Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Stantec

South Island Freight Study

Study objective:

To understand the movement of freight in the South Island

better informing infrastructure planning and investment

Action plan

Phase	What	Why	Cost
Short Term (<12 months)	Maximise use of existing data to better understand demands and plan infrastructure	Consistent presentation of data and understanding of proposals with freight component	**$**
Medium Term (12-36 months)	Fill existing data gaps	Consistent evaluation of proposals and smarter use of available and new freight data	**$$$**
Long Term (24 months+)	Standardise use of data for long term planning	Robust evaluation including future scenarios of proposals with freight component	**$$**

Scope

Task 1 – Project Establishment and Start Up

This phase sets the direction for the project. Key outcomes from this phase of the project include:

- An agreed stakeholder list to interview,
- An agreed questionnaire for use in the stakeholder interviews; and
- Agreed regionally and nationally developed work relating to South Island freight movements to be reviewed.

Task 2 - Stakeholder Interviews and Literature Review

Information finding. Specifically:

- Interviewing stakeholders in the project establishment phase and collating and reporting on insights,
- Review of the provided regionally and nationally developed work relating to South Island freight study identified and provided from Task 1.

Scope

Task 3 – Data Insights and RTC Presentation

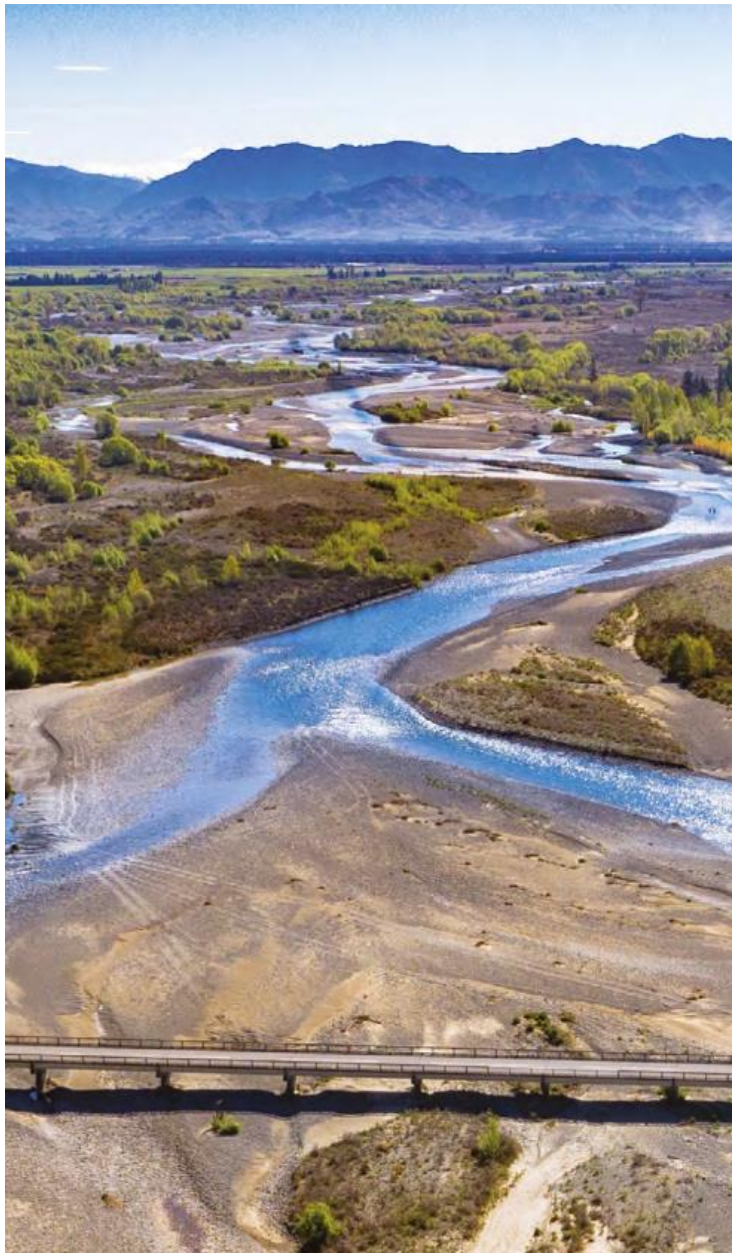
Here the insights and data learnt in the previous phases are collected and analysed in a way for presentation.

Task 4 – Reporting

This work closes out Phase 1 of the study. It documents the findings from the literature review, interviews and other insights gained during this phase of the freight study in a simple and easy to understand manner.

