Understanding and optimising the greenhouse gas reduction potential of land transport investment programmes

Climate Assessment Tool for Investment (CATI)

Transportation Group NZ
Decarbonising Transport Conference 2021, Auckland
Tuesday 11th May 2021

Rob Hannaby
Lead Advisor - Environment

WAKA KOTAHI NZ TRANSPORT AGENCY

New Zealand Government

Investment decision making and long-term GHG emission reduction

- Paris Agreement 2015 - Article 2.1.c
  - “Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development”.
- Climate Change Commission Draft Advice 31 Jan 2021: Time Critical Action 6 - Align investments for climate outcomes
  - “To meet emissions budgets and achieve the 2050 target, it is important that policy decisions and investments made now do not lock Aotearoa into a high emissions development pathway. Safeguards and signals will be needed to prevent this, including a specific focus on ensuring long-lived assets such as infrastructure are net-zero compatible”.

Waka Kotahi and Investment

Managing the funding of the land transport system

- Waka Kotahi has a very significant investment role on behalf of Government
- Waka Kotahi Investment Decision Making Framework Review, implemented in August 2020, resulted in investment settings that:
    - are aligned to the Treasury's well-being framework and give effect to the Government Policy Statement on Land Transport.
    - include a mandatory requirement to consider GHG emissions as part of economic assessments and optioneering exercises.
- Toitū Te Taiao Our Sustainability Action Plan provides for further action to enable investment settings that:
    - take into account the long term,
    - are balanced and,
    - achieve multiple outcomes ahead of trade-offs.

National Land Transport Programme 2018-21

- National Land Transport Fund
- Crown Funding
- Local Authority Funding

Waka Kotahi and GHG Emission Reduction

Toitū Te Taiao Our Sustainability Action Plan

WHAT WE WILL DO

As part of the Investment Decision-Making Framework Review, we will:

Summary actions Headline actions to June 2021

Enable investment for land transport GHG emission reductions through:

- Embedding long term emission reduction objectives and emissions-based thinking into planning, investment and accountability instruments (includes consideration of planning and investment bottom lines)
- Designing and implementing a methodology to support emission profiling and monitoring of national and regional land transport programmes; and significant infrastructure with an inter-generational life
- Working with central government partners to establish values for carbon aligned to international best practice.

https://www.nzta.govt.nz/about-us/about-waka-kotahi-nz-transport-agency/environmental-and-social-responsibility/toitu-te-taiao-our-sustainability-action-plan/

Climate Assessment Tool for Investment (CATI)

An innovative tool designed to inform decision makers about the potential for greenhouse gas emission reduction from different investment programmes.

Climate Assessment Tool for Investment (CATI)

Enabling informed early investment decision making at the programme-level is critical

Problem

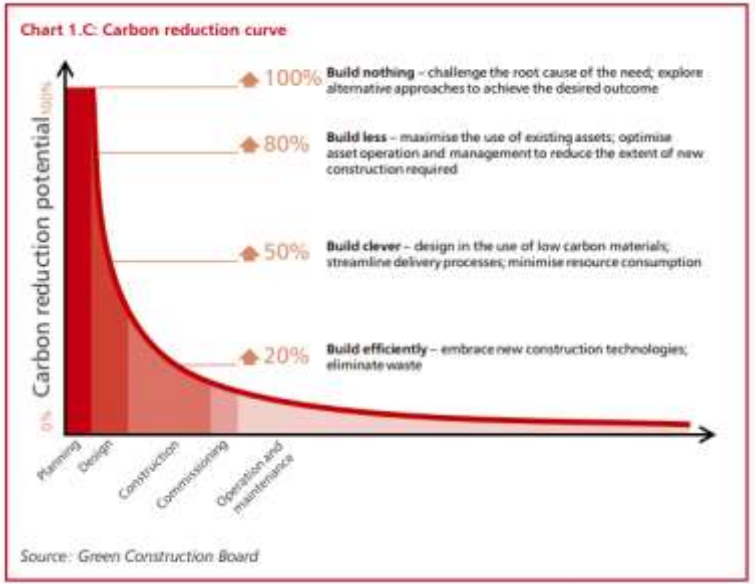
There is currently no simple method, that can be applied quickly, to comprehensively and robustly understand how investment programmes might positively or negatively impact land transport emissions.

