

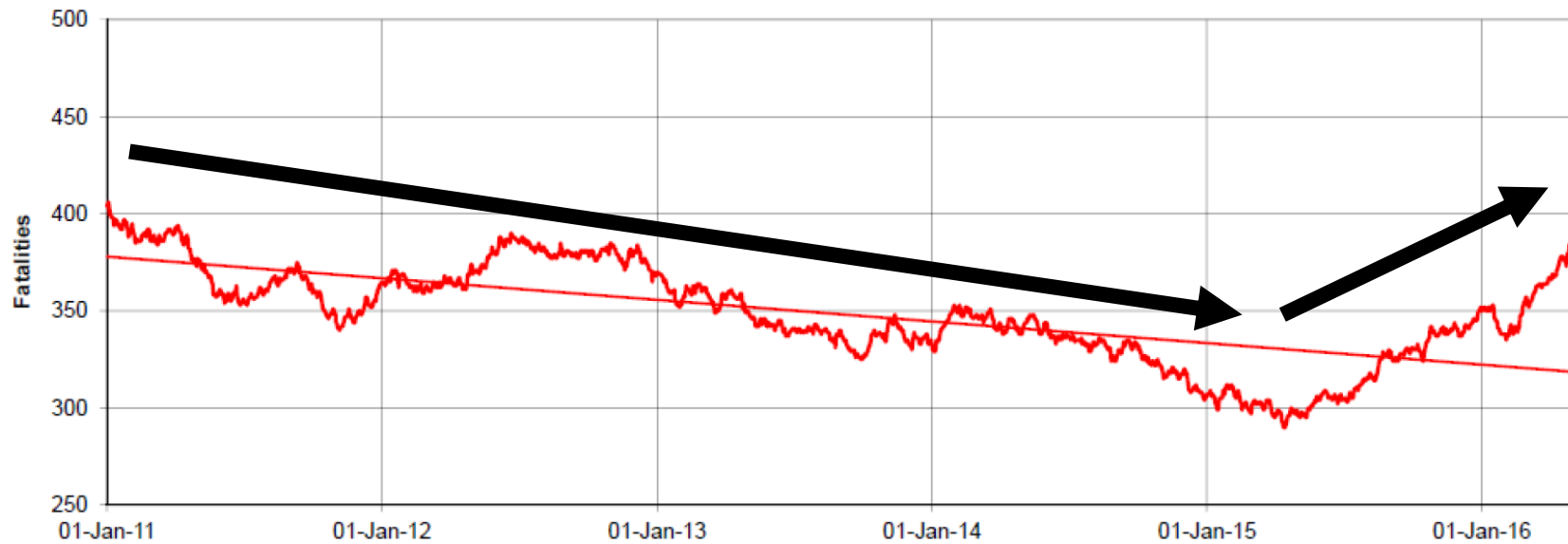
*A fresh approach for prioritising and
treating high risk curves*

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IPENZ TG Conference 2017



The issues...



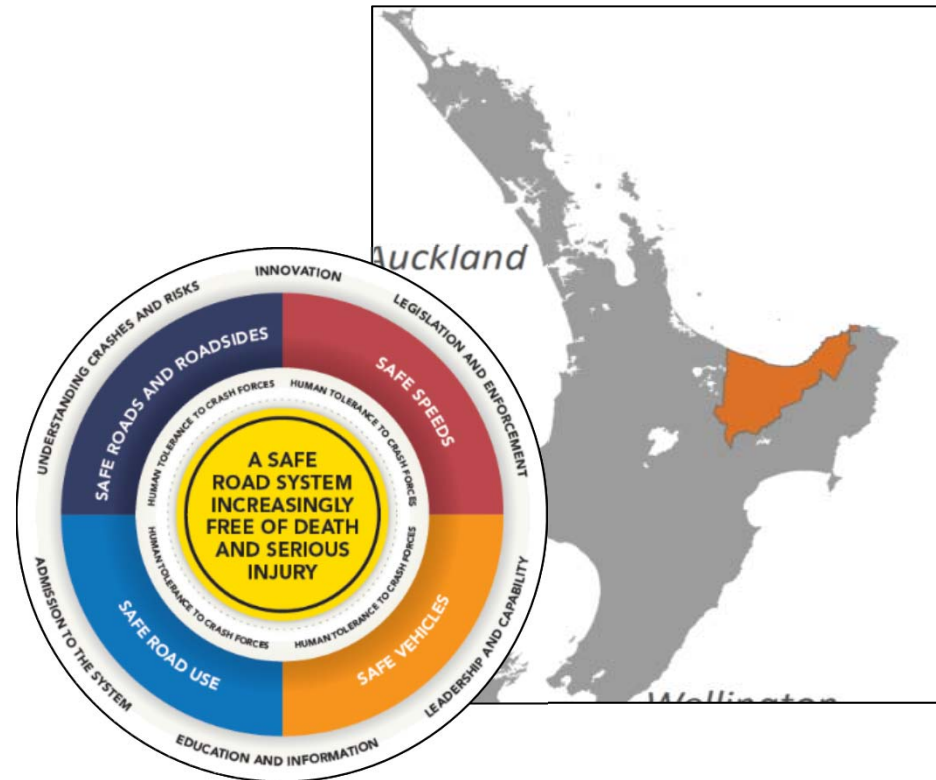
The issues...

