Asset Management Plan

Transport Infrastructure (Sealed Roads)

Policy Number: POL08/131
Adopted: 25/06/2007
Reaffirmed: 28/07/2009
Minute Number: MIN07.869, MIN09.978
File: 25442
Produced By: Strategic Planning & Infrastructure Group
Review Date: 01/12/2012

For more information contact the Strategic Planning & Infrastructure Group

*Administrative Centre, Bridge Road, Nowra • **Telephone (02) 4429 3111** • Fax (02) 4422 1816 • PO Box 42 Nowra 2541*
*Southern District Office – Deering Street, Ulladulla • **Telephone (02) 4429 8999** • Fax (02) 4429 8939 • PO Box 737 Ulladulla*

council@shoalhaven.nsw.gov.au • www.shoalhaven.nsw.gov.au

CONTENTS

1. INTRODUCTION AND EXECUTIVE SUMMARY

Shoalhaven City Council provides approximately 1637 kilometers of roads that are critical for the Shoalhaven transport network that supports the delivery of many services provided by the Council and others. Many of these council services, that rely on the effectiveness and availability of the transport network, are included in the programs and strategies identified in council's strategic Cityplan under the four headings of: -

Environment,
Economy
Community, and
Council.

Approximately 1156 Kilometers of these roads are sealed roads and the effective management of these assets is essential for the provision of access to communities; the movement of good and services, haulage roads for industries, recreational and tourist pursuits.

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

It is considered that the current level of service for correction of pavement defects is satisfactory however the current level for resealing is insufficient and it is predicted that there will be a backlog of reseal needs of ten ($10) Million by 2010. This would result in an increase in pavement failures with a drop in level of service. There will be an increase in need for funds for pavement reconstruction as existing road pavements age and this will increase the demand for additional funding.

To improve the data on pavement condition and assist in optimizing availability of funding it is proposed to introduce an improved Pavement Management System over 2005/06 to improve the development in reseal and rehabilitation programs.

This Asset Management Plan is the continuation of an ongoing process to provide a sustainable approach to the management of this critical asset having regard to the inevitability of limited resources available at the council to continue to ensure the economic, environmental and social sustainability of the city.

The plan recognises the continuous improvements that have been achieved by the council in the development of the City to date and the fact that the existing sealed road network generally provides currently a satisfactory level of service to the community. Realistic targets for service levels, age and renewal demands need to be adopted as it is appreciated that funding shortfalls based on past target levels are unlikely to be met. Importantly these service level targets will have to be based on the functional classification of each road segment in Council's Transportation plan. Service level targets will have to differentiate between rural and urban sealed roads

A critical priority for all maintenance will need to be the management of all risk and this plan refers to the existing Risk Management Procedure. At the same time, as resources permit, investments need to be made in both rehabilitation and improvement work to protect and maximize the value of past investments by the city in this component of its infrastructure.

2. SERVICE LEVELS

Sealed roads play a critical and important part in the Shoalhaven transport network providing access to communities, industry, services, recreation facilities and tourist sites.

Shoalhaven City Council is committed to providing a quality road network for the benefit of residents and visitors. In order to maintain an acceptable level of service there needs to be a focus on the sustainable management of the resources input that has produced the current level.

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

- Accessibility/location,
- All weather access,
- Travel times,
- Safety,
- Ride quality,
- Traffic management structures, and
- Visual/environmental attributes.

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

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

- Condition of existing surface,
- Quality and condition of existing pavement
- Climatic conditions,
- Surface drainage
- Scouring and erosion potential of edges,
- Condition of shoulders,
- Traffic volume and percentage of heavy vehicle usage,
- Road gradient and alignment,
- Pavement marking and road signage,
- Roadside drainage and
- most importantly, user satisfaction normally measured by number and type of service requests.

With regard to user satisfaction, maintenance staff advises that they are currently holding the situation in responding to customer service requests and satisfying immediate risk management targets.

The following table shows the number of customer service requests/defects recorded for roads and associated assets/issues.

Description	**2001-02** external	**2002-03** external	**2003-04** external
Sealed roads pot hole and edge break repairs	482	466	553
Shoulder grading and repairs	710	359	302
Removal of spilled or loose materials	12	39	19
Street sweeping - all areas	67	85	62
Totals	**1271**	**949**	**936**

The figures available do not have numbers over a sufficiently long time period to show any trends of defects. YTD figures are not available for 2004-05 period at the time of preparation of the plan. At this stage only anecdotal information is available on assessing long term performance of the road network as condition data does not have sufficient history to graph long-term deterioration models.

The fact that the city's maintenance staff is able to hold their own in meeting immediate targets for the management of risks associated with the sealed roads is clear evidence of the benefits of recent investments by council in the rehabilitation of the sealed roads. It is also noted that customer requests have remained fairly static over the past few years.

Because of the increasing average age of the sealed roads the incidence of potholes and reactive maintenance is increasing at an ever faster rate. The Risk Management Procedures set targets for Heavy Patching and potholes and the ability to maintain these targets as the asset ages will have to be carefully monitored. Unfortunately a potentially serious consequence of an ageing and deteriorating sealed road asset is the ultimate break down of the pavement surface and the dramatic escalation in cost to restore the surface to a higher level of service. In this situation there will come a time when the need for reactive repair type of maintenance will be greater than Council's ability to handle the task. When this occurs major failures will develop.

Whilst the focus of the asset management plan for sealed roads is normally on the sealed pavement section the importance of the unsealed shoulders adjacent to many pavements cannot be overlooked. In the urban communities the shoulder type and condition can have an effect on the road pavement due to the use made with vehicles parking. The safety factors associated with the shoulders of rural roads with high travel speeds are critical in any risk management strategy.

In the city area there is a significant length of unsealed shoulders on both the urban and rural road network. In the urban area there is approximately 600 kilometres of unsealed shoulder without kerb and gutter. The cost of placing kerb and gutter and constructing the strip between the central pavement and the new gutter would be in the order of $100 million for the whole of the City area.

