EROAD

An Exploratory Study Using Big Data for Improved Safety and Operational Efficiency: A New Zealand Case Study

Gareth Robins
Director of Analytics
EROAD

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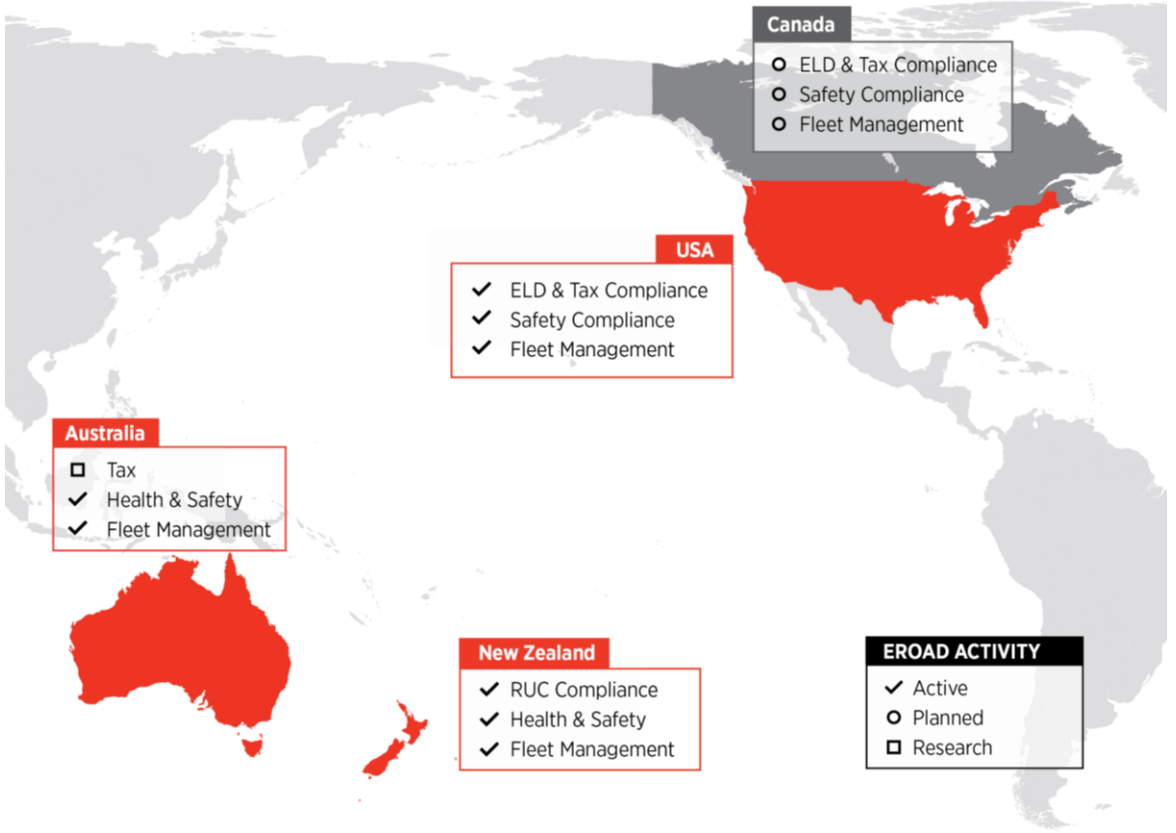
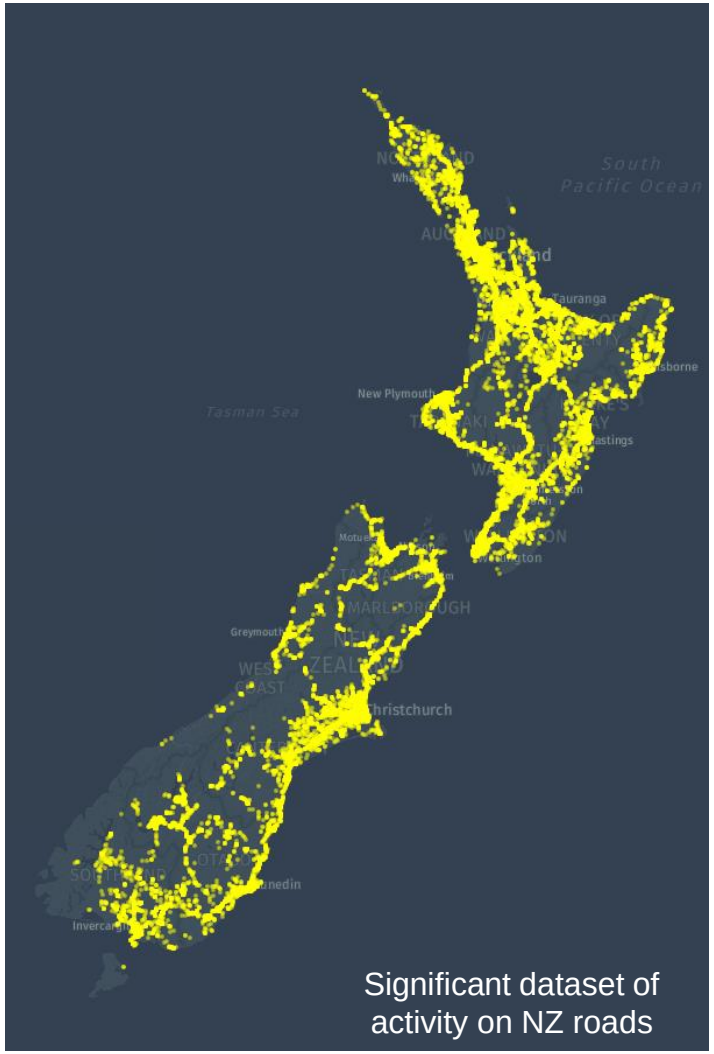
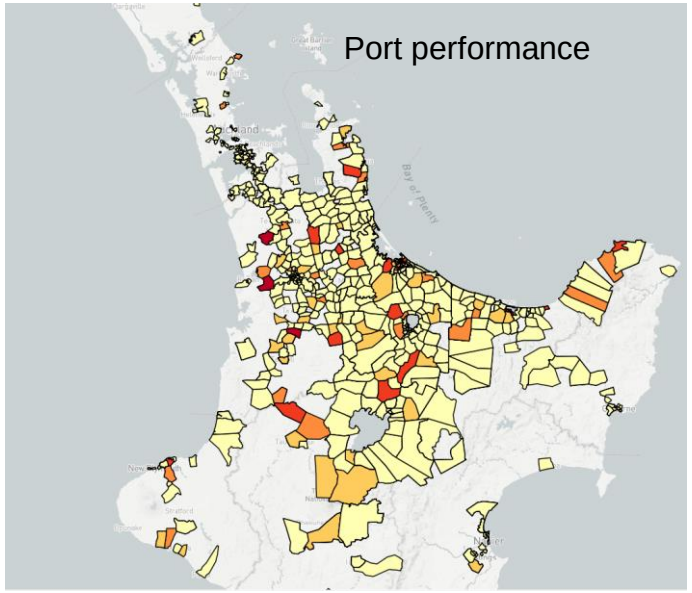
About EROAD

