Children cycling on footpaths
Edward Randal, Romane Baland, Michael Keall

Encouraging cycling is important for health, societal and environmental reasons. Cycling has been shown to have clear benefits for cardiorespiratory health and can reduce risk of certain cancers and rates of all-cause mortality. Over the past 30 years there has been a dramatic decline in children cycling to school along with a substantial reduction in adults cycling for transport. During this time, New Zealand has invested heavily in roads that encourage private motor vehicle travel with very little investment in infrastructure to facilitate cycling.

New Zealand law currently states that bicycles (with wheels larger than 355mm diameter) are not to be ridden on footpaths, except for mail delivery. It is, however, legal to ride a scooter on the footpath, so long as this is done safely. There is currently no legal minimum age to cycle on the road, although the New Zealand Police recommend that children under the age of 10 should not ride on the road unsupervised, while the New Zealand Transport Agency (NZTA) state that children may be ready to ride on the road unsupervised from age 11. Due to the lack of dedicated cycling infrastructure, young cyclists are left with a choice of breaking the law by cycling on the footpath or risk sharing the road with often high-volume motor traffic.

In 2014, a petition to legalise footpath cycling by children was considered by the Transport and Industrial Relations Committee. It argued that children are not generally ready to cycle on the road safely and need the opportunity to learn to cycle in a safe environment that is easily accessible.

The NZTA commissioned a review of footpath cycling rule options. In this report the authors reviewed the academic literature on cycling and footpath safety, and noted that the safety implications of children cycling on the footpath were not clear. There is conflicting evidence on the frequency of crashes and severity of injuries from cycling on footpaths, with numerous limitations in the data and study designs used. It is also unknown what the impact will be on the very young, elderly and disabled footpath users in terms of their safety and comfort of using the footpaths with children cycling. Analysis using New Zealand crash data found that cyclist crashes on footpaths were less severe than on-road crashes and pedestrians were involved in less than 2% of cyclist crashes on footpaths (although these crashes are likely under-reported). The NZTA report concluded that ideally pedestrians, cyclists and motor vehicles should be separated, but as this is currently unfeasible on most roads, providing particularly vulnerable cyclists the option of riding on the footpath when necessary and allowing organisations to legally train children to ride safely on footpaths would improve cycle safety overall. The final recommendation was to allow children 12 years and under (and any accompanying adults) to cycle on the footpath. On considering this report and other evidence, the Select Committee Review agreed with this recommendation.

A further limitation in the evidence presented was that there were no studies on the speeds of children cycling on the footpath. Higher speeds increase the risk and severity of collisions, and harm, both in terms of injury and reductions in perceived safety, to pedestrians is a legitimate concern for policy makers. The aim of the research presented here is to provide speed measurements of children currently cycling on footpaths in Wellington, along with speed measurements of children legally riding scooters on the footpath as a comparison.

Methods

Children 12 years and under were observed cycling or riding scooters on their way to or from four schools in Wellington City—two contributing primary schools.
(years 1 to 6), one full primary school (years 1 to 8) and one intermediate school (years 6 to 8)—during July and August 2017. These schools were chosen to ensure children observed were not older than 12 years of age. Observation sites near the schools were selected to observe behaviour on both flat and sloped roads (to get a fairer measure of speeds).

Observers timed children travelling between two points of known distance (measured beforehand by the observers), and speeds were calculated accordingly. Observers also noted whether the children were riding on the road or footpath, whether they were travelling uphill, downhill or on the flat, whether they were alone or with other children or an accompanying adult, and whether they were on a scooter or bicycle.

Results were then collated and the difference in mean speeds between scooter-riders and children on bicycles was then assessed for statistical significance using Student’s t-test.

Results

A total of 105 children were observed riding a bicycle or scooter on the road or footpath. Of these, 77 were riding scooters on the footpath, 25 were riding bicycles on the footpath and three were riding bicycles on the road. The maximum speed observed was 26.1 km/h, by a child riding a bicycle on the road. The maximum speed observed on the footpath was 25.3 km/h, by a scooter rider. The fastest speed of a bicycle on the footpath was 22.5 km/h. Table 1 shows the mode, location and speed of all observations over 20 km/h.