In routine maintenance, an allocation of $364,000 is allowed for gravelling and grading and sealing of shoulders. This equates to about 120 kms of unsealed shoulders receiving some maintenance each year. With Urban 600 and Rural 958 kilometres requiring attention the current funding equates to a maintenance cycle of about 12 years; where a 2 year return frequency would be more in line with community expectations. This leaves an ongoing shortfall of about $1,800,000 each year if the community expectation was to be achieved. This would in the longer term reduce to shoulder and table drain maintenance costs.

Future decisions on the allocation of adequate resources and funds to maintain affordable levels of service of the sealed roads network will need to have regard to the Transportation Planning Strategies of the City and the Transportation Traffic Hierarchy Plan for the City.

3. TIME FRAME

Assumed life and maintenance actions required have various timeframes. This does not take into account improvements required caused by increased development of the city which changes uses and category of the asset.

The road structure for financial reporting and planning purposes. 100 years

Financial modeling for renewal economic life	60 years
For rehabilitation planning – pavement life	20 to 30 Years
For surface refurbishment or resealing	8 to 15 years depending on traffic

A number of alternative treatments are available for each of the actions types above

Over a number of years the rehabilitation and maintenance programs for the asset has not been sufficient to cover the anticipated surface treatments and rehabilitation requirements for the road pavements. This has caused a back-log or deferred works which will have to be funded to prevent the total failure of the road pavement which will require the complete renewal of the road pavement and running surface.

Surface treatments are required on a cycle of about 8/12 years depending on many factors, the most significant would be surface deterioration caused by traffic and weather. The structural road pavement should be rehabilitated and strengthened at about the second resurfacing with total reconstruction about on the fourth resurfacing cycle.

There are other methods where the initial capital costs is delayed by providing a lower strength pavement initially with a program or intention to strengthen or upgrade the pavement in 10/15 years when the traffic conditions increase and the demand requires some action.

This situation, which is based on available evidence, presents a serious funding issue for sealed roads and the collection of improved data is now critical.

The financial effects of this maintenance short fall will be addressed under Financial Issue

4. DESCRIPTION OF THE ASSET

There is approximately 1156 kilometers of sealed road in the city. This information is based on data in “Conquest” Asset management system. Plans are already in place for this information to be updated with the reintroduction of a Pavement Management System in late 2005 and a survey of the condition and remaining life of the sealed roads asset segments

Future actions for the management of the sealed road assets include the continuous monitoring of traffic volumes (AADTs) and a reintroduction of a contemporary Pavement Management System (PMS). Funds are available in the current budget for this to begin. It will take approximately five years to acquire accurate data for the whole of the network and review the financial projections for maintenance and renewals.

There are a small number of roads within the City area that have been determined to be load restricted for various reasons. The majority of the limits were placed to protect the structural integrity of the road pavements. In some cases to improve the social and environmental amenity of the area, particularly in the residential precincts of some of the older developments to reinforce the road hierarchy of the transport network.

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

Road type	**Urban**	**Non-urban**	**Totals**
	(Km)	(Km)	(Km)
Regional Roads - RTA	16.77	78.45	95.22
Local Roads	645.19	410.82	1068.40
Total sealed - SCC	**654.93**	**501.56**	**1156.49**

5. MANAGEMENT OF RISK

The Adopted "Sealed Road Risk Management Procedure" Version 1 – 1 July 2003 provides as follows;

This Road Pavement Risk Management Procedure forms a part of the corporate Risk Management Policy. The development of a risk management procedure for the road pavement asset type is a specific requirement of the corporate Policy. For the purpose of this Procedure, "road pavement" is defined as the total constructed width of a carriageway or formation including sealed and unsealed shoulders but not including any kerb and guttering or other longitudinal drainage.

The purpose of this procedure is to reduce Council's exposure to liabilities associated with the maintenance and repair of road pavements and it has the following objectives:

- *To apply the risk management principles of identification, evaluation and treatment of risks to road pavement maintenance*
- *To implement a formal system of road pavement inspections which record identified risks including defined hazards*
- *To develop and maintain a risk register for road pavements through inspections and incorporate reports of road pavement hazards received from the public and/or employees*
- *To implement a method of prioritising the risks identified by the various sources*
- *To establish reasonably practicable response times, in which to effect repairs or provide temporary warnings, for the risks identified*
- *To establish a system of documenting all important steps of the Procedure to allow ongoing review and to provide evidence to defend road pavement-related claims against Council*

In addition to the above there should be a system which permits to monitoring of performance of the "Management of Risk" which should include a process where the following data is collected.

- Condition or standard of the asset to allow the performance of the asset with regard to safety and fulfilling "fit for purpose" requirements to be monitored,
- To have a procedure to ensure that defects are identified and that the responses are within the accepted response times
- To have a procedure where the density of the defects are monitored to determine if the maintenance activities are not covering up a latent major defect.

The procedure set out the following Inspection intervals:

There should be provision for "special inspections" to identify and record any defects which may require a quicker response to suit special events or anticipated higher deterioration levels caused by unexpected incidents

Road Type	**Hazard/Risk Identification Inspection Interval**	**Distribution of Inspections**
Sealed Arterial Roads	Monthly	12 in any 12 month period
Sealed Collector Roads	4 Monthly	3 in any 12 month period
Sealed Local Roads	6 Monthly	2 in any 12 month period

Definitions for minimum recording levels of hazards are as follows

Hazard Code	**Hazard Description**	**Recording Level**
1200	Pot holes and Edge Breaks	150mm in diameter or 150mm from design edge of seal both at least 50mm deep
1240	Surface Irregularity	40mm above Design level of road
1250	Edge drop-off	50mm below Design level of road
1280	Spilled or Loose Material	Any oil/chemical spill 1sq metre in area Any granular material deeper than 10mm and 1 sq metre in area

Priorities are defined in the procedure and are generally on road hierarchy as other ranking systems are considered to be too complex to be consistently and meaningfully applied by all employees.

Maximum Response times are set out for various types of road and risks and the response will be either:

- a recorded inspection to verify the extent and location of the risk, or,
- the erection of appropriate warning devices, or,
- the temporary or permanent repair to reduce the risk or eliminate the hazard.

