COMPARISION OF NZ AND UK TRIPS AND PARKING RATES

Presented by **Andy Milne**

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Abstract

There is a need to provide New Zealand transport practitioners with better quality and quantity of trip and parking prediction information by making UK data applicable in NZ. This presentation describes research that extends the work undertaken in 2000/2001 and published as Transfund Research Report 209. The current research, undertaken on behalf of Land Transport New Zealand, brings UK and NZ data together into comparative tables for equivalent land uses. The analysis demonstrates the similarities and differences between UK and NZ situations and includes a review of the most suitable trips and parking predictor variables associated with particular land uses. The presentation will be of interest to transportation engineers and road controlling authorities that prepare and audit transport assessments and transport studies and present transport evidence to Planning Commissioners.

Introduction

The Trip Database Bureau (TDB) (formerly the New Zealand Trips and Parking Database Bureau) has made good progress in recent years developing a database of trip generation and parking demand information. Despite this, the database remains comparatively small and this limits the statistical reliability of its information.

The establishment of linkages with the much larger UK TRICS database creates a potential for significant improvements to the reliability of forecasting for the assessment of the traffic generation and parking demands associated with developments in NZ. This study assesses the comparability of eight land use activities from opposite sides of the world to discover how similar and consistent their vehicle trips and parking demands have become.

Data Sources and Site Selection Process

TRICS contains traffic count information for over 2,705 sites, 5,257 days of survey counts and 110 land use sub-categories. A growing number of surveys included in the database are multi-modal. TRICS uses 16 Land Use categories to structure the data and these categories are split further into land use sub-categories. The TDB data base by comparison contains approximately 594 surveys and is sorted into nine 'land use groups'. Currently TDB data only includes vehicle trip making and parking information, however, its focus is aimed at enhancing the database to include more surveys that include multi-modal information.

The land use descriptions within each database were relatively easily aligned with only the terminologies of some land uses such as pre-school (NZ) and Nursery (UK) or Medical Centre (NZ) and Clinics and GP Surgeries in the UK differing but nonetheless considered to be analogous. The locational categories within the NZ database are not well defined but the majority of the sites can be described as being in a suburban location. For assessment purposes, the UK 'edge/out of town' sites and NZ suburban sites have been assumed to be broadly compatible.

Parameters used to explain the trips and parking rates including Gross Floor Area (GFA), employee numbers, pupils or dwelling numbers were tested. In general GFA tended to provide the most convincing trip rate predictor for most land use activities although it is recognised that in the UK that Retail Floor Area (RFA) presents a stronger predictor for retail trips and parking characteristics.

The eight land use activities analysed, included; Retail, Commercial, Industry, Health, Assembly, Recreation, Education and Residential. Similar patterns of trips and parking rates were found for some activities including retail, restaurants, service stations, medical centres, pre-schools and residential. However the greatest consistency between the NZ and UK databases was found in the retail and residential activities which tended to be well represented in each database. The land uses where no consistent trip and parking rate pattern emerged related to those activities that were represented by too little data, thus indicating wide variability in the trips and parking patterns recorded.

Retail data sample was enlarged by combining shopping centres and supermarkets into a single data set. Although practitioners treat the supermarket category as a unique land use activity distinct from shopping centres, Figure 1 demonstrates that both activities follow the same general pattern of decaying trip rates with increasing floor area. The low data samples in the extreme floor area ranges may explain the higher variance in trip rates between the two data sets. However, the general trend is similar, and coupled with the strong overlap of trip generation rates particularly for retail outlets of between 2000 - 6000 sq m GFA, the comparison indicates that the two retail activities can be combined to form a single data

