E.5 Primer Seal Dust Suppression Roads - Long Term Management Strategy

File No:	**CM13/628**
Department:	**Infrastructure**
Council Plan Strategic Objective:	**Sustainable Development & Growth**
	Our built environment complements our landscape, lifestyle and climate.

Previous Items: CBR1/13 - Primer-seal Dust Suppression Roads - Long term management strategy (10.15am - 11.00am) - Policy Workshop - 24 July 2013
CBR2/13 - Dust Suppression Roads - History, Status, Roads at Risk (11.20am - 12.05pm) - Policy Workshop - 8 May 2013
SR9/10 - Tulloch Street Dalyston - Review of Dust Suppression Treatment - Council - 15 September 2010

Review of Dust Suppression Treatments 2005-2007 – Council – 18 November 2009

Declaration

The author has no direct or indirect interest in this issue.

Summary

Between 2005 and 2007 Council trialled a range of dust suppressant products and one of these products was a primer seal treatment.

Previous Council reports have explained that the original intention of the primer seal applications was as a dust suppressant treatment only, and because of the minimal surface preparation these works had a limited life expectancy. In simple terms, the primer seals that have been applied could be likened to applying a coat of paint to a building without undertaking any repairs to the building's structure.

These primer seal treatments have served their short term purpose to suppress dust. Some have deteriorated significantly and a long term management strategy for these roads is now required.

This Council report proposes a long term management strategy for the dust suppressant roads treated with a primer-seal, and in particular focuses on:

- The rationale for resealing the better performing roads.
- Setting clear intervention criteria for returning unsealed surfaces to the roads as they continue to deteriorate.

This report recommends that having considered the current condition of the dust suppressant roads treated with a primer-seal directs that:

- **The future management of these roads is in accordance with the management strategy described in attachment two of this report.**

Introduction

Four different types of dust suppressants were trialled on Council roads from 2005 to 2007. Previous Council reports have concluded that primer seal dust suppression proved to be the most effective of all these treatments. This treatment involved a sprayed bituminous binder with the application of stone on an unsealed road, with minimal surface preparation. A list of the roads that had the primer seal dust suppression treatment is attached to this report (Attachment 1).

The original intention of the primer seal applications was as a dust suppressant treatment only and because of the minimal surface preparation prior to the application; the treatment has a limited life expectancy. This is generally because of the poor insitu material, inadequate pavement depth, steep gradients, inadequate drainage and traffic loadings.

All of the primer-sealed dust suppression roads are showing signs of deterioration, some more extensive than others. Put simply, as these roads deteriorate they become more expensive to maintain, and the repairs do not last because of the conditions listed above.

Effectively, this means that Council cannot feasibly maintain them in a cost effective manner without substantial rebuilding works.

There have been two previous Council reports submitted about the primer seal dust suppression roads.

The first report was submitted in November 2009 and was a general update on each of the roads.

The second report was submitted in September 2010 and this mainly related to the condition of Tulloch Street, Dalyston. This road has deteriorated the most significantly and Council Officers required direction on the approach to be taken.

Part of the decision at the September 2010 meeting also stated that prior to considering the option to return the unsealed surface to a road, that Council Officers would first survey local landowners to ascertain if the majority would support an owner funded special charge scheme for the full construction of these roads.

This matter is currently being addressed in the review of the Urban Roads and Drainage Improvement policy.

Both of these Council decisions support the approach that ultimately the Council's Urban Streets Improvement Policy should be the mechanism used to undertake these rebuilding works. A management strategy now needs to be implemented for these roads until they can be upgraded to a level that can be sustainably maintained in the future (through the urban roads and drainage improvement upgrades).

The key elements of the strategy are:

1) Resealing Criteria - Resolving the criteria to be used to determine which roads are appropriate for resealing.
2) Intervention Timing and Criteria - Determining when pro-active action needs to be undertaken to keep the roads safe and able to be maintained in an efficient manner. For example, returning the roads to an unsealed crushed rock surface.

Management Strategy

The below information is a summary of the management strategy. Further detail is provided in Attachment Two.

1) Resealing Criteria

A condition survey of each primer seal dust suppression roads has recently been completed by Council's independent road auditor. The primer seal for each road was given an overall condition rating from 0 – 10. The primer seals that are in the best condition have a condition rating of 0. The most deteriorated surfaces are rated 10.