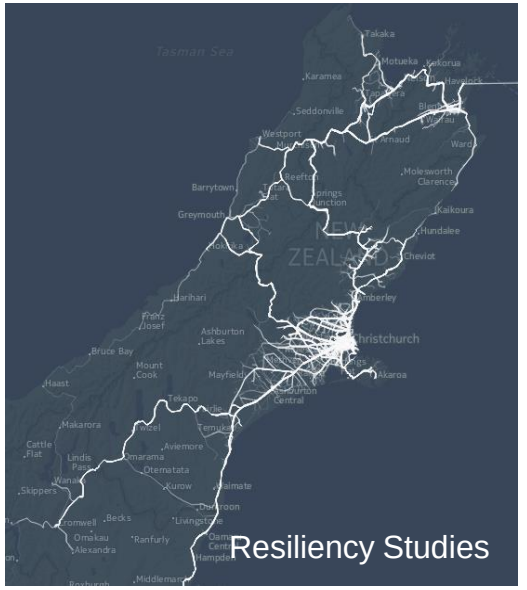
- EROAD is a fully integrated technology, tolling and services provider. Our advanced technology provides road charging, compliance and commercial services with the same platform to lower overall client and delivery costs.
- **World First – EROAD was the first company** to implement a national network wide GNSS based eRUC solution (New Zealand – Feb 2010).
- Operations in **New Zealand, Australia and North America**
- **86,240 units** across three countries (September 2018)
- EROAD's services include:
  1. **Tax (RUC, WMT, IFTA)**
  2. **Compliance services (Elogs, ELD, HOS)**
  3. **Commercial services**