	Risk/Hazard Type			
Road Type	Pot Holes	Edge Break	Surface Irregularity (Shoving)	Spilled Materials
Sealed Arterial Roads	5 working days	15 working days	25 working days	8 hours
Sealed Collector Roads	20 working days	2 months	6 months	12 hours
Sealed Local Roads	2 months	6 months	12 months	1 day

In some cases, the severity of the risk would need to be verified by inspection and a quicker response may be warranted. This would also apply to road pavements, which are known to deteriorate quicker under the prevailing traffic or weather conditions than is normally expected.

The procedure states that it is necessary to regularly review the Procedure to verify that its requirements are reasonably practicable and that it is effective in reducing Council's exposure to liability claims.

Because of the age of the sealed road assets this annual review is critical.

5.1. Maintenance Actions

Maintenance is being carried out on an ongoing basis, the following plant and equipment is utilized to undertake the required activities. The resources are fully utilized on routine maintenance activities.
Plant.

Bitumen patching and potholes

- Northern area — Jet patcher
- Central — Flocon with jet patcher nozzle
- Basin — Flocon Truck
- Ulladulla — Bogie Jet patcher

An overview of the current maintenance activities tends to show that the general pavement surface appears to held at an equilibrium condition by works staff. This, in reality, is not sustainable as the underlying pavement is deteriorating at an ever-increasing rate. To keep the running surface and riding quality the corridor outside the traveled surface should be maintained to a satisfactory standard. This is not the situation as evidenced by the shoulders and table drains showing signs of distress. E.g. edge drop off, scouring of shoulders and table drains, all showing signs of deterioration in standards.

Another cause for concern is the failure of the outer wheel path of the garbage trucks, with shoulder shoving and in some cases the tilting of the adjacent kerb and gutter. In the future this will be a significant problem where the pavement will have to be constructed and the kerb and gutter replaced. These types of failure will continue to occur due to the type of loading and previous construction practices. To cope with this problem a fresh approach needs to be adopted. More funding has to be directed to the road corridor and look at alternative processes to possibly achieve the result of rectifying this type of failure

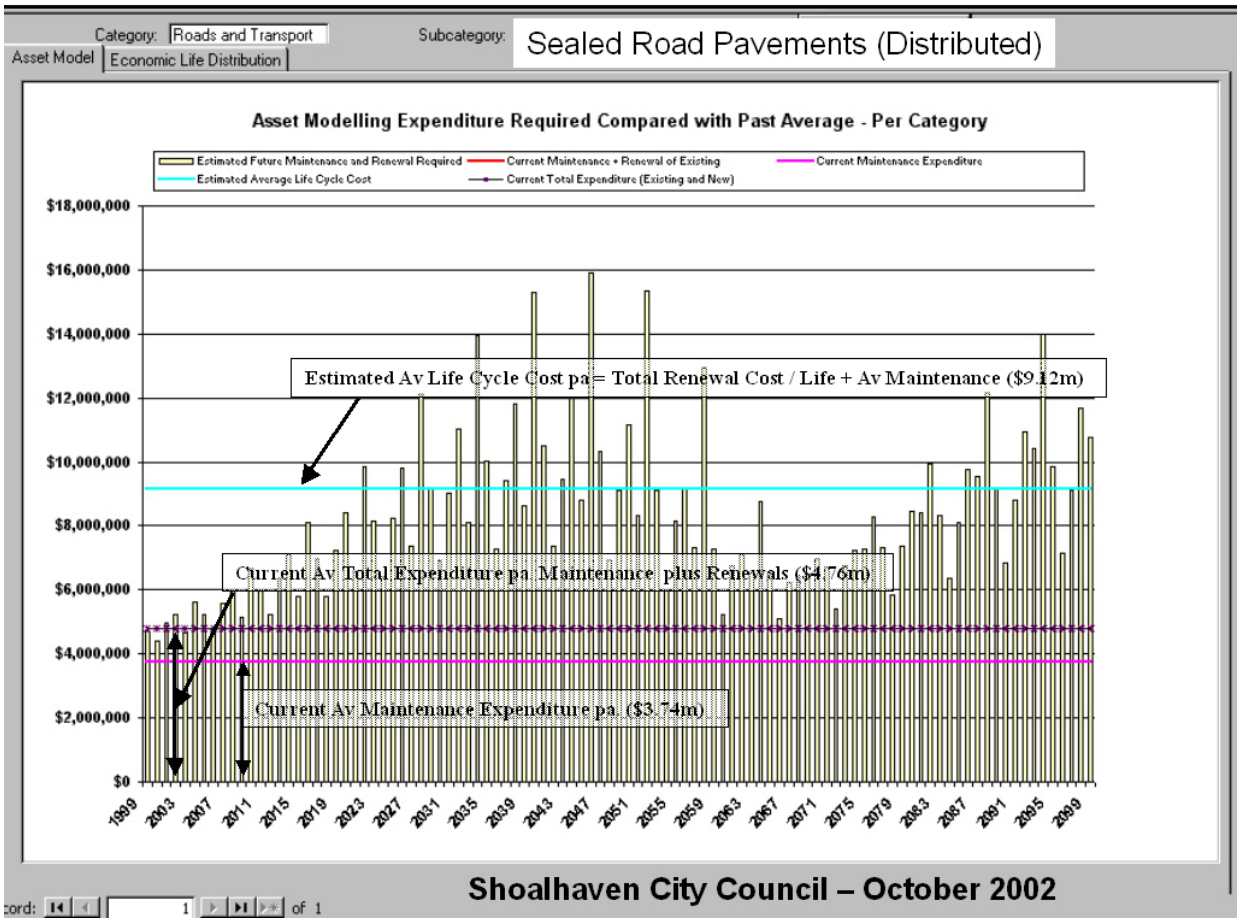
Finally in addition to the operational risk management associated with the sealed road assets consideration and planning must be given to the strategic or business levels of risk. The sealed road network has a strategic importance for the efficient and effective delivery of the many services included in the programs and strategies identified in the council's strategic **City***plan.* The consequences of any deterioration in the level of service from the sealed roads on Councils ability to achieve its objectives under the four headings of: -

Environment,
Economy
Community, and
Council.

needs to be monitored and used to assist in any decision making on the allocation of scarce resources for future long term financial planning.

