Toitū te marae o Tāne,
Toitū te marae o Tangaroa,
Toitū te iwi

The land endures, The sea endures,
We, the people, endure.

A healthy whenua (land) and moana (sea) is a fundamental aspect of health and physical, mental, spiritual and social wellbeing. It provides resources to feed, shelter and heal whānau, an opportunity to learn, and opportunity to connect people to Papatūānuku.

2. Land Transport

This chapter sets out the numbers and rates of tamariki fatalities and hospitalisations for injury caused by land transport in Aotearoa. Fatalities are presented for the years 2014 to 2018 and hospitalisations for the years 2017 to 2021, with some trends presented for the years 2012 to 2021.

The current levels of fatalities and serious injuries sustained on and around the roads across Aotearoa are unacceptable and altogether avoidable, and this section highlights the need for a continued focus on addressing the risks that land transport injury pose to tamariki. The category 'land transport' covers a range of injury types, and the terms we use all have specific meanings. We have provided a text box below, to help readers navigate what might be confusing terms.

This chapter is split into three parts.

- Part A provides an overview of the numbers of land transport related fatalities and hospitalisations for tamariki.
- Part B focuses on 'motor vehicle traffic' injuries for tamariki.
- Part C looks at 'non-motor vehicle/non-traffic injuries (made up of 'other pedal cyclist', 'other pedestrian', and 'other land transport' injuries) for tamariki.

Land transport injuries are the cause of a substantial number of tragic fatalities in tamariki, and after suffocation (including SUDI), they are the second-highest cause of death from injury. For this reason, more detailed information on land transport-related deaths has been included in this chapter than in the chapters on other injury types.

Key terms for Land Transport Injury

Motor Vehicle Traffic: injury sustained in a land transport incident involving a moto vehicle on a street or highway including footpaths and cycleways (on-road). The unjured tamariki may be a vehicle occupant, pedestrian, pedal cyclist or motorcyclit.

Non-motor Vehicle/Non-Traffic Injuries: are combined injuries from the 'other pedal cyclist', 'other pedestrian' and 'other land transport' categories.

Other Pedal Cyclist: Injury sustained by a pedal cyclist in an incident that did not involve a motor vehicle (e.g., non-collision pedal cycle incident, collision with a stationary object) or in an off-road incident.

Other Pedestrian: Injury sustained by pedestrian in an off-road incident (e.g. motor vehicle in driveway) or an incident that did not involve a motor vehicle (e.g. collision with pedal cyclist).

Other Land Transport: Injury sustained in other land transport incident that did not involve motor vehicle traffic (e.g., off-road motor vehicle incidents, animal riders, all-terrain vehicles (ATVs) or other land transport accidents.

In brief

In the years 2014 to 2018, 66 tamariki died from 'motor vehicle traffic' injuries. Over this same period, an additional 29 fatalities in tamariki were related to non-motor vehicle/non-traffic.

In the years 2017 to 2021, there were 4,494 tamariki hospitalisations from land transport injuries. Around 35% of these were related to injuries sustained by a pedal cyclist ('other pedal cyclist'). Across all types of land transport-related injury, hospitalisation was more common for male tamariki than for female tamariki.

When it came to motor vehicle traffic injury:

- While there was a decrease in the rate of tamariki fatality from 2009 to 2012, these rates were almost unchanged between 2012 and 2018 (1.5 per 100,000 in 2012; 1.6 per 100,000 in 2018).
- In the years 2009 – 2018, the Waikato DHB [57] and Waitematā DHB areas [58] had the highest numbers of tamariki deaths from this type of injury across all the DHB regions (n=16 each). Whanganui DHB had the highest rate of tamariki deaths from this type of injury (6.06 per 100,000).
- The rates of tamariki hospitalisation increased slightly over the period 2012 to 2021(24.7 per 100,000 in 2012; 27.2 per 100,000 in 2021).
- In the years 2012 to 2021, the Counties Manukau [59] (n=345) and Waikato DHB areas (n=302) had the highest number of tamariki hospitalisations for this type of injury. The Whanganui DHB region [60] had the highest rate of tamariki hospitalisation for this type of injury (47.6 per 100,000).
- Injury as an occupant of a motor vehicle was the leading cause of tamariki hospitalisation for this type of injury, and the rates increased with age (11.5 per 100,000 for those aged 0 to 4 years, to 14.6 per 100,000 for those aged 5 to 9 years, and 20.5 per 100,000 for those aged 10 to 14 years).
- Tamariki Māori (45.0 per 100,000) and Pacific children (28.0 per 100,000) had the highest rates of hospitalisation for this type of injury.
- Tamariki living in the most relatively deprived areas of Aotearoa had the highest rate of hospitalisation for this type of injury overall (40.0 per 100,000 for NZDep quintile 5, compared with 15.3 per 100,000 for NZDep quintile 1).

57. Waikato DHB area stretches from northern Coromandel to close to Mt Ruapehu in the south, and from Raglan on the west coast to Waihi on the east.
58. Waitematā DHB area covers the northern and western parts of Auckland, from Te Hana to Birkenhead.
59. Counties Manukau DHB area covers the southern parts of Auckland, including Otara-Mangere, Manukau, and Franklin districts, and eastern localities including Howick, Pakuranga, and Flat Bush.
60. Whanganui DHB area covers Whanganui, Rangitikei Territorial Authority areas and the Ruapehu Territorial Authority area wards of Waimarino and Waiouru- known as South Ruapehu.

- Male tamariki accounted for a greater proportion of hospitalisation from this type of injury (59%) than female tamariki (41%).

For non-motor vehicle/non-traffic injury: [61]

- The rates of tamariki hospitalisation for this type of injury varied slightly each year, but overall there was little change, from the rate in 2012 (69.2 per 100,000) to the rate in 2021 (67.0 per 100,000).

- The rates of tamariki hospitalisation for this type of injury increased with age for the crash types 'other pedal cyclist' and 'other land transport'. However, the rate of hospitalisation for injury in the 'other pedestrian' category was highest for those aged 0 to 4 years (6.2 per 100,000).

- The highest rates of hospitalisation for this type of injury were amongst European/other children (94.2 per 100,000). Tamariki Māori had the second-highest rate of all the ethnic groupings (64.3 per 100,000).

- In direct contrast to the findings for 'motor vehicle traffic' injury, tamariki living in the least relatively deprived areas of Aotearoa were more likely to be hospitalised for 'non-motor vehicle/non-traffic' injury (80.1 per 100,000) than those living in the more relatively deprived areas (52.6 per 100,000).

- When broken down by geographic location, the former Waikato DHB region had the highest number of tamariki hospitalisations for this type of injury (n=414), and the Tairāwhiti DHB region [62] had the highest rate (142.0 per 100,000).

61. Non-motor vehicle/non-traffic injury covers "other pedal cyclist", "other pedestrian", and "other land transport".
62. Tairāwhiti DHB area (known as Hauora Tairāwhiti) covers the Gisborne district, local and territorial authority areas

Part A – Overview of land transport injury

Fatalities, trend over time

In the years 2014 to 2018, 66 tamariki died from 'motor vehicle traffic' injury across Aotearoa. Most of these tamariki were occupants in a motor vehicle (n=51).