Conceptual approach to study

- Confirm overarching objective
- Understand issues by interviewing infrastructure owning stakeholders
- Identify issue themes, potential benefits and relevant information gaps (if any) and possible KPIs
- Review supporting literature and available data, identify any gaps (that aren't being resolved elsewhere)
- Identify ways to resolve issues and deliver benefits, strategic response
- Identify plan of next steps, potential investment and level of benefits to frame scope of stage 2
- Engage with Chairs on next steps and funding pathways



Interview process

Interview process

- *Eight interviews from 30th July to 6th September*
- *Seven organisations (MoT has not yet participated):*
  - Dunedin City Council
  - Christchurch City & Selwyn District Councils
  - Marlborough Roads
  - Environment Southland
  - KiwiRail
  - NZTA (3):
    - Data insights
    - National freight planning
    - South Island context

Interviews

Interviews

Organisations
- NZTA (x3)
- KiwiRail
- Marlborough Roads
- Christchurch City Council
- Selwyn District Council
- Dunedin City Council
- Environment Southland

Common problems

Reliance on local knowledge and relationships to understand how freight uses the transport network

Limited awareness of Origin Destination data for different modes and specific products / commodities being moved

A lack of network resilience especially enabling alternative routes

Uncertainty about the impacts of upstream and downstream freight supply chain changes (new hubs, distribution points, land use changes)