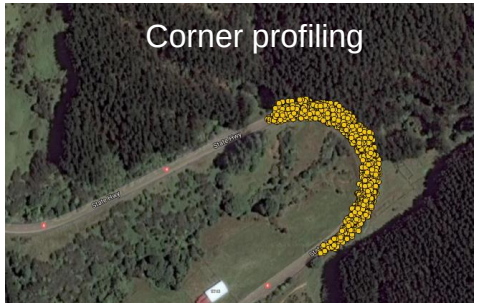


Downstream benefits

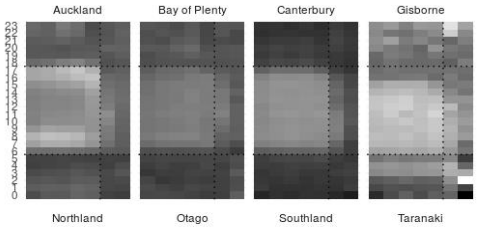


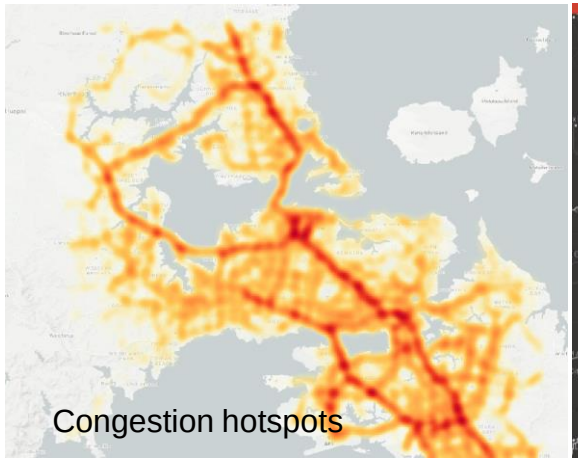


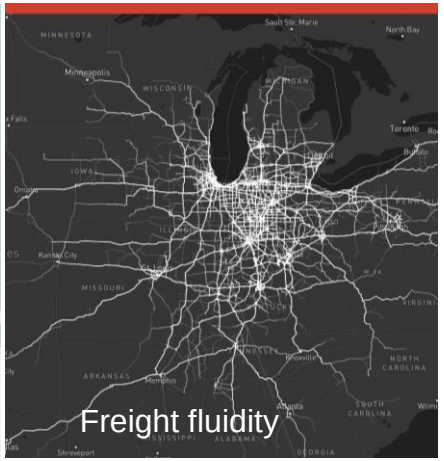


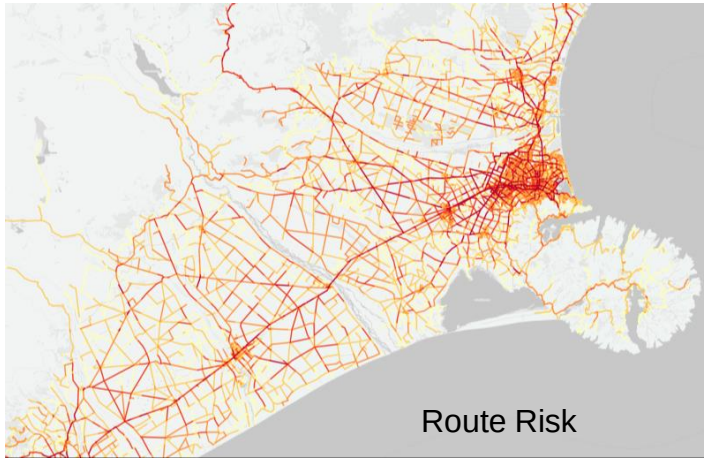


Travel time reliability

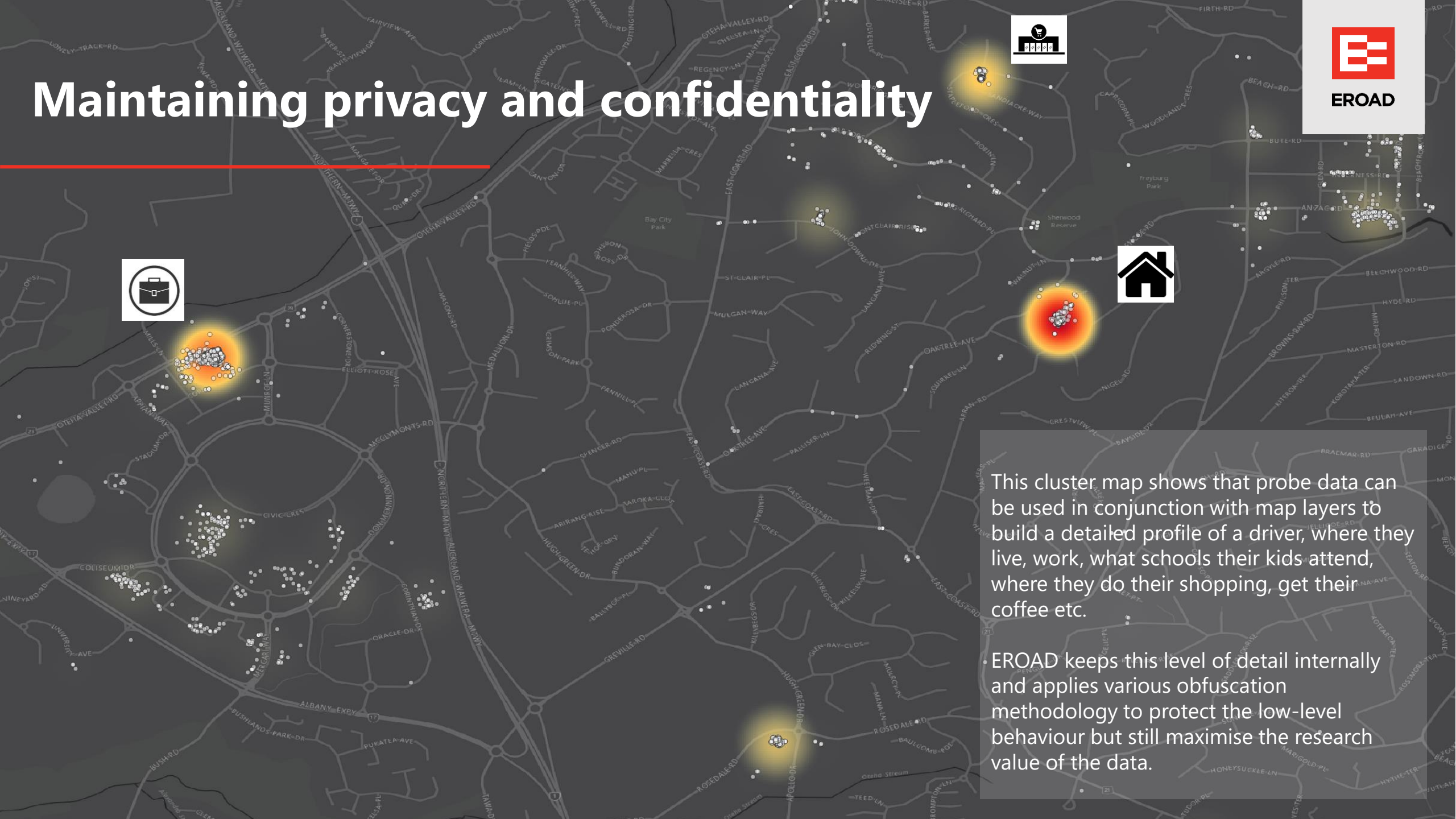








Maintaining privacy and confidentiality



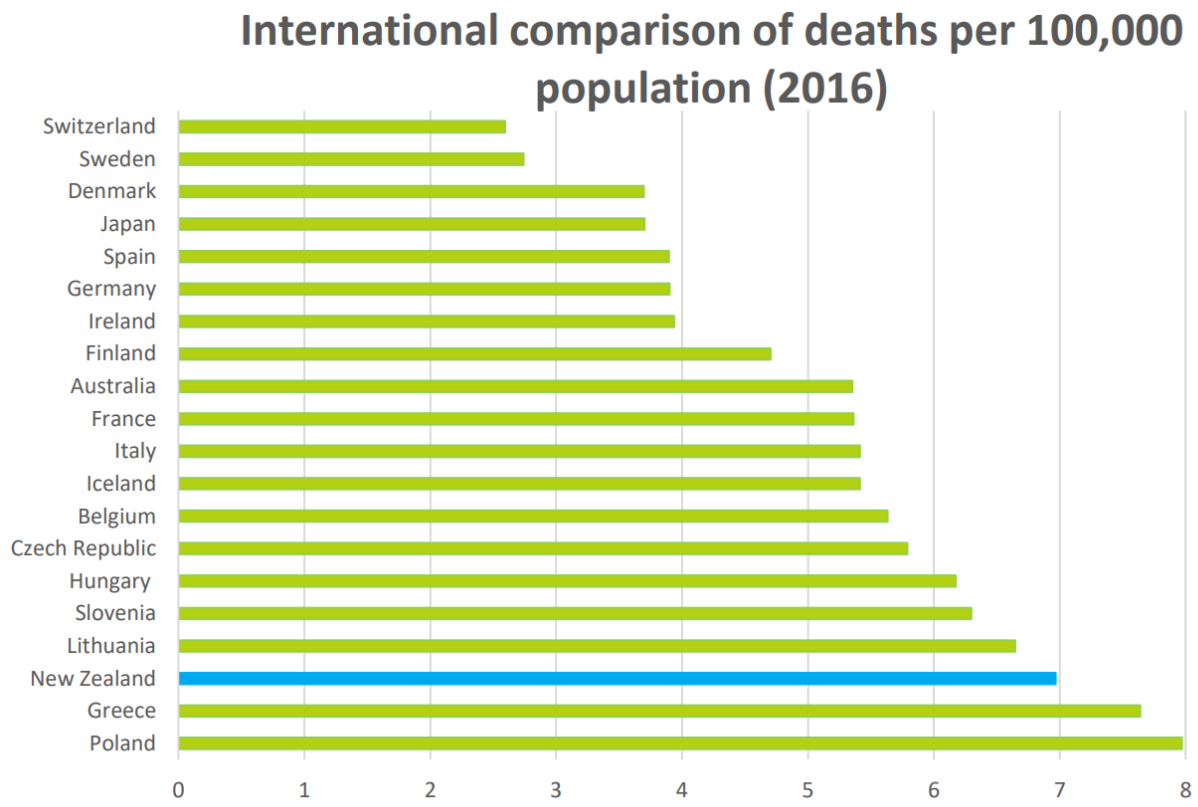
This cluster map shows that probe data can be used in conjunction with map layers to build a detailed profile of a driver, where they live, work, what schools their kids attend, where they do their shopping, get their coffee etc.

