



Project Title - How New Zealand's land use and transport patterns shape transport energy demand

Host University - University of Otago

Industrial Partner – ViaStrada Ltd.

Academic Supervisor(s)

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Project Description

This project will develop novel metrics of transport accessibility that includes the energy demand associated with particular land use and transport patterns in Aotearoa New Zealand and considers the energy costs associated with transport for different population groups. Metrics will be available in a dashboard and available to the public sector, developers and the community to add value to investment cases and support healthy, equitable and sustainable development of our towns and cities.

A just and resilient energy transition requires innovative and cost-efficient solutions to reduce energy consumption in the transport sector, ensuring that energy that is consumed is sustainable, equitable and benefits communities and population wellbeing.

We will take an equity- focused approach in this project. There is growing international attention being paid to the concept of Double Energy Vulnerability (DEV) which brings transport related energy use into definitions of energy hardship and fuel poverty. Although the public health implications of energy hardship have been well researched, transport energy use has largely been excluded from existing research.

More connected, accessible places where destinations important for daily life are within easy reach can help reduce transport energy consumption both by reducing the need to travel so far, and by facilitating use of lower energy forms of transport, such as walking and cycling. Reducing the need to travel has been identified as the most equitable way in which to achieve a mode-shift to lower carbon transport. International approaches such as Accessibility Planning and X-minute cities have advanced the idea of planning for more connected and accessible cities, but these have not been explicitly linked to energy consumption in an Aotearoa context.

Linking accessibility metrics to socio-demographic data in the Integrated Data Infrastructure offers a rich resource for modelling the transport energy needs of different communities and could be used to model different development scenarios, their energy intensity, and health equity and wellbeing implications. This project will use existing administrative data sets, population level surveys, and accessibility metrics to advance knowledge on the transport energy needs of different land use scenarios and model the implications of transition pathways for different population groups. We expect engagement with communities, including hapori Māori to inform methodology that is locally relevant and informed by the needs of our communities.

The objectives are:

- Develop accessibility metrics to model the energy needs associated with different types of urban development
- Build metrics aligned with SDGs and principles of maanaakitanga and kaitiakitanga e.g. by considering the nonhuman impacts and implications for and needs of different populations including Māori, women, disabled people and children
- Model energy demand associated with future-focused land use and transport scenarios including health equity implications of different transport-energy scenarios.
- Develop actionable recommendations to support transformative change towards an equitable and resilient transport sector, including making data available to communities and decision-makers.

Student Time Split

University base for student (university, campus, department):

University of Otago, Christchurch, Department of Public Health

Industry base for student (company, site, address):

ViaStrada Level 1, 284 Kilmore Street, Christchurch 8011

Expected Time Split Between University and Industry Partner (in months):

18 months at each location

Application

To apply for this project please first read the guidance document and then complete the application form on the Applied Doctorates Scheme website.