

Footpath Cycling - Rule Options Research Addendum to Report (November 2016)

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1. Introduction

This technical note provides further analysis of hospital injury data associated with footpath cycling as requested by the NZ Transport Agency.

Injury data is available from the NZ Injury Query System (NIQS). The Injury Prevention Research Unit at University of Otago regularly uses New Zealand publicly funded hospital discharge (National Minimum Data Set – NMDS) and Mortality Collection data from the Ministry of Health to inform the NIQS. The data includes injury cause, location, type of injury, age and gender of person injured and number of days in hospital.

Cyclist and pedestrian injury records were obtained for the latest available 5-year period (2010 to 2014 inclusive). The initial analysis focused on the location of the injury being 'street and highway – sidewalk'. Unintentional cyclist injuries caused by "collision with a pedestrian or animal" and unintentional pedestrian injuries caused by "collision with a pedal cycle" were examined.

The content provided in our November report is included in Appendix 1.

Further analysis is provided in Sections 2 and 3 and includes the following:

- Pedestrian injury causes for the following locations to allow comparison across a range of environments
 - Street and Highway – roadway
 - Street and Highway - sidewalk
 - Non Street and Highway
- Pedestrian injuries caused by "collision with a pedal cyclist" in a range of environments – location, injury type and age
- Pedestrian injuries caused by "collision with a pedal cyclist" on the sidewalk – injury type and age

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2. Transport accident injuries

2.1 Definitions

A transport accident is “any accident involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another”.

In terms of where the transport accident occurs there are non traffic accidents and traffic accidents.

- A non traffic accident is “any vehicle accident that occurs entirely in any place other than a public highway”.
- A traffic accident is “any vehicle accident occurring on the public highway [i.e. originating on, terminating on, or involving a vehicle partially on the highway]. A vehicle accident is assumed to have occurred on the public highway unless another place is specified, except in the case of accidents involving only off-road motor vehicles, which are classified as nontraffic accidents unless the contrary is stated.”

A highway is defined as “A public highway [trafficway] or street is the entire width between property lines (or other boundary lines) of land open to the public as a matter of right or custom for purposes of moving persons or property from one place to another. A roadway is that part of the public highway designed, improved and customarily used for vehicular traffic”.

There were 59,717 transport accident injuries between 2010 and 2014.

2.2 Hospital admissions and injury type

The injuries discussed in this technical note were associated with hospital discharges. This includes short stay emergency department admissions of a minimum of 3 hours^[1] of treatment and day patients. Readmissions for the same incident are excluded.

To avoid double counting with the Mortality Collection, hospital discharge data includes only non-fatal data. i.e.it does not include patients who were discharged dead from hospital.

It should be noted that a given hospital event may have several contributing diagnoses, but the principal diagnosis is given to be the primary reason for admission.

^[1] For the purposes of the national collections, healthcare users who receive assessment and/or treatment for three hours or more, or who have a general anaesthetic are to be admitted. This also applies to healthcare users of Emergency Departments (ED). When calculating the three hours, exclude waiting time in a waiting room, exclude triage and use only the duration of assessment/treatment. If part of the assessment/treatment includes observation, then this time contributes to the three hours. ‘Assessment/treatment’ is clinical assessment, treatment, therapy, advice, diagnostic or investigatory procedures from a nurse or doctor or other health professional”.
Ministry of Health Glossary
https://www.health.govt.nz/system/files/documents/pages/appendix_b_national_collections_glossary_2014.pdf

2.3 Pedestrian injuries (transport accident)

Table 2.1 shows the pedestrian injuries sustained in transport accidents during the five year period (2010-2014) in the roadway, sidewalk and non-street and highway places. There were a total of 3,849 pedestrian injuries in these transport accidents, this equates to 6.5% of the total transport accident injuries.