6. FINANCIAL INFORMATION

Renewal projections based on then available data were prepared in October 2002 and a copy of the profile based on the then recurrent expenditures is below.



This showed the 2002 total expenditure on both maintenance $3.74 million pa and renewal was $4.76 million pa. The average Estimated life cycle cost including renewals and maintenance was projected at $9.12 million pa.

Special Schedule No 7 in the 2002-2003 Financial Report of the Council showed that the estimated cost to bring the sealed in the city to a “satisfactory” standard is **$9,200,000**. This schedule also reports that the estimated annual maintenance required for roads is **$6,587,000** and the actual maintenance expenditure for the year was **$4,890,217**.

The capacity of council to meet this shortfall within the foreseeable future will determine the extent to which alternate lower cost service levels will need to be established. From the graph it indicates that the Funding required to maintain and renew to road network is increasing with time and would theoretically peak in about 30/50 years time in 2035/55. This is calculated on the assumption that the network is maintained at a "satisfactory" level. With the current level of maintenance and CWP the asset is deteriorating at a faster rate than the maintenance is able to repair. In the future in 2035/55 some of the major roads will require major upgrading and/or renewal, if funds are not available to carry out the works catastrophic failure may occur with a breakdown in the networks capacity to perform the transport task.

More recent budget allocations for Sealed Roads for the 2005-2006 Budget are shown below:

2005/06 Budget

FOCUS AREA AND ACTIVITY	UNIT	EST. QUANTITY	UNIT COST	Budget Allocation	Required amount
SEALED ROADS					
SEALED ROAD POTHOLES	SQM	14,400	$42	$604,800	$900,000
SEALED ROAD SWEEP PAVEMENT/INTERSECTIONS	SQM	15,000	$1.50	$22,500	$22,500
SEALED ROAD H'PATCH	SQM	9,000	$60	$540,000	$810,000
SEALED ROAD OTHER	ITEM			$5,000	$5,000
SEALED ROAD RESEAL PROGRAM	ITEM			$1,494,000	$3,000,000
				$2,666,300	**$4,737,500**
SHOULDERS - Urban and Rural					
SHOULDER GRADE	KM	80	$1,150	$92,000	$230,000.0
SHOULDER OTHER	ITEM			$12,000	$12,000
SHOULDER SEAL	ITEM			$120,000	$240,000
SHOULDER REGRAVEL	ITEM			$140,000	$280,000
				$364,000	**$762,000**
CWP - Road Strategy projects					
North Nowra Link Road				$100,000	
South Nowra access Road				$50,000	
				$150,000	
CWP - Regional Road repair program					
Bolong Road rehab				$110,000	
Bolong Road repair and widen				$245,000	
Jervis Bay Road				$180,000	
				$535,000	
CWP - Local Road repair program					
Mitchell Pde Mollymook				$300,000	
Coonemia Road Rehab				$250,000	
Golden Wattle Drive - Ulladulla				$60,000	
Tapitallee Road				$40,000	
				$650,000	
Total CWP Identified projects - sealed				**$1,335,000**	

roads

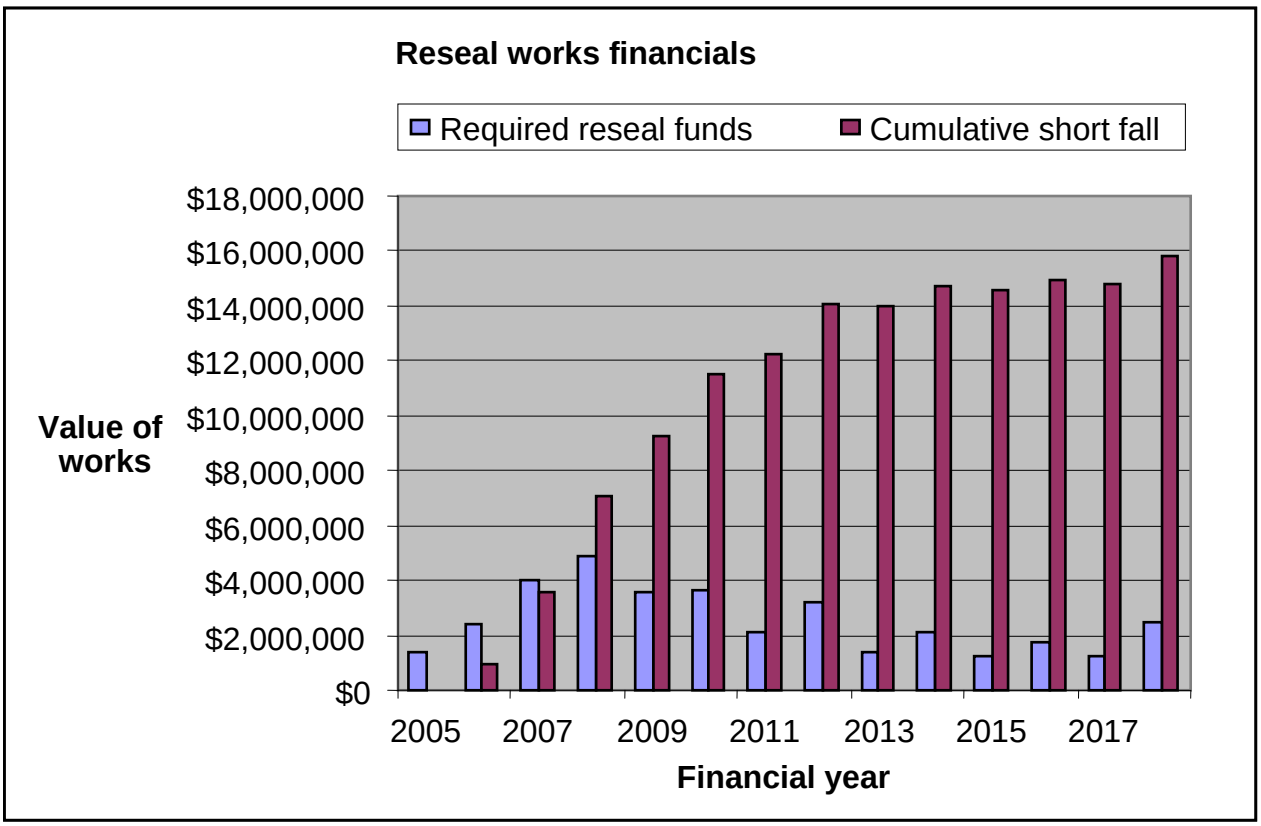
The table below shows the impact of the current reseal budget based on existing service standards required for the local sealed roads.

