	$1,262,300	$1,255,900
		Less Transfer to Reserves							$6,638,200	123	$0	$0	$0	$0	$0
		Add Transfer from Reserves							$8,501,000	660	$4,332,000	$17,609,000	$13,962,000	$13,498,000	$355,000
		Add Capital Income Applied							$4,681,300	(12)	$5,682,000	$185,000	$8,528,700	$192,500	$196,400
	Sealed -Local	Less Capital Expenditure	Road & Transport	0%	0%	0%	100%	100%	$10,955,800	36	$14,312,100	$22,564,000	$28,354,400	$19,026,400	$6,120,300
		Cash Result after Capital Movements							**-$7,945,800**	**8**	**-$8,258,000**	**-$8,724,500**	**-$9,491,500**	**-$9,794,500**	**-$10,040,800**

ROADS AND MARITIME SERVICES

LEDGER ACCOUNT	NETWORK	BUDGET ITEMS	AMP	INCOME	OPERATIONS	MAINTENANCE	CAPITAL	TOTAL	2017/18	%	2018/19	2019/20	2020/21	2021/22	2022/23
														ESTIMATED	
		OPERATING EXPENSES													
		State Highways Routine Maintenance													
32255.5130.0401	Sealed -Regional	State Highways Routine Maintenance	Road & Transport	0%	0%	100%	0%	100%	$0	0	$0	$0	$0	$0	$0
		State Highway Ordered Work													
32220.5099.0401	Sealed -Regional	RMCC Contract Ordered Work	Road & Transport	0%	0%	50%	50%	100%	$0	0	$0	$0	$0	$0	$0
		Regional Roads M & I													
32250.4233.0401	Sealed -Regional	Regional Roads Signs & Lines	Road & Transport	0%	0%	100%	0%	100%	$0	0	$0	$0	$0	$0	$0
32240.3460.0401	Sealed -Regional	Regional Road 545 Operations	Road & Transport	0%	100%	0%	0%	100%	$70,000	(56)	$102,500	$105,100	$107,800	$110,500	$113,300
32240.5120.0401	Sealed -Regional	Regional Road 545 Operations	Road & Transport	0%	100%	0%	0%	100%	$0	0	$0	$0	$0	$0	$0
32241.3464.0401	Sealed -Regional	Regional Road 545 Maintenance	Road & Transport	0%	0%	100%	0%	100%	$60,000	164	$88,200	$90,500	$92,800	$95,200	$97,600
32242.3460.0401	Sealed -Regional	Regional Road 7734 Operations	Road & Transport	0%	100%	0%	0%	100%	$70,000	(26)	$102,500	$105,100	$107,800	$110,500	$113,300
32243.3464.0401	Sealed -Regional	Regional Road 7734 Maintenance	Road & Transport	0%	0%	100%	0%	100%	$60,000	67	$88,200	$90,500	$92,800	$95,200	$97,600
32248.3460.0401	Sealed -Regional	Regional Road 7735 Operations	Road & Transport	0%	100%	0%	0%	100%	$40,000	17	$56,400	$57,900	$59,400	$60,900	$62,500
32249.3464.0401	Sealed -Regional	Regional Road 7735 Maintenance	Road & Transport	0%	0%	100%	0%	100%	$30,000	9	$41,000	$42,100	$43,200	$44,300	$45,500
32251.3460.0401	Sealed -Regional	Regional Road 695 Operations	Road & Transport	0%	100%	0%	0%	100%	$72,000	(65)	$97,400	$99,900	$102,400	$105,000	$107,700
32252.3464.0401	Sealed -Regional	Regional Road 695 Maintenance	Road & Transport	0%	0%	100%	0%	100%	$60,000	(21)	$61,500	$63,100	$64,700	$66,400	$68,100
32250.5126.0401		Traffic Facilities	Road & Transport	0%	0%	100%	0%	100%	$124,000	(52)	$127,100	$130,300	$133,600	$137,000	$140,500
32254.5578.0401		MR7734 Howards Bridge	Road & Transport	0%	0%	100%	0%	100%	$0	(100)	$0	$0	$0	$0	$0
		Total Operating Expenses							**$586,000**	**(36)**	**$764,800**	**$784,500**	**$804,500**	**$825,000**	**$846,100**
		Operating Result - Surplus / (Deficit)							**$160,000**	**82**	**$0**	**$0**	**$0**	**$0**	**$0**
		Cash Result - Surplus / (Deficit)							**$160,000**	**82**	**$0**	**$0**	**$0**	**$0**	**$0**
		Capital Movements													
		Less Loan Principal Repayments							$0	0	$0	$0	$0	$0	$0
		Less Transfer to Reserves							$0	0	$0	$0	$0	$0	$0
		Add Transfer from Reserves							$0	(100)	$0	$0	$0	$0	$0
		Add Capital Income Applied							$0	0	$0	$0	$0	$0	$0
	Sealed -Regional	Less Capital Expenditure	Road & Transport	0%	0%	0%	100%	100%	$160,000	(40)	$0	$0	$0	$0	$0
		Cash Result after Capital Movements							**$0**	**(100)**	**$0**	**$0**	**$0**	**$0**	**$0**

Asset Description				Expenditure Year 2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28
Roads																
Roads - Reconstruction Program	Various		see breakup	$6,596,000	$5,841,700	$7,444,400	$2,207,000	$2,245,000	$2,739,700	$1,956,700	$2,309,400	$2,480,500	$2,812,500	$3,572,800	$3,765,400	$3,769,700
Roads - Airport Boulevard	Various		see breakup		$40,600	$100,000	$6,900,000									
Roads - Roads to Recovery	Various		see breakup		$900,000	$900,000	$492,000	$634,000	$646,700	$659,700	$672,900	$686,400	$700,200	$714,300	$728,600	$743,200
Roads - LRM Dividend			see breakup			$0	$0	$0	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000
Roads - SRV			see breakup			$389,600	$711,100	$900,000	$900,000	$923,000	$946,000	$970,000	$994,000	$1,019,000	$1,044,000	$1,070,000
Urban Roads - Bitumen Reseals	Various		see breakup	$318,600	$275,500	$324,000	$337,000	$350,000	$359,000	$368,000	$377,000	$386,000	$396,000	$406,000	$416,000	$426,000
Rural Roads - Bitumen Reseals	Various		see breakup	$320,600	$291,900	$314,000	$327,000	$340,000	$349,000	$358,000	$367,000	$376,000	$385,000	$395,000	$405,000	$415,000
Urban Roads - Heavy Patching	Various		see breakup	$277,000	$212,600	$380,800	$356,000	$370,000	$379,000	$388,000	$398,000	$408,000	$418,000	$428,000	$439,000	$450,000
Rural Roads - Heavy Patching	Various		see breakup	$175,500	$133,800	$218,900	$182,000	$189,000	$194,000	$199,000	$204,000	$209,000	$214,000	$219,000	$224,000	$230,000
Bypass Funds - Alstonville			see breakup	$44,700		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bypass Funds - Ballina			see breakup	$199,700	$70,700	$227,400	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Bypass Funds - T2E			see breakup			$355,000										
River St - Moon to Grant							$2,500,000									
Lake Ainsworth Upgrades			see breakup	$262,500	$42,200	$53,600										
S 94 - River / Moon Sts Roundabout			see breakup	$473,800												
S 94 - Hutley Drive			see breakup		$42,100	$50,600	$0	$17,224,000								
S 94 - River St - Four Lanes			see breakup						$15,614,000							
S 94 - River St - Four Lanes Bridge			see breakup						$6,195,000							
S 94 - River St - Four Lanes Land			see breakup						$155,000							
S 94 - Tamarind Dr - Four Lanes			see breakup							$8,556,000						
S 94 - Tamarind Dr - Bridge			see breakup							$4,786,000						
S 94 - Heavy Vehicles			see breakup		$354,600	$184,000	$192,000	$200,000	$208,000	$216,000	$225,000	$234,000	$243,000	$382,000	$392,000	$402,000
Sub-Total -Roads				**$8,668,400**	**$8,205,700**	**$10,942,300**	**$14,204,100**	**$22,452,000**	**$28,239,400**	**$18,910,400**	**$5,999,300**	**$6,249,900**	**$6,662,700**	**$7,636,100**	**$7,914,000**	**$8,005,900**
(Reseals)						$638,000	$664,000	$690,000	$708,000	$726,000	$744,000	$762,000	$781,000	$801,000	$821,000	$841,000
(Heavy Patch)						$599,700	$538,000	$559,000	$573,000	$587,000	$602,000	$617,000	$632,000	$647,000	$663,000	$680,000
(Reconstruction)						$9,137,600	$5,391,000	$3,079,000	$4,094,400	$3,332,400	$3,707,300	$3,900,900	$4,255,700	$5,169,100	$5,386,000	$5,414,900
(NEW)						$177,400	$6,900,000	$17,224,000	$21,964,000	$13,342,000	$0	$0	$0	$0	$0	$0
(SRV)						$389,600	$711,100	$900,000	$900,000	$923,000	$946,000	$970,000	$994,000	$1,019,000	$1,044,000	$1,070,000
						$10,942,300	**$14,204,100**	**$22,452,000**	**$28,239,400**	**$18,910,400**	**$5,999,300**	**$6,249,900**	**$6,662,700**	**$7,636,100**	**$7,914,000**	**$8,005,900**
Bridges	Various		see breakup	$96,000	$89,900	$173,500	$108,000	$112,000	$115,000	$118,000	$121,000	$124,000	$127,000	$130,000	$133,000	$136,000
Sub-Total -Bridges				**$96,000**	**$89,900**	**$173,500**	**$108,000**	**$112,000**	**$115,000**	**$118,000**	**$121,000**	**$124,000**	**$127,000**	**$130,000**	**$133,000**	**$136,000**
Total - Roads and Bridges				**$8,764,400**	**$8,295,600**	**$11,115,800**	**$14,312,100**	**$22,564,000**	**$28,354,400**	**$19,028,400**	**$6,120,300**	**$6,373,900**	**$6,789,700**	**$7,766,100**	**$8,047,000**	**$8,141,900**

TABLE D01

The S94 & Airport Boulevard capital works budgets (in yellow hi-light above) were NOT included in the budget charts or analysis as they would not affect the current asset base condition & thought to be fixed future costs.

SCENARIO Case # 3: Roughness CHARTS

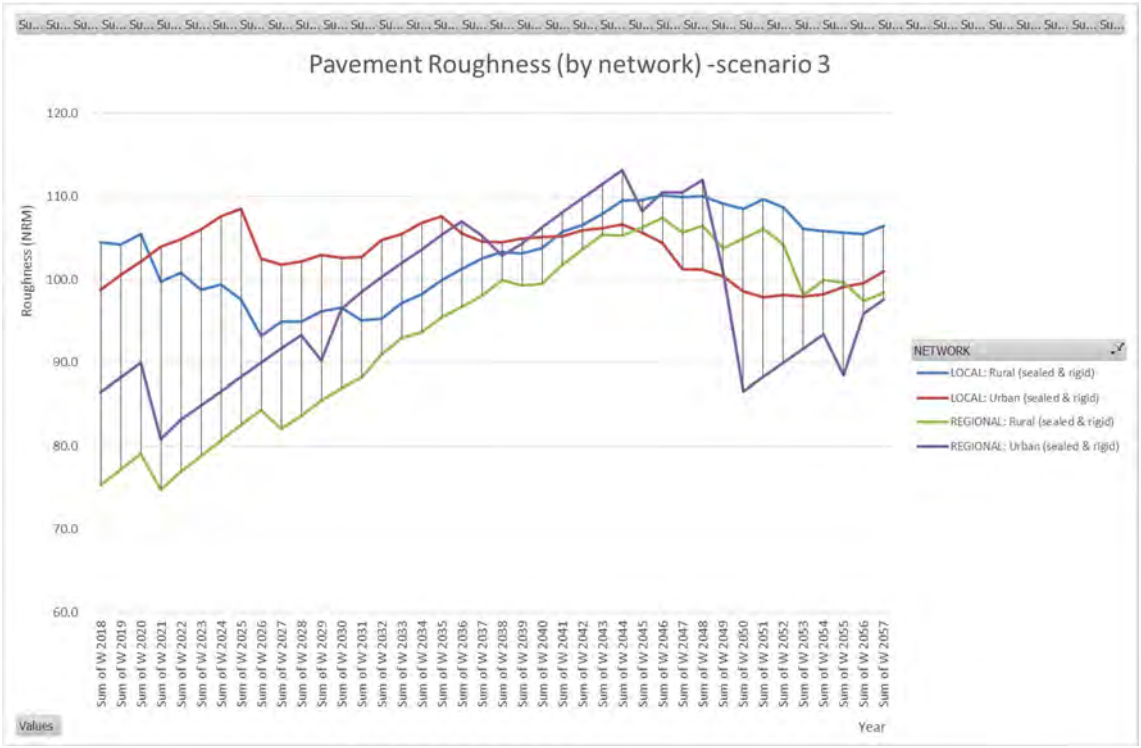


FIG D03: S3 Roughness Profiles

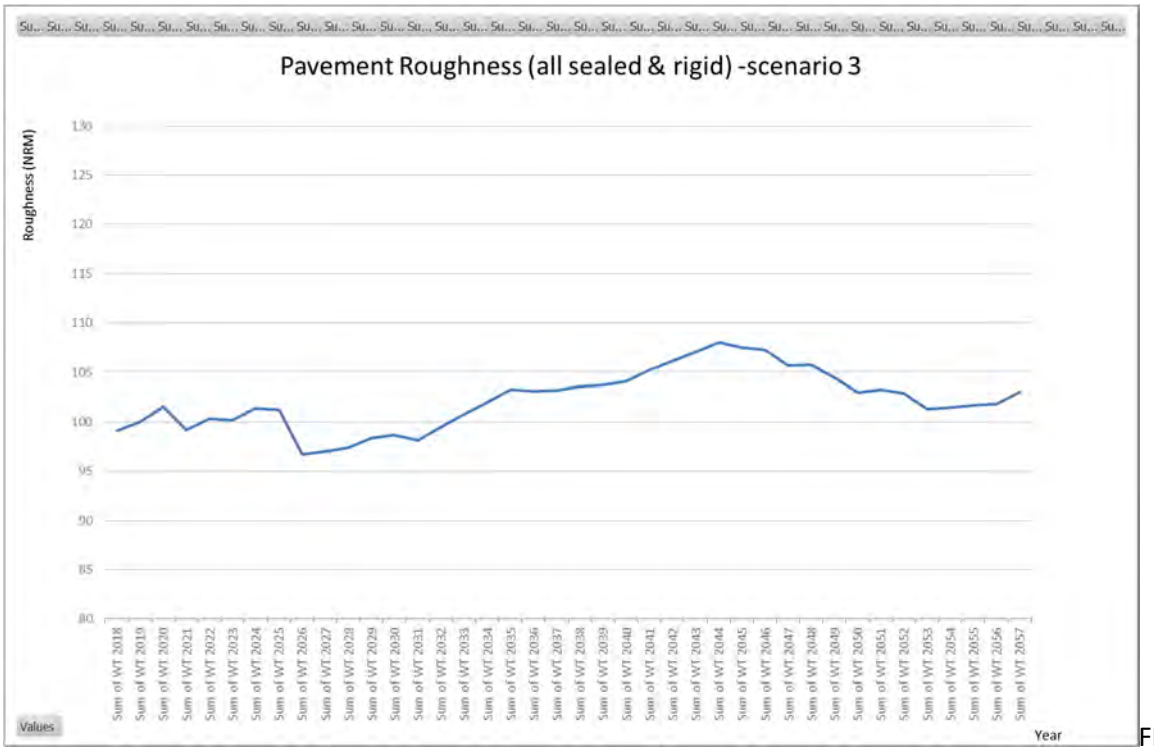


FIG D04: S3 Roughness Profile (ALL Sealed & Rigid)

