Assessment of personal travel adaptive capacity using a participatory survey approach

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Assessment of personal travel adaptive capacity using a participatory survey approach

• Overview
  – Adaptive capacity
  – Motivation
  – The survey
  – Results
    • Compared to Household travel
    • Adaptive capacity
    • Important factors found
  – Summary and on going work
Adaptive capacity / Resilience

• Travel adaptive capacity defined as
  – *maximum potential to reduce private transport fuel consumption through*;
    - changing transport mode,
    - car-pooling, and
    - participating in the activity without traveling

• Higher adaptive capacity $\rightarrow$ increased resilience to;
  – fuel price increases,
  – fuel supply interruptions,
  – Other factors that may impact private transportation
Adaptive capacity / resilience

New Zealand Household Travel Survey 2009-2012, May 2013

Google Maps (showing Christchurch) 2015,
Motivation

Continued supply

Price

Environmental

New Zealand’s specialist land-based university
The survey
Found out peoples typical weekly travel activity
  – time, purpose, mode, distance...
For each trip, we asked;
  “If you couldn’t use your normal mode, how many other ways could you travel”
  • I could do this activity without travelling
  • I could share a ride
  • I could use a bike
  • I could walk
  • I could use a bus (or some other public transport mode)
  • Other
The survey

Web based survey

University of Canterbury, Staff and students

Rural town of Oamaru

New Zealand’s specialist land-based university
The survey
## Results

- Compared with the Household travel survey

<table>
<thead>
<tr>
<th>Mode</th>
<th>Christchurch</th>
<th>Otago Region</th>
<th>Oamaru</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip legs in sample</td>
<td>17959 MOT</td>
<td>8816 MOT</td>
<td>2082 TACA</td>
</tr>
<tr>
<td>%household trip legs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Car/van driver</td>
<td>46% MOT</td>
<td>53% MOT</td>
<td>68% TACA</td>
</tr>
<tr>
<td>2. Car/van passenger</td>
<td>24% TACA</td>
<td>23% TACA</td>
<td>7% TACA</td>
</tr>
<tr>
<td>3. Pedestrian</td>
<td>23% TACA</td>
<td>20% TACA</td>
<td>18% TACA</td>
</tr>
<tr>
<td>4. Cyclist</td>
<td>3% TACA</td>
<td>1% TACA</td>
<td>6% TACA</td>
</tr>
<tr>
<td>5. PT (bus/train/ferry)</td>
<td>4% TACA</td>
<td>1% TACA</td>
<td>1% TACA</td>
</tr>
<tr>
<td>6. Motorcyclist</td>
<td>0% TACA</td>
<td>0% TACA</td>
<td>0% TACA</td>
</tr>
<tr>
<td>7. Other</td>
<td>1% TACA</td>
<td>1% TACA</td>
<td>1% TACA</td>
</tr>
<tr>
<td>Total</td>
<td>100% TACA</td>
<td>100% TACA</td>
<td>100% TACA</td>
</tr>
</tbody>
</table>
Results

How people normally travel

- Oamaru
- Students
- Academics
- General Staff

Trips

- Not a car trip
- Car trip

New Zealand’s specialist land-based university
Results

- Options they have

- Oamaru
- Students
- Academic
- General Staff

New Zealand's specialist land-based university
Results

How people normally travel

New Zealand’s specialist land-based university
Results

Options they have
Results

• Summary of results
  – Over half of all car travel had an alternative, leaving approx. 25% of all trips having no alternative to the car
  – The adaptive capacity depended on
    • Transport infrastructure
    • Location of activities in relation to home (distances)
    • Demographics to some degree
  – Multinomial logit model developed to tease out factors of influence
On Going work...

• Adaptive Capacity can be calculated at individual level given survey results

• Desirable if it could be calculated from existing data...can be using;
  – WOF – current energy demands
  – Minimum Energy Activity modelling
Summary

• Travel adaptive capacity defined as
  – maximum potential to reduce private transport fuel consumption through changing transport mode, car-pooling, and participating in the activity without traveling

• Web based survey undertaken found
  – Over half of all car travel had an alternative, leaving approx. 25% of all trips having no alternative to the car

• Ongoing work has developed a measure of vulnerability (limited adaptive capacity) based on existing data sources