It is proposed that in order for a dust suppressant road treated with primer seal to be considered for resealing, the following criteria must be satisfied:

- Condition rating of 0
- Adequate pavement integrity
- Roads that are not on the current urban roads upgrade list in the next 5 years
- Roads that service more than local traffic only
- Roads that represent a saving on maintenance – Refer table below

Road Type	Dust suppression Road Condition Rating 0	Dust suppression Road Condition Rating 9 - 10	Unsealed crushed rock road
Annual Maintenance Cost	$400/km	Up to $6000/km	$1065/km

Based on the above criteria, the following roads are proposed to be resealed:

Table One

Road name	**To**	**From**	**Township**
Beachcomber Ave.	Back Beach Rd.	Car Park	Smiths Beach
Marlin St.	Beachcomber Av.	Smiths Beach Rd.	Smiths Beach
Waterloo St.	Rhyll-Newhaven Rd.	Beach Rd.	Rhyll
Longstaff St.	Kirrak St.	Wentworth Rd.	Wonthaggi
Reed Cr.	Cameron St.	Matthew St.	Wonthaggi

This affects 13,958m2 of road and will cost $72,580.

To stop any further deterioration of the road surfaces, it would be beneficial if resealing works take place at the commencement of the next resealing season, which will commence in the later months of 2013.

2) Intervention Timing and Criteria

As has been advised in previous Council reports, there are a number of primer seal treatments on dust suppressant roads that have deteriorated extensively. In the condition survey that has recently been completed these are the roads that have been

rated a 9 or 10. The deteriorated surfaces of the roads are expensive to maintain and difficult to keep in a safe condition. It is therefore proposed that the surfaces of these roads will soon need to be returned to a traditional unsealed surface. This work involves the road surface being ripped using an attachment on the back of a grader. What remains of the seal is then graded and mixed into the road's pavement. If the road has limited material in the pavement, then more crushed rock may need to be applied.

The intervention criteria for returning a road back to a more serviceable unsealed crushed rock road is proposed as follows:

- Condition rating of 9 or greater
- Inadequate pavement integrity
- Roads that have defects occurring at a rate greater than inspection cycles (therefore / are difficult to maintain safely)
- Greater than 50% of the seal has broken down
- Roads that represent a saving on maintenance by returning them to a unsealed crushed rock status

Following site inspections and a review of the condition ratings, it is anticipated that the following roads will need to be returned to an unsealed state within the timeframes stated within table two.

Table Two

Road name	Section/whole road	Estimated timeframe	Condition rating
Tulloch Street, Dalyston	Whole road	6 months	10
Kallay Drive, Pioneer Bay	Whole road	6 months	10
The Esplanade, Sunderland Bay	Possibly sections only	12 months	9
The Esplanade, Surf Beach	Possibly sections only	12 months	9 & 10
Dunvegan, Surf Beach	Possibly sections only	12 months	10
Brown Street, Wonthaggi	Possibly sections only	12 months	9

Prior to any road being returned to an unsealed surface it is recommended that letters be sent to affected property owners advising them of the action that needs to be taken and the reasons why.

Currently there are a number of surfaces that are suffering minor deteriorations. The maintenance practices for these roads will be consistent with Council's standard maintenance practice.

Strategic Basis

A strategy in the Sustainable Development and Growth objective in the 2013 - 2017 Council Plan states:

Provide infrastructure and facilities that are well managed, environmentally sustainable and are suitable for the community's needs.

As a strategy, dust suppression treatments on unsealed roads in residential areas have provided a short term benefit. However, many of these roads are reaching the end of their useful life and to ensure that we continue to meet the community's needs, a long term management strategy for these roads now needs to be formalised.

Another strategic document which guides the management of the dust suppressant roads treated with primer seal is Council's Asset Management Policy. The objective of this policy is:

To enable Council to optimize the whole of life costs of its assets, whilst meeting the present and future service delivery needs of the community and minimizing exposure to risk.

Therefore, the long term management strategy for these roads also needs to meet the objective of the Asset Management Policy.

Council is currently also undertaking a review of its Urban Roads and Drainage Improvements Policy and this will set out long term strategy for upgrades of urban areas.

Finances

Dust suppression treatments were undertaken as a trial.

There has been no allowance in the Council's current budget or strategic resource plan to continue with these treatments.

The management plan recommended within this report, if adopted, will mean an amount of $72,580 will be required to be put forward in the next budget review.

Based on the maintenance costs for different surface types, it would take approximately 20 years to recover the resealing costs. The expected life of the resealing works on dust suppressant roads treated with primer seal is 10 – 15 years.