- A much higher crash rate on high speed roads (>80 km/h) compared to roads with lower speed limits.
- A high proportion of crashes on curves.



A bit of history...

- Eastern Bay of Plenty Safe System Signature Project
- Development of a risk prediction model and mapping interface: “SignatureNET”
- See <http://bit.ly/2nc5Grf>



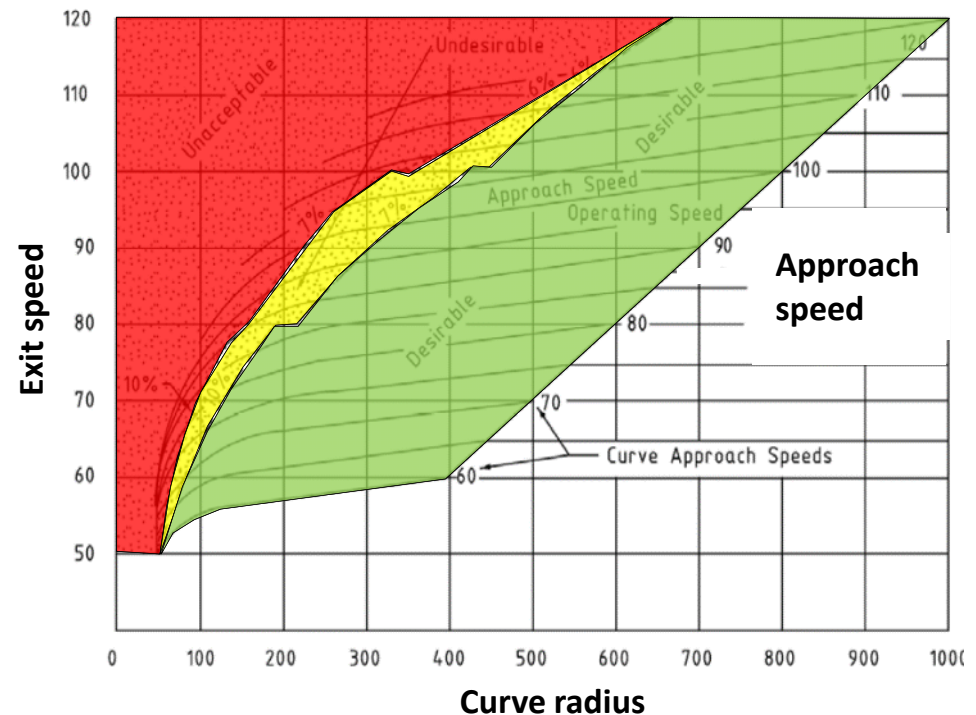
A GIS Approach...

