

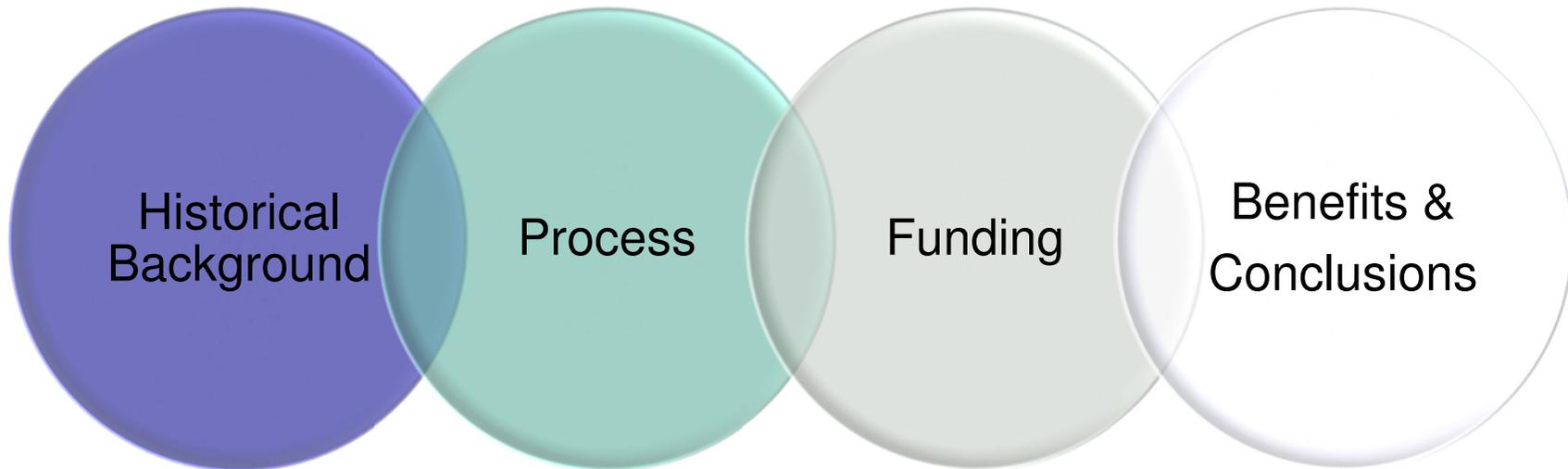


NZ TRANSPORT AGENCY
WAKA KOTAHI

Prioritising State Highway Skid Resistance in New Zealand – A Policy for all Budgets

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Prioritising State Highway Skid Resistance in New Zealand



Historical Background

T10 introduced in 1997 – policy for managing skid resistance in New Zealand.

Skid resistance is managed around Investigatory Level (IL) and Threshold Level (TL).

In New Zealand we correct the SCRIM Coefficient (SC) for both within season variations and between year variations.

To enable “early” action an Exception Report is issued promptly after survey using non seasonally corrected data on 10m sections of the network that are below TL.

Historical Background

In 2010 we introduced a Curve Risk Analysis Policy to target a reduction in the number of “loss of control” wet road crashes on curves.

As a result:

**More network was managed as curves and at a higher IL.
Significant increase in number of Exceptions reported.**

Parallel to this financial constraints on maintenance budgets put additional pressure on addressing this increase in the Exception Report.

No mechanism for prioritising when funding < No. of sites.

Historical Background

T10 also requires a further review of seasonally corrected data which needed to be prioritised.

These issues were addressed in 2012 with the introduction of a two level prioritisation process

- a. Exception Report - 10m lengths around TL.**
- b. Skid Assessment Lengths (SAL) - typically 50-100m lengths around IL.**

Both levels use microtexture, macrotexture and “wet crash” history to target a “best value” safety outcome on the State highway network.

Process – Exception Report

1st Level - Identifies most urgent 10m sites for investigation.

Each length is assigned either a Priority A or B.

Priority A sites are those meeting at least 1 of 3 criteria:

- 1) sites that are below the threshold and have had at least two wet skid crashes in the previous five years (any wet crash within $\pm 250\text{m}$ of the site will be included in the analysis).**
- 2) sites that are flushed (defined as having a wheelpath SC value of ≤ 0.35 combined with a same wheelpath texture value of $\leq 0.7\text{mm MPD}$)**
- 3) sites where the SC is very low (currently defined as having a lane SC value of $< IL - 0.15$).**

All other sites are given Priority B.