There also be financial impacts in future years, but the amount is expected to lessen over years, as roads get upgraded as part of the Council's Urban Roads and Drainage Improvement Policy. Overtime, roads may also fall outside the criteria for reapplication of the seal.

Stakeholders

The stakeholders include:

- Bass Coast Shire Council
- The community adjoining the roads that have had a primer seal application
- The landowners and residents of Bass Coast Shire
- Domestic and international tourists and visitors

Statutory Requirements/Codes/Standards/Policies

The relevant statutory requirements include:

- Road Management Act 2004

- Councils Road Management Plan
- Councils Asset Management Plan
- Council's Urban Streets Improvement Policy

The Road Management Plan defines the acceptable level of defects that are allowable for various categories of roadway. The plan specifies criteria for when sections of deteriorated dust suppressant roads treated with primer seal have reached or are reaching intervention level. Once this criterion is reached, Council needs to take appropriate action to correct the situation.

Other Options

There are many options that are available to Council for resealing of the roads and for intervening when the roads are badly deteriorated.

All of these alternatives will have an impact in terms of:

- The capital costs for resealing
- The operational maintenance budgets
- The ability to maintain the deteriorated surfaces
- The amenity benefit of alternative surfaces

Details of four alternative options are included in Attachment Three.

Officer's Comments/Conclusion

The primer seal applications that were applied via Council's dust suppression program between 2005 and 2007 were a short term solution, and a significant number are now starting to reach the end of their effective life.

The expected rate at which they fail towards the end of their useful lives will be rapid with the likely scenario being that most roads will fail within a few years of each other. With this in mind, it is now very important that the long term management of these roads is formalised, particularly with regards to returning the unsealed surface of the road when they reach the pre-determined intervention level.

It may cause angst in the community when their roads are returned to an unsealed status, even though they are likely to get a better level of serviceability (but reduced level of amenity) with an unsealed road. However, Council Officers believe that any other option for the significantly deteriorated surfaces will be an inefficient use of Council funds.

In regards to any resealing works, from a financial viability perspective, it does not represent value for money to continue to reseal those roads that have a primer seal treatment for dust suppression purposes. However, it is the officer's opinion that when taking into account amenity and financial viability that a realistic option is to reseal only of those surfaces which are in the best condition and have primarily received a condition rating of 0.

It is recommended that the long term management of the dust suppressant roads treated with primer seal should be in accordance with the management strategy that has been described (Attachment Two).

Recommendation

The report recommends that having considered the current condition of the dust suppressant roads treated with a primer-seal directs that:

1. **The future management of these roads is in accordance with the management strategy described in Attachment Two of this report**

Attachments

AT-1 List of road treated with Primer Seal Dust Suppressant

AT-2 Key elements of the management strategy for dust suppressant roads treated with primer-seal from 2005 - 2007

AT-3 Options available

Council Decision

Moved: Cr. Phil Wright / Seconded: Cr. Jordan Crugnale
The report recommends that having considered the current condition of the dust suppressant roads treated with a primer-seal directs that:

1. **The future management of these roads is in accordance with the management strategy described in Attachment Two of this report, excluding The Esplanade in Sunderland Bay and Surf Beach until the Integrated Transport Study for Phillip Island is completed and possible traffic management options for the townships are identified.**

CARRIED

Cr Le Serve used her casting vote and voted in favour of the motion.