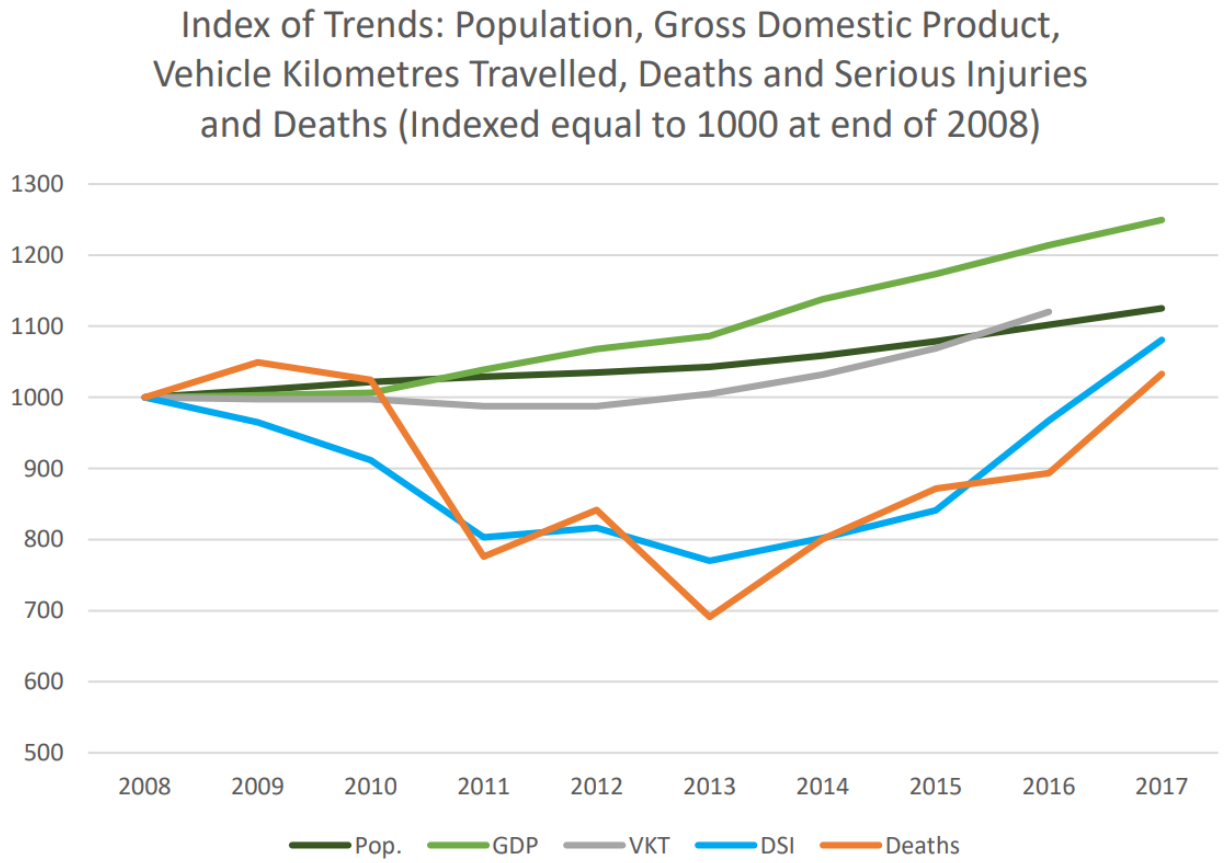
EROAD keeps this level of detail internally and applies various obfuscation methodology to protect the low-level behaviour but still maximise the research value of the data.

New Zealand

Credit: www.newzealand.com

NZ Road Safety



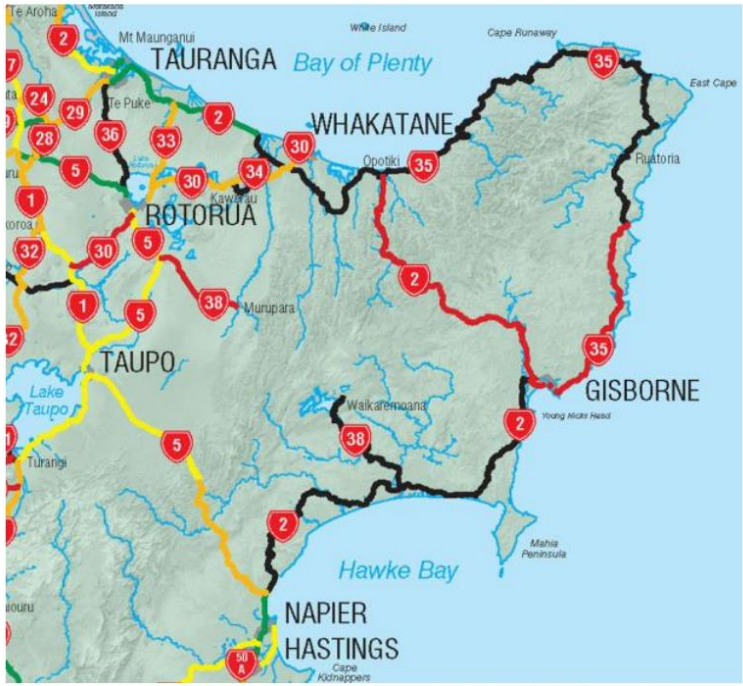


Infrastructure Risk Rating

Personal risk is a person's chance of being killed or seriously injured on the road per 100 million kilometres travelled

