

Gravel Roads - GENERAL FACTS AND F.A.Q. RESPONSES

Unsealed Roads – Varied Lifecycles

Unsealed roads vary considerably in condition because they are exposed to sun, rain, wind and traffic. They pothole when wet, and when dry they become loose (unravel), corrugate, and create a dust nuisance.

Changes in surface condition are highly variable due to exposure to the natural elements and this is compounded further by traffic loads, which often fluctuate due to changing land use.

Grading of roads is an attrition-based maintenance treatment that, despite the best efforts by the grader driver, will always result in disturbance of the existing gravel being spilled from the ends of the grader blade.

Grading roads contributes to gravel loss costing Councils more money in the long run, so current maintenance strategies look to defer grading for as long as reasonably possible, with emphasis on localised pothole filling where practical.

New Specifications - Unsealed Road Wearing Course (UWC)

Different gravels have different uses with larger 'cleaner' stone used on logging routes due to its ability to support heavy loads. Routes mostly used by light vehicles suit smaller gravel sizes.

National industry standards now specify Unsealed Road Wearing Course (UWC). The new UWC replaces traditionally stony, loose, unsealed road gravels. UWC will help reduce the frequency of corrugations, minimise the extent of potholes and deliver a more consistent, smoother road surface with less grading costs.

National standards for aggregate on unsealed roads encourage the blending of materials in the gravel to improve cohesion. Some gravels can appear red or orange-brown and drivers have raised concerns about UWC gravels appearing muddy. Retaining and/or addition of clays, silts and other fine materials into the gravels is required to meet the UWC specifications.

Concerns sometimes raised over 'muddy' roads being unsafe to drive on when wet are taken seriously by Council staff. Where we receive reports of cars skidding in the mud, our engineers will conduct skid resistance and traction tests. Invariably, these tests show that braking and steering performance is the same, if not better, than on dry, loose, stony surfaces.

Natural Product – Gravel is natural and safe

Some people have raised concerns about the safety of roading materials. Gravel that is used in road construction is an inert, naturally occurring mineral and there is little evidence that rain runoff from unsealed roads contaminates waterways. Stormwater runoff can result in localised deposits of gravel at culvert outlets and on private properties. These deposits are not harmful to the health of people, crops or livestock. Where these deposits are assessed to be a nuisance or impact private property, they can be removed by Councils contractors.

If you still have concerns about the safety of these materials, please contact the Regional Council which has responsibility for air and water quality.

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Environment – gravel roads are dirty

The exposed nature of unsealed roads means they are dirty when wet and dusty when dry. Dirty vehicles (dusty when dry, muddy when wet) is an unavoidable consequence of driving on unsealed roads.

We often get comments about ‘clean’ looking gravel vs ‘muddy’ looking gravel and the impact this has on road traction. Traditional stony and loose road gravels often make it difficult for vehicles to gain traction, particularly on inclines when conditions are dry. Traction is much less of a problem for new UWC road materials that appear bound and smooth in the dry and slushy during wet conditions. It is common that the top 30-40mm of freshly applied UWC gravel presents as ‘muddy’ during rain. This is superficial and reduces over time as the UWC gravel consolidates and wears in.

Vehicle Care – Punctures and Wear-&-Tear

Unsealed road conditions change rapidly, and all drivers should drive to the conditions.

Gravel road surfaces can be loose when dry, affecting vehicle traction and making punctures more common. It has been identified that some low-cost brands of tyres that are primarily rated for sealed road can be more susceptible to punctures.

Complaints of ‘sharp’ stones are taken seriously by the Council and all gravels used on our roads are tested for compliance by quarries and contractors. The Council also conducts verification testing on gravel when required. Differences in crushed stone often relates to the method of crushing (e.g. cone vs jaw) and the Council works closely with suppliers to ensure aggregate quality complies with national industry standards.

The blending of clays and fines materials to improve cohesion of UWC gravels provides smoother unsealed road surfaces. This reduces vehicle wear and tear. However, vehicle owners are encouraged to check their vehicle regularly and to undertake regular servicing to ensure vehicles are mechanically sound.

Summer Grading – grading dry roads

Sections of unsealed roads often become loose (unravel) over summer because there is not enough moisture in the fines to bind larger stones together. This unravelling causes rutting and corrugations.

Grading is an attrition-based maintenance treatment. Despite the best efforts by the grader driver grading unsealed roads will always result in disturbance of the existing gravel being spilled from the ends of the grader blade. This is further exacerbated in dry weather conditions.

Applying metal and grading hard, dry roads will cause further problems and usually results in an increase in road-user complaints.

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Surface defects can only be effectively dealt with by cutting to a depth greater than the defect. Doing this while the road is dry only provides relief for a few days but then creates more unravelling and damage. That is why road users will often notice a reduction in grading or metalling over summer when roads are very dry.

Grading of dry roads creates increased dust nuisance and also accelerates gravel loss, costing Councils more money in the long run.

Grading with a Roller – Compaction

Wet-grade-roll treatments is up to 10x more expensive than normal grading, so it is done sparingly within budget constraints.

Wet-grade-roll is typically limited to hill sections that have traction difficulties and/or focused on unsealed roads with very high traffic use.