ATTACHMENT 1

Road	Town	Year sealed
The Esplanade	Sunderland Bay	2005
Reid Street	Rhyll	2005
Beach Road	Rhyll	2005
Cassia St	Cape Paterson	2006
Anderson Pde	Corinella	2006
Tulloch St North	Dalyston	2006
Powlett St Nth	Dalyston	2006
Bent St	Dalyston	2006
Daly St Nth	Dalyston	2006
Kallay Drv	Pioneer Bay	2006
Beach Rd	Rhyll	2006
Waterloo St	Rhyll	2006
Wolfenden St	Rhyll	2006
Felicia Ave	Rhyll	2006
Franklyn St	Rhyll	2006
Jansson Rd	Rhyll	2006
Reed Cr (Section 1)	Wonthaggi	2006
Reed Cr (Section 2)	Wonthaggi	2006
Queen St	Wonthaggi	2006
Brown St	Wonthaggi	2006
Merrin Cres	Wonthaggi	2006
Dickson St	Wonthaggi	2006
Edgar St	Wonthaggi	2006
Longstaff St	Wonthaggi	2006
Zelma Drive	Rhyll	2006
Beach Rd	Rhyll	2006
Scenic Drive	Cowes	2007
Outlook Drive	Cowes	2007
Bayview Drive	Cowes	2007
Maxwell Street	Cowes	2007
Park Lane	Cowes	2007
Anglers Road	Sunderland Bay	2007
Hill Street	Sunderland Bay	2007
Glen Street	Surf Beach	2007
Batman Avenue	Surf Beach	2007
The Esplanade	Surf Beach	2007
Hopetoun Crescent	Surf Beach	2007
Dunvegan Crescent	Surf Beach	2007
Dolphin Crescent	Smiths Beach	2007
Marlin Street	Smiths Beach	2007
Barramundi Avenue	Smiths Beach	2007
Gilmore Street	Smiths Beach	2007
Beachcomber Avenue	Smiths Beach	2007
Hollywood Crescent	Smiths Beach	2007
Honolulu Avenue	Smiths Beach	2007
Back Beach Rd (SR)	Sunset Strip	2007
Sunset Drive	Sunset Strip	2007
Panorama Drive	Sunset Strip	2007
Happy Valley Drive	Sunset Strip	2007
Bermagui Crescent	Sunset Strip	2007
Bonney Road	Grantville	2007
Panoramic Drive	Grantville	2007
Malcolm Drive	Grantville	2007

Att. 2. Key elements of the management strategy for dust suppressant roads treated with primer-seal from 2005 – 2007 (Primer Seal Dust Suppression Roads: Long Term Management Strategy)

The following is an explanation of the key elements of the management strategy for dust suppressant roads treated with primer-seal from 2005 - 2007;

The key elements of the strategy are;

1) Resealing criteria - Resolving the criteria to be used to determine which roads are appropriate for resealing
2) Intervention Timing and Criteria - Determining when proactive action needs to be undertaken to keep the roads safe and able to be maintained in an efficient manner – i.e. returning the roads to an unsealed crushed rock surface

1. Resealing criteria

There are some primer seal dust suppression roads that are in reasonable condition and are considered appropriate to have a second bituminous seal laid on top of the existing surface. This would extend the life of the sealed surface until the road can be reconstructed (i.e. through the urban roads and drainage improvement upgrades).

It is proposed that the following criteria should be used for selecting which roads would be appropriate to have a second seal applied:

1. *Those roads currently within intervention*

A condition survey of each primer seal dust suppression road will regularly be completed by Council's independent road auditor. The primer seal for each road is given an overall condition rating from 0 – 10. The primer seals that are in the best condition have a condition rating of 0. The most deteriorated surfaces are rated 10.

It is recommended that only those roads that have presented the least failures and will require minimal preparation prior to resealing be selected. Preparation work can be expensive and these roads generally do not have pavement strength that is equivalent to a fully constructed sealed road. Therefore they do not warrant expensive preparation work being spent on them.

It is therefore proposed that only roads that have a rating from 0 are considered for resealing.

The exception to this is when a poor quality road or section of road with a rating higher than 0 is in between roads or connect to roads which are rated 0, and are therefore in better condition. Not resealing these roads may result in difficult sections of unsealed roads to maintain in the future.

It excludes 0 rated roads that carry little traffic or are surrounded by roads that aren't recommended for reseal.

Some roads are also made up of a number of sections, each with their own condition rating. Generally when more than 50% of the total length of road is in good condition and therefore has an acceptable condition rating, they will be considered for resealing.

2. *Those roads with adequate pavement integrity*

During the condition survey an assessment of the existing pavement was made. Those roads with poor pavement condition will not be considered for resealing.

It is considered that roads that have a condition rating of 0 have adequate pavement integrity.

3. *Those roads not included in the current urban roads upgrade list for the next 5 years*

The life expectancy of resealing works on the better performing dust suppressant roads treated with a primer seal should be greater than 5 years. Therefore resealing works on roads included in the current urban roads upgrade list for the next 5 years may potentially be sacrificed when those roads are reconstructed, prior to the end of their life.

The current urban roads upgrade list for the next 5 years include roads in the areas of Cape Paterson, Pioneer Bay and Sunset Strip.

If any of these projects get delayed beyond the anticipated life of the reseals, then roads included in those projects could be reconsidered for resealing.

4. *Traffic volumes*

Some high traffic roads, which generally carry more than just local traffic and have performed well over the last 5 years, have been included.