SCENARIO Case # 3: Sensitivity

Sensitivity	ROUGHNESS Value (over 40 years)	LOCAL: Rural (sealed & rigid)	LOCAL: Urban (sealed & rigid)	REGIONAL: Rural (sealed & rigid)	REGIONAL: Urban (sealed & rigid)	SHIRE WIDE (sealed & rigid)
TARGET	**Average**	103.0	103.1	93.9	97.5	102.2
	Minimum	93.2	97.9	74.8	80.9	96.7
	Maximum	110.1	108.6	107.5	113.2	108.0
TARGET +5%	**Average**	105.8	105.6	96.5	99.9	104.8
	Minimum	94.8	99.2	75.8	81.9	98.2
	Maximum	113.9	110.0	110.9	116.1	111.3
TARGET -5%	**Average**	100.3	100.6	91.4	95.2	99.6
	Minimum	91.5	94.1	73.8	79.9	95.2
	Maximum	106.4	107.4	104.0	110.2	104.6

TABLE D02

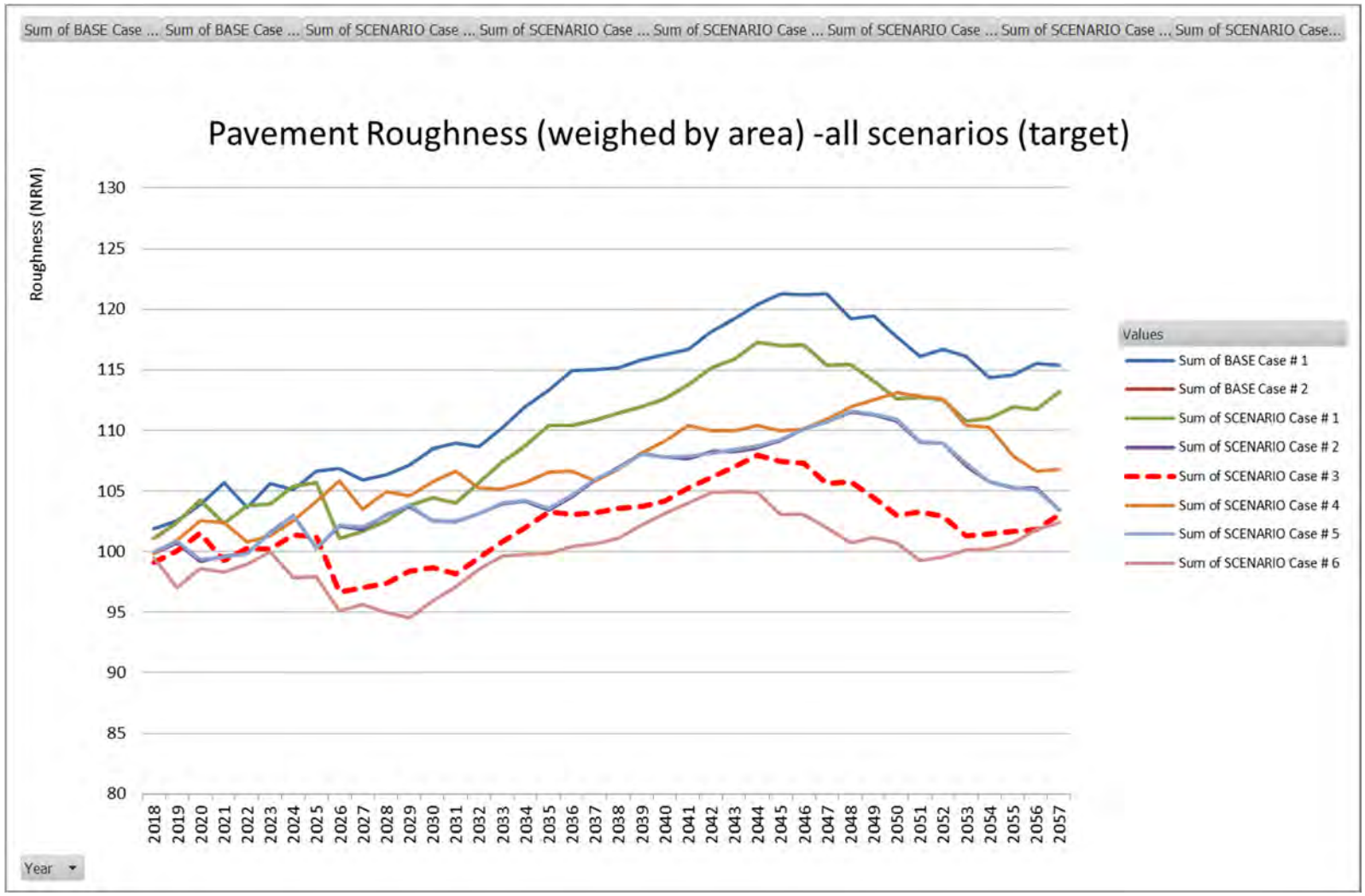


FIG D05: Roughness Profiles using target treatment effect assumptions (all scenarios)

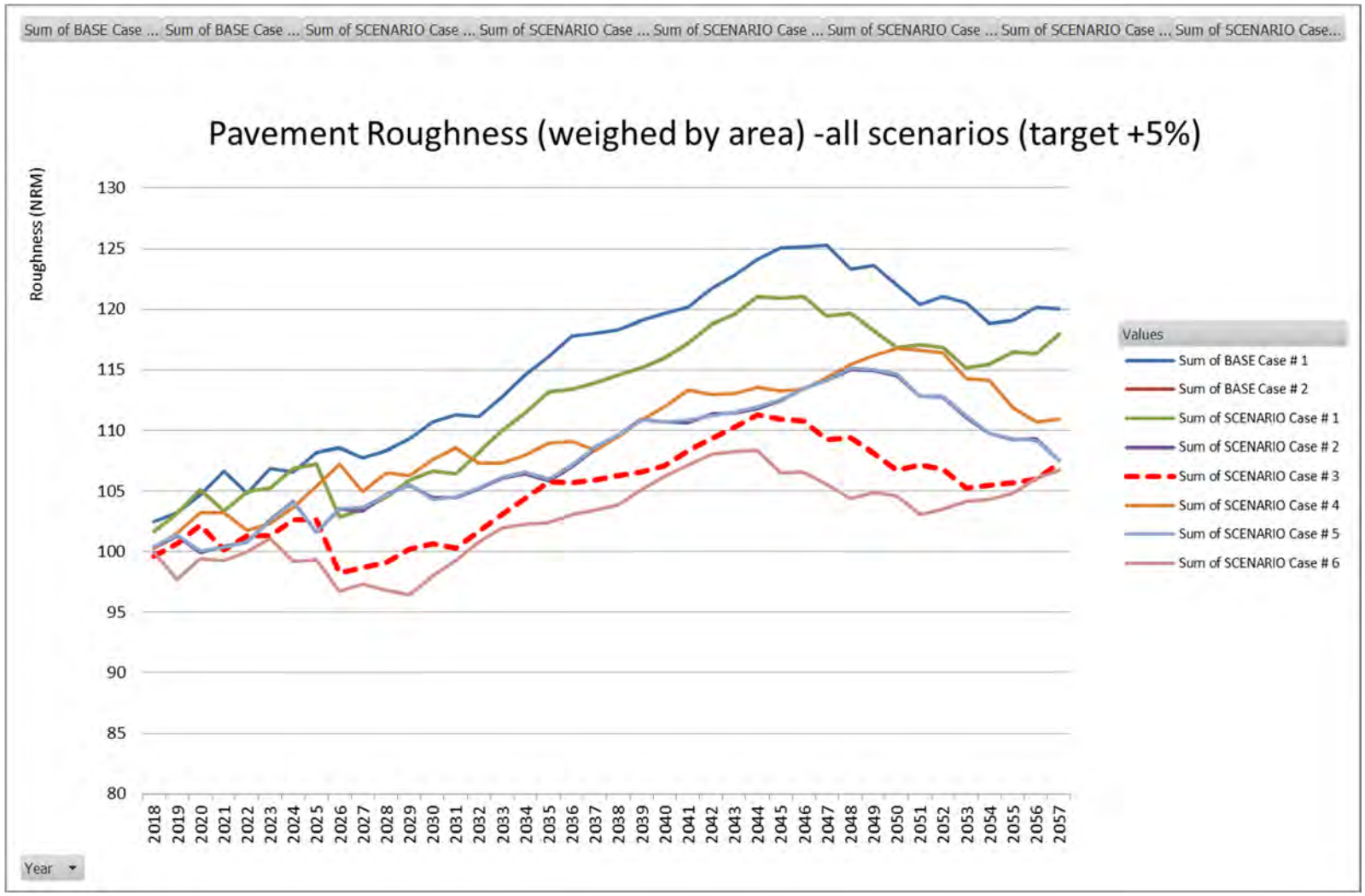


FIG D06: Roughness Profiles using target treatment effect assumptions +5% (all scenarios)

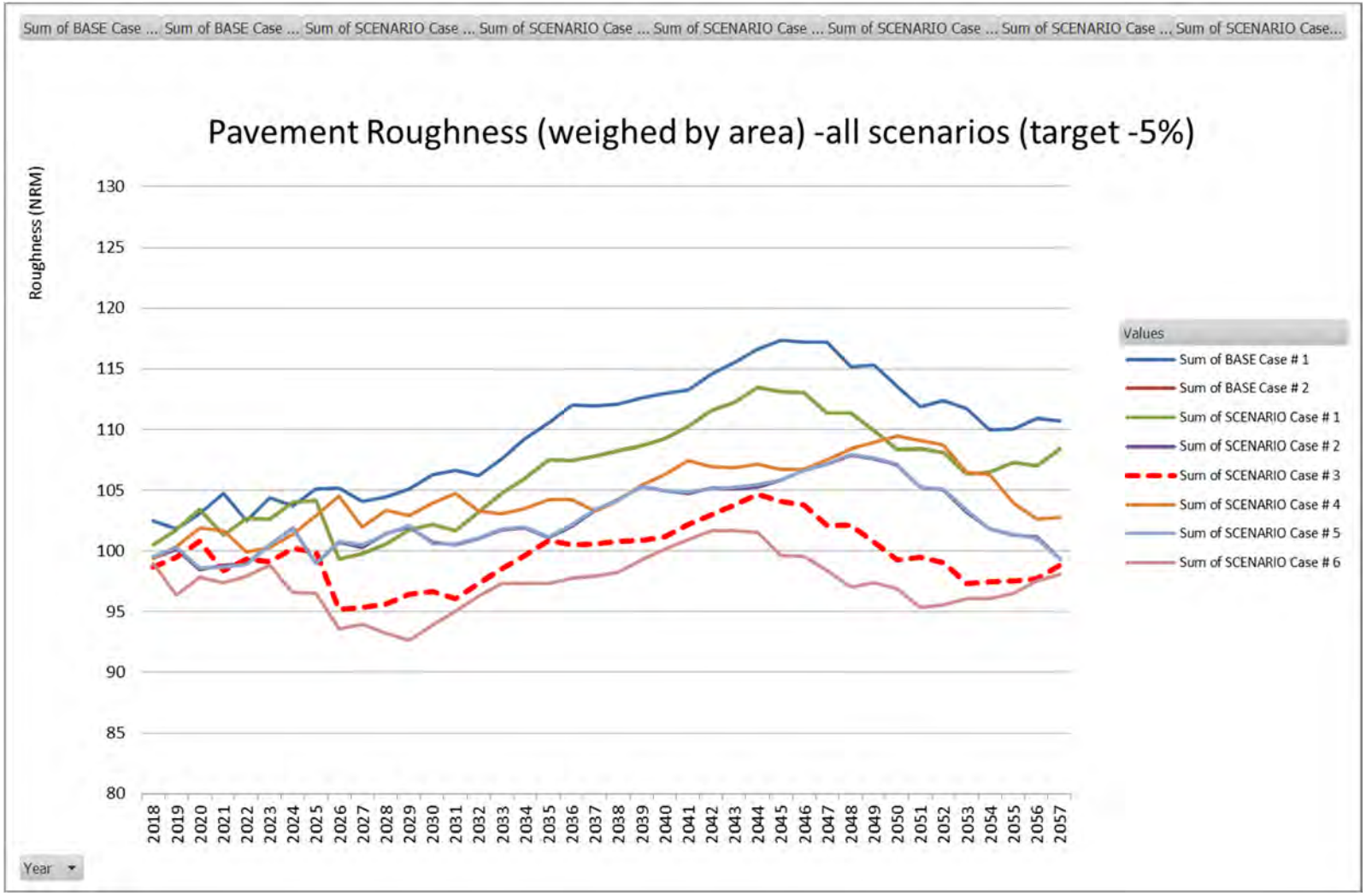


FIG D07: Roughness Profiles using target treatment effect assumptions -5% (all scenarios)

Appendix E Unsealed road assessment & scoring system for seal upgrade (2018)

Following a series of reports to the Finance committee & to Council Ordinary meeting during 2017 & 2018, it was resolved that Council investigate / consider options to amend the current roads program to incorporate a rural road upgrade program and the assessment to give consideration to any possible long-term impacts on the road management strategy associated with these options. The assessment was to include the definition of project priorities based on an agreed weighted criteria assessment to work within the pavement assessment model.

Section One: Dust Sealing Priority Criteria

The World Bank Roads and Rural Transport Thematic Group developed the 'Surfacing Alternatives for Unsealed Rural Roads' transport note in May 2006.

This is summarised below, with slight modifications to reflect Council's situation. The criteria involve the rating of five socio-economic factors and three physical factors as per Tables E1 and E2. These factors are dissected into different impact levels, and for each level a score is assigned and the total provides the overall score.

The value of the overall score indicates whether the unsealed site is suitable for dust sealing. The higher the score the greater the demand for a dust seal treatment. The outcomes of a criteria assessment can also be used to determine priority rankings for projects.

Table E1: Socio-Economic Factors (for unsealed road assessment)

SOCIO-ECONOMIC FACTORS		
(Non Motorised Transport) DEMAND FOR SURFACING		
Factor	**Score**	**Weighting**
1: Animal or NMT with low volume (NMT < 50 per day)	1	12.5%
3: NMT with medium volume (50 < NMT < 250)	3	
5: NMT with high volume (NMT > 250 per day)	5	
MOTORIZED TRAFFIC VOLUME		
Factor	**Score**	**Weighting**
1: Low Traffic (ADT < 50 per day)	1	12.5%
3: Medium Traffic (50 < ADT < 200 per day)	3	
5: High Traffic (ADT >200 per day)	5	
IMPACT OF DUST FORMING		
Factor	**Score**	**Weighting**
1: Slight	1	12.5%
3: Medium	3	
5: Severe	5	
TRAFFIC INCREASE AFTER SEALING		
Factor	**Score**	**Weighting**
1: Unlikely	1	12.5%
3: Some	3	
5: Likely	5	
AVAILABILITY OF QUALITY MATERIAL		
Factor	**Score**	**Weighting**
0: Available and short hauling distance	0	12.5%
3: Available but distance > 10km	3	
5: Material is scarce or depleted	5	

Table E2: Physical Factors (for unsealed road assessment)

PHYSICAL FACTORS		
TOPGRAPHY (grade)		
Factor	**Score**	**Weighting**
0: Flat or Undulating area (< 4%)	0	12.5%
2: Undulating to Hilly area (4 - 8%)	2	
4: Hilly to Mountainous area (8 - 14%)	4	
5: Mountainous area (> 14%)	5	
CLIMATE & SOIL CONDITIONS		
Factor	**Score**	**Weighting**
0: Soils suitable for weather & traffic	0	12.5%
3: Soils suitable for weather if treated	3	
5: Soils predominantly unsuitable	5	
SEAL IMPACT ON SURROUNDING SEGMENTS		
Factor	**Score**	**Weighting**
1: Proposed Seal will create 'Island' Seal in Existing	1	12.5%
3: Proposed Seal will be encompass > 50% of unsealed length	3	
5: Proposed Seal Removes Unsealed Gap in Existing	5	

Total scores range from 5 to 30, where 30 represents a maximum need to upgrade an unsealed road and 5 a minimum need.

