CT MANAGEMENT GROUP®

UNSEALED ROAD NETWORK REVIEW
PREPARED FOR SURF COAST SHIRE

5 AUGUST 2024

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Synopsis: Surf Coast Shire is custodian of its unsealed road network and requested a review of the management framework, the gap between community expectation and current service delivery. This review provides recommendations for improvement that will help diminish the service delivery gap.

CONSULTANTS DISTRIBUTION SCHEDULE

Version No.	Date	Distribution	Reference
1	29/05/2024	Travis Nelson, Alf Della Monica	Early review
2	3/6/2024	Travis Nelson, Alf Della Monica	Review
3	11/6/2024	Travis Nelson, Alf Della Monica	Review
4	17/7/2024	Travis Nelson, Rishi Viner	Review track changes
5	1/8/2024	Travis Nelson, Rishi Viner, Alf Della Monica	Final review

SCHEDULE OF ADOPTION

Version No.	Date	Comment	Reference
6.1	5/8/2024	For Executive and Council approval	Final Version

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1. EXECUTIVE SUMMARY

The Surf Coast Shire (the Council) local government municipality encompasses an area of 1,553 square kilometres and has a rapidly growing population, which was 37,694 at the 2021 census.

The Victorian Local Government community satisfaction survey, reinforced by a community engagement process carried out in conjunction with this review, found that the Shire's unsealed road service delivery is rated low compared with many other Council service areas. However, the 2024 community satisfaction survey rating is 48, up from 46 in 2023 which rates significantly better than the satisfaction ratings in the comparison group of Large Rural Councils (34) and Statewide (36).

Figure 1: Unsealed Road Pothole Damage
(*Source: Courtesy Surf Coast Shire*)

The unsealed road network is maintained by the Civil Operations unit, which is responsible for the construction, maintenance and day-to-day operation of Council's sealed and unsealed road network.

In undertaking these responsibilities, the unit is also required to source and manage contracting services to assist with the completion of works, regularly review the standard and cost of materials, and to keep up to date with improved work practices.

The unit's unsealed road maintenance activities primarily respond when issues are identified by inspections or customers and work is guided by the Council's Road Management Plan (RMP). The RMP sets out intervention levels for hazards and timelines for corrective action. Council is consistently delivering on these requirements, although its performance has been impacted by weather events, aging roads and budget constraints.

Meetings with officers, site visits to the Shire, and analysis of the financial, assets, policies, plans and other information was undertaken to assess the current performance of the various services relating to unsealed roads.

A community engagement process was carried out in association with this review, and this identified concerns over the state of unsealed roads, and about the standard of maintenance services provided by the Council. Benchmarking against other councils showed that relative to other municipalities, Surf Coast Shire satisfaction ratings are better compared to other councils and the overall State average.

This review was applied to identify strengths, barriers and gaps in performance and to develop various options for improving levels of service delivery. The four options considered comprised a range of initiatives that required no-cost, low-cost, medium-cost and high-cost investments.

The review did not assess unsealed roads maintenance and expenditure in comparison to other Council assets and services. It does not make recommendations on what Council should spend less on in other areas if there is more expenditure on unsealed roads. This is the perennial challenge of local government, and this review did not include this challenge or potential funding solutions in its scope.

Climate hazards, including drought, storm events, bushfires etc. impact the condition of Council's unsealed road network. Severe weather events impact the condition of unsealed roads caused by too much or too little moisture content in the road pavement, sediment runoff into drainage infrastructure requiring clean-up/maintenance activities following these weather events. The findings of this review can be incorporated into Council's future climate risk assessments.

2. RECOMMENDATIONS

The review of Council's unsealed roads has identified various initiatives that could improve the delivery of these services. These have been allocated into the four option categories developed for Council's consideration.

An initiative within any particular option does not necessarily exclude it from also being implemented alongside another overall option, should Council so decide. For instance, one or more no-cost initiatives and low-cost initiatives may also be implemented alongside medium and high-cost initatives. Accordingly, in the table below, implications as to what implementing the initiative would entail is included, and a priority rating has also been applied, to provide Council with some guidance on the ease/impact of delivering any particular initiative.

The priority rating is based on the impact and ease of implementing a recommendation. A high priority rating is for high impact/high ease; medium priority is for high impact/low ease or low impact/high ease; and low priority is for low impact/low ease.

A following table (refer to: Table 10: Options for Delivering Improved Unsealed Road Services) provides a summary of the estimated costs of the various initiatives, grouped under no-cost, low-cost, medium-cost and high-cost. Costs are in 2024 dollars.

Table 1: Initiatives for Options to Deliver Improved Unsealed Road Services

No.	Initiative	Implication	Priority
Option 1 – No-Cost ($0)			
1	Improve grader crew utilisation by reducing nonproductive time.	To identify improvements to crew and plant productivity, it would require data collection and analysis of staff and plant availability, and ideally this would be through an improvement team approach to ensure ownership of possible solutions.	Medium
2	Increase grader productivity through changes to the nine-day RDO roster; by having substitute grader crews operate on the tenth day.	Increasing the days for maintenance grading could deliver an additional 10% plus production output, fixing a further 140km plus of damaged roads per annum. Note that achieving this would require support from the workforce.	Low
3	Ensure that maintenance grading is programmed such that jobs are grouped in similar locations to avoid excessive travel between jobs.	The nature of reactive works means that it isn't always a priority to group geographically located jobs, yet efficient planning and programming is crucial to minimising lost productive time.	Medium

No.	Initiative	Implication	Priority
4	Re-evaluate the importance/weighting of Gherang gravel road pavement material age in the calculation of asset condition scores, in consultation with Civil Operations maintenance staff.	Condition rating of Gherang gravel pavements currently doesn't provide an accurate residual life estimate. Civil Operations maintenance crews have experienced roads with aged materials that lack structure and these pavements do not retain their profile, leading to poor maintenance outcomes. This initiative to re-evaluate the assessment rating for material age (taking into account traffic volume) in the current asset management modelling is to assist in the development of the renewal program.	High
Option 2 - Low-Cost (Operating Budget: $660,000 p.a.) *(10 year spend estimate $7.6 Million)*			
5	Increase service levels for maintenance grading.	Trialled increased maintenance grading on some roads has been well received by the community. Adding $225,000 p.a. to the budget would result in an additional 240km of grading. This would deliver an extra service per year to half of all Council's unsealed roads, or alternatively an additional 1.5 services for primary access roads, or an additional service to three quarters of all secondary access roads.	Medium
6	Consider increasing budgets for dust suppression programs.	Dust suppression trials have improved unsealed road performance on long lengths of unsealed road. Community feedback has been very positive. Extending the program to other priority roads could reduce maintenance grading costs and enhance community perceptions of unsealed road services, for minimal outlays. A doubling of the current service would be another $120,000 p.a.	High
7	Ensure that water carts are available to support maintenance grading operations. (Evaluate the cost/benefit of acquiring a water cart for maintenance grading works. If feasible, develop a business case for capital approval).	Acquiring an additional water cart mitigates the risk and dependence on obtaining hire units during dry periods. Allow for $60,000p.a hire to cover peak periods, should the business case not proceed.	Low

No.	Initiative	Implication	Priority
8	Ensure that roller(s) are available to support maintenance grading operations on primary access roads. (Evaluate the cost/benefit of acquiring a multi-tyred roller for maintenance grading works. If feasible, develop a business case for capital approval).	A stand-alone roller delivers better compaction and higher quality pavement outcomes. Field feedback indicates performance is sustained for several weeks longer than if a roller is not used. Having a roller on the job also enhances the maintenance grader's productivity. Allow for a $60,000 p.a. hire, should a business case for a new roller not proceed.	Medium
9	Have maintenance crews operate overtime hours during optimum maintenance grading seasons.	Optimum seasons for grading are usually autumn and spring, when there is an ideal moisture content in pavements and days are still long enough to operate in good conditions. Achieving this would require support from the workforce. The cost of working an additional two hours of overtime per day during these peak periods would be around $30,000 p.a.	Medium
10	Engage a part time supervisor, or contractor, for around a four-month total time during the peak autumn and spring periods.	The role would be to oversee ripping and grading works to ensure maximum productivity, safety, and quality. The additional cost would be around $50,000 p.a.	Medium
11	Add an excavator to the peak season ripping and grading works.	The excavator would improve grader crew productivity through speeding up drainage clearing and other tasks. The extra cost would be around $80,000 p.a.	Medium
12	Develop and instigate plans for backing up field staff who are absent.	Crew productivity will improve with back-up support. A potential option is to identify and develop back-up operators from elsewhere in Council, who can quickly substitute for absent staff. Allow a nominal budget of $20,000 p.a.	High
13	Provide training to field staff to support the Salesforce IT Transformation project, which includes a digital tablet solution for integrating work orders with field activities.	Using tablets to capture works information improves productivity and asset management processes. This information is useful to analyse for process improvement, benchmarking, developing standard costing, reviewing if quality is queried, and more. Allow a nominal training budget of $15,000 p.a.	Medium

No.	Initiative	Implication	Priority
Option 3 – Medium-Cost (Operating Budget: $970,000 pa; Capital Budget: $3,500,000 pa) *(10 year spend estimate – Operational $11.1 Million. Capital $40.1 Million)*			
14	Increase the current level of service for maintenance grading to better align these with community expectations. Consider removing the requirement for 4.5 EFTs in the Civil Operations unit, and associated plant, to be dedicated to capital works projects. These would be the resources required to cover the additional service.	This will require an upgrade of road services maintenance intervention level standards and a move to proactive maintenance. (*Note: The RMP documentation is due for review within the year following the next Council election*). Community feedback strongly favours an increased level of service for maintenance grading of unsealed roads, this will require additional frequency of grading, which will require resourcing. Additional funding will be required to diminish the gap between current levels of service and the community's desired levels of service. Allow a budget of $300,000 per annum.	High
15	Stabilise pavements in areas that are subject to water damage and/or traffic damage, such as in floodways or steep road sections.	Identify and prioritise road segments that would benefit from stabilising. This will add infrastructure resilience to mitigate the impact of future extreme weather events due to climate change. Allow a budget of $100,000 per annum.	Low
16	Place additional crushed rock during maintenance grading to reinstate road crossfalls and pavement structure.	The practice of adding crushed rock over Gherang gravel pavement improves profile and adds structure and durability to the pavement. Based on current costs, allow a budget of $300,000 per annum, which would treat 10km of unsealed roads to a 50mm depth.	High
17	Increase the amount of drainage and vegetation clearing works.	Improved drainage will protect roads from water pooling and hence mitigate against pothole formation. This will reduce maintenance intervention callouts and reduce costs in the longer-term. Allow a budget of $100,000 per annum.	Medium
18	Research potential options for improving gravel quality and durability.	Consider collaborating with quarry and admixture suppliers to identify ways to beneficiate their product. Liaise with the City of Greater Geelong, which is undertaking trials of incorporating admixtures into unsealed road pavements. Allow a research budget of $50,000 p.a.	Medium

No.	Initiative	Implication	Priority
19	Engage an Unsealed Roads Team Leader.	This role will focus on unsealed roads to drive productivity, efficiency and quality improvements. An additional benefit would be to enable the current two team leaders to be more productive and focused on their primary roles. Allow a budget of $120,000 per annum for wages and overheads.	Medium
20	Increase budgets for resheet renewal programs so that a 10-year cyclic frequency can be achieved. (*Note: Evaluate the benefits of the new level of resheeting standards (75mm Gherang gravel topped with 25mm of crushed rock). Confirm that the benefits outweigh the additional cost of material. A lower cost specification will increase the number of roads that can be resheeted per year*).	The resheet program only renewed 20.8km, or 4.4% of unsealed roads, on average over the past four years, If this rate was continued, it would take almost 25 years to resheet all Council's unsealed roads. Ideally, unsealed road materials should be replenished every five to eight years, so current practice is inadequate to sustain the network. To at least maintain close to the status quo of pavements, provide sufficient funds to be able to resheet Council's unsealed roads on a 10-year cycle, provide for additional capital renewal budget of $3,500,000 per annum.	**High**
Option 4 – High Cost (Operating Budget: $470,000 p.a.; Capital Budget: $4,600,000 p.a. and $7,700,000 in year one) *(10 year spend estimates – Operational $5.4 Million. Capital $52.7 Million)*			
21	Raise the level of service standard to that desired by the community.	This would entail establishing at least one more maintenance grading team, or use contractors, to deliver a proactive maintenance grading program. Assume the cost would be the same pro rata for an additional maintenance grading cycle of $450,000 per annum.	High
22	Significantly increase the capital renewal resheet program so that the 5-year cyclic frequency for primary access roads and a 10-year cyclic frequency for secondary access roads can be achieved.	This would mean resheeting 62.4km of roads each year at current average direct costs of $13.39/m^2, or over $73k per km (at an average road width of 5.5m). This requires an investment of $4,600,000 per annum.	High
23	Develop a sealing of unsealed roads policy, identify roads that merit sealing and develop a costed program for funding consideration.	The first task will be to develop a policy for sealing of unsealed roads that will provide an objective and transparent process for identifying unsealed roads that merit sealing. The next part would be to prepare a prioritised list of roads for sealing, and to develop a costed program that will enable	High

No.	Initiative	Implication	Priority
		budget processes to consider whether funding could be allocated. Allow a once-off cost of $20,000 for this initiative.	
24	Upgrade unsealed roads to sealed roads to a 9.2m wide carriageway with 7.2m of seal. The upgrading would be based on the sealing of unsealed roads policy, and relevant criteria and maintenance cost savings would prioritise the unsealed roads to be upgraded.	Table 14: Cost Estimate to Transition Unsealed Roads to Sealed Roads provides costing for an upgrade of 5% (23.85km) of unsealed roads at an initial capital cost of nearly $7,700,000. Renewal costs for resealing and shoulder resheeting would be required every 10 years, but annual operating maintenance costs would be lower than for unsealed roads. Note: This program could be adjusted and spread over multiple years, as funding permits. For example, sealing 5km would cost $1.6M.	Low

3. INTRODUCTION

3.1 Purpose and Scope

In January 2024, Surf Coast Shire (the Council) engaged CT Management to review its network of unsealed roads (the Review) to achieve the following objectives:

- Evaluate the road management framework
- Identify and analyse gaps between service provision and community expectations.
- Assess the condition and performance of the unsealed road network and maintenance and renewal scheduling and delivery practices.
- Identify strengths, weaknesses and gaps in policy and procedures.
- Propose practical and actionable options and costs to enhance the Council's approach to managing, maintaining, and renewing the unsealed road network.
- Develop decision-making recommendations, guidance and criteria to inform the prioritisation of future works.

The scope of the Review included a community engagement component that undertook extensive consultation with the community through various means, such as an online survey, emails to businesses, pop up stalls, drop-in sessions and calls for submissions.

Desktop reviews and analysis of Council supplied files, and website information were supplemented by site visits and discussion with Council officers to identify opportunities for improving the unsealed roads service. Evaluation of financial information was undertaken to assess alternative resourcing requirements for adjusting levels of service.

3.2 Outcomes

Council's road management framework for maintaining and renewing its unsealed road network is founded on its *Road Management Plan 21 – 25* (RMP), which establishes a risk management basis for inspection and actioning intervention level defects within a reasonable timeframe. The RMP aims to balance the needs of road users and the cost of the service to ratepayers.

The unsealed roads service is largely based on undertaking maintenance activities in a response manner. Action is taken when intervention levels become apparent, whether through proactive inspections or unsolicited reporting of defects. Renewal programs are based on asset management principles and priorities. There are sound policies and procedures that underpin these processes, and the framework is appropriate in that sense.

Issues arise when the ability of Council to achieve the required rectification action within a timeframe does not satisfy the customer's expectations of the service. Adverse weather events, aging road pavements and limited resources impact on Council's ability to meet its RMP standards. Furthermore, the community consultation process showed that the level of service being delivered does not meet expectations, which also exceed those prescribed in the RMP.

To achieve its standards under the RMP, let alone satisfy its community's desired level of service, Council must consider changes for unsealed road services.

3.3 Analysis of Strengths, Barriers, and Gaps

Detailed analysis of the strengths, barriers, and gaps associated with Council's unsealed roads service is primarily contained in section 7 Review Findings, but the key elements have been extracted from that section and condensed into the following table to provide a summary of the primary items of interest.

Table 2: Strengths, Barriers and Gaps

Strengths
Council has tools, policies and procedures that support good asset management practices.
Council has a robust asset management function with current asset data that utilises a good system for predictive modelling of its road infrastructure. Digital imagery is also captured as part of Council's three-yearly condition audits.
Crushed rock unsealed roads are more durable and weather better than Gherang gravel roads when wet.
Overlaying Gherang gravel roads with crushed rock has apparently improved the pavement's structure and performance.
The Torquay depot is modern and well equipped for its function and the yard is spacious and well laid out.
There has been a budget increase for unsealed road renewals (resheets) in FY24.
The Council's fleet of plant and equipment is modern and capable of delivering its maintenance functions.
Dust suppression is very effective on Gherang gravel pavements.
The resheet design comprising a 75mm compacted layer of Gherang gravel, topped with a 25mm compacted layer of crushed rock has a superior structure and durability in wet weather. It is an innovative approach to reducing longer-term maintenance costs and to achieving improved trafficability.
There is a good skill level across the workforce, it is stable and generally morale is good.
Barriers
Road renewal programs must compete for financing against other capital renewal projects and are not guaranteed full funding.
The community is not satisfied with the level of service being provided for its unsealed roads.
In Aireys Inlet township there has traditionally been a strong resistance to using crushed rock, instead of Gherang gravel, on unsealed roads, and some people oppose sealing streets.
Is not possible to effectively compact aged Gherang gravel pavements.
There is no increase in budget to cater for asset growth, nor for increased traffic volumes due to population growth, despite associated increases in maintenance requirements.
When a breakdown occurs, Council hires its own replacement plant and is also penalised in utilisation / charge back to the program calculations.
Work order allocation process is paper based and there would be minimal information included in digital close-out of work order upon completion of works.
The Civil Operations unit has insufficient capacity to cover any absentees and, if even only one person is away, it impacts crew productivity.
Gaps
Unsealed roads condition data does not appear to weight the age of Gherang gravel pavement material sufficiently.
Maintenance grading utilises grade-rolls but compaction outcomes are not sufficient for long-term optimum performance.
Maintenance grading operations do not always have reliable access to water carts or rollers. (Business cases may provide justification for acquiring Council-owned water carts and rollers).
There are no approved forward plans to seal gravel roads, although some R2R funding may yet be possible. Certainly, the community engagement feedback indicated that there is a strong desire in some areas for this to be done.
Surf Coast Council does not have a policy or procedure for determining whether an unsealed road should be upgraded and sealed.
The Shire does not use tablets to digitally capture task information and would not have photographic records of pre and post maintenance works.

3.4 Methodology

3.4.1 Stage 1: Project Establishment

- CT Management project team met on 9 January 2024 with Council's **Project Review Team** to confirm scope, key contacts, milestones etc. and commence the project.
- Initiated community engagement process and outlined methodology.
- Planned site visit to meet with the Coordinator Civil Operations.
- Request for key documents provided following meeting.
- Sharepoint online folder established for collection of key documents.

