Impediments to Walking as a Mode choice

OPUS
INTERNATIONAL
CONSULTANTS

Land Transport NZ
Ikiiki Whenua Aotearoa

Dr Darren Walton

Research Manager Behavioural Sciences

Opus Central Labs

darren.walton@opus.co.nz

Foundation for Research
Science and Technology

Outline of Presentation

Background

a. Declines in walking rates

b. Definitions of walking

c. Poor methodological and evidential support for policy development

Research Design

a. Three research Questions

Results & Implications

Recommendations

OPUS

General and purpose-specific analysis of walking trips in New Zealand

Walking trips	Year		
	1989/1990	1997/1998	2003/2004
Percentage trips walked[a]	21.2%	18.4%	15.0%
Percentage of trips walked less than 1km[b]	63.6%	63.7%	72.9 %
Percentage of trips walked less than 2km[b]	85.6%	85.2%	79.8%
Average trip distance[c]	0.89 km	0.93 km	0.91 km
Mean distance to change mode[b]	0.64 km	0.65 km	0.59 km
Mean duration to change mode	7.69 min (14.67)	7.84 min (15.36)	7.08 min (11.62)
Mean distance for social/recreational trips[b]	1.08 km	1.1 km	1.1 km
Mean duration for social / recreational trips	13.0 min (20.83)	13.25 min (18.17)	13.2 min (17.94)
Mean distance for shopping trips[b]	0.79 km	0.76 km	0.71 km
Mean duration for shopping trips	9.53 min (12.88)	9.11 min (13.45)	8.54 min (14.85)

Definitions of Walking

Four walking types defined by Tolley (1993)

1. Access Mode
2. Access sub-mode
3. Recreational/leisure
4. Circulation/Exchange.

OPUS

Overseas findings on Impediments to Walking

USDOT (1993) Review of Walking studies	Reasons for not walking			% Believing Following changes would increase walking	
	Seattle	Toronto	Ottawa		
Distance	33%	47%	56%	Reduce crime/Safer Streets	19%
Too slow; Takes too long	14%	12%	14%	Education; awareness of health benefits	15%
Weather	8.7%			More sidewalks	14%
Dislike walking/Lazy	6.4%			Improved street crossings	8%
Difficult to carry things	5.7%	50%	48%	More trails , paths and places to walk	5%
Inconvenient	5.7%			Better Street Lighting	4%
Fear of Crime	3.3%			Enforcing Pedestrian laws	3%
No Time	2.0%			Nothing more should be done	29%
Darkness	1.7%				
No Sidewalks	1.3%				