The World Bank note also provides advice about the minimum score for a road to be considered for surfacing and the scoring depends on the level of development of the infrastructure within a country where the assessment is being made.

The recommended minimum scores for different national development levels are presented in Table E3 below

Table E3: Score System for Upgrading Unsealed Roads to Surfaced Roads

Unsealed Road Network	**Minimum Score**	**Minimum (weighted) Score**
Developed Countries / Stable Funding Regimes	12 to 15	1.50 to 1.88
Developing Countries / Uncertain Funding Regimes	16 to 20	1.88 to 2.50
Severely Under Funded Networks	21 to 30	2.50 to 3.75

For the purposes of this assessment, we have used the ‘developed countries / stable funding regime’ criteria.

It is likely this type of analysis is more suited to national governments considering their strategic infrastructure plans and funding levels. Nonetheless, Table E3 is helpful for establishing a clear boundary which roads are included in the priority assessment process, as it is not practical to include all roads due to the unrealistic size of the program that would create.

The criteria has been applied to the 28 candidate unsealed roads identified in the previous Council report. The results are outlined in Table E4 below. Using this process 23 of the candidate unsealed roads met the world-bank criteria as defined for a ‘stable funding regime’.

The roads selected under that analysis remain the recommended priority for Council (due to the reduced overall maintenance costs). Funding for a wider program is not recommended based on the findings explained in section two below.

The recommendation to this report suggests Council adopt the criteria and assessment outcomes so that the community is aware of Council's current preference should grant or other funds become available. Adopting the program allows the community to see an outcome of this review.

Item	Road	Suburb	Length	Physical Factors		
				Topography	Climate and Soil Conditions	Impact on Surrounding Segments
1	Converys Lane (10:080)	RURAL -McLeans Ridge	519	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
2	Scanlon Lane (10:036)	RURAL -Knockrow	670	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
3	Houghlahans Creek Road (10:170)	RURAL -Pearces Creek	2491	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	5: Proposed Seal Removes Unsealed Gap in Existing
4	Ingrams Road (10:056)	RURAL -Teven	701	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
5	Leadbeatters Lane (10:072)	RURAL -Tuckombil	1341	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
6	Whites Lane (10:096)	RURAL -Rous	2368	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
7	Rishworths Lane (10:014)	RURAL -Brooklet	988	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
8	Shaws Lane (10:069)	RURAL -Tuckombil	780	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
9	Laws Lane (10:107)	RURAL -Rous Mill	537	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
10	Grays Lane (10:094)	RURAL -Lynwood	340	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
11	Alstonvale Road (10:076)	RURAL -Alstonvale	572	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
12	Chesworths Lane (10:099)	RURAL -Rous	1436	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
13	Weis Lane (10:097)	RURAL -Rous	848	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
14	Phillips Road (10:007)	RURAL -Newrybar	1019	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
15	Cumbalum Road (10:041)	RURAL -Cumbalum	1726	0: Flat or Undulating area (< 4%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
16	Martins Lane -east (10:023)	RURAL -Knockrow	1108	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
17	Howards Road (10:070)	RURAL -Tuckombil	1368	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
18	Sandy Flat Road (10:046)	RURAL -Tintenbar	2004	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
19	Eyears Road (10:078)	RURAL -McLeans Ridge	844	0: Flat or Undulating area (< 4%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
20	Fosters Lane (10:115)	RURAL -Dalwood	595	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
21	Behs Lane (10:091)	RURAL -Lynwood	543	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
22	Victoria Park Road (10:051)	RURAL -Dalwood	806	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
23	Gap Road (10:102)	RURAL -Tuckombil	2591	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
24	Newports Lane (10:088)	RURAL -Uralba	752	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
25	UNL off Pacific Parade to Camp Drew (30:014)	RURAL -Lennox Head	1609	0: Flat or Undulating area (< 4%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
26	Hill Street (10:045)	RURAL -Tintenbar	500	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
27	Coolgardie Road (10:149)	RURAL -Coolgardie	2391	4: Hilly to Mountainous area (8 - 14%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
28	O'Keefes Lane (10:151)	RURAL -Patches Beach	350	0: Flat or Undulating area (< 4%)	0: Soils suitable for weather & traffic	3: Proposed Seal will be encompass > 50% of unsealed length
3A	Houghlahans Creek Road (10:170:080)	RURAL -Pearces Creek	296	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	5: Proposed Seal Removes Unsealed Gap in Existing
3B	Houghlahans Creek Road (10:170:130)	RURAL -Pearces Creek	330	2: Undulating to Hilly area (4 - 8%)	0: Soils suitable for weather & traffic	5: Proposed Seal Removes Unsealed Gap in Existing

Table E4.1: Unsealed road assessments for dust sealing treatment (using World Bank Model) –Physical Factors

Item	Road	Suburb	Length	Socio-Economic Factors				
				Non Motorised Traffic Demand for Surfacing	Motorised Traffic Volume	Impact of Dust Forming	Traffic Increase After Sealing	Availability of Quality Material for Unsealed Overlays
1	Converys Lane (10:080)	RURAL -McLeans Ridge	519	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
2	Scanlon Lane (10:036)	RURAL -Knockrow	670	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
3	Houghlahans Creek Road (10:170)	RURAL -Pearces Creek	2491	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	5: Severe	3: Some	0: Available and short hauling distance
4	Ingrams Road (10:056)	RURAL -Teven	701	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
5	Leadbeatters Lane (10:072)	RURAL -Tuckombil	1341	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
6	Whites Lane (10:096)	RURAL -Rous	2368	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
7	Rishworths Lane (10:014)	RURAL -Brooklet	988	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
8	Shaws Lane (10:069)	RURAL -Tuckombil	780	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
9	Laws Lane (10:107)	RURAL -Rous Mill	537	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
10	Grays Lane (10:094)	RURAL -Lynwood	340	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
11	Alstonvale Road (10:076)	RURAL -Alstonvale	572	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
12	Chesworths Lane (10:099)	RURAL -Rous	1436	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
13	Weis Lane (10:097)	RURAL -Rous	848	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
14	Phillips Road (10:007)	RURAL -Newrybar	1019	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
15	Cumbalum Road (10:041)	RURAL -Cumbalum	1726	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
16	Martins Lane -east (10:023)	RURAL -Knockrow	1108	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
17	Howards Road (10:070)	RURAL -Tuckombil	1368	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
18	Sandy Flat Road (10:046)	RURAL -Tintenbar	2004	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
19	Eyears Road (10:078)	RURAL -McLeans Ridge	844	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
20	Fosters Lane (10:115)	RURAL -Dalwood	595	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
21	Behs Lane (10:091)	RURAL -Lynwood	543	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
22	Victoria Park Road (10:051)	RURAL -Dalwood	806	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
23	Gap Road (10:102)	RURAL -Tuckombil	2591	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
24	Newports Lane (10:088)	RURAL -Uralba	752	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
25	UNL off Pacific Parade to Camp Drew (30:014)	RURAL -Lennox Head	1609	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
26	Hill Street (10:045)	RURAL -Tintenbar	500	1: Animal or NMT with low volume (NMT < 50 per day)	1: Low Traffic (ADT < 50 per day)	3: Medium	1: Unlikely	0: Available and short hauling distance
27	Coolgardie Road (10:149)	RURAL -Coolgardie	2391	1: Animal or NMT with low volume (NMT < 50 per day)	5: High Traffic (ADT >200 per day)	5: Severe	3: Some	3: Available but distance > 10km
28	O'Keefes Lane (10:151)	RURAL -Patches Beach	350	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	3: Medium	1: Unlikely	3: Available but distance > 10km
3A	Houghlahans Creek Road (10:170:080)	RURAL -Pearces Creek	296	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	5: Severe	3: Some	0: Available and short hauling distance
3B	Houghlahans Creek Road (10:170:130)	RURAL -Pearces Creek	330	1: Animal or NMT with low volume (NMT < 50 per day)	3: Medium Traffic (50 < ADT < 200 per day)	5: Severe	3: Some	0: Available and short hauling distance

Table E4.2: Unsealed road assessments for dust sealing treatment (using World Bank Model) –Socio-Economic Factors

Item	Road	Suburb	Length	TOTAL	TOTAL (weighted)	RANKING	Stable Funding Regime Rating
1	Converys Lane (10:080)	RURAL -McLeans Ridge	519	16	2	7	consider
2	Scanlon Lane (10:036)	RURAL -Knockrow	670	16	2	7	consider
3	Houghlahans Creek Road (10:170)	RURAL -Pearces Creek	2491	21	2.625	2	consider
4	Ingrams Road (10:056)	RURAL -Teven	701	11	1.375	29	-
5	Leadbeatters Lane (10:072)	RURAL -Tuckombil	1341	15	1.875	17	consider
6	Whites Lane (10:096)	RURAL -Rous	2368	16	2	7	consider
7	Rishworths Lane (10:014)	RURAL -Brooklet	988	16	2	7	consider
8	Shaws Lane (10:069)	RURAL -Tuckombil	780	15	1.875	17	consider
9	Laws Lane (10:107)	RURAL -Rous Mill	537	16	2	7	consider
10	Grays Lane (10:094)	RURAL -Lynwood	340	14	1.75	20	consider
11	Alstonvale Road (10:076)	RURAL -Alstonvale	572	16	2	7	consider
12	Chesworths Lane (10:099)	RURAL -Rous	1436	16	2	7	consider
13	Weis Lane (10:097)	RURAL -Rous	848	16	2	7	consider
14	Phillips Road (10:007)	RURAL -Newrybar	1019	18	2.25	5	consider
15	Cumbalum Road (10:041)	RURAL -Cumbalum	1726	14	1.75	20	consider
16	Martins Lane -east (10:023)	RURAL -Knockrow	1108	18	2.25	5	consider
17	Howards Road (10:070)	RURAL -Tuckombil	1368	13	1.625	26	-
18	Sandy Flat Road (10:046)	RURAL -Tintenbar	2004	11	1.375	29	-
19	Eyears Road (10:078)	RURAL -McLeans Ridge	844	12	1.5	28	-
20	Fosters Lane (10:115)	RURAL -Dalwood	595	16	2	7	consider
21	Behs Lane (10:091)	RURAL -Lynwood	543	16	2	7	consider
22	Victoria Park Road (10:051)	RURAL -Dalwood	806	14	1.75	20	consider
23	Gap Road (10:102)	RURAL -Tuckombil	2591	15	1.875	17	consider
24	Newports Lane (10:088)	RURAL -Uralba	752	14	1.75	20	consider
25	UNL off Pacific Parade to Camp Drew (30:014)	RURAL -Lennox Head	1609	14	1.75	20	consider
26	Hill Street (10:045)	RURAL -Tintenbar	500	13	1.625	26	-
27	Coolgardie Road (10:149)	RURAL -Coolgardie	2391	24	3	1	consider
28	O'Keefes Lane (10:151)	RURAL -Patches Beach	350	14	1.75	20	consider
3A	Houghlahans Creek Road (10:170:080)	RURAL -Pearces Creek	296	19	2.375	3	consider
3B	Houghlahans Creek Road (10:170:130)	RURAL -Pearces Creek	330	19	2.375	3	consider

Table E4.3: Unsealed road assessments for dust sealing treatment (using World Bank Model) –Socio-Economic Factors

Appendix F Network effect: movement of capital renewal to dust-sealing (2018)

A resolution from the finance committee meeting held 14 March, 2018 necessitated a comparative analysis into long term road network health (pavement roughness) under a number of maintenance and capital funding distributions under our current long-term budgets.

Council wished to know what the likely effect on our road network health (determined by roughness) from the movement of a range of budgets from the existing capital renewals budget to a proposed unsealed road upgrade program.

Long-term effects of transferring funds for Dust Sealing

The following information examines the effects on network health in terms of roughness, if we transfer funds from existing budgets to a dust sealing program that will continue for the life of the analysis (40 years). Roughness, which has a technical definition and can be measured, is the preferred strategic indicator for overall road condition.

The purpose of this analysis is to enable Council to determine if, on balance, it is preferred to focus only on renewal and rehabilitation, as per the current road asset management plan, or allocate some funds for improvements so that social and environmental benefits can be achieved from a dust sealing program.

Analyses were performed for five different funding amounts, being potential budget amounts to be reallocated from renewal spending to dust sealing. The scenarios tested were,

- Budget A: $0 pa (no money transferred to dust seal program)
- Budget B: $200,000 pa
- Budget C: $300,000 pa
- Budget D: $400,000 pa
- Budget E: $500,000 pa

The analysis seeks to answer is there an acceptable level of permanent budget transfer where roughness is affected to an unacceptable degree in respect of long term of network health and levels of service.

Results

The results are in the form of:

1. Average 10-year budget distributions for each road network class
2. Roughness profiles per road network type
3. Roughness profile in total for all sealed and rigid roads

The outcome of this modelling is shown in figures F01 to F20 below.

Figure F16 is however the key piece of information as it provides the results for a combination of all road network types.

In summary, the inclusion of the dust sealing program and the resulting decrease in capital spending has the effect of increasing network roughness over the 40 year analysis period by 1 to 1.2 NRM (roughness meter counts) per $100,000 per annum transferred from the capital budget. NRM is explained further below.

This equates to approximately a 2% increase in average network roughness per $100,000 of reallocated capital funds.

The RMS Test Method T182 & the AUSTROADS Pavement Evaluation & Treatment Guide both recommend a pavement condition profiles and terminal roughness indicators based on road function, and advocate a terminal roughness of 150 NRM for major (local) roads and 175 NRM for minor (local) roads. Council has adopted the following roughness profiles within our road hierarchy.

Table F01 – NRM (Roughness Meter Counts) Values

	Roughness NRM	
Descriptive Condition	Local Roads (major)	Local Roads (minor)
Excellent	<60	<60
Very Good	61 - 90	61 - 100
Good	191- 120	101 - 140
Poor	121- 150	141 - 175
Very Poor	>150	>175
NAASRA Classes	N2, N3, N6, N7	N4, N5, N8, N9

These condition ratings are sourced from an industry recognised guideline.

It is important to note this technical rating of level service may not align with the community perceptions of road condition as we do not normally describe our roads as poor, as they do provide a high level of service.

The purpose of undertaking this action will assist to;

- enable staff and Councillors to respond to the regular submissions for road sealing by explaining a formal policy and whole of network strategy position of Council has been developed by this review

- we can monitor road condition and asset ratios and adjust the road strategy if compliance with the above benchmarks are achieved in the future

- we have a policy and information to support any grant applications that are specific assistance for converting unsealed roads to sealed surfaces.