Table 2.1 2010-2014 Pedestrian injuries (Roadway, sidewalk and non street and highway)

Street or Highway – Roadway (excluding sidewalk)	No.	%
- Pedestrian conveyance accident	7	<1%
- Collision with pedal cyclist	46	2%
- Collision with 2 or 3 wheeled motor vehicle	34	1%
- Collision with car, pick-up truck or van	2,022	88%
- Collision with heavy transport vehicle or bus	130	6%
- Collision with railway train or railway vehicle	2	<1%
- Collision with other nonmotor vehicle	3	<1%
- Other and unspecified transport accidents	62	3%
Sub Total	2,306	
Street or Highway – Sidewalk	No.	%
- Pedestrian conveyance accident	23	9%
- Collision with cyclist – see Section 3.3	33	13%
- Collision with 2 or 3 wheeled motor vehicle	5	2%
- Collision with car, pick-up truck or van	181	70%
- Collision with heavy transport vehicle or bus	5	2%
- Other and unspecified transport accidents	13	5%
Sub Total	260	
Non 'street and highway' location	No.	%
- Pedestrian conveyance accident	139	11%
- Collision with pedal cyclist	55	4%
- Collision with 2 or 3 wheeled motor vehicle	46	4%
- Collision with car, pick-up truck or van	751	59%
- Collision with heavy transport vehicle or bus	57	4%
- Collision with railway train or railway vehicle	14	1%
- Collision with other nonmotor vehicle	22	2%
- Other and unspecified transport accidents	199	16%
Sub Total	1,283	
Total	3,849	

3. Further analysis

3.1 Pedestrian collision with a pedal cyclist - all environments

During the five year period (2010-2014) there were 150 pedestrian injuries caused by a collision with a pedal cycle. 33 of these occurred on sidewalks. These 150 injuries accounted for less than 1% of all transport accident injuries.

The external cause code is 'V01 - Pedestrian injured in collision with pedal cycle' in a transport accident. These injuries were sustained in a range of locations as shown in **Table 3.1**.

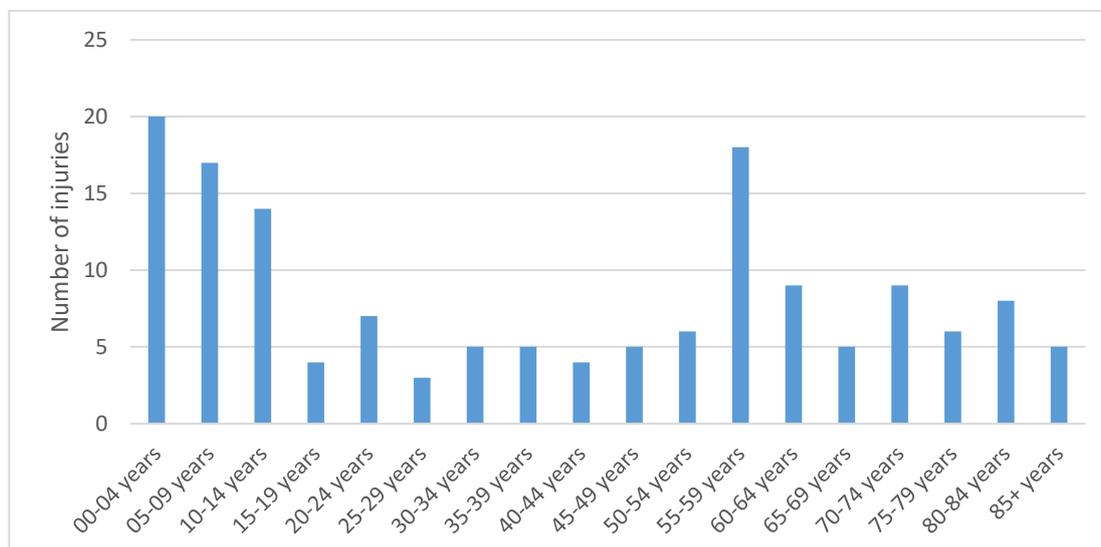
63% of the accidents occurred in the 'street and highway', with the highest proportion sustained in the roadway and second highest on the sidewalk.

Table 3.1
Pedestrian injuries caused by collision with a pedal cycle – location (2010-2014)

Injury location	No.	%
Home - Driveway to home	2	1%
Home - Other and unspecified place in home	7	5%
Home - Outdoor areas (garden, tennis court)	5	3%
Other specified place - Beach	1	1%
Other specified place - Other specified place of occurrence	9	6%
School, or other institution - School	4	3%
Sports and athletics area - Racetrack and racecourse	2	1%
Sports and athletics area - Skating rink	3	2%
Sports and athletics area - Sporting grounds (outdoor)	1	1%
Street and highway - Cycleway	3	2%
Street and highway - Other specified public highway, street or road	2	1%
Street and highway - Roadway	46	31%
Street and highway – Sidewalk	33	22%
Street and highway - Unspecified public highway, street or road	11	7%
Trade and service area - Shop and store	1	1%
Unspecified place of occurrence	20	13%
Total	150	

The age of persons injured by a collision with a pedal cycle is shown in **Figure 3.1**. 89 of the pedestrians were female, 61 were male.

