

Our Ref: 4062 tdb comparison of nz and aust trip and parking rates

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Attn: Stuart Woods

Dear Stuart

### **COMPARISON OF NZ AND AUSTRALIAN TRIP AND PARKING RATES**

Further to our meeting on Monday 9 July 2012, this letter summarises the findings of a comparison between the New Zealand and Australian data stored in the TDB Trips Database undertaken by Abley Transportation Consultants.

#### Introduction

The comparison focuses on both peak trip and parking rates for those land use activities where New Zealand and Australia sources are available. As far as possible the categories and assumptions included in the 'Comparisons of NZ and UK Trips and Parking Rates' (NZTA Research Report 374) have been maintained, although as the New Zealand and Australian data is stored in the TDB Database in the same format, a more direct comparison is permitted in some situations.

There is sufficient data to directly compare 9 land use activities for trip rates and 8 land use activities for parking rates as follows:

- Commercial - Office,
- Commercial – Business Park (note only a trip rate comparison is included),
- Education - Pre-school/day care (both pre-school and day care activities are included in the Australian data set, however all NZ data is coded as pre-school activity),
- Medical Centres,
- Recreation – gymnasium,
- Retail – bulky goods (better known as large format retail),
- Retail – fast food,
- Retail – restaurant, and
- Retail – shopping centre.

In all cases, any duplicate or incomplete data and perceived outliers were removed prior to analysis. Much of the retail data included multiple surveys of a single site on consecutive days. As with the NZTA RR374, the highest weekday and weekend peak hour rates were maintained and the other lower rates were discarded.

For all non-retail activities whereby the morning and evening peak trip rates were recorded on the same day, the higher of the two was carried forward into the analysis and the lower rate discarded. This is consistent with the analysis in NZTA RR374.

### Results of Analysis

The comparison of peak trip rates is included in **Table One** and the comparison of peak parking rates is included in **Table Two**. In most cases the average and standard deviation of peak trip and parking rates are per 100 m2 square metres of GFA. Trip and parking rates are also compared per staff for Medical Centres and per student for pre-schools.

**Table One: TDB New Zealand and Australian Peak Trip Rate Comparison**

Land Use Activity	Size	Unit	New Zealand			Australia			Are Means Significantly Different?
			n	Ave	Stdev	n	Ave	Stdev	
Bulky Goods	1-10000	sqm GFA	11	7.95	5.92	36	3.47	2.29	Yes
	>10000	sqm GFA	4	4.99	0.90	6	3.54	2.11	No
Business Park	All	sqm GFA	3	0.98	0.42	16	1.22	0.82	No
Fast Food	1-500	sqm GFA	4	34.01	26.33	38	67.03	27.24	Yes
	>500	sqm GFA	2	28.11	15.61	4	49.39	5.35	No
Gymnasium	1-1000	sqm GFA	3	6.44	2.00	16	8.93	4.17	No
	>1000	sqm GFA	1	2.88	0.00	4	5.48	4.44	No
Medical Centre	1-500	sqm GFA	3	11.87	4.60	21	10.32	5.45	No
	>500	sqm GFA	3	7.81	4.30	16	7.82	3.57	No
	1-15	staff	4	5.20	14.60	15	9.70	5.70	Yes
	16-30	staff	1	1.74	0.00	14	7.86	3.91	Yes
	>30	staff	1	2.51	0.00	8	6.14	3.61	No
Office	1-5000	sqm GFA	7	1.85	1.12	10	2.76	1.31	Yes
	5000-20000	sqm GFA	4	1.21	0.86	7	1.56	0.53	No
	>20000	sqm GFA	3	1.17	0.87	3	0.78	0.66	No
Pre-school	1-200	sqm GFA	9	24.63	13.63	9	26.95	20.83	No
	201-400	sqm GFA	8	18.85	9.45	8	13.42	4.48	Yes
	>400	sqm GFA	3	7.97	2.37	3	10.99	6.37	No
	1-40	students	12	1.35	0.63	14	0.93	0.38	Yes
	41-60	students	9	1.01	0.25	3	1.00	0.38	No
	>60	students	6	0.86	0.38	1	0.88	0.00	No
Restaurant	1-500	sqm GFA	2	14.00	6.51	7	24.02	10.76	No
	>500	sqm GFA	3	12.30	9.32	3	12.70	1.37	No
Shopping Centre	1-5000	sqm GFA	64	15.65	6.30	6	17.58	6.29	Yes
	5001-10000	sqm GFA	14	12.14	5.25	10	12.63	3.43	No
	10001-20000	sqm GFA	16	7.93	2.99	12	7.59	2.57	No
	>20000	sqm GFA	5	5.03	2.02	42	5.35	1.95	No