Overall, there was no significant difference (p=0.569) between the average speed of scooter riders and cyclists on the footpath, with average speeds of 10.9 km/h and 10.2 km/h respectively. Children cycling on the road appeared to travel the fastest, with an average speed of 16.6 km/h, although the estimated average is imprecise because of the very small sample size. Mean and median speeds of observed scooter riders and cyclists on the road and footpath are shown in Table 2.

Table 1: All observations over 20km/h (out of 105 total observations).

<table>
<thead>
<tr>
<th>Travel mode</th>
<th>Footpath/Road</th>
<th>Slope</th>
<th>Speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>20</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>21.0</td>
</tr>
<tr>
<td>Bike</td>
<td>Footpath</td>
<td>Downhill</td>
<td>21.3</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>21.6</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>21.6</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>22.2</td>
</tr>
<tr>
<td>Bike</td>
<td>Footpath</td>
<td>Downhill</td>
<td>22.5</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>22.8</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>23.1</td>
</tr>
<tr>
<td>Bike</td>
<td>Road</td>
<td>Downhill</td>
<td>23.6</td>
</tr>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>Downhill</td>
<td>25.3</td>
</tr>
<tr>
<td>Bike</td>
<td>Road</td>
<td>Downhill</td>
<td>26.1</td>
</tr>
</tbody>
</table>

Table 2: Average speeds of scooter riders and cyclists.

<table>
<thead>
<tr>
<th>Travel mode</th>
<th>Footpath/Road</th>
<th>Observations</th>
<th>Mean speed (km/h)</th>
<th>Median speed (km/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scooter</td>
<td>Footpath</td>
<td>77</td>
<td>10.9</td>
<td>9.6</td>
</tr>
<tr>
<td>Bike</td>
<td>Footpath</td>
<td>25</td>
<td>10.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Bike</td>
<td>Road</td>
<td>3</td>
<td>16.6</td>
<td>23.6</td>
</tr>
</tbody>
</table>
Discussion
Children observed in this study cycling on the footpath were not travelling faster than those riding scooters.

While this study was carried out at a small number of locations around Wellington during winter, when cycling numbers are low because of the cold weather, 102 footpath users were still observed. The lack of statistical significance for the difference in speed was not particularly surprising given the relatively small sample size. From a policy perspective the difference in mean speed between scooter riders and children on bicycles was very small (less than 1km/h). As this was an observational study on public roads the observers did not need to identify themselves to passers-by or notify parents or children that the observations were taking place. Therefore, the behaviour of the observed children was unlikely to have been altered by the presence of the observers, thus giving a fair representation of the speeds children travel on the footpath at these locations. Safety considerations for children cycling on footpaths need to be examined carefully. A child cycling on a footpath will still encounter motor vehicles when crossing driveways and roads. Some drivers may be caught by surprise by a rapidly moving child crossing their path. Although children riding scooters or skateboards on footpaths already present such challenges to drivers' attention, some environmental modification of footpaths, intersections and drives may be justified to reduce this risk. In terms of risk to pedestrians, it has been estimated that the risk of sustaining a severe injury (Abbreviated Injury Scale 4 or greater) reaches 10% when a person is hit by a vehicle at an impact speed of around 28km/h, but the risk will be a fraction of this when the impact speeds are as low as the means estimated in our study and the “vehicle” has a vastly smaller mass.

In conclusion, based on the observations of speeds made in this study, allowing a given child 12 years of age and under to cycle on the footpath in New Zealand would be unlikely to impose increased injury risk on pedestrians beyond that already imposed by that child riding a scooter. There are, of course, other factors that influence injury risk of footpath users, including the sheer number of scooters and bicycles on the footpath, the way collisions occur, the handling and stopping performance of bicycles and scooters and other mobility devices, the design of footpath environments and social attitudes and norms around the use of shared spaces. These unknowns provide ample scope for future research. By legalising a practice that is already occurring, schools and other providers will be able to train children to cycle safely and courteously on footpaths, improving the safety and experience of cyclists and other footpath users. If the law is changed, future work is merited monitoring the impact of this change on cycle skills, cyclist and pedestrian injuries, footpath user experiences and satisfaction, and long-term cycling trends.

Competing interests:
Nil.

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