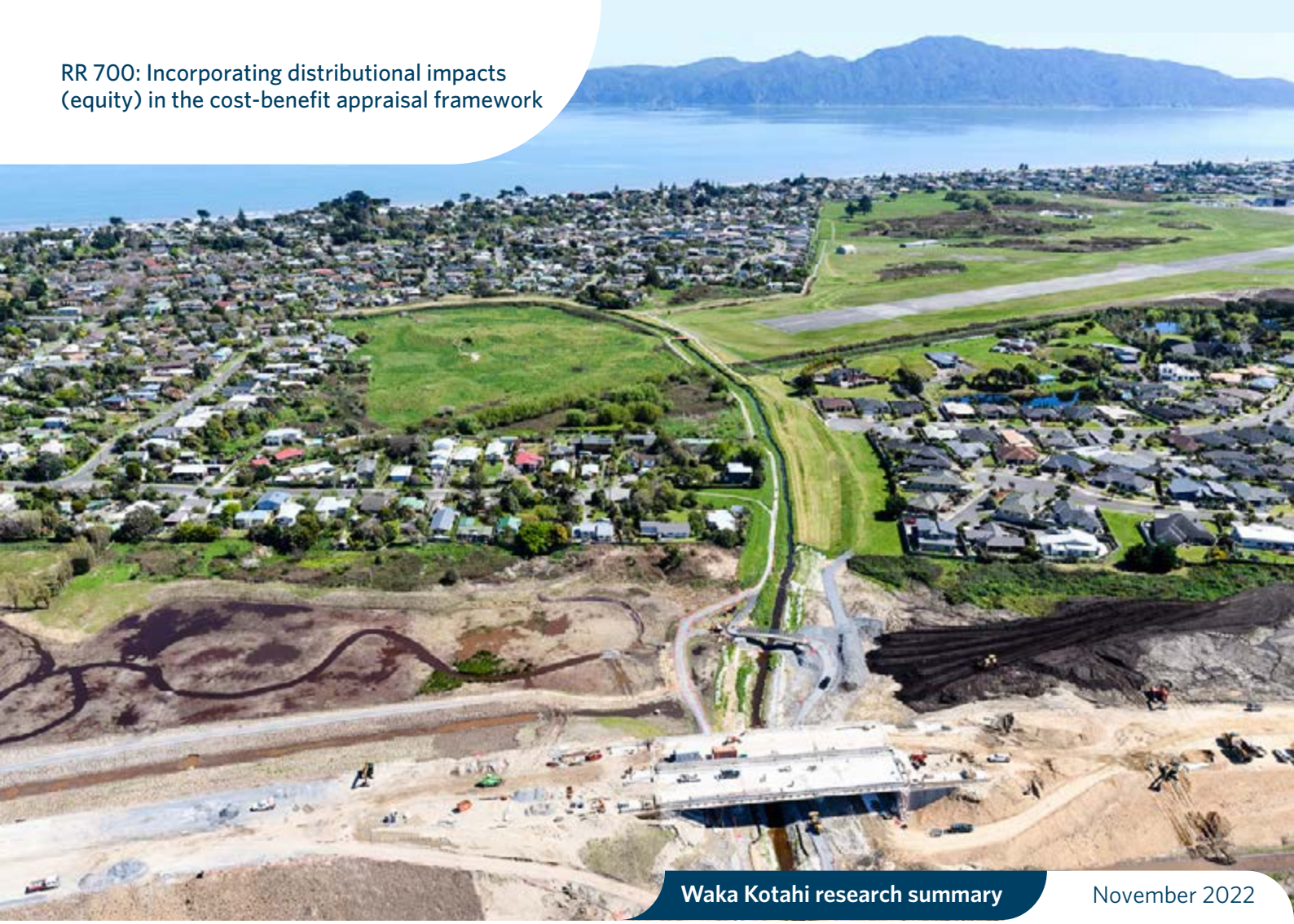

Waka Kotahi research summary

November 2022

Transport initiatives – who benefits?

Transportation decisions can have large and varied impacts on travellers and their communities. It's important to measure these effects and consider their impact on various groups when planning projects.

Waka Kotahi uses a framework to decide which transport projects and programmes to pursue. The economic business case must contain a cost–benefit analysis (CBA). CBAs assess the economics of a proposal by valuing (monetising) the costs and benefits to all members of society. However, CBAs sum across a wide range of people and don't calculate inequities between groups or individuals, or who ultimately benefits from the project.

