Non-motor vehicle related pedestrian injury on and near the road – implications for the Safe System Approach to road safety

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Safer Journeys Road Safety Strategy

- It follows that:
  - The management of all modes on the network should have a Safe System Approach
  - These Safe System Approaches should work together to move towards a safe system
  - Road Safety Funding should be structured so as to allow this to happen.
Walking

Walking, as an active mode is part of a Government push towards safe sustainable transport.

- It is important that the public has confidence in its ability to walk safely on the street network.
- This means putting effort into identifying under what circumstances pedestrian injury occurs, and to instigate effective counter measures.

Our Safe System approach means that:
  - Road Controlling Authorities (RCAs) are responsible for minimising injury on their networks, whether or not motor vehicles are involved.
  - Their networks include the roadway and areas near the roadway used by pedestrians.
  - Thus the responsibility to mitigate pedestrian injury falls upon the RCA.
- **Type of injury *Safer Journeys* addresses**
  
  - Injury which occurs on the road network and about which we have accessible data.
  - There is some information on cycling where no motor vehicle is involved.
  - However, non-motor vehicle pedestrian injuries are recorded in separate databases that do not feed into *Safer Journeys*. 
Impacts on non-motor vehicle pedestrian injuries

- They receive scant attention, although they form an important part of the road injury burden.
- Therefore there is a knowledge gap about non-motor vehicle pedestrian injuries, particularly how they relate to infrastructure.
- This impedes our ability to provide the correct infrastructure and fix problems.
Impacts on non-motor vehicle pedestrian injuries

† This needs to be remedied if we are to achieve the potential of walking as a serious and safe mode of transport.
† This presentation seeks to address this knowledge gap by presenting information related to the circumstances surrounding ACC* claims for pedestrian injury, occurring on or near the road, where motor vehicles were not involved.
† This required a home interview survey of injured people as the information on the ACC claim form on the circumstances of the injury is scant.

* The Accident Compensation Corporation (ACC) is New Zealand’s publicly owned no-fault personal injury insurance provider.
Information sources

- Two sources of information and data were used:
  - ACC claims for pedestrian injury occurring on or near the road, where motor vehicles were not involved; and
  - a structured home interview survey of Wellington pedestrians injured on roads or footpaths and other roadside areas.

- Excluded were injuries that did not occur on or near a road (e.g. on a walking track, park or golf course) and rare events like a mugging or sudden physical disability (e.g. muscle cramp) causing a fall.

- Survey participants ranged in age from toddlers, where a parent, present at the time of the accident, was interviewed, to elderly pedestrians (up to 97.5 years), with an average age of 52 years.
调研样本

- 如预期，调研样本存在年龄偏见。
- 样本中64+的百分比为29%，而估计的人口65+的百分比为13%。
- 这与年龄增长导致的行人脆弱性相关联。

![Histogram of Age at Time of Accident](image-url)
Walking environment

- Residential: 47.50%
- CBD: 37.3%
- Small set of shops: 9.60%
- Rural: 4.1%
- Industrial: 1.60%
Level of design features for a pleasant walking environment (out of 10)
Type of injury

- Sprain/strain, 43.30%
- Laceration/puncture, 15.60%
- Contusion, 14.60%
- Fracture/dislocation, 12.50%
- Other, 14.10%
Location of injury
Surface pedestrians slipped, tripped or fell on
Obstacles

The chart shows the percentage of main obstacles encountered on or beside the road. The chart compares two categories: Beside road and On road. The main obstacles include:

- Loose material
- Driveway
g- No obstruc-
t- Pole
t- Natural

The chart indicates that the most common main obstacle is 'Uneven surface' on the road, followed by 'Other' categories. The percentage of each obstacle is indicated on the y-axis, ranging from 0% to 40%.
Maintenance or design?

- Poorly maintained surfaces are ranked as a more persistent cause of accidents than design issues.
- Poor maintenance includes:
  - uneven construction (e.g. cracks)
  - temporary deterioration
- Design issues include:
  - vertical changes (e.g. kerbs), particularly when stepping up (as opposed to down)
  - slippery surfaces
Lighting

- 13% of accidents occurred where lighting is perceived to be poor.
- These were overwhelmingly in artificially lit areas.
- Indicates that:
  - current artificial lighting may not always be adequate
  - possible hazards may need to be “flagged” in some way if they cannot be removed
Responsibility and prevention

- Most pedestrians felt responsible for the accident and its prevention.
- 51% thought they had the best chance of preventing the accident and 38% thought they were its main cause.
- Seventy-six people felt responsible for an accident while believing the main prevention mechanism related to maintenance, design or another person.
- May contribute to underreporting.
The role of predictability

- Predictability problem:
  - occurs when there is a disparity between the perceived predictability of the environment and the actual continuity of the environment

- Self-explaining footpaths:
  - “no surprises” environments
  - intuitively encourage safe user behaviours
Complexity of pedestrian injury factors

- The causes of a pedestrian slip, trip or fall are typically complex and certainly not solely a function of the environment.
- The survey indicates that people carry loads, may be fatigued, engage in other activities or hurry through their walking environment.
- These factors can block their vision, distract them from their task and alter their gait.
- Therefore, environments that are not forgiving to pedestrians that may be fatigued, visually impaired or distracted etc are more likely to cause injury than those which are more forgiving.
Pedestrian injury/death rates per million hours walked
Pedestrian injury related to PT journeys

- Pedestrian journeys often involve a PT leg.
- Injuries to people on PT or entering or exiting PT are not reported through the tradition methods.
- The next slide looks at ACC claims related to various types of PT.
## ACC database search by claim and transport type

### Table 1. Number of new claims by transport type text term: 2009-2014

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
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<td>1,080</td>
<td>1,059</td>
<td>1,123</td>
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<td>120</td>
<td>138</td>
<td>129</td>
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<td>35</td>
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<td>41</td>
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<td>Tram</td>
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<td>9</td>
<td>6</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Carriage</td>
<td>7</td>
<td>6</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total by year</strong></td>
<td><strong>1,263</strong></td>
<td><strong>1,259</strong></td>
<td><strong>1,237</strong></td>
<td><strong>1,317</strong></td>
<td><strong>1,439</strong></td>
<td><strong>1,610</strong></td>
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</tbody>
</table>

### Table 2. Transport type by text search for activity prior Getting On/Off or In/Out of: 2009-2014

<table>
<thead>
<tr>
<th></th>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
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</thead>
<tbody>
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<td>Bus</td>
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<td>757</td>
<td>817</td>
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<td>97</td>
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<td>Tram</td>
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<td>11</td>
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<td>Carriage</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>814</strong></td>
<td><strong>873</strong></td>
<td><strong>867</strong></td>
<td><strong>949</strong></td>
<td><strong>1,064</strong></td>
<td><strong>1,151</strong></td>
</tr>
</tbody>
</table>
The future

- With predicted increases in the older population, vulnerable older pedestrians will be more numerous.
- This is likely, all other things being equal, to increase pedestrian injury.
Recommendations

That:

- The prevention and mitigation of non-motor vehicle pedestrian injury be formally recognised as an integral and important part of road safety.
- At local, regional and national levels, all road safety strategies, safety management systems and associated action plans have regard to these pedestrian injury events.
- Research be instigated to provide improved data and analysis tools to prioritise such countermeasures vis-à-vis other uses of road safety funds.
Acknowledgement

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