



IP3: A resilient Aotearoa New Zealand transport system





IP3 Scope

- Key research questions:
 - How can we use a transport-as-a-service modelling paradigm to represent all components of this system?
 - How can resilient transportation networks and logistics play an enhanced role in post-disaster response and recovery?
 - How can we approach resilience investment decision-making under uncertainty?

Transport system modelling

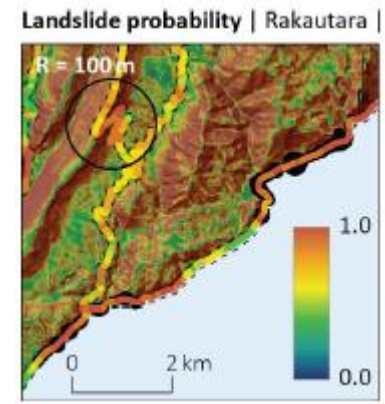
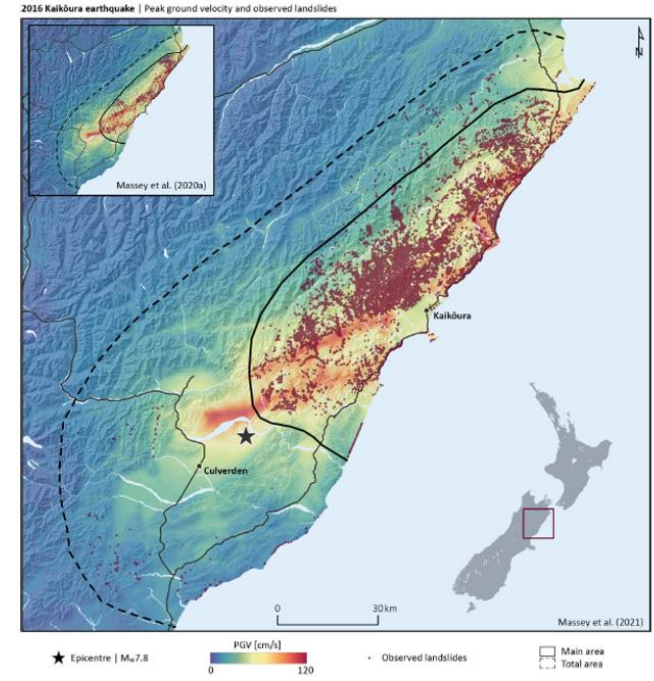


Key Aspects

- Need to improve representation of transport components, networks and users of these networks
 - A/NZ focus
- Nodes and links across networks
- Real world data and complexity
- Leverage case histories

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- Seismic and co-seismic network exposure models