Collective risk is the overall number of fatal and serious injury crashes per kilometre travelled

RISK RATING	COLLECTIVE RISK Average annual fatal and serious injury crashes per km	PERSONAL RISK Average annual fatal and serious injury crashes per 100 million vehicle-km	COLOUR
Low	≤0.039	<4	
Low-medium	0.04≤0.069	4≤4.9	
Medium	0.07≤0.10	5≤6.9	
Medium-high	0.11≤0.189	7≤8.9	
High	0.19+	9+	



Personal risk map

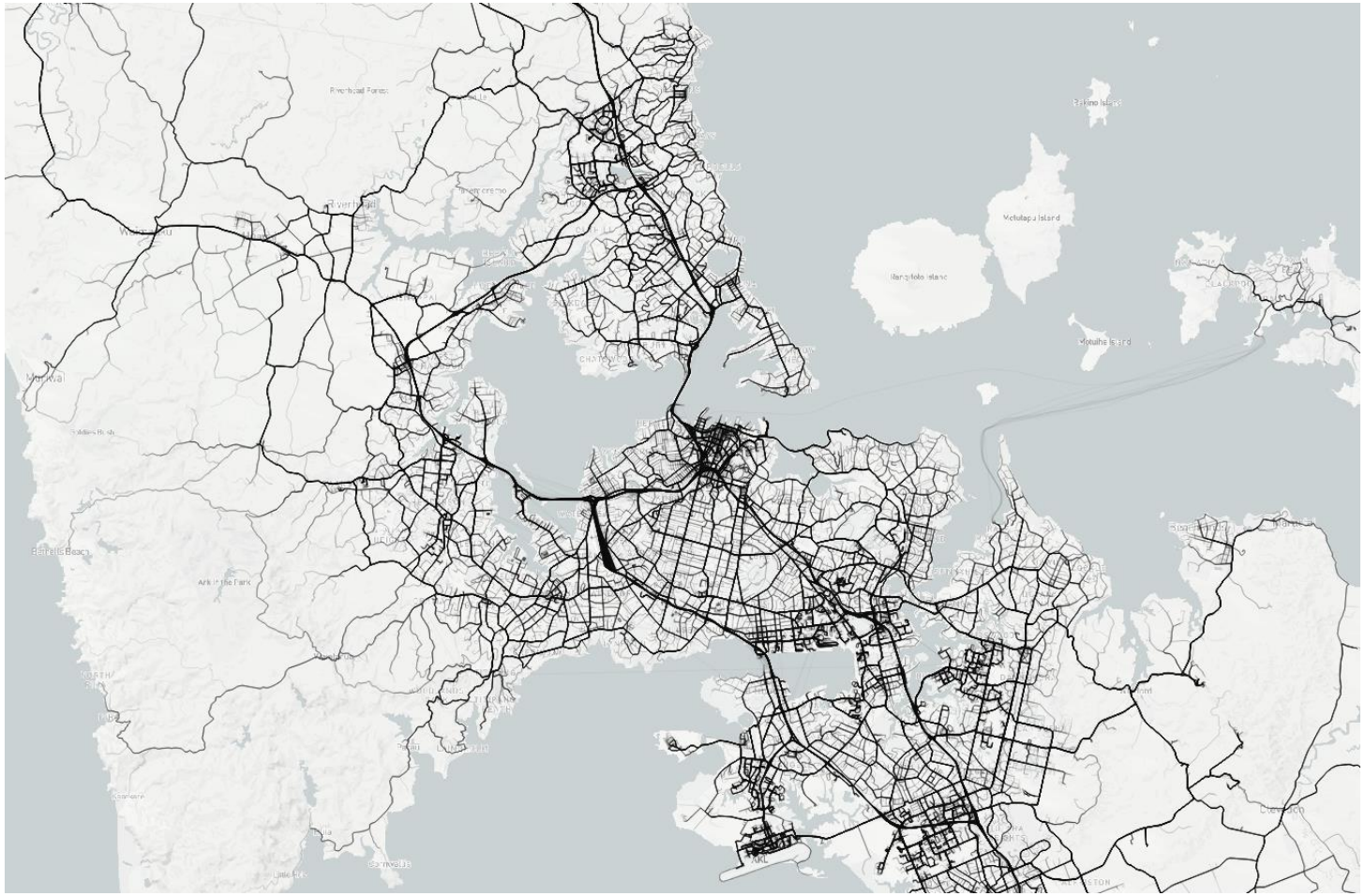
Around 1/3 of our roads have a Medium-high or High personal risk rating

Infrastructure Risk Rating by land use nationally

Land Use	High	Medium High	Medium	Low Medium	Low
Rural	32.9%	23.3%	37.1%	5.6%	1.0%
Urban	1.1%	13.4%	40.8%	39.1%	5.6%
All	25.6%	21.0%	38.0%	13.3%	2.0%

