

# SURVEY OF PEDESTRIANS AND CYCLISTS INVOLVED IN CRASHES AT CHRISTCHURCH HOSPITAL

## ABSTRACT

Pedestrians and cyclists involved in crashes with motor-vehicle were surveyed over two 4 week periods at Christchurch hospital (emergency department). Telephone surveys were also undertaken of people who had reported a cycle or pedestrian crash to ACC in 2002. The survey was designed to capture more detailed information on crashes than was available from Police records, and focused on more severe crashes.

The questionnaire covered the following areas; demographics, travel mode, cycle type, date, time and location of crash, light conditions, weather, crash type, footpath and road conditions, main crash causes, estimate of vehicle and cycle speeds, trip purpose, details on injuries sustained and emergency services that attended (to check with other databases). This technical note presents the key findings from this survey.

The technical note also provides information on reporting rates for serious pedestrian and cycle crashes and the compliance rates (those crossing on green man) of pedestrians at traffic signals by time of day.



## DATA COLLECTION:

**A - Christchurch Hospital interviews** - Only pedestrian and cyclist accidents where the accident occurred on a public road or footpath in Christchurch City were interviewed at Christchurch Hospital. The key determinant was that the accident occurred on the road reserve. Accidents both involving and not involving motor vehicles were included in the survey.

**B - ACC interviews** - People who were involved in pedestrian and cycle accidents on public roads, were interviewed in Christchurch, Palmerston North and Hamilton. In the main study, ACC data were supplied for the year 2002. Each accident casualty was called and interviewed using the same questionnaire used at the hospital by telephone.

**C - Questionnaire** - The same questionnaire was used for all interviews. The questionnaire included the following factors:

- **Demographics** (age and gender)
- **Travel mode** (pedestrian, cyclist, other e.g. skateboarding)
- **Cycle type** (mountain bike, 10 speed, other) and set up (e.g. lights)
- **Date and time of accident**
- **Location of accident:** (road, footpath or "other")
- **Light conditions:** (dark, at twilight, or in the daylight)
- **Weather:** (during accident or other conditions)
- **Accident type** (e.g. pedestrian vs. car, pedestrian only)
- **Road, footpaths or cycleway conditions** (e.g. loose gravel)
- **Cause of accident** (often several factors for each accident)
- **Accident description** (a description of the sequence of events and a diagram)
- **Estimate of speed of vehicles and cyclists**
- **Trip purpose** (e.g. school, recreation, work)
- **Injury sustained during accident** (e.g. grazes, bruises and head injury)
- **Emergency services that attended accident** (if any)
- **Information on previous pedestrian and/or cycle accidents** (in the past two years)

## RESULTS

### Relationship between proportion of cycle and pedestrian trips and cycle and pedestrian accidents in each age group

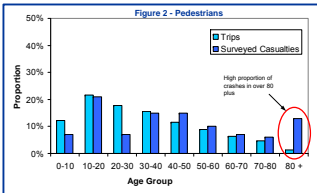
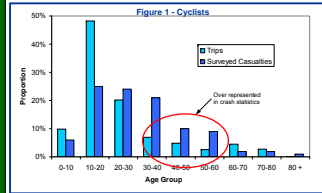


Figure 1 shows the comparison between those surveyed as casualties and those who cycle. This shows that generally the proportion of cyclists matches the proportion of casualties surveyed in each age group. However, the age group from 10 to 20 makes up a high proportion of cycle trips but lower proportion of casualties and cyclists between 30 and 60 years old, particularly 30 to 40, feature higher in the number of accident casualties surveyed than they contribute to proportion of cycle trips. This may be a result of cyclists in this age group being more likely to travel down higher volume roads and having a higher exposure by travelling longer distances.

Figure 2 shows the comparison between the ages of those casualties that were surveyed in this study and the proportion of pedestrians of different ages from the LTSA (2000a) travel survey. From this graph it can be observed that the number of trips undertaken by a particular age group was generally proportional to those surveyed casualties. However there is one particularly noticeable exception when comparing the number of trips and number of surveyed casualties in the 80+ age group. This is clearly a vulnerable group in society due to decreased physical ability and mental response time.