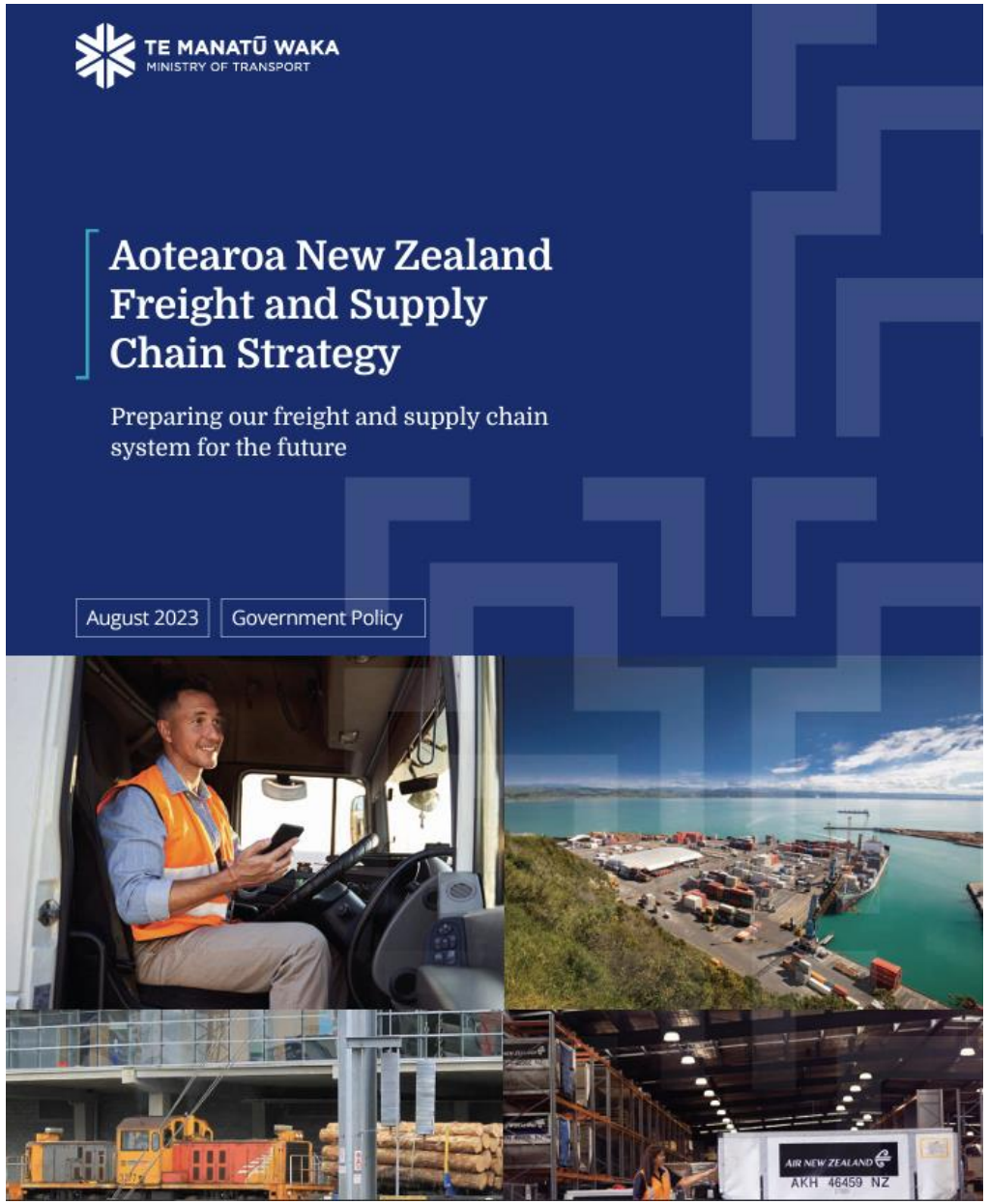
Investment proposal themes

System Improvement Proposal

Responding to a Development Proposal and Land Use Change

Interview themes raised and discussed

Theme	CCC	SDC	DCC	ESouth	KiwiRail	MR	NZTA Data	NZTA Freight planning	NZTA SI Context
OD Data / Movements	Unaware entirely	Unaware entirely	Unaware entirely except local knowledge		Yes (rail only)	No Limited exceptions for some industry	Yes	Yes	Yes (not widely known)
Resilience		Aware	Low priority	Yes	Yes		Yes	Yes	Yes
Uncertainty and Supply Chain Changes	Somewhat	Somewhat	Somewhat	Yes	Yes	Aware	Yes	Yes	Yes
Local Knowledge & Relationships		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

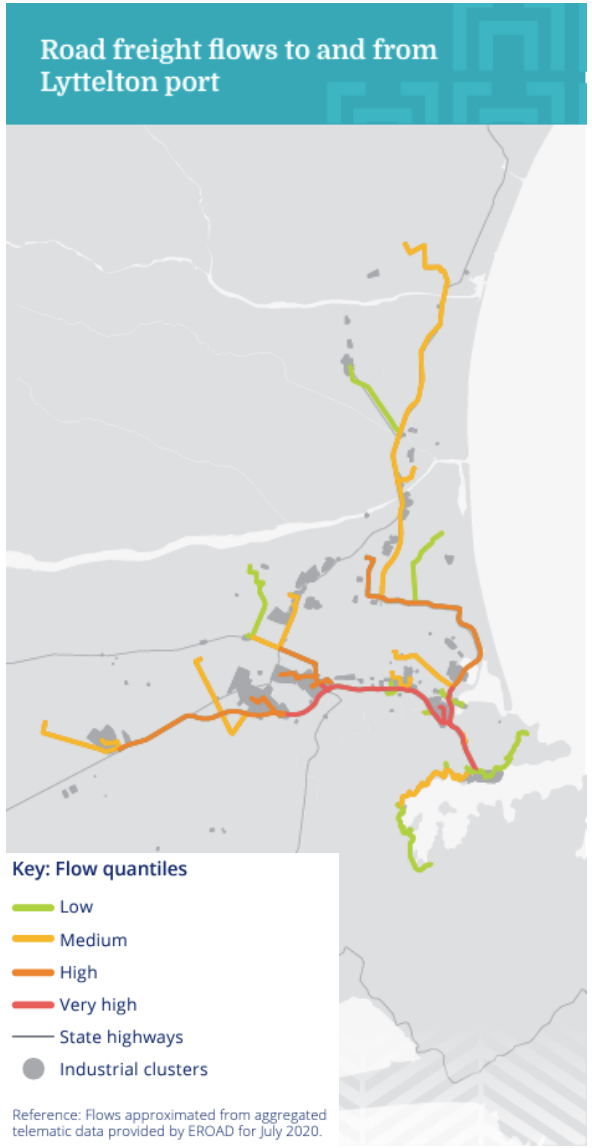


Literature review

Document type	Frequency
National level studies	10
National level tools / frameworks	3
National level policy documents	4
South Island level studies	3
Regional level studies / strategies	3
Research reports	6
Network design / planning document	1
TOTAL	30