The table is calculated from information held in the Road condition database for sealed roads. The estimated value of reseals is calculated from the assessment of the current condition of the road seal and pavement. Values are determined at current costs for works and cumulative costs are in today's dollars. Due to the variability and uncertainties of the deterioration rates of roads these figures are best estimates. Significant weather events and changes in traffic patterns could cause a major change in the resealing requirements. The table below and the graph does not include any allowance for rehabilitation or renewal of the road surface and pavement.

The cumulative deferred or short fall in funds for resealing is based on the historical budget allocations for reseals of $1,400,000 for previous years.

Identified Local Reseal needs

Year	Estimated Value of reseals by program	Cumulative Deferred Reseal Values
1/07/2005	$1,388,333	$0
1/07/2006	$2,377,075	$977,075
1/07/2007	$4,011,884	$3,588,959
1/07/2008	$4,895,561	$7,084,520
1/07/2009	$3,570,714	$9,255,234
1/07/2010	$3,663,911	$11,519,145
1/07/2011	$2,125,442	$12,244,588
1/07/2012	$3,195,979	$14,040,566
1/07/2013	$1,383,474	$14,024,040
1/07/2014	$2,101,873	$14,725,913
1/07/2015	$1,247,547	$14,573,460
1/07/2016	$1,748,227	$14,921,687
1/07/2017	$1,252,203	$14,773,889



On the following pages are the ten-year projections for the General and Strategic Roads Programmes CWP.

Program	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Roads General Program										
Forward Survey & Design	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000	$15,000
Guardrail Provision/Replacement Program	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Land & Easement Acquisition	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000	$100,000
Local Road Repair Program										
Program to be determined	$600,000	$600,000	$600,000	$600,000	$600,000	$800,000	$800,000	$800,000	$800,000	$800,000
Regional Road Repair Program										
Program to be determined	$352,000	$360,000	$360,000	$360,000	$360,000	$360,000	$360,000	$360,000	$360,000	$360,000
Roads to Recovery										
Forest Rd	$1,280,000	$1,280,000	$1,280,000							
Major Road Projects										
Berry By Pass							$450,000			
MR 92	$4,000,000	$2,850,000								
Eastern Nowra Sub Arterial	$400,000		$500,000	$100,000				$1,000,000	$3,000,000	$3,000,000
Nowra CBD Traffic		$400,000	$500,000	$500,000	$1,000,000	$1,000,000	$500,000		$500,000	
North Nowra Link Road (01ROAD0101- plan to be reviewed)	$100,000		$600,000		$200,000	$4,000,000	$4,000,000	$2,000,000		
NBSP Land Rezonings				$500,000	$500,000			$500,000	$500,000	
South Nowra Western Service Road (01ROAD0103)				$400,000						
South Nowra Internal Service Rd & Drainage (01ROAD0104&5)	$100,000		$500,000	$1,000,000	$1,000,000	$1,000,000				
Quinns Rd/Browns Rd link (01ROAD0143)				$380,000						
Old Southern Rd		$30,000	$350,000							
Naval College Rd Realignment (03ROAD0033)										
Bomaderry ByPass (01ROAD0106)										
Snowood Rd										
Currambene Ck Crossing										
Turpentine Rd			$500,000		$1,000,000	$1,000,000	$1,000,000			
Huskisson Inner ByPass										
St Georges Basin (Anson St extension)	$300,000	$300,000		$300,000						
St Vincents St extension & Hwy connection (05ROAD0006&8)			$300,000		$200,000					
Milton CBD Road Network Upgrades				$250,000						
Northern Link Rd Mollymook (05ROAD0001)	$300,000		$3,000,000		$1,500,000					
South Ulladulla Hwy Upgrades		$200,000								
Corks Lane Milton		$250,000								
Dolphin Pt Rd Closure	$150,000									
Matron Porter Dr widen									$600,000	

SOURCE OF FUNDS	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Loans/Revenue/Reserves	$6,891,000	$5,960,000	$6,295,000	$3,725,000	$5,595,000	$7,245,000	$7,195,000	$4,045,000	$5,345,000	$4,045,000
Section 94										
Eastern Nowra Sub Arterial			$100,000	$20,000				$200,000	$200,000	$200,000
Nowra CBD Traffic (including Stocklands)										
North Nowra Link Road (01ROAD0101- plan to be reviewed)	$20,000		$100,000		$50,000	$1,000,000	$1,000,000	$1,000,000		
NBSP Land Rezonings										
South Nowra Western Service Road (01ROAD0103)				$100,000						
South Nowra Internal Service Rd & Drainage (01ROAD0104&5)	$100,000	$0	$500,000	$1,000,000	$1,000,000	$1,000,000	$0	$0	$0	$0
Quinns Rd/Browns Rd link (01ROAD0143)				$380,000						
Old Southern Rd		$15,000	$250,000							
Naval College Rd Realignment (03ROAD0033)										
Bomaderry ByPass (01ROAD0106)										
Snowood Rd										
Currambene Ck Crossing										
Turpentine Rd										
Huskisson Inner ByPass										
St Georges Basin (Anson St extension)	$200,000	$200,000		$200,000						
St Vincents St extension & Hwy connection (05ROAD0006&8)			$150,000		$100,000					
Milton CBD Road Network Upgrades										
Northern Link Rd Mollymook (05ROAD0001)	$150,000		$1,000,000		$700,000					
South Ulladulla Hwy Upgrades										
Corks Lane Milton										
Dolphin Pt Rd Closure										
Matron Porter Dr widen									$300,000	
Grants	$1,456,000	$1,460,000	$1,460,000	$180,000	$180,000	$180,000	$180,000	$180,000	$180,000	$180,000
Contributions								$500,000	$1,000,000	$1,000,000

6.1. Local Roads – Repair Program.

A Local Road repair program funding has been adopted in the budget with initial allocations of $600,000, the actual works have not been determined. Ongoing allocations with increasing amounts are show in the 10 year CWP.