Opportunity

How can we provide decision-makers with the ability to make informed early decisions about investment programmes so that they positively contribute to reducing land transport emissions?

Climate Negative	Climate Neutral	Climate Positive

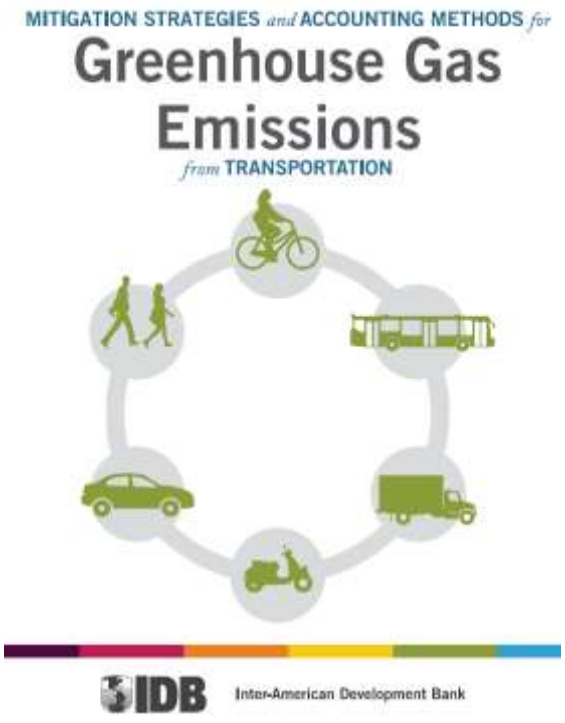
Tackle carbon early



https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/260710/infrastructure_carbon_review_251113.pdf

CATI
Concept Design

Climate Category	Activities [Activity class/work category/TIO information]	Influencing factors	Rating
Climate +ve **Carbon reduction potential**	Public Transport; Walking and cycling; Demand management (incl. Intelligent Transport Systems; High occupancy vehicle (HOV) lanes)	Population density Land use Scale of impact Pace of impact Existing or new	**6-7: H-VH**
			4-5: M-MH
			2-3: L-LM
Climate neutral	Road maintenance, resilience, safety		**1 Low-Neutral**
Climate -ve **Carbon increase potential**	Road improvements (primarily road capacity improvements and responding to growth)		**0 Negative**



https://publications.iadb.org/en/publication/16402/mitigation-strategies-and-accounting-methods-greenhouse-gas-emissions

CATI

Scope and limitations

- Generates a qualitative assessment of the relative potential to reduce enabled (vehicle tailpipe) emissions of interventions included in land transport investment programmes.
- Multi-modal projects require investments to be appropriately apportioned across climate (emission reduction) categories.
- Current version does not assess the following programme aspects (other tools and approaches are needed):
  - Tonnes/year of GHG emissions / carbon dioxide (up or down)
  - GHG emission monetised costs and benefits
  - Implications of broader system policy settings, e.g. implementation of vehicle emission standards, local government parking policy, spatial planning committments, etc
  - Construction, operation and end-of-life GHG emissions

CATI

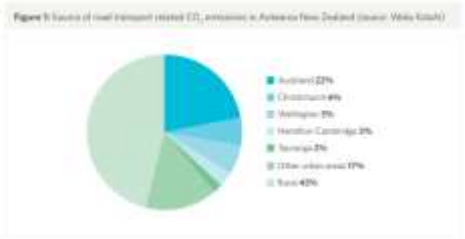
Using the tool

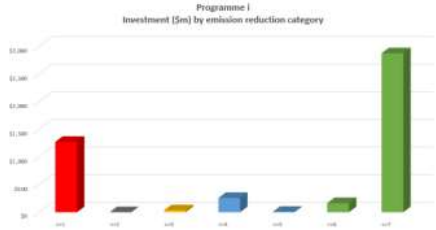
Table 4. Transport GHG reduction strategies: Implementation challenges and impacts