Literature review summary

Document type	Key literature takeaways	Relation to the objective
National level studies	There are lots! Much of the information is at a high level.	Some of the data can be used, but may can require additional work to be able to be applied in a focused way in the South Island.
National level policy documents	A few, some outdated – such as the Planning Policy Manual (2007), others age quickly with change of government.	Usually more indirectly related – for example informing and directing regional or district plans.
South Island level studies	There have been a few, and these have helped to develop a common approach / view.	These studies have helped provide data and analysis, and an action plan related to the objective.
Research reports	The research reports are often on specific topics	Some provide specific tools that could be used – e.g. Freight route lifeline criticality assessment, or level of service metrics.
National level tools and frameworks	Some really useful tools available that provide some overall direction.	For example – ONF/ONRC provides a high-level framework for applying what is known to understand freight movement.
Regional level strategies / studies	Great examples of work done at a regional level.	Brings together understanding of freight on a regional level, with regional focused actions.
Network design / planning document	A broad range of information provided from planning to designing.	Some information may be directly applicable at the problem / option level.

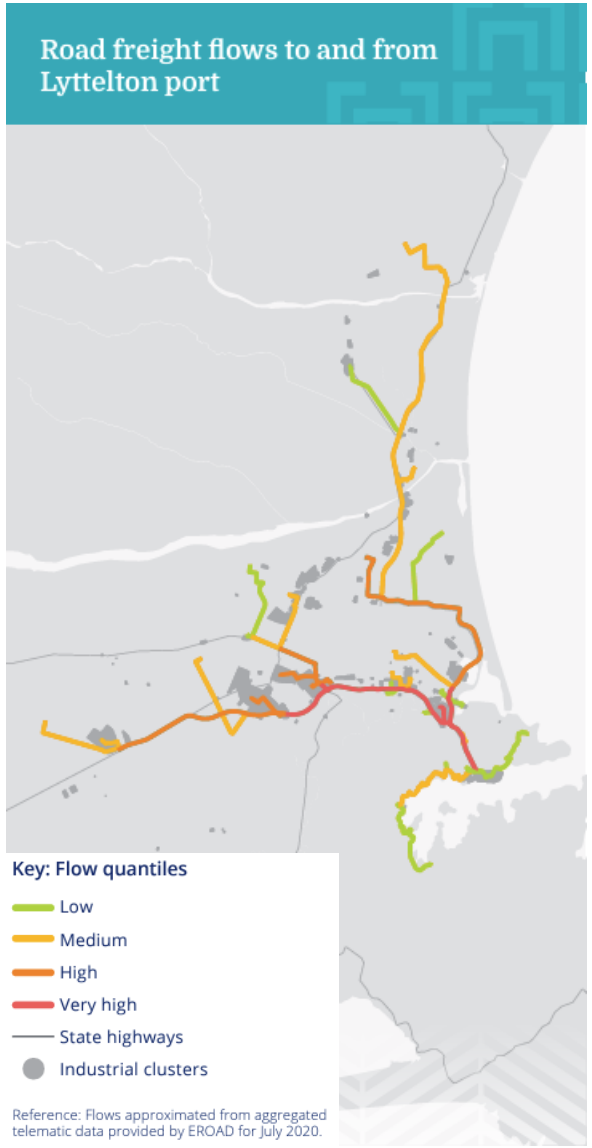


Improving understanding of freight

- There is limited guidance / assistance on how to plan, develop, support freight networks
- We don’t always have a strong grasp on the trip generation of various land use activities
- New, and disruptive technology is a fast changing and developing area
- How demographic change will impact the freight task is not well understood
- Freight policy changes regularly
- The knowledge of goods value on each journey leg is variable
- Relative inefficiencies of different parts of the freight task (to compare scale of problem) is not well understood across the system
- Efficiency disruption knowledge and planning is limited – for example detour planning

Combining what is known and desired

ID	Problem/Opportunity	Examples	What we have	Knowledge gaps based on interviews and literature review
P1	Productivity now	Inadequate infrastructure Competing infrastructure uses Different controlling authorities, and functioning of the authorities	RAMM AADT Travel time data NFDS	Richer Origin/Destination data Knowledge of scale of opportunity (i.e. the value of the movement), and in relation to other opportunities. Assistance to prioritise investment (tools / data)
P2	Productivity future	Movement growth Changing demographics Changing freight task New disruptive technology	NFDS Stats NZ Freight supplier surveys	
P3	Network disruption	Resilience events	Resilience risks on the state highway network Resilience risks on the KiwiRail network State highway detour routes Council hazard databases	Assistance and/or standard approach to detour planning and treatments (both planning and response phases) Rating of local road resilience risks (how big are the problems?)
P4	Movement impacts now	Competing uses – congestion, severance Infrastructure – pavement degradation / maintenance costs Environmental impacts Road safety	AADT Travel time data RAMM (Pavement) CAS / IRR / KiwiRap District Plan requirements Design guidelines / standards	Assistance to prioritise investment (tools / data) – for example maintenance
P5	Movement impacts future	New disruptive technology Movement impacts now assessed with predicted future volumes New land use developments	Transport models Trip generation studies District Plan requirements Design guidelines / standards	Assistance to prioritise investment (tools / data) – for example maintenance