3.4.2 Stage 2: Information Gathering

- Key documents and data for review placed into Sharepoint folder.
- Council website and documents from other relevant sources reviewed.
- Community engagement surveys and face to face information undertaken.

3.4.3 Stage 3: Consultation

- Site visit and interviews with officers completed.
- Participated in drop-in and pop-up stall consultation process.

3.4.4 Stage 4: Service Analysis

The analysis phase provided:

- Documented levels of service per activity/service.
- Understanding of resource level requirements.
- Recommendations on opportunities for improvement.
- Options for adjusting levels of service.

3.4.5 Stage 5: Options Review

Various service delivery options were considered including increasing levels of service to ensure meeting RMP standards and closing the gap towards community expectations.

Cost/benefit and risk analysis were undertaken on the options and a preferred direction established.

3.4.6 Stage 6: Report & Project Review Team Review

A summary report was provided to the **Project Review Team** for review. This report includes:

- Summary of key issues
- Conclusions
- Key recommendations.

The final report was then based on the outcomes of this review.

4. BACKGROUND

The area that is now Surf Coast Shire is the traditional home of three Traditional Owners: the Wadawurrung, the Gulidjan, and the Gadubanud people of the Eastern Maar nation.

Figure 2: Traditional Owners Map

(Source: https://www.surfcoast.vic.gov.au/files/sharedassets/public/v/1/surf-coast-shire-reflect-rap-dec23-dec24-low-res.pdf)

The Surf Coast Shire is a local government area in the Barwon South West region of Victoria on the coastline from near Breamlea to Cumberland River. It extends northwards to the Barwon River, westwards to Deans Marsh and eastwards to Greater Geelong. It covers an area of 1,553 square kilometres and includes the towns of Aireys Inlet, Anglesea, Lorne, Moriac, Torquay, and Winchelsea.

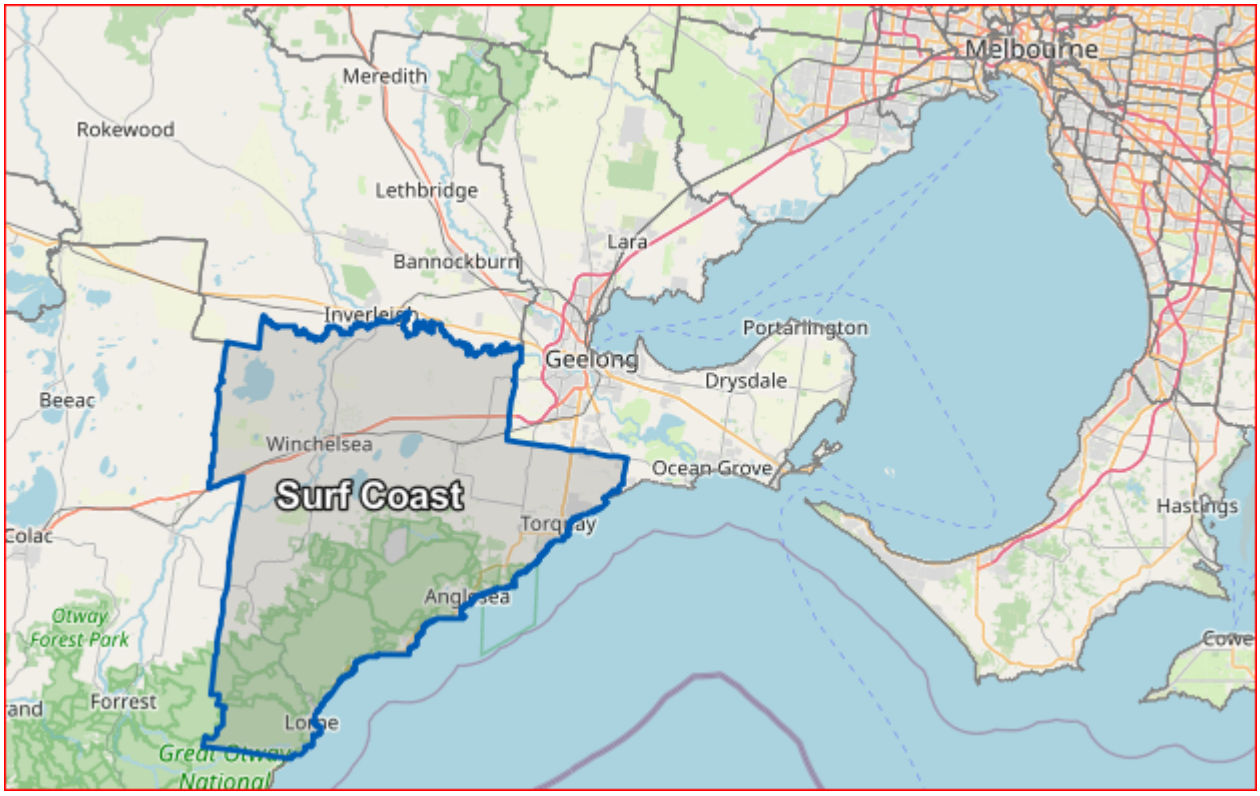


Figure 3: Surf Coast Shire local government area

(*Source: Australian Bureau of Statistics*)

Surf Coast Shire was formed in 1994 through the amalgamation of most of Winchelsea and Barrabool Councils and part of the former City of South Barwon.

The population of the Surf Coast in the 2021 census was 37,694, almost a 30% increase on the 2016 census population and over 45% growth on the 2011 census population. This is a significant increase and is testament to the beauty of the area and its lifestyle. However, this growth, and the region's popularity for attracting tourists, places increasing pressure on maintaining the region's road infrastructure, including its unsealed road network.

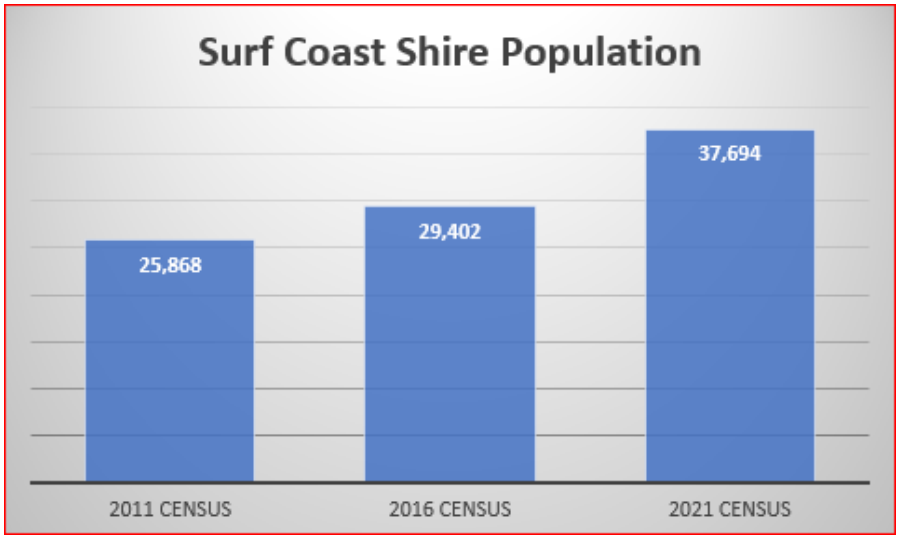


Figure 4: Surf Coast Shire LGA Population - ABS Census Data

(*Source: ABS* 2021 Surf Coast, Census Community Profiles | Australian Bureau of Statistics (abs.gov.au))

In 2021, the Surf Coast Shire's community developed a Vision for "… *an active, diverse community that lives creatively to value, protect and enhance the natural environment and our unique neighbourhoods* …". This vision was adopted by the Council as a foundation statement for its strategic plans.

There are 10 principles that support the Vision and, for several of these principles, having a functional and effective road network is an enabling service critical to success. In particular, Principle 2 **Planning for Growth**, Principle 3 **Sharing our Home with the World**, Principle 8 **Commitment to a community that promotes cultural and recreational activities** and Principle 9 **A place to nurture, acknowledge and promote innovation, the creative arts and industries** are reliant upon effective transport infrastructure.

Surf Coast Shire's overall road network covers approximately 1,100 kilometres, of which about 44% (477km) is unsealed.

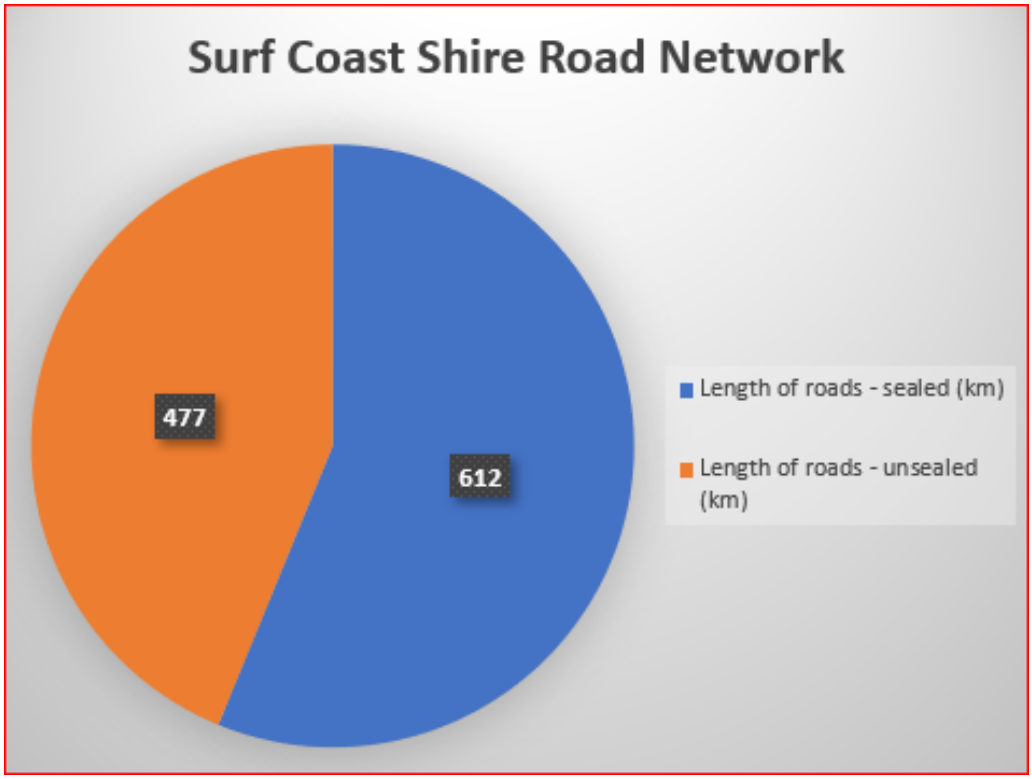


Figure 5: Surf Coast Shire Road Network

(*Source: Operations BIS data review.xlsx*)

Most unsealed roads are in rural areas, with under 10% (32km) in urban areas.

Road infrastructure in urban areas includes pathways, road furniture, kerbs and channels. Open drains and culverts generally control stormwater on rural roads. Road infrastructure also includes major assets such as bridges and major culverts.

The condition of these assets and the road environment significantly impact the safety of residents, business employees and visitors who use the network for recreation, sport, leisure, education and commerce.

The unsealed road network is maintained by the Civil Operations unit, which is responsible for the renewal construction, maintenance and day-to-day operation of Council's sealed and unsealed road network, ensuring that it can support day-to-day transport activities across the shire. The Civil Works team also maintains drains and footpaths and other civil infrastructure. In undertaking these responsibilities, the unit is also required to source and manage contracting services to assist with the completion of works, regularly review the standard and cost of materials, and to keep up to date with improved work practices.

Council's Civil Operations team undertakes its role with support from Fleet Management, which provides graders and other plant, and Asset Management which provides road condition status and generates renewal (gravel resheeting) programs.

The unsealed road maintenance activities are largely reactive and in response to routine inspections or ad hoc reports that identify hazards. Responses are guided by the Council's Road Management Plan, which sets out intervention levels for hazards and timelines for corrective action.

The community engagement initiative that was carried out in association with this review identified there can be considerable improvement in the state of unsealed roads, and in the maintenance services provided by the Council.

This Review examines how the Council can respond to the community's feedback on its unsealed road network and identifies opportunities to improve its service delivery. It does so within the backdrop that Council has commitments to other services and infrastructure which must also be maintained and renewed. Future decisions may need to consider alternative funding and/or a reduction in other services or community facilities should Council determine to increase unsealed roads maintenance expenditure.

4.1 Service Definition

The community survey carried out in association with the unsealed roads review provided the following Fact Sheet information as part of the communication with the public. These details neatly summarise the services provided by Council for its unsealed road network,

How we currently manage our unsealed roads
Depending on their hierarchy, we inspect the unsealed road network every 2, 3 or 6 months. We conduct a detailed condition assessment every 3 years to inform our maintenance and replacement programs.

Our cyclic resheeting program renews unsealed roads throughout the Shire. Last year, the budget for unsealed road resheeting increased to around $1.2M (double that of previous years).

Magnesium salt is applied at the start of the dry summer period for 100m in front of houses to suppress dust.

Our cyclic unsealed road grading program is programmed to reduce rutting and reshape unsealed road surfaces. Maintenance grading is scheduled based on our inspections and when the road conditions reach the set intervention level.

We respond to unsealed road issues such as potholes, corrugations, rutting, and drainage issues as per the timeframes in our Road Management Plan.

We use two types of material for unsealed roads:

- *Gherang gravel - made of river sand, clay and pebbles and is a red/orange colour that fades to a sandy yellow colour with age*
- *Crushed rock – dark grey, angular stone*

All unsealed roads break down over time due to traffic use, age and weather cycles. Gherang gravel and crushed rock have different properties, strengths and weaknesses. We choose the best material for each situation to maximise the life of the surface.

The following table outlines key road service measures for Council's road network within its local government area.

Table 3: Surf Coast Council Road Services

Road Services	2020-21 Actual	2021-22 Actual	2022-23 Actual	2023-24 Budget
Road Network Details				
Length of roads - sealed (km)	609	609	612	612
Length of roads - unsealed (km)	478	478	477	477
Total length of roads (km)	*1087*	*1087*	*1089*	*1089*
Key Service Outputs				
Gravel roads graded (km/year)	1000	1020	1491	1,422
Footpaths maintained (m^2)	1200	1400	1432	1,468
Potholes repaired (no)			394	620
Roads - resealed (km)	9.1	12.0	3.2	2.0
Roads - resheeted (km)	18.1	15.0	30.0	20.2
Unsealed Roads - Financial Details				
Operational Costs	$2,031,482	$2,255,893	$2,632,678	$2,517,532
Rural % - operating spend	78%	74%	78%	78%
Urban % - operating spend	22%	26%	22%	22%
Capital Renewal Costs				
Unsealed roads - resheets	$ 697,252	$ 796,010	$1,062,573	$1,916,826

(*Source: Operations BIS data review.xlsx & Coordinator Civil Operations*)

The operations budget for annual maintenance activities rose 11% in FY22 and 17% in FY23, but has plateaued, and is forecast to slightly dip by 4% in FY24 followed by a small 3% rise in FY25.

Unsealed renewal expenditure has risen considerably in recent years. It increased by 14% in FY22 and 33% in FY23, and jumped by 80% in FY24, with a significant increase of just over $850,000 between FY23 and FY24.

The following charts demonstrate the changes in operating and capital renewal expenditure since FY21.

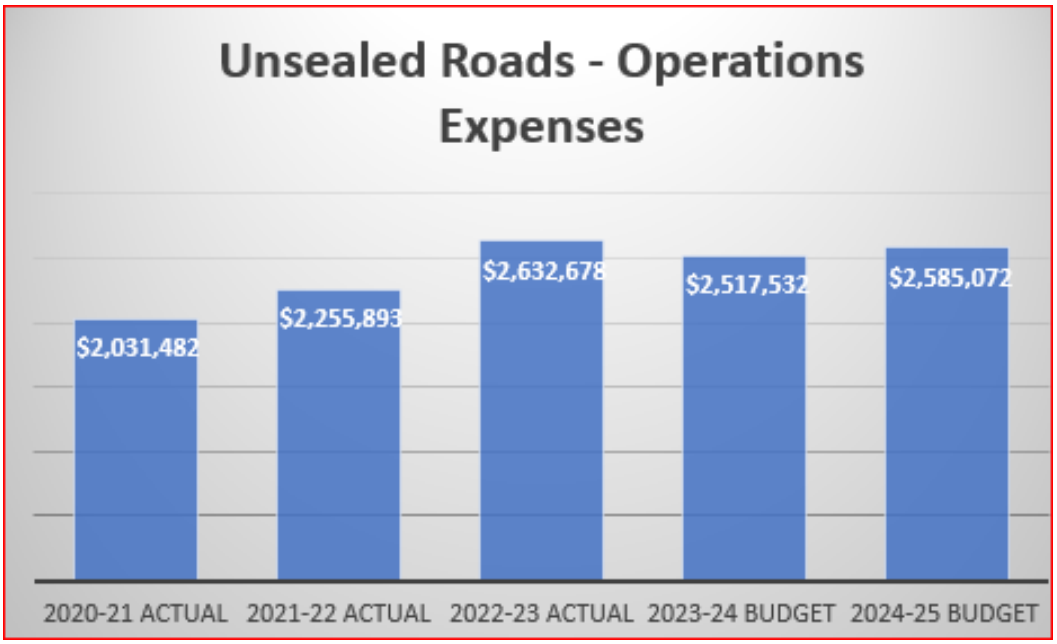


Figure 6: Unsealed Roads - Annual Operating Spend

(*Source: Operations BIS data review.xlsx*)
(*Note*: These figures include around $300k per annum in overheads)

The capital renewal budget for gravel road resheets received a major boost in the FY24 budget.