Table 6 provides an overview of tamariki fatalities from 'motor vehicle traffic' incidents for the years 2014 to 2018, broken down by crash type.

Due to low numbers, it was not possible to provide meaningful statistical analysis for fatalities from 'non-motor vehicle/non-traffic' incidents ('other pedal cyclist', 'other pedestrian', and 'other land transport'), so data on fatalities has not been presented for these categories of injury. Twenty-nine tamariki died from 'non-motor vehicle/non-traffic' incidents in the years 2014 to 2018. Fifteen of these deaths related to 'other pedestrian' injury and 12 related to 'other land transport' injury. Of the 'other pedestrian' deaths, 73% (11 out of 15) were tamariki aged 0 to 4 years who died in an off-road collision with a motor vehicle (e.g. driveway runover).

Table 6: Overview of tamariki fatalities from 'motor vehicle traffic' incidents, 2014–2018

Main External Cause of Fatal Injury		Number	Rate per 100,000	%
Motor Vehicle Traffic Crash	Total	66	1.4	22.8
	Occupant	51	1.1	17.6
	Pedestrian	9	0.2	3.1
	Pedal Cyclist	<6	s	s
	Motorcyclist	<6	s	s

Hospitalisations, trend over time

In the years 2017 to 2021, 4,494 tamariki were hospitalised from land transport injury.

Table 7 provides an overview of tamariki hospitalisations for land transport injury, broken down into the main categories of land transport incident.

Table 7: Overview of tamariki hospitalisations for land transport injury, 2017–2021

External Cause of Non-Fatal Injury		Number	Rate per 100,000	95% CI	%
Land Transport	Total Motor Vehicle Traffic Crash	1,353	28.36	26.87 - 29.92	30.1
	Occupant	742	15.56	14.46 - 16.72	16.5
	Pedestrian	338	7.08	6.35 - 7.88	7.5
	Motorcyclist	165	3.46	2.95 - 4.03	3.7
	Unspecified	8	0.17	0.07 - 0.33	0.2
	Pedal Cyclist	100	2.10	1.71 - 2.55	2.2
	Other Pedal Cyclist	1,569	32.89	31.28 - 34.56	34.9
	Other Pedestrian	200	4.19	3.63 - 4.82	4.5
	Other Land Transport	1,372	28.76	27.26 - 30.33	30.5
Total		4,494	94.12	91.48 - 97.01	100

Additional points to note from Table 7:

- The most common type of non-fatal land transport injury was 'other pedal cyclist' (a rate of 32.9 per 100,000, n=1569). This category represented around 35% of all non-fatal land transport injuries.
- The rates of hospitalisation for tamariki aged 0 to 14 over this period were similar to each other in terms of 'other land transport' (28.8 per 100,000) and 'motor vehicle traffic' (28.4 per 100,000).

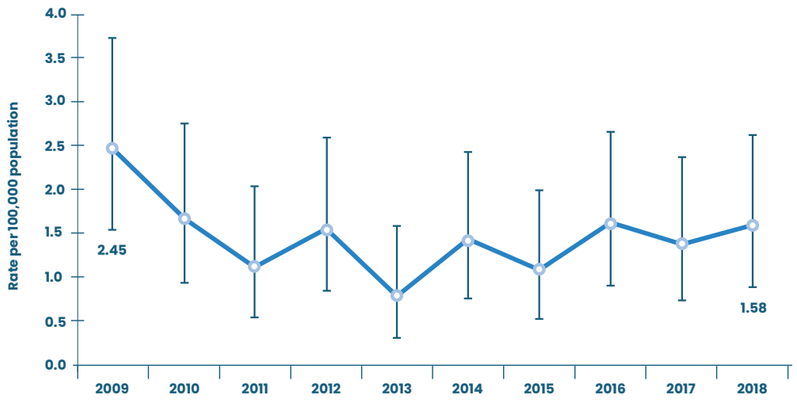
Part B – 'Motor vehicle traffic' injury
Fatalities, trend over time

Although the rates of fatal injury for tamariki from 'motor vehicle traffic' incidents have varied slightly each year, between 2009 and 2018, they were generally steady in the years 2012 to 2018 (1.5 per 100,000 in 2012; 1.6 per 100,000 in 2018).

Figure 17 shows the rates of fatal injury for tamariki from 'motor vehicle traffic' incidents over time, for the years 2009 to 2018.

Additional data on tamariki fatalities from 'motor vehicle traffic' incidents are provided in Appendix 2. [63]

Figure 17: Rates of fatal injury for tamariki from 'motor vehicle traffic' incidents over time, 2009–2018



63. See Table 41, Appendix 2.

Hospitalisations, trend over time

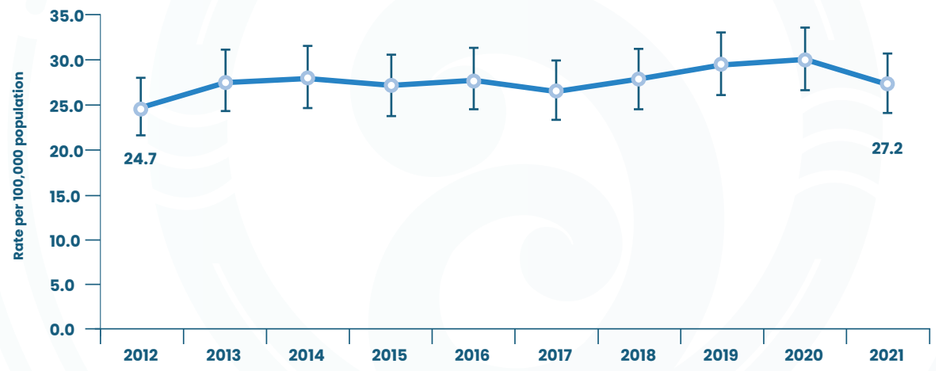
Rates of tamariki hospitalisation for injury related to 'motor vehicle traffic' incidents increased slightly over time (24.7 per 100,000 in 2012; 27.2 per 100,000 in 2021).

In the years 2017 to 2021, 1,353 tamariki were hospitalised for injuries from 'motor vehicle traffic' incidents (a rate of 28.6 per 100,000). These tamariki were most likely to be occupants in motor vehicles (n=742) or pedestrians (n=338).

Figure 18 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, for the years 2012 to 2021.

Additional data on tamariki hospitalisations for this category for each year from 2012 to 2021 are provided in Appendix 2. [64]

Figure 18: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents over time, 2012–2021



64. Table 41, Appendix 2.

Age group

In the years 2017 to 2021, almost half (48.6%, n=657) of all tamariki hospitalisations for injury from 'motor vehicle traffic' incidents were for tamariki aged 10 to 14 years. This was the highest rate of all the age groups (41.5 per 100,000).