Curve Identification



Identifying curve limits

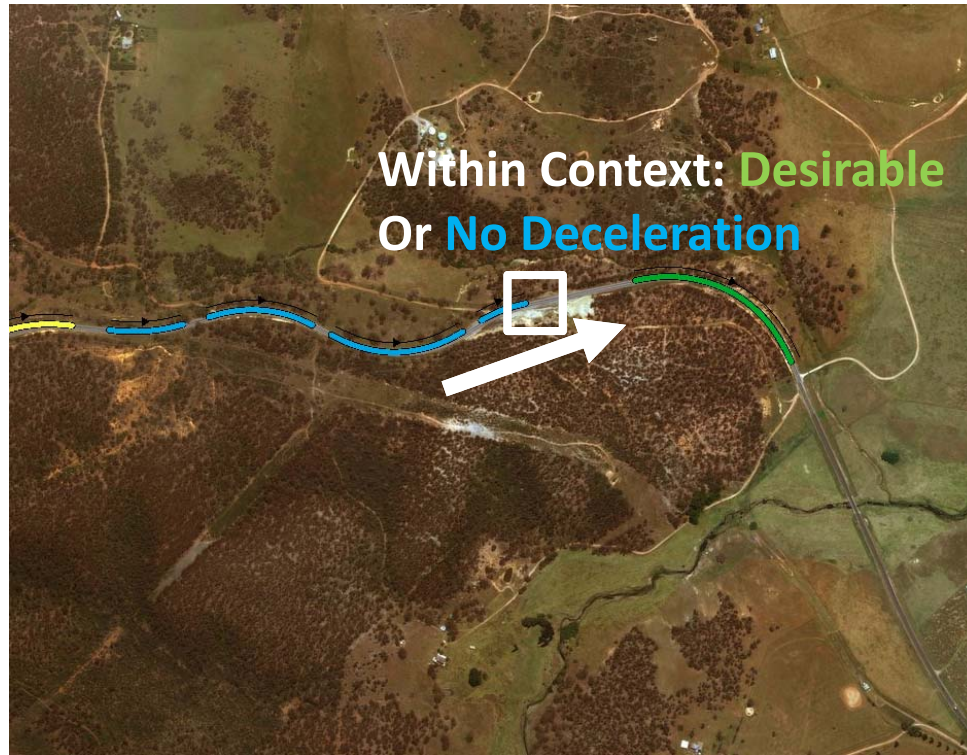
- **Within context:**
 - No limit (no deceleration)
 - Desirable (some deceleration)
- **Out-of-context:**
 - Undesirable
 - Unacceptable



What is an out-of-context curve?

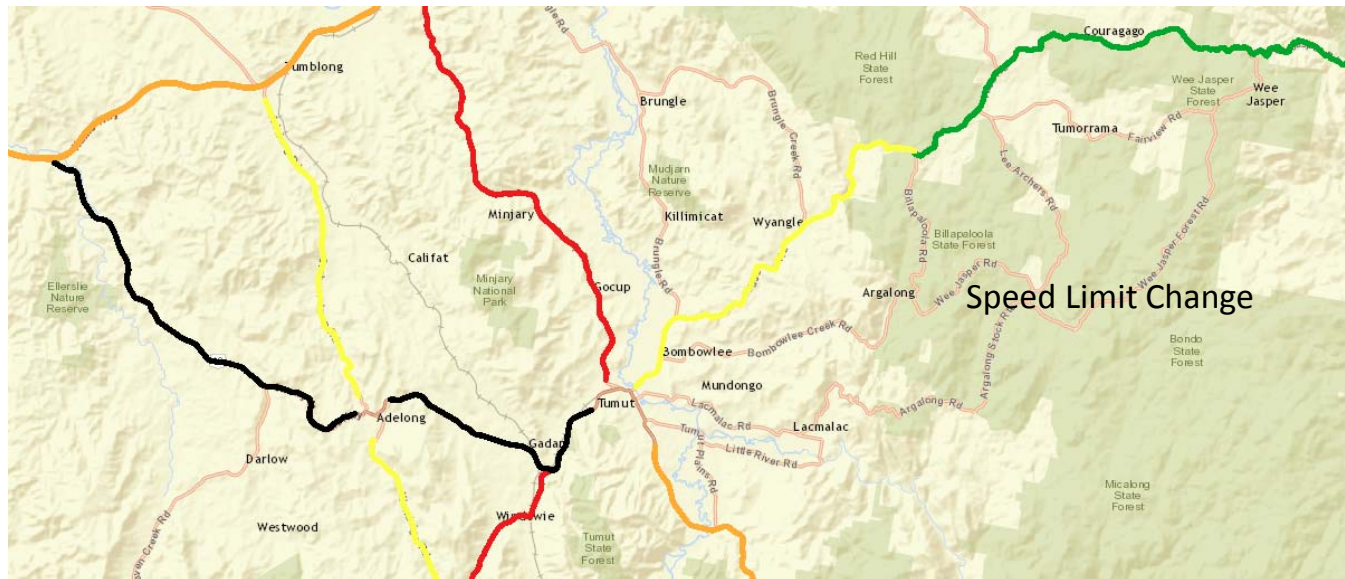


What is an out-of-context curve?



How can we figure out which curves to treat?

- Prioritise corridors rather than individual curves to ensure consistency from a drivers' perspective.