6.2. Regional Roads (RTA classified)

6.2.1. Regional Roads - Block Grant.

The Roads and Traffic Authority provides funding on an ongoing basis to Council for assistance in maintaining the Regional Road network within the Council area. The amount is dependant on a formula related to the perceived needs to maintain the network for the regional component of the traffic. Council has the prerogative to determine how and where the funds are spent on the regional road network.

6.2.2. Regional Roads Repair Program

The Regional Road Repair Program is an ongoing RTA funded program with a 50/50 funding for improvements. The program has been on a 4 year cycle and each project is evaluated on its merits against other projects within the region. The current allocation to Council is in the order of $360,000 each year for the duration of the program. The detailed program has yet to be determined.

7. CHANGES IN SERVICE POTENTIAL OF ASSETS

The financial impact of maintaining a deteriorating asset and its subsequent replacement needs to be carefully studied. This study will need to be in conjunction with the overall Strategic Asset Management Strategy of the Council and have regard to the City's overall Strategic Plans, Councils statutory obligations as the Road Authority and the sustainable levels of Infrastructure Assets required

A first step in establishing an effective AMP should be a more accurate assessment of the remaining life of each section of the asset and the analysis of the demand for future renewals of sealed roads.

The Transportation Traffic Hierarchy Plan should be reviewed to meet the needs of the City's transportation task to maintain the amenity and fulfill the strategic development detailed in **City**plan.

With a view to evaluation of the costs of road maintenance and rehabilitation there should be an analysis of the classification and service levels required for all categories of road. If costs are to be reduced the service levels of lower categories of roads should be reduced and the funds redirected to the more important Arterial or Collector roads. Any changes in level of service provided should not have an overall detrimental effect on the stakeholders who use the asset. The impact of possible changes in service levels and road classifications should be monitored

The historical and required maintenance expenditures must be examined to consider sustainable and realistic options for future management of the sealed roads. The development of options with alternative lower levels of service is essential in the light of both the current shortfall of funding required for maintenance and the accumulated cost of deferred maintenance and renewals.

8. ASSUMPTIONS AND CONFIDENCE LEVELS

The data on sealed roads has been modeled to show renewal projections. Because of the very large funding implications a high priority should be the updating and validation of this

data. Particular emphasis is needed to improve the estimates on economic and remaining life of the assets. The economic life used for financial reporting purposes should be examined to endeavor to ensure that the financial reporting to residents and ratepayers on the management of these significant and critical assets is as accurate as possible.

The quality of any improved data will rely on regular updates of condition surveys and the continuation of and the effectiveness of maintenance strategies to maintain and prolong life of the assets.

Until better data is available on the condition and rate of deterioration of the various sections of the pavement and road surface it will be difficult to accurately predict the long term financial commitment required to effectively maintain and provide for renewal of the sealed road asset. This will be complicated by the need for a CWP to enhance and improve the network to cater for on-going planned development within the City

9. STRATEGY OPTIONS

There are a number of approaches which can be taken to extend the useful life of the road asset. These are intervention at specific times in the life cycle of the asset. The type of treatment to be applied will be determined by the extent of the deterioration, type of defects observed and the aim of the activity to improve the performance criteria;

a. **Routine on-going maintenance** (*Maintenance funding***)** (hold defects at an acceptable level)
   i. Pothole patching – mechanical or by hand
   ii. Edge- break and shoulder drop off
   iii. Shoulder grading and maintenance
   iv. Heavy patching – isolated failed areas < 100 m2

b. **Resealing** (*Maintenance funding***)** (renew running surface to improve aesthetics and water proofing, a programmed maintenance activity does not increase the structural life of the pavement)
   i. Bitumen enrichment
   ii. Flush chip seal
   iii. Rubber seal
   iv. Fabric seal and
   v. Asphalt overlay

c. **Rehabilitation (***Capital Works or Local Road Repair***)** (strengthen pavement and improve ride quality, increases the structural service life of the pavement and ride quality)
   i. Pavement stabilization – mechanical or chemical
   ii. Overlay with additional pavement material
   iii. Excavation and replacement with new pavement material

d. **Enhancement (***Capital Works or Local Road Repair)* (improve capacity and safety, increases the amenity and life of the structural pavement and asset)
   i. Minor changes in alignment – Horizontal and/or vertical
   ii. Changes to improve capacity for better traffic flow
   iii. Changes to improve strength to handle greater heavy vehicle usage

e. **Renewal or improvements (***Capital Works)* (renew of existing asset – improved amenity, capacity and safety generally in the same location)
   i. Full reconstruction to new alignment and standard

ii. Full reconstruction for improved capacity and/or strength of pavement

f. **Complete new road asset (***Capital Works)* (additional capacity and new route) examples
   i. North Nowra Bypass
   ii. East Nowra sub arterial
   iii. Snowwood Road –(Currambene Creek crossing) may not proceed

In relation to the above activities which Council carries out, (a) and (b) would be considered to be maintenance activities and are ongoing without any significant improvement to the life of the asset. Items (c) to (e) are capital items which improve the quality and substantially extend the life and performance of the asset if undertaken at the appropriate time in the lifecycle. Item (f) is for the building of a completely new asset where one does not currently exist. The new asset may supplement an existing asset but it does not replace the existing asset.