Across all age groups, the leading cause of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents was being an occupant in a motor vehicle, with the rates increasing with age (from 11.5 per 100,000 for tamariki aged 0 to 4 years; 14.6 per 100,000 for tamariki aged 5 to 9 years; 20.5 per 100,000 for tamariki aged 10 to 14 years).

Within the age group 0 to 4 years, most hospitalisations for injury from 'motor vehicle traffic' incidents were for tamariki aged 1 to 4 years (91%, n=239).

Table 8 shows tamariki hospitalisations for injury from 'motor vehicle traffic' incidents, presented by age group, for the years 2017 to 2021.

Figure 19 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, presented by age group and type of crash, for the years 2017 to 2021.

Table 8: Tamariki hospitalisations for injury from 'motor vehicle traffic' incidents, by age group, 2017–2021

Age Group (Years)	No. of Hospitalisations	%	Rate per 100,000	95% CIs	
0 - 4	264	19.5	17.39	15.35	19.62
5 - 9	432	31.9	25.91	23.52	28.47
10 - 14	657	48.6	41.47	38.36	44.77
Total	**1,353**	**100**	**28.4**	**26.87**	**29.92**

Additional points to note from Table 8:

- For the years 2017 to 2021, the rate of hospitalisation for injury for tamariki aged 10 to 14 years (41.5 per 100,000) was significantly higher than the rates for those aged 5 to 9 years (25.9 per 100,000) and 0 to 4 years (17.4 per 100,000).

Figure 19: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by age group and crash type, 2017–2021

Additional points to note from Figure 19:

- Across all age groups tamariki aged 10 to 14 years had the highest rate of hospitalisation for the subcategory 'occupant' (20.5 per 100,000). This was a statistically significant finding.
- The hospitalisation rate for tamariki aged 10 to 14 years for the 'pedal cyclist' subcategory (3.9 per 100,000) was significantly higher than in the age group 5 to 9 years (2.0 per 100,000) and 0 to 4 years age group (0.40 per 100,000).
- Tamariki aged 10 to 14 years also had the highest rate of hospitalisation for injury in the subcategory 'motorcyclist' (7.3 per 100,000) – significantly higher than for tamariki aged 5 to 9 years (2.5 per 100,000) and 0 to 4 years (0.5 per 100,000).

Ethnicity

In the years 2017 to 2021, tamariki Māori had significantly higher rates of hospitalisation for injury from 'motor vehicle traffic' incidents (45.0 per 100,000) than European/other children (22.8 per 100,000) or Asian children (16.7 per 100,000). Pacific children had the second-highest rate of all the ethnic groups (28.0 per 100,000). The rate for MELAA children was 24.8 per 100,000.

Looking at crash type, tamariki Māori had the highest rate of hospitalisation of any ethnic group for injury in the subcategory 'occupant' (27.1 per 100,000). Pacific children had the highest rate of hospitalisation for injury in the subcategory 'pedestrian' (11.4 per 100,000).

At every age group, tamariki Māori had the highest rates of hospitalisation for injury from 'motor vehicle traffic' incidents of any ethnic group. Although, in the 0 to 4 year old group, the rate for Pacific children (29.3 per 100,000) was very close behind that of tamariki Māori (29.5 per 100,000).

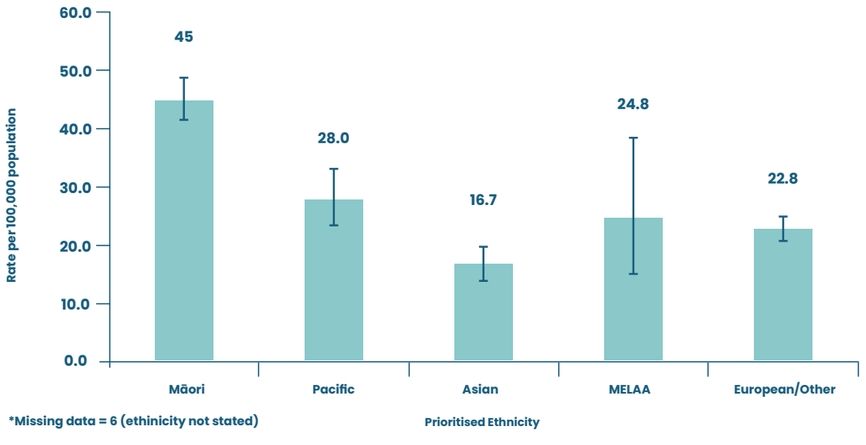
Figure 20 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity, for the years 2017 to 2021.

Figure 21 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity and crash type, for the years 2017 to 2021.

Figure 22 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity and age group, for the years 2017 to 2021.

Additional data on tamariki hospitalisations for 'motor vehicle traffic' injury, by prioritised ethnicity, are provided in Appendix 2. [65]

*Figure 20: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity, 2017-2021**



*Missing data = 6 (ethinicity not stated)

65. Table 42, Appendix 2.

*Figure 21: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity and crash type, 2017–2021**

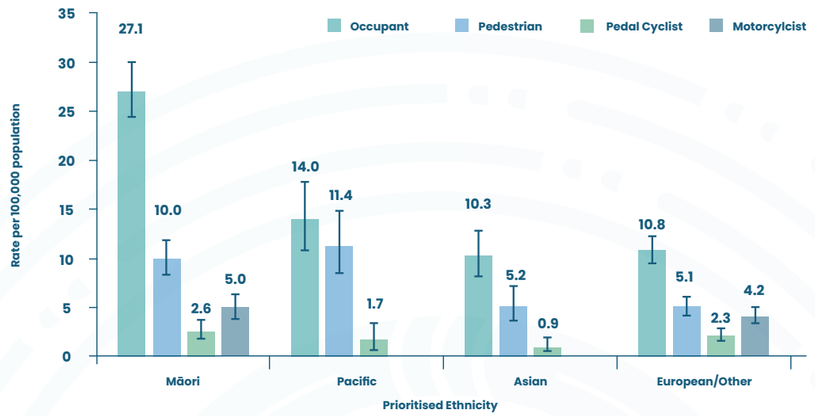


*Figure note: Data for the MELAA ethnic group is not presented, due to low numbers.

Additional points to note from Figure 21:

- Tamariki Māori had the highest rates of hospitalisation of any of the ethnic groups for injury in the subcategory 'occupant' (27.1 per 100,000). This was a statistically significant finding when compared with Pacific (14.0 per 100,000), Asian (10.3 per 100,000) and European/other children (10.8 per 100,000). Tamariki Māori also had the highest rates of hospitalisation in the subcategory 'pedal cyclist' (2.6 per 100,000) and motorcyclist (5.0 per 100,000).

- The rate of hospitalisation for injury in the subcategory 'pedestrian' was significantly higher for tamariki Māori (10.0 per 100,000) and Pacific children (11.4 per 100,000), when compared with Asian (5.2 per 100,000) and European/other children (5.1 per 100,000).