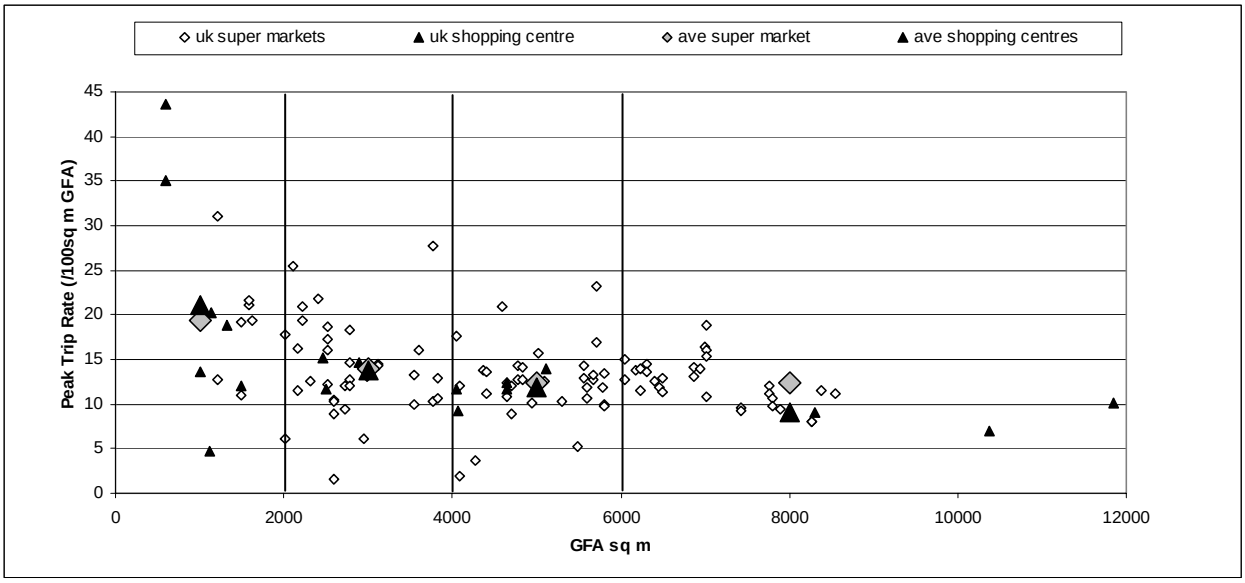

Fig .1 Comparisons of Vehicle Trip Rates for UK Supermarkets and UK Shopping centres

This process was repeated for the NZ data set which also showed a high degree of overlap between supermarkets and shopping centres. Figure 2 illustrates the comparison between the combined NZ and UK retail activities.

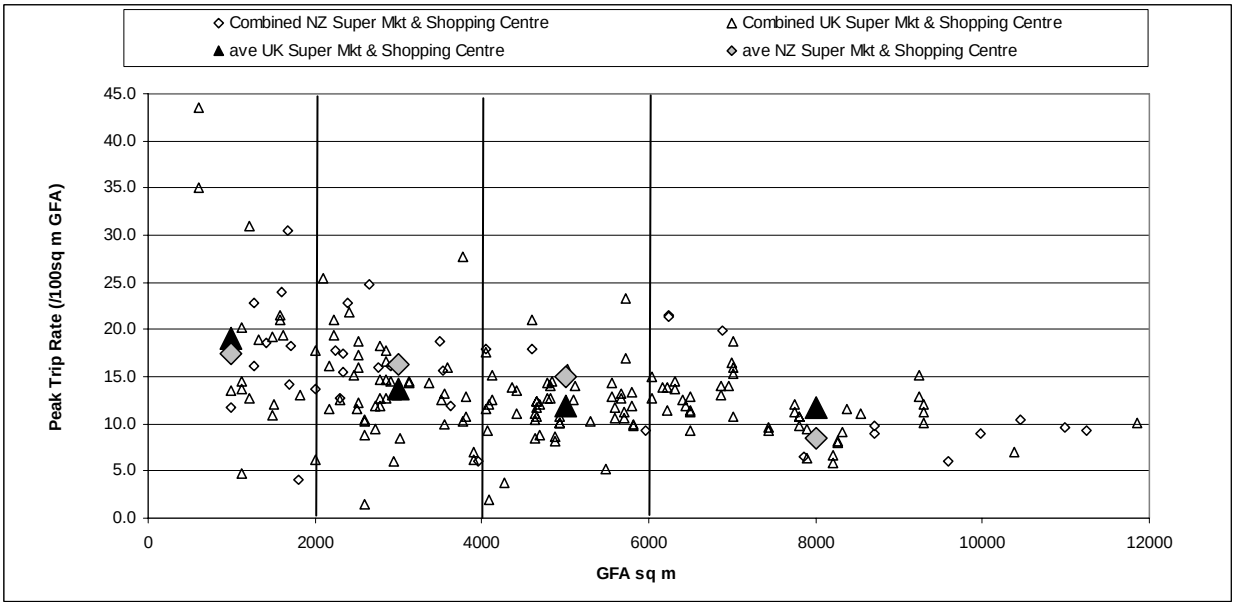

Figure 2 Comparisons of Vehicle Trip Rates for UK and NZ Retailing

Figure 2 confirms the trend of reducing trip generation rates with increasing floor area and shows that the rate of change in trip generation is greatest at the 0-2,000 and 2,001 - 4,000 sq m GFA range. The average points within each floor area range suggest that the NZ retail sites generate around 2 to 3 trips per 100 sq m GFA more than the UK sites between the 2000-6000 sq m GFA range, but that there is a higher average trip generation rate for the UK in the extreme floor area ranges below 2,000 sq m GFA and above 6,000 sq m GFA.