TRANSPORT GHG REDUCTION STRATEGY	IMPLEMENTATION DIFFICULTY	IMPLEMENTATION COSTS	VKT REDUCTION	GHG EMISSIONS REDUCTIONS
PUBLIC TRANSPORTATION IMPROVEMENTS				
Operational improvements	Medium	Low	Medium - High	Medium - High
Fare system improvements	Medium	Low	Low - Medium	Low - Medium
System integration in priority corridors	Medium - High	Low - Medium	Medium	Medium
Bus rapid transit	Medium	Medium - High	Medium - High	Medium - High
Light rail, metro rail, and commuter rail systems	High	High	Medium - High	Medium - High
Eco-useful life regulation and vehicle phase-out, scrappage programs	Low - Medium	Low - Medium	Medium	Medium

Influence: Scale	Influence: Infrastructure	Influence: Fit to Context	Influence: Density	Avg Influence	Regional Rating	Rounded Regional Rating
1.25	1	1	1	1.0625	0	0
1.25	1	1	1	1.0625	2.125	2
1.25	1	1	1	1.0625	3.1875	3

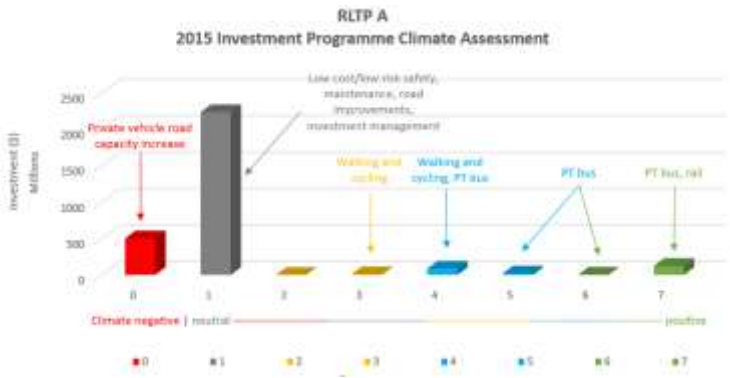
Capture Investment Programme Elements → Apply Generic Rating → Confirm Geographical Emission Context → Apply Influencing Factors → Validate Influencing Factors → Generate Programme Specific Rating → Create Programme Outputs

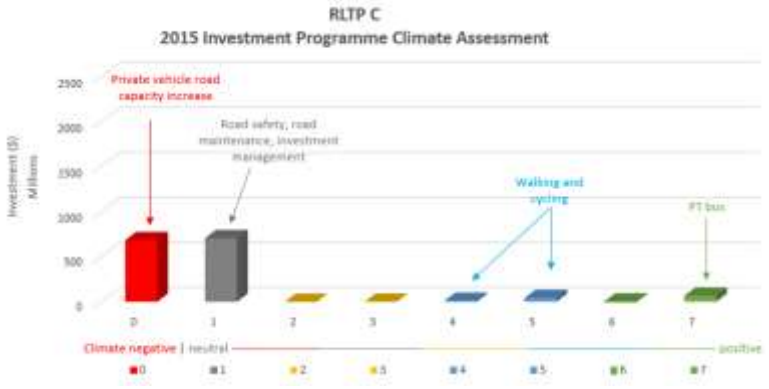




CATI Early Application

Establising Regional Land Transport Plan (RLTP) baselines



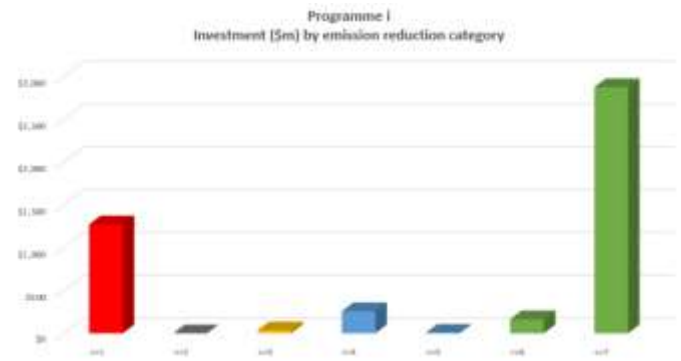


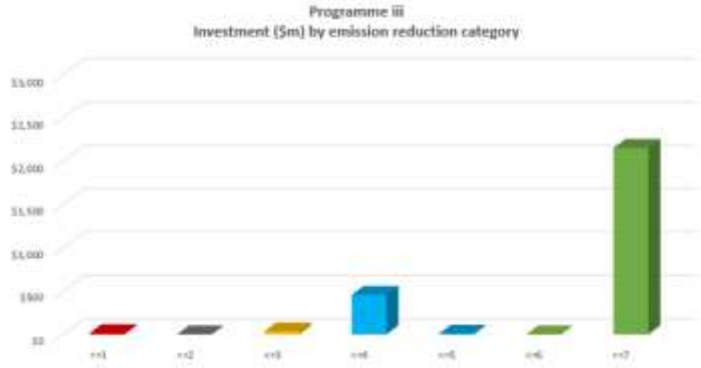
CATI can be used to assess, monitor and report investment programme baselines.