*Figure 22: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, by prioritised ethnicity and age group, 2017–2021**

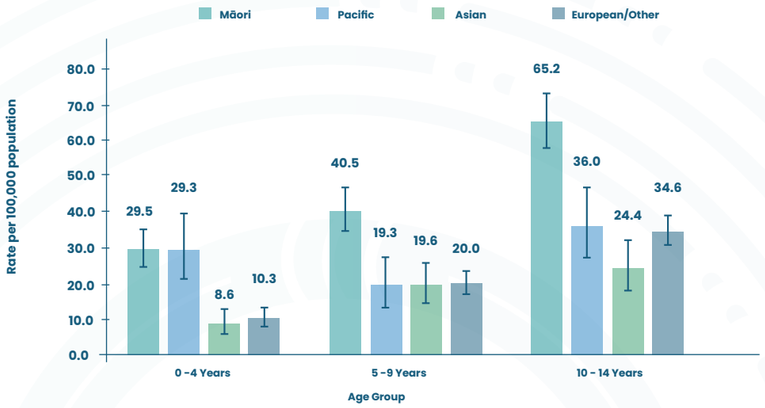


**Figure note: Data for the MELAA ethnic group is not presented, due to low numbers.*

Additional points to note from Figure 22:

- In the age group 0 to 4 years, tamariki Māori (29.5 per 100,000) and Pacific children (29.3 per 100,000) had significantly higher rates of hospitalisation for injury from 'motor vehicle traffic' incidents than Asian (8.6 per 100,000) and European/other children (10.3 per 100,000).
- In the age groups 5 to 9 years and 10 to 14 years, tamariki Māori had significantly higher rates of hospitalisation for injury from 'motor vehicle traffic' incidents than all the other ethnic groups (40.5 per 100,000 in the age group 5 to 9 years; 65.2 per 100,000 in the age group 10 to 14 years).
- In the age group 10 to 14 years, Pacific children had the second-highest rate of hospitalisation for injury from 'motor vehicle traffic' incidents (36.0 per 100,000), followed by European/other children (34.1 per 100,000) and Asian children (24.4 per 100,000).

Socio-economic deprivation

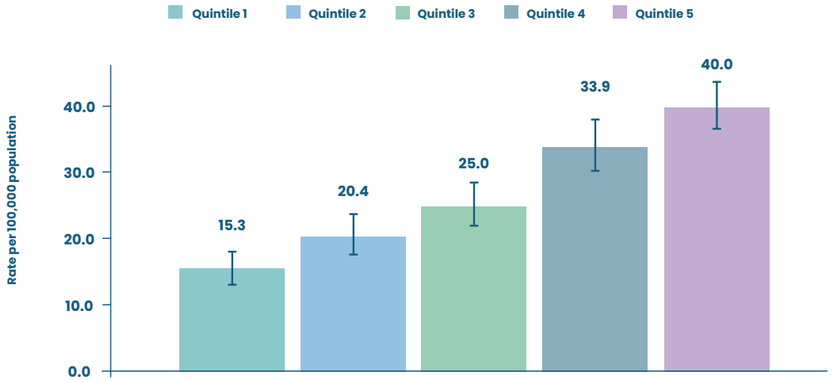
In the years 2017 to 2021, tamariki living in the most relatively deprived areas of Aotearoa had significantly higher rates of hospitalisation for injury related to 'motor vehicle traffic' incidents (40.0 per 100,000 for NZDep quintile 5) than those living in the least relatively deprived areas (15.3 per 100,000 for NZDep quintile 1). This social gradient is also evident when looking specifically at hospitalisations for tamariki who were injured as occupants in motor vehicle crashes.

Figure 23 shows the rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incidents, presented by NZDep quintile for the years 2017 to 2021.

Figure 24 shows the rates of tamariki hospitalisation for injury in the subcategory 'occupant' (a subcategory of motor vehicle crashes), presented by NZDep quintile, for the years 2017 to 2021.

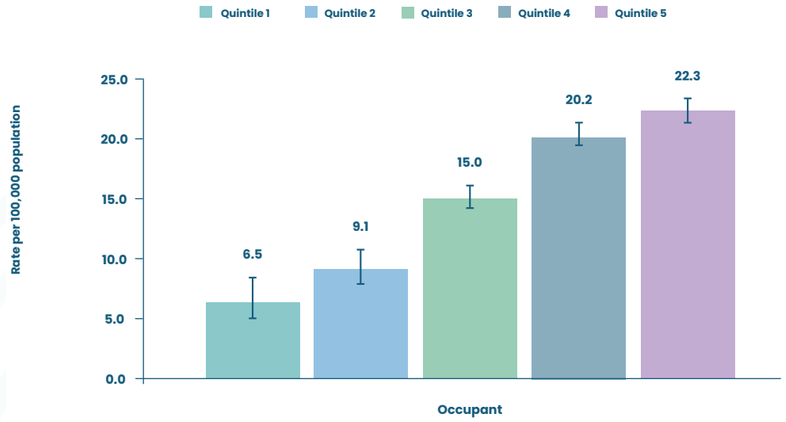
Additional data on tamariki hospitalisation for 'motor vehicle traffic' injury, by NZDep quintile and crash type, are provided in Appendix 2. [66]

Figure 23: Rates of tamariki hospitalisation for injury from 'motor vehicle traffic' incident, by NZDep quintile, 2017–2021



66. See Table 43, Appendix 2.

Figure 24: Rates of tamariki hospitalisation for injury in the subcategory 'occupant', by NZDep quintile, 2017–2021



Additional points to note from figure 24:

Tamariki living in the most relatively deprived areas of Aotearoa had a significantly higher rate of hospitalisations for injury in the subcategory 'occupant' (22.3 per 100,000 in NZDep quintile 5) than those in the least relatively deprived areas (6.5 per 100,000 in NZDep quintile 1, 9.1 per 100,000 for NZDep quintile 2, and 15.0 per 100,000 NZDep quintile 3).

Gender

In the years 2017 to 2021, male tamariki (59%, n=801) accounted for a greater proportion of tamariki hospitalisations for injury from 'motor vehicle traffic' incidents than female tamariki (41%, n=552). The rate of hospitalisation for males (32.7 per 100,000) was significantly higher than that for females (23.8 per 100,000).

Table 9 shows tamariki hospitalisation rates and numbers for injury from 'motor vehicle traffic' incidents, by gender, for the years 2017 to 2021.

Table 9: Tamariki hospitalisations for injury from 'motor vehicle traffic' incidents, by gender, 2017-2021

	Number	%	Rate per 100,000	95% CIs
Female	552	40.8	23.8	21.85 - 25.86
Male	801	59.2	32.7	30.47 - 35.04
Total	**1,353**	**100**	**28.4**	**26.87 - 29.92**

Geographic region

This subsection looks at 'motor vehicle traffic' data broken down by DHB regions. Although DHBs were disestablished by legislation in 2022 and replaced by Health New Zealand | Te Whatu Ora, which is now responsible for health services across Aotearoa, [67] DHBs were in operation during the time period that this data relates to. For many of the regions, the numbers were too low to complete meaningful statistical analysis so these results should be interpreted with some caution.