### Trip Purpose

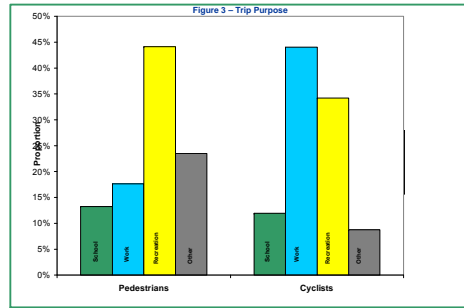
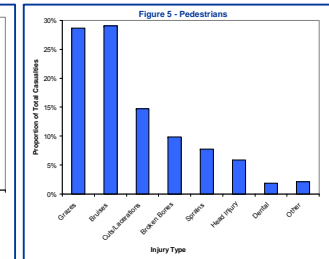
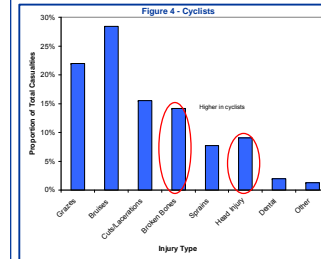


Figure 3 shows the trip purpose of pedestrian and cyclist accident casualties surveyed. Figure 3 shows that a large percentage of cycle trips are either commuter or recreational trips. Pedestrian trips were predominantly for recreational or "other" purposes (such as shopping). Surprisingly few of the pedestrian accident casualties were on the journey to or from work.

### Major injury sustained



The survey data for this study was disaggregated into the most severe type of injury the cyclist or pedestrian suffered. Figure 4 and 5 shows the most severe injury suffered by cycle and pedestrian accident casualties. Grazes and bruises occurred in a larger proportion of the injuries sustained by both pedestrians and cyclists. Broken bones and head injuries were more common in cyclist crashes. This is to be expected given the generally higher collision speeds.

### Key Accident Causes

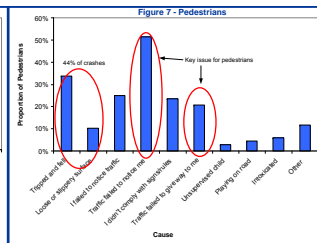
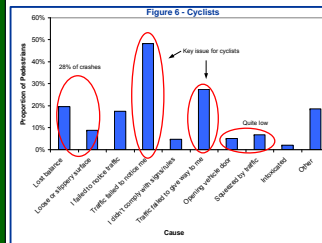


Figure 6 and 7 show the causes stated by accident casualties for cycle and pedestrian accidents respectively.

The percentage of cyclists reporting they lost balance or contribute their injury to loose or slippery surface is 28%. A high percentage (76%) of cyclists stated that other traffic failed to notice them or failed to give way to them. Surprisingly, the number of cyclists that reported drivers opening doors on them or where "squeezed by traffic" was less than 5%.

The percentage of pedestrians reporting that they tripped and fell or contribute their injury to loose or slippery surface is 44%. A high percentage (72%) report that other traffic failed to notice them or failed to give way to them. 24% of the injured pedestrians admitted that they did not comply with the traffic rules. This compares with the average proportion of pedestrians that cross with the "green man" at traffic signals of 70%, at sites in Christchurch.

### Pedestrian Compliance Rates at Traffic Signals

Pedestrian crossing data were divided into:

1. Those that crossed with the green pedestrian signal ("the green man"),
2. Those who began to cross on the red pedestrian signal ("red man" or flashing red man), and
3. Those that crossed up to 50 metres away from the intersection or crossed without activating the pedestrian phase.

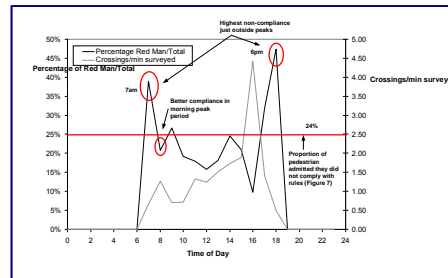
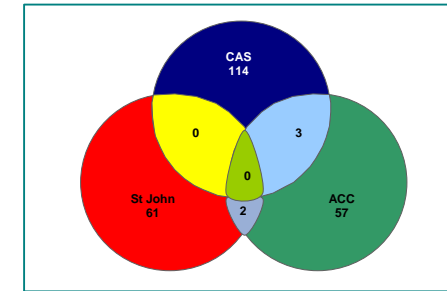


Figure 8 shows that when flows are at their highest (in the evening peak) then a larger percentage of pedestrians appear to cross on the 'green man' (see dip in profile to around 10% at 16:00 hours).

### Reporting Rates



An analysis was undertaken comparing crash data in 2001 data from CAS, St Johns and ACC to help understand reporting rates. Figure 9 illustrates the matching of these data. This data indicate that for every crash recorded in the CAS database, there is an additional 0.92 crashes reported in either the St John or ACC database. Notably, there are a particularly small proportion of crashes in the ACC database (8%) that match with crashes in either the CAS or St John database. This indicates that at least half of the more severe crashes that occur are not reported. This compares well with NZTA Reports Rate information.