



## Martin Gribble

The relative contribution of primary industries to loading of local roads

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## Overview

- Local authorities faced with increasing maintenance costs
- Seeking equitable way of funding these costs
- Pavements are designed for a specific number of vehicle loadings given the existing ground conditions
- Logging traffic can generate a short intense period of loading



## Overview

- A common perception is that the logging traffic is what has caused the road to fail
- This view fails to take account of the historic traffic loading generated by other farming sectors and the timing of loads
- Forestry typically has a 30 year harvest period which equates to 30 years of rates and road user charges



## Frame group data

Rural land production yield (tonne Ha <sup>-1</sup> yr <sup>-1</sup> )	
Dairy farming	9
Kiwifruit	17
Forestry	22
Pip fruit	40

## Frame group data

### Truck movements generated by various land uses (trucks Ha<sup>-1</sup> yr<sup>-1</sup>).

<b>Sheep</b>	0.02
<b>Mixed sheep and beef</b>	0.09
<b>Forestry</b>	0.8
<b>Beef</b>	0.81
<b>Dairy farming</b>	1.94

## What production figures are applicable?

- Queried a variety of data sources
  - Statistics New Zealand
  - Livestock Improvement and Dairy New Zealand
  - Beef and Lamb
- Some difficulties obtaining data

## Exports from various farming sectors for one hectare over a 30 year period

- Dairy
  - 300 tonnes, therefore 12 tanker trips are generated per hectare by milk production.
- Forestry
  - 500 tonnes, so 17 truck movements are generated by forestry
- Sheep
  - 5.4 tonnes of sheep live weight and generates 0.2 truck movements (excludes wool)
- Beef
  - 4.8 tonnes of beef stock and generates 0.17 truck movements

## Exports from various farming sectors for one hectare over a 30 year period

- A number of sheep and beef farms were queried regarding total movement of stock.
- When farming imports are included the numbers increase to approximately 14 tonnes/hectare over a 30 year period
- Presumption dairy is similar





## Ruapehu regional production

Industry	Regional percentage
Sheep	8-16
Exotic harvesting (forestry)	79-60
Beef	4-7
Dairy farming	9-18

## What does a dead road look like

- Traditionally a rut depth of 20 mm or a roughness greater than 150 NAASRA
- Other factors such as edge break and potholes contribute to the death of a pavement.
- Extensive patching and other repairs can also indicate a dying road

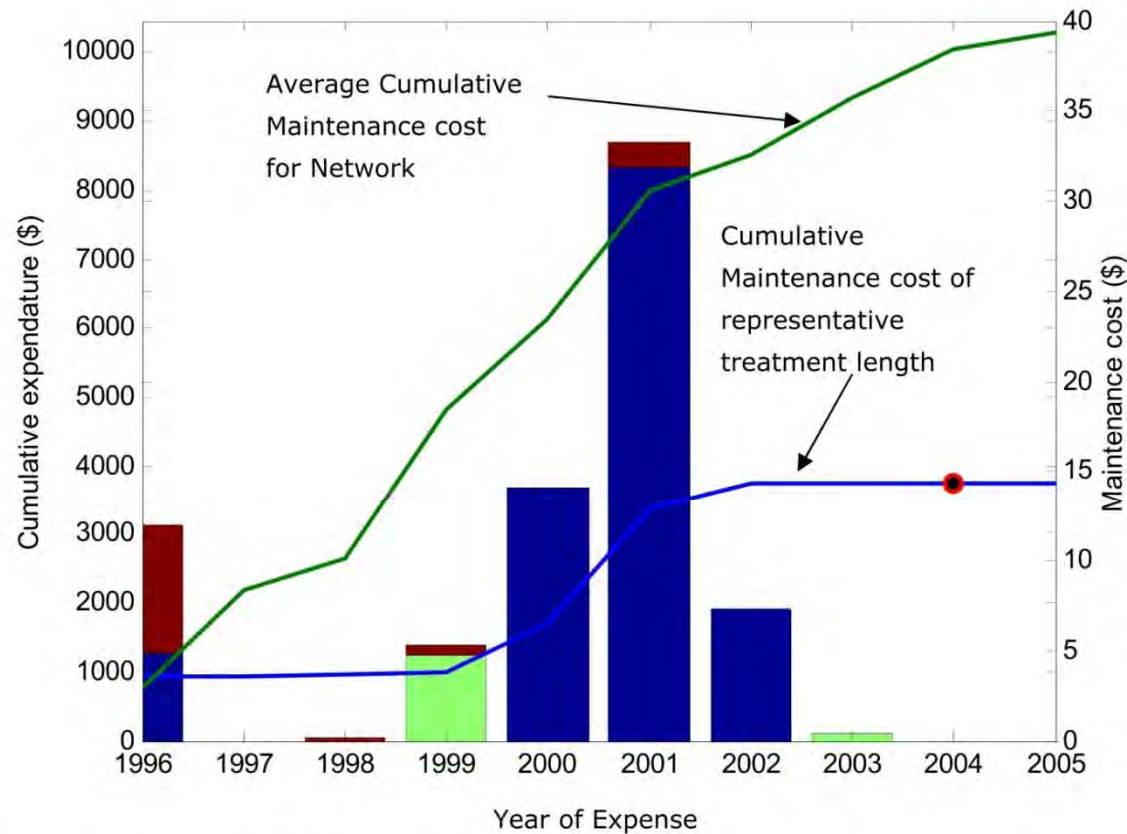


## Rehabilitation decision

- Research into what causes roads to be rehabilitated showed that a dominant factor was maintenance cost