Suggested responses from interviews

- Improved access to OD Data
  - Split by commodity type
  - Related to land use
- Route preference for Heavy Vehicles to include alternative routes
- Double handling costs - awareness
- More Weigh in Motion data across the country
- Updated trip generation rates – including logistics hubs
- Centralised forecasts for freight generation / demand
- Understanding the value of freight movements:
  - Value by dollar amount and economic impact
  - Value by importance to the community

Data fragmentation – a case study

The Proposal

Recent Dunedin studies looked at the feasibility of rail transfer facilities to enable mode shift for freight moving to port:

- A DCC study explored a log and container facility near Milton/Milburn.
- A private sector study explored a container facility in Mosgiel.

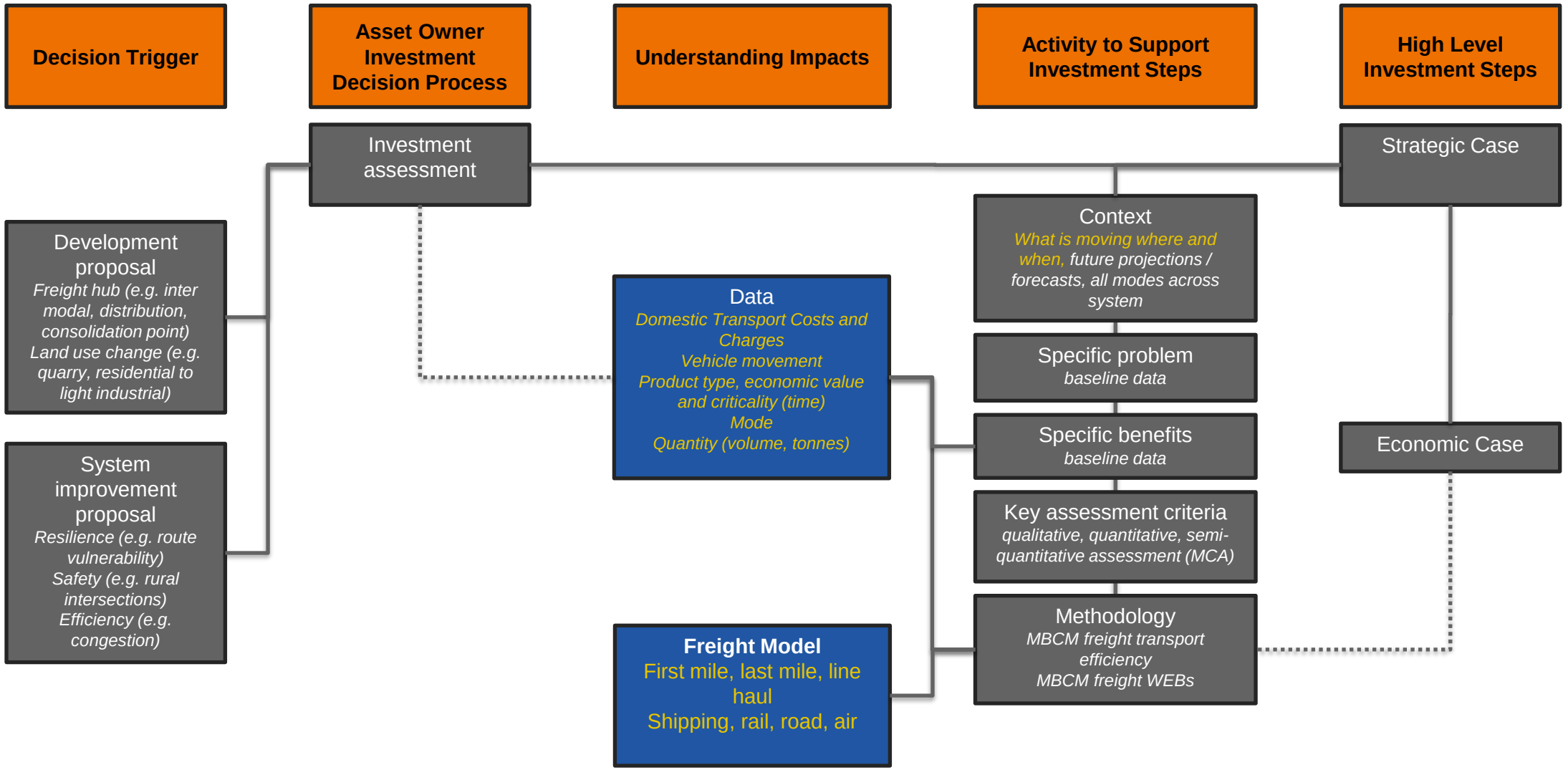
Both sought to change land use and consolidate industrial movements away from central Dunedin in different ways.

