Executive Summary

This research report describes the reformulation during 2003-2004 of the LTSA's 1997/1998 New Zealand (Household) Travel Survey trips database into trip chains and tours and provides some preliminary results using the reformulated datasets. The reformulation required us to create definitions and programming sequences for the key elements of the new datasets (segments, trip chains, tours, main mode and main purpose) as well as a new tour classification scheme, which acknowledges the distinctive travel patterns for different tour purposes.

The Nature of Short Trips

Trip chains describe how New Zealanders link their travel between "significant" locations, namely home, work or education, and other activities where they remain more than 90 minutes. A trip from home, stopping at a shop for a newspaper and travelling on to work is an example of a trip chain. Highlights of our trip chain analysis include:

- 48% (of all trip chains) are only one segment and a further 33% are two segments.
- 22% are less than 2 km in length and 51% are less than 6 km.
- 90% use only one mode of transport (48% are vehicle driver trip chains; 25% are vehicle passenger and 13% are walking).
- Of the chains with vehicle driver as the main mode, 13% are less than two kilometres long and 42% are less than six kilometres.
- Fairly equal numbers of trip chains have the purposes of Subsistence (work or education), Maintenance (personal business, shopping, etc) and Discretionary (social, recreational, leisure) – 24%, 21% and 24% respectively.

"Tours" describe how New Zealanders link their trip segments in a round trip that begins and ends at home. A simple tour could consist of leaving home, travelling to work and returning home again at the end of the working day. Tours may consist of multiple segments, either for the same purpose (e.g. a "multi-part" work tour) or for a mix of purposes (e.g. a "composite" work tour, containing non-work segments). Key fundamentals from our tours analysis include:

- 56% (of all tours) are simple, two segment tours (e.g. home–activity–home); a further 17% are three segment tours.
- 28% are less than 4 km in total and 53% are less than 10 km.
- 84% use one mode of transport; 47% are vehicle driver tours.
- 66% have a main purpose other than work or education.
- 23% are for work purposes; nearly half of these are simple two segment tours and over 75% have "vehicle driver" as the main mode.
- 10% are for education purposes; 86% of these are completed by 3 to 17 year olds.

We examined the relationship between vehicle driver tours in terms of their length and the type of tour in order to identify what potential there is for encouraging environmentally friendly mode use, particularly walking and cycling. Nearly all walking tours (98%) in New Zealand are less than 10 km in total; 83% are less than 4 km. With respect to cycling tours, nearly one-half (48%) are less than 4 km, while 82% are under 10 km. This suggests that targeting vehicle driver tours of less than 10 km is a reasonable proposition.

We found that 19% of vehicle driver tours are less than 4 km and 46% are less than 10 km in total length. When examined by type of tour, we established that "simple" vehicle driver tours of all types were far more likely than composite or multi-part vehicle driver tours to be less than 4 km long. Nearly 68% of all simple non-work/non-education vehicle driver tours are less than 10 km, compared with 46% of simple work tours and 40% of simple education tours.

Examining vehicle driver tours that are under 4 km in length (i.e. averaging less than 2 km "each way") seems reasonably comparable in principle to the New Zealand Transport Strategy emphasis on vehicle driver trips (segments) less than 2 km. The results are markedly different however: 33% of vehicle driver segments are less than 2 km, but only 19% of tours with vehicle driver as the main mode average less than 2 km each way.[1] Such differences have important implications for analysis of sustainable transport. Furthermore, the alternative of considering trip chains up to 2 km long also delivers a result markedly lower than 33%; only 13% of chains with vehicle driver as the main mode are less than 2 km.

Potential New Performance Indicators

We demonstrated the potential to develop new performance indicators using the trip chain and tour datasets, presenting baseline performance indicators for walking-only and cycling-only trip chains less than 2 km long in the three major cities. For example: in Wellington 58% of trip chains less than 2 km long are walked, and in Christchurch 6% of trip chains less than 2 km long are cycled. More general *national* performance indicators of increasing cycling and walking mode share, based on main mode, can also be derived using the new datasets.

School Travel

We considered trip chains involving the travel of children to and from school, both from the perspective of the children going to school and, in the cases where the children were passengers in a vehicle in Auckland, Wellington, and Christchurch, the vehicle driver. We believe this to be the first assessment of mode share or purpose of children's travel *from* school, either nationally or by disaggregated groups. Referring to children's (aged 5-17) travel to and from school, we found that:

- 85% leave home and go straight to school (no interim stops are made on the way).
- Trip chains from school are more complex than those going to school.
- In the three main centres, there is a significant contrast between how some age groups travel to school and from school.
- Dramatic differences in mode use for trip chains from school are shown by 2-year age groups (ages 5-6, 7-8, 9-10, 11-12, 13-14, and 15-17).

Until we created such reformulated datasets, it has not been feasible to describe the journey made by the vehicle driver dropping children off to or picking them up from school. However, due to the small sample size available for analysis, the results for driver trip chains must be regarded as indicative only. With respect to driver trip chains to school in the three main centres, we determined that:

- 27% had the sole purpose to drive a child/children to school and 56% ended at work or their own place of education.

1 Note that we are not suggesting that all driver tours of less than 4 km in total are walk- or cycle-able. Due to factors unknown to us, such as time constraints, having heavy loads to carry, catering to other passengers who may not be able to walk or cycle themselves, driving a company car, and so on, an individual's mode choice may (at a given point in time) be limited to car driver.

- 25% of the home to school segment of all chains (regardless of purpose) were less than 1.4 km – an easily walk-able distance; 50% were less than 2.5 km (i.e. walk- or cycle-able).

For driver trip chains from school, we established that:

- 59% start from home and 34% start from work.
- 69% do not have any other purpose than to pick up their child/children and either accompany them to a child-related activity or take them home.

This information highlights some reasonably obvious targets for efforts to change mode use, such as those who drive home immediately after dropping off or picking up their child at school and who thus have no other reason for being on the road at that time. Such drivers make up around a quarter (27%) of the total driving children to school and probably even more of those driving children from school. For many of these journeys, the distance between home and school is eminently "walk-able", suggesting that other factors may be causing these parents to drive.

It also highlights the fact that primary school children (5-12 year olds) are the ones who are most commonly driven to and from school, whereas 13-17 year old urban dwellers are commonly driven to school but use a different mode to travel home. This suggests that targeting for school travel initiatives should focus on primary schools for both journeys. With high schools, there is probably a need to be more selective as to where school travel initiatives are undertaken.

Potential for Further Research

The results presented here draw attention to the potential of the reformulated trip chains and tour datasets to improve understanding of New Zealanders' travel behaviour, particularly the nature and frequency of "short trips". It is essential to realise there are many other possible applications for the trip chain and trip tour datasets. Hence the most important outputs from the overall research project are the datasets and the associated programming rather than the initial reports.