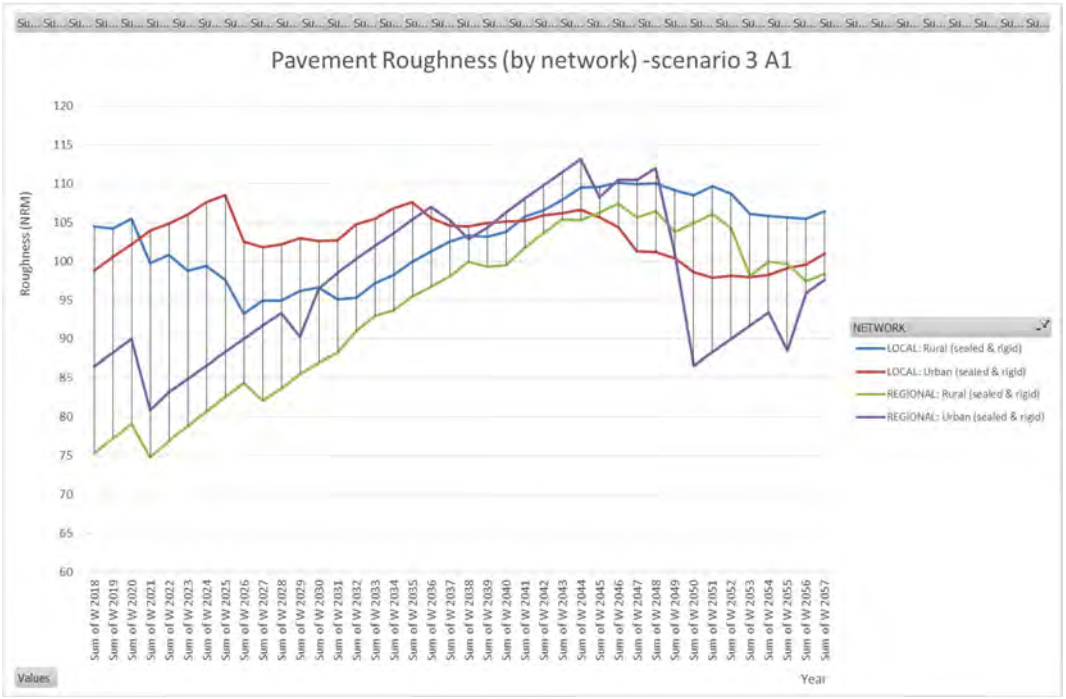


Figure F01: All network roughness profiles given NO transfer of capital budget to dust sealing program -A

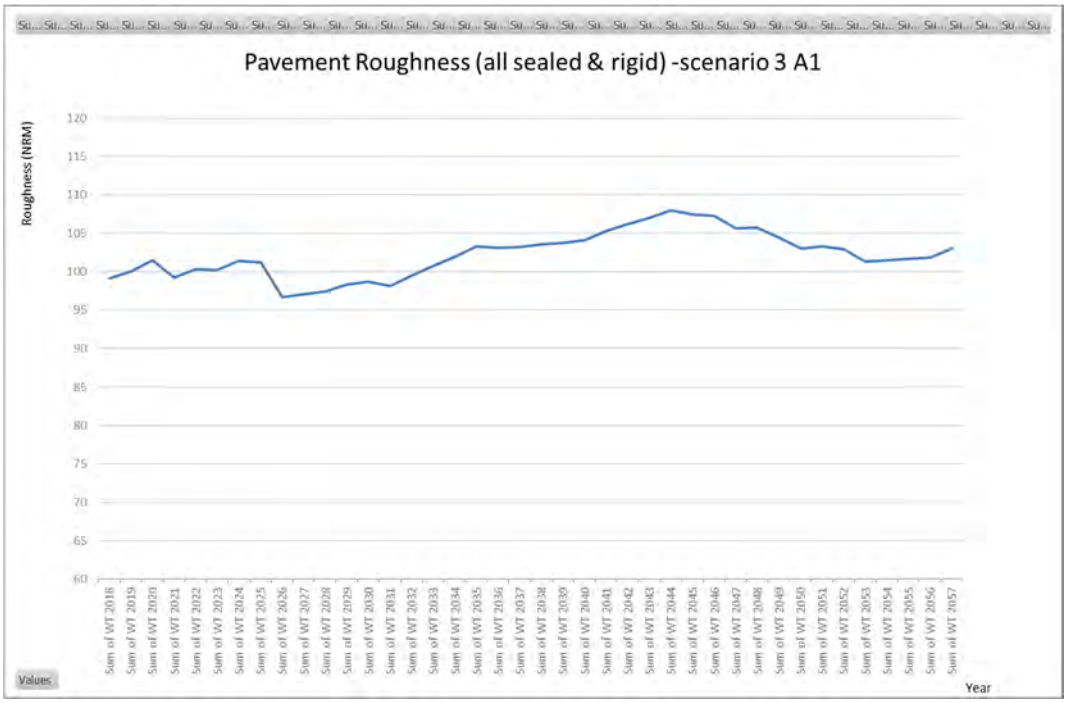


Figure F02: Combined network roughness profiles given NO transfer of capital budget for dust sealing -A

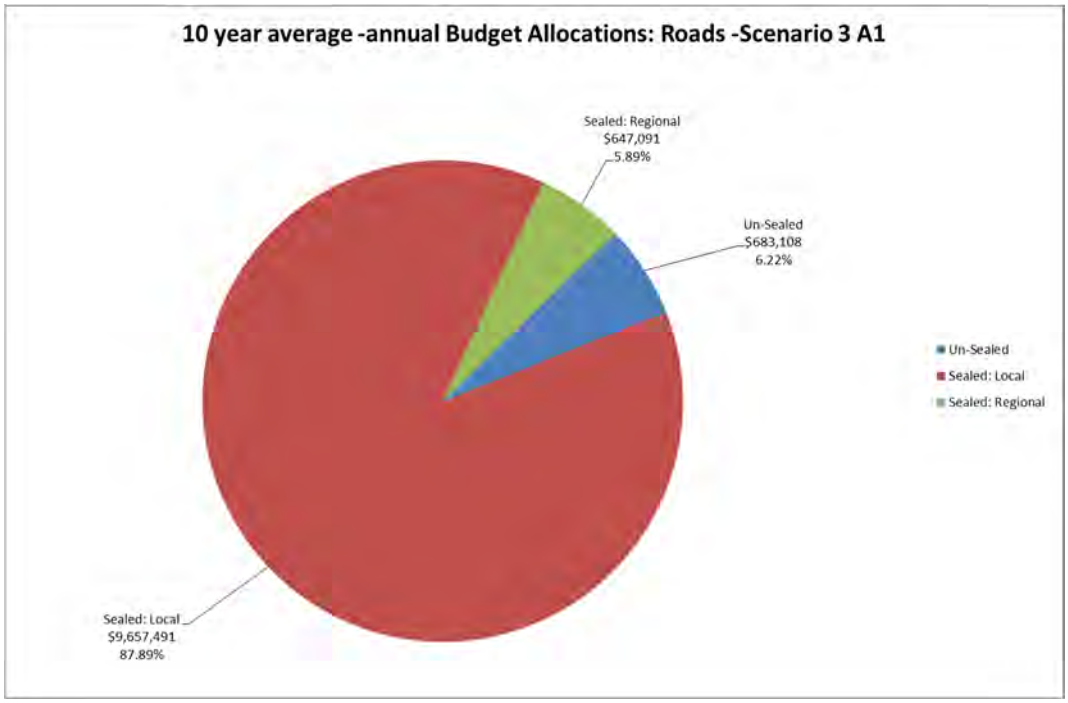


Figure F03: Budget Profile -A

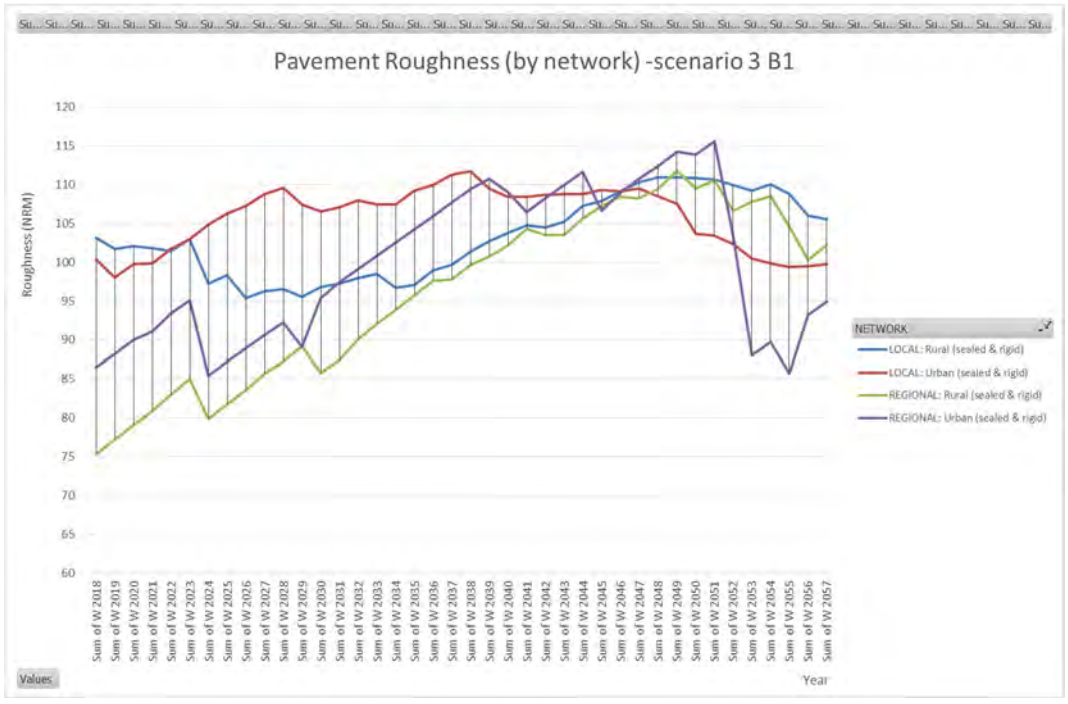


Figure F04: All network roughness profiles given $200K transfer of capital budget to dust sealing program -B

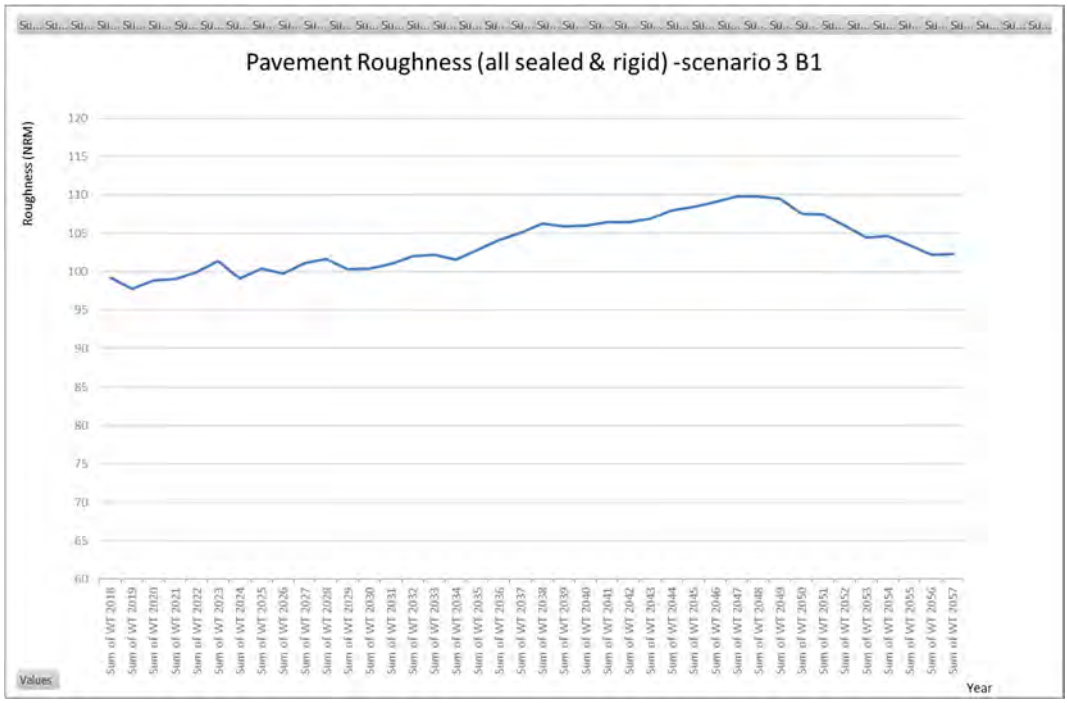


Figure F05: Combined network roughness profiles given $200K transfer of capital budget for dust sealing -B

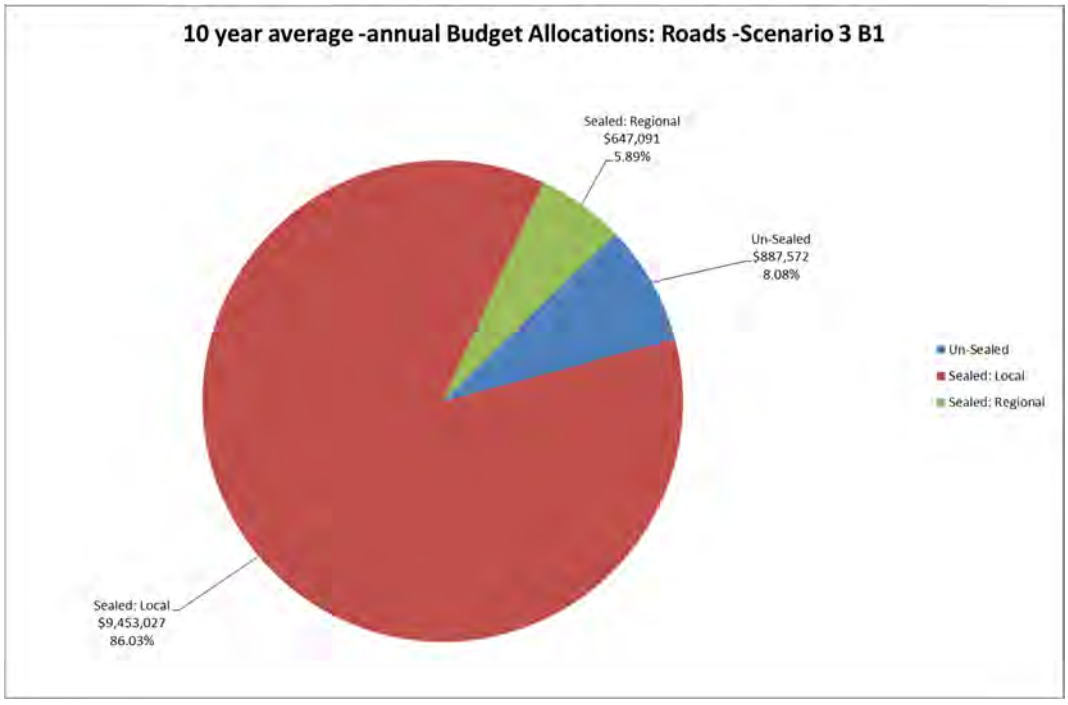


Figure F06: Budget Profile -B

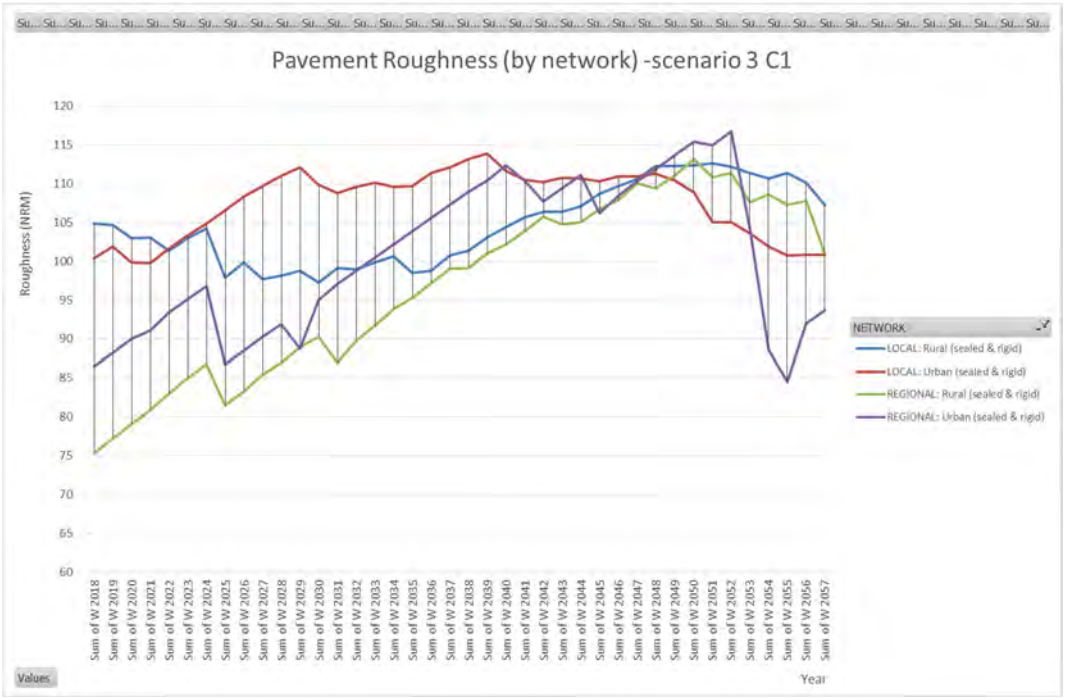


Figure F07: All network roughness profiles given $300K transfer of capital budget to dust sealing program -C