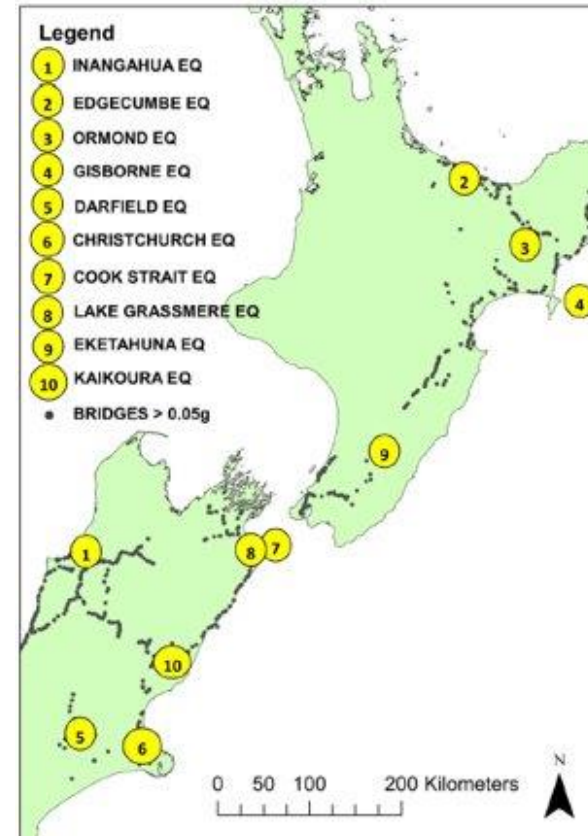


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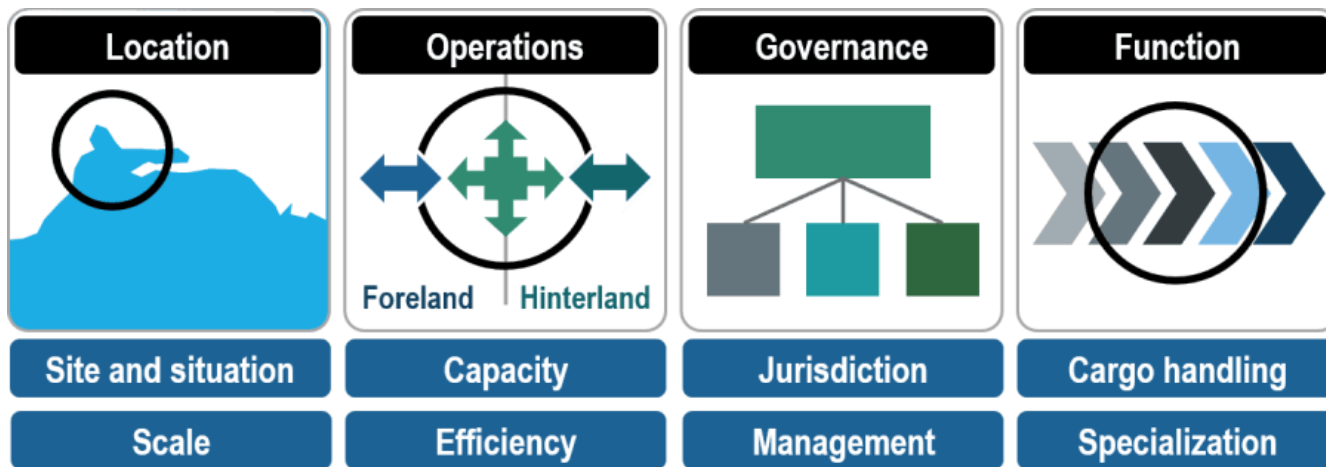
Te Hiranga Rū | QuakeCoRE
Aotearoa New Zealand Centre for Earthquake Resilience