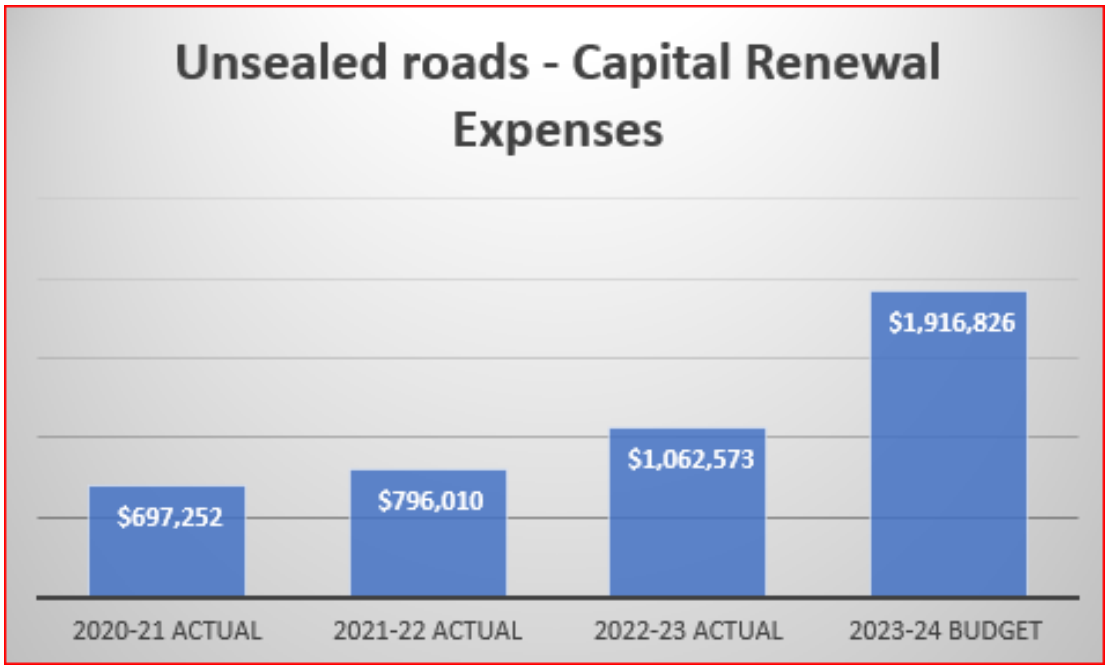


Figure 7: Unsealed Roads - Annual Capital Renewal Spend

(*Source: Operations BIS data review.xlsx*)

The underlying trend in resheeting (or renewal) cost per km (see the orange line in the chart below) has been between $35k to $53k per km, but jumped to $95k per km, including overheads, in 2023-2024. This uplift in FY24, is largely due to an inflationary spike, leading to significant increases in cartage, material and contractor costs. It is also partly due to a new specification for resheeting being trialled. This is to place and compact a 75mm layer of Gherang gravel and to add an extra 25mm compacted layer of crushed rock. This has a superior structure, and roads should achieve rideability and durability benefits that reduce maintenance costs and increase road-user satisfaction levels in the long-term.

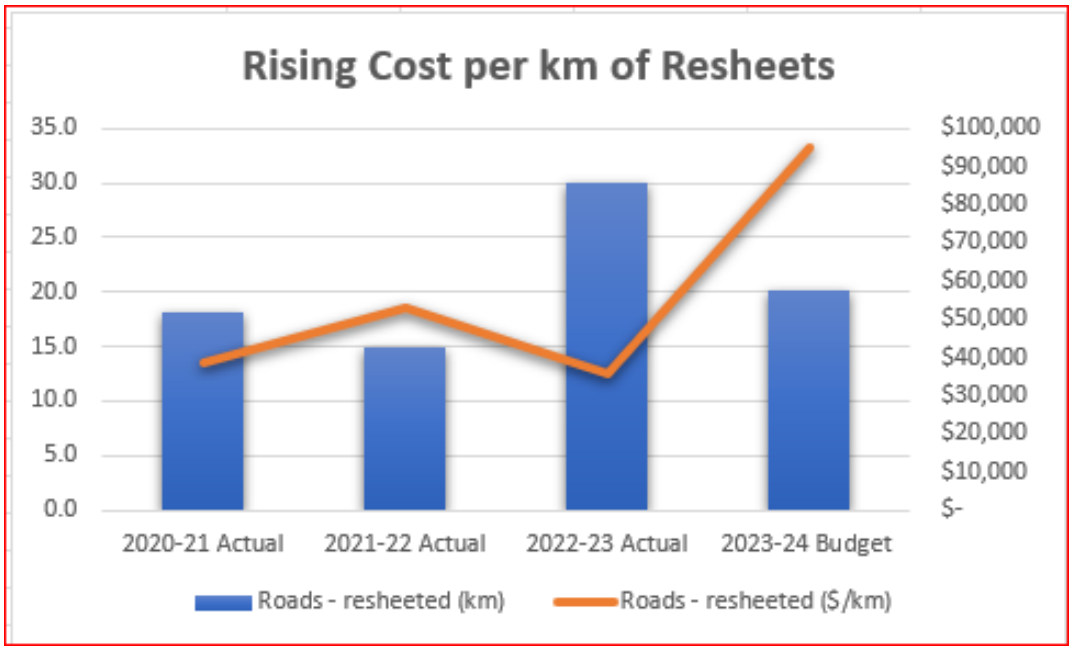


Figure 8: Renewal (Resheet) km & $/km

(*Source: Operations BIS data review.xlsx & Coordinator Civil Operations*)

Should the current number of km resheeted per annum remain at around 20km, then it will take 23 years to resheet every unsealed road in the municipality. Given that the Australian Roads Research Board (ARRB) best practice guide level of service target is to resheet every five years, then the current level of service is not achieving this.

(*Note*: FY24 estimated direct cost information for material, cartage, plant hire, traffic control and supervision indicates that the 20.23km of resheets, with an average road width of 5.5m, cost an average of $95,000 per km, or $17.27 per square metre. However, there is no information on direct expenses available for previous years, so the above graphs use costs that contain overheads to compare across several years).

Furthermore, the following table shows that the average age since the last known resheet of primary access roads is 7.6 years, and for secondary access roads it is 10.8 years. Overall, the asset data on road segments has dates of the last known resheet for 71% of the unsealed road network. The average age of these resheets is 9.6 years, which is nearly double the target service level of ARRB best practice target of resheeting unsealed roads every five years.

Reasonably though, Council's renewal program is not based on a cycle of resheeting roads on a set number of years but is based on the condition of the road and whether it requires resheeting. However, the two factors of a long cycle for renewing/resheeting all unsealed roads and the advanced average age of resheets means that road pavements will worsen at an accelerating rate. This may be especially so for Council's secondary access roads, given their average age being high, notwithstanding that these are lesser used roads and would generally not require resheeting as often as primary access roads.

The consequence is that aged Gherang gravel pavements will no longer have the binder needed to allow it to compact and roads will lose their profile, retain water and deteriorate. Pavement depths will diminish and issues such as potholes, corrugations and rutting will become more prevalent and maintenance grading will not have sufficient gravel to remedy these defects. Roads in this condition require re-sheeting.

Table 4: Average Age of Unsealed Road Resheets

Age of Resheeted Roads			
Unsealed Council Roads	**km**	**%**	**Average Age (Years)**
Primary Access Road			
Resheet Age Unknown	31.3	20%	?
Resheet Age Known	126.7	80%	7.6
Total	**158.1**	**100%**	
Secondary Access Road			
Resheet Age Unknown	105.1	34%	?
Resheet Age Known	202.8	66%	10.8
Total	**307.9**	**100%**	
Combined			
Resheet Age Unknown	136.4	29%	?
Resheet Age Known	329.6	71%	9.6
Total	**466.0**	**100%**	

(*Source:* Segment Asset Data)

The following analysis has been undertaken, using FY24 direct costs for renewal/resheeting, to assess the scale of the investment necessary to increase Surf Coast Shire's resheeting cycle. The chart on the following page plots the annual direct costs required to resheet all unsealed roads at cycles varying from the FY24 rate, and every 20, 15, 10 and 5 years.

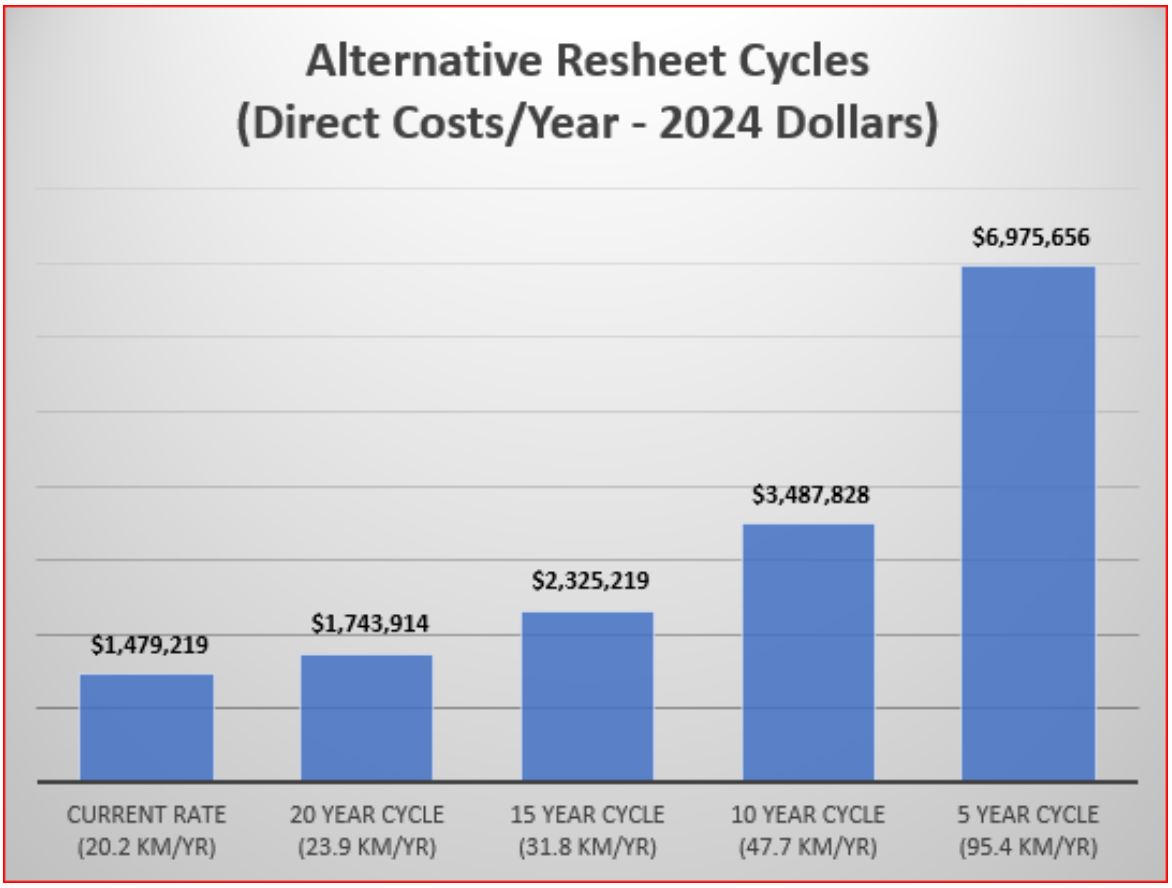


Figure 9: Direct Cost to Resheet All Unsealed Roads at Various Cycles

(Source: Resheet Program 23 24 Cost Estimates.xlsx

Given that the current average age of all unsealed roads is 9.6 years, then to just maintain the status quo it would require a 10-year cycle program of resheeting nearly 48 km per year at a cost of almost $3.5M per annum. This is $2M more than the investment made in FY24.

Ideally, a five-year cycle program investment of approximately $7M per annum for several years would improve the network more rapidly, after which road condition assessments and asset management modelling could guide longer term renewal strategies.

Increasing investment in unsealed road infrastructure would ensure that the network is better condition and would better meet community expectation. As previewed earlier in the report, this review does not make recommendations on where Council should invest less to make increased spending on unsealed roads possible. These would be key strategic decisions Council would need to make in the future.

4.2 Organisational Structure

The following charts detail the management structure for senior management and directorates, and the Civil Operations unit that reports to the Manager Operations within the Community Life directorate.

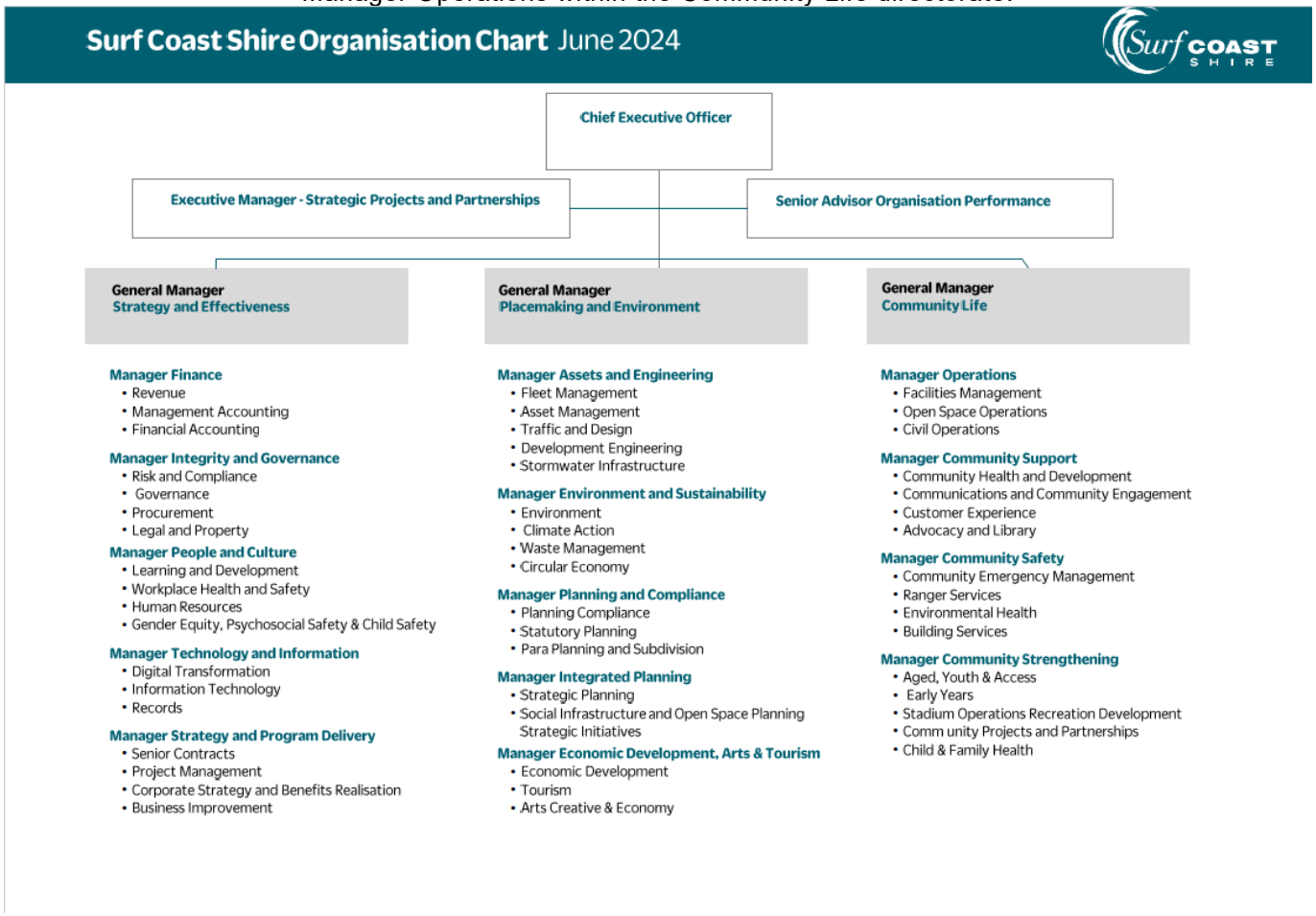


Figure 10: Surf Coast Shire Organisation Structure – Senior Management

The Civil Operations unit is led by the Coordinator Civil Operations.

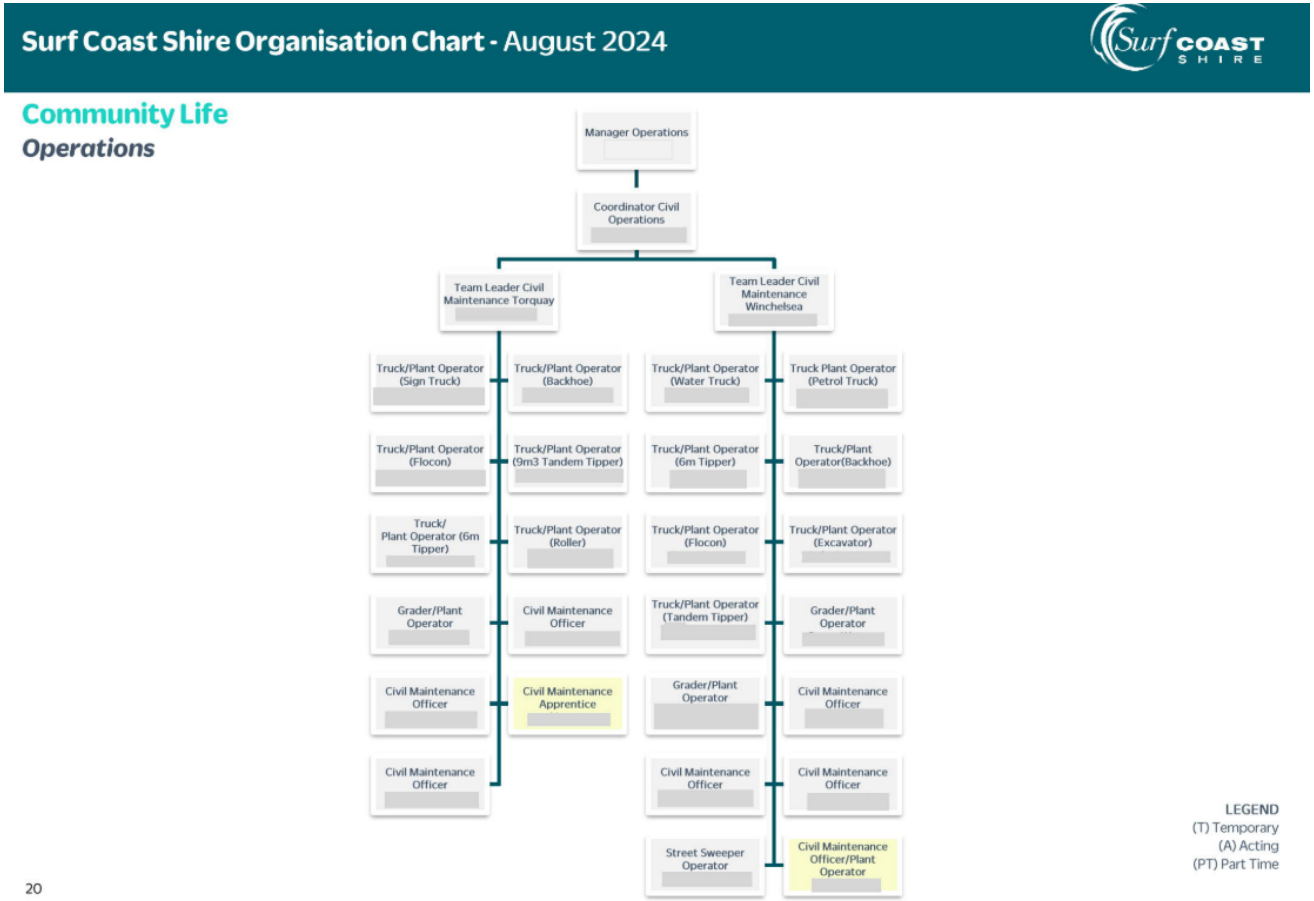


Figure 11: Surf Coast Shire Organisation Structure - Civil Operations

The Civil Operations unit reports to the Manager Operations, within the Community Life division. The unit comprises 34 positions. There is also a requirement for 4.5 EFTs in the Civil Operations unit, and associated plant, to be dedicated to capital works at various times throughout the year. The costs for these resources are charged to the capital works program budgets, not recurrent staff budgets.

Within Civil Operations, the unsealed road maintenance service function is delivered through three grader maintenance crews. The plant used consists of a grader, which may use a tag-along multi-tyred roller set-up, or a separate multi-tyred roller, and a water cart. The roller is hired, as are some water carts, as required.