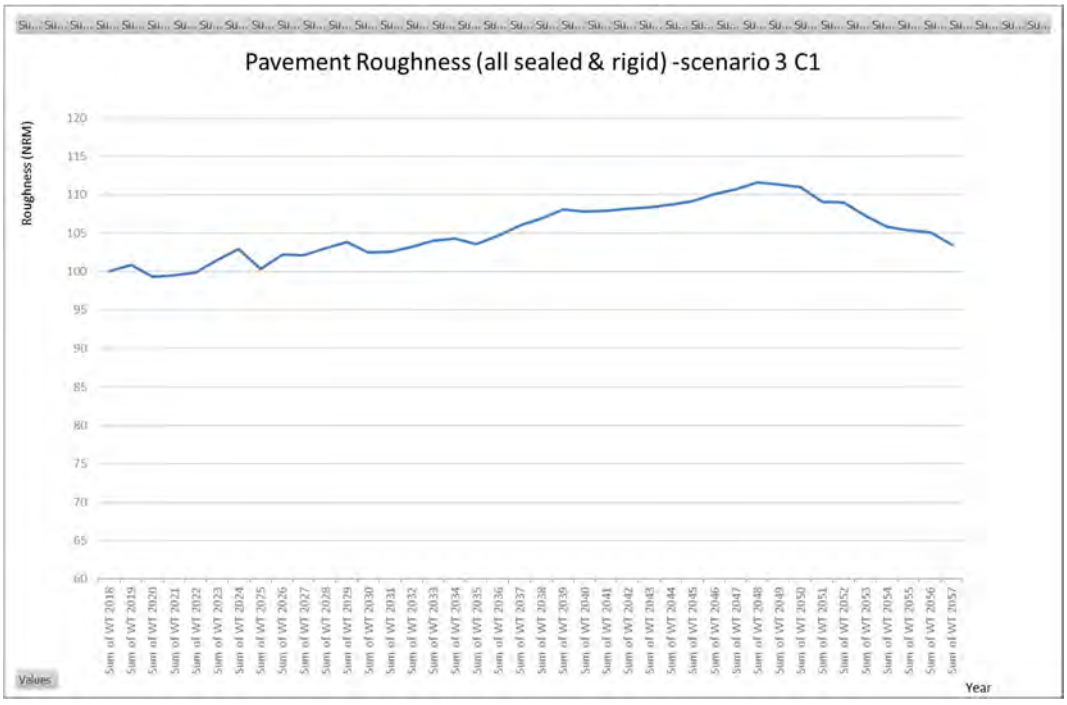


Figure F08: Combined network roughness profiles given $300K transfer of capital budget for dust sealing -C

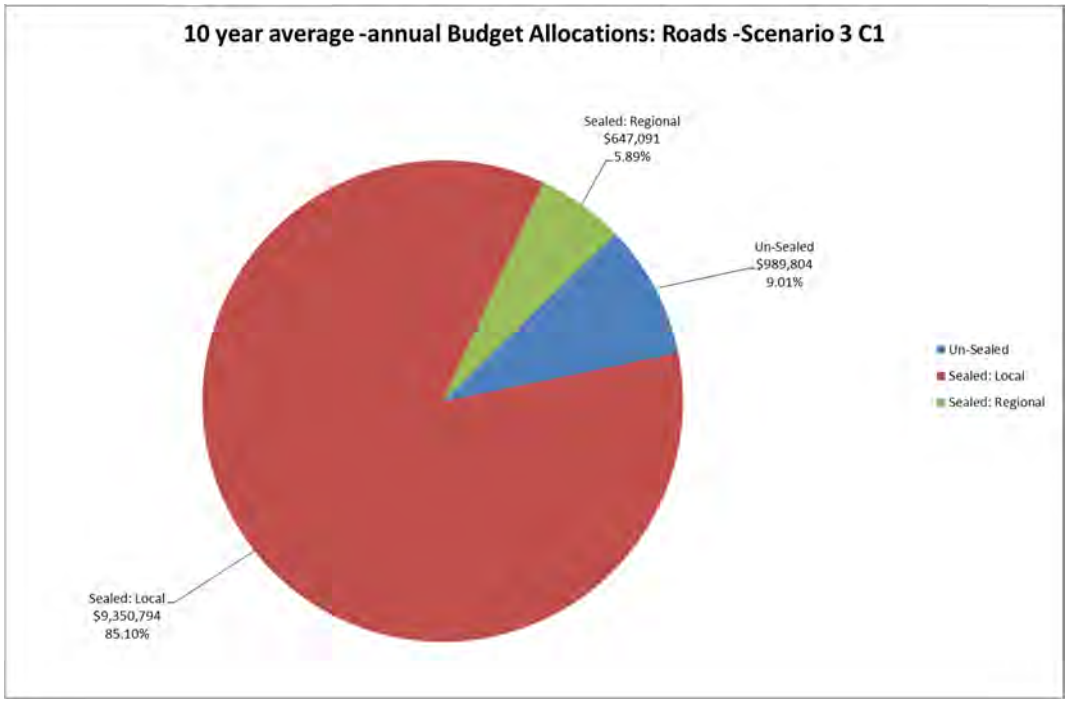


Figure F09: Budget Profile -C

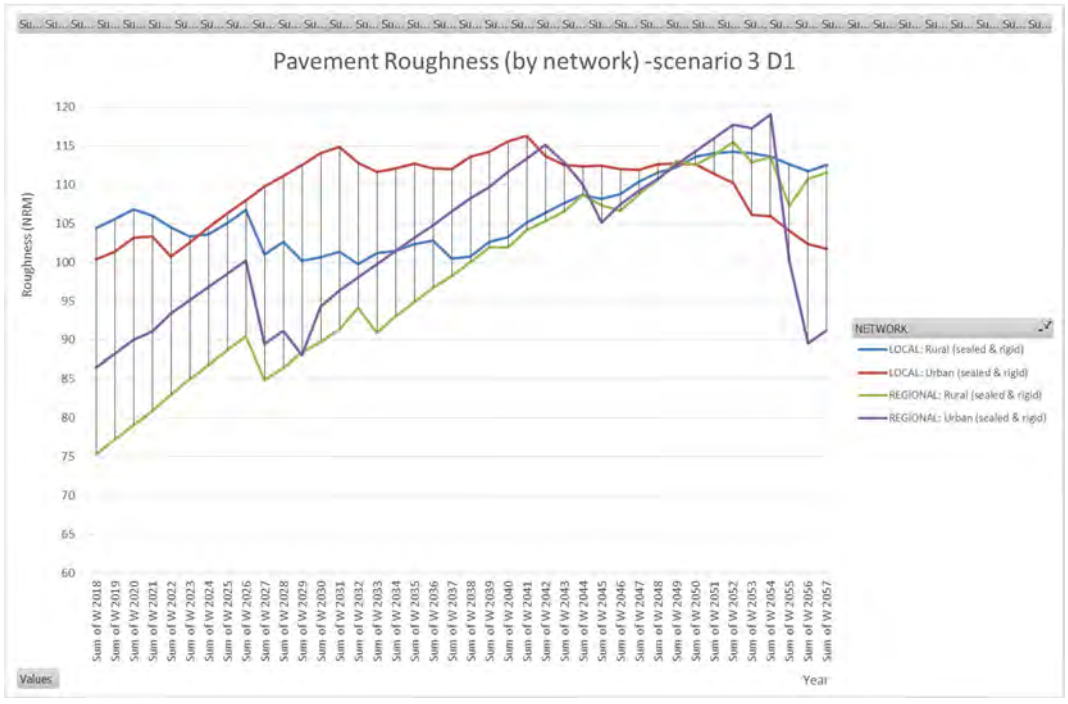


Figure F10: All network roughness profiles given $400K transfer of capital budget to dust sealing program -D

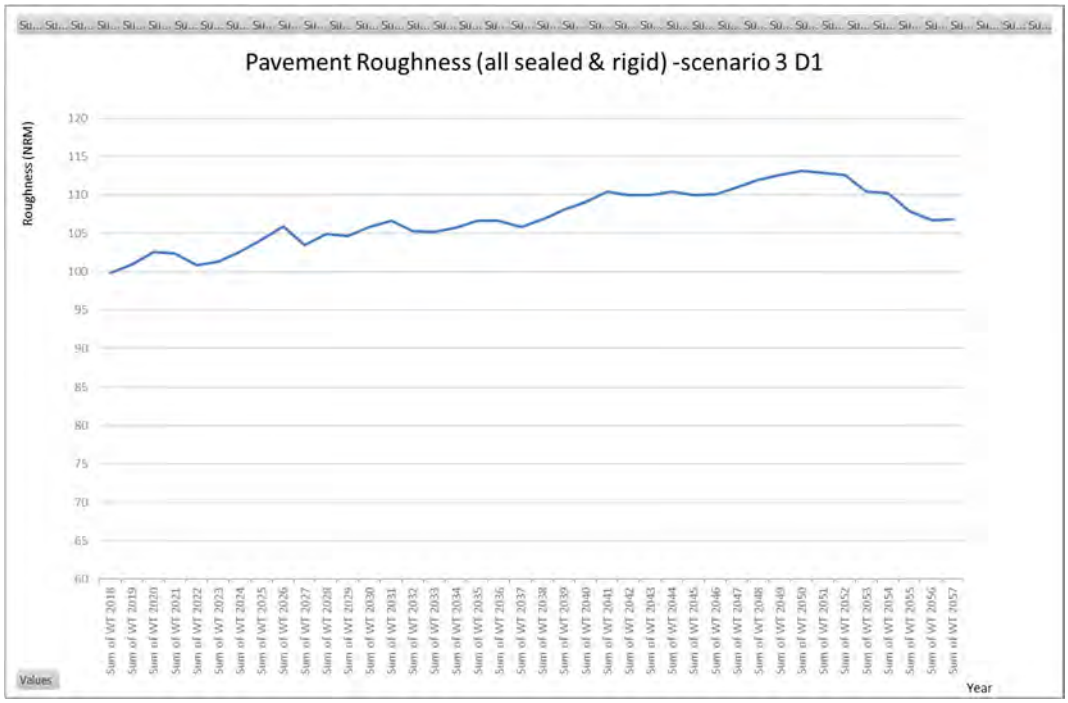


Figure F11: Combined network roughness profiles given $400K transfer of capital budget for dust sealing –D

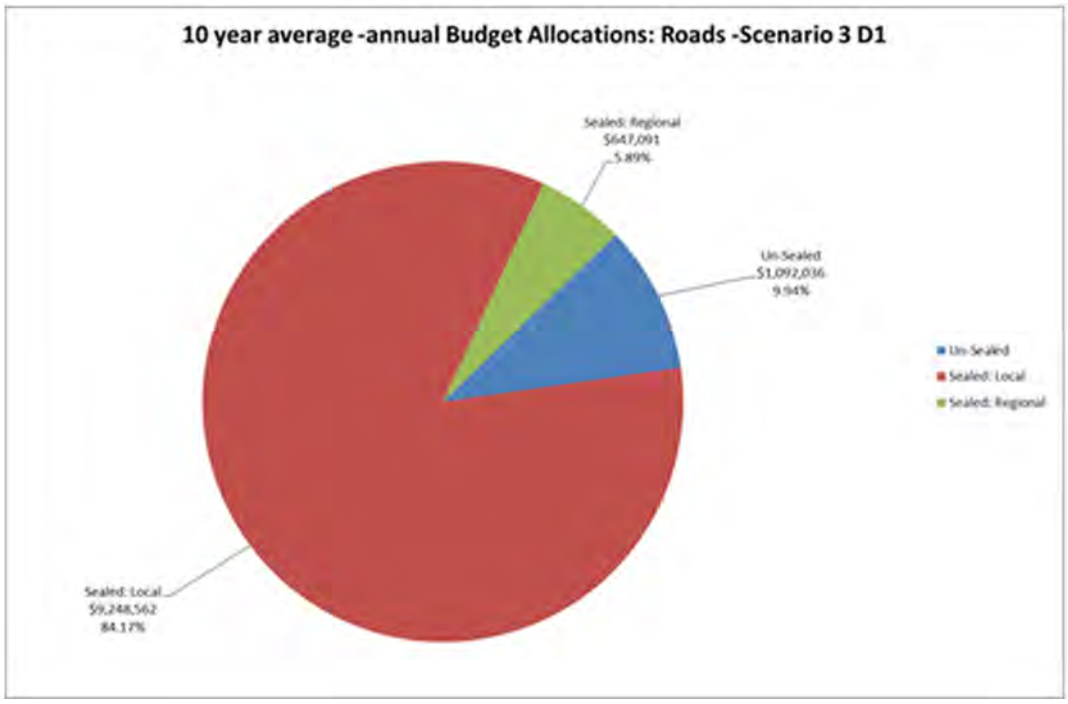


Figure F12: Budget Profile -D

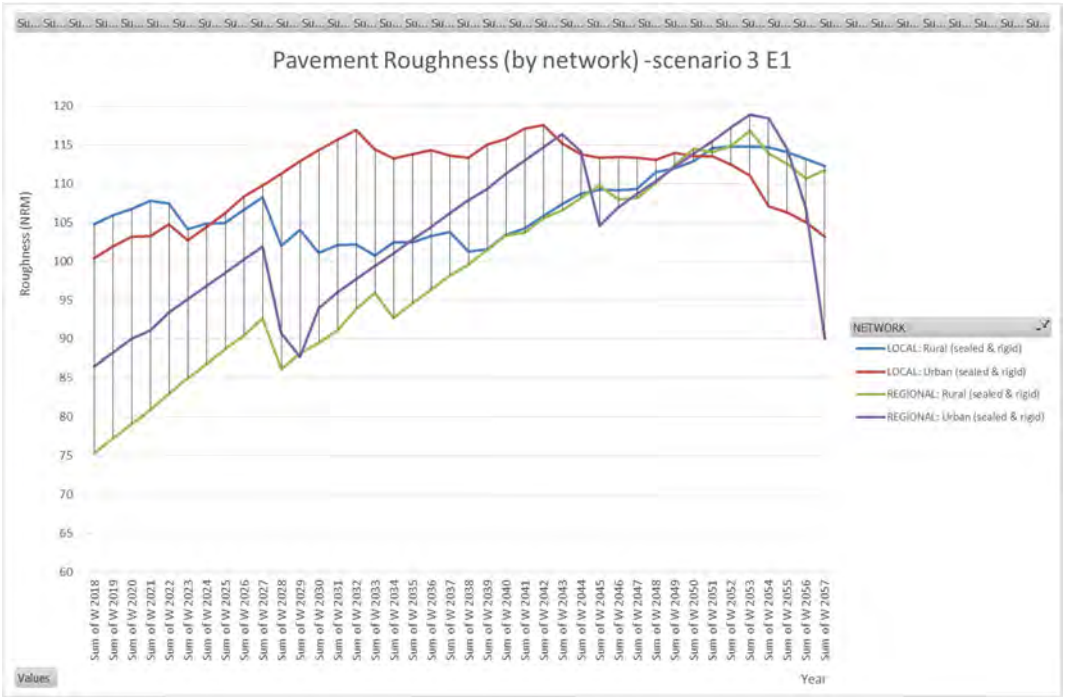


Figure F13: All network roughness profiles given $500K transfer of capital budget to dust sealing program -E