- Models for A/NZ transport system components



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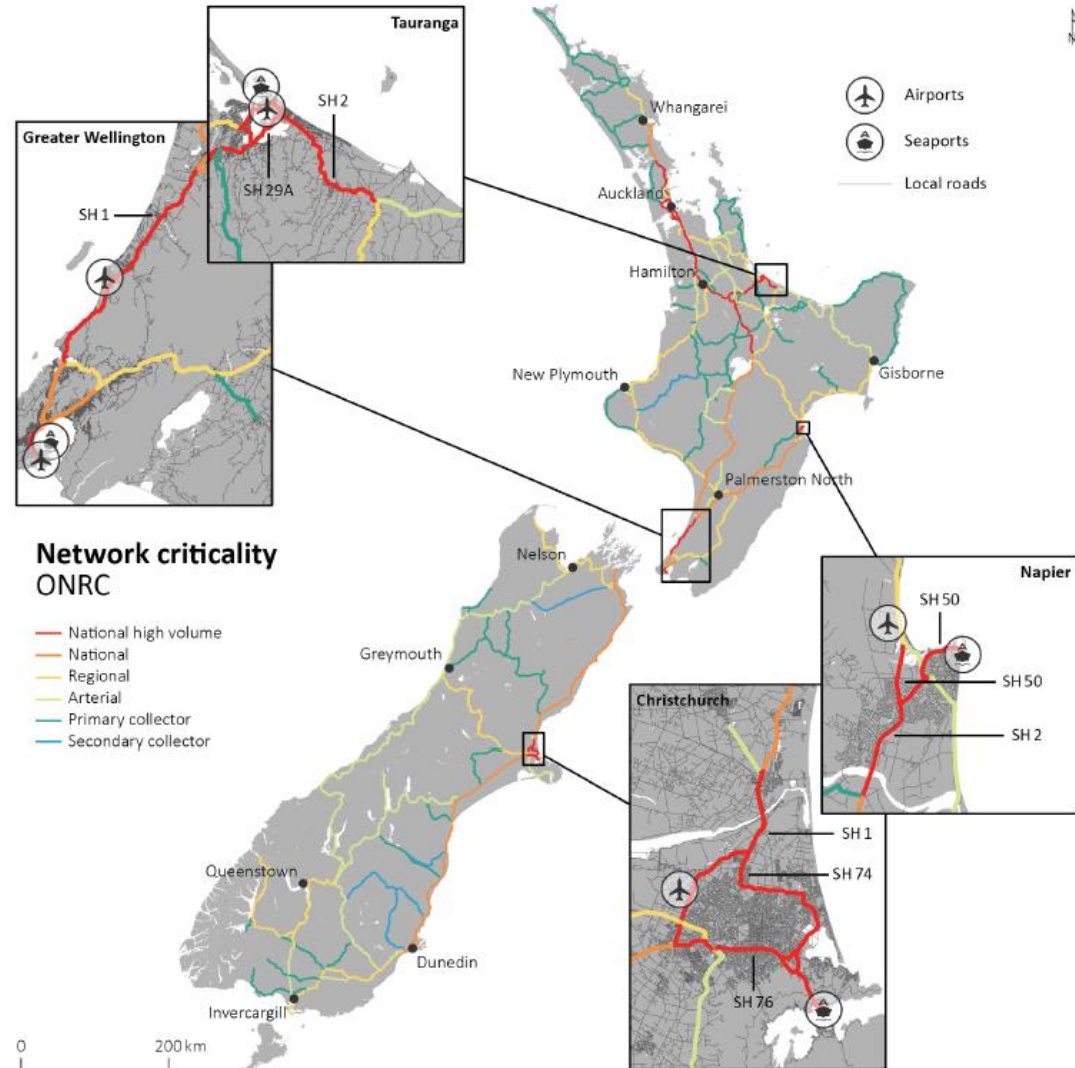
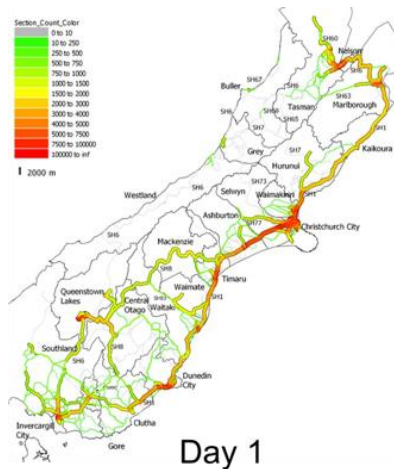
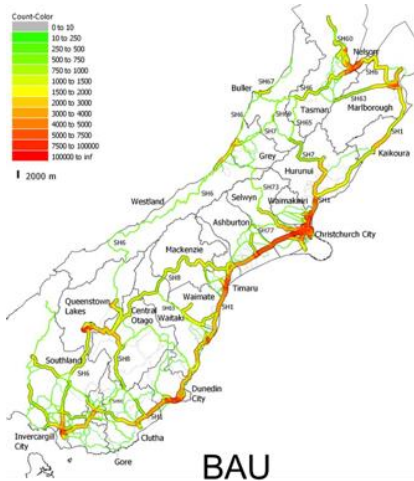
- Resilience of hub components + systems



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- Integrated transport system models