10. SEALED ROAD MAINTENANCE STRATEGIES

As part of the evaluation process to determine the treatment to be used on a section of the asset the goal of the works should be decided as to what improvement in the life cycle is the be achieved. This could be a low cost, short term improvement to hold the asset in an acceptable condition pending a major rehabilitation or enhancement.

Before any maintenance activities other than routine maintenance activities are undertaken on a sealed road asset the aim of the activity shall be determined. The asset shall be examined to determine if the are any planning strategies which may require improvement in the future due to development of the area served or its change of classification. The change in status may determine the type of treatment especially if road is to be upgraded in the medium to long term.

Currently Council does no impose consent conditions of pavement upgrade (expect in a small number of S94 projects) for pavement strengthening due to increased traffic loadings from developments. This requires further investigation.

The following treatments may be use for the various increases in life cycle

a. Short term – 2 to 8 years - surface course and waterprofing improvements
   i. Bitumen enrichment
   ii. Flush chip seal

b. Medium term – 5 to 12 years - surface course improvement and possibly minor pavement strengthening
   iii. Rubber seal
   iv. Fabric seal
   v. Asphalt overlay
   vi. Thin pavement stabilization – mechanical or chemical

c. **Long term** greater than 15 years
   vii. Overlay with additional pavement material
   viii. Excavation and replacement with new pavement material
   ix. Any treatment which changes the alignment or capacity of the road including full reconstruction or renewal

11. IMPROVEMENT PROGRAMME

Future actions for the management of the sealed road assts include the continuous monitoring of traffic volumes (AADTs) and a reintroduction of a contemporary Pavement Management System (PMS). Funds are available in the current budget for this to begin as it will take approximately five years to provide accurate data for the whole of the network and review the financial projections for maintenance and renewals. Plans for the implementation of the PMS, with pavement conditions, into Conquest in late 2005 are in place.

Accelerated deterioration arises from increased traffic generation from developmentsis an ongoing issues and is a cost imposition on Council. Some of these costs may be recoverable from Section 94 funds that can be levied on future developments under the provisions of the Environmental Planning and Assessment Act.1979. Any Council contribution towards the improvement of these roads would have to be sufficient to cover the cost, between the developer contribution and the actual costs to bring the roads up to the appropriate standard for the classification of the road. Developers can only be required to pay the incremental costs of providing for the increased usage created by their development.

However, the option of a direct contribution into a “sinking fund” requires further investigation. The Section 94 contribution plans are currently being reviewed to ensure planning and financial sustainability. A summary of the current S94 road projects is shown below.

With planned growth in the city new release land areas that will impact on the road network are: -

1 Nowra Bomaderry Structure Plan, and
2 Jervis Bay release Area.

The internal roads in the Nowra Bomaderry Strategic plan Area should be 100% funded by development however there will be some cost to council associated with existing roads to service this release area. Timing is anticipated is the next 2 to 10 years. It is critical that these future costs and responsibilities are evaluated in conjunction with the short and long term planning required to enable the city to provide a sustainable road network the met all the needs and objectives in Shoalhaven’s **City***plan.* The financial cost to Council arising from the new release areas is yet to be calculated and carefully consideration of the impact on funding the current roads is required.

JB Strategy study includes a proposal to provide a road crossing of Currambene Creek and development of a road (Snowwood Road) to join the north and south development areas near Husskisson / Myola. However the feasibility of these projects is in doubt.

Contributions	Asset Income	Trust Income	Interest	Expenditure	Committed	S94 Funds currently Available	Total Estimated Developers Share	Total Estimated Council Share	Total Project Estimate
$5,489,342	$81,953	$302,451	$1,034,630	-$6,076,280	-$302,267	$529,831	$28,489,894	$41,124,800	$69,614,536

Continuous communication on the impact of these plans with the community is critical to assure that the future direction of the Asset Management Plan is both understood and accepted by the community and all stakeholders. As better information on the potential impacts of a sustainable management plan on levels of service becomes available it is recommended that this Asset Management Plan be placed on public exhibition.

An issue which needs to be addressed relates the requirements for a road capacity to be increased in addition to the sealing or existing pavement improvements. Road pavements have a finite life determined by the ability to carry traffic, roads fail by fatigue and the pavements have to be strengthened when increase traffic volume is directed onto an arterial road. With increased loads generated by the development and construction traffic, the life will be shortened.

There should be a mechanism to provide Council with funds to not only seal access road but to provide for pavement improvements and for construction of additional traffic lane when the threshold capacity requires additional traffic lane to more from a two (2) lane to a four (4) lane road. These will be issues with Greenwell Point Road and some of the access roads to the new release areas.

12. LINKAGE TO COUNCIL'S STRATEGIC DOCUMENTS

The Management Plan for Shoalhaven City continues the programs and strategies identified in the Council's Strategic **City***plan, which* was adopted in June 2000. These programs and strategies are grouped under the four headings of:

Environment,
Economy,
Community, and
Council

The progressive development of Asset Management Plans for various asset types is one of the objectives in Council's **City***plan*.

With the identified shortfalls in funding for sealed roads (and other infrastructure assets) there is the real challenge of a decline or lowering of standards used by the City to define acceptable and sustainable service levels.

The consequential impacts of any redefined service levels on the current objectives of **City***plan* will have to be monitored and managed. Implicit in this is the need to require the objectives of **City***plan* to be redefined to be both environmentally and economically sustainable.

Reference is made to initiatives made by the Council in 2000 to develop Priority Ranking Assessment Criteria based on the Council's stated Mission

"To enhance Shoalhaven's Community, Economy and Environment through good government, public involvement and innovative use of our resources."

The continued development of this methodology into ***Decision Support Systems*** for both the strategic and operational management of sealed roads (and all other infrastructure assets) is essential to ensure a sustainable 10 year Financial and Capital Works Program.

13. COMMUNITY CONSULTATION

It is proposed to place the draft Asset Management Plan (Sealed Roads) on public exhibition and comment before formal adoption by Council.