Of the 134 tamariki deaths for injury from 'motor vehicle traffic' incidents in the years 2009 to 2018, the Waikato [68] and the Waitematā [69] districts had the highest number of tamariki deaths (n= 16 each). The Bay of Plenty district [70] had the next highest number of deaths in tamariki between 2009 and 2018 (n=13).

Whanganui district [71] had the highest rate of tamariki deaths for injury from 'motor vehicle traffic' incidents (6.0 per 100,000, n=8) in the years 2009 to 2018.

In the years 2012 to 2021, the Whanganui also had the highest rate of tamariki hospitalisation from injury from 'motor vehicle traffic' injury (47.6 per 100,000), followed by the Northland [72] (45.6 per 100,000), and Tairāwhiti [73] (43.1 per 100,000) DHB districts.

Table 10 shows tamariki deaths (for the years 2009 to 2018) and hospitalisations (2012 to 2021) from injury from 'motor vehicle traffic' incidents, broken down by DHB district.

67. Pae Ora (Healthy Futures) Act 2022.
68. Waikato DHB area stretches from northern Coromandel to close to Mt Ruapehu in the south, and from Raglan on the west coast to Waihi on the east.
69. Waitematā DHB area covers the northern and western parts of Auckland – from Te Hana to Birkenhead. B
70. ay of Plenty DHB area covers the area from Waihi beach to East Cape and south to Ruatahuna and includes five district council areas (Kawerau, Opotiki, Tauranga, Western Bay of Plenty and Whakatane).
71. Whangaui DHB area covers the Whanganui and Rangitikei Territorial Authority areas, as well as the Ruapehu Territorial Authority area wards of Waimarino and Waiouru.
72. Northland DHB area covers from Te Hana in the south to Cape Reinga in the north.
73. Tairāwhiti DHB area covers the area from beyond Hicks Bay in the north to the Wharerata ranges in the south.

Table 10: Tamariki deaths (2009–2018) and hospitalisations (2012-2021) from injury from 'motor vehicle traffic' incidents, by geographic region

	Deaths from 'Motor Vehicle Traffic Incidents		Hospitalisations for 'Motor Vehicle Traffic Incidents	
DHB District	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Auckland	<6	s	194	23.83
Bay of Plenty	13	2.78	167	34.21
Canterbury	7	0.73	203	20.49
Capital & Coast	<6	s	97	17.71
Counties Manukau	11	0.91	345	27.50
Hauora Tairawhiti	<6	s	50	43.08
Hawke's Bay	9	2.57	120	33.87
Hutt Valley	<6	s	52	17.20
Lakes	<6	s	77	32.11
Mid Central	9	2.59	104	29.57
Nelson Marlborough	<6	s	62	22.84
Northland	10	2.71	173	45.58
South Canterbury	<6	s	20	18.78
Southern	7	1.24	131	22.77
Taranaki	<6	s	79	31.84
Waikato	16	1.92	302	35.16
Wairarapa	<6	s	23	26.59
Waitematā	16	1.40	271	23.00
West Coast	<6	s	23	39.45
Whanganui	8	6.06	63	47.60
Total	**134**	**1.46**	**2,599**	**27.78**

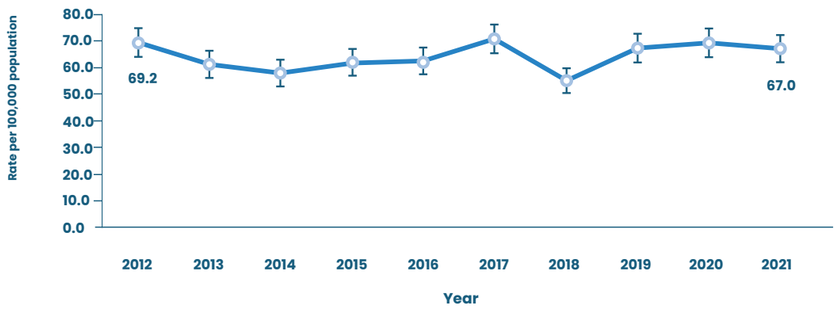
Part C: 'Non-motor vehicle/non-traffic' injuries ('other pedal cyclist', 'other pedestrian', and 'other land transport')

Hospitalisations trend over time

In the years 2012 to 2021, the rates of hospitalisation of tamariki for injury from 'other pedal cyclist', 'other pedestrian', and 'other land transport' incidents have varied slightly each year, but overall there was little change from 2012 (rate of 69.2 per 100,000) to 2021 (rate of 67.0 per 100,000).

Figure 25 shows the rates of tamariki hospitalisations for injury from 'non-motor vehicle/non-traffic' incidents over time, for the years 2012 to 2021.

Figure 25: Rates of tamariki hospitalisation for injury from 'non-motor vehicle/non-traffic' incidents over time, 2012–2021



Age group

In the years 2017 to 2021, the most common cause of hospitalisations for injury from 'non-motor vehicle/non-traffic' incidents was 'other pedal cyclist'.

The rates of hospitalisation of tamariki for 'non-motor vehicle/non-traffic' injury increased with age for 'other pedal cyclist' and 'other land transport' crash types. However, the rates of hospitalisation for 'other pedestrian' were highest for tamariki aged 0 to 4 years (at a rate of 6.2 per 100,000).

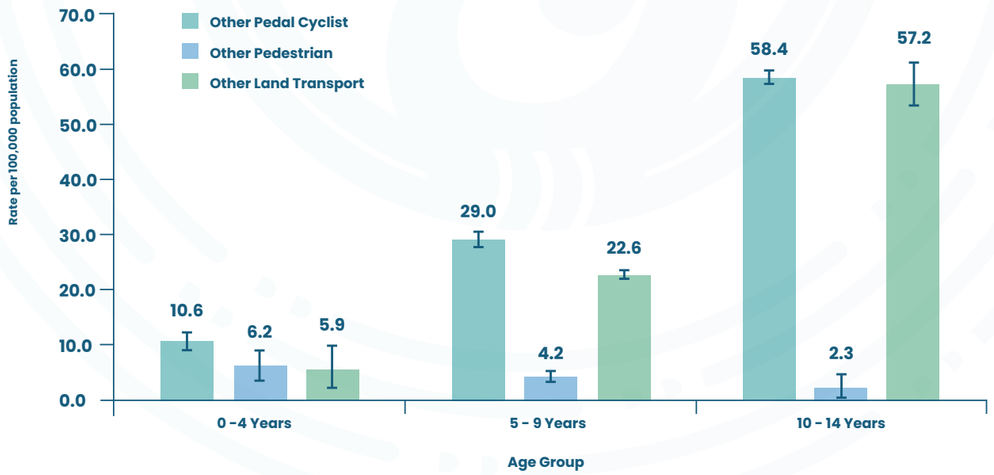
Compared with the two younger age groups, tamariki aged 10 to 14 years had the highest rates of hospitalisation for injury from 'non-motor vehicle/non-traffic' incidents for the subcategories 'other pedal cyclist' (58.4 per 100,000) and for 'other land transport' injury (57.2 per 100,000).