Resilient logistics networks and post-event response and recovery

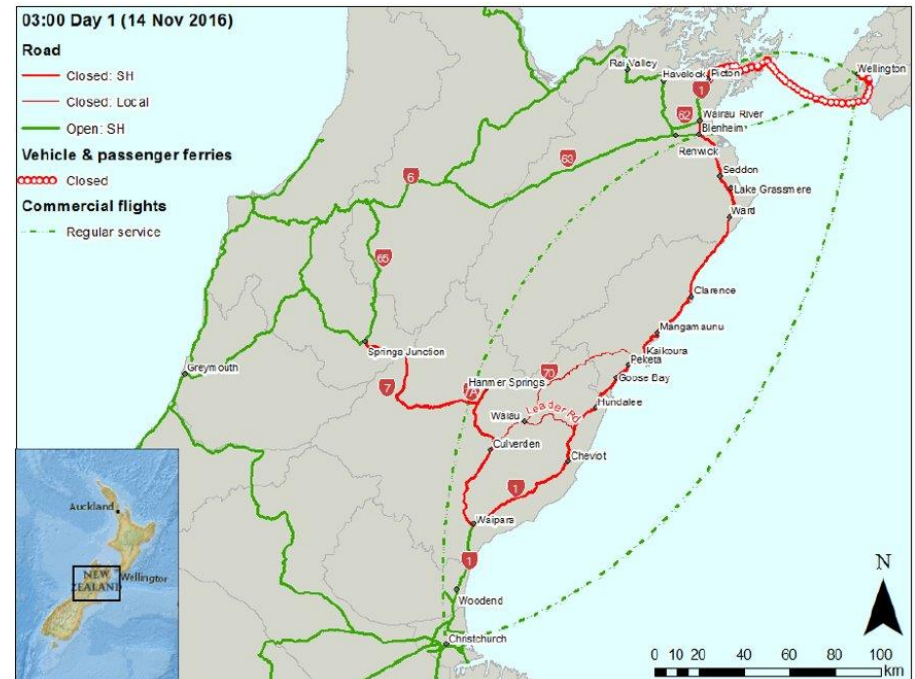
Key Aspects

1. Emergency response: movement of emergency supplies and people in the immediate aftermath of an event
 2. Management of longer-term disruptions in the flow of commercial freight and the movement of people
- ➔ Supporting communities and economic functionality post-event
 - ➔ Improving the representation of logistics networks that support these efforts and the populations affected can better inform resilience decision making

Projects

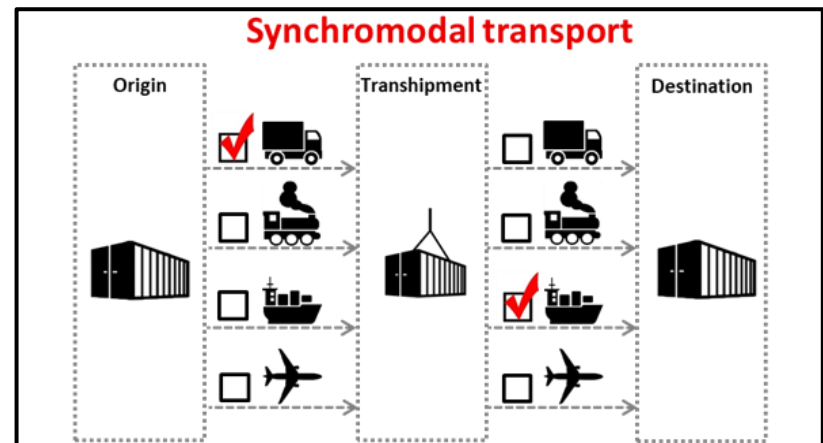
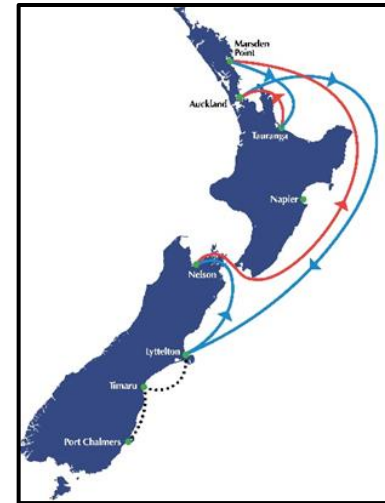
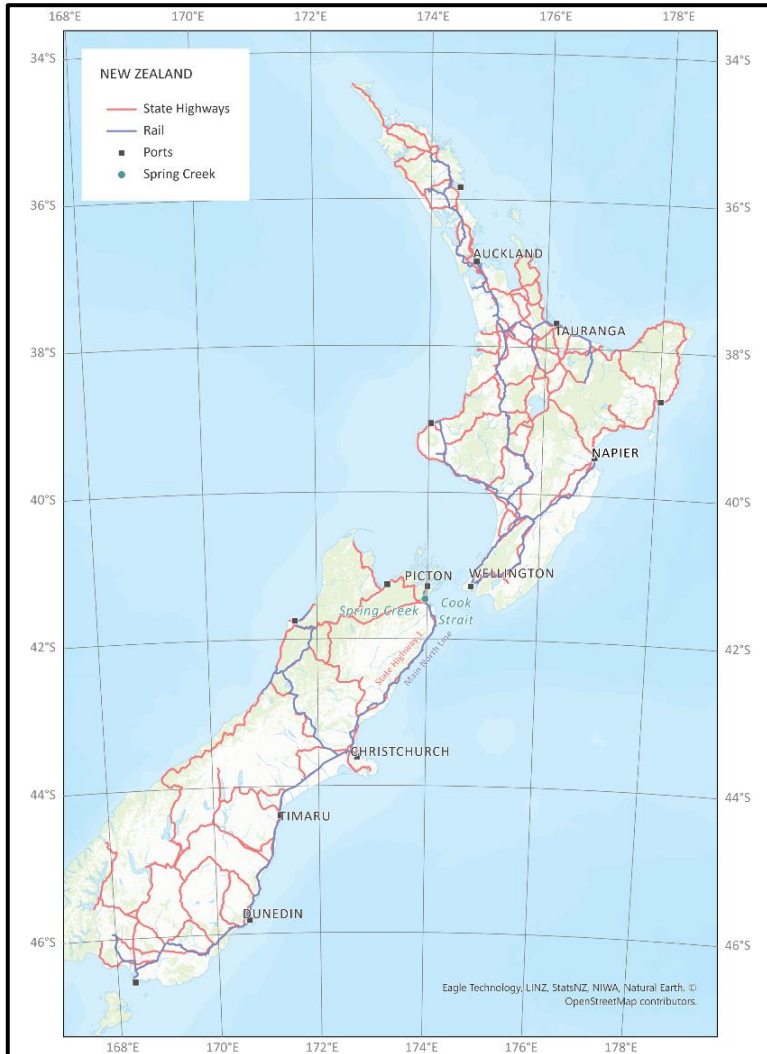