Furthermore, reseals on roads with future high or heavy predicted traffic volumes may not last an adequate amount of time and should therefore not be resealed.

5. *Value for money*

Those primer seals that have required less maintenance will provide better value for money and minimise any financial loss on investment. This indicates that there are less underlying issues with the road's structure and therefore the reseal will continue to remain in a reasonable condition with minimal maintenance required.

The roads with a condition rating of 0 have generally performed the best over the last 5 years, and therefore they have required and cost the least in maintenance.

2. Intervention Timing and Criteria

The following is the criteria to be used to determine when the road surface has deteriorated to the extent that the unsealed surface should be reinstated. Typically, it is recommended that when a road or section of road reaches an intervention level of 9 or 10, it is returned to an unsealed surface. The following additional criteria will also be used;

1. When the maintenance costs for a primer sealed road become more expensive than the average maintenance cost for an unsealed road in similar urban areas; and/or
2. When a primer seal surface can no longer be maintained in a safe condition for road users. We typically find that this situation occurs when road surface defects appear in between our regular inspection and maintenance cycles. This results in more defects appearing than those that are identified through our regular inspections; and/or
3. When the majority of the surface has inadvertently returned to an unsealed state through maintenance practices or by traffic using the road. Therefore making the original purpose of the seal, as a dust suppressant, ineffectual.

In some circumstances it may be better to keep maintaining a primer seal that has reached a condition rating of 9 or 10. This will generally be when the primer seal is in a section of road that is in between or connects to a primer seal that is in an acceptable condition.

It may also be appropriate to return a deteriorated section of road to an unsealed surface rather than the whole length. This will be determined by the condition of the other section of the road, and how efficient it would be to maintain the two different surface types.

The condition ratings are only relevant to the current condition of the roads. These roads will continue to deteriorate and therefore it is intended that the roads get re-surveyed every three years when Council's full audit of its road network gets done. This will re-evaluate the condition of the dust suppressant roads treated with a primer seal and adjust the condition rating. The new condition rating can be used to determine how much life is left in the surface of the roads and whether more need the unsealed surface returned. The above mentioned additional criteria (1-3) will be used in between the three yearly condition audits, to indicate when the primer seal surfaces have reached intervention and the unsealed surface needs to be returned.

Prior to any road being returned to an unsealed surface it is recommended that letters be sent to affected property owners advising them of the action that needs to be taken and the reasons why.

Att. 3. Options available to Council for resealing the dust suppressant roads treated with primer seal and for intervening when the roads are badly deteriorated (Primer Seal Dust Suppression Roads: Long Term Management Strategy)

There are many options that are available to Council for resealing the dust suppressant roads treated with primer-seal and for intervening when the roads are badly deteriorated.

All of these alternatives will have an impact in terms of

- the capital costs for resealing
- the operational maintenance budgets
- the ability to maintain the deteriorated surfaces
- the amenity benefit of alternative surfaces

Four alternative options are as follows

Option 1. Reseal road sections rated 0 - 2 plus other more deteriorated linking roads

This option includes all road sections with a condition rating of 0 - 2, except:

- When less than 50% of the length of road has a condition ratings from 0 - 2
- When the road is surrounded by unsealed roads or roads not recommended for reseal
- Roads included in the current urban roads upgrade list within the next 5 years
- For operational efficiency includes some more deteriorated roads or sections of roads which are in between or connecting to roads which are rated 0 - 2
- This would affect 45,355m2 and cost $235,850

Option 2. Reseal road sections rated 0 – 1 plus other more deteriorated linking roads

This option includes all road sections with a condition rating of 0 - 1, except:

- When less than 50% of the length of road has a condition ratings from 0 - 1
- When the road is surrounded by unsealed roads or roads not recommended for reseal
- Roads included in the current urban roads upgrade list within the next 5 years

- For operational efficiency includes some more deteriorated roads or sections of roads which are in between or connecting to roads which are rated 0 - 1
- This would affect 28,753m2 and cost $149,500

Option 3. No resealing of any roads

The third option to consider is not resealing any of the primer seal roads. It is recommended that the roads continue to be repaired using minor maintenance techniques, until they reach a pre-determined intervention level. At this time, the roads will be turned back to an unsealed surface.

Option 4. Resealing of all roads.

This has not been considered in detail because of the impact to Council's financial resources, and the financial legacy that this would leave for the future. It would however cost over $620,000 plus extensive preparation work for the more deteriorated surfaces.