Compacted unsealed roads have a limited lifecycle before becoming loose (unravelling) and corrugating when dry or potholing when wet. A road that has been graded and compacted with a watercart and roller may last less than 3 months, depending on the type of gravel, the terrain and traffic volumes.

It is also common for the Regional Council to place water-take restrictions on many rivers and streams, during summertime periods, preventing Council from directing the Contractor to grade a road with a water cart and roller.

Health & Safety – dust and speed management

Vehicle speed and size are major contributors to road dust – the bigger and faster the vehicle, the more dust created.

A regional review of speed limit bylaws is currently underway, and communities will have an opportunity to provide input on proposed speed limit changes. Speed reductions will result in less road dust being created.

Councils work with forestry companies to manage the impact of trucks on log harvest routes. These companies are very aware of the impact their trucks have on unsealed roads and the dust they create. Many haulage operators have placed self-imposed speed restrictions on their drivers, including additional roadside warning signage and GPS vehicle tracking to educate drivers on slowing down in front of residential homes.

Council works with Forestry partners for summertime dust suppression, entering into co-funding agreements to assist in the application of dust suppression product in front of affected homes on some busier designated haulage routes.

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Sealing of Roads – dust matrix

There are three funding options available to the Far North District Council for the sealing of roads:

- 1) Non-subsidised sealing (i.e. 100% funded from rates)
- 2) Subsidised sealing (i.e. 67% subsidised by Waka Kotahi NZTA [69% from 1 July 2021])
- 3) Community Funded Sealing (i.e. Policy No. 4112).

The Far North District Council prioritises road sealing based on criteria that ranks the impacts of road dust according to the number of houses impacted and severity, as well as economic and other benefits.

1. Non-subsidised sealing (i.e. 100% funded from rates)

The Dust Matrix measures 22 criteria relating to road sections (Treatment Lengths). Below are the 22 criteria we measure, including types and numbers of traffic movements and speeds, number of houses and distance from the road, the terrain/exposure of houses, and the function/hierarchy of the road, etc.

SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE	SCORE
HCV 5 day AADT FNDC	HCV Speed FNDC	LDV 5 day AADT FNDC	Speed of LDVs (Est) FNDC	Houses within 300m from road	Schools	Maraes	Churches	Health Centers	Ecological Areas	Horicultural areas	Location of Roadway FNDC	Frequency of rain days	Longevity of HCV route	Annual Maintenance Cost Prev 3 year av./km	Estimated Sealing Cost	Tourism Route	Disaster Resilience	Network Resilience	Logging Route	Years of Logging / HCV Est.	Milk sheds
3	4	3	4	7.40	0	0	0	0	1	1	1	2	0	0	0	0	0	0	0	0	0

There are more than 1,840 sites (treatment sections) creating in excess of 40,500 records.

Due to continuous updating of information, the rankings can change. The Far North District Council uses this tool to prioritise and select its annual road sealing programme based on the best information available at the time. This includes considering other works nearby and cost savings that may be possible by co-ordinating this work.

2. Subsidised Sealing (i.e. 67% subsidised by Waka Kotahi NZTA)

The Dust Matrix measures 11 criteria relating to Waka Kotahi’s NZTA General Circular 16/04 criteria as shown in the table below.

					NZTA (General Circular 16/04)													
Road Name	Road ID	Start	End	Length	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	16/04 SCORE	SCORE
					HCV 5 day AADT	HCV Speed	LDV 5 day AADT	Speed of LDVs (Est)	Houses / km (80m from road)	sensitive locations /km, schools, marae, etc	Ecological Areas / km	Horicultural areas / km	Location of roadway	Frequency of rain days (>5mm)	Longevity of HCV route use			NZTA Circular 16/04 OVERALL

Its is increasingly difficult for the Councils to gain funding assistance from Waka Kotahi under that criteria, mainly due to the volumes of truck movements being lower than Waka Kotahi’s requirements.

3. Community Funded Sealing (Policy No. #4112)

The Far North District Council will consider sealing a section of road where 75% of property owners and/or ratepayers directly impacted by the work agree to fund the work.

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Dust Suppression – Summertime treatments

The Far North District Council has a limited budget for the application of dust suppression products on sections of unsealed road during summer months. The Dust Matrix is used to select dust suppression sites based on the following four criteria:

- 1.** Target building is within 25m from the road
- 2.** More than 130 vehicles per day
- 3.** More than 30 trucks per day
- 4.** Vehicle speed assessed at more than 65kph.

This product has a lifespan of around three months and is applied before Christmas.

The Council works with the forestry industry to co-fund the application of dust suppression products along key harvest routes.

The Far North District Council has identified over 150 sites across the district that meet its dust suppression criteria.

Dust Suppression – can be paid for by Individuals

The Far North District Council has agreed to support individuals who fall outside the criteria above by covering the cost of applying the dust suppression products when it undertakes its summertime work. The cost of the product is borne by the individual. Product to treat a 100m long x 5m wide stretch of unsealed road typically cost approximately \$750 - \$800 + GST based on current market rates.

Where the individual pays for the product, the Council will add this site to its work programme and pay for the contractors to apply it.

To arrange privately funded dust suppression, contact the Contractor directly:

Gravel Lock Ltd
Anneke Koens
Office Manager
021 506 337