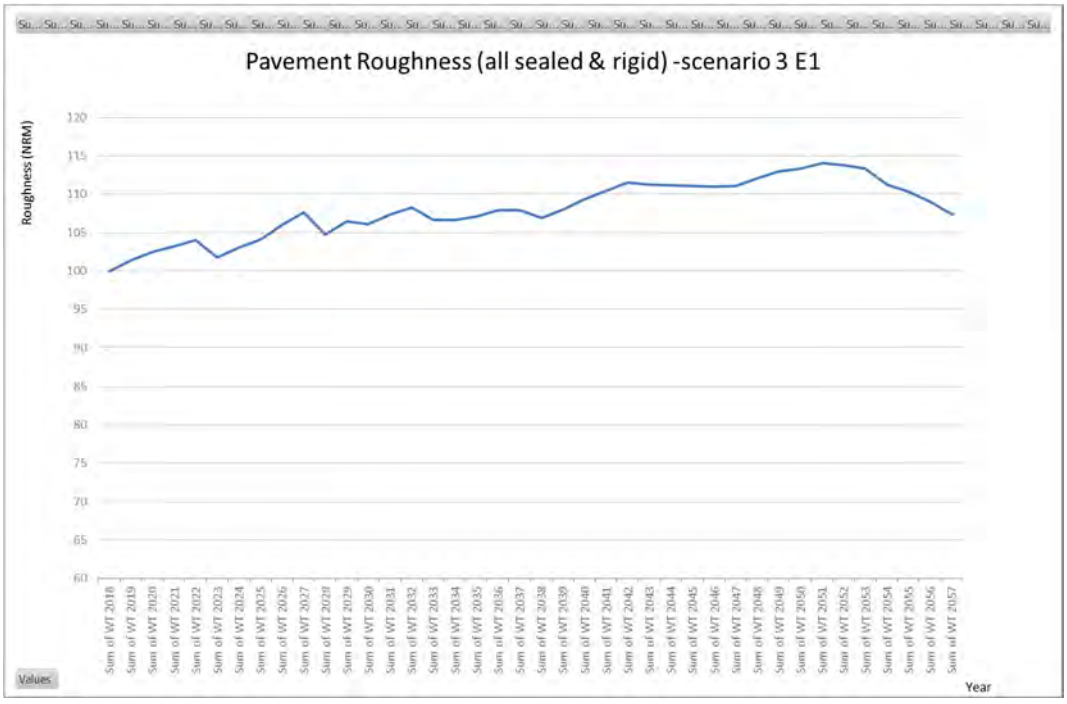


Figure F14: Combined network roughness profiles given $500K transfer of capital budget for dust sealing -E

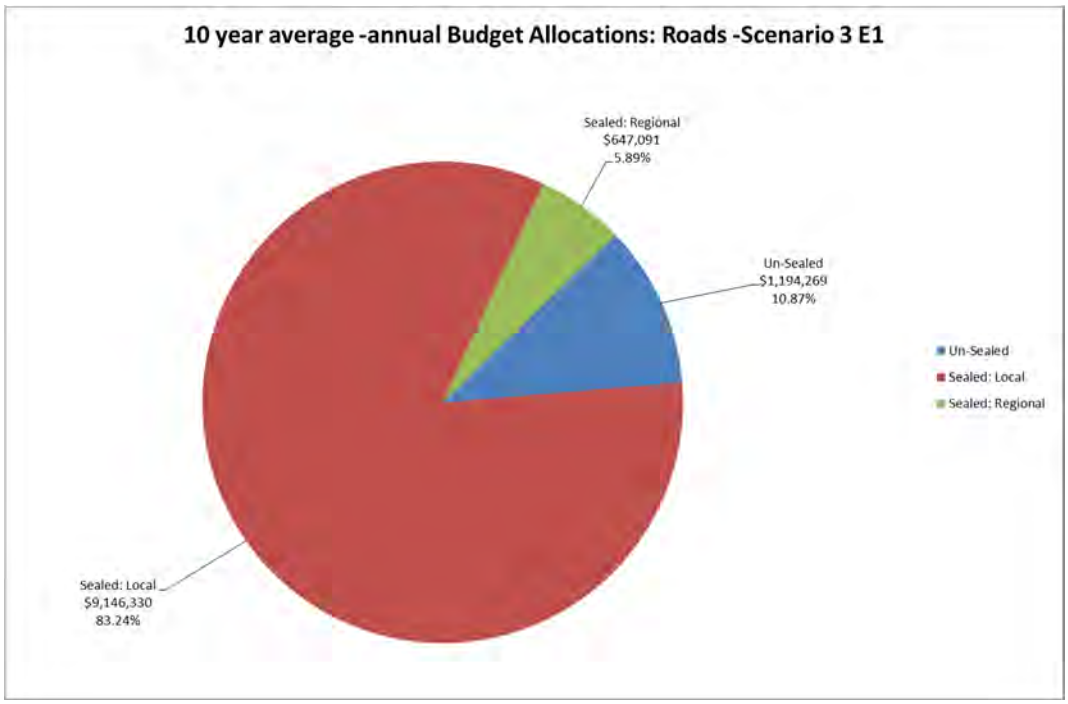


Figure F15: Budget Profile -E

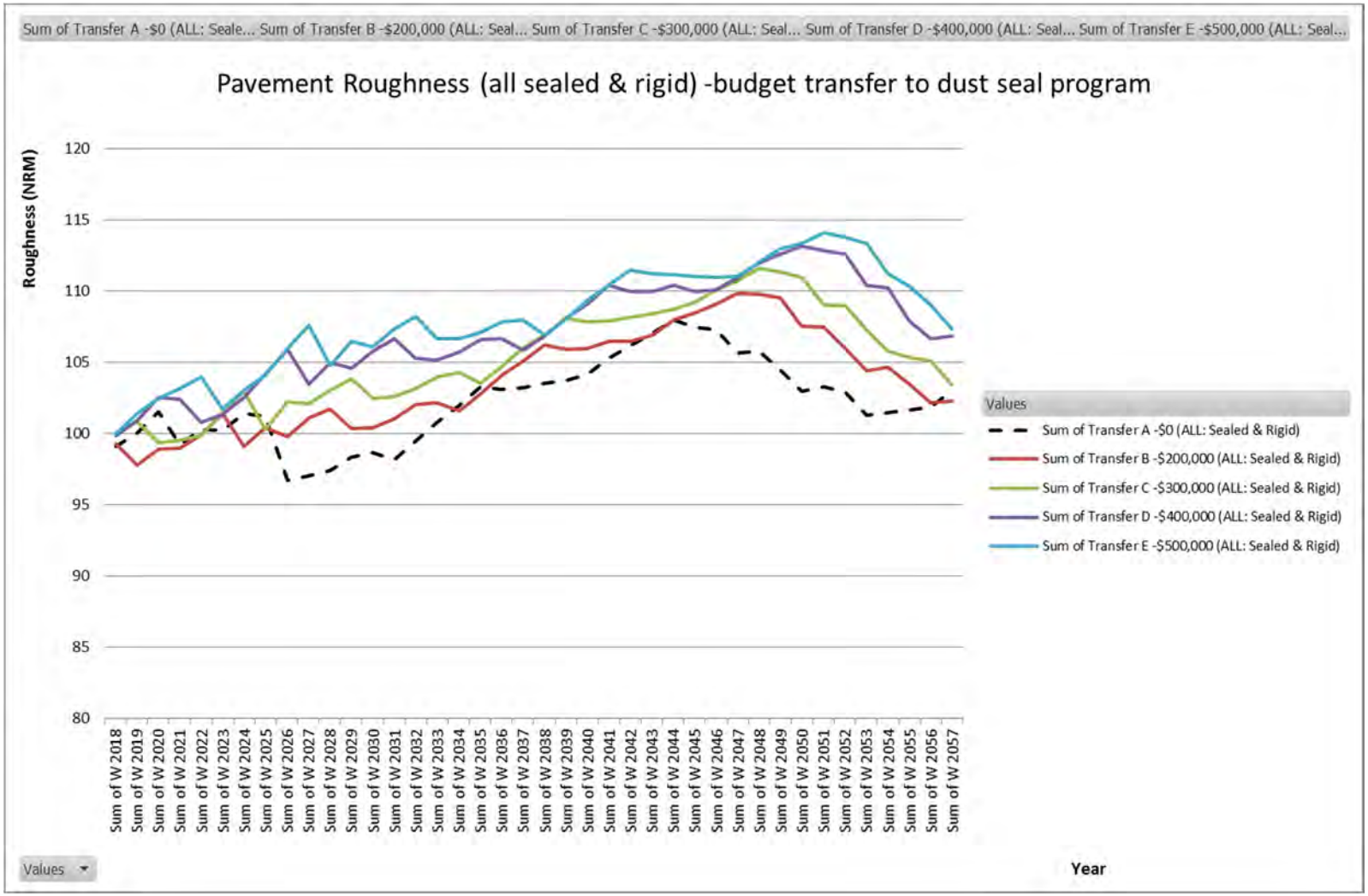


Figure F16: All network roughness profiles given various transfer of capital budget to dust sealing program

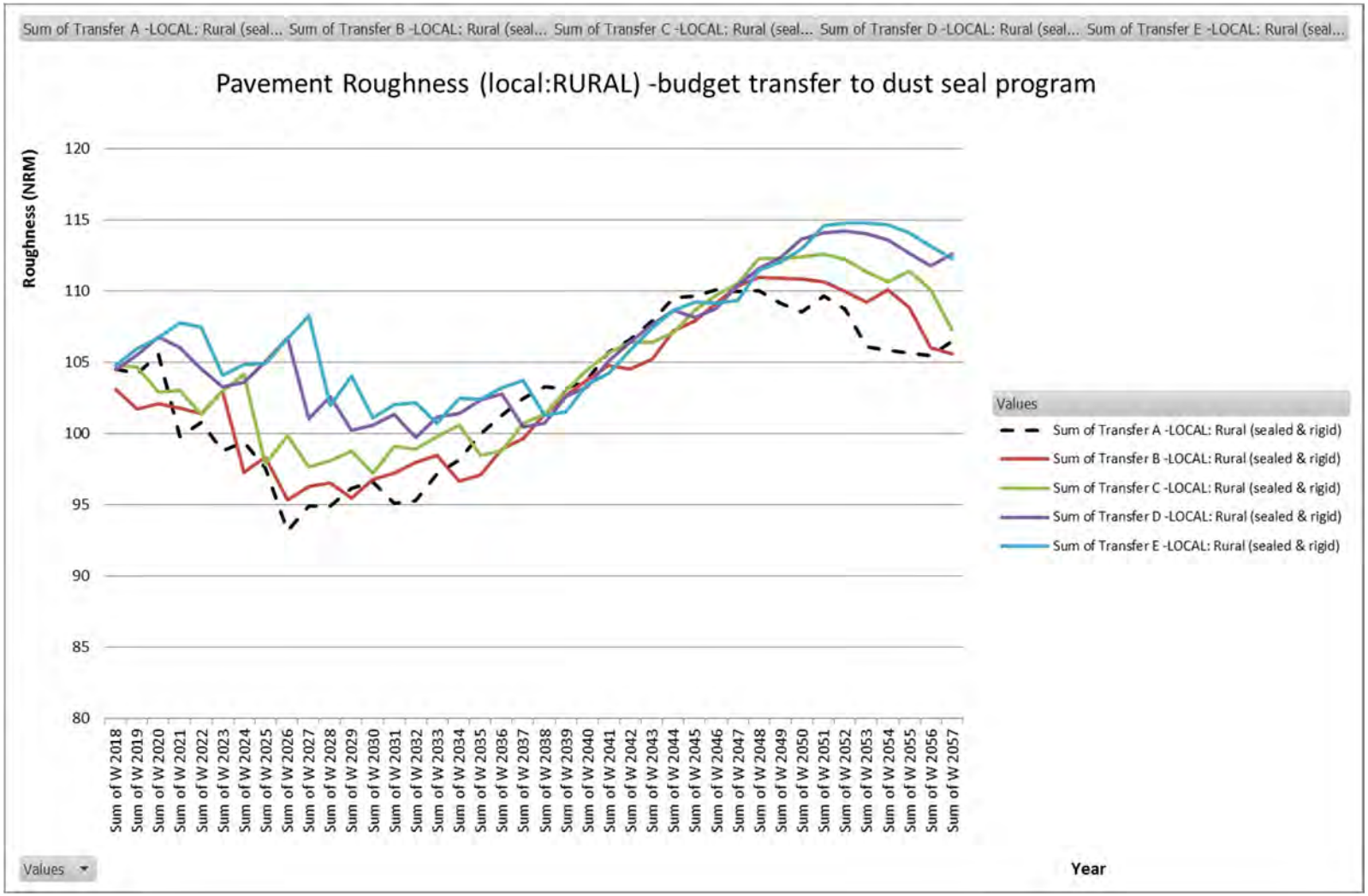


Figure F17: Local-Rural roughness profiles given transfer of capital budget to dust sealing program