Investigating transport equity

Transport equity discussions focus on social justice. Equity impact analysis helps policymakers to make good decisions for a wide range of people, and the researchers suggest considering distributive justice along with CBA results.

To measure equity, we need to:

- identify the equity type
- identify who is affected
- identify and measure the range of outcomes.

Most studies find that multi-criteria analysis addresses the shortcomings of the CBA framework. This is consistent with Waka Kotahi multi-criteria guidelines.

WAKA KOTAHI NZ TRANSPORT AGENCY

Te Kāwanatanga o Aotearoa
New Zealand Government

Literature review

The researchers found that a monetised benefits and costs manual (MBCM) needs to provide equity estimates across various impacts and consider different scenarios. Their preferred method extended the current MBCM approach to distributional analysis, providing further scenario analysis of various impacts. This is a comprehensive approach using publicly available data and the current mobility-based approach of the Waka Kotahi MBCM. The output measures from distributional analysis can also be used in a multi-criteria analysis.

They found that distributional analysis:

- gives more information to policymakers
- can be used within the Waka Kotahi MBCM
- is a step toward equity analysis in current CBAs
- can be improved in the future.

The researchers identified four scenarios for further investigation in distributional analysis:

- Scenario 1 – baseline (MBCM): Status quo method used to compare with other scenarios.
- Scenario 2 – extended scenario: Adds measurements of benefits and burdens that are not included in scenario 1.
- Scenario 3 – income adjustment: Adjusts scenario 2 for the decreasing marginal utility from income. A standardised, simplified version of a welfare-weighted method.
- Scenario 4 – time effect: Accounts for long-term effects. Includes long-term health and environmental effects and longer-term intergenerational issues, using a lower discount rate (compared with scenario 2).

A standardised four-scenario approach allows:

- a transparent and consistent appraisal of projects
- a more customised approach to CBA
- a minimalist introduction of welfare weights into CBA.

Case study: analysis of Auckland Transport Alignment Project

The researchers used distributional analysis to evaluate the Auckland Transport Alignment Project and identified various impacts. The table below summarises their findings across household income groups.

Summary of the distributional analysis of the Auckland Transport Alignment Project 2021–2031

	Household income groups				
Social group	**1) $1–$30,000**	**2) $30,000–$70,000**	**3) $70,000–$100,000**	**4) $100,000–150,000**	**5) $150,000 or more**
User benefits	✓✓	✓✓	✓✓	✓✓✓	✓✓
Air quality	–	–	–	–	–
Accidents	✓✓	✓	✓✓	✓✓	✓✓✓
Security	–	–	–	–	–
Severance	–	–	–	–	–
Accessibility	✓✓	✓✓	✓✓	✓✓	✓✓✓
Labour market deepening	–	–	–	–	–
Social cohesion	–	–	–	–	–
Affordability	✓✓✓	✓✓	✓✓	✓	✓

Source: Principal Economics

Note: Ticks show the relative benefit to different income groups, ranging from less beneficial (✓) to more beneficial (✓✓✓).

The researchers suggest that the outputs of the distributional impact analysis need to be complemented with wider investment and planning considerations. This includes any comprehensive policy framework that accounts for the overlapping effects of transport, housing and taxing policies.

For example, transport investment initiatives bring improvements to living environments. This can result in increases in housing costs, which can result in people on lower incomes moving out. This leads to social exclusion.

Recommendations for further research

The study provides a useful approach for the assessment of distributional impacts. Further research is needed to:

- improve the accuracy of the method and outputs of the distributional analysis
- measure distributional effects of equity impacts not yet quantified.
- Future studies should provide further information on:
- the use of accessibility in the Waka Kotahi MBCM
- measures of accessibility and their relevance to policy targets, including resilience and wellbeing
- the 'willingness to pay' of different socioeconomic groups for improved accessibility.

The researchers identified accessibility and enhanced-capability benefits (method D) as a comprehensive and useful method for considering equity effects. However, they suggest the current transport equity studies are focused on providing access to all groups, without taking demand into consideration. A useful approach accounts for demand and the importance of accessibility to different socioeconomic groups.

The results provide quantitative information on equity impacts and allow for different perspectives within a CBA. The outputs of a CBA will always need to balance against other priorities.

For a more comprehensive transportation equity analysis, additional research and data collection are needed.

RR 700: Incorporating distributional impacts (equity) in the cost-benefit appraisal framework, Waka Kotahi NZ Transport Agency research report. Available at **www.nzta.govt.nz/resources/research/reports/700**