

CASE STUDY: Are our roads safe when it's wet?



FACTS AT A GLANCE

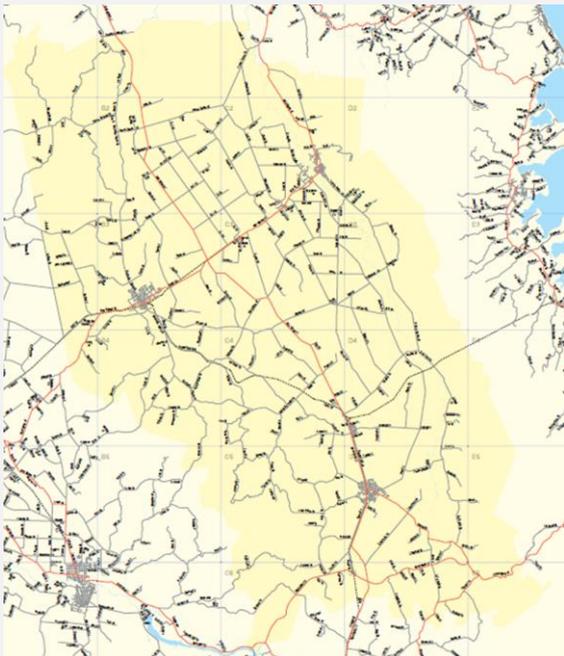
Matamata Piako District Council and Fulton Hogan

ONRC Performance Measure: Safety

Technical Output 4: loss of control on wet roads

Matamata Piako district is located in Waikato against the Kaimai Ranges. The area is relatively flat with intensive agricultural production and processing. Rainfall per year is nearly 1,400mm, falling regularly throughout the year (80 to 140mm per month).

The road network totals 1,000 km and all but 55 km is sealed. Since 2015 Fulton Hogan has assisted MPDC to develop a skid resistance strategy which aligns closely with the ONRC performance measure approach.



Pictures: Matamata Piako District Council and Fulton Hogan

Introduction

This case study describes the development and implementation of a cost-effective skid resistance programme, which aligns with ONRC Performance Measure: Safety Technical Output 4.

This performance measure helps 'unpack' the fatal and serious injury crash figures detailed in Safety Customer Outcome 1, and identifies whether there is a skid resistance issue to address.

A paper presented at the 2015 IPWEA Conference discusses the approach used and implemented. Since then it has been further refined, and aligns well with ONRC principles.

The NZTA Maintenance Guidelines for Local Roads targets 'adequate skid resistance on all sealed roads'. The question raised in this strategy was – what does that mean? It does not mean measuring the skid resistance for the whole network, but applying a risk based approach. This reflects the ONRC assess-evaluate-challenge principle.

The process employed on the Matamata Piako network splits the network into skid demand segments, based on the principles of NZTA's T/10: Specification for state highway skid resistance management and notes: 2013. Each segment is then rated, based on the consequence and likelihood of a crash, to provide a total safety risk score. The Council assesses its budget, the safety risk scores, crash history and the road hierarchy to determine which road segments to test and which to treat.

The approach has been designed so that it can be applied to any network. It is tailored to reflect the detail and completeness of a council's asset inventory and condition data, i.e. from basic inventory data through to comprehensive GPS-located condition data.

Using the ONRC performance measure, this approach could be focussed on networks with a crash history.

“The NZTA Maintenance Guidelines for Local Roads targets “adequate skid resistance” – what does that mean?”

Key Benefits

Investigating the factors that contribute to crashes is often seen as the role of specialists. This may hinder a pragmatic approach to safety.

Using available data, road network managers can determine their safety priorities themselves.



Methodology

Before the introduction of the ONRC Performance Measures, Matamata-Piako District Council and Fulton Hogan were already looking at safety measures on the network, and how wet weather crashes contributed to the crash numbers. Their investigation identified the likelihood and consequence of a crash (proactive approach), crash history (reactive approach) and the road hierarchy to determine a site's priority to visit, test and treat.

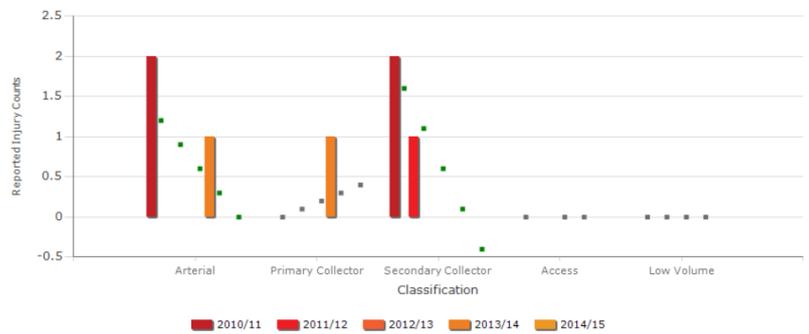
The ONRC Performance Measures for safety break down a fatal and serious injury crash analysis into manageable groups. Safety Technical Output 4 questions if wet weather crashes are disproportionately high and what trends are associated with those crashes. . As many Local Authorities will target road safety outcomes through their long term planning, this measure will help connect actions to outcomes.

The NZTA Maintenance Guidelines for Local Roads target 'adequate skid resistance on all sealed roads' but this is not defined in a way that can be applied across a varied road network. Undertaking extensive data capture to determine if there may be an issue is not cost effective.