Issues arise when capital works require the dedicated 4.5 EFTs and associated plant to deliver projects. This can be disruptive to the maintenance operations schedule and the unit's ability to undertake maintenance tasks efficiently. Other challenges arise when an operator is away, as there are limited replacement resources. A grader operator was ill for an extended period last year and this impacted on grader utilisation. Accessing water carts during dry periods can be difficult, and this is also a risk to productivity.

Resheet renewal programs are contracted out and project managed by Council. This appears to be a cost-effective means to deliver the program and the quality of the re-sheeted road, observed during a site visit, was excellent.

The issues raised above give rise to opportunities for improvement and these are addressed in the Review Findings section.

5. SERVICE QUALITY AND STANDARDS

Surf Coast Shire outlines its principles for its delivery of services in its Financial Plan 2021 -2031 document.

1.4 Service Performance Principles

Council services are designed to be purpose, targeted to community needs and value for money. The service performance principles are listed below:

a) Services are provided in an equitable manner and are responsive to the diverse needs of the community. The Council Plan is designed to identify the key services and projects to be delivered to the community. The Financial Plan provides the mechanism to demonstrate how the service aspirations within the Council Plan may be funded.
b) Services are accessible to the relevant users within the community.
c) Council provides quality services that provide value for money to the community. The Local Government Performance Reporting Framework (LGPRF) is designed to communicate council's performance regarding the provision of quality and efficient services.
d) Council uses a performance monitoring framework to continuously improve its service delivery standards.
e) Council service delivery framework considers and responds to community feedback and complaints regards service provision.

Figure 12: Service Performance Principles - Surf Coast Shire

(*Source:* Surf Coast Shire Financial Plan 2021 – 2031)

With respect to road service functions, there are various authorities that provide guidance on typical levels of service, such as the following:

- Australian Road Research Board (ARRB) - Best Practice Guides for Local Governments
- Austroads Guides
- Institute of Public Works Engineering Australasia (IPWEA)
- Department of Transport (Victoria)

According to ARRB, levels of service are core to asset management because they:

- Represent road standards and qualities that the asset owner agrees to provide to users; and

- Are the key drivers critical to good asset management practice and the basis upon which recommendations, conclusions, decisions, and budgets are based.

Levels of service are characterised by customer levels of service, which focus on how the road user experience services, and technical levels of service, which relate how to the asset owner measures the service elements.

The following table from ARRB's unsealed roads guide provides a useful template for customer and technical levels of service measures (described as CLoS and TLoS).

Table 5: Typical Unsealed Road Levels of Service

Table 2.1: Summary of CLoS attributes, descriptions and TLoS measures

CLoS attributes	CLoS description	TLoS measures
Accessibility	The network is available at most times, except during heavy rainfall and its drainage off the pavement.	Roads aimed to have 100% to 90% annual availability to traffic, except during heavy rainfall and its drainage off the pavement
Function	Different unsealed road types are available to different road users (heavy vehicles, etc.) based on their functional needs	Rideability (roughness, potholes, rutting and dust suppression) Suitable lane width and numbers of lanes
Navigation	Signs, delineation and markings are clear, easy to read and provide information	Suitable reflectivity, conspicuity measure
Safety	The road network is always safe to use, except during heavy rainfall and its subsequent drainage off the pavement Safety risks are proactively managed	Stable wearing surface Limits to lane rut depth and potholes Number of crashes per 100 000 km travelled Suitable shoulder width and surfacing
Reliability	Users can expect consistent travel times with some exceptions	Average travel speed (km/hr)
Resilience	The likelihood of a journey being disrupted by an unplanned incident or hazard event is minimised	Adequate stability rating (factor of safety) of embankments and cutting

(*Source*: AARB Unsealed Roads Best Practice Guide (Edition 2 2020) Table 2.1)

Delivering levels of service is constrained by budgets and road services must compete against other Council services for funding. The approved budget will ultimately determine what levels of service can be delivered for road users and this may not provide the standard desired by the user. A variable that Council is yet to measure is what percentage of the population are regular users of unsealed roads.

Ideally, Council understands the user's expectations and, where sustainable and achievable, establishes its technical levels of service to match the customer's levels of service desires. As a very minimum, the technical levels of service must satisfy safety and regulatory requirements.

Regarding how the community views Council's unsealed roads service, the following figure comes from the JWS Research Victorian Local Government Community Satisfaction Survey of council services. The 2024 survey identified that its residents' mark Surf Coast Shire's performance of unsealed roads maintenance service (index score of 48 – up from 46 in 2023). This is the lowest score of all the services measured in the survey, but this rates comparatively well against the Statewide score for unsealed roads (36) and the large rural group (34).

Summary of Surf Coast Shire Council performance

Services	Surf Coast 2024	Surf Coast 2023	Large Rural 2024	Colac Otway 2024	Corangamite 2024	Macedon Ranges 2024	Mitchell 2024	Wellington 2024	Moyne 2024	State-wide 2024
Unsealed Roads	48	46	34	31	36	30	25	40	33	36

The table above benchmarks Surf Coast Shire's unsealed road rating when benchmarked against similar sized councils and the Statewide rating in the 2024 Local Government Community Satisfaction Survey.

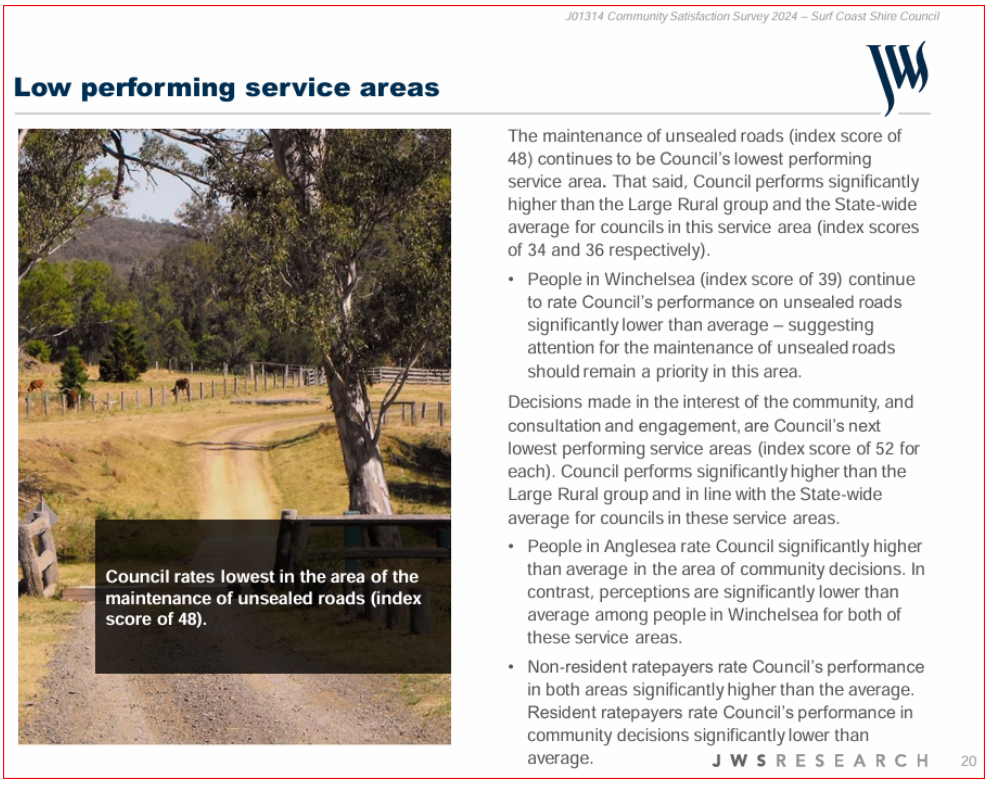


Figure 13: JWS Research - Community Satisfaction Survey 2024 p20

(*Source:* 2024 Local Government Community Satisfaction Survey – Surf Coast Shire)

The following figure shows that the community's perception of Council's unsealed road service rates behind other key services, and well behind sealed local roads and waste management services.

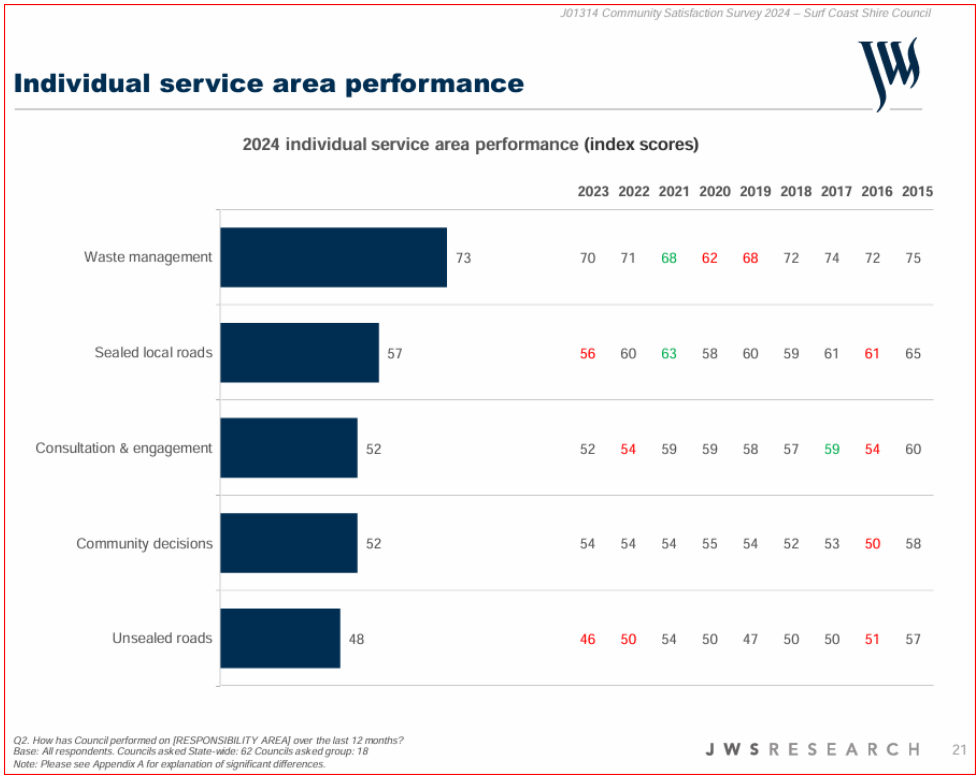


Figure 14: JWS Research - Community Satisfaction Survey 2024 p21

(*Source:* 2024 Local Government Community Satisfaction Survey – Surf Coast Shire)

30% of respondents rated unsealed roads as good or very good, 31% rated them as poor or very and 28% rated them as average. 10% of respondents couldn't say.

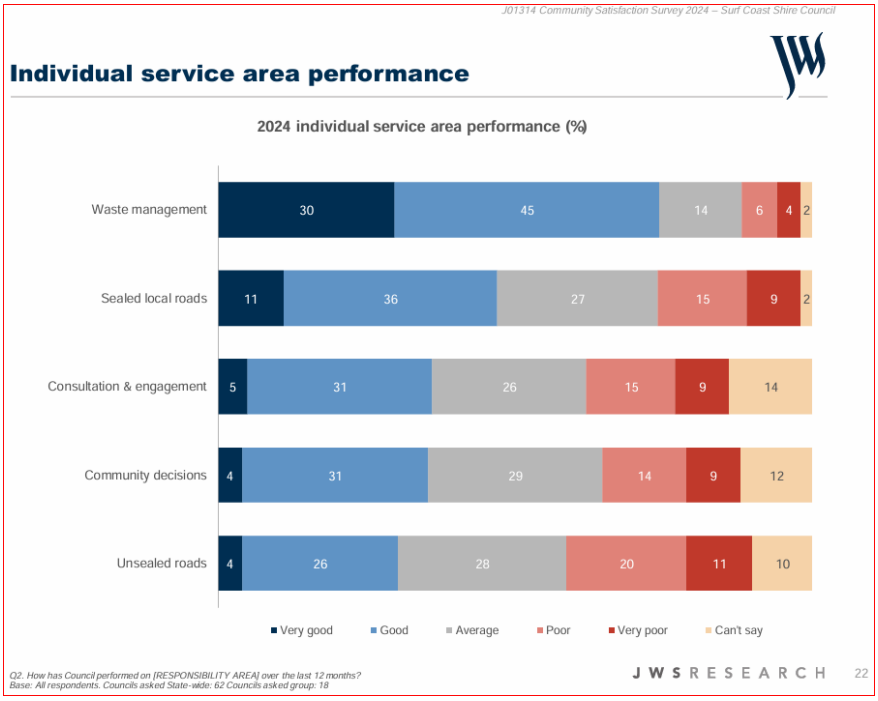
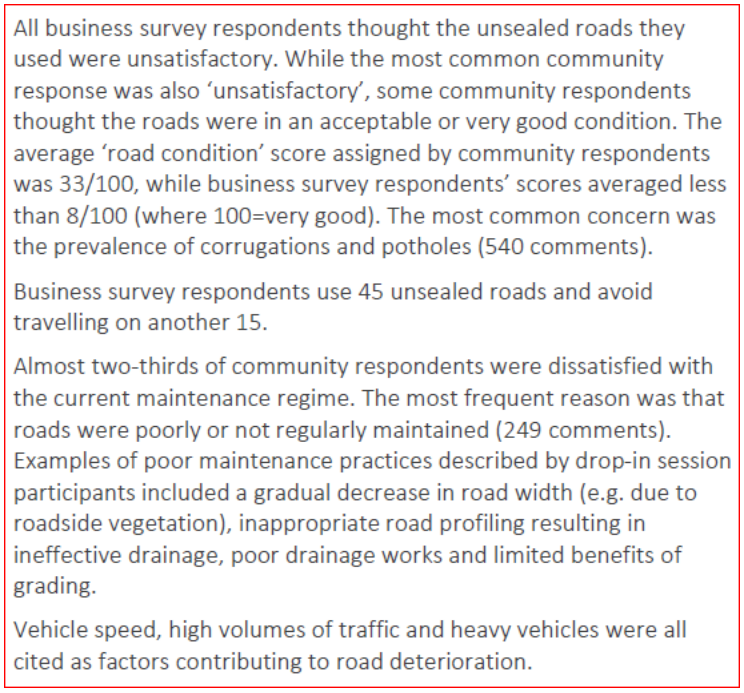


Figure 15: JWS Research - Community Satisfaction Survey 2024 p22

(*Source:* 2024 Local Government Community Satisfaction Survey – Surf Coast Shire)

Feedback from the Kismet Forward community engagement for this Unsealed Road Review is consistent with the JWS Community Satisfaction Survey results for unsealed roads. The Consultation Report produced following the engagement process identified high levels of dissatisfaction with the state of the Shire's unsealed road network, and with Council's maintenance framework.



All business survey respondents thought the unsealed roads they used were unsatisfactory. While the most common community response was also 'unsatisfactory', some community respondents thought the roads were in an acceptable or very good condition. The average 'road condition' score assigned by community respondents was 33/100, while business survey respondents' scores averaged less than 8/100 (where 100=very good). The most common concern was the prevalence of corrugations and potholes (540 comments).

Business survey respondents use 45 unsealed roads and avoid travelling on another 15.

Almost two-thirds of community respondents were dissatisfied with the current maintenance regime. The most frequent reason was that roads were poorly or not regularly maintained (249 comments). Examples of poor maintenance practices described by drop-in session participants included a gradual decrease in road width (e.g. due to roadside vegetation), inappropriate road profiling resulting in ineffective drainage, poor drainage works and limited benefits of grading.

Vehicle speed, high volumes of traffic and heavy vehicles were all cited as factors contributing to road deterioration.

Figure 16: Excerpt from Executive Summary - Consultation Report

(*Source:* Unsealed Road Network Review - Consultation Report (April 2024))

5.1 Current Technical Level of Service

The management of Council's road network including unsealed roads is governed by Section 20 of the Road Management Act 2004 which states that "the principal object of road management is to ensure that a network of roads is provided primarily for the movement of persons and goods as part of an integrated transport system and that road reserves are available for other appropriate uses."

Council has road asset and risk management policies and maintenance procedures, and it undertakes inspections and receives customer requests that trigger corrective actions.

A key principle of the Road Management Act 2004 that applies to the management of works and infrastructure is the minimisation of road safety hazards. In the application of this principle, Council has taken a risk management approach to the development of timeframes and intervention levels that apply to inspections, and any necessary repairs of defects that are found to exceed stated intervention levels.

Current technical levels of service relating to inspections and defect response times for unsealed road asset management are detailed in Council's *Road Management Plan 2021-2025*. In addition, Council undertakes cyclic maintenance such as unsealed road grading, dust suppression, surface re-sheeting and reconstruction and reprofiling of unsealed roads. These levels of service have been added to ensure all technical levels of service relating to unsealed road asset management are covered for this service review.

The combination of levels of service documented in Council's RMP and levels of service obtained through the service review process are used as the basis for the presentation of options to improve service delivery as part of this service review.

5.2 Current Performance of Levels of Service

The performance of some unsealed roads services, under the current framework of maintenance and capital renewal activities, are not delivering the outcomes that community members desire. The following indicate the current performance related to the key services delivered relating to unsealed roads.

5.2.1 Drainage Works

The current performance of drainage works has been rated low by some community members, comments summarised in the community engagement report were "issues with poor drainage/culverts, not cleared/repaired and/or wash away of materials". .

Roads inspected during the January site visit also indicated build-up of vegetation and/or silts in table drains in many locations.

Some improvements are underway with an initiative by the Coordinator Civil Operations starting a program of proactive grading and reworking road-edge build up back into the pavement. This removes the built up gravel and debris alongside the edge of the road that blocks free road drainage. Fine material from this build up is reintroduced into the pavement to bind the surface and the necessary crown profile is reshaped. The result has been that water now drains and potholes are less likely to form.

5.2.2 Dust Suppression

The performance of dust suppression, where applied on roads with Gherang gravel, has been excellent. However, this is a requested service and feedback from the community engagement was that it should be done annually as a matter of course.

The current trial on Ghazeepore Road has been very effective at holding the surface together, not just suppressing dust. There is certainly merit in extending the application of dust suppression to other priority roads in the upcoming season, and beyond should it still prove effective.

This review recommends that Council considers doubling the current budget allowance and apply dust suppression on priority segments of higher-usage unsealed roads. Should this prove effective, based on dust mitigation, and also reduced maintenance grading requirements, then Council should make the extension to the dust suppression program an ongoing budget item.

5.2.3 Maintenance Grading

The online survey seeking feedback, on whether unsealed roads were maintained sufficiently, overwhelmingly showed that more work was required. In the following figure that came from the Have Your Say initiative, the markers are placed by contributors on a map of Surf Coast's unsealed road network. Blue indicates where unsealed roads could be upgraded more, green indicates where the road was upgraded enough, and red indicates where no upgrading was required. The end result was that blue markers dominated, indicating that contributors believe that Council's unsealed roads need to be upgraded more.