Figure 3.1 Age distribution for pedestrians injured in collision with pedal cycle (2010-2014)



The injury types sustained are shown in **Table 3.2**. Given the definition of a serious injury^[2] used in the Crash Analysis System (CAS) injury coding system it is assumed that, as the injuries involved hospital admission, most are likely to have been 'serious'.

Table 3.2 Injury type - pedestrian collision with a pedal cycle all environments (2010-2014)

Injury type	Frequency
Dislocation	2
Fracture	63
Internal organ injury	31
Open wound	22
Other specified injury	5
Superficial & contusion	15
Unspecified injury	12
Total	150

^[2] **Serious injuries:** Fractures, concussion, internal injuries, crushings, severe cuts and lacerations, severe general shock necessitating medical treatment, and any other injury involving removal to and detention in hospital.

3.2 Pedestrian collision with a pedal cyclist - sidewalk

During the five year period (2010-2014) there were 33 pedestrian injuries caused by a collision with a pedal cycle on the sidewalk.

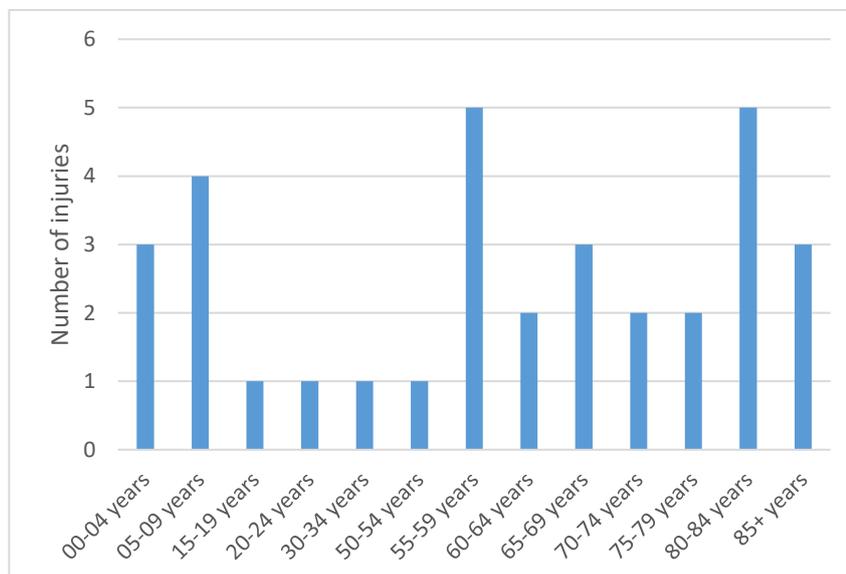
The injury types sustained are shown in **Table 3.3**.

Table 3.3 Injury types - pedestrian collision with pedal cycle on sidewalk (2010-2014)

Injury type	Frequency
Fracture	19
Internal organ injury	3
Open wound	5
Other specified injury	1
Superficial & contusion	3
Unspecified injury	2
Total	33

The age of pedestrians injured by a collision with a pedal cycle is shown in **Figure 3.2**. 23 of the pedestrians were female, 10 were male.

Figure 3.2 Age distribution for pedestrians injured by collision with pedal cycle on sidewalk (2010-2014)



4. Summary of findings

The following findings are based on the NIQS data for five year period 2010 to 2014 inclusive. NIQS data is based on publicly funded hospital treatments.

There were 59,717 unintentional injuries sustained in 'transport accidents'.

Pedestrian injuries - roadway, sidewalk and non street or highway

3,849 pedestrians were injured in the roadway, sidewalk and non street or highway within the five year period (2010 to 2014). These injuries accounted for 6.5% of all transport accidents.