How can we figure out which curves to treat?

Out-of-context Curve Risk

Measures the number of injury crashes occurring on OoCCs per OoCC.

Developed as a proxy for the number of crashes that can be targeted if OoCCs along a section are improved to an appropriate standard.

All injury crashes are used as opposed to just loss of control, as some other types of crash are likely to be attributable to the curve being out of context e.g. cutting the corner resulting in a head-on.



How can we figure out which curves to treat?

Overall Curve Risk

Measures the number of injury crashes occurring on all curves (not just OoCCs) normalised for traffic volume.

Designed to filter out corridors that have a high number of crashes relative to the number of curves, but a low crash rate per vehicle traversing the corridor. Low crash rates indicate that safety improvements may not yield as much safety benefit when compared to corridors with high crash rates.

Also highlights corridors with a poor safety record on all curves rather than just OoCCs. This metric helps to show sections where mass action corridor treatments, such as the installation of audio tactile edge lines may improve safety.



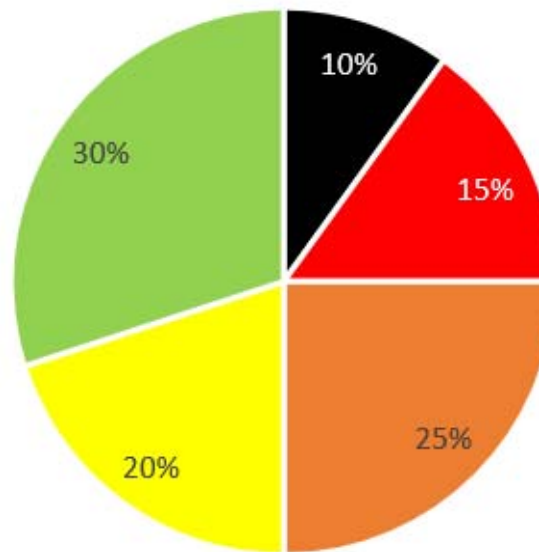
Risk Rating Matrix

		Out-of-context Curve Risk				
		LOW	LOW MEDIUM	MEDIUM	MEDIUM HIGH	HIGH
Overall Curve Risk	HIGH	MEDIUM	MEDIUM HIGH	MEDIUM HIGH	HIGH	HIGH
	MEDIUM HIGH	MEDIUM	MEDIUM	MEDIUM HIGH	MEDIUM HIGH	HIGH
	MEDIUM	LOW MEDIUM	MEDIUM	MEDIUM	MEDIUM HIGH	MEDIUM HIGH
	LOW MEDIUM	LOW MEDIUM	LOW MEDIUM	MEDIUM	MEDIUM	MEDIUM HIGH
	LOW	LOW	LOW MEDIUM	LOW MEDIUM	MEDIUM	MEDIUM

Restrictions

- A corridor classified as **HIGH RISK** must have had at least 3 fatal or injury loss of control crashes during the analysis period.
- A corridor classified as **MEDIUM HIGH** risk must have had at least 2 fatal or injury loss of control crashes during the analysis period.