The comparison of peak parking rates for NZ and UK retail outlets is illustrated in Figure 3.

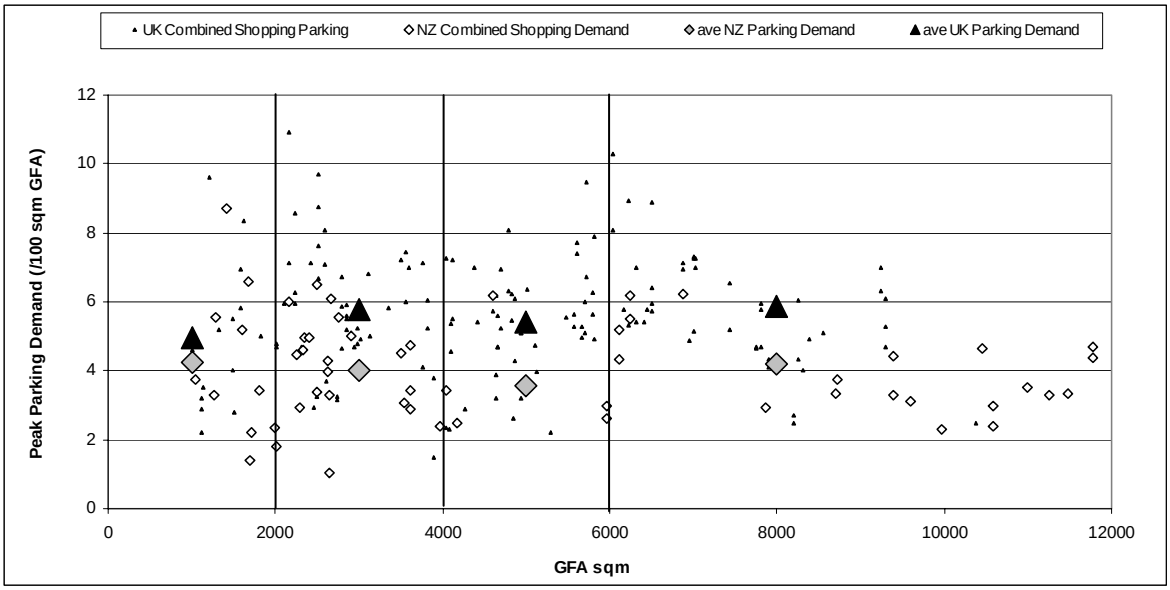

Figure 3 Comparisons of Parking Demand Rates for UK and NZ Retailing

In each floor area segment it can be seen that the NZ parking demands are lower than the UK retail parking demands. The difference between the parking demands equates to one parked vehicle in the 1-2000 sq m GFA range with the difference of around 2 parked vehicles remaining relatively constant throughout the remaining floor area segments.

The majority of UK sites indicated average parking demands ranging from 5-6 spaces /100sq.m. and the NZ sites display an average parking demand that ranges from 3-4 spaces /100sq.m. GFA. In general the UK retailing activities generate a parking demand that is 2 vehicles per 100 sq m GFA higher than the NZ retailing activities. This may reflect a tendency for UK shoppers to park for longer durations due to a wider variety of activities or use of parking space to visit adjacent facilities.

In some circumstances practitioners are required to design for 85th%ile trip and parking rates. The 85th%ile trips and parking rates established using log regression curves are shown in Figure 4 and Figure 5.