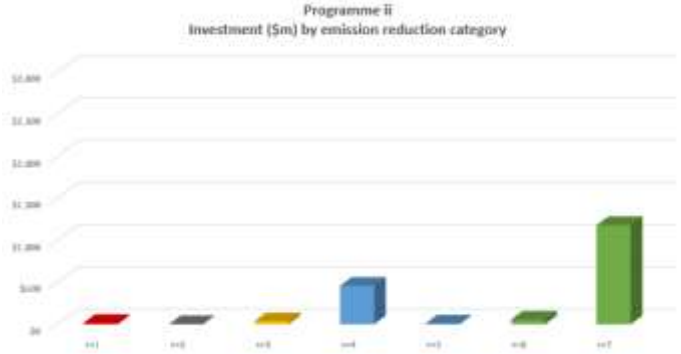
This allows relative comparisons to be made and provides a potential mechanism for benchmarking programme investments.

CATI Early Application

Testing programme options







CATI can be used to test programme options and to support multi-disciplinary team engagement and constructive challenge.

It allows options to be quickly assessed to understand how different interventions affect the emission reduction potential of a programme.

CATI Work Programme

Current focus

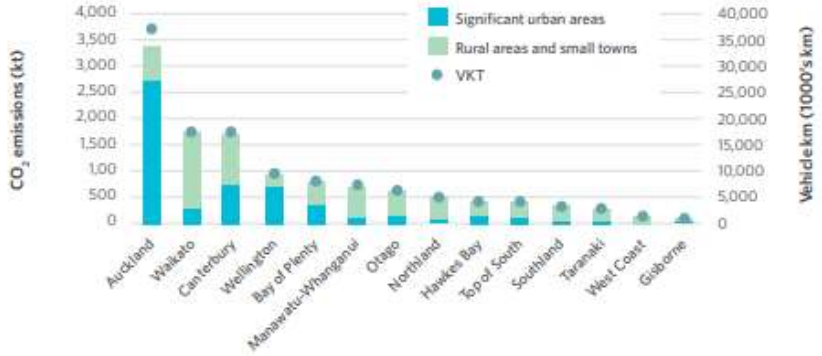
1. Finalise beta version
2. Establish 2018 and 2021 RLTP and NLTP baselines
3. Enhance robustness of tool
   - QA/QC
   - Influencing factors
   - Investment categorisation
4. Improve functionality and user experience
5. Develop in-house capability
6. Engage with stakeholders and partners – especially local government
7. Integrate CATI within broader Waka Kotahi investment decision making requirements

CATI Work Programme

Complementary Tools and Analysis

- Understand the strategic land use and transport planning context
- Use regional strategic transport models to predict:
  - Vehicle Kilometres Travelled
  - GHG Emissions
- Use Waka Kotahi Vehicle Emission Prediction Model and Mapping Tool to understand baseline land transport enabled emissions
- Benchmark against comparable investment programmes and test the outcomes delivered
- Explore options to make better use of innovative policy and research transport and emission models.
- Undertake screening assessments of emissions associated with infrastructure construction (e.g. embodied carbon in materials) and operation (e.g. energy used for lighting).

Figure 2: Annual CO_2 emissions (kilotonnes) in rural and urban areas compared to total vehicle kilometres travelled (VKT) in 2018 *(source: Waka Kotahi)*



https://www.nzta.govt.nz/assets/About-us/docs/tiakina-te-taiao-sustainability-monitoring-report.pdf

CATI is one new tool of many that will be needed to understand and optimise the GHG emission reduction potential of land transport investment programmes

Questions?

Rob Hannaby

Lead Advisor –Environment

Safety, Health and Environment