**Table Two: TDB New Zealand and Australian Peak Parking Rate Comparison**

Land Use Activity	Size	Unit	New Zealand			Australia			Are Means Significantly Different?
			n	Ave	Stdev	n	Ave	Stdev	
Bulky Goods	1-10000	sqm GFA	8	4.23	2.45	36	1.30	0.76	Yes
	>10000	sqm GFA	4	1.60	0.48	6	1.65	0.66	No
Fast Food	1-500	sqm GFA	3	8.06	5.35	18	7.26	2.75	No
	>500	sqm GFA	2	7.91	2.47	4	6.74	1.20	No
Gymnasium	1-1000	sqm GFA	3	4.96	2.08	16	7.16	4.17	No
	>1000	sqm GFA	1	3.29	0	5	4.28	3.37	No
Medical Centre	1-500	sqm GFA	3	3.89	2.19	11	4.10	1.48	No
	>500	sqm GFA	2	4.17	2.42	8	3.21	0.51	No
	1-15	staff	3	1.64	1.2	8	1.19	0.78	No
	16-30	staff	1	1.83	0	7	0.91	0.41	No
	>30	staff	1	1.22	0	4	0.71	0.16	No
Office	1-5000	sqm GFA	4	0.27	1.01	10	2.83	2.01	Yes
	5000-20000	sqm GFA	2	2.29	0.20	7	1.98	0.92	No
	>20000	sqm GFA	0	0	0	3	0.73	0.45	n/a
Pre-school	1-200	sqm GFA	9	4.14	2.40	9	6.14	4.21	Yes
	201-400	sqm GFA	12	3.69	1.84	8	3.52	0.95	No
	>400	sqm GFA	3	1.80	1.35	3	3.04	2.17	No
	1-40	students	10	0.90	0.44	14	1.96	0.68	Yes
	41-60	students	5	1.49	0.83	4	2.28	1.20	No
	>60	students	3	0.61	0.35	1	2.11	0	No
Restaurant	1-500	sqm GFA	2	10.70	2.40	6	19.90	10.44	No
	>500	sqm GFA	3	9.67	3.75	3	12.50	4.22	No
Shopping Centre	1-5000	sqm GFA	89	3.58	1.63	6	5.47	1.55	Yes
	5001-10000	sqm GFA	21	3.83	1.44	12	4.43	1.28	Yes
	10001-20000	sqm GFA	24	3.18	0.88	14	4.06	2.03	Yes
	>20000	sqm GFA	4	3.24	1.14	43	3.70	0.86	No

In general, the size of the Australian Shopping Centres included in the TDB Database (measured as Gross Floor Area (GFA)) is greater than the New Zealand sites. The average New Zealand site was noted at 7,000 sq m GFA with a range of up to 44,000 sqm GFA, and the average Australian site is calculated as approximately 35,000 sqm GFA with a range of up to 100,000 sqm GFA.

The opposite situation is evident for business parks whereby Australian sites ranged from 3,000-36,000 sqm GFA, and the three New Zealand sites were larger at 42,000-76,000 sqm GFA. Care has been taken to evaluate the trip and parking rates by the size of the facility in much the same manner as the comparative analysis in NZTA RR374. As there

is no overlap between the NZ and Australian size ranges of the surveyed business parks, these have not been broken down further.

Statistical testing has been included in the form of a two-sample t-Test to compare the population means of the New Zealand and Australian data sets<sup>1</sup>. Where 'Yes' is recorded in the right-hand-most column of Table One and Table Two, the statistical test evaluates with a 95% confidence level, that the New Zealand and Australian mean trip (or parking) rates are different. Subsequently, there is a less than 5% chance that the means of the New Zealand and Australian data sets are equal.

The majority of the peak trip rates compared in this analysis are not significantly different, and it is generally only the smaller facilities that exhibit significantly different peak trip rates as follows (the country with the higher peak trip rate is noted in parentheses):

- Bulk Goods - less than 10,000 sq m GFA (New Zealand),
- Fast Food – less than 500 sq m GFA (Australia),
- Medical Centres – 1-15 staff and 16-30 staff (Australia),
- Office – less than 5,000 sq m GFA (Australia),
- Pre-School – less than 40 students and 201-400 sq m GFA (New Zealand), and
- Shopping Centres – less than 5,000 sq m GFA (Australia).

The statistical testing of the peak parking rate analysis offers up similar differences as follows (the country with the higher peak parking rate is noted in parentheses):

- Bulk Goods - less than 10,000 sq m GFA (New Zealand),
- Office – less than 5,000 sq m GFA (Australia),
- Pre-School – less than 40 students and 1-200 sq m GFA (Australia), and
- Shopping Centres – all categories up to 20,000 sq m GFA (Australia).

In many of the cases itemised above the sample sizes are relatively small and it is plausible that there are definition issues that contribute to a lack of consistency between the land use activities in each country. Some of the Australian data may be obsolete with fast food and office surveys dating back to the late 1970s. Further analysis into the location, specific survey days and other attributes stored in TDB may be useful in understanding the differences between NZ and Australian trip rates.

The findings of this analysis generally concur with the conclusions of NZTA RR374 in that there are many similarities and a high degree of consistency between the two data sets as was noted between the NZ TDB and UK TRICS data. The NZ and Australian data sets are valuable interchangeable sources of both trip and parking rates, but care must be taken with regard to the size of shopping centre and business parks that are being evaluated.

It is interesting to note, however that the number of different land use activities stored in the Australian database is very small (approximately 50 activities in New Zealand and 10 in Australia).

The Australian database includes retirement home data for which there is no comparable New Zealand survey data. The New Zealand database includes some very significant

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<sup>1</sup> Refer to "Understanding Statistics", Ott and Mendenhall, (1990, Fifth Edition) page 313 for the specific test statistic applied.

activities such as residential dwellings, motels, service stations, storage depots, garden centres, primary schools and secondary schools for which there are no Australian equivalents recorded.

It is proposed that there is value in sourcing available survey data or preparing targeted surveys to address these gaps in the combined NZ and Australian TDB database. The data gaps noted in this letter should be considered in conjunction with the feedback from the current TDB member's survey.

If you have any questions please do not hesitate to contact me.

Regards

**Abley Transportation Consultants Limited**

A handwritten signature in blue ink, appearing to read 'Dave Smith', with a long horizontal flourish extending to the right.

*Dave Smith*

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