# Rehabilitation decision

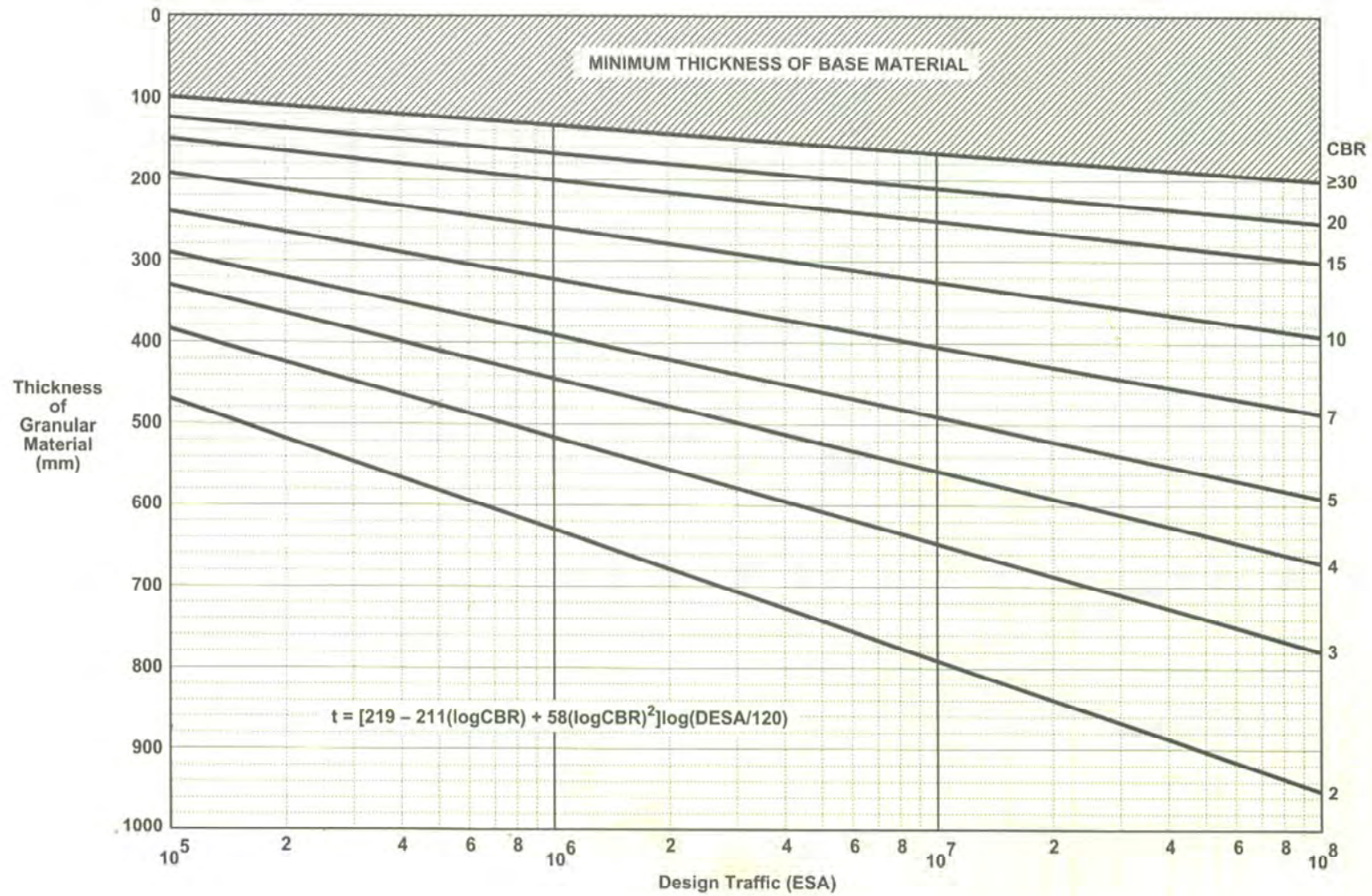


**Figure 1.1** Example of maintenance costs versus year of expense for a representative treatment length. The blue component of the bars represents pavement maintenance costs (MC), green represents shoulder MC and brown represents surfacing MC. The year of pavement rehabilitation, 2004, is indicated by the red circle centred black.

## Rehabilitation decision

- Recent research has shown that the traditional condition factors that are used to identify a failed pavement do not reliably forecast a rehabilitation requirement





## Rehabilitation questions

- Does maintenance address faults or merely hold the pavement?
- Or is maintenance making the problem worse?
- Can primary industries work with Local Authorities to minimise maintenance requirements?



## Conclusion

- The actual district production values need to be used to calculate the contribution of each industry to the vehicle loading on the road.
- It cannot be simply assumed that forestry yield is twice that of dairy, therefore the damage generated is twice that of dairy farming.
- Forestry accounts for a significant component of the loading on the local roads





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