The vast majority of hospitalisations for the age group 0 to 4 years related to tamariki aged 1 to 4 years (98%, n=338).

Figure 26 shows the rates of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury, by selected crash type, presented by age-group for the years 2017 to 2021.

Additional data on tamariki hospitalisations for 'non-motor vehicle/non-traffic' related injury, by age group, are provided in Appendix 2. [74]

Figure 26: Rates of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury, by age group and crash type, 2017–2021



74. Table 44, Appendix 2.

Ethnicity

In the years 2017 to 2021, European/other children had the highest overall rates of hospitalisation for 'non-motor vehicle/non-traffic' injury (94.2 per 100,000), followed by tamariki Māori (64.3 per 100,000). The rate for European/other children was significantly higher than that for tamariki Māori. The rates for both European/other children and tamariki Māori were significantly higher than the rates for Pacific children (27.3 per 100,000) and Asian children (18.0 per 100,000).

European/other children had the highest rates of hospitalisation for injury related to 'other pedal cyclist' (a rate of 45.3 per 100,000) and 'other land transport' (a rate of 46.5 per 100,000) out of all ethnic groups.

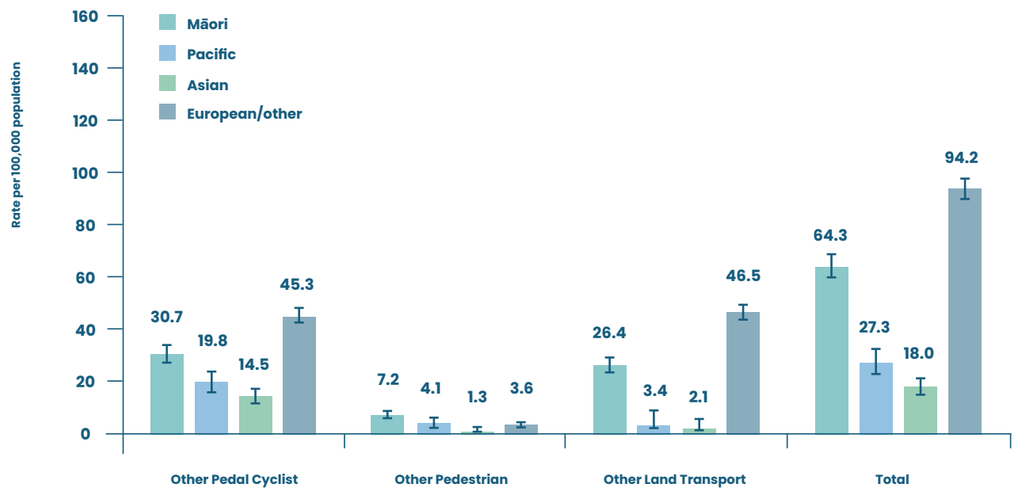
Tamariki Māori had the highest rates of hospitalisation for injury related to 'other pedestrian' (rate of 7.2 per 100,000), followed by Pacific children (4.1 per 100,000).

Figure 27 shows the rates of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury from the 'other pedal cyclist', 'other pedestrian', and 'other land transport' subcategories, by prioritised ethnicity, for the years 2017 to 2021.

Additional data on tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury for tamariki by prioritised ethnicity are provided in Appendix 2.[75]

75. Table 45, Appendix 2.

*Figure 27: Rates of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury, for tamariki by crash type and prioritised ethnicity, 2017-2021**



*** Data for the MELAA ethnic group is not presented, due to low numbers.**

Additional points to note from Figure 27:

- The rate of hospitalisation for injury from 'other pedal cyclist' was significantly higher for European/other children (45.3 per 100,000) than that for tamariki Māori (30.7 per 100,000), Pacific children (19.8 per 100,000), and Asian children (14.5 per 100,000). The rate for tamariki Māori was also significantly higher than the rates for Pacific and Asian children.

- The rate of hospitalisation for injury from 'other land transport' incident was significantly higher for European/other children (46.5 per 100,000) than that for tamariki Māori (26.4 per 100,000), Pacific children (3.4 per 100,000), and Asian children (2.1 per 100,000). The rate for tamariki Māori was also significantly higher than the rates for Pacific and Asian children.

Socio-economic deprivation

In direct contrast to 'motor vehicle traffic' injury (see Figure 23, above), tamariki living in the least relatively deprived areas of Aotearoa were more likely to be hospitalised for 'non-motor vehicle/non-traffic' injury (rate of 80.1 per 100,000) than tamariki living in the more relatively deprived areas of Aotearoa (rate of 52.6 per 100,000).

Looking in more depth at each of the three sub-categories of crash type:

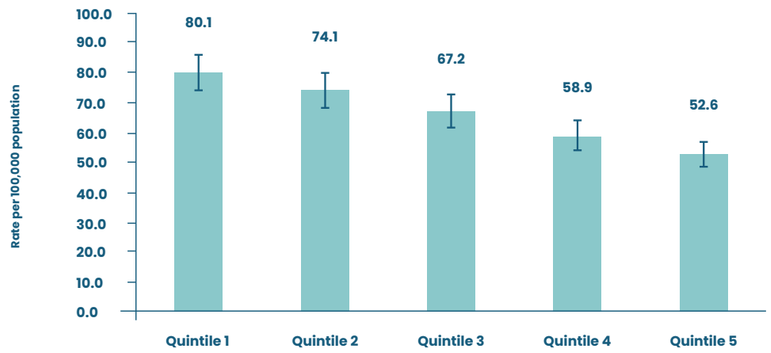
- The rates of tamariki hospitalisation for injury caused by 'other pedal cyclist' and 'other land transport' subcategories tended to decrease as the level of relative deprivation increased. Out of all the quintile groups, tamariki living in the least relatively deprived areas of Aotearoa (NZDep quintile 1) had the highest rates of hospitalisation for 'other pedal cyclist' injury (41 per 100,000) and the highest rates of 'other land transport' injury (34.9 per 100,000). [76]

- An exception to this inverse social gradient was in hospitalisation rates for tamariki for 'other pedestrian' injuries. In this category, tamariki living in the most relatively deprived areas of Aotearoa (NZDep quintile 5) had higher rates than all the other quintile groups (5.5 per 100,000). However, there was not a linear pattern in this category, as tamariki living in the least relatively deprived areas (NZDep quintile 1) had the second-highest rate (4.1 per 100,000).

Figure 28 shows the rates of tamariki hospitalisation for non-fatal injury from 'non-motor vehicle/non-traffic' injury from 'other pedal cyclist', 'other pedestrian', and 'other land transport' incidents, presented by NZDep quintile, for the years 2017-2021.

Additional data on tamariki hospitalisations for 'non-motor vehicle/non-traffic' injury for tamariki by NZDep quintile are provided in Appendix 2.[77]

*Figure 28: Rates of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury, by NZDep quintile, 2017–2021**



**Missing Data =16

76. See Table 46, Appendix 2.
77. See Table 46, Appendix 2

Gender

In the years 2017 to 2021, male tamariki accounted for a greater proportion of hospitalisations for 'non-motor vehicle/non-traffic' injury than female tamariki (70% males, n=2,205; 30% females, n=936). The rate of hospitalisation for 'non-motor vehicle/non-traffic' injury for male tamariki (90.0 per 100,000) was also significantly higher than the rate of hospitalisation for female tamariki (40.3 per 100,000).

