NZ TRANSPORT AGENCY
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Highways & Network Operations Division

Prioritisation Process - 2016/17

Prioritisation Process – Selecting and Prioritising Pavement Renewals

A table of the results of this process will be supplied to all Network Managers. This contains all 100m sections requiring renewal, and their priority (1 or 2). Network Managers can use this information to validate their own renewal Forward Works Plan with differences justified. The process below details the method of prioritisation used to establish the 100m lengths.

The purpose for this process is to improve the objectivity of scheme selection, produce a consistent process for all regions and to focus work where there is the greatest need. Prioritisation uses a two stage process.

In stage 1 the sites for assessment are identified. This uses threshold levels to determine if the site should be included in the inspection programme. The bulk of the information comes from the condition data, but other data is also used such as age and dTIMS. It should be noted that for this process the network has been broken into 100m lengths. This is so the treatment can be focussed on where the need is rather than applying treatments to the whole treatment length when only part is defective. The decision on whether a treatment should be undertaken will be made at time of inspection.

Stage 2 involves collating the individual 100m sites and prioritising.

Identifying Sites for Inspection

Table 1 shows thresholds levels for the condition parameters. If any 100m length meets the parameter score for the particular State Highway Classification it should be included on the list for inspection to determine if treatment should be applied. In addition to the sites meeting the criteria in table 1 other sites that have been identified should also be inspected. This may include sites where a holding treatment has been applied so the condition is improved temporarily.

This renewal process does not cater for sites where skid resistance is the only issue. This is covered in the T10 specification.

Table 1: Parameter Scores for Investigation[1].

Item	Parameter	State Highway Classification				
		NS (HV)	NS	RS	RC	RD
1	Number of rut depth values > 15mm	1	1	1	2	3
2	Rut trend mm/yr in 1 year	0.8	1.0	1.3	1.5	1.8
3	Roughness (100m NAASRA)	110	140	160	N/A	N/A
4	Roughness trend in 1 year (start value 70 NAASRA)	5	10	15	N/A	N/A
5	Shoving (length of shove(m) > 10mm in height	>0	>0	>1	>2	>3
6	Past maintenance (% of total area)	5	7	10	15	20
7	Cracking % (m^2)*	1	5	10	15	25

[1] The threshold levels shown in table 1may be changed each year.

Item	Parameter	State Highway Classification				
		NS (HV)	NS	RS	RC	RD
8	Flushing (m) (ESC < 0.35 and MPD < 0.7)	10	10	20	30	30
9	dTIMS	Treatment Identified	Treatment Identified	Treatment Identified	Treatment Identified	Treatment Identified
10	Ravelling (m^2)**	1	2	3	5	5
11	Age	>Design Life + 1year	>Design Life + 1 year	>Design Life + 2 years	>Design Life + 2 years	>Design Life + 2 years

Note: The threshold levels shown in the table above may be changed each year.

Notes:

Item 1 Using the 20m mean rut depths from RAMM HSD and selecting the wheel path with the greatest rut.

Item 2 The rutting trend will only be determined where the average of the '20m mean rut depths' of any wheel path is greater than 10mm. The rutting trend of the wheel path is the change from one year to the next of the average over 100m of the '20m mean rut depths' using wheel path with greatest trend value.

Item 3 Roughness alone will not trigger an inspection for classifications RC and RD.

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Item 5 Shoving is collected in the HSD but is not reliable therefore the assessment of shoving will be done by engineering judgement. The information for this parameter may not be available at this stage so will need to be visually assessed.

Item 6 Based on maintenance from last surfacing date. Pavement repairs only using $1m^2$ for potholes. Assuming 2 lanes – 10m wide road for overall area.

Item 7 The assessment of cracking will typically be done by engineering judgement. The information for this parameter may not be available at this stage.

Item 8 The measure is for total flushing in any wheel path.

Item 9 This information may not be available.

Item 10 Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site. This information may not be available at this stage.

Item 11 Design life is available for RAMM.

If data is not available for any parameter, then proceed with using data that is available and collect additional data during site inspection.