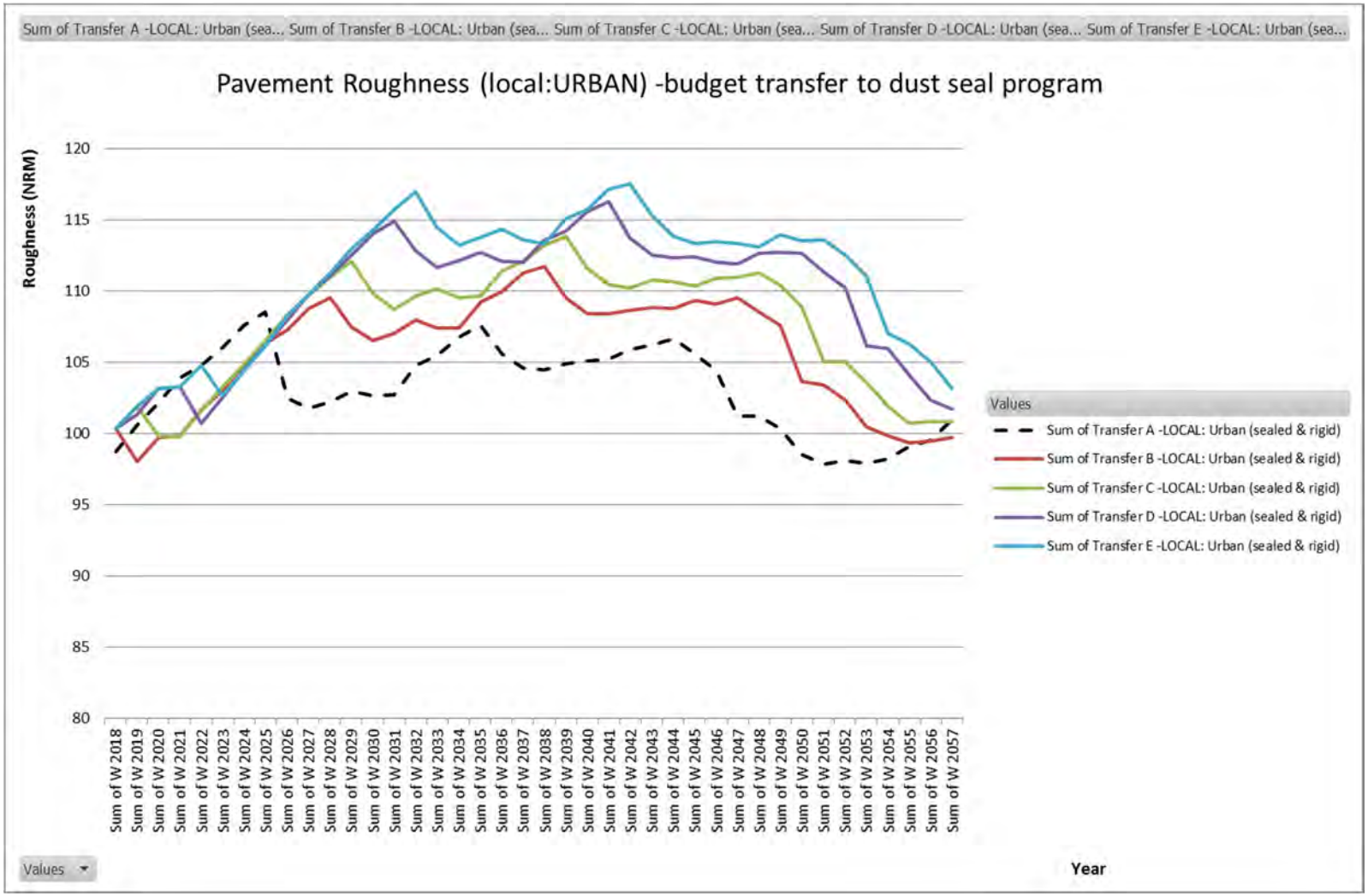


Figure F18: Local-Urban roughness profiles given transfer of capital budget to dust sealing program

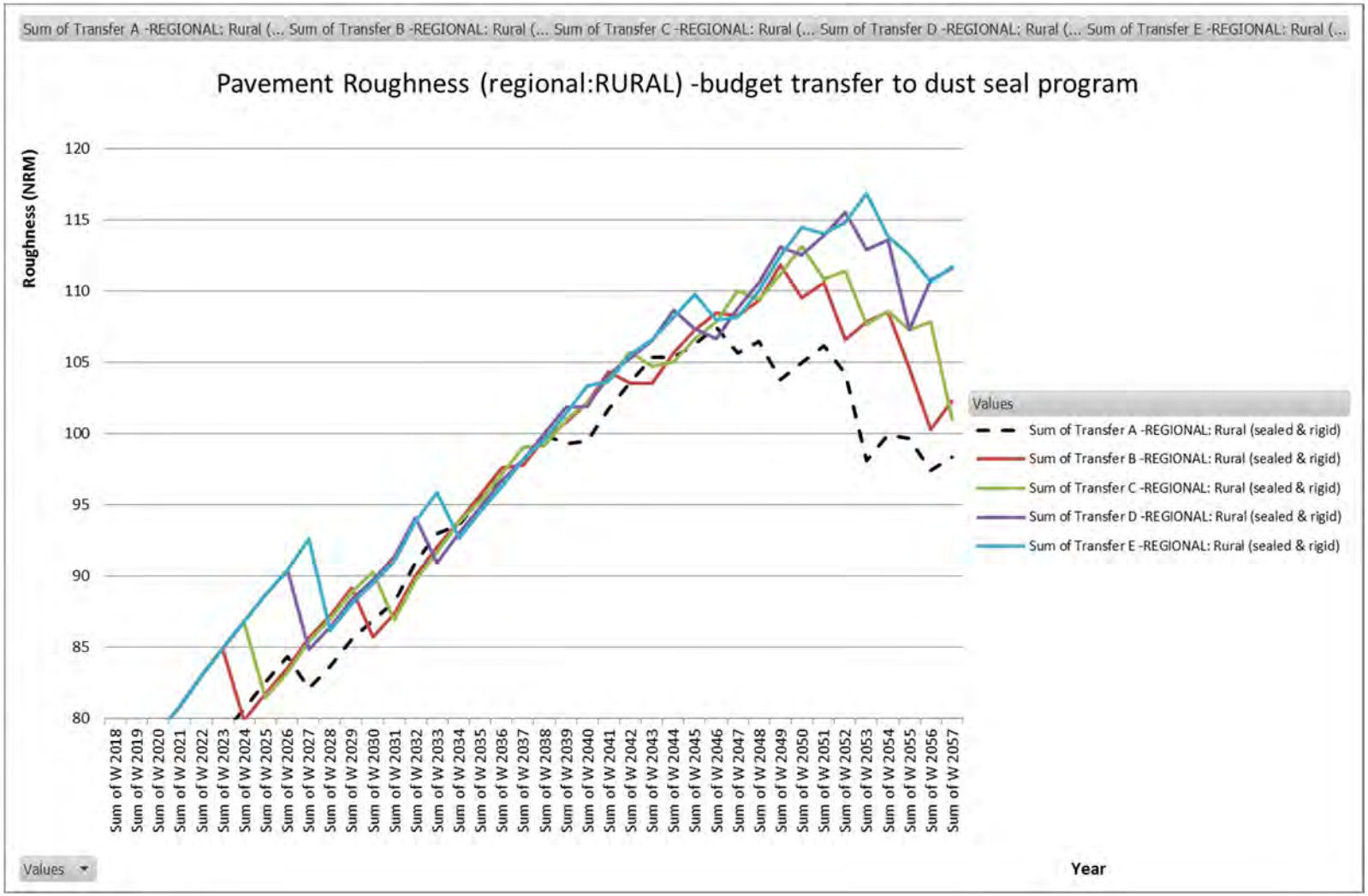


Figure F19: Regional-Rural roughness profiles given transfer of capital budget to dust sealing program

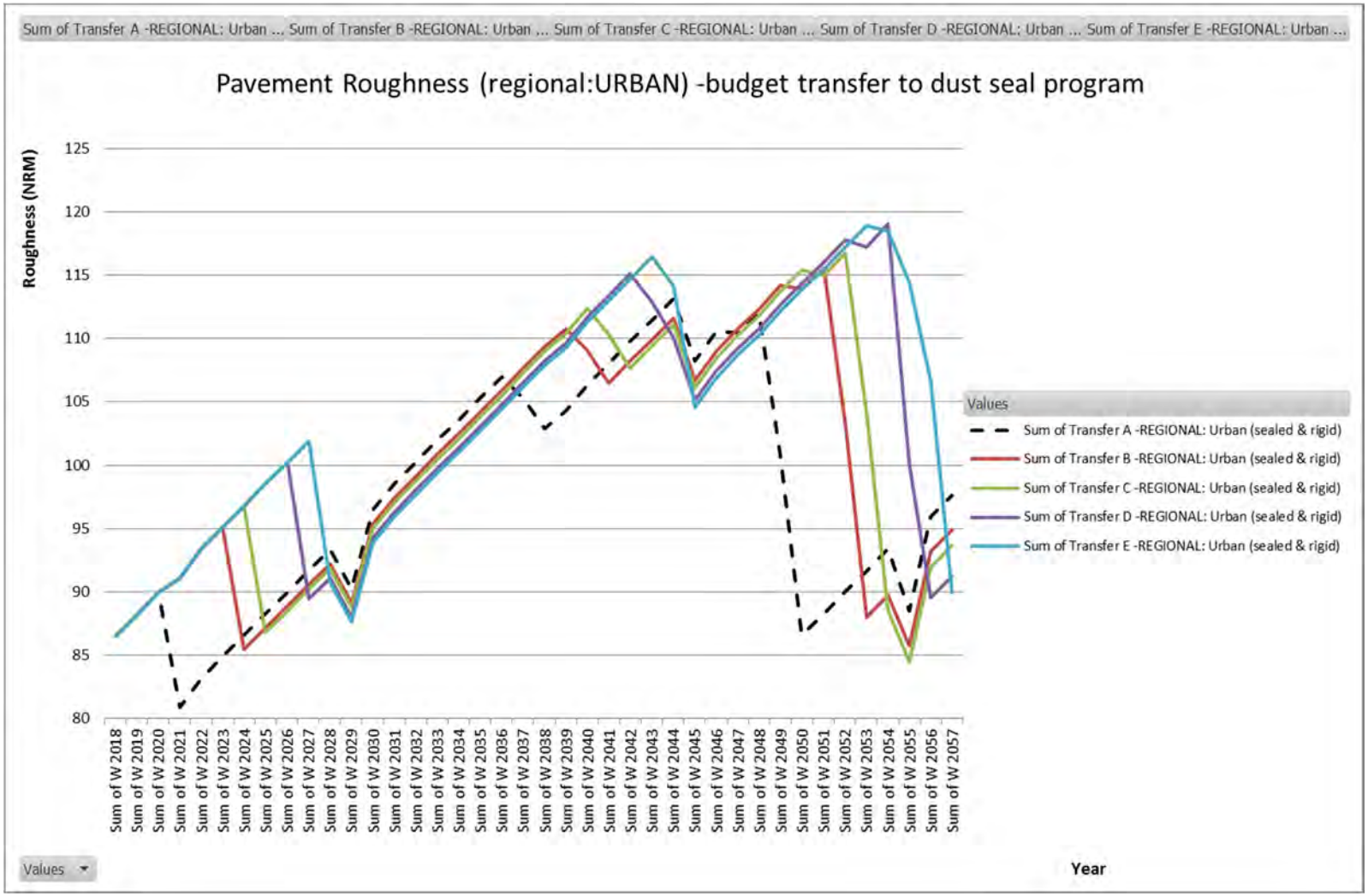


Figure F20: Regional-Urban roughness profiles given transfer of capital budget to dust sealing program

The inclusion of the dust sealing program and the resulting decrease in capital spending has the effect of increasing over network roughness over the 40-year analysis period, by 1 to 1.2 NRM per $100,000 per annum removed from the capital budget. This equates to approximately 2% increase in average network roughness per $100,000 of reallocated capital funds.

For a dust sealing budget of $200,000 per annum, despite this average increase over the analysis period being applied, the network average roughness after 40 years is approximately unchanged from the base case.

Appendix G Optimisation of spray seal design lives (2018)

Basis of the 17-year spray seal cycle.

Council has been using a road maintenance application called Reflect for a number of years now. It allows council crews program & undertake road inspections, from this, defects are recorded & maintenance works programmed.

Recorded at the segment level, via tablet making it paperless and available online

- Works location (segment)
- Work type
- Date of work
- Quantity of work

With the program being used a number of years; we have a large data set available (which increases data confidence)

We have exported the data set to excel, and as the data is recorded to the segment level, we have been able to import the age of the seal at the time each work item was performed from the Authority data.

From there, a number of excel pivot tables & pivot charts were created from the combined Reflect-Authority maintenance data set that display works done in $/sq.m per year vs seal age.

Excel is used to create a least squares parabolic trend line (x = seal age)

Equation 1

$$Maintenance\ Cost\ (\$\ /sq.m\ /year) = 0.0012x^2 + 0.0025x$$

The cost to seal can be expressed in the same units, given that

- Cost to reseal is approx. $6.50 per sq.m
- The design life is designated as X (years)

So, the cost to seal is expressed as

Equation 2

$$Seal\ Cost\ (\$\ /sq.m\ /year) = \frac{\$6.50 \times 1}{x}$$

We want to now determine when the cost to seal is more cost effective that to maintain the existing. We equate equation 1 with equation 2, and end up with a cubic equation

$$\frac{\$6.50 \times 1}{x} = 0.0012x^2 + 0.0025x$$

$$0.000184615x^3 + 0.000384615x^2 - 1 = 0$$

Primary Root is

X = 16.89442996
X = 17 years (rounded)

(the 2 other roots are complex numbers & do not apply)

What makes this analysis useful is that we have been able to utilize our own data and maintenance works practices in the base data, rather than relying on standard tables and figures from external agencies, which is not necessarily a bad thing.

In the end we are trying to optimize the net effect / benefit the money we allocate, has on our road networks. This will be an ongoing process and tweaked as more data is made available.

Appendix H Road Maintenance & Renewal Policy (2018)

Background

Council has a duty of care under common law to ensure that the road network is as safe as it can be within the limited resources available. A strategic approach to management of the road network as set out in this Roads & Transport Asset Management Plan (RTAMP) will ensure Council delivers the highest level of service within budget constraints.

Roads vary in their construction and the environment in which they are required to function. Competing demands for resources across a full range of Council services means that the resources available to undertake new construction work and new maintenance activities may not always meet community expectations.

The aim is to strike a balance between optimal maintenance, minimising whole of life costs, user amenity and safety, and value for money in a risk management context. The primary purpose of this report is to limit Council's maintenance liabilities to existing levels, due to the high demand for Council services and the limited financial resources.

Road Network Register

The Asset Register in Council's Authority Asset Management System (AM) includes a *Transport and Stormwater Infrastructure* group, which contains the Road Network Register (RNR). The RNR records details of all public roads maintained by Council.

Under this RTAMP Council will only maintain road lengths included in the RNR. Not all public roads under the control of Council are included in the RNR, as roads to be maintained by Council.

The RNR has been developed over a long period of time and it reflects that it is not economically feasible, or reasonable, to provide maintenance services to all the public roads under the control of Council. Typically, roads not maintained by Council are road lengths that serve none, one or two dwellings only.

It is acknowledged that the historical development of this register may, arguably, have resulted in inconsistent outcomes, which could be perceived as being unfair to some residents. To address this would require Council to establish agreed criteria for inclusion in the register and undertake a comprehensive review of each road segment. This would be a substantial project.

It is possible that such a review, dependent on the approach, could lead to increased maintenance costs to Council by expanding the length of network maintained.

It would also be difficult for Council to reduce existing service levels for a road currently maintained that did not meet any newly defined criteria.

On this basis, the Council Policy is to maintain the current RNR as the limit of its maintenance service. This decision is based on the opinion that the current level of service is reasonable, recognising the resource constraints that all councils face in managing roads.

Requests for Inclusion on the Road Network Register

Requests can be made, in writing, to Council to consider further inclusions on the RNR. These requests will be determined by the General Manager or nominated delegate, on a merit basis.