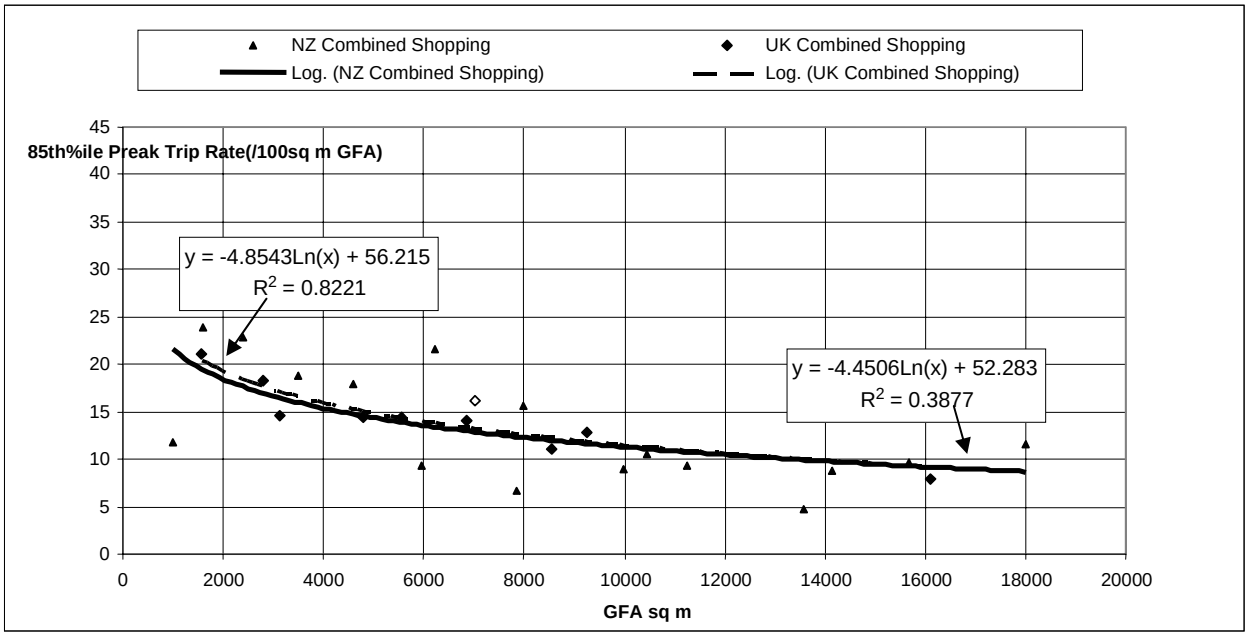

Figure 4 Comparisons of UK and NZ 85th Percentile Vehicle Trip Rates - Retail

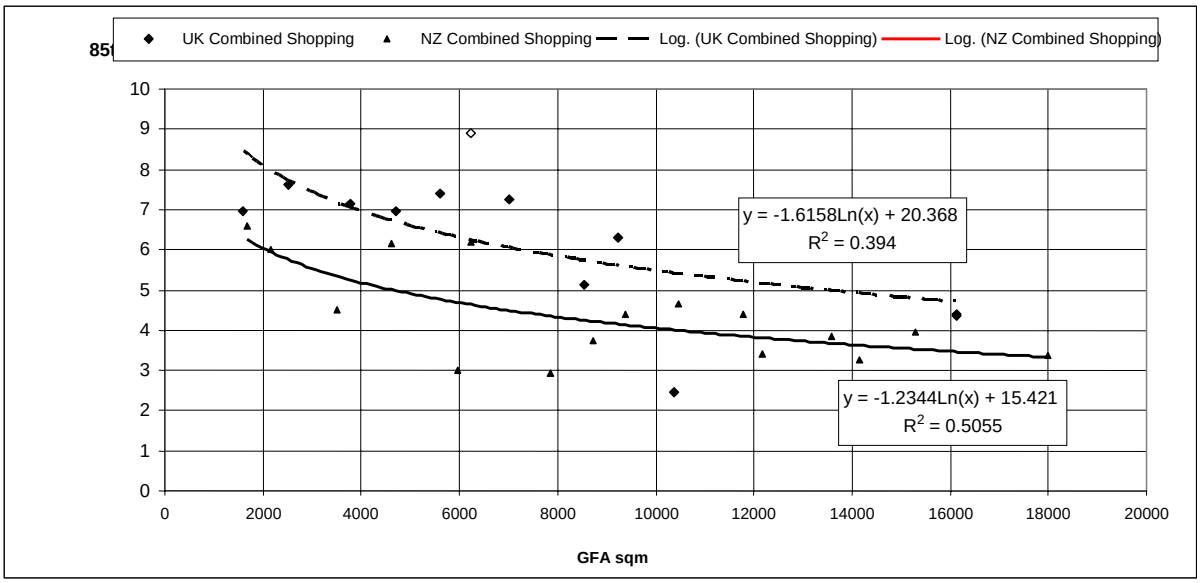

Figure 5 Comparisons of UK and NZ 85th Percentile Vehicle Parking Rates - Retail

It can be seen that in both the trips and parking rate comparisons that a clear relationship can be defined albeit that the variability particularly around the parking curves are such that the correlation is not as persuasive as the trip rate relationships between NZ and the UK.

Other findings of the retail element of the study show that in general UK sites in large conurbations generate only marginally lower trip rates than retail sites located elsewhere in the UK. The UK retail outlets that include a Petrol Filling Station (PFS) display trip generation rates that are between 2-5 trips per 100 sq m GFA higher than those outlets that do not have a PFS on site. Some NZ retail outlets are now adopting a retail plus PFS format. With little existing NZ data on such formats, practitioners may find benefit in applying an adjustment to the NZ trip rate values to reflect the difference observed in the UK.