Stage 1 - Inspection

Inspection templates need to be loaded into JunoViewer. The Inspection template will include but is not limited to:

- Results from Table 1 - Parameter condition and scores.
- Crash details.
- Surfacing and pavement history.
- Engineer's decision on need for treatment.
- If treatment required
    - Urgency for treatment

- Possible treatments
- Priority
- Proposed year for treatment
- Testing requirements to confirm/refine treatment.

JunoViewer will be taken to the field, and information gathered in the field, including comments on each site, are to be entered into JunoViewer.

If not already done the estimate of cracking and ravelling should be undertaken during inspection.

The inspection team shall determine which sites require treatment and whether a renewal or reactive maintenance is required. Only renewals are considered in this report.

Stage 2 - Prioritising Sites for Treatment

For the sites that require treatment they should be split into priority 1 and priority 2.

The priority 1 sites include sites:

- That require treatment to preserve the asset and an improvement in skid resistance is required. To be classified as needing an improvement to the skid resistance the average of the 'Skid Assessment Length' (see NZ Transport Agency T10) should be < Threshold Level for polishing and/or macrotexture.
- Where the condition other than skid resistance impacts significantly on the safety of the road, eg ruts holding water, roughness causing hazard on horizontal curves.
- Where the condition is very likely to deteriorate rapidly if left untreated leading to sudden large failure, eg existence of significant cracks pumping fines.

All priority 1 sites should be programmed for treatment. Rehabilitation sites must comply with the NPV requirement.

The remainder of the sites should be classified as priority 2 and ranked using the proposed scoring system in table 2 to Table 6 below for the different State Highway Classifications. For data available in RAMM the scores for each 100m length will be automatically calculated. For other data such as cracking and ravelling the fields will accept manual input of data. It is important that each parameter field is considered and scored as appropriate. The scores for each parameter should be summated and the sites ranked from the highest to the lowest score.

The condition and scores shown in table 2 to Table 6 may be changed each year.

a) **Table 2:** Condition Score for National Strategic High Volumes.

Parameter	Condition and Score		
Avg. Rut depth (mm) Using wheel path with greatest rut	8	10	12
Score	5	10	20
Rut trend mm/yr (start value 10mm). Using wheel path with greatest rut trend	1.0	1.2	1.5
Score	5	10	20
Roughness (100m NAASRA)	80	90	100
Score	5	10	20
Rough trend (start 70 NAASRA)	5	7	10
Score	5	10	20
Shove length(m)>10mm in height)	>0		

Parameter	Condition and Score		
Score	20		
Past maintenance m^2 % *	1	2	5
Score	5	10	20
Cracking % (m^2)**	1	2	5
Score	5	10	20
Flushing (m) (ESC < 0.35 and MPD < 0.7)	10	20	30
Score	5	10	20
Ravelling (m^2)***	1	2	5
Score	5	10	20
Number of years > Design life of surfacing	0	2	4
Score	5	10	20

* Percentage maintenance area using a fixed 10m carriageway width.

** The assessment of cracking will typically be done by engineering judgement.

*** Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site.

b) **Table 3:** Condition Score for National Strategic Roads.

Parameter	Condition and Score		
Avg. Rut depth (mm) Using wheel path with greatest rut	9	11	13
Score	5	10	20
Rut trend mm/yr (start value 10mm). Using wheel path with greatest rut trend	1.0	1.2	1.5
Score	5	10	20
Roughness (100m NAASRA)	90	100	110
Score	5	10	20
Rough trend (start 70 NAASRA)	7	9	12
Score	5	10	20
Shove length(m)>10mm in height)	>0		
Score	20		
Past maintenance m2 % *	1	2	5
Score	5	10	20
Cracking % (m2)**	1	2	5
Score	5	10	20
Flushing (m) (ESC < 0.35 and MPD < 0.7)	10	20	30
Score	5	10	20
Ravelling (m2)***	1	2	5
Score	5	10	20
Number of years > Design life of surfacing	0	2	4
Score	5	10	20

* Percentage maintenance area using a fixed 10m carriageway width

** The assessment of cracking will typically be done by engineering judgement

*** Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site

c) **Table 4:** Condition Score for Regional Strategic Roads.