Research Design
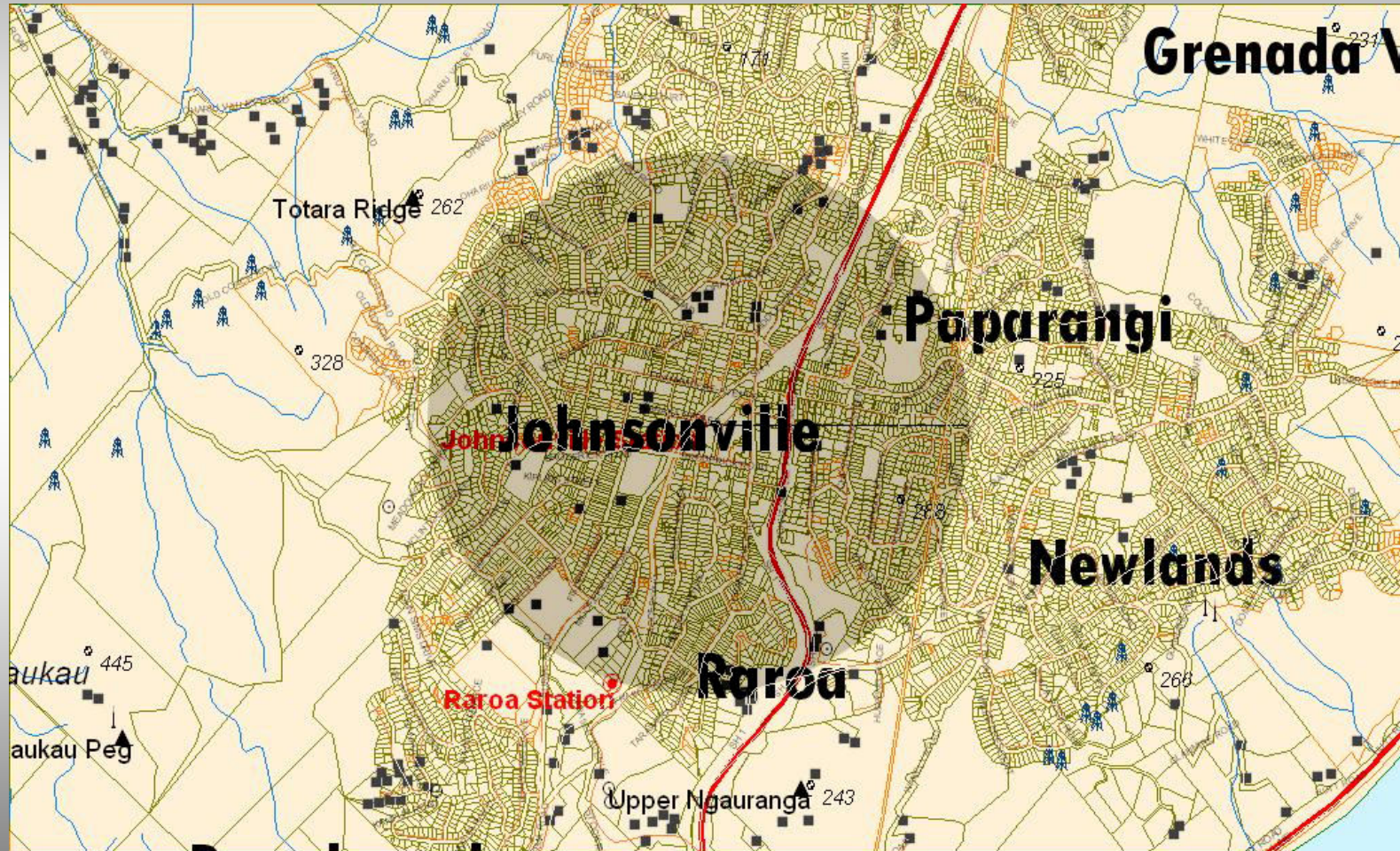
Park and Riders (N= 110)

Walkers (N=138)

Samples collected in Wellington and Auckland to compare groups to assess location effects

OPUS

Case-Participant Selection Criterion

Characteristics of samples

1. Equal mix of genders
2. Self-reported experience of walking to the station
   a. Auckland drivers 26%
   b. Wellington drivers 41%
   c. Auckland Walkers 72%
   d. Wellington Walkers 85%

3. Thus no group walks or drives exclusively
4. Income effects are observed for Aucklanders, but not between driver groups.

Thus all analyses conducted to account for location differences

OPUS

The survey

Research Design (continued)

a. Weather
b. The walking environment
c. Parking prices

d. Social norms and influences
e. Fitness/fatigue
f. Variability in travel times
g. Inconvenience of walking

Research Design (continued)

h. Car dependency for trip chains

i. Enjoyment of walking

j. Fear of crime

k. Concern for time

Summary

- Weather
- The walking environment
- Parking prices
- Social norms and influences
- Fitness/fatigue
- Variability in travel times
- Inconvenience of walking
- Car dependency for trip chains
- Enjoyment of walking
- Fear of crime
- Concern for time
- Geography

OPUS

Research Questions

1. When controlling for distance what factors distinguish between drivers and walkers in the walking for the access sub-mode?

2. What is determined to be a reasonable distance to walk to the train station and does the individual's perception of this distance influence their mode choice?

3. Are the factors that impede mode choice location specific?

Perceptions of Walking Distances

Table 3. Drivers and Walkers Perceptions of the Walking Times and Distances the Average New Zealander might take to the Train or Bus station.