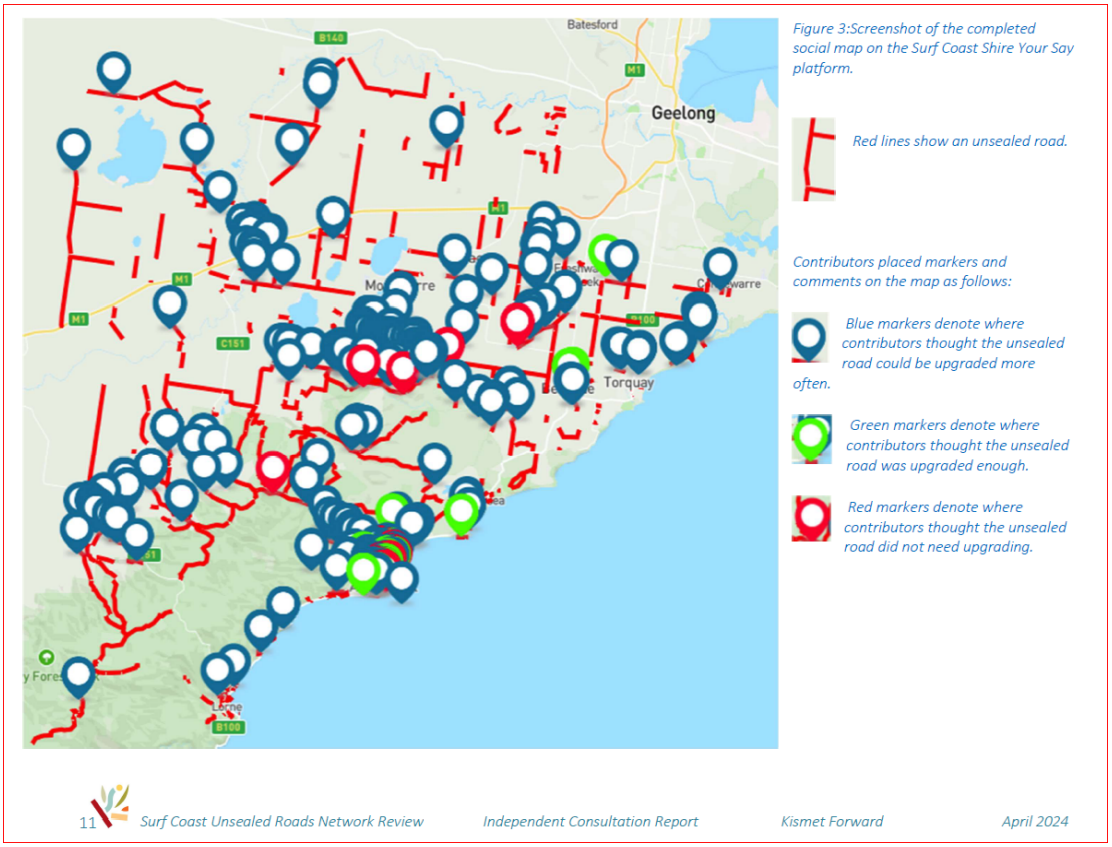


Figure 17: Online "Your Say" Responses to Unsealed Roads Maintenance Needs
(*Source*: Kismet Forward Report (April 2024))

There are complex issues around maintenance grading, and it will not be a simple solution to be able to satisfy all road users all the time. There are technical, resource, environment, equity and even aesthetic factors associated with delivering the optimum level of service.

The two types of material that comprise the various unsealed road pavements are the Local-Mix quarry Gherang gravel and Holcim Colac quarry crushed rock. These have very different properties and durability. As the Gherang gravel ages, it loses the high Plasticity Index (PI) clay fines that bind the material matrix together and the pavement becomes difficult to compact. The consequence is that roads flatten, lose crossfall, hold water and become more susceptible to potholing and corrugating. Crushed rock is more durable than the Gherang gravel but coarse aggregate unravels when fines are lost, and unintended berms, or mounds of loose stone, build up alongside the road edge. Crushed rock pavements can also corrugate and form potholes, particularly when water pools in flat sections.

Traffic volume and the nature of vehicles using roads make a significant impact on how quickly a road will deteriorate and need maintenance. Buses and commercial vehicles using roads will have a major impact on pavements. Environmental factors also play a major role in the performance of unsealed roads; storm events can wash out road pavements and culverts, wet periods contribute to pothole and corrugation formation and dry periods lead to loss of fines, causing dust problems and corrugations.

The community engagement process highlighted that aesthetics play an important role in the community's perception of its unsealed roads. The Aireys Inlet region residents have a strong preference for the Gherang gravel to provide the road colour they like. Whereas other areas prefer crushed rock because it makes for a more durable pavement.

6. CURRENT LEVELS OF SERVICE – UNSEALED ROADS

The Surf Coast Shire has established levels of service for its management of Council roads, including for unsealed roads, based on a risk management approach. This is in alignment with the *Road Management Act 2004* key principle of minimising road safety hazards. Council has developed timeframes and intervention levels that apply to inspections, and any necessary repairs of defects that are found to exceed stated intervention levels. These levels of service are documented in the Surf Coast Shire's *Road Management Plan 2021-25* (RMP).

The following tables are adapted from the RMP and also from the FY24 operating and capital renewal budget for unsealed roads. The current performance of the various unsealed roads related services has been assessed and is documented in the last column of the various tables.

The first table relates to the types of inspections undertaken, and required timeframes for instigating inspections, in accordance with the RMP. The second table prescribes the RMP intervention level of various defects and specifies the timeframe for initiating action to address the defect.

Proactive inspections ensure full coverage of the road network to identify intervention level hazards, in a reasonable and sustainable timeframe. Reactive inspections triage hazards based on risk, with higher risk hazards requiring a rapid inspection response. Condition inspections provide information for long term renewal planning.

The third and fourth tables have been derived from financial information about the operational and capital renewal services provided by Council. The current performance assessment is an appraisal based on community and officer feedback, and an analysis of pavement resheet age.

6.1.1 Inspections Assessments

Table 6: Inspection Assessment Levels of Service

	Activity		Primary Collector	Secondary Collector	Primary Access	Secondary Access	Notes/ Current Performance
Operational – Inspection/ Assessment	***Proactive Inspection (Triggered by RMP schedule)***	*Proactive daytime and night-time*	*Daytime: All roads will be inspected as per maintenance programs, but at least once within each second Calendar month* *Night time: Reflective signage: Once within each Calendar year during winter season*	*Daytime: All roads will be inspected as per maintenance programs, but at least once within each second Calendar month* *Night time: Reflective signage: Once within each Calendar year during winter season*	*Daytime: All roads will be inspected as per maintenance programs, but at least once within each second Calendar month* *Night time: Reflective signage: Once within each Calendar year during winter season*	*Daytime: All roads will be inspected as per maintenance programs, but at least once within each second Calendar month* *Night time: Reflective signage: Once within each Calendar year during winter season*	*Proactive inspections are 100% compliant.*
	Reactive inspection (Triggered by Customer Request)	*For defects identified as:* • *Water over road* • *Spillage /* • *Obstruction* • *Stop and Give Way signage*	*Respond by inspecting within four (4) hours and implement temporary measures such as signage as required.*	*Respond by inspecting within four (4) hours and implement temporary measures such as signage as required.*	*Respond by inspecting within four (4) hours and implement temporary measures such as signage as required.*	*Respond by inspecting within four (4) hours and implement temporary measures such as signage as required.*	*Reactive inspections are 100% compliant.*
	Reactive inspection (Triggered by Customer Request)	*For all other defects*	*Respond by inspecting within five (5) days*	*Respond by inspecting within five (5) days*	*Respond by inspecting within five (5) days*	*Respond by inspecting within five (5) days*	*Reactive inspections are 100% compliant.*
	Condition Assessment (Triggered by the Asset Management Plan)	*Once within every 36 months period*	*Once within every 36 months period*	*Once within every 36 months period*	*Once within every 36 months period*	*Once within every 36 months period*	*Compliant*

(*Source*: Road Management Plan 2021-25)

6.1.2 Unsealed Defect Response Times

Table 7: Unsealed Roads Defect Response Levels of Service

Hazard or Defect	Criteria for intervention	Primary Collector	Secondary Collector	Primary Access	Secondary Access	Notes/ Current Performance
Water Across Roads	*Obstruction to more than 50% of traffic lane with water greater than 300mm deep.*	*1 day*	*1 day*	*1 day*	*1 day*	*See general comment below.*
Spillage / obstruction	*Debris on carriageway causing an obstruction to more than 50% of the traffic lane*	*1 day*	*1 day*	*1 day*	*1 day*	*See general comment below.*
Rutting	*Greater than 100mm depth and greater than 25m long as measured by a three (3) metre straight edge from centreline towards edge of road.*	*50 days*	*50 days*	*50 days*	*50 days*	*See general comment below.*
Potholes	*Greater than 100mm depth and with a diameter greater than 500mm.*	*NA*	*30 days*	*30 days*	*30 days*	*See general comment below.*
Corrugations	*Corrugations greater than 35mm in depth for a length greater than 300 metres road length.*	*NA*	*60 days*	*60 days*	*60 days*	*See general comment below.*
Sight distances - grass/shrubs	*Intersections where grass/shrub height is greater than 900 mm above the general road surface level and within the sight triangle.*	*5 days*	*10 days*	*15 days*	*20 days*	*See general comment below.*
Sight distances - overhanging vegetation	*Intersections where overhanging vegetation sit below 2 metres above the general road surface and within the sight triangle.*	*5 days*	*10 days*	*15 days*	*20 days*	*See general comment below.*
Signage – Stop and Give Way	*Signs missing or more than 70% of sign illegible at 100m distance*	*4 hours*	*4 hours*	*4 hours*	*4 hours*	*See general comment below.*
Signage – other	*Sign missing or more than 70% of sign illegible at 100m distance.*	*10 days*	*10 days*	*10 days*	*10 days*	*See general comment below.*
Vegetation Clearance	*Overhanging vegetation above traffic lanes less than 4.9m from the road surface.*	*60 days*	*60 days*	*60 days*	*60 days*	*See general comment below.*

(*Source*: Road Management Plan 2021-25)

General Comment: Individual costing of defect repairs was not undertaken, but overall works are part of around $360k of forecast spending in FY24. This is calculated based on total direct costs ($2,215k) less that for maintenance grading ($1,330k), dust suppression ($120k) and drainage works ($406k).In 23/24 financial year, the completion rate of works achieved within the specified time set out in the Road Management Plan was 95%. This completion rate has been due to the impact of weather events, deterioration of roads and budget constraints over recent years.

6.1.3 Cyclic Maintenance

Table 8: Cyclic Maintenance Levels of Service

	Activity	Description	Primary Collector	Secondary Collector	Primary Access	Secondary Access	Current cost per annum	Notes/ Current Performance
	Drainage Works	*Clearing of blocked drains and culverts.*	*As requested*	*As requested*	*As requested*	*As requested*	***$406k***	Compliant But variable performance, many drains need attention.
Operational - Maintenance	***Dust Suppression***	*Cyclic spraying of suppressant along unsealed roads*	*As requested*	*As requested*	*As requested*	*As requested*	***$120k***	Compliant. Good performance and positive community feedback in areas suppression is completed.
	Grading	*Cyclic grading of roads to reduce/ remove corrugations and improve rode quality*	*Annually*	*Annually*	*Once every 2 years*	*Once every 2 years*	***$1,330k (around FY22 actual and FY24 forecast for maintenance grading)***	Not able to achieve compliance. Variable performance and some community feedback is negative.

(*Source*: Surf Coast - Unsealed roads financials.xlsx)

In FY24 there are 1,422km of unsealed roads budgeted to be graded, which is equivalent to an average three maintenance grades per annum. But this is not spread evenly across the network, in that grading is generally done reactively based on intervention level requirements. There are some exceptions, such as Blackgate Road, which is currently being graded monthly as a trial, and the Shire's most-used roads potentially receive around 10 grades per year. However, most other roads are only graded infrequently.

6.1.4 Unsealed Road Renewal

Table 9: Unsealed Road Renewal Levels of Service

	Activity	Description	Primary Collector	Secondary Collector	Primary Access	Secondary Access	Current cost per annum	Notes/ Current Performance
Capital Renewal	***Unsealed Road Resheeting***	*Cyclic resurfacing of unsealed road surface material and grading, reprofiling of adjacent drainage.*	*Every 5 years *According to ARRB Best Practice Guidelines*	*Every 5 years *According to ARRB Best Practice Guidelines*	*Every 5 years *According to ARRB Best Practice Guidelines*	*Every 5 years *According to ARRB Best Practice Guidelines*	***$ 1.9M (FY24 budget, but this is double to triple traditional levels)***	Not compliant. The resheeting works done perform well, but cyclic target is not achieved.
	Unsealed Road Reconstruction/ Reprofile	*Full reconstruction and re profiling of unsealed road pavement/ base and surface gravel. Reprofiling and shaping of adjacent drainage channels.*	*As condition information determine road has reached reconstruction intervention point*	*As condition information determine road has reached reconstruction intervention point*	*As condition information determine road has reached reconstruction intervention point*	*As condition information determine road has reached reconstruction intervention point*	***Cost is estimated to be in the order of $150k per km.***	The focus has been on resheeting. Not aware of any reconstruction works in recent times.

(*Source*: Surf Coast - Unsealed roads financials.xlsx for 'Current cost per annum' column)

In FY24, 20.23km (4.2%) of unsealed roads resheeted. This equates to a cycle of nearly 25 years for all roads to be resheeted, almost five times the cyclic resheeting target of every five years.

Contractors carry out the resheeting program and the works inspected looked to be of high quality and will perform well, if adequately maintained.

6.2 Options for Delivering a Better Outcome in Unsealed Roads Services

Given that current performance of unsealed road services is not to the satisfaction of the community and that some components of the service are not meeting desired standards, the following sections canvass options for improvement. These options range from a no-cost to a high-cost set of measures.

The costs are reported as operational and capital renewal expenditure and are all in 2024 dollars. Each cost option contains a description of the 10 year cost estimates consistent with Council's long term financial plan time period.

6.2.1 Option 1 - No Cost

It may be possible to achieve some lift in the condition of unsealed roads through service efficiencies and other measures. The sorts of improvements that could be made include:

- Increase grader utilisation by reducing nonproductive time. This could be by ensuring all plant and staff are carrying out maintenance grading each available workday.
    - Current information on grader utilisation indicates that, on average, each grader is in use around 170 days in the year. Assuming that maintenance grading can be carried out on every available working day for a 47-week year (allowing for annual leave, public holidays, etc), then around 210 days of grading is theoretically achievable. This is a greater than 20% productivity improvement.
    - To identify improvements to crew and plant productivity, it would require data collection and analysis of staff and plant availability, and ideally this would be through an improvement team approach to ensure ownership of possible solutions.
- Increase grader productivity through changes to the nine-day RDO roster, by having substitute grader crews operate on the tenth day. This would arguably further improve productivity output by over 10% per annum.
- Ensure that maintenance grading is programmed such that jobs are grouped in similar locations to avoid excessive travel between jobs. This is already happening, but the nature of reactive works means that it isn't always a priority, and efficient programming should be prioritised.
- Re-evaluate the importance/weighting of gravel, determined through date of last resheet, with the appropriate criterion importance/weighting in the asset modelling of unsealed roads. Gherang gravel loses its ability to compact as it ages and this makes it difficult to maintain. This initiative will improve renewal modelling outcomes and facilitate timelier re-sheets.

6.2.2 Option 2 - Low Cost

The total cost for the Low-Cost Option is $660,000 per annum.
(10 year spend estimate $7,6 Million)

Further improvements are possible through moderate investment in operations activities. These could include:

- Increase service levels for maintenance grading activities. The trial of monthly grading of Blackgate Road has been well received by the community and this could be duplicated for other priority roads, based on traffic volumes and heavy vehicle use, customer requests, etc. The cost to maintenance grade was calculated to be $934 per km and this rate could be used to determine the extra level of service that Council considers appropriate. For example, one extra grade per year on all roads would cost Council around $450,000 extra per annum. Allow for a nominal amount of $225,000 per annum to cover an additional half cycle.
- Extend the dust suppression program to include long stretches of unsealed road, as per the Ghazeepore Road and Point Impossible Road trials. These roads have had reduced need for maintenance grading and have performed well over the summer period. The savings in maintenance work for pothole and corrugation rectification works may even outweigh the extra cost for dust suppression. A doubling of the current service would cost around $120,000 extra per annum.

- Ensure that water carts are available to support maintenance grading operations; there are occasions when crews cannot grade when no water cart can be sourced. Allow for $60,000 hire per annum to cover peak periods. Owning versus hiring a water cart will reduce the risk of not having one ready when needed.
    - A business case to purchase additional water cart(s) could show this to be cost neutral, or even have positive return on investment.
- Ensure that a stand-alone roller is available for maintenance grading operations on primary access roads. The hired roller was idle on the day of the site visit because the operator was away; someone should be trained and made available on short notice to take their place. Having a roller on site will assist in improving grader productivity and also produce higher compaction and better-quality pavements. These pavements will perform better and require less maintenance over the long-term. The tag roller is adequate for lower traffic volume secondary access roads. Allow for $60,000 hire per annum. Consideration should be given to acquiring an in-house roller:
    - The current multi-tyred roller is hired for around $3.5k per month, plus fuel, tyres and minor maintenance costs. A business case to purchase a stand-alone roller(s) could show this to be cost neutral, or even have positive return on investment.
    - The most suitable roller may be similar to the current hire-unit, or perhaps consider a tractor-towed unit that could be more mobile between sites and more versatile.

Figure 18: (example) Tractor Drawn Combination Multi-Tyred and Steel Drum Roller Unit

- Have maintenance crews operate overtime hours during optimum seasons for grading, usually autumn and spring, when there is an ideal moisture content in pavements and days are still long enough to operate in good conditions. The cost of working an additional two hours of overtime per day during these peak periods would be $30,000 per annum.
- Engage a part time or contractor supervisor for around a four-month total time during the peak autumn and spring periods. The role would be to oversee ripping and grading works to ensure maximum productivity, safety, and quality. The additional cost would be around $50,000 per annum (576 hours @ $80 per hour).
- Add an excavator to the peak season ripping and grading works to improve grader crew productivity through speeding up drainage clearing and other tasks. The extra cost would be around $80,000 per annum (576 hours @ $140 per hour).
- Identify and train backup operators for key maintenance grading plant. These staff would be able to backfill normal operators when on annual or sick leave occasions. Allow a budget of $20,000 per annum.
- Provide training to field staff to support the Saleforce I.T. Transformation project, which includes digital technology and tablet systems that will capture asset and works order

information. This will assist in better understanding assets and costs to maintain them, plus other investigatory analysis to improve services. Allow a budget of $15,000 per annum.