Process – Exception Report

Investigating Priority A sites

All priority A sites must be investigated to determine if treatment is necessary. The investigation should also include the following checks:

- 1) Confirm that any “wet crashes” are correctly assigned to the exception for location and that the cause of each crash is likely to be related to the wet skidding resistance on site.**
- 2) Confirm that the current IL is correct.**
- 3) Whether the exception is caused by temporary contamination.**

Process – Exception Report

Treatment Options

Where treatment is found necessary it must be designed and programmed and may include.

- i. Reseal in current year (providing timing allows for construction)**
- ii. Following year's reseal programme (if too late in season)**
- iii. Waterblasting or Re-texturing**
- iv. Signage (including use of temporary speed limits)**
- v. No treatment (temporary contamination, false data, acceptable risk etc.)**

Reactive process but does treat sites with low skid resistance and no crash history.

Process – Skid Assessment Lengths

2nd Level – After seasonal correction and based on longer skid assessment lengths (SAL).

Uses site category feature lengths and directional. Lengths are prioritised using a scoring system below:

Parameter	Scores and criteria
Number of wet skid crashes	One crash zero points, two or more crashes 80 points for each crash.
SCRIM difference (averaged over the SAL)	4 points for each 0.01 between IL and IL-0.05. 10 points for each 0.01 between IL-0.06 and -0.1 15 points for each 0.01 below IL-0.1
Texture difference (averaged over the SAL)	5 points for each 0.1 between ILM-0.1 and ILM-0.3 10 points for each 0.1 when less than ILM-0.3
Annual average daily traffic (AADT)	1 point for each AADT/1,000

Process – Skid Assessment Lengths

Investigating and Treating sites

Number of sites determined from a “cut off” score targeted to suit available funding and resources. Ensures areas with greatest need investigate more sites.

All sites above the “cut off” score must be investigated to determine if treatment is necessary.

“Flag” provided to avoid duplication of sites investigated under the Exception Report process and provide an audit trail.

Process – Skid Assessment Lengths

Investigation should include the following check

Confirm that any “wet crashes” are likely to be wet skidding crashes and are correctly located and only assigned to one SAL.

Information and decisions are recorded recommending one or more of the following

- i. a change in the IL, with justification.
- ii. treatment to improve the skid resistance, with details of what is required and when.
- iii. treatment other than for the skid resistance, including reasons why and to whom this information will be communicated to ensure the necessary action is taken.
- iv. no treatment, including the reason why.

Funding

The prioritisation was then used to determine the level of “ring-fenced” funding allocated to skid resistance.

Dedicated funding removes the Engineer’s dilemma between prioritising asset preservation against safety when budgets are constrained.

A range of SAL scores were investigated and analysed both nationally and regionally to obtain a balance between affordability and an appropriate level of safety.

A value of 140 was found to be suitable and would include sites with poor skid resistance and texture without wet crash history.

Funding

The final analysis used the following criteria:

SAL score ≥ 140 and with an average ESC value $\leq IL > -0.05$.

Total length of 10m sites meeting above was calculated and given as % of national need.

These % were tested against a range of dollar amounts to determine length of treatment that could be achieved based on typical surfacing costs

Then compared to regional historical lengths treated for skid resistance to confirm what would be an appropriate .

Each region was then allocated funding to treat sites > 140

Benefits

Major benefit is the flexibility to adjust the “cut off” criteria to suit different funding scenarios.

More funding - increase Priority A sites by reducing criteria for low skid resistance or investigate more SAL lengths by reducing “cut off” score.

Prioritisation allows us to work towards our goal in a cost effective “needs driven” manner within available budgets.

Allows us to prioritise to regions where greatest need exists.

Needs to be coupled with better treatments and life.

Conclusions

Aim of T10 is to contribute to a reduction in wet skidding crashes on State Highway network by improving skid resistance.

The prioritisation process will allow NZTA to achieve this aim within available budgets to deliver a “best value” safety outcome.

Also allows benchmarking between regions and identifies area of greatest need where we can direct expert assistance.

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THANK YOU