NORTHLAND TRANSPORTATION ALLIANCE
"Moving Northland Forward"

Meeting: **Council - 24 September 2020**

Name of item: **FNDC Dust Matrix Prioritisation Tool update**

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Date of report: 27 August 2020

1 Purpose

The purpose of this paper is to provide Council with an update on progress and further developments with the Dust Matrix Prioritisation tool.

2 Background

In 2019 FNDC/NTA staff developed the Dust Matrix prioritization tool to help inform the Council decision making process of investments for seal extensions, with dust nuisance management a key driver. The use of this prioiritisation matrix was endorsed through the following Council resolution on 27th June 2019.

AGENDA ITEM 13.4 DOCUMENT NUMBER A2472399, PAGES 34 - 42 REFERS

RESOLUTION 2019/27

Moved: Mayor John Carter

Seconded: Cr Ann Court

That Council:

a) Approve the RAMM-sections based prioritisation methodology (inclusive of criteria and weightings) to inform the four funding streams being:

- **i) NZTA Dust Mitigation Initiative**
- **ii) Provincial Growth Fund Applications**
- **iii) Tourist Infrastructure Fund Applications**
- **iv) FNDC Dust Management Fund**

b) Approve a scrutiny-based optimisation process for roads identified to fall under FNDC's unsubsidised funding scheme.

c) Mandate the Northland Transport Alliance to develop appropriate applications under:

- **i) the NZ Transport Agency 16/04 Dust Mitigation Initiative**
- **ii) the Provincial Growth Fund**
- **iii) the Tourism Infrastructure Fund**

CARRIED

The benefits of sealing roads, many anecdotal, are briefly summarized in layman's terms as:

- Elimination of dust (Health and Environmental benefits);
- Improved air quality;
- Reduced stormwater runoff / sediment contaminant;
- Improved water catchment quality;
- Elimination of gravel road corrugations, thus improved ride quality;
- Reduced high-frequency maintenance interventions with gravel pavements retained and reduced gravel consumption;
- Increased sustainability of finite quarry resources;
- Reduced carbon footprint through reduction in high frequency grader/truck operations, and;
- Increased lifecycles of road pavements.

The Dust Matrix measures available data relating to road sections (Treatment Lengths or TLs) including:

- Types and numbers of traffic movements and speeds;
- Number of and distance to houses;
- The terrain/exposure of the houses, and;
- Function/hierarchy of the road importance etc.

These parameters are all informed with the best data available and sites (TLs) on roads ranked accordingly. The Dust Matrix seeks to inform decision making when investing in sealing of unsealed roads based on objective data, for FNDCs 100% funded sites, NZTA's subsidy funded sites and any external funding submissions (PGF / TIF etc.). Data accuracy is therefore important and there are 22 criteria to be informed across more than 1,840 Treatment Lengths (TLs), totalling more than 40,500 data entries to date. As such, rankings generated from the Dust Matrix prioritisation tool, are not absolute.

3 Discussion

3.1 Traffic Count Data – Count Station Locations and Seasonal Variances

Traffic Count data generates significant debate for stakeholders with challenges relating to:

- lack of actual counts (many road sections have estimates only),
- locations of the count station (often only one per road) and
- period the counts were taken (not reflective of seasonal traffic peaks).

Where we do traffic counts and there is an unusually high number of HCV movements recorded, this is questioned, and another verification count completed. Waimanoni Road is a recent example of this, where it had an unusually high HCV count that we and NZTA queried, hence has been removed from the NZTA *Circular 16/04* priority list until verified.

Nonetheless seasonal traffic counts peaks are important to understand (vs. random one-off localised activities). To that end the NTA has a project underway on behalf of FNDC of defining roads with high seasonal traffic changes to further inform the Dust Matrix prioritisation tool. It will also include looking at how we can do counts on the same road at different locations to better understand the change in traffic count further down that road, with effort on trying to gain

better visibility of subdivisions and land-use changes that may generate new traffic movements.

There will be a comprehensive traffic count project planned for this summer 2020/2021 to capture anticipated traffic increases on forestry routes, tourist destinations and summer holiday locations etc.