Source: New Zealand Transport Agency

Dynamic Risk modelling



FAMILIAR

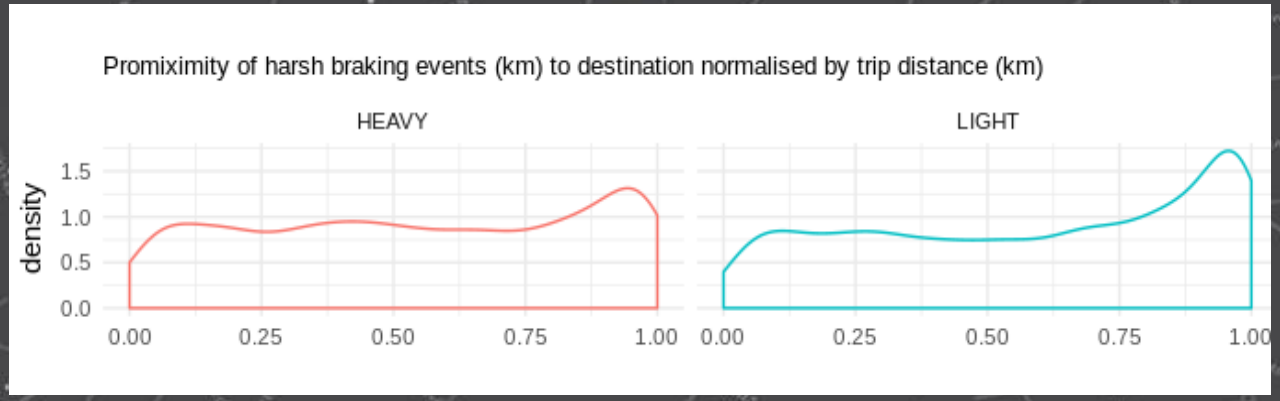
FATIGUED

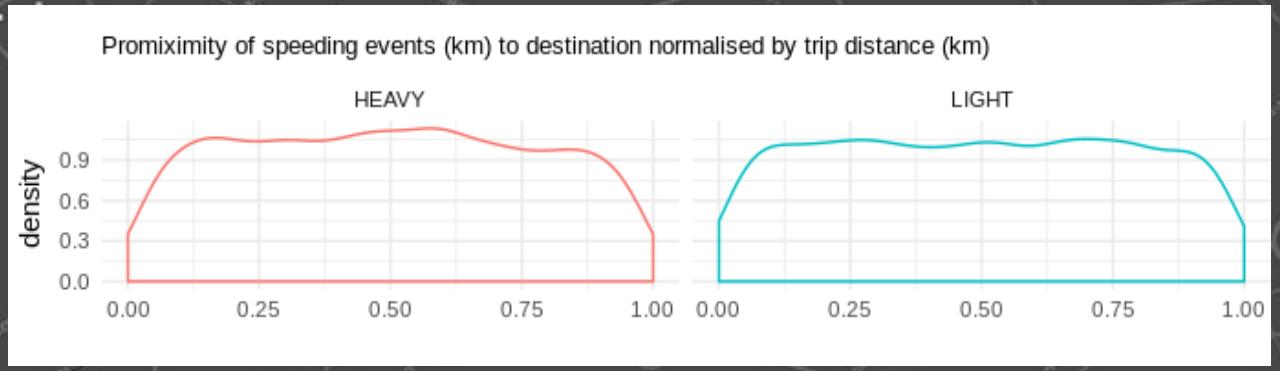
FRUSTRATED

Familiarity

Cluster analysis of stopped locations shows areas of frequent visitation for each driver.

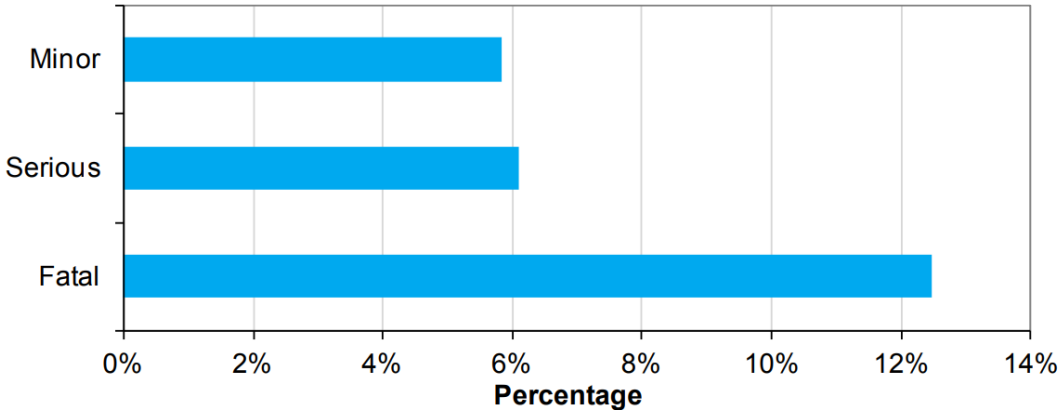
Incorporating temporal elements adds another level of classification such as work or home.