Table 11 shows tamariki hospitalisations for 'non-motor vehicle/non-traffic' injury from 'other pedal cyclist', 'other pedestrian', and 'other land transport' incidents, for tamariki, by gender, for the years 2017 to 2021.

Table 11: Tamariki hospitalisations for 'non-motor vehicle/non-traffic injury', by gender and injury cause, 2017–2021

	Number	Rate per 100,000	95% CIs	
All Crash Types				
Female	936	40.3	37.8	43.01
Male	2,205	90	86.29	93.84
Total	3,141	65.8	63.56	68.19
Other Pedal Cyclist				
Female	348	15	13.46	16.66
Male	1,221	49.8	47.08	52.72
Total	1,569	32.9	31.28	34.56
Other Pedestrian				
Female	75	3.2	2.54	4.05
Male	125	5.1	4.25	6.08
Total	200	4.2	3.63	4.82
All Crash Types				
Female	513	22.1	20.24	24.11
Male	859	35.1	32.76	37.49
Total	1,372	28.8	27.26	30.33

Additional points to note from Table 11:

- For male tamariki, the most common cause of 'non-motor-vehicle/non-traffic' injury was 'other pedal cyclist', with a hospitalisation rate of 49.8 per 100,000, compared with 15.0 per 100,000 for female tamariki. This was a statistically significant result.

- For female tamariki, the most common cause of 'non-motor vehicle/non-traffic' injury was from 'other land transport' (n=513), although both the number (n=859) and rate of hospitalisation for male children for injury from this subcategory (35.1 per 100,000) was still significantly higher than that for female tamariki (22.1 per 100,00).

Geographic region

In the years 2017 to 2021, the Waikato district [78] had the highest number of hospitalisations of tamariki from non-motor vehicle/non-traffic injury (n=414), followed by the Canterbury district [79] (n=331).

The Tairāwhiti district [80] had the highest rate of hospitalisation for tamariki for 'non-motor vehicle/non-traffic' injury (142.0 per 100,000), followed by the Wairarapa [81] (a rate of 111.3 per 100,000), and Taranaki [82] (a rate of 95.5 per 100,000) districts.

The Hutt Valley DHB district [83] had the lowest rate of tamariki hospitalisation for 'non-motor vehicle/non-traffic' injury of all regions in Aotearoa (a rate of 33.6 per 100,000).

Table 12 provides information on tamariki hospitalisations for 'non-motor vehicle/non-traffic' injury, broken down by DHB district.

78. Waikato DHB area stretches from northern Coromandel to close to Mt Ruapehu in the south, and from Raglan on the west coast to Waihi on the east.
79. Canterbury DHB area covers the east coast of the South Island from Kaikoura to Ashburton.
80. Tairāwhiti DHB area (known as Hauora Tairāwhiti) covers the Gisborne district, local and territorial authority areas.
81. Wairarapa DHB area covers Martinborough, Featherston, Greytown, Carterton, Masterton and outlying rural districts.
82. Taranaki DHB area includes New Plymouth, Hawera, Pātea, Stratford and Waitara.
83. Hutt Valley DHB area covers the cities of Lower Hutt and Upper Hutt.

Table 12: Hospitalisations for non-motor vehicle/non-traffic injury for tamariki, by DHB district 2017-2021

DHB	Number	Rate per 100,000	95% CIs
Northland	165	84.6	72.2 - 98.57
Waitematā	279	46.1	40.83 - 51.81
Auckland	179	44.5	38.24 - 51.8
Counties Manukau	263	40.6	35.82 - 45.78
Waikato	414	93.5	84.71 - 102.97
Bay of Plenty	228	89.4	78.17 - 101.79
Lakes	109	89.5	73.5 - 107.99
Hauira Tairawhiti	82	142.0	112.96 - 176.31
Taranaki	1212	95.5	79.27 - 114.16
Hawkes Bay	145	80.6	68.05 - 94.89
MidCentral	113	63.2	52.08 - 75.98
Whanganui	57	85	64.39 - 110.16
Hutt Valley	51	33.6	25.01 - 44.17
Capital and Coast	107	39.1	32.08 - 47.3
Wairarapa	49	111.3	82.34 - 147.17
Nelson Marlborough	129	94.6	78.95 - 112.37
South Canterbury	41	76.6	54.99 - 103.97
Canterbury	331	64.9	58.13 - 72.33
West Coast	19	68.8	41.4 - 107.43
Southern	243	83.2	73.04 - 94.32
Total	**3141**	**65.8**	**63.56 - 68.19**
Area Outside DHB	16	-	-

Policy implications

Preventing fatal and severe motor vehicle traffic injury

Fatalities and serious injuries on roads across Aotearoa are unacceptable and avoidable. The data in this chapter highlights the distance we still have to go to achieve the vision of no death or serious injury for tamariki when it comes to our roads and cars. [84]

Consistent with the findings of the Study of Road Trauma Evidence and Data (SORTED) for 2017/18 to 2018/19, [85] tamariki Māori are disproportionately impacted by 'motor vehicle traffic' injury, having the highest rates of hospitalisation of all ethnic groups, followed by Pacific children. The inequitable impacts are further amplified for tamariki Māori and Pacific children when deprivation and geographic location are considered, whereby tamariki living in the most relatively deprived areas of Aotearoa have the highest rates of motor vehicle traffic injury. There are also increased rates of hospitalisation for tamariki living in rural areas compared with urban areas.

Our overall recommendation is that Aotearoa ensures its road safety policy is underpinned by a population health approach that aims for equitable outcomes for Māori and Pacific populations and those living in areas of highest relative deprivation, and that ensures equitable investment and robust monitoring so that progress can be seen in real time. This includes the need to strengthen the data collected by transport and related agencies, as well as the way it is analysed and used. As with all policy in Aotearoa, road safety policies must align with Te Tiriti o Waitangi obligations.

84. This is consistent with the "Vision Zero", an approach to road safety that began in Sweden in 1997 and advocates for a holistic safety approach that shifts responsibility from the people using the roads to the people designing them.
85. Ministry of Transport (accessed January 2024): https://www.transport.govt.nz//assets/Uploads/SORTED2022Web.