The Issues

The lack of a consistent source of data on movements caused issues for both projects:

- The DCC project had to rely on discussions with freight shippers to build on limited data from the National Freight Demand Study and other sources.
- The private project had to rely on limited commercial data from participating trucking companies.
- Gaps in the data sources resulted in estimates being made (roughly validated by companies involved – reliant on positive relationships).
- Only high-level benefits and changes in externalities (maintenance, safety, CO2, noise pollution etc.) from removal of trucks could be assessed. Not impacts to wider journey times etc.
- Inconsistent approaches to quantifying benefits made comparing the proposals difficult despite their similar focus.

Freight information & investment decisions



Actions needed to inform decisions: context

The Issues

While triggers for assessing an investment proposal may change, the data required to effectively assess them does not:

- The data to understand how investments impact freight and economic outputs is not readily available
- The is a lack of consistency in how we assess projects from a freight perspective
- The ability of a region to understand the impacts and prioritise projects within their RLTP is inconsistent.

South Island / National Data

Data
Domestic Transport Costs and Charges
Vehicle movement
Product type, economic value and criticality (time)
Mode
Quantity (volume, tonnes)

Freight Model
First mile, last mile, line haul
Shipping, rail, road, air

Volume / tonnage
Mode
Economic impact

How this fits into activity to Support Investment Steps

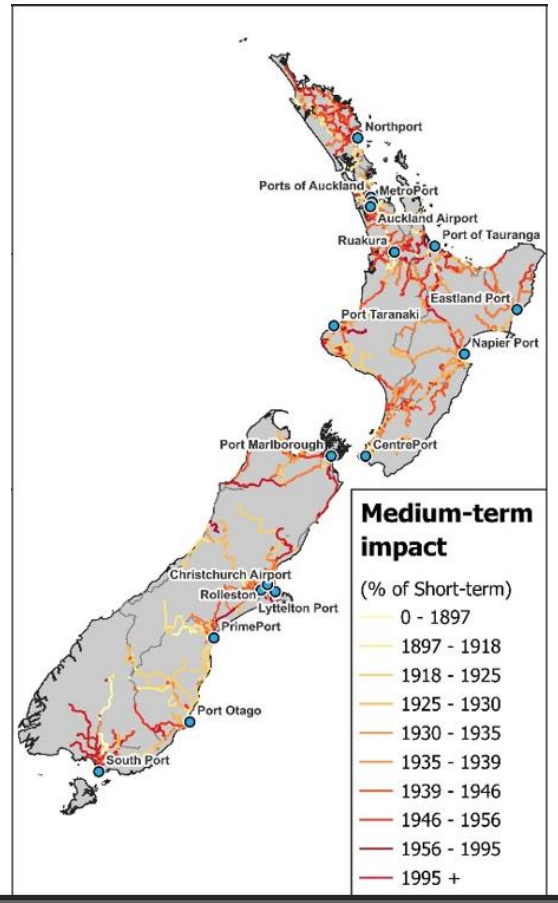
Context
What is moving where and when, future projections / forecasts, all modes across system