To monitor strategy performance it is **proposed *to undertake an annual customer satisfaction survey*** as well as monitor customer action requests. This will allow any changes in stakeholder feedback to be monitored by type and frequency with relation to areas of concern. A concentration by location would be able to be overviewed by the CAMS GIS plot.

There is a need to undertake a study to define acceptable service levels with the community so that appropriate distribution of available funding can be made. This action is not currently resourced but options are under consideration.

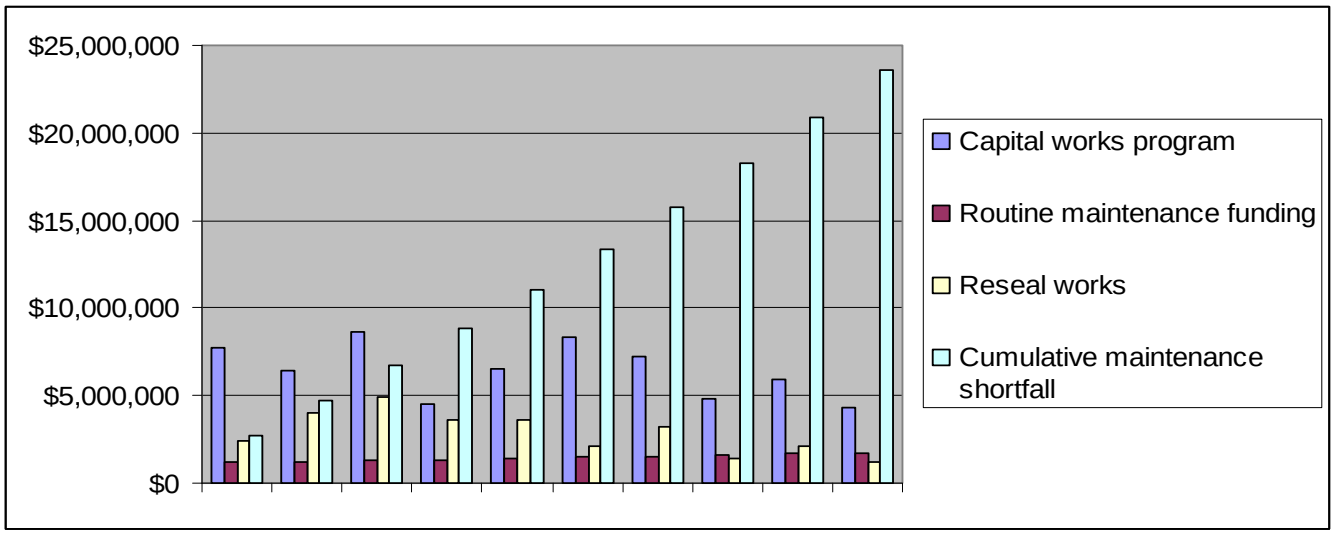
14. FUNDING NEEDS SUMMARY

Funding is required on a basis to reseal the sealed network on an average of 11 years. With 1156 kilometres of road average width of 7.5 metres this approximates to $28,500 / km and 115.6 kms are required each year. In current dollar terms an allocation of $3,000,000 should be allocated for reseals. An additional unknown is the pricing of bitumen which is rising significantly faster than CPI. This requires a review approach to look at alternative treatments which may minimize cost rises with possibly non-traditional approaches to protecting and rejuvenating the surface treatment.

Currently the budget for bitumen resurfacing is about $1,400,000 each year, giving a short fall for deferred resealing of approximately $1,600,000 cumulative each year. Details of the cumulative maintenance short fall are shown in the table below. This does not include funds required to supplement developer s94 contributions or special projects for which funds have not been allocated.

Additional funding is still required to be provided for the renewal of aging road pavements when they have reached the end of the economic life cycle and maintenance treatments are unable to keep the level of service required. This has not been calculated as part of the needs but has been addressed in section 5.

Program - Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Capital works program	$7,747,000	$6,435,000	$8,655,000	$4,555,000	$6,525,000	$8,325,000	$7,275,000	$4,825,000	$5,925,000	$4,325,000
Routine maintenance funding	$1,172,300	$1,225,054	$1,280,181	$1,337,789	$1,397,990	$1,460,899	$1,526,640	$1,595,338	$1,667,129	$1,742,149
Reseal works	$2,377,075	$4,011,884	$4,895,561	$3,570,714	$3,663,911	$2,125,442	$3,195,979	$1,383,474	$2,101,873	$1,247,457
Cumulative maintenance shortfall	$2,714,595	$4,670,283	$6,707,676	$8,830,452	$11,042,453	$13,347,694	$15,750,371	$18,254,869	$20,865,768	$23,587,859



Note: In respect to the deferred costs as shown above it should be considered that they would not be totally cumulative if all works were funded. There would be impacts across the activities, significant additional funds towards one activity may have an beneficial flow onto other activities which may reduce the maintenance funding required. This interaction is difficult to model simplistically due to the large number of variables which have interactions many of those are not able to be controlled by Council.

15. SERVICE DELIVERY MODEL

The majority of maintenance and construction activities are currently undertaken by council workforce however some construction projects are undertaken by contract to supplement available resources. Some specialized tasks within projects are carried out by contract as Council does not have the resources and/or equipment to economically undertake the activity.

In order to improve strategic directions and public accountability in service provision Council resolved to establish a service provision management model of client and provider and maintenance activities are specified under an Annual Service Agreement.

It is proposed to 'benchmark' maintenance services and to regularly compare construction costs to contract rates to ensure best value.

16. REVIEW SCHEDULE

Typically a plan of this nature should be reviewed every three (3 years) but in the light of the plans to set up a Pavement Management System and to begin to resurvey the condition of sealed roads over the next few years annual reviews of this AMP in the first instance are warranted.

When a better understanding of the asset performance is available the plan should be reviewed to represent the lifecycle of the asset as the rate of deterioration could be modeled and alternative treatments for maintenance could be assessed for lifecycle costs. This will allow a better planning of rehabilitation to achieve the aims and objectives as set out in the **City***plan* document.