More specific recommendations to prevent fatal and injury from motor vehicle traffic crashes include:

- **Promote sustainable and safe alternatives to motor vehicle use.** This recommendation includes ensuring continued investment in public transport networks, both within cities and between regions; increasing public transport options for tāngata whaikaha Māori and disabled people aged 0 to 14 years; creating safe and accessible alternatives to driving (e.g., for pedestrians and cyclists); and offering low- or no-cost public transport to tamariki (and their whānau). Improving tamariki safety on school buses (especially when getting on or off buses) is included in this recommendation, as is increasing support from local councils to create safe environments for tamariki to walk to and from school. Reducing the overall reliance on private motor vehicles would also have other positive health and environmental impacts and was recommended in 2020 by an academic expert group as part of work on a plan for global road safety. [86]

- **Ensure safe and appropriate speed limits for all roads in Aotearoa. In some cases, this will mean enforcing 30km-per-hour speed zones, especially around schools.** According to New Zealand Transport Agency's analysis, [87] only around 15% of our roads have safe speed limits. This means, nearly 85% of roads across Aotearoa do not have safe and appropriate speed limits. This proportion is even higher for roads in rural areas, where 93% of roads do not have safe and appropriate speed limits. [88] In 2019, the Ministry of Transport's Road Safety Strategy Speed Reference Group noted that half of all crashes causing injury occurred on roads where the posted speed limit did not reflect the level of risk posed by the road. [89] World Bank-published research has rated reducing traffic speeds to 30km per hour or below in zones shared by pedestrians as potentially 'highly effective' (meaning a crash reduction of greater than 30%). [90] Local research (looking at Wellington City) has also shown permanent speed limit reduction (with a mix of 40km and 30km per hour zones) to have the highest crash reduction benefits. [91] Guidance from Healthy Auckland Together shows that chances of survival from a motor vehicle traffic collision are substantially higher at lower speeds (see infographic 1).

86. Academic Expert Group for the 3rd Global Ministerial Conference on Road Safety 2020 (AEG), available online at: https://www.roadsafetysweden.com pdf
87. Waka Kotahi | NZ Transport Agency, 2022.
88. Ministry of Transport, 2019.
89. Ministry of Transport, 2019.
90. Turner & Mitra, S., 2021.
91. Mandic, S., et. al., 2023.

Infographic 1: Healthy Auckland Together analysis of the impacts of unsafe road speeds [92]

- **Make safe rural roads a strategic priority.** Data in this chapter shows that areas with larger rural roading networks (e.g., Waikato, Whanganui, Northland and the Tairāwhiti DHB areas) have higher numbers and rates of tamariki death and injury from 'motor vehicle traffic' incidents. These areas should be prioritised for regional roading infrastructure, such as installing additional median barriers, side barriers, and rumble strips.

- **Invest in programmes that focus on tamariki Māori and Pacific children, developed in partnership with Māori and Pacific communities.** Programmes like Te Ara Haepapa (a holistic Māori designed and led programme supported by Auckland Transport) has proven highly successful in engaging and connecting with hapori Māori (whānau, marae, hapū, kōhanga reo and kura kaupapa Māori) on a range of topics, such as child passenger safety, educating drivers, cycle safety, and pedestrian safety.[93] We recommend that this type of approach be extended across Aotearoa, as should similarly, tailored, programmes that focus on road safety for Pacific families.

92. Healthy Auckland Together (August 2023) Safe Speeds Scorecard Report: Analysis of Auckland Transport's' Katoa, Ka Ora' proposals by Local Board, available online at: https://www.healthyaucklandtogether.org.nz/reports/
93. For a summary see: Auckland Transport (2021) Vision Zero for Tāmaki Makaurau: A transport safety strategy and action plan to 2030.

- **Support drivers to make the safer choices when buying motor vehicles.** This recommendation necessarily involves exploring ways to increase the number of Māori and Pacific drivers, and drivers in areas of high deprivation, who can access cars with higher star safety ratings. These star safety ratings for cars tell consumers how well a vehicle is likely to perform in a crash. Star ratings range from 1 to 5 (with the safer cars having a higher number of stars), and they are an important consideration when purchasing a car.[94] While awareness-raising initiatives regarding the star safety ratings are useful for keeping consumers informed, not everyone benefits from them, especially those on lower incomes. In 2022, Waka Kotahi (NZ Transport Agency) contracted research that showed from a series of surveys of car owners that purchase price was the highest-ranking factor in making a decision on which car to buy.[95]

- **Extend the safe and appropriate use of child restraints (car seats) to cover older tamariki.** The data in this chapter has shown that the rates of hospitalisation for tamariki occupants in 'motor vehicle traffic' increase with tamariki age. This indicates the effectiveness of mandatory requirements for children aged under 7 years to use an approved child restraint – and that the risks of motor vehicle traffic injury continue for children even after that age. We recommend that Aotearoa's car seat regulation moves in line with international best practice and that children should use an approved child restraint until they are at least 148cm tall or they turn 12 years old.[96]

  We also noted that improvements could be made in this area by reducing the number of child restraint standards that are accepted. Having a more streamlined approach to child restraint standards could help to reduce confusion around what is suitable for a child at any particular age, and possibly help to limit the misuse of seats and the installation errors that are caused by contradictory advice across different standards.

94. Up-to-date safety ratings of cars in Aotearoa can be checked on the Rightcar website: https://www.rightcar.govt.nz/. Star ratings are derived from three sources: the Australasian New Car Assessment Program (ANCAP), which assesses new vehicles based on crash tests; the Used Car Safety Ratings (UCSR), which assess used vehicles that are already in the market, based on real-world data; and the Vehicle Safety Risk Ratings (VSRR), which assesses most vehicles that don't have an ANCAP or UCSR rating.
95. Malcolm et al., 2022.
96. For example, in Germany, children who are aged under 12 years and are less than 150cm tall have to be restrained in a suitable child car seat. For more information on international comparisons, see Safekids Aotearoa, 2013.

Improve post-crash care and paediatric trauma clinical networks in Aotearoa.

Early findings from a research collaboration between trauma networks in Aotearoa and Australia suggest that once the data are standardised for severity and other factors, tamariki in Aotearoa are twice as likely to die from paediatric injuries than children in the Australian state of Victoria. Spokespeople from the research team have suggested that one of the key factors driving the different outcomes is where the children, once they are stabilised, are treated for most of their recovery. In Victoria, those aged under 16 years with serious trauma injuries are sent to the Royal Children's Hospital in Melbourne, while in Aotearoa, tamariki could be treated in a range of hospitals, each with varying levels of trauma care. [97]

Reducing tamariki cycling injuries

As data in this chapter has shown, the subcategory 'other pedal cyclists' had the highest rates of hospitalisation of all land transport injury types. This particularly affects male tamariki aged 10 to 14 years, and unlike most other injury types, it has a disproportionate impact on European/other children and those tamariki who are living in the areas of least relative deprivation in Aotearoa.

In the case of cycle-related injury however, lower rates of injury for some population groups may also reflect lower rates of cycling overall. Cycling can be an excellent mode of transport and recreation, and lower cycling rates for some groups might actually reflect a lack of access to bicycles, bicycle helmets, and safe cycle routes. To better understand data around cycling injuries it should be triangulated with travel survey data in the future.

In addition to ongoing education to ensure bicycle helmets are fitted appropriately and worn correctly, bicycle skills training, and increasing the use of visibility aids (e.g., high visibility or reflective clothing on tamariki while they are cycling), there should be continued enhancement of safe cycle routes, including cycle lanes and paths. In combination with other road safety policies, such as lowering speed limits near