Location	Drivers		Walkers		Total
	Auckland	Wellington	Auckland	Wellington	Total
N	30	80	112	126	348
Perceived average New Zealander's walking distance of (metres)	865 (376)	809 (385)	808(383)	829(346)	820.1(368.4)
Perceived average New Zealander's Walking Time (minutes)	13.91 (6.04)	11.67 (4.56)	15.11(8.56)	12.43(5.01)	13.24(6.50)
Perceived average New Zealander's walking speeds (metres per minute)	62.16m/m	69.28m/m	53.39m/m	66.67m/m	61.94m/m
Estimated walking Distance to closest station	1103 (475)	878 (455)	1120 (617)	893(510)	980 (542)
Estimated walking time to closest station (minutes)	20.24 (22.5)	11.46 (5.45)	18.75(11.91)	11.75(8.14)	14.62(11.34)
Perceived walking speeds (metres per minute)	54.49m/m	76.61m/m	59.73m/m	76.00m/m	
Calculated Distance of closest intersection to train station (metres)	1334(n = 26)	643(n = 68)	973(n = 30)	624(n = 27)	824(n = 151)
Summary compared to perceived average	Walking is further and longer but at a slower pace	Walking is the same distance and same time but at a quicker pace	Walking is further and longer but at a slower pace	Walking is further, less time, but at a quicker pace	

OPUS

Difference between individual and Perceived Average Walking Distances
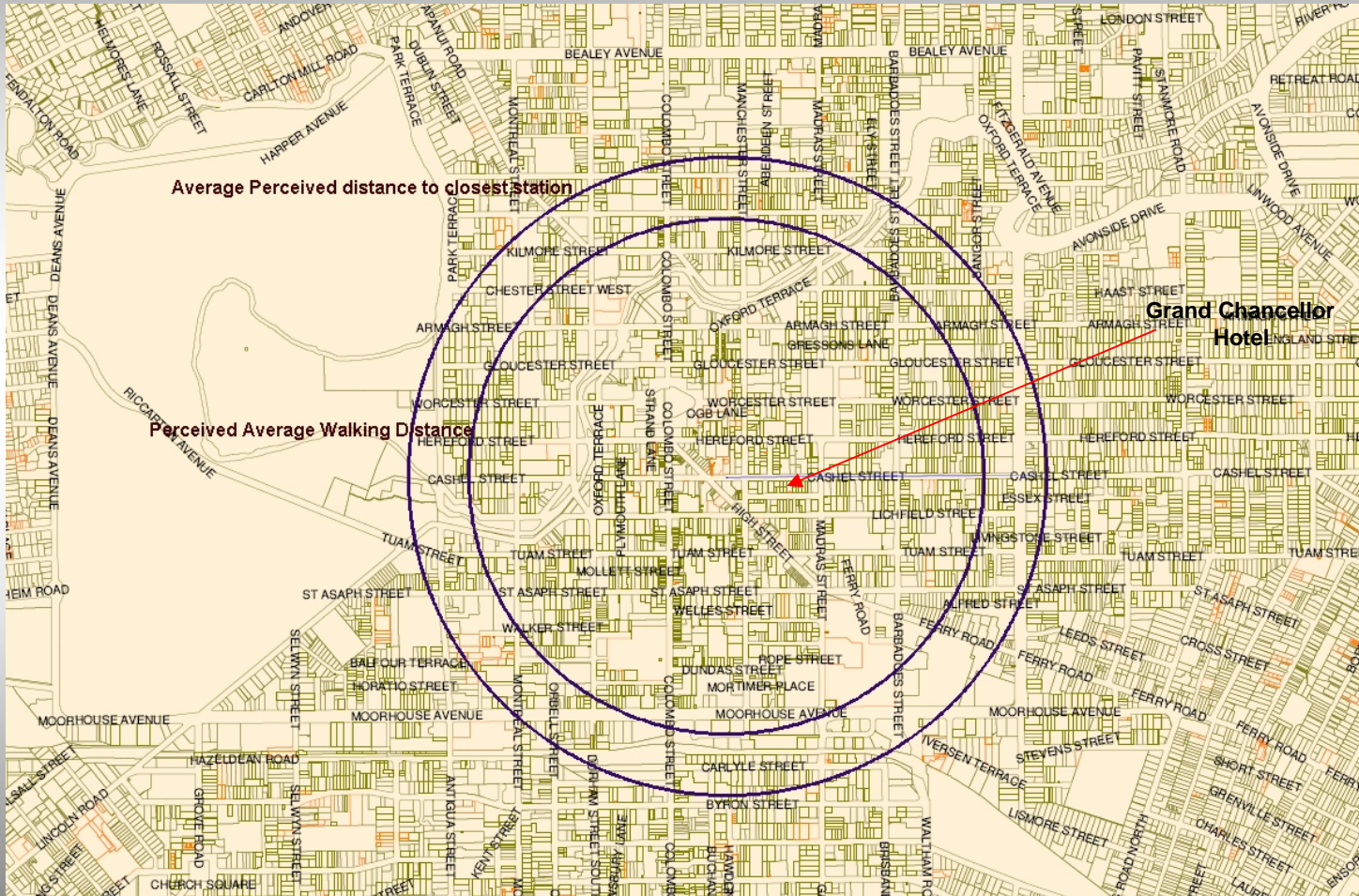
Backward Wald Stepwise logistic regression