- 3,231 injuries involved a motor vehicle
- 2,306 injuries were sustained in the roadway, 2% of these were collisions with pedal cycles
- 260 injuries were sustained on the sidewalk, 13% of these were collisions with pedal cycles
- 1,283 injuries were sustained in a non street or highway location, 4% of these were collisions with pedal cycles

Pedestrian collision with a pedal cyclist - all locations

150 pedestrians were injured in a collision with a pedal cycle in all environments within the five year period (2010 to 2014). This is an average of 30 pedestrians per year being injured in a collision with a pedal cycle. These injuries accounted for less than 1% of all transport accidents.

The injuries were sustained in the following locations:

- 31% in the roadway (e.g. crossing the road);
- 22% on the sidewalk;
- 13% in an unspecified place of occurrence and
- The remaining 35% were sustained in 13 other environments

The key demographic statistics were:

- 22% of injured pedestrians were aged 65 years or over;
- 25% of injured pedestrians were under 10 years of age;
- 59% of injured pedestrians were female and
- 42% of the injuries were fractures, this is the most common injury type.

Pedestrian collision with a pedal cyclist - sidewalk

33 pedestrians were injured in a collision with a pedal cycle on the sidewalk within the five year period (2010 to 2014). This is an average of 6-7 pedestrians per year being injured by a pedal cycle while on the sidewalk. These injuries accounted for less than 1% of all pedestrian transport accidents.

The key demographic statistics were:

- 45% of injured pedestrians were aged 65 years or over;
- 21% of injured pedestrians were under 10 years of age;
- 70% of injured pedestrians were female and
- The main injury type was fracture (57% of the injury types).

Appendix 1 – Extract from November report (pages 38/39)

Hospital data - The NZ Injury Query System (NIQS)

The Injury Prevention Research Unit at University of Otago regularly uses New Zealand publicly funded hospital discharge (National Minimum Data Set – NMDS) and Mortality Collection data from the Ministry of Health to inform the NIQS. The online data is based on cause, for ‘pedal cyclists’ and ‘pedestrian’ injuries by Motor Vehicle Traffic Causes and Non-Motor Vehicle Traffic Causes. However, by specific request, cycling injury records were obtained for the latest available 5-year period (2010 and 2014) where the scene of the injury was ‘street or highway - sidewalk’.

The key limitations of the data are:

- Broad injury types do not provide the reason for the crash (e.g. in a collision with a motor vehicle the location is not provided, such as driveways);
- Age is provided in 5 year brackets; and
- Difficult to compare directly with the CAS data.

Overview of the 2010 and 2014 period

431 cyclists who were riding on the footpath within the road environment were injured (this includes day patients). 217 of the 431 were hospitalised (had to stay overnight in hospital).

The breakdown of the cycle injuries in terms of type were:

- 1% - Pedal cyclist injured in collision with pedestrian or animal;
- 3% - Pedal cyclist injured in collision with other pedal cycle;
- 10% - Pedal cyclist injured in collision with car, pick-up truck, or van;
- 13% - Pedal cyclist injured in collision with fixed or stationary object;
- 68% - Pedal cyclist injured in non-collision transport accident (assumed this is a fall off the bike - such as people learning to ride); and
- 5% - Pedal cyclist injured in other and unspecified transport accidents.

32% of the injured cyclists were aged between 5 and 14-years-old. 61% of cyclists who were injured were male (this includes day patients).

33 pedestrians who were hit by a cyclist riding on the footpath were injured (this includes day patients). 19 were hospitalised (not including day patients). The main injury was fracture (57% of the injury types). The key demographic statistics were:

- 45% of non-fatal injuries to pedestrians who were hit by a cyclist riding on the footpath were aged 65 years or over;
- 21% of non-fatal injuries to pedestrians who were hit by a cyclist riding on the footpath were under 10 years of age; and
- 70% of pedestrians who were hit by a cyclist riding on the footpath who were hospitalised were female (this includes day patients).

Overall the injury data showed that there is an under-reporting in CAS of pedestrian injuries caused by crashes with cyclists on the footpath (CAS showed 13 crashes in 10 years and NIQS showed 33 crashes in 5 years). It is also clear that in pedestrian/cyclist crashes pedestrians receive the greatest number of injuries (33 pedestrians compared to 13 cyclists). This is consistent with the CAS findings, albeit at a different ratio.

The overall number of cycle crashes reported in CAS and the NIQS are difficult to compare as the NIQS includes falls that are very unlikely to have been attended by the Police.