Risk Rating Matrix

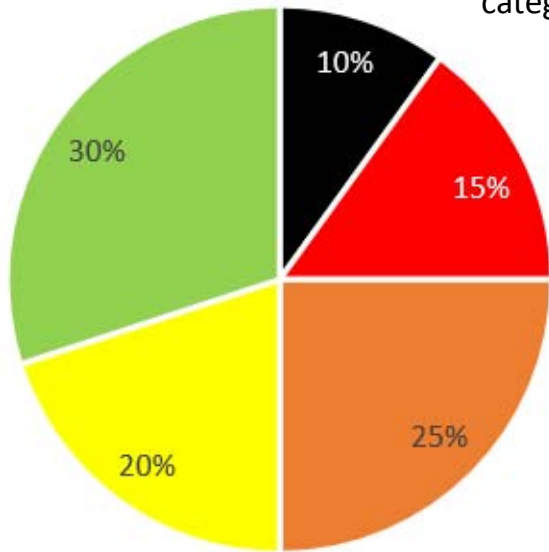


Percentage of network
(by length) in each risk
category

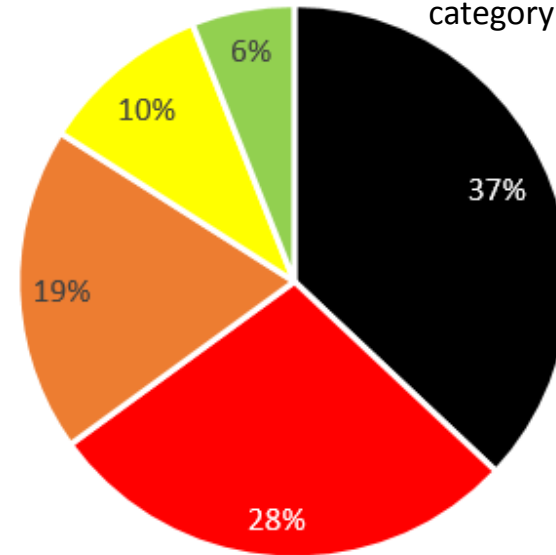
■ HIGH ■ MEDIUM HIGH ■ MEDIUM ■ LOW MEDIUM ■ LOW

The Results!

Percentage of network (by length) in each risk category



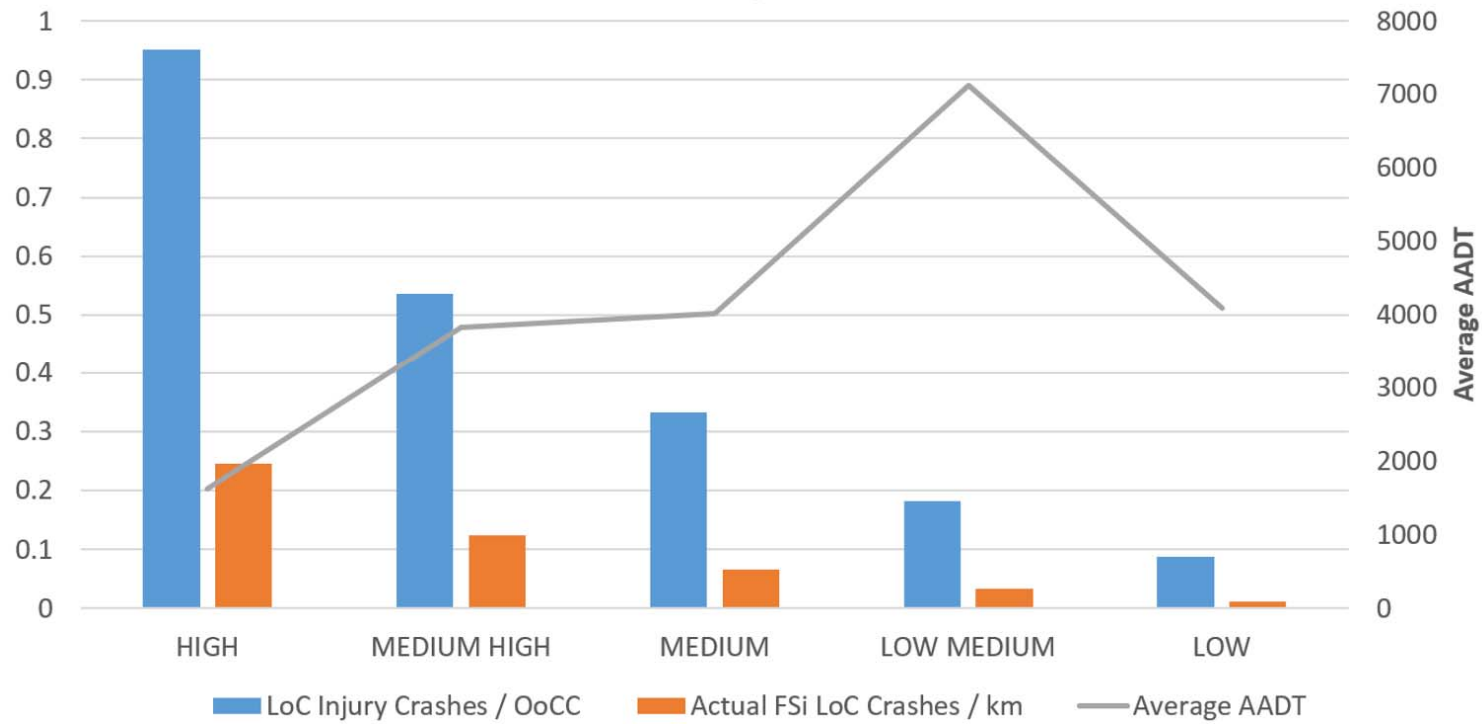
Percentage of LOC crashes in each risk category



