Transportation Research at University of Auckland

Showcasing some of the Research

Dr Douglas Wilson

Wednesday 14th November 2018
Tricia Austin, Architecture and Planning
...designing neighbourhoods for residents of different ages, life stages, ethnicities and abilities / disabilities

Assessing exposure to risk from traffic for children in residential neighbourhoods

Comparing pedsheds for pedestrians with diverse abilities

400 m. Pedshed along the walking network
400 m. Pedshed for a vulnerable wheelchair user

Shaping Places: Future Neighbourhoods

Green is a safe car-free route
Orange is a shared surface driveway / service lane
Red is a crossing over a road
Objectives / Mission

- Provide research, policy analysis and educational programmes to
- help business & Govt confront energy issues of national significance to NZ

Background Context

- Economics Dept of Business School
- Founded 2004
- Supported by Energy Education Trust NZ

Three Broad Research Themes

- Energy markets,
- Resource and environment markets and
- Transport economics

Example Current Research projects

- Electricity, market design, demand side managements,
- Renewables, wind, solar
- Transport, mode of choice to work, congestion management
- Oil and gas, development, intern markets
- Energy efficiency
- Greenhouse gas emissions
- Simulations of Wind in electricity
Future & Inclusive Streets – Healthy Future Mobility Solutions
School of Population Health, Key Contact: Prof Alistair Woodward

University of Auckland, Massey University, University of Otago, Mackie Consulting, Dovetail Consulting, Auckland Transport, NZTA, Māngere-Ōtāhuhu Local Board, Design Tribe Architects, MBIE

Prof Shanthi Amerautunga
Public Policy Institute
Te Whare Marea Tātari Kaupapa

Connecting People
- Communities
- Researchers
- Stakeholders

Independent, critical research
- Evidence-informed
- Interdisciplinary
- Policy design, advocacy and evaluation

Teaching
- Master of Public Policy

Events
- Policy Briefings
- Policy Commons blog
- Policy Pod

Knowledge Exchange
- Impact

Auckland Policy Commons

Policy briefing 2/2017

Hot Property in New Zealand: Housing bubbles in the metropolitan centres

Dr Ryan Greenaway-Davies, University of Auckland

Distinguished Professor, Public Affairs, University of Auckland, Deputy Dean of Business, Te Whare Māra Tātari Kaupapa, Singapore Management University

Level of Health Services in New Zealand: Centralized Services

Dr John Sinnott, Director, Auckland District Health Board

Chief Executive, Auckland Health Systems Research Institute
The Public Policy Institute fosters independent, critical research on key policy issues affecting New Zealand, the Asia Pacific, and the global community. We bring together researchers from across disciplines to create and disseminate evidence-informed, policy-relevant knowledge that speaks to policy agendas and amplifies policy impact. We support the work of those undertaking policy design, advocacy, and evaluation, to grow partnerships with governments (both local and central), non-profits, communities, and others engaged in policy research and evaluation in New Zealand and internationally.

The PPI is committed to creating strong relationships with iwi and hapū to ensure that all aspects of our research, teaching, and external activities support and engage with mātauranga Māori and the goals of Māori self-determination and development.

The PPI is also home to the Master of Public Policy, where postgraduate students engage in learning and knowledge exchange with researchers and professionals to address a range of challenging policy questions.

**Core Research Themes:**

- Liveability, Ecology and Infrastructure
- Wellbeing across Generations
- Wealth, Poverty and Inequality
- Diversity and Justice in a Bicultural Society
- Science for Policy
- Global Policy and Foreign Affairs
Objectives / Aim:
- Provide a vibrant and innovative research hub for both academic and commercial research in Transportation Engineering in NZ

We offer:
- Multi-disciplinary expertise from Engineering, Science and Business Faculties
- Extensive collaborative ties with Central, Local Govt, industry and international researchers
- Extensive Transportation Laboratories (both in laboratories and in field testing)
- Founded 2002

Three Broad Research Themes:
- Transportation infrastructure materials, design and life cycle asset management,
- Traffic engineering, operations, ITS and modelling
- Traffic Safety, Sustainability and Travel behaviour

Example Current Research projects:
- Transport Infrastructure & materials
- Infrastructure resilience & climate adaptation
- Active Modes & Mobility disadvantaged
- Road safety & traffic management
- Future Mobility & Sustainability
- ITS, SAV and Future mobility
Analytics & Optimisation Tools for Transport Modelling
Engineering Science, Key Contact: Dr Andrea Raith

- Electric Vehicles
  - Impact of incentives on uptake
  - Electric Vehicle routing with planned charging stops and optimal location of chargers

- Electric bus
  - Energy modelling and network optimisation

- First-Last-Mile Transport and automated vehicles in future transport systems

- Traffic emission optimisation

- Modelling of cyclist route choice for optimal infrastructure investment
Leveraging Aggregate Resources – Achieving Greater Sustainability through better use of Aggregate Mineral Resources – Dr Doug Wilson, Prof Philippa Black

Current PhD Students

Pritesh Karan
Wentao Li
Ebrahim Sangsfedi
Ashkan Tatari
Nazanin Ardalan
Ahmed Marghani
Inductive Power Transfer (IPT) charging of EVs in Roadways
Key Contacts: Prof Grant Covic, Prof Simon Bickerton & Dr Doug Wilson
Current UoA Research
1. SAV User Perception
2. First Km – Last Km solutions
3. Public Transport Integration
4. Mobility Disadvantaged
5. Economics and Optimisation
Aim: Assess the resilience of rural road network based on Alpine Fault (AF8) scenarios using special transportation simulation
(West Coast of South Island, NZ)
Research Goal:

- The intention is to be able to estimate perceived risk of a route based on objective measures of the surrounding infrastructure and traffic. The long-term goal is to develop a cycle risk safety index (CRSI) which will provide a relative indicator for cyclist safety, thereby helping to inform cyclists of safer route choices.

Naturalistic Methodology on Bicycles

- Bicycle safety can benefit from the naturalistic methodology
- By recording all events leading to an accident, naturalistic data can provide a better understanding of the driver’s behaviour, and thus valuable and unique insight into accident causation

Bicycle Instrumentation Setup

<table>
<thead>
<tr>
<th>Sensors</th>
<th>To Measure/Record</th>
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</thead>
<tbody>
<tr>
<td>1. Ultrasonic Rangefinder</td>
<td>Proximities between cyclists and overtaking motor vehicles</td>
</tr>
<tr>
<td>2. Video Cameras</td>
<td>Video information of conflicts</td>
</tr>
<tr>
<td>3. Accelerometer</td>
<td>Road Roughness (Vibration)</td>
</tr>
<tr>
<td>4. Data and power hub parts:</td>
<td></td>
</tr>
</tbody>
</table>
  1. Power source         | 1. Battery Source                                      |
  2. Single computer board | 2. Data logger                                         |
  3. GPS                   | 3. Location, Speed                                     |
  4. Ultrasonic rangefinder| 4. Passing distance                                    |
  5. Rear video camera     | 5. Vehicle type                                        |
  6. Powered USB hub       | 6. Connect the sensors to data logger                   |
Some of our Current PhD Researchers in Engineering

We have more than 25 current PhD Students in Transportation Engineering and many more Masters and Final Year project students

Approx. 160 current PhD Students in Civil & Environmental Engineering.