Specific problem
baseline data

Specific benefits
baseline data

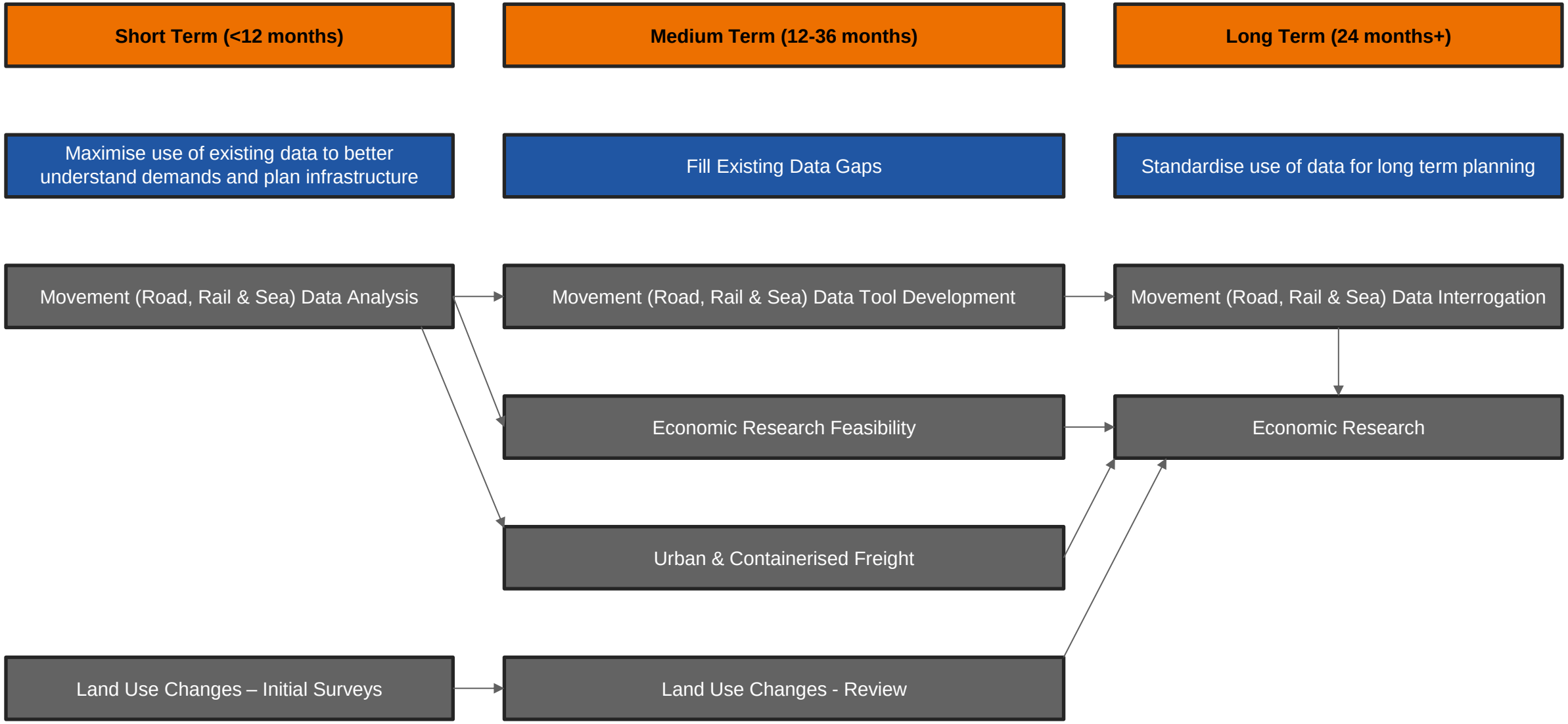
Key assessment criteria
qualitative, quantitative, semi-quantitative assessment (MCA)

Methodology
MBCM freight transport efficiency
MBCM freight WEBs



We currently can estimate impacts of resilience events, but haven't yet combined EROAD and economic modelling to understand freight contributions to the economic outcomes

Action plan


Short Term (<12 months)
Medium Term (12-36 months)
Long Term (24 months+)
Maximise use of existing data to better understand demands and plan infrastructure
Fill Existing Data Gaps
Standardise use of data for long term planning
Movement (Road, Rail & Sea) Data Analysis
Movement (Road, Rail & Sea) Data Tool Development
Movement (Road, Rail & Sea) Data Interrogation
Economic Research Feasibility
Economic Research
Urban & Containerised Freight
Land Use Changes – Initial Surveys
Land Use Changes - Review

Action plan – short term

Action

Short Term (<12 months)

Movement (Road, Rail & Sea) Data

- *Work with NZTA to analyse existing EROAD data to understand commodity types movement through the SI with existing data sets*
- *Engage with KiwiRail & ports to understand their freight movements relevant to the South Island*
- *Develop visualisation tools, such as heatmaps of freight movements within the South Island*
- *Work with NZTA to procure NZ Post / Navman / courier data to understand last mile distribution*

Land Use Changes

- *Review freight movements around the Rolleston iZone / Fairfield Freight Hub to better understand actual trip generation rates*