Safety Technical Output 4 - Loss of Control on Wet Roads

The number of reported serious injuries and fatalities (DSI) attributable to loss of driver control on wet roads, each year on the network.

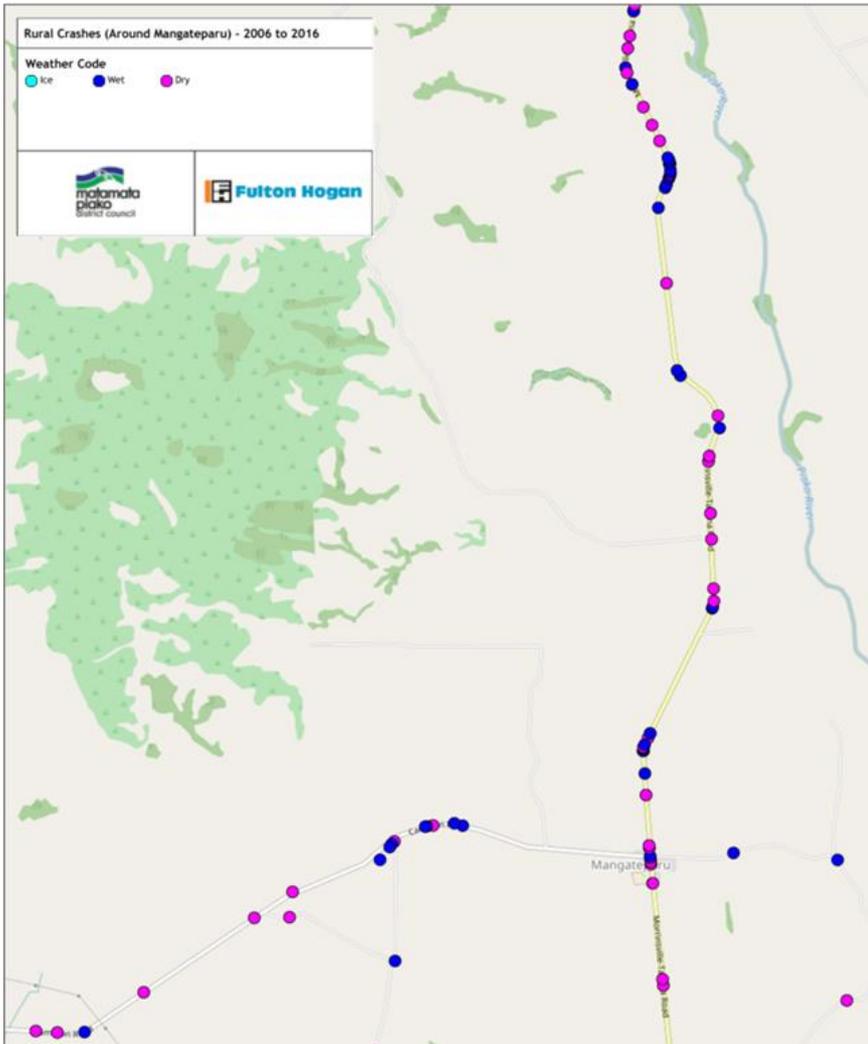
Financial Year: 2014/15
 RCA: Matamata-Piako
 Classifications: High Volume, National, Regional, Arterial, Primary Collector, Secondary Collector, Access, Low Volume
 Year: 2010/11, 2011/12, 2012/13, 2013/14, 2014/15
 2014/15: Results for 2014/15 may be variable - some data may not be available
 * There are 4 data validation errors, see below for details.



On the MPDC network it can be seen that crash numbers are small overall but the spike in 2010/11 was on higher classification roads.

While the MPDC/FH project used traffic numbers, the performance measure includes a comparison across ONRC classifications. The data survey considered the severity of curves along with the consequences of leaving the road. This preliminary approach was combined with the CAS data to prioritise where investigation should be undertaken.

Curve Severity or Context			
Severity Descriptor	Slight	Moderate	Tight
	Gentle bend; little or no change in speed	Moderate braking required. Required to reduce speed by about 20 km / hr to negotiate smoothly	Reasonably hard braking required. The curve surprises you and possibly tightens up as you enter it
Visual Guideline			



Outcome

The approach taken by MPDC and Fulton Hogan aligns with the ONRC philosophy:

- What is the outcome sought?
- What evidence do I have and what does it suggest?
- Do I need more information?
- What is an efficient and effective response to the issue?

With this approach, it was decided that 50% of the arterial routes, high-risk crash sites and collector roads with a high risk rating would be tested for skid resistance.

The MPDC study used a combination of local knowledge and CAS data to prioritise investigations and actions. Without much number-crunching this measure will help network managers focus their effort where it should make the greatest contribution to ONRC safety customer outcomes.

The adjacent graphic shows the impact of wet weather crashes, noting all crashes are shown.

NZTA's T10 Notes 2013 (1) state: Numerous studies internationally have shown that a skid resistance policy, which implements appropriate skid resistance at various locations on the network, reduces crashes and is a very economic crash reduction tool when used both proactively and reactively.

References

Waikato Region Road Safety Analysis, Opus (2016)

Simon Hunt, Delivering a Cost-effective Skid Resistance Strategy for a Roding Network, IPWEA (2015)

NZTA T10: Specification for state highway skid resistance management and Notes: (2013)

New Zealand Transport Agency Maintenance guidelines for local roads (2012)

The Road Efficiency Group (REG) is a collaborative project between local government and the NZTA Transport Agency. For more information, please contact:

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