- **Living on the Hills is counter-intuitive. Living on a hill increases the likelihood of walking 4.5 times.**

- **Each additional car in the household reduces the likelihood of walking to the station by about 50%**

- **The belief that park and rides are for people who live a long way away is a significant factor and therefore important if interventions are to be developed to encourage walking**

Variable	Explanation	B	Odds ratio	CI Lower	CI Upper
NCARS (0-4)	Number of cars owned	-0.435	1.55	1.04	2.30
Q51 (1-5)	P&R's are only for people who travel a long way to use the bus or train	0.562	1.75	1.28	2.4
Q27 (1-5)	Normally walk to the station when the weather is fine	0.455	1.58	1.21	2.06
Q29 (1-5)	Sometimes more convenient to take the car	-0.611	1.84	1.32	2.57
Q37 (1-5)	Chance of rain will take the car	-0.588	1.80	1.32	2.44
Hills (0-1)	Live on a hill	-1.548	4.69	1.84	12.05

$\hat{g}$ (W) = 6.735 - 2.771 (Auckland_Wellington) -.435 (NCars) + .562 (Q51) + .455 (Q27) -.611 (Q29) - .588 (Q37) -1.548 (Hills)

OPUS

Why walk uphill?
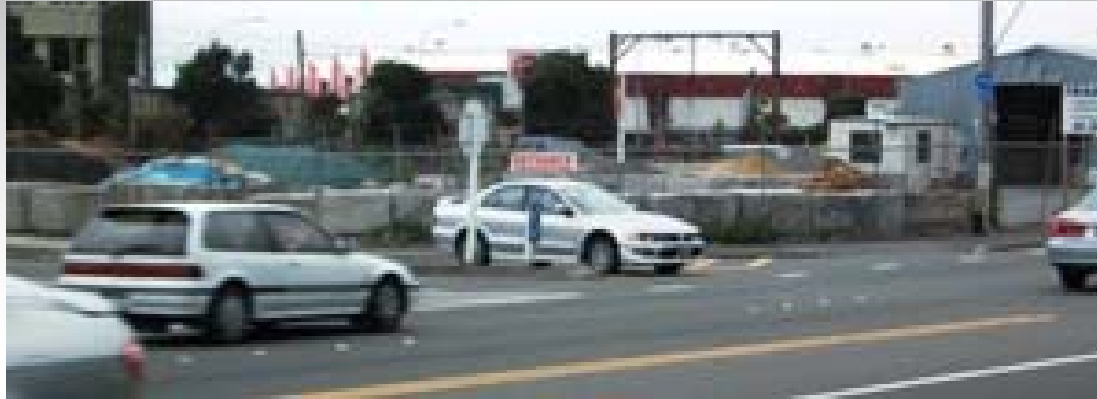
Conclusions

1. A reasonable walking distance is perceived to be about 820m

2. 'Rain' has an influence on the choice to drive vis-a-vis fine weather that aids the decision to walk.

3. The opportunity to park it for free in a monitored facility induces the reasonable walking trip to be replaced by a car trip.

4. Factors thought to influence the uptake of walking such as time, distance, fatigue, the carriage of goods, concern for crime are not found to be real impediments to the walking journey considered as an access sub mode.

OPUS

Recommendations

1. Improve the infrastructure concerning rain by providing better shelters, covered walkways and so on to prevent reliance on the car.

2. Establish a ticketing system that prevents use of park-n-rides on a regular basis by those who live within 850metres of the station.

3. Move park and ride facilities away from the train station (200m) to force a walking distance that competes with the convenience of getting in the car.

4. Charge a fee for park-n-ride facilities to prevent their use by people who might otherwise walk.

OPUS