Parameter	Condition and Score		
Avg. Rut depth (mm) Using wheel path with greatest rut	10	12	15
Score	5	10	20
Rut trend mm/yr (start value 10mm). Using wheel path	1.0	1.2	1.5

Parameter	Condition and Score		
with greatest rut trend			
Score	5	10	20
Roughness (100m NAASRA)	100	110	120
Score	5	10	20
Rough trend (start 70 NAASRA)	9	11	13
Score	5	10	20
Shove length(m)>10mm in height)	>1		
Score	20		
Past maintenance m2 % *	5	7	10
Score	5	10	20
Cracking % (m2)**	1	2	5
Score	5	10	20
Flushing (m) (ESC < 0.35 and MPD < 0.7)	10	20	30
Sore	5	10	20
Ravelling (m2)***	1	2	5
Score	5	10	20
Number of years > Design life of surfacing	0	2	4

* Percentage maintenance area using a fixed 10m carriageway width

** The assessment of cracking will typically be done by engineering judgement

*** Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site

d) **Table 5:** Condition Score for Regional Connector Roads.

Parameter	Condition and Score		
Avg. Rut depth (mm) Using wheel path with greatest rut	15	18	20
Score	5	10	20
Rut trend mm/yr (start value 10mm). Using wheel path with greatest rut trend	1.2	1.5	1.7
Score	5	10	20
Roughness (100m NAASRA)	120	130	140
Score	5	10	20
Rough trend (start 70 NAASRA)	12	15	20
Score	5	10	20
Shove length(m)>10mm in height)	>1	>2	>3
Score	5	10	20
Past maintenance m2 % *	10	15	20
Score	5	10	20
Cracking % (m2)**	3	5	7
Score	5	10	20
Flushing (m) (ESC < 0.35 and MPD < 0.7)	10	20	30
Score	5	10	20
Ravelling (m2)***	1	2	5
Score	5	10	20
Number of years > Design life of surfacing	0	2	4
Score	5	10	20

* Percentage maintenance area using a fixed 10m carriageway width

** The assessment of cracking will typically be done by engineering judgement

*** Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site

e) **Table 6:** Condition Score for Regional Distributor Roads.

Parameter	Condition and Score		
Avg. Rut depth (mm) Using wheel path with greatest rut	18	20	25
Score	5	10	20
Rut trend mm/yr (start value 10mm). Using wheel path with greatest rut trend	1.2	1.5	1.7
Score	5	10	20
Roughness (100m NAASRA)	130	140	150
Score	5	10	20
Rough trend (start 70 NAASRA)	12	15	20
Score	5	10	20
Shove length(m)>10mm in height)	>1	>2	>3
Score	5	10	20
Past maintenance m2 % *	10	15	20
Score	5	10	20
Cracking % (m2)**	3	5	7
Score	5	10	20
Flushing (m)(ESC < 0.35 and MPD < 0.7)	10	20	30
Score	5	10	20
Ravelling (m2)***	1	2	5
Score	5	10	20
Number of years > Design life of surfacing	0	2	4
Score	5	10	20

* Percentage maintenance area using a fixed 10m carriageway width

** The assessment of cracking will typically be done by engineering judgement

*** Ravelling includes scabbing and chip loss as well as aggregate loss from AC. The amount should be estimated by the engineer on site

Scoring Sites

After each 100m site has been rated as priority 1 or 2 look at adjacent or close-by 100m lengths with the view to combining lengths.

When scoring lengths to be treated for prioritising, use the average score for all adjoining 100m sites that require treatment. However, in some cases it may be cost effective to include low scoring single 100m lengths in the length for treatment. In these cases do not include the score for the low scoring site in the average but it is important that a clear statement is made to this effect. For example, in the five 100m sections below if it is considered cost effective to treat the length with the score of 15 then average the other 4 lengths and state plus a 100m length.

Therefore:

Average score = 81.25 + 100m length:

85	75	15	80	85