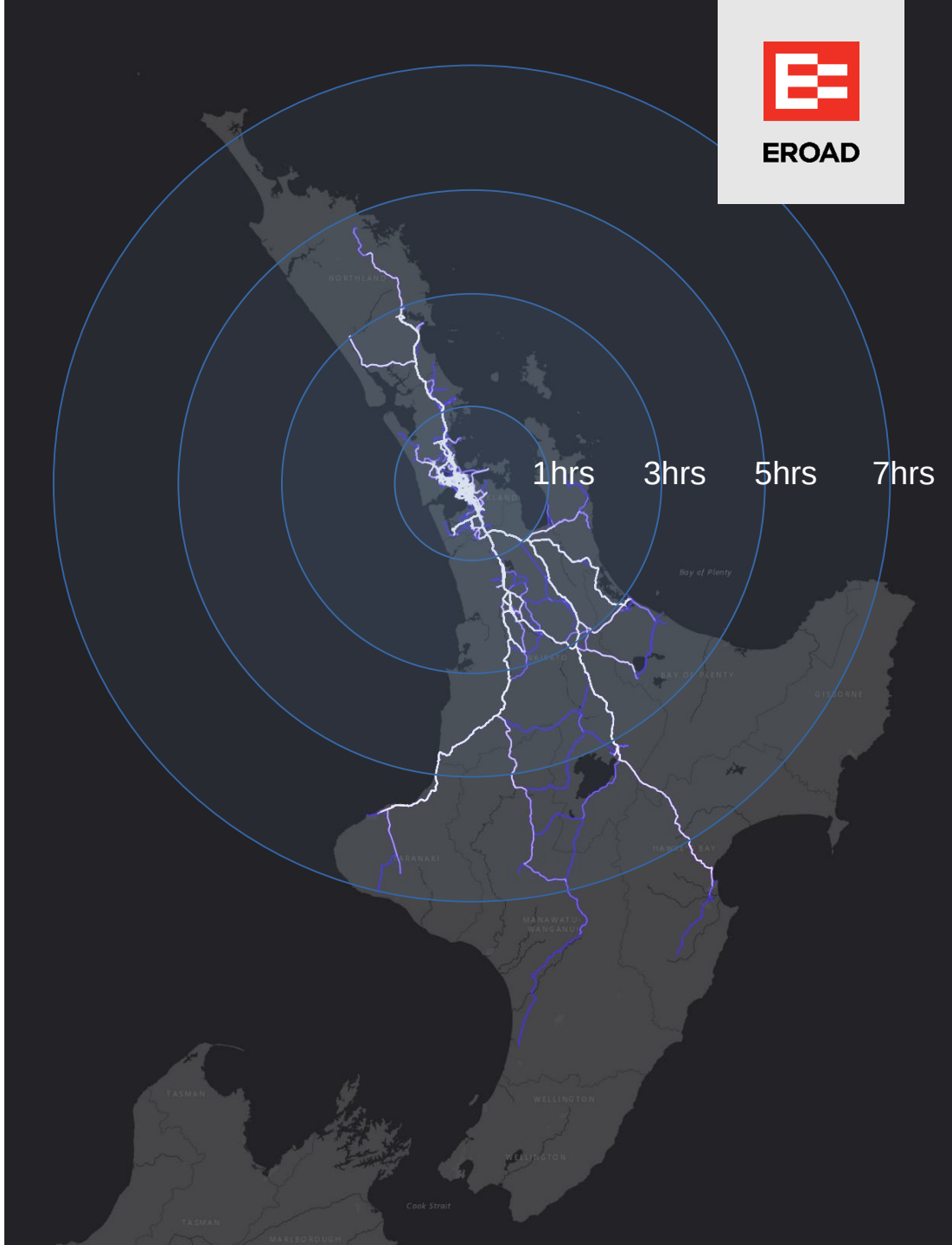


Fatigue

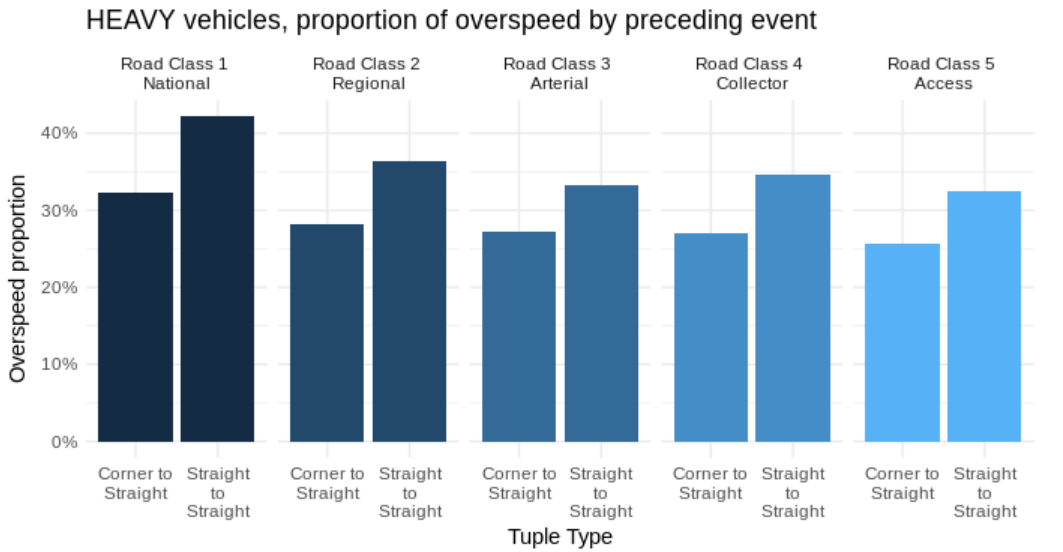
Figure 1: Percentage of crashes with fatigue as a contributing factor (2014–2016)

