Travel Activity Constraint Adaptation Simulation (TACA Sim)

Associate Professor Susan Krumdieck
Montira Watcharasukarn
Dr Shannon Page

Presented by: Stacy Rendall
Motivation

Motivation

Key question:

Could you get to your activities another way?
Transport Energy Use Auditing

- Activity (trip purpose)
- Destination of activity
- Mode
- Travel Time
- Trip Frequency
- Route
- Occupancy
Adaptive Capacity

Paragraph: People will change behavior to preserve wellbeing according to their own needs and alternatives (Krumdieck 2005).

Images:
- Shift time, frequency or mode
- Participate from home
- Curtail activity
- Change destination
Survey is needed

TACA Sim
:A survey for adaptive capacity assessment
(www.tacasim.aemslab.org.nz)

TACA Sim Results

The following is a summary and analysed results based on information provided about your vehicles and typical week of travel.

Personal Results:
Total Distance Travelled: 157.64 km
Travel Distance by Car: 148.36 km
Fuel Consumption: 8.37 litre
Total Travel Time: 360 mins

Vehicle Dependence:
The percentage of activities accessed by motor vehicle
Your Dependence: 94%
Average Kiwi: 79%

Effective Fuel Economy:
Calculated from all km's traveled and total fuel use
Your Fuel Economy: 5.31 L/100km
Average Kiwi: 4.7 L/100km

Risk exposure to fuel price increase:
Calculated based on the amount of travel in which your vehicle was the only option
Your Price Risk: 0%
Average Kiwi: 28%
Studies

University of Canterbury, Christchurch

Oamaru

Urban

Rural
### Christchurch

- 1,369 invitations sent by email and letter to students, staff and academics.

  **Response rate 19.8%**

- Advertisements with pull-off contact details were posted around campus for students – with a draw to win an i-pod.

- A $10 grocery voucher or a gift voucher at a popular campus café was offered for staff.

### Oamaru

- 870 invitation post cards were sent to rate payers.

  **Response rate 13.8%**

- People were also approached on the main street with an offer of a chocolate bar and $10 supermarket voucher for their participation.
Participant residential locations

- 271 participants in Christchurch
- 120 participants in Oamaru
Adaptive capacity analysis

**Trip Adaptability (TA\textsubscript{trip}):**
Fraction of car trips in which the participant had an option for getting to the activity another way.

**Distance Adaptability (DA\textsubscript{travel}):**
Fraction of car kilometres in which the participant had an option for getting to the activity another way.
Adaptive Capacity results

Adaptability Score

Trip Adaptability
Distance Adaptability

Cohort
Oamaru
Students
General staff
Academic staff
Mode adaptability

*Mode adaptability (MA):* fraction of car trips for which the participant had an adaptation option.
Distance adaptability

**Christchurch**

**Oamaru**

Adaptable travel distance (kilometres)

Percentage

- Other
- Ride with somebody
- Bus
- Bicycle
- Walk

<2  2-5  5-10  10-20  20-30  30-50  >50

<2  2-5  5-10  10-20  20-30  30-50  >50
Mode Adaptability – Age

![Graph showing mode adaptability by age cohort for different categories: Oamaru, Academic, Staff, and Student.](image-url)
Mode Adaptability – Gender
Mode Adaptability – Income
Participating without travelling

Activity Adaptability (AA): fraction of car trips in which the participant selected that they could participate without travelling.

In Christchurch the Activity Adaptability was less than 0.01, only 2.9% of participants.

None of the 120 participants in Oamaru reported being able to participate without travelling.
Conclusions

• Asking participants to consider their alternatives to car travel revealed how adaptable they could be.

• Most participants selected a change of mode as an alternative to a car trip rather than participating in activity from home.

• Walking and cycling were the favourite alternative methods for short distance travel.

• A lack of public transport service in Oamaru limits people’s adaptive capacity for medium and long distance travel.

• Providing greater access to alternative modes and closer destinations would enhance the ability of Oamaru residents to reduce private car use.