6.2.3 Option 3 – Medium Cost

The total cost for the Medium-Cost Option is Operating Budget: $970,000 pa; Capital Budget: $3,500,000 pa.
(10 year spend estimate – Operational $11.1Million. Capital $40.1Million)

Medium cost investments to enhance levels of service even further could include:

- Lift service levels even higher, consider introducing proactive maintenance grading so that roads do have a cyclic regime that is suitable for their class of road. Some reactive maintenance would still likely be required due to storm events and other intervention level causations.
    - This may be able to be achieved by removing the requirement for 4.5 EFTs in the Civil Operations unit, and associated plant, to be dedicated to capital works. The current requirement disrupts maintenance schedules, and graders are also redirected from maintenance grading to capital works.
    - This change would require capital works to be delivered by other internal or external resources. The cost impact would be to fund 4.5 EFT workers, costing in the order of $300,000 per annum.
- Stabilise pavements in areas that are subject to water damage and/or traffic damage, such as in floodways or steep road sections. Allow a nominal budget of $100,000 per annum.
- Place additional gravel during maintenance grading to reinstate road crossfalls and pavement structure. Based on current costs, allow a nominal budget of $300,000 per annum, which would treat 10km of unsealed roads to a 50mm depth.
- Increase the amount of drainage and vegetation clearing works to protect roads from water pooling and hence mitigate against pothole formation. This will reduce maintenance intervention call-outs and reduce costs in the longer-term. Allow a nominal budget of $100,000 per annum.
- Undertake research into improving gravel performance. Allow a nominal budget of $50,000 per annum.
- Engage an unsealed roads Team Leader to focus on unsealed roads to drive productivity, efficiency and quality improvements. An additional benefit would be to enable the current two team leaders to be more productive and focussed on their primary roles. Allow a nominal budget of $120,000 per annum for wages, superannuation, overheads and expenses.
- Increase the number of roads to be resheeted so that a 10-year cyclic frequency can be achieved. This will ultimately result in less need for reactive maintenance grading and other works as the unsealed road network condition improves. The resheet program only renewed 20.8km, or 4.4% of unsealed roads, on average over the past four years. If this rate continued, it would take 25 years to resheet all Council's unsealed roads. Ideally, unsealed road materials should be replenished every five to eight years, so current practice is clearly inadequate to sustain the network. To at least maintain close to the status quo of pavements, provide sufficient funds to be able to resheet Council's unsealed roads on a 10-year cycle for a nominal capital renewal budget of $3,500,000 per annum.
    - Also evaluate the benefits of the new level of resheeting standards (75mm Gherang gravel topped with 25mm of crushed rock) to confirm that this has a positive long-term cost/benefit. It may be more cost effective to lower this standard to deliver a more extensive resheet program.

6.2.4 Option 3 – High Cost

The total cost for the High-Cost Option is Operating Budget: $450,000 pa, plus a one-off $20,000; Capital Budget: $4,600,000 pa plus a one-off $7,700,000.
(10 year spend estimates – Operational $5.4 Million. Capital $52.7 Million)

High cost investments are essentially a further multiple of medium cost measures, and include:

- Raising the level of service standard to that desired by the community. This would likely entail establishing at least one more maintenance grading team or using contractors to deliver a

proactive maintenance grading program. Assume the cost would be the same pro rata for an additional maintenance grading cycle of $450,000 per annum.

- Significantly increase the capital renewal resheet program so that a 5 year cyclic frequency for Primary Access roads and a 10 year cycle for secondary access roads can be achieved. This would mean resheeting nearly 62.4km of roads each year at a current average direct cost of $13.39/m^2, or over $73K per km for an average road width of 5.5m. This requires an investment of $4,600,000 per annum.
- Develop a sealing of unsealed roads policy, identify roads that merit sealing and develop a costed program for funding consideration. The first task will be to develop a policy that will provide an objective and transparent process for identifying unsealed roads that merit sealing. The next part would be to prepare a list of roads, and to develop a costed program that will enable budget processes to consider whether funding could be allocated. Allow a nominal one-off budget of $20,000 for the initiative.
- Upgrade unsealed roads to sealed roads, based on the prioritised list of roads, with emphasis on maintenance cost savings. Table 14: Cost Estimate to Transition Unsealed Roads to Sealed Roads provides costing for an upgrade of 5% (23.85km) of unsealed roads at an initial capital cost of nearly $7,700,000. Each following 10 years, renewal costs of $2,700,000 (average $270,000 per year) for resealing and shoulder resheeting would be required, but operating maintenance costs would reduce by $27,000 per year.
    - Note: This program could be adjusted and spread over multiple years, as funding permits. For example, sealing 5km would cost only $1.6M.

The following table is a summary of the different options and initiatives.
(*Note*: All costs in the table are ongoing per annum costs, except for the once-off costs for the Seal Upgrade Policy & Program and the Upgrade to Seal (5% of network) line items).

Table 10: Options for Delivering Improved Unsealed Roads Services

Initiative	Option 1 No Cost	Option 2 Low Cost		Option 3 Medium Cost		Option 4 High Cost	
		Operating Cost	Capital Cost	Operating Cost	Capital Cost	Operating Cost	Capital Cost
Grader Crew Utilisation	$ -						
RDO Roster	$ -						
Efficient Programming	$ -						
Pavement Condition - Age	$ -						
Extra Grading Cycles		$ 225,000					
Extra Dust Suppression		$ 120,000					
Extra Water Carts		$ 60,000					
Extra Roller		$ 60,000					
Overtime		$ 30,000					
Peak Season Supervisor		$ 50,000					
Extra Excavator		$ 80,000					
Train Back-Up Operators		$ 20,000					
Tablet Technology		$ 15,000					
Capital Works 4.5 EFTs				$ 300,000			
Stabilise Pavements				$ 100,000			
Extra Gravel				$ 300,000			
Drainage Clearing				$ 100,000			
Research Gravel Enhancement				$ 50,000			
Unsealed Roads Team Leader				$ 120,000			
Extra Resheets - 10 Year Cycle					$ 3,500,000		
Extra Grading Crew						$ 450,000	
Extra Resheets - 5/10 Year Cycle							$ 4,600,000
Seal Upgrade Policy & Program						$ 20,000	
Upgrade to Seal (5% of network)							$ 7,700,000
TOTALS	**$ -**	**$ 660,000**	**$ -**	**$ 970,000**	**$ 3,500,000**	**$ 470,000**	**$ 12,300,000**

Note: The Upgrade to Seal item does not include the recurrent 10 year renewal capital cost of $2,700,000, nor the $27,000 pa operating savings.

6.3 Sealing of Unsealed Roads

Council does not currently have a policy for upgrading unsealed roads to sealed roads, and it is recommended that one be developed to provide transparent and objective guidance.

A policy for upgrading unsealed roads would enable officers to develop a list of potential candidates for future sealing programs, subject to Council funding resources being made available.

There are examples from other Councils, that could be adapted to consider local nuances, which can assist with producing such a policy.

For example, Melton Council applies six contributing factors that would influence the justification for a road to be sealed, which are:

- Traffic volumes (impact on road safety, pavement deterioration, maintenance frequency, dust generation, etc)
- Urbanisation of the area (dwelling density)
- Safety classification (accident severity statistics)
- Current pavement surface
- Current maintenance type
- Drainage

A weighted scoring system is then applied to the unsealed road and those that score highly enough are potential candidates for an upgrade. Any upgrade is subject to funding availability. Roads that are most likely to be impacted by future subdivisions are not upgraded until developer contributions are realised.

Griffith City Council (NSW) has a policy for upgrading unsealed roads, with some similar criteria, to determine whether there is justification for listing a road for sealing works and consideration by Council within a proposed budget. When a request is received to seal a road, a score is applied to each criterion and a minimum score of 8 must be attained for a road to be listed.

Table 11: Griffith City Criteria and Scoring Method

Criteria	Points		
1.	Traffic Volume	Less than 100 vpd	0
		Between 100 - 200 vpd	1
		Over 200 vpd	2
		Over 20 heavy vehicles/day	2
		Over 20 long vehicles and road trains/day	2
2.	Accident History	Accident within past 3 years to be noted	-
3.	Local Amenity	a) 10 houses/km or greater in urban area	1
		b) 5 houses/km or greater in non urban area	1
		c) Dust problem (horticultural areas)	1
		d) Within Urban or Village boundary	1
4.	Roads Importance to Community	a) School Bus route	1
		b) Serves a major industry	2
		c) Serves an industry	1
		d) Serves a major community facility, service or attraction	2
		e) Serves as a bypass or feeder road	1

(*Source:* Griffith City Council Policy: Roads – Maintenance and Upgrade of Unsealed Roads)

AECOM's *Unsealed Road and Street Network Strategy (February 2017)* to Surf Coast Council provides a multi-criteria analysis tool that was used to prioritise unsealed roads that were prime candidates to be sealed under special charge schemes.

The criteria in AECOM's report included:

- strategic routes (inter-town, school bus, industrial, agricultural, cycling seasonal and tourist roads);
- road surface condition (based on Council's asset management database condition rating);
- severity of vehicle crashes;
- population growth;
- number of bordering dwellings; and
- traffic volumes on each road link (roads with traffic counts under 60vpd were excluded).

These criteria are all still applicable, but for a policy to upgrade roads, it is especially recommended that consideration be given to economic factors, driven by maintenance needs, including:

- steep road sections – these develop shoving and rutting, and are prone to washouts that fill side-drains and potentially silt-up waterways;
- continually damp roads, such as in the Otways, that more readily pothole;
- township lanes, such as one in Lorne, that are difficult to grade and are a long way and costly for a grader to attend; and
- towns streets between sealed intersections, particularly those that are on slopes. These develop wash-outs adjacent to the sealed intersections and silt up drains.

Roads such as these are likely to justify being sealed on a purely cost/benefit basis.

Figure 19: Boundary Road, Aireys Inlet - steep hill with road rutting and erosion

Figure 20: Aireys Street, Aireys Inlet- steep hill with washout erosion between sealed intersections

Costs to upgrade an unsealed road to a sealed road will depend on the design carriageway and seal width, and the pavement thickness. Costs will also vary depending on factors such as whether road realignment, major drainage upgrade and/or major pavement redesign is required.

Annual Average Daily Traffic (AADT) is the standard measurement for vehicle traffic on a section of road. It is the volume of traffic on a road over the year, divided by 365 to give a daily average traffic count. It is the measure for how busy a road is, and it is the basis for decisions regarding transport

planning and road design. Where AADT is not available, which is generally the case for unsealed roads, then the Average Daily Traffic (ADT) can be used based on the maximum daily traffic per annum.

The following tables from ARRB Unsealed Roads Best Practice Guide 2 and Austroads 2021 - Guide to Road Design Part 3 provide a suggested design for any unsealed-to-sealed upgrade. The first table shows typical ADTs for unsealed roads, and it is recommended that those roads to be considered for upgrading to seal fall into the 4A class of road for design purposes. That is, assume that the road's ADT is over 150 vehicles per day.

Table 12: Typical ADT Estimates for Various Unsealed Road Classes

Table 3.9: Unsealed roads classification system

Road class	Class type	Service function description	Road type description
4A	Main road > 150 ADT	This type of road is used for major movements between population centres and connection to adjacent areas. High traffic volumes occur, and the road can carry large vehicles.	• All weather road, predominantly two-lane and unsealed. Can be sealed if economically justified. • Operating speed standard of 50–80 km/h according to terrain. • Minimum carriageway width is 7 m.
4B	Minor road 50–150 ADT	This type of road is used for connection between local centres of population and links to the primary network. Roads may or may not be sealed depending on the importance and function of the road.	• All-weather two-lane road formed and gravelled or single-lane sealed road with gravel shoulders. • Operating speed standard of 30–70 km/h according to terrain. • Minimum carriageway width is 5.5 m.
4C	Access road 10–50 ADT	Provides access to low use areas or individual rural property sites and forest areas. Caters for low travel speed and a range of vehicles and may be seasonally closed.	• Substantially a single lane two-way, generally dry weather, formed road. • Operating speeds standard of < 20–40 km/h according to terrain. • Minimum carriageway width is 4 m. • May be restricted to four-wheel drive vehicles.
4D	Tracks < 10 ADT	Mainly used for fire protection purposes, management access and limited recreational activities.	• Predominantly a single-lane two-way earth track (unformed) at or near the natural surface level. • Predominantly not conforming to any geometric design standards. • Minimum cleared width is 3 m. • Primarily for four-wheel drive vehicles.

(*Source:* ARRB Unsealed Roads Best Practice Guide 2)

The next table provides a carriageway design width of 9.2m for roads with 150-500 AADT.

Table 13: Geometric Design - Single carriageway rural road widths

Table 4.5: Single carriageway rural road widths (m)

Element	Design AADT				
	1–150	150–500	500–1000	1000–3000	> 3000
Traffic lanes[1]	3.7 (1 x 3.7)	6.2 (2 x 3.1)	6.2–7.0 (2 x 3.1/3.5)	7.0 (2 x 3.5)	7.0 (2 x 3.5)
Total shoulder	2.5	1.5	1.5	2.0	2.5
Minimum shoulder seal [2],[3],[4],[5],[6]	0	0.5	0.5	1.0	1.5
Total carriageway	8.7	9.2	9.2–10.0	11.0	12.0

1 *Traffic lane widths include centrelines but are exclusive of edge-lines.*
2 *Where significant numbers of cyclists use the roadway, consideration should be given to fully sealing the shoulders. Suggest use of a maximum size 10 mm seal within a 20 km radius of towns.*
3 *Wider shoulder seals may be appropriate depending on requirements for maintenance costs, soil and climatic conditions or to accommodate the tracked width requirements for Large Combination Vehicles.*
4 *Short lengths of wider shoulder seal or lay-bys to be provided at suitable locations to provide for discretionary stops.*
5 *Full width shoulder seals may be appropriate adjacent to safety barriers and on the high side of superelevation.*
6 *A minimum 7.0 m seal should be provided on designated heavy vehicle routes (or where the AADT contains more than 15% heavy vehicles).*

(*Source*: Austroads 2021 - Guide to Road Design Part 3)

For costing purposes, it is proposed to adopt a design for a 9.2m of carriageway, comprising 2 x 3.1m sealed lanes, plus 2 x 0.5m sealed shoulders and 2 x 1.0m unsealed shoulders, consistent with the above ARRB recommendation. This 7.2m width of sealed road and shoulder will mitigate maintenance costs to repair edges, will be safer for cyclists, allows for traffic growth and caters for industrial and agricultural vehicles.

An estimate of upgrade costs has been calculated based on Council's financial reports and assumptions that no major pavement redesign, drainage upgrade or other significant costs will be incurred. (*Note*: The costs to upgrade unsealed roads to sealed roads are indicative calculations and costs would need to be verified by Council).

Table 14: Cost Estimate to Transition Unsealed Roads to Sealed Roads provides an example costing estimate for sealing 5% of Council's unsealed roads. This gives an indication of the order of initial capital outlay to seal 23.85km and the changed average annual renewal and operating maintenance costs between sealed and unsealed roads. The capital costs are amortised over a 30-year timeframe, to simulate the annualised costs from construction to reconstruction. Reseals have been assumed for every 10 years and resheets every 10 years.

In the example below, the initial capital cost to upgrade 5% of Council's unsealed roads is $7.7M, which will reduce annual operating costs by $27k per year. The average (amortised capital and operating) net cost increase for sealing and maintaining 23.85km of sealed roads, versus continuing as unsealed roads, is $500k/year in 2024 dollars. (Note: By comparison, the AECOM *Unsealed Road and Street Network Strategy* (Feb 2017) report indicated that to upgrade the top rated 15 road segments (15km of unsealed roads) would have a capital cost of $3M in 2017 dollars).

Table 14: Cost Estimate to Transition Unsealed Roads to Sealed Roads

Road Network Details					
Sealed Roads	612	km			
Unsealed Road	477	km			
Road Upgrade Specification	**New**		**Existing**		
Carriageway Width	9.2	m	5.5	m	
Sealed Width	7.2	m	0	m	
Proposed Upgrade	5%	% of Network	23.85	km of Network	
Item	**Cost per m2**		**Cost per km**		**Comments**
	Capital	**Operating**	**Capital**	**Operating**	
Initial Upgrade Capital					
Build Carriageway Pavement	$ 16.30		$ 150,000		Council's cost estimate
Initial Seal (2 coat seal)	$ 24.00		$ 172,800		$12/m2 per coat
Total Cost per km			$ 322,800		Pavement plus seal costs in carriageway
Total Cost for Upgrade			**$ 7,698,780**		Cost for all upgraded roads
Average Cost per Year			**$ 256,626**		Assume 30 year life
Renewal Capital					
Reseal (1 coat)	$ 12.00		$ 86,400		Reseal every 10 years (7,2m width)
Resheet	$ 13.39		$ 26,780		Resheet every 10 years (2 x 1m shoulders)
Total Cost per km			$ 113,180		Renewal every 10 years per km
Total Cost for Upgrade			**$ 2,699,343**		Renewal every 10 years for all upgraded roads
Average Cost per Year			**$ 269,934**		Ave renewal cost per year
Maintenance					
Sealed Road Maintenance		$ 0.50		$ 3,500	FY24 direct costs (assume ave 7m sealed width)
Unsealed Road Maintenance		-$0.84		-$4,620	FY24 direct costs (assume ave 5.5m unsealed)
Change in Maintenance Cost				**-$1,120**	Sealed-Unsealed mtce costs per km
Average Cost/Year				**-$26,712**	Operating cost change for all upgrades
Summary of Annualised Costs					Capital and operating cost for all upgrades
Annualised Cost - Capital			$ 526,560		Amortised Cost (Initial Upgrade + Renewal)
Annualised Cost - Operating				-$26,712	Change in Maintenance Cost
Annualised Net Cost			**$ 499,848**		Net average cost per year for all upgraded roads

(*Source: Surf Coast - Unsealed roads financials.xlsx derived from Council financials)*

7. REVIEW FINDINGS

The following sections outline various themes that arose from the observations and findings from discussions with Council officers, site visits, community engagement participants and reports and other information examined during the Review.

7.1 Asset Management

Council has policies and procedures that support good asset management practices. It has a robust asset management function with current asset data that utilises a good system for predictive modelling of its road infrastructure.

The Asset Management unit undertakes three yearly condition audits, and the Asset Management Coordinator produces renewal programs based on gathered condition data and in consultation with the Civil Operations team, especially with the road inspector. These programs must also compete for financing against other capital renewal projects and are not guaranteed full funding.

Moreover, while unsealed roads condition rating data captures depth of remaining pavement, the age of the pavement material must be adequately considered. This is pertinent, as the Gherang gravels lose fines and plasticity as they age and wear under traffic. The pavement surface does not bond and the structure cannot be adequately compacted during maintenance grading. The pavement loses shape and is more likely to corrugate and develop potholes.

Improvement Opportunity:

- Re-evaluate the importance/weighting of road pavement material age in the calculation of asset condition scores.

7.2 Community Expectations

The 2023 JWS community satisfaction report, and the community engagement process and its final report, strongly indicates that the community seeks improvement in the condition of Council's unsealed roads.

The themes from survey respondents were about the quality and level of maintenance work done, such that unsealed roads had corrugations, the crossfalls were too flat, potholes were reoccurring, dust was a problem and there were safety hazards. Some of this feedback can be attributed to aged Gherang gravel pavements, but it is also likely that maintenance resources are stretched and cannot deliver the level of service desired by road users.

There is a strong preference in the Aireys Inlet community to retain the nature (colour and rustic appeal) provided by Gherang gravels. The browny yellow colour appeals to the residents and tourists alike. There has traditionally been a strong desire to keep township roads unsealed for this reason, but this conviction is not prevalent in all responders and more residents are indicating that they would like more roads to be sealed. Moreover, silts from unsealed streets wash into drainage systems, impacting performance as well as eventually ending up in waterways and negatively impacting the environment. Prime candidates for sealing would be steeper streets with already sealed intersections.