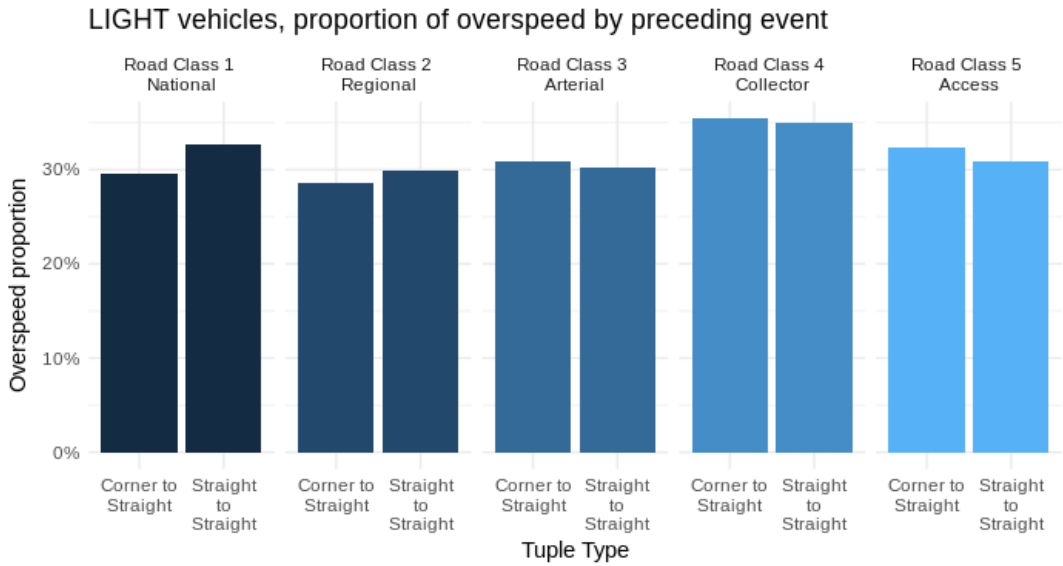


Source Ministry of Transport, NZ

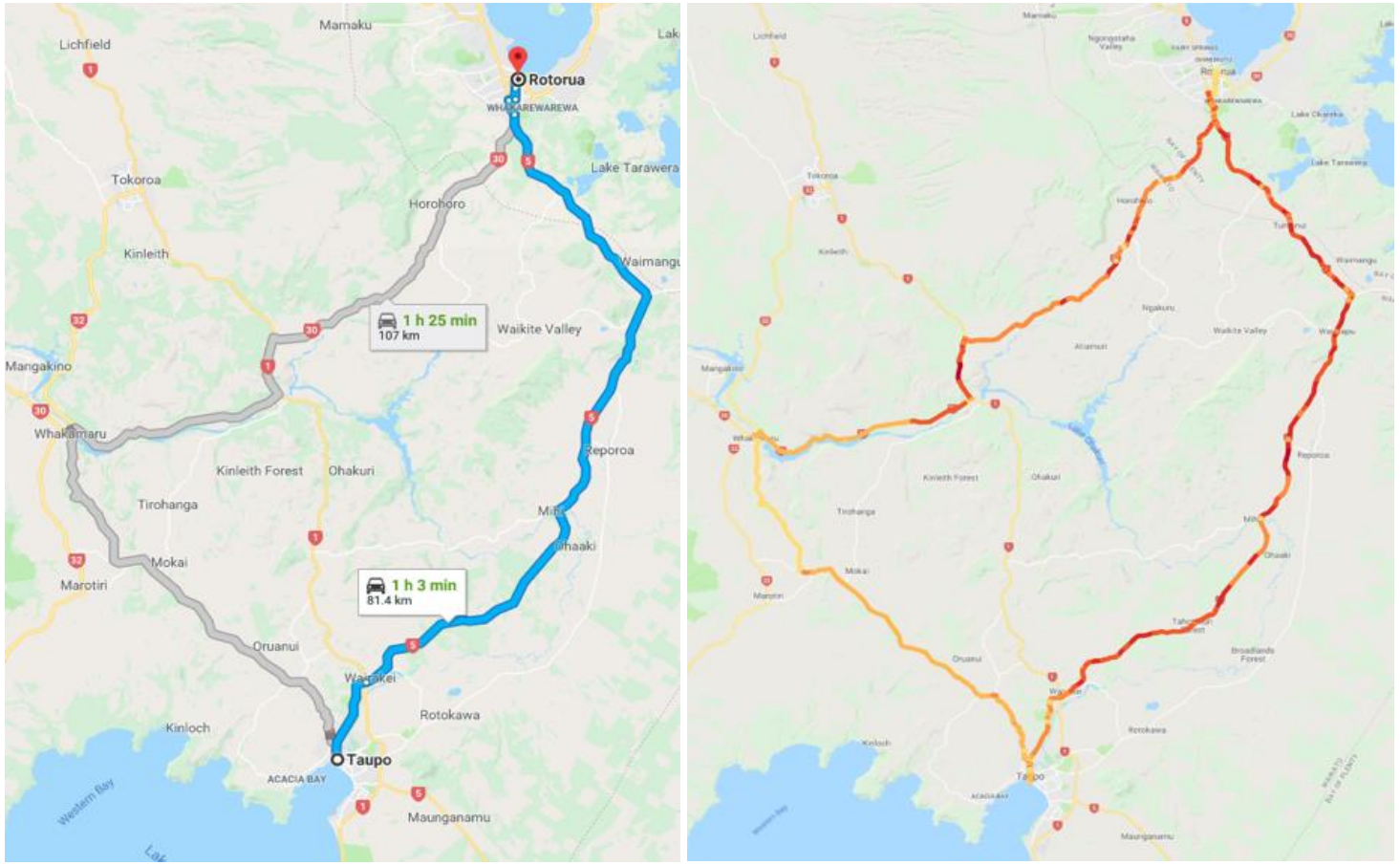


Frustration



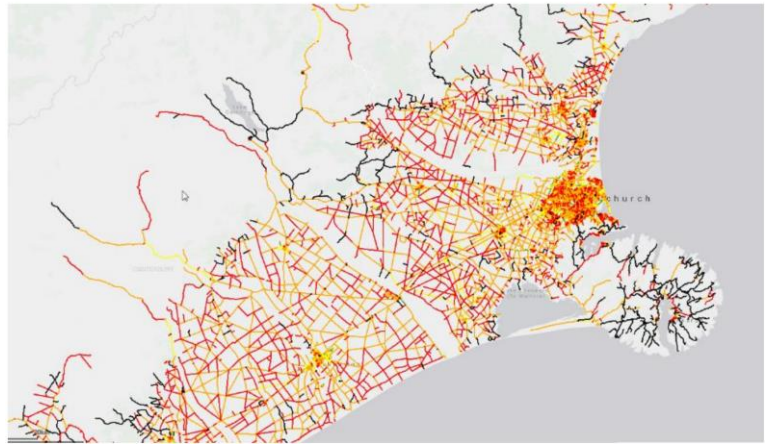


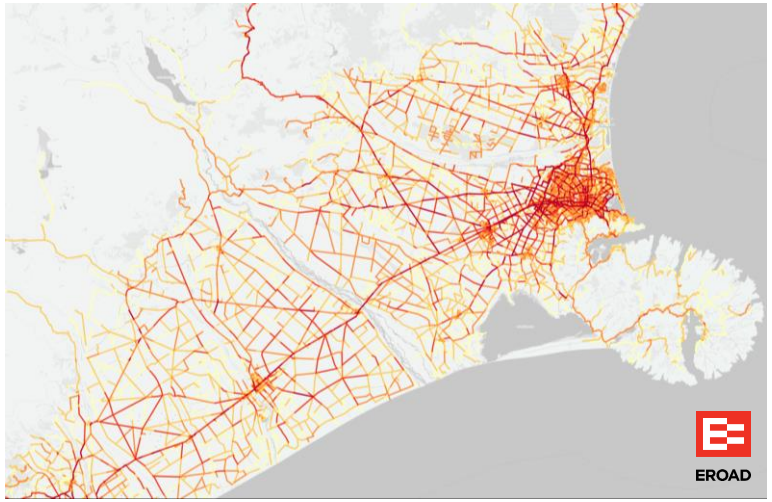
Combined Risk



Next Steps

Infrastructure Risk Rating





THANK YOU

Gareth Robins
Director of Analytics - EROAD
gareth.robins@eroad.com