Applications for inclusion on the RNR will be subject to relatively high standards and will only be successful where there is or has been:

- A major change in the traffic demands for the road
- A gross inequity when compared to other road segments within the register
- Exceptional circumstances that warrant inclusion

Where an application for inclusion on the register is unsuccessful, this decision will only be reviewed through a Councillor Notice of Motion presented to the Council in accordance with the Code of Meeting Practice.

Appendix I Contributions for Dust Sealing of Roads (24 October 2019)

Background

Council can accept voluntary monetary contributions from residents to allow the self- funding of dust sealing of unsealed (gravel) roads, subject to the rules and conditions contained within this plan.

A dust seal is a low cost technique which consists of a seal applied to the existing road configuration, with limited need for road drainage, road formation and road pavement reconstruction.

A dust seal is usually most suitable for low traffic roads where the cost of a dust seal can offer maintenance savings, improved amenity and/or environmental outcomes.

A dust seal is a risk-based solution for locations where road works to standard engineering specifications are non-economic.

The following rules and conditions apply.

Road Condition and Restrictions

1. Council will assess the suitability of gravel road segments on a merit basis for suitability of the application of a dust seal.

2. Dust sealing will need to include formation reconstruction, pavement reconstruction and drainage reconstruction, where necessary.

3. Dust sealing of isolated segments of gravel road (ie; not being continuous with the existing sealed road network) is not permitted by this policy as it results in the ad hoc sealing of Council's road network. However, exceptions to this provision will be referred to Council for review where it is considered by the General Manager that such an exception is reasonable in the circumstances.

4. Dust sealing of longer lengths of roads may be achieved by a group of residents cooperatively working together. For example, this may apply to residents living on a gravel lane. (However, the gravel lane will need to link to a sealed road.)

5. Council will manage the works. A contractor working directly for the property owner is not permitted.

6. The discretion to reject or accept a contribution resides with the General Manager or delegate.

Costs

1. The voluntary self-funded dust seal cost will include the dust seal as well as formation reconstruction, pavement reconstruction and drainage reconstruction, where considered necessary.

2. Council will provide a cost estimate for the works prior to commencement, however, the final costs of the works will be based on actual costs upon completion.

3. Council's cost estimate will be calculated using all appropriate overhead costs (i.e. oncosts), however Council will not seek a profit from the delivery of the dust seal.

4. Council will not make any contribution to the works, nor will it accept any offer that is conditional on Council making a contribution, except for the circumstances discussed in point 6.

5. The priority decisions of Council's works program will be made without regard to the potential or otherwise of a contribution under this plan.

6. Council will consider making a contribution to the works in circumstances where the voluntary contribution is greater than $100,000 and the pay back period for Council's contribution compared to its avoided gravel maintenance costs is less than 7 years. The authority to make this contribution is not delegated, meaning a staff report to Council is required to assess the merits of the proposal. Council will reserve the right not to make a contribution, even if the above criteria are met, as the Council will also need to consider the availability of funds and the strategic merit of the proposal compared to the other priorities with our road asset management planning framework.

Schedule

1. The voluntary self funded dust seal, if approved, will be included in Council's works program to suit resources and programming.

2. The voluntary self-funded dust seal will not take priority over existing public works programs.

3. Sealing works are generally undertaken during the summer periods, when warmer weather is experienced

Conditions and Obligations

1. Council accepts the voluntary self-funded dust seal contribution without any preferential maintenance commitment, or obligation, in favour of the completed dust seal works.

2. Council will take ownership of the completed dust seal works and manage the improved road asset in accordance with Council's existing programs and practices.

3. The voluntary self-funded contributor will not have any authority or exercise any rights over the works by Council during or after construction.

4. Payment for cost of the works will be made prior to commencement of works and will be based on the cost estimate provided. Final costs shall be reconciled at completion of the works. Either party, as necessary, will adjust payment within 30 days of notification of final costs.

5. Prior to Council undertaking the work, it will be necessary for the landholder to sign and execute an agreement prepared by Council confirming the conditions and obligations of this plan.

6. Acceptance of a contribution does not imply acceptance by Council of the work as satisfying any existing or future condition of development consent

Appendix J Parking in Residential Rear Lanes (28 November 2019)

Policy
At the meeting held 28 November 2019, Council resolved the following in respect of parking management for residential rear lanes.

1. That Council confirms it will rely on NSW Road Rules for management of parking in residential lanes, instead of the installation of signage unless there are extenuating circumstances.

2. That Council update the Road and Transport Asset Management Plan with information in response to point one and the contents of this report.

The following information explains Council's assessment in developing this policy approach.

Background

The historical road network arrangements in parts of the Shire include residential rear lanes. Overtime as traffic volumes have increased, as well as changes in demographics and economic factors, there has been an increase in the number of complaints to Council in respect of parking in rear lanes.

Often these complaints are concerned with parking across or too close to driveways, or parking opposite a driveway making the reverse out movement difficult.

The management options for Council include relying on the NSW Road Rules, or the Council can more directly manage or restrict parking.

Assessment

The Ballina Local Traffic Committee considered this issue at a meeting held 14 October 2019. The information reported to the Committee (and ultimately to Council) advised the following.

The problem of vehicles finding it difficult to access driveways and garages on narrow (standard width 6m) laneways, due to the presence of parked cars (on the opposite side of the lanes), occurs in many rear residential lanes in residential areas of Ballina Shire. The problem has increased as more existing residential lots are redeveloped/subdivided to create additional residences in back yards that only have access onto rear lanes.

The problem is worst when garages are located very close to lane boundaries.

These garages can be prone to blockage when vehicles are legally parked on the other side of the lane, even with the 3m minimum clearance required by NSW Road Rules. Whilst most drivers may be able to manoeuvre back and forward multiple times to turn in and out using the available 3 m clearance, some drivers find this difficult.

From time to time requests are received from residents to create No Parking zones on sections of rear lanes. Up to this time these requests have been resisted due to:

- Practical and equity (between residents) issues in choosing which sections and sides of a particular lane should be designated No Parking. Determining which sections and sides of lanes should have restricted parking depends on a number of factors including

garage/driveway location, spacing between driveways, which side of the lane garages are on, how they alternate from side to side etc. It needs to be individually determined for each lane and sometimes there is no optimal solution. The determinations may also need to be changed when new flat/units are developed with additional access to lanes.

- Providing No Parking zones in lanes decreases the total available supply of parking. Parking is often in high demand in lanes due to the increasing number of secondary type residences being built in backyards with lane only access and the increasing numbers of cars per residence.

- The cost to Council's budget if this form of parking management is adopted throughout residential lanes:

    - The current annual budget for local road signage and markings of $102,000 is always fully expended and many important tasks such as regular renewal of roundabout markings, centreline markings and establishment of more angle parking space delineations are the priority for these funds to ensure these works are undertaken at or close to preferred frequencies.

    - Council also has some access to the RMS Block Grant of $120,000 per year for classified roads and local roads signage and markings, and as per above, this source of funds is also fully expended on an annual basis.

    - There is around 20 km of rear residential lanes in the urban areas of Ballina Shire. If all these lanes were to be regulated for parking using signage, a preliminary estimate for the initial cost could be in the order of $60,000 and annual maintenance/replacement costs of around $5,000.

- Additional resource time would be required from Council's compliance staff to monitor parking compliance in lanes.

Some lane parking management has been undertaken in lanes at the rear of CBD areas where the amount of general and commercial traffic is sufficient to warrant this level of regulation and cost.

The main NSW Road Rules that govern parking in areas such as narrow lanes are Rules 198(2) and 208(7) reproduced as follows:

198 Obstructing access to and from a footpath, driveway etc

(1) A driver must not stop on a road in a position that obstructs access by vehicles or pedestrians to or from a footpath ramp or a similar way of access to a footpath, or a bicycle path or passageway unless:

(a) the driver is driving a public bus that is dropping off, or picking up, passengers, or

(b) the driver stops in a parking bay and the driver is permitted to stop in the parking bay under these Rules.

Maximum penalty: 20 penalty units.

Note.
Bicycle path is defined in rule 239, and ***footpath***, ***parking bay*** and ***public bus*** are defined in the Dictionary.

(2) A driver must not stop on or across a driveway or other way of access for vehicles travelling to or from adjacent land unless:

(a) the driver:

(i) is dropping off, or picking up, passengers, and

(ii) does not leave the vehicle unattended, and

(iii) completes the dropping off, or picking up, of the passengers, and drives on, as soon as possible and, in any case, within 2 minutes after stopping, or

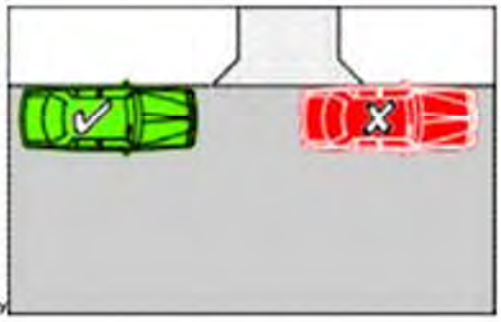
(b) the driver stops in a parking bay and the driver is permitted to stop in the parking bay under these Rules.

Maximum penalty: 20 penalty units.

Note 1.
Adjacent land is defined in the Dictionary.

Note 2.
A driver stops on or across a driveway or way of access if any part of the vehicle is on or across the driveway or way of access—see rule 350.

Example.



Blocking a driveway

In the example, the vehicle marked with an "X" is stopped in contravention of subrule (2).

208 Parallel parking on a road (except in a median strip parking area)

(1) A driver who parks on a road (except in a median strip parking area) must position the driver's vehicle in accordance with subrules (2) to (8).

Maximum penalty: 20 penalty units.

Note.
Driver's vehicle and ***median strip parking area*** are defined in the Dictionary.

(2) The driver must position the vehicle to face:

(a) in the direction of travel of vehicles in the marked lane or line of traffic on, or next to, the part of the road where the driver parks, or

(b) if there is no traffic on, or next to, that part of the road—in the direction in which vehicles could lawfully travel on that part of the road.

Note.
Marked lane is defined in the Dictionary.

(3) If the road is a two-way road, the driver must position the vehicle parallel, and as near as practicable, to the far left side of the road.

Note.
Two-way road is defined in the Dictionary.

(4) If the road is a one-way road, the driver must position the vehicle parallel, and as near as practicable, to the far left or far right side of the road, unless otherwise indicated by information on or with a parking control sign.

Note.
One-way road, ***parking control sign*** and ***with*** are defined in the Dictionary.

(5) If the driver does not park in a parking bay, the driver must position the vehicle at least 1 metre from the closest point of any vehicle in front of it and any vehicle behind it.

Note.
Parking bay is defined in the Dictionary.

(6) If the road has a continuous dividing line or a dividing strip, the driver must position the vehicle at least 3 metres from the continuous dividing line or dividing strip, unless otherwise indicated by information on or with a parking control sign.

Note.
Dividing line and ***dividing strip*** are defined in the Dictionary.

(7) If the road does not have a continuous dividing line or a dividing strip, the driver must position the vehicle so there is at least 3 metres of the road alongside the vehicle that is clear for other vehicles to pass, unless otherwise indicated by information on or with a parking control sign.

(8) The driver must position the vehicle so the vehicle does not unreasonably obstruct the path of other vehicles or pedestrians.

These rules require vehicles to be parked on the left side of the road (lane), facing the direction of travel, clear of driveways and leaving at least 3m clearance alongside the vehicle.

In most lanes where there are issues, neighbours can generally work things out amongst themselves to arrange parking that does not conflict with other neighbours access.

However this negotiated arrangement sometimes breaks down where there is conflict and it does not apply when vehicles are parked by persons who do not live in the neighbourhood (eg. parking by persons attending sporting events at a nearby park).

Options

The report presented to the meeting of Council held 28 November 2019, noted the following two options in response to the information above.

Option 1. Maintain the status quo.

Under this option, staff will continue to rely on NSW Road Rules for management of parking in residential lanes, assisted by negotiated arrangements between neighbours.

This option maintains the discretion for staff to approve the installation of signage where there are extenuating circumstances.

Option 2: Develop a program to implement active management of parking in residential lanes.

This option would respond positively the requests we receive, however, additional funding would be required, there are practical and equity issues to consider, as well as amenity impacts from the increased level of signage.

As well as maintenance and installation costs, once implemented, parking regulation must be enforced to be effective and the impacts on the resource capabilities for Council's Compliance Team would need careful consideration.

Decision

In response to the reporting described above, Council supported option one and resolved the following;

1. That Council confirms it will rely on NSW Road Rules for management of parking in residential lanes, instead of the installation of signage unless there are extenuating circumstances.

2. That Council update the Road and Transport Asset Management Plan with information in response to point one and the contents of this report.

Appendix K Dust Sealing Priority Program (16 March 2021)

Further to Appendix F, Council considered some reporting regarding the options to develop a priority program for a dust sealing program.

The following program was adopted:

Table 3 - Ten Year Program - 2021/22 to 2030/31

Road	Seal Cost @ $10/m2	DELIVERY PROGRAM									
		2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30	2030/31
Rishworths Lane (10:014)	$ 34,580	$120,000									
O'Keefes Lane (10:151)	$ 16,100		$120,000								
Gap Road (10:102)	$ *43,160*			$43,160							
Houghlahans Creek Road (10:170)	$ *34,560*			$34,560							
Cooks Lane (10:116)	$ 144,450			$42,280	$ 102,170						
Bartletts Lane (10:122)	$ 164,416				$ 17,830	$ 120,000	$ 26,586				
Buckombil Mountain Road (10:159)	$ 66,250						$ 66,250				
Old Bagotville Road (10:166:70)	$ 165,760						$ 27,164	$ 120,000	$ 18,596		
Old Bagotville Road (10:166:20)	$ 146,594								$ 101,404	$ 45,190	
Carneys Lane (10:153)	$ 128,340										
Whytes Lane -west (10:132)	$ 36,582									$ 36,582	
Lumleys Lane (10:158:40)	$ 56,640										
Danns Lane (10:138)	$ 54,880										
Saltwater Creek Road (10:148)	$ 46,280										
Deadmans Creek Road (10:057)	$ 10,400										
Chinamans Lane (10:164)	$ 14,628									$14,628	
Troughtons Lane (10:029)	$ 20,965									$20,965	
Whytes Lane -east (10:130)	$ 87,360										$87,360
Gubay Lane (10:254:30)	$ 56,040										$56,040
Gubay Lane (10:254:10)	$ 27,180										$27,180
		$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$117,365	$170,580

Further background information regarding this program can be located on our website under the Council – Council Business – Agenda and Minutes tab.

The relevant reports are included in the agenda's for the meetings held:

- Council meeting December 2020
- Finance Committee March 2021

Appendix L Abbreviations

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

Appendix M Glossary

Annual service cost (ASC)

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

Asset

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

Asset category

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

Asset class

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

Asset condition assessment

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

Asset hierarchy

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

Asset management (AM)

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

Asset renewal funding ratio

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

Average annual asset consumption (AAAC)*

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

Borrowings

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

Capital expenditure

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

Capital expenditure - expansion

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

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

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

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

Capital funding
Funding to pay for capital expenditure.

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

Capital investment expenditure
See capital expenditure definition

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

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

Class of assets
See asset class definition

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

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

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

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

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

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

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

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

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

Economic life
See useful life definition.

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

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

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

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

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

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

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

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

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

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

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

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

Loans / borrowings
See borrowings.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Recurrent funding
Funding to pay for recurrent expenditure.

Rehabilitation
See capital renewal expenditure definition above.

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

Renewal
See capital renewal expenditure definition above.

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

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

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

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

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

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

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

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

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

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

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

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

Source: IPWEA, 2009, Glossary

Additional and modified glossary items shown *