In other locations, the locals prefer crushed rock gravel roads as these are more durable and weather better than Gherang gravel roads when wet.

There are mixed responses regarding sealing of unsealed roads, apart from the Aireys Inlet area, many would like to have their road sealed, provided that this does not increase traffic speeds and volumes, nor pose a threat to wildlife.

Improvement Opportunities:

- Increase the level of service for maintenance grading to diminish the gap between resident's desired levels of service and current technical levels of service.
- Evaluate the benefits of sealing those unsealed roads that have been highlighted during the community engagement process.

7.3 Construction/Maintenance Matters

Attempts to compact aged Gherang gravel pavements indicated that this could not be adequately achieved. These pavements subsequently lose their required profile, pool water and deteriorate with the formation of potholes and corrugations. In some locations, crushed rock is being laid on the surface of the road and this has improved pavement structure and performance.

Maintenance grading utilises grade-rolls (graders with tag along roller units), but compaction outcomes are not sufficient for long-term optimum performance. Council's hired multi-tyred roller produces good compaction outcomes and there may be a business case for acquiring at least one and potentially a roller for each of the three crews. There would be both productivity and quality benefits from such a set-up.

Improvement Opportunities:

- Research potential options for improving gravel quality and durability. This may involve in-situ blending or at the quarry, or by incorporating admixtures.
- Evaluate the benefits of operating stand-alone multi-tyred roller(s) for maintenance grading (and other) functions.

7.4 Facilities

The Torquay depot is modern and well equipped for its function and the yard is spacious and well laid out. The Winchelsea depot was not inspected so no comments have been made regarding improvement opportunities for Council's facilities.

7.5 Financial Resources

Civil Operations' maintenance budget appears to be based on an annual historical amount, plus CPI increases. A concern is that there is no budget increase for asset growth, nor population growth that results in increased usage of unsealed roads, despite associated increases in maintenance requirements. This squeezes the amount that can be allocated across the whole unsealed road network.

Furthermore, unsealed road services are not fully achieving RMP response guidelines, let alone community expectations, in part because of the level of resourcing.

The renewal budget received a fillip in last year's allocation and this is a positive for the resheet program. However, the funding has not extended the number of km able to be treated, as it appears that high inflationary impacts and, in part, the scope of works, as in road preparation and depth of pavement, have increased costs substantially.

Improvement Opportunity:

- Increase budget resources, justified by delivering RMP targets and in response to community engagement feedback.

7.6 Fleet, Plant and Equipment

The Council's fleet of plant and equipment are modern and capable of delivering its maintenance functions. It generally has in-house plant but does hire in additional plant as needed.

Council owns one water cart and hires others as required. There may be a business case for acquiring another unit, which would enable better control during high demand dry periods and could sustain maintenance grading operations.

The Fleet Management Team manages the fleet and uses the previous year's plant utilisation outcomes to establish the current year's plant hire rates. There was an increase of 22% charge out rate across the fleet in FY24. An anomaly is that when a breakdown occurs, Operations must hire its own replacement unit and the maintenance team leader has to do the legwork. This potentially acts as a disincentive for the Fleet team to deliver a highly responsive service.

Improvement Opportunities:

- Evaluate the benefits of purchasing a water cart to mitigate risk of not being able to maintenance grade during dry periods.
- Evaluate the benefits of purchasing stand-alone multi-tyred roller(s) for maintenance grading (and other) functions.
- Review the practice of Operations incurring the cost of replacing broken down plant while also being penalised for lower utilisation of the downed plant.

7.7 Materials

Council applies a magnesium salt based dust suppressant on an on-request basis. This material seems highly effective on Gherang gravel pavements and Council is trialling a long section of Ghazeepore Road and on Pt Impossible Rd to assess the impact on maintenance requirements. The site visit to Ghazeepore Road showed a smooth, tight surface with no dust emission.

A resheet project on Crafters Road was inspected. The materials being placed were a 75mm compacted layer of Gherang gravel, topped with a 25mm compacted layer of crushed rock. This has a superior structure and durability in wet weather and is an innovative approach to improving longer-term maintenance cost and to achieving improved trafficability. While it produces a better result, it has a higher direct cost at $73 per km vs an estimated $41k per km (by removing the cost of the extra layer crushed rock), based on the FY24 resheet program.

Similarly, introducing crushed rock into Gherang gravel pavements is improving structure and extending the life of the road. Patching potholes in Gherang gravel roads with crushed rock likewise seems effective.

Improvement Opportunities:

- Extend the dust suppression program to enhance road performance, not just to suppress dust in front of houses.
- Evaluate the benefits of the new level of resheeting standards versus the additional cost of material.

7.8 Road Upgrade

There are no approved forward plans to seal gravel roads, although some R2R funding may yet be possible. Certainly, the community engagement feedback indicated that there is a strong desire in some areas for this to be done.

- Locations where it could be beneficial include in the Otways, particularly where roads can be used as a short-cut by locals, are steep and remain damp year-round.
- Other prime locations for sealing unsealed roads in non-urban area are on steep gradients where traffic churns up the surface and/or water runoff scours the road, causing loss of gravel and creating maintenance issues.
- In urban areas, there are unsealed sections of road between sealed intersections which would be better off by being sealed and have drainage issues addressed, especially those roads that are steep. Roads like these that were sighted on the visit had no formal footpaths so pedestrians would be required to walk along muddy roads in wet periods.
- An example was also provided whereby an unsealed lane in Lorne required a grader to be sent whenever it requires maintenance. This takes some time and would be a costly exercise, that could be avoided if the lane was sealed.
- Surf Coast Council does not seem to have a policy or procedure for determining whether an unsealed road should be upgraded and sealed. Melton was used as an example of a council that does have a process for prioritising roads for sealing, using a matrix with traffic volumes, steepness of road, number of intersections, number of houses, etc.

Improvement Opportunities:

- Develop a policy that guides whether an unsealed road could merit being sealed, subject to available funding.
- Evaluate the cost for sealing roads that could be considered as candidates for sealing and develop a business case for future budget approval.

7.9 Systems

At the time of the site visit, the work order allocation process was paper based and there would be minimal information included in digital close-out of work order upon completion of works. Paperwork would apparently be "filed" by the supervisor in chronological order. The Shire does not use iPads, or equivalent, to digitally capture task information and would not have photographic records of pre and post works. However, it is understood that a new IT project will develop a digital solution to resolve these legacy processes. However, there will likely be a need for additional support for staff, particularly training, under the new system.

Improvement Opportunity:

- Support a digital solution that will use tablets to capture information that is useful to analyse for process improvement, benchmarking, developing standard costing, reviewing if quality is queried, etc.

7.10 Workforce

There is a good skill level across the workforce, it is stable and generally morale is good. The Civil Operations unit has three maintenance grader crews and uses contractors for resheet programs. However, the unit has insufficient capacity to cover any absences and, if even one person is away, it impacts crew productivity.

Overtime is judiciously used on capital works projects as this ensures maximum utilisation of expensive hire plant to minimise day-hire cost.

Improvement Opportunity:

- Develop and instigate plans for backing up field staff who are absent, for example, identify and develop back-up operators from elsewhere in Council, who can quickly substitute for absent staff.

7.11 Climate impacts

Climate change is driving the increased frequency and intensity of extreme weather, as well as making weather patterns more volatile and unpredictable. Climate impacts projected for the Surf Coast Shire region include less overall rainfall and increased likelihood of drought conditions; increased heatwaves; more intense storm and rainfall events with increased likelihood of flash flooding; increased bushfire risk; and sea level rise.

These climate hazards impact the condition of Council's unsealed road network, increasing the risks of poor condition associated with too much or too little moisture content in the road pavement, sediment runoff into Council's drainage infrastructure, and clean-up/maintenance activities following wind, storm or bushfire events. As well as physical climate risks on unsealed roads, there are also transition risks to consider, including uptake of low carbon road materials to lower Council's emissions liability.

Council acknowledges the need to address climate risk and has commitments in place to build resilience across its services, infrastructure and operations. A climate risk assessment of the unsealed road network was not within the scope for this review; rather, the findings of this review can be incorporated into Council's future climate risk assessments.

Improvement Opportunity:

- Undertake further analysis of this review to determine the impacts of climate change by incorporating in Council's forthcoming climate risk assessment process.

8. BENCHMARKING

8.1 Benchmark Schedule

The following benchmark schedule table was developed, in collaboration with officers, to assist Council to compare its unsealed roads services with Colac Otway and Golden Plains councils, which have environmental similarities. CT Management Group had also undertaken some higher-level budget and staffing level benchmarking with these councils, which has been added to the schedule.

Unfortunately, insufficient information has been provided to enable any worthwhile conclusions to be formed that will assist in identifying opportunities for improvement for Surf Coast Shire's unsealed road maintenance services. However, Surf Coast should consider following up with both councils in due course and refine the data requested to match readily available information.

Discussions with Golden Plains did indicate that it has benefited from utilising a grader operator training organisation to improve its grader operator's skills and processes. Golden Plains also reviewed its RMP intervention level charter to specify more sustainable maintenance regimes.

Table 15: Unsealed Roads Benchmark Schedule

Council details	Name	Surf Coast	Colac Otway	Golden Plains	Comments
Area	km^2	1,553	3,437	2,703	Municipal area
Population	No.	37,694	22,423	24,985	At last census (2021)
Budget (Op Ex)	$k	68,892	49,930	42,657	CTM Group (2024)
Budget (Civil)	$k	6,270	8,570	-	CTM Group (2024)
Budget (Resheets)	$k	1,025	1,201	800	
FTE Total	No.	368	245.5	196	CTM Group (2024)
FTE (Civil Mtce)	No.	34	-	27.5	CTM Group (2024)
Description	**Unit**	**Amount/Rate**	**Amount/Rate**	**Amount/Rate**	**Comments**
Network details:					Council owned only
Sealed roads	km	612	566	1,034	
Unsealed roads	km	477	1,058	705	
Capital Works					
Unit rates:					Complete Unit Rates worksheet
Formation	$\$/m^2$			6.67	Up to 200mm cut
Pavement	$\$/m^2$	22.21		29.85	Depth of 200mm
Drainage	$/lm				

Council details	Name	Surf Coast	Colac Otway	Golden Plains	Comments
Resheeting	$/m^2	5.08		13.15	Depth of 50mm
Pavement Design:					
Urban Roads:					Typical road details
Major unsealed - depth	mm	75-100			Council arterial roads
Pavement Type	Spec.	Gravel/rock			Gravel, crushed rock
Minor unsealed - depth	mm	75-100			Local residential roads
Pavement Type	Spec.	Gravel/rock			Gravel, crushed rock
Non Urban Roads					Typical road details
Unsealed - depth	mm	75-100			Council roads
Pavement Type	Spec.	Gravel/rock			Gravel, crushed rock
Unsealed - depth	mm	75-100			Typical council road
Resheet frequency	years	25			
Maintenance Works					
Budget:					Annual budget / network details
Unsealed roads	$/km	5,240			Total direct/indirect
Dust suppression	$/km	251			Direct
Drain clearing	$/km	851			Direct
Production rates:					Annual output
Drain clearing	lm per year				
Pothole repairs	no. per year				Could use m^2/year
Maintenance grading	km per year	1,422			
Production rates:					Typical per crew rates
Drain clearing	lm per day				
Pothole repairs	no. per day				Could use m^2/day
Maintenance grading	km per day	2.8			
Resources:					
Maintenance crews					
Patching	No. of crews	2			
Grading	No. of	3		4	

Council details	Name	Surf Coast	Colac Otway	Golden Plains	Comments
	crews				
Drain clearing	No. of crews	2			
Other	No. of crews	4			Various
Workforce					
Patching Crew:					
Plant operators	No.	2			
Labourers	No.	1			
Grading Crew:					
Grader operator	No.	3		4	
Water cart driver	No.	1		4	
Roller driver	No.	2		4	
Truck driver	No.	2		4	
Labourers	No.				
Drainage Crew:					
Operators	No.	2			
Labourers	No.	2			
Other Crew:					Various
Operators	No.	5			
Labourers	No.	5			
Materials:					Type and cost/unit
Patching material	$/tonne	16.50			Gravel
Other	$/tonne	27.50			Rock
Other	$/unit				

9. CONCLUSION

Council faces significant challenges in maintaining the Shire's unsealed road network. The asset renewal program budget was increased in FY24 but is still not sufficient to resheet unsealed roads at a frequency that will sustain them at a standard desirable to the community.

Maintenance grading and drainage clearance works have not been achieving the RMP levels of service due to the impact of weather events, aging pavements and budget constraints. Tight staffing levels and requirements to allocate 4.5 EFT positions to capital works programs impact efficient scheduling of maintenance operations.

Aged Gherang gravel pavements are difficult to compact and quickly deteriorate after maintenance grading. This contributes to a poor perception by the community of Council's workmanship and of the state of unsealed roads.

The community engagement process highlighted dissatisfaction about the state of many unsealed roads and exposed a gap between the Council's RMP levels of service standards and the community's expectations for its standards.

There are unsealed roads that would benefit from being sealed to reduce maintenance costs, improve safety and accommodate increased traffic volumes. One such example is Luggs Road, which is a steep road that carries reasonably high traffic loads. The road is difficult to sustain in good condition due to traffic shoving the pavement and especially when storm events erode the pavement material.

Figure 21: Luggs Road

Analysis of financial and asset information, discussions with stakeholders, review of other relevant documents has enabled the formulation of a range of cost option initiatives to be considered by Council to help improve unsealed road condition and close the level of service gap.

ANNEXURES

APPENDIX 1 – UNSEALED ROAD NETWORK REVIEW – CONSULTATION REPORT (APRIL 2024)

The *Unsealed Road Network Review – Consultation Report (April 2024)* was produced by Kismet Forward in conjunction with the Unsealed Roads Review. A copy of the stand-alone Kismet Forward report will be tabled with this report.

APPENDIX 2– OBSERVATIONS FROM OFFICER FEEDBACK AND SITE VISITS

A meeting with Rishi Viner, Coordinator Civil Operations was held at Surf Coast Shire Council's Torquay depot on Friday 19 January, followed by site visit to various unsealed roads in the municipality. Further discussions with Travis Nelson, Manager Operations and the Coordinator Civil Operations were conducted at the Connewarre unsealed roads community engagement session on Saturday 16 March.

The following record of the observations from these discussions and site visits has been grouped into relevant categories to assist the review of unsealed roads.

Asset Management

- Unsealed Roads Resheeting:
    - A capital renewal program is primarily created by the Asset Management Unit, for sealed and unsealed roads, buildings, footpaths, etc. However, there is only "one pot of money" and kindergartens, basketball courts, playgrounds and all other capital renewal projects, and unsealed roads must compete for its allocation.
    - Council uses an asset management system (formerly known as Assetic) for road asset management. A condition rating is carried out every three years, which includes getting the depth of remaining gravel pavement at 500m intervals, and this generates the resheeting program. However, prioritising which roads to resheet, could be informed further by placing greater emphasis on age of material.
- Assist case for renewal of aged gravel roads.

Community Expectations

- Members of the Aireys Inlet District Association have a strong view that the district is defined by the nature (colour, rustic appeal) of the roads built with Gherang gravels. However, there are a growing number of permanent residents want sealed roads, especially to cope in winter conditions.
- Need to check community survey information to see if there is any feedback on unsealed roads. Surf Coast Council has done its own surveys and there is the general Victorian council survey as well that could be helpful.
- There has been some feedback through community engagement about the quality of work done, such that unsealed roads had corrugations, the crossfalls were too flat, potholes reoccurring, etc. However, the issues identified relate more to but the fact that the pavement material was old and not holding shape.

Construction/Maintenance Issues

- A trial to really work an aged gravel pavement indicated that it would not compact, presumably due to lack of binder material and angular stone and a likely grading gap.
- PowerCorp underground cables were laid in numerous Surf Coast Shire roads several years ago, presumably following major Victorian bushfire events that were initiated by overhead power lines. These cables are causing considerable problems for any excavation work, including deep pavement ripping or drainage works, that Council undertakes. The power cables have been laid at variable depths and in alignments that interact with roads and table drains. Any work requires Dial-Before-You-Dig and careful excavation to locate lines.
- Must use a certain amount of equipment and people for capital works, this impacts resources required for the operating maintenance program.

Construction/Maintenance Standards

- For new developments and road construction, the Surf Coast Council follows the standard Infrastructure Design Manual (IDM) adopted by most Victorian councils.
- Road Management Plan (RMP) intervention levels did not have any guidance for edge of road build up clearing. There is a recently introduced program to clean off the high build-up of loose gravel and debris along the road edges, which has resulted in a reduction in potholes as water is able to shed off the road into table drains.
- Council is documenting standards and is producing written work standards.
- What would be the Coordinator, Civil Operations' desired outcomes from the Review be?
    - Would like to benchmark things like:
        - RMP intervention levels
        - Are there ways to do better, such as an alternative to using grade-rolls (graders with tag along roller units) as compaction is minimal. Council hires a multi-tyred roller for $5k/month (*Possible opportunity: Develop a business case to justify purchasing a roller).*

Contractors

- Capital resheet renewal projects run for 5 to 8 months and are generally contracted out, including traffic control, grader and operator, water cart, roller and quarry delivery trucks, and project managed by the Council's team leader.
- Crafters Road
    - Resheet project undertaken by contractor.
    - 75mm layer of Gherang gravel topped with a 25mm+ FCR FCR from Holcim Colac quarry.
    - A section of the new work was soft due to the heavy rain event the previous week, but this was expected to tighten up. Otherwise, the resheet looked terrific.

Council Plan

- The Council Plan does not specifically feature roads, but of course roads are important enablers in achieving most aspects of the plan. Roads also impact the Council Plan's Accountable and Viable theme as road renewal and maintenance are large cost areas.

Data

- Useful Benchmarking information would be what resources and how many km of roads another similar council, such as Colac Otway, has.

Facilities

- Tour of Torquay depot:
    - Very good offices and common meeting area.
    - Outside yard area seems spacious and adequate.

Finance

- Notwithstanding, last year saw an increase is funding for resheeting to around $1.2M, double the usual $600k budget in normal years.
    - The budget is based on annual historical budget amounts plus CPI or similar, as appropriate. A concern is that there is no increase due to asset growth, despite increases in population growth and maintenance requirements.

Fleet, Plant and Equipment

- A hired multi-tyred roller was parked in the yard, because lack of staff meant it couldn't be on the job that day.
- A very well set up signage truck arrived during the visit.
- Water carts can be wet or dry hired to supplement own plant. This can be challenging in dry seasons due to lower availability.
- Council has one owned water cart and hires others as required. There may be a business case for acquiring another unit, which would enable better control during high demand dry periods and could sustain maintenance grading operations.
- Council owns tippers (9 cubic m capacity units). It uses contract cartage operators to deliver bulk gravel to jobs and gets good rates.
- Mostly have in-house resources.
- Do a lock-up of equipment on owner's land at work sites but bring in on Friday afternoon and RDOs for servicing.
- Rarely need to take a machine off road.
- Challenge is that the Assets Team owns the fleet and uses the previous year's utilisation rate. There was an increase of 22% across the fleet this year.
- When a breakdown does occur, operations have to hire its own replacement unit and the maintenance team leader has to do the legwork. This is a disincentive for Assets to deliver service.
- Lost utilisation impacts the next year's charge rate.
- With the current breakdown, the grader budget now will be under pressure.