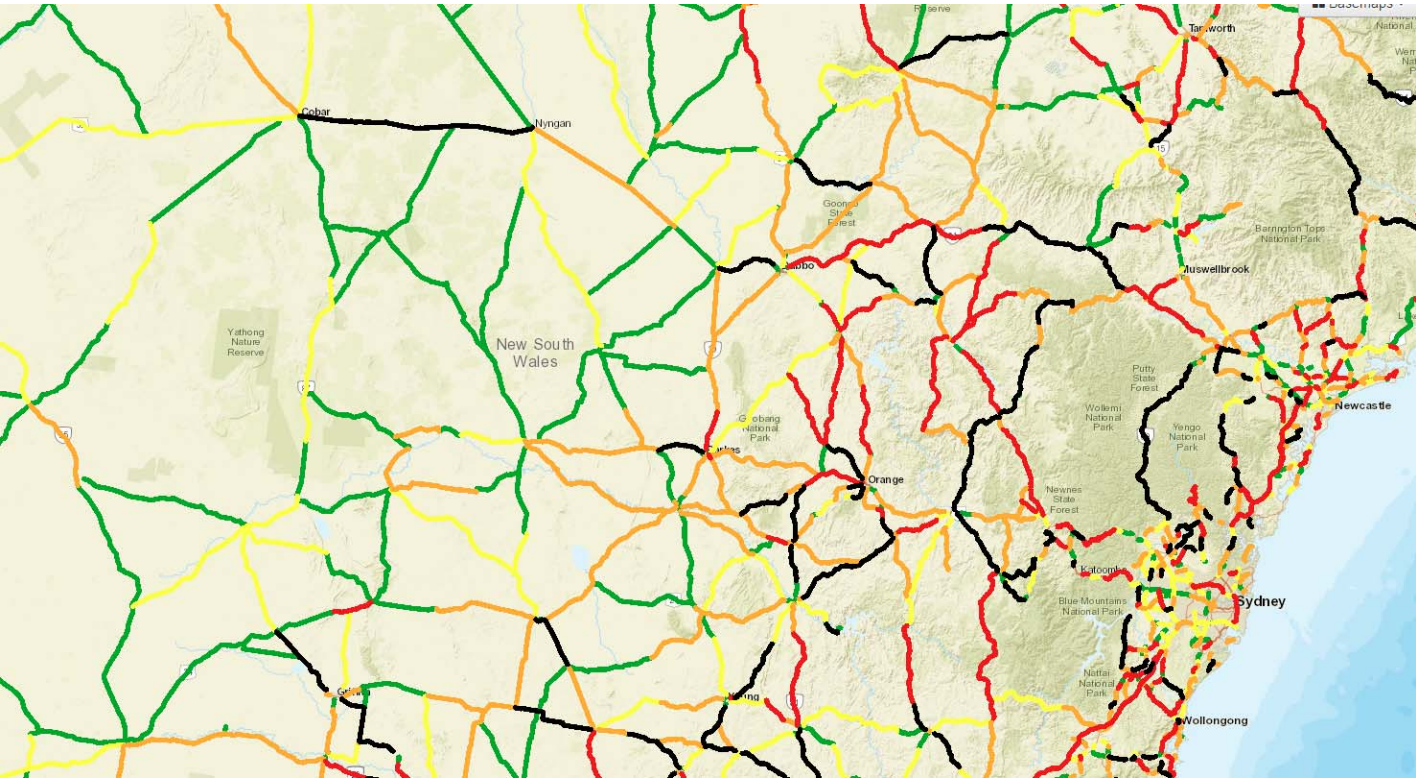
■ HIGH ■ MEDIUM HIGH ■ MEDIUM ■ LOW MEDIUM ■ LOW

■ HIGH ■ MEDIUM HIGH ■ MEDIUM ■ LOW MEDIUM ■ LOW

The Results!



The Results!



- Curve Risk Rating
- High
- Medium High
- Medium
- Low Medium
- Low

High-Risk Curve Treatment Hierarchy

Objective

- To help practitioners identify appropriate curve treatments on corridors prioritised for improvements

Treatment Strategy Categories

- Type A – minimum baseline specification
- Type B – delineation-based treatments
- Type C – physical infrastructure treatments
- Type D – physical works to the road pavement



Where to next?

- Transport for NSW have used Abley's high-risk curve analysis work, in conjunction with other analyses, to justify their targeted road safety program over the next 5 (or 10) years
- NZ results are coming soon! (watch this website: www.roadsafetyrisk.co.nz)



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