Outcomes

Maximise use of existing data to better understand demands and plan infrastructure

Movement (Road, Rail & Sea) Data Outcomes

- *Understand the overarching movement of HCVs with an indication of the type of goods through the company ISO classification*
- *Understand the quantity of freight moved by rail to better understand where the mode is most competitive*
- *Ability to visualize and understand freight movements to better inform infrastructure planning*
- *Understanding of final mile and urban freight movements*

Land Use Changes Outcomes

- *Improved understanding of the change in freight movements from new freight hubs including trip generations and impacts to local networks and maintenance impacts*

Implementation

Date	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
ERUC data analysis (first generation)	$20-50k								
Early engagement and data sourcing with NZTA									
Initial data review and data cleaning									
Data analysis & presentation									
Engagement with KiwiRail and ports	$20-50k								
Engagement with KiwiRail									
Engagement with Ports									
Agree data sharing / non disclosure agreements									
Data cleaning & analysis									
Visualisation tools development (first generation)	$35-100k								
Engagement of GIS contractor									
Visualisation development									
Visualisation finalisation									
Last mile freight data	$50-100k (assumes NZTA purchases the data)								
Early engagement and project structure agreement									
Procurement of last mile freight data									
Integration into EROAD data standards									
Import into visualisation tools									
Land use change surveys	$20-50k								
Engage surveys around iZone									
Analysis of results									
Engage surveys around Fairfield									
Analysis of results									
Comparative report between iZone and Fairfield Freight									
Medium and long term work scoping	$10-20k								
Scope medium term works									
Scope long term works									

Action plan – medium term

Action	Outcomes
Medium Term (12-36 months)	Fill Existing Data Gaps
Movement (Road, Rail & Sea) Data • *Work with NZTA to develop new tools to interrogate the EROAD Data – i.e. identifying dwell periods, trip chaining, route choice, real time travel time reliability/variability The South Island should position itself as an ideal spot to develop tools* • *Identify key resilience events to understand freight supply chain changes from the past 10 years (multi modal assessment) including long term changes* • *Proactively identify routes where changes are expected to monitor and understand changes (i.e. the shift from road to rail to Lyttleton Port)*	Movement (Road, Rail & Sea) Data Outcomes • *Consistent tools to understand freight movements and assess various investment proposals will result in consistent and unbiased decision making* • *Improved understanding of how the freight supply chain responds to resilience events of various severity and economic impact* • *Improved understanding of how the freight industry responds to changes influencing altered mode choice by logistics companies*
Economic Research • Feasibility study of incorporating EROAD data into economic models (MERIT, computable general equilibrium economic models) • Case study in using economic outputs of models to better understand net economic impact of various freight movements	Economic Research Outcomes • *Improved economic models which can be used to understand the economic benefits at a high level from infrastructure investment* • *Proof of concept if value of freight movements can be understood by region to specific areas*
Urban & Containerised Freight • *Engagement with Foodstuffs & Woolworths to understand the food distribution chain* • *Engagement with key logistics companies to understand drivers for where modal shift works*	Urban & Containerised Freight Outcomes • *Understanding of drivers for food distribution and identification of areas of concern from a resilience perspective* • *Ability to understand drivers for mode shift and where it makes economic sense*
Land Use Changes • *Utilise data from the short term to review effectiveness of the ITAs prepared in support and identify whether or not trip generation rates require updating and understanding expected maintenance impacts*	Land Use Changes Outcomes • *Improved understanding of freight generations rates and impacts to maintenance and capital programmes to effectively support the development*

Action plan – long term

Outcomes

Long Term (24 months+)

Movement (Road, Rail & Sea) Data

- *Utilise the tools developed in the medium term to analyse and understand key freight movements through key areas, ports, airports, rail hubs and industrial areas*
- *Consider application of a model where freight logistics companies can share data through an anonymised central government toll (e.g. FLOW example)*

Economic Research

- *Research in conjunction with NZTA to update MBCM incorporating:*
  - *Economic value of freight movements*
  - *Freight investment prioritisation methodology*
- *Develop freight proposal assessment guidance*

Outcomes

Standardise use of data for long term planning

Movement (Road, Rail & Sea) Data

- *Complete understanding of the freight movements around the South Island*
- *Detailed understanding of freight movements and generation in key activity areas*
- *Ability for freight companies to react and plan in real time to demand*

Economic Research

- *Consistent process for assessing freight proposals based on recent evidence which is updatable*
- *Consistent process for understanding likely impacts of changes to land used based on research*