- Analysis of logistics impacts across past events and potential scenarios in A/NZ



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- Development of A/NZ logistics models



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- Resilience of tourist and transient populations



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- Pre-positioning strategies for post-earthquake response



Transport Decision Making

Key aspects



- Transportation system decision processes that reflect the inherent uncertainty facing the sector (e.g. hazards, climate and population change)
- Decision processes that account for end-user expectations

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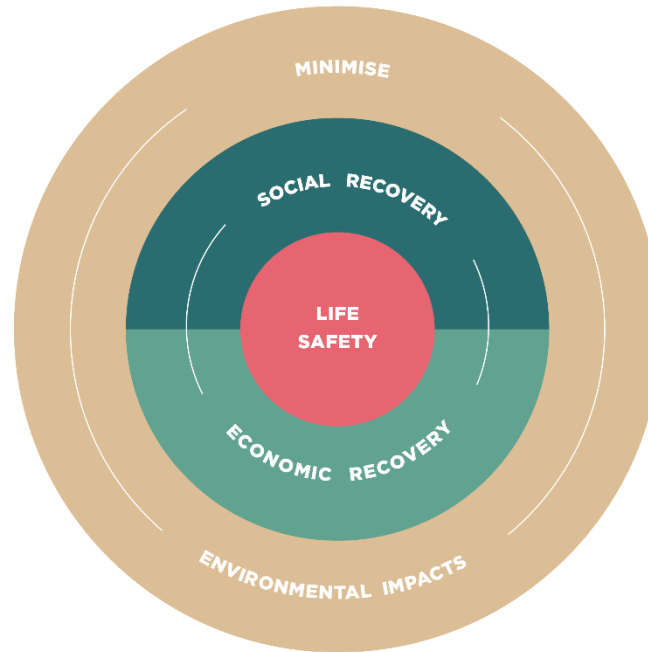
- FMCG case study



• Transportation-as-a-service expectations



MOT Transport Outcomes Framework



1: LIFE SAFETY

Avoid mass casualty events
Protect vulnerable persons
Ensure safety at mass gathering points
Preserve high value skills and resources
Support immediate response activities
Maintain a perception of safety

2: SOCIAL RECOVERY

Ensure equitable access to essential goods and services
Enable effective governance
Have places to connect
Return sense of normalcy
Retain sense of place and cultural identity

3: ECONOMIC RECOVERY

Restore enabling services and industries
Enable people to work
Build business confidence

4: MINIMISE ENVIRONMENTAL IMPACT

Minimise waste generation
Avoid hazardous waste or potential public health risks
Reduce embodied carbon

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- Decision-making under uncertainty