3.2 Understanding Dust Generation vs Social / Economic Benefits

The Dust Matrix seeks to score and calculate both the factors the generate dust and weigh up the benefits to residents and communities.

To improve interaction with residents affected by dust nuisance it is helpful to understand what locations suffer the most and not only focus on an optimised investment calculation. Clearly it is sensible to understand the economic benefit of the capital investment, however this detracts from first understanding and communicating with stakeholders about their site-specific circumstances.

The Roading Department has applied the Dust Matrix using "multiple passes" and then initially ranking roads by the factors that generate dust (i.e. traffic/environment / exposure) to enable visibility of those locations suffering the most. Thereafter followed by ranking those roads based on social and economic benefits (i.e. numbers of houses / schools / marae / churches / milking sheds / logging routes / horticulture / resilience and tourism routes etc.).

The application of "multiple passes" consistently highlighted the following roads as being listed in the top 20 sites that have high dust generation factors (based on current data, in alphabetical order).

Akerama Road	Arawhata Road	Aurere Beach Road	Bonnetts Road
Brass Road	Church Road (Kaitaia)	Hupara Road	Kaimaumau Road
Kokohuia Road	Koropewa Road	Manukau Road	Matai Bay Road
Ngapipito Road	Ninihi Road	Oromahoe Road	Otangaroa Road
Otaua Road	Parapara Road	Parapara-Toatoa Road	Pawarenga Road
Pembroke Street	Purerua Road	Quarry Road	Redcliffs Road
Ruapoa Road	Spains Road	Te Hapua Road	Te Tii Road
Waimanoni Road	Waimatenui / Mataraua Road	West Coast Road (Kohukohu)	Whakataha Road

Based on this the Roading Department can now focus a targeted review of the respective data sets for improved accuracy, including traffic count locations and target seasonal variances for the upcoming summer program.

3.3 Sealing of Targeted Dust Nuisance Locations vs Carriageway Sections

The complexity of the scoring and associated weightings when endeavouring to calculate the best site is currently significantly influenced by the length of road being assessed. Originally the Dust Matrix applied pre-defined road Carriageway Sections, as classified within the Road Asset Maintenance Management data base (RAMM software). These Carriageway Sections were not linked to the respective house locations, it simply applied the numbers of houses, plus the other 21 factors, to that existing Carriageway Section.

This saw locations where one or two houses, that suffer significant dust nuisance, being on a Carriageway Section that is over 1.5km long and therefore would never rank high for sealing – despite their exposure to dust being very high. Conversely some roads with low dust generation factors, that had more houses within a short, defined carriageway section, ranked higher. These disparities left Council unable to confidently answer to stakeholders that we understand their unique circumstances.

The Roading Department has subsequently reviewed the Dust Matrix to identify each house along every road and identified specific Treatment Lengths (TL). Based on dust clouds dissipating around 150m the nominal minimum TL is 300m (**NB:** 1x seal spray tanker delivers

just enough to achieve 300m long by 6m wide seal coverage). Where houses are within suitable proximity the TLs are joined. This now enables Council to understand each household's unique dust nuisance in comparison to others, instead of previously being defined by the RAMM Carriageway Length.

Discussion of pros-and-cons of sealing more numbers of targeted house frontages (i.e. dust strips) instead of sealing full road Carriageway Sections is required to guide investment decision making.

Analysis of the benefits of sealing several 300m sections on a single road vs sealing the road continuously remain possible by use of the Dust Matrix, by changing the length to suit.

4 Summary

The Dust Matrix is a 'tool' and as such the tool can only do so much by itself. The tool relies on updated and verified information combined with field validation by Roading Department engineers exercising their skills and experience in finalising site selection, all-the-while keeping Elected Members will informed of the risk, benefits and opportunities for final endorsement.

There will be a comprehensive traffic count project planned for this summer 2020/2021 to capture anticipated traffic increases on forestry routes, tourist destinations and summer holiday locations. The updated count data will further inform the accuracy of the Matrix and will likely see continued adjustment of the rankings.

5 Report Approval

Approved by:

Calvin Thomas - NTA Manager
27th August 2020