Residential surveys were also well represented in each data base and as can be seen from Figure 6 a pattern for trip generation rates / household using number of households as a parameter is evident.

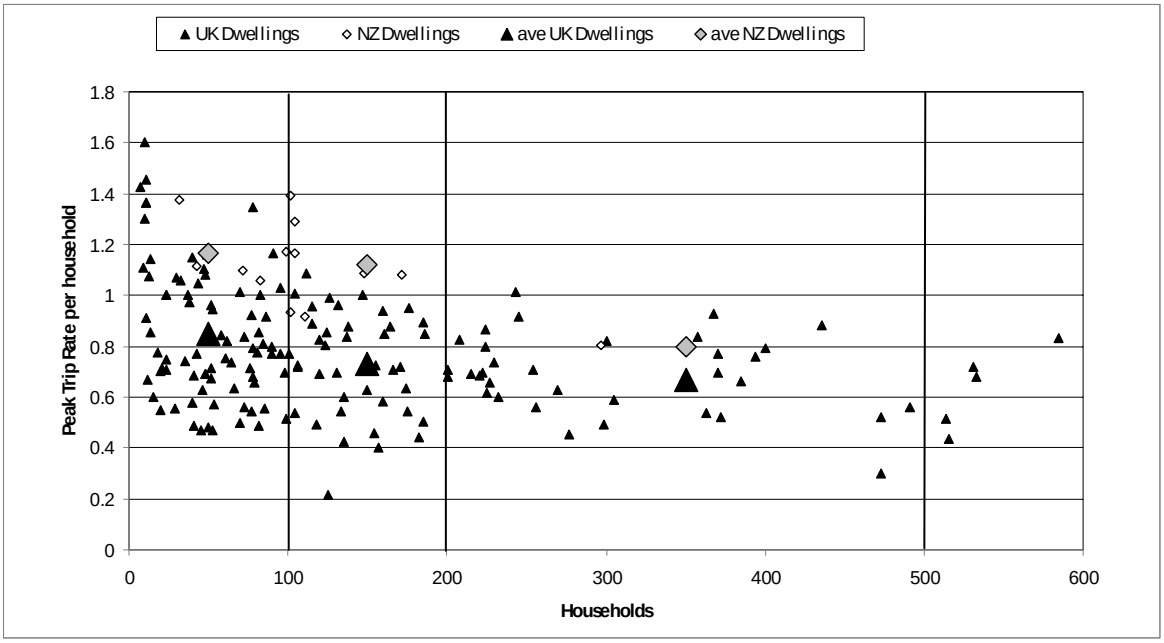

Figure 6 Comparisons of UK and NZ Vehicle Trip Rates - Residential

Figure 6 shows that there is a similar trend in the two sets of data and illustrates that NZ

residential vehicle trip generation rates are some 0.4 trips per hour per household greater than their UK counterparts for locations that contain up to 200 dwellings. For locations in excess of 200 dwellings the difference in trip rates drops to around 0.1 trip per hour per dwelling with NZ locations producing higher trip rates per household.

Conclusions

a) The comparison of NZ & UK trip making and parking demands by different land uses has been tested successfully.

b) Comparison and analysis of eight land uses in the UK and NZ have shown that the average, and the 85th percentile, trip generation and parking demand rates are consistent and similar for retail activities.

c) There are also similar and consistent trip making patterns for residential activities with NZ dwelling generating higher trip rates that the UK equivalent dwelling.

d) Future sharing and exchange of basic data on traffic generation, parking and travel information within each country and internationally could be increased to advantage.

e) The analysis shows that for over half of the land uses that were analysed there appears to be consistent relationships between trip generation rates and Gross Floor Area for NZ and the UK data, meaning that where similarities exist, practitioners may find use in examining the TRICS data base to support NZ trips and parking rate predictions.

f) Where similar trips and parking rate trends were not established, this was in the main attributed to lack of NZ data. However definitional issues also contributed to a lack of synergy for some land use activities.

g) The results of the research and the comparisons give confidence that transportation professionals should seek to gain access to both the NZ and UK databases so as to broaden the basis of comparison and judgement when making decisions about existing and future land use trip generation and parking demand design levels. It is recommended that this work should be ongoing as the larger the databases become the greater their value in making appropriate transportation assessments of existing and future developments.

h) The analysis demonstrates that where NZ land uses are well represented, similar trends with their UK counterparts exist. This may suggest that trip generation and parking rates associated with NZ land uses that are poorly represented may be informed by the equivalent UK data.

Acknowledgments

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