Materials - Dust Suppression

- Dust suppression:
    - Surf Coast Shire makes extensive use of the Rainstorm magnesium salt dust suppression product, which seems to be effective on sandy roads. The material is added to water carts and sprayed on the gravel; it reduces dust emission and retains fines in the pavement. It does require annual application.
    - Council policy is to spray the dust suppression for a 100m length in front of a house.
    - Council is trialling a long section of Ghazeepore Road and on Pt Impossible Rd to assess the impact on maintenance requirements. The site visit to Ghazeepore Road showed a smooth, tight surface with no dust emission.
    - Crushed rock unsealed roads apparently require double the application to be as effective as the Gherang gravel roads.

Materials - Pavement Design

- A very good resheet outcome is to place and compact a 75mm layer of Gherang gravel and top it with a 25mm compacted layer of crushed rock. This has a superior structure and durability in wet weather. The site visit included an inspection of Crafters Road where this was being constructed by a contractor for Council, and Atkins Road, which had been recently completed.

Materials - Properties

- The Gherang gravel comprises river sand, clay and pebbles and is a red/orange colour that fades to a sandy yellow colour with age.
- Gravel issues:
    - Clay and fines are lost under traffic and in wet weather the clays are soluble, so the pavement becomes sandy and coarse. (*Possible opportunity: Is there potential to stablise with cement or lime in key locations?*)
    - The life of a Gherang gravel pavement is around five years, although can be extended to eight years with a heavy maintenance grade to reintroduce fines and structure. The older pavements don't have the structure and binder that holds the surface and mere grading and rolling does not compact the material. (*Possible opportunity: Lab test for grading of insitu material to determine if it is feasible to add material e.g. 5mm minus with PI, to improve the material*).
- When resheeting with Gherang gravel, it can be puggy during the first year, if it is a wet season, because it has a high clay content.
- Some older Gherang gravel roads have had crushed rock applied and this seems to have improved their structure and performance. Patching potholes with crushed rock also seems to be effective.

Figure 22: Aerial View of Gherang Gravel Quarries

- *(Source: Google Maps)*

Materials - Supply

- Council has contracts for quarry supplies.
- Crushed rock is supplied from the Holcim Colac Quarry.
- Gherang gravel is supplied by Local Mix, which is the operator of the Council's deposit off Forest Rd, Gherang. Council pays for the material at contract rates but receives a royalty that partly offsets the cost. (Holcim also has a deposit adjacent to the Local Mix operation).
- Road base materials costs are $13-$15/tonne for screened gravel and $20-$30/tonne for crushed rock.

Road Condition

- Site Visits:
    - Dickins Road – 15 years-old gravel with 20mm Class 3 FCR added.
        - Very loose surface in dry zone, top 25mm-50mm, not compactable.
        - Deeper in the pavement, where some moisture, compaction seems reasonable.
        - The road surface was holding well in sections where dust suppression had been applied.
    - Boundary Road – crushed rock gravel.
        - Steep road that caters for higher volume of traffic because it is a short cut.
        - Road surface is shoving under traffic in places.
        - Gravel is washing out and eroding into the table drain.

- Various gravel roads (Atkins, Bambra, Blackgate, Breakfast Creek, Dickins, Ghazeepore, Luggs, Reserve, Thielemanns and others)
    - Roads are generally in good condition, although steeper roads and older Gherang gravel pavements have issues such as corrugations, potholes, washouts, surface looseness, etc.
    - Gherang gravel pavements that have been dust suppressed are tight and compact and smooth, with only minor potholing.
    - Crushed rock pavements are not as tight as a dust suppressed Gherang gravel road but are sound and ride well.
    - Sections of Gherang gravel roads that have had crushed rock overlays or pothole patching seem to be holding up well.
- Aireys Inlet roads
    - Intersections are sealed but streets are unsealed between intersections. It looks like a patchwork and must be a challenge to maintenance-grade efficiently.
    - Steep streets have some washout and erosion loss of gravel into drains.
    - Roads are apparently wet and muddy during winter and there are no footpaths for pedestrians, so they would be forced to use the road.

Road Upgrade

- Sealing of unsealed roads – there are no approved forward plans or budgets to seal gravel roads yet, although the Assets and Engineering department have been working towards this objective.
    - Locations where it could be beneficial include in the Otways, particularly where roads can be used as a short-cut by locals, are steep and remain damp year-round.
    - Other prime locations for sealing unsealed roads in non-urban area are on steep gradients and traffic churns up the surface and/or water runoff scours the road, causing loss of gravel and creating maintenance issues.
    - In urban areas, there are many unsealed sections of road between sealed intersections which would be better off by being sealed and have drainage issues addressed, especially those roads that are steep. Roads like these that were sighted on the visit had no formal footpaths so pedestrians would be required to walk along muddy roads in wet periods.
    - An example was also provided whereby an unsealed lane in Lorne required a grader to be sent whenever it requires maintenance. This takes some time and would be a costly exercise, that could be avoided if the lane was sealed.
    - Surf Coast Council does not seem to have a policy or procedure for determining whether an unsealed road should be upgraded and sealed. Melton was used as an example of a council that does have a process for prioritising roads for sealing, using a matrix with traffic volumes, steepness of road, number of intersections, number of houses, etc.
    - Assist the case for a policy for sealing unsealed road, with a prioritising process to assist decision-making. However, would then need to be able to make a case for budget allocation.

Systems

- Work order allocation process is paper based and there would be minimal information included in digital close-out of work order upon completion of works. Paperwork would apparently be “filed” by supervisor in chronological order. The Shire does not use iPads, or

equivalent, to digitally capture task information and would not have photographic records of pre and post works.

- RMP intervention level works:
    - Intervention grading is only undertaken when the RMP triggers a job.
    - The process is that a proactive inspector logs a work order or the asset inspector receives a request that meets RMP intervention level.
    - The team leader programs work, cognisant of time-to-repair standards for various intervention levels, attempting to batch jobs in the most efficient manner.
    - Crews will then fix the problem and the work order is closed.
    - Documentation is handwritten, without photos of before and after, and details of the work is not comprehensive.
    - Daily timesheets record time, including plant hours, against the asset. For example, basic information such as location: Blackgate Rd; Staff 3 persons for 3 hours: Plant: grader, water cart, roller for 3 hours. But materials usage for gravel, water, etc is unlikely to be captured.
    - Finance can capture all costs against the asset, but it is not an easy task to get information, such as grading km/day, from the Civica database.
    - (*Possible opportunity: Develop a digital solution using tablets to capture information that is useful to analyse for process improvement, benchmarking, developing standard costing, reviewing if quality is queried, etc).*
- There are two projects underway that may be relevant to the key issues relating to paper work orders. These are:
    - Development of digital works management system with a change to the customer request system; and
    - IT Transition Project which is considering moving from Civica to some other system. (Salesforce is one under consideration, as is Crisis Works Management, although this has had issues with mobile coverage, but no decision yet).
    - There are clear documented work systems that are audited – there are some niggles from workers about this, but now showing benefit with improved quality level.

Workforce

- Workforce matters:
    - There is a good skill level across the workforce.
    - There is a stable workforce, and generally morale is good.
    - The operations workforce did have an aging profile but five older staff have left and younger members have joined.
    - Many outdoor staff positions working on unsealed roads are Band 3, so the Shire has difficulty competing with private contractors on salary.
- Insufficient resources for maintenance. For example, losing a roller because no one free to operate it.
- Three grader crews for capital and maintenance works and contractor for resheet works.
- If one person is away it impacts crews.
- Overtime is used on capital works, mainly because these projects use expensive hire plant so it is better to work longer hours to reduce day-hire costs.

APPENDIX 3 – ROAD RENEWAL PROGRAM (FY2023-2024)

Surf Coast Shire has an annual road renewal program and the 2023-2024 budget was approximately $1.85M for pavement rehabilitation and overlays on sealed roads, and $2.0M for gravel resheeting of unsealed roads. The following table lists the details of the renewal works.

Table 16: FY 2023-2024 Road Renewal Program

2023 - 2024 ROAD RENEWAL PROGRAM

Sealed Road Renewal

Approx. Budget: $1,850,000

Town	Location	Description of Works
Winchelsea	Cape Otway Road - 0154 - 006 - Marshmans Outlet To Dysons Lane	Partial Pavement Rehabilitation over culvert (approx. 90m)
Winchelsea South	Centre Road - 0173 - 001.1 - Wormbete Station Rd To Ch 115m	Partial Pavement Rehabilitation at Intersection
Lorne	Clovelly Court - 100 - Intersection Seal Otway St To End of Seal	Intersection Overlay
Torquay	Fischer Street - Merrijig Drive to Inshore Drive including roundabout at Inshore Drive	Pavement Rehabilitation
Torquay	Ironbark Court - 0502 - 001 - Enfield Drive To End	Partial Pavement Rehabilitation and Drainage Works at Entry
Winchelsea	Jackson Street, Winchelsea - 001 - Mercer Street To 5m North Princes Hwy	Intersection Overlay
Torquay	Merrijig Drive - Surfcoast Highway to Fischer Street including roundabout at Merrijig Drive / Fischer Street	Pavement Rehabilitation including speed hump renewal
Torquay	Point Impossible Road - 0692 - 100 - Intersection Seal at Blackgate Road	Intersection Overlay
Torquay	Scorpio Street - 0752 - 002 - Aquarius Ave To End	Partial Pavement Rehabilitation including Tree Removal to approx. 60m damaged area
Anglesea	Tonge Street - 003 - Gt Ocean Rd To Parker St	Intersection Overlay

Unsealed Road Renewal

Approx. Budget: $2,000,000

Town	Location	Description of Works
Wensleydale	Alsops Road - 0021 - 001 - Breakfast Crk Rd To End	Gravel Resheet
Lorne	Armistead Street, Lorne - 1152 - 001 - Hall St To Dorman St	Gravel Resheet
Inverleigh	Barwonleigh Lane - 0069 - 002 - Barwonleigh Ln to Inverleigh-Winchelsea Rd	Gravel Resheet
Inverleigh	Barwonleigh Lane - 0069 - 001 - Inverleigh-Winchelsea Rd To End	Gravel Resheet
Modewarre	Batsons Road - 0076 - 001.1 - From Ch 55m To Ch 1000m	Gravel Resheet
Bells Beach	Bells Road - 0092 - 002.1 - Bones Rd + 107 m To Addiscott Rd	Gravel Resheet
Benwerrin	Benwerrin-Mt Sabine Road - 0097 - 001.3 - From Ch 1281m To Pennyroyal Tk	Gravel Resheet
Aireys Inlet	Berthon Street - 0098 - 003 - Start of seal to end	Gravel Resheet
Aireys Inlet	Boundary Road - 0120 - 001 - Eagle Rock Pde To Hartley St	Gravel Resheet
Aireys Inlet	Boundary Road - 0120 - 005 - Gilbert St to McConachy Rd	Gravel Resheet
Gherang	Crafters Road - 0207 - 001.1 - End of Seal To Property No. 290	Gravel Resheet
Gherang	Crafters Road - 0207 - 001.2 - Property No 290 To End of Road	Gravel Resheet
Gherang	Dangers Road - 0220 - 002 - Layards Rd To Guye Ct	Gravel Resheet
Gherang	Dangers Road - 0220 - 004 - Layards Rd To Guye Ct	Gravel Resheet
Gherang	Dangers Road - 0220 - 006.2 - Property No 545 To Tanners Rd	Gravel Resheet
Lorne	Erskine Avenue - 0274 - 002 - End of Seal To End	Gravel Resheet
Fairhaven	Fairhaven - Yarringa Linear Reserve	Gravel Resheet
Anglesea	Gum Flats Road - 0361 - 005.2 - Culvert To Track North Side	Gravel Resheet
Bellbrae	Gundrys Road - 0362 - 007 - 138m West Vickerys Rd To Eagle Point Rd	Gravel Resheet
Pennyroyal	Pennyroyal Station Road - 0658 - 008 - Deans Marsh Lorne Rd to Old Lorne Rd South	Gravel Resheet
Deans Marsh	Pennyroyal Valley Road - 0659 - 007 - End of Seal to House No 485	Gravel Resheet
Torquay	Point Impossible Rd - 0692 - 001 - Blackgate Rd to Carpark Entrance	Gravel Resheet
Lorne	Staughton Avenue - 0794 - 002 - Minapre Street To Waverly Av	Gravel Resheet
Wensleydale	Wensleydale Station Road - 0880 - 005 - End of Seal to Start of Seal Gum Flats Rd	Gravel Resheet

Notes:

Programs subject to change

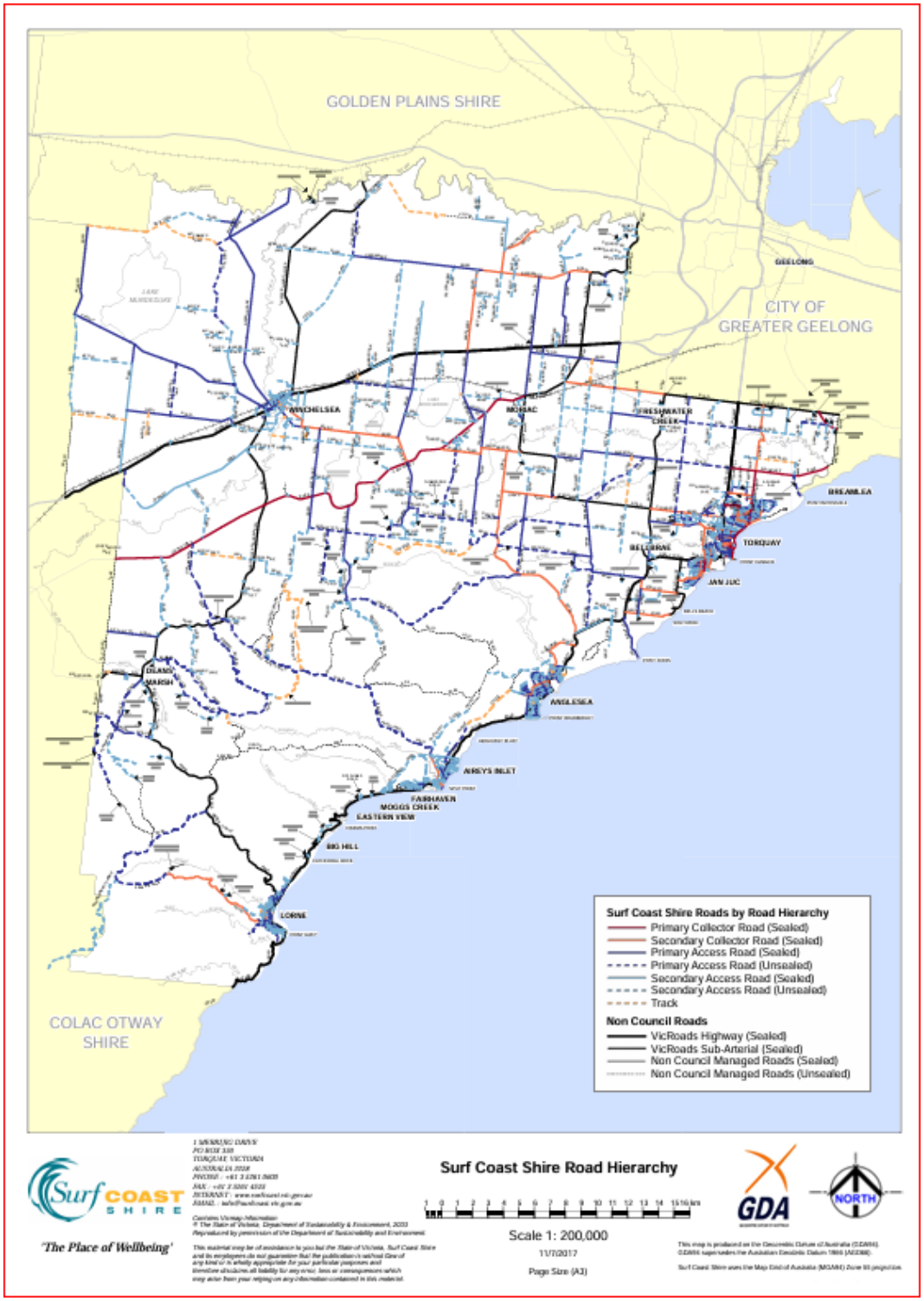
Reseals, Rehabilitations and Resheets may be full or partial segment of roads

(*Source*: Surf Coast Shire website - Road management - Surf Coast Shire)

APPENDIX 4 – SURF COAST SHIRE ROAD HIERARCHY

The roads within the Surf Coast Shire comprise state highways, tourist roads and arterial roads (main roads) that are 100% funded and maintained by Transport for Victoria, State Forest unsealed roads managed by the Department of Environment, Land, Water and Planning, National and State Park unsealed roads managed by Parks Victoria, sealed and unsealed roads and car parks managed by the Great Ocean Roads Parks Authority, and Council managed roads.

Figure 23: Surf Coast Shire Road Hierarchy



(*Source*: Surf Coast Shire website)

APPENDIX 5– AIDA SURVEY – 1983 -2020

The Aireys Inlet and District Association undertake periodic community questionnaires on a wide range of topics including environmental, planning and development opinions concerning the local district. The following is an excerpt from the longitudinal results of these surveys from 1983 to 2020. There are several sub-elements relating to Question 8 that are of relevance to the unsealed roads review, and these are highlighted in yellow below.

Although there are only two years in which these questions were asked, what the responses indicate are that residents have significantly eased their opinions regarding development of local street infrastructure. The key question relating to unsealed roads shows a major change from approving of unsealed roads (74%) to only just over a third (30%) of respondents saying they are very important.

Table 17: Aireys Inlet & District Association Longitudinal Survey Results - Q8

	Dec 1983	Oct 1990	Oct 1999	Feb 2015	Dec 2020
7. Aireys Inlet to Eastern View has some special environmental controls not applying elsewhere. Do you support them?					
• Protection of the night sky, by limiting street lighting, illuminated advertising and private external lighting	- -	- -	- -	Working well 62%	Strongly support 84%
• Protection of neighbourhood character, including environmental protection, by controls on house design and site development	- -	- -	- -	Needs more 58%	Strongly support 82%
8. There is a variety of opinions on some local issues. What do you think about					
• The provision of housing for older persons, close to the shops?	- -	- -	- -	Approve 75%	Important 35%
• Pedestrians sharing local streets with cars?	- -	- -	- -	Approve 73%	Very important 36%
• Naturally vegetated residential roadsides?	- -	- -	- -	Approve 92%	Very important 52%
• Unsealed local streets?	- -	- -	- -	Approve 74%	Very important 30%
• Separate roadside foot paths?	- -	- -	- -	Dis-approve 43%	Low priority 33%
• Controlling the amount and style of signage around town?	- -	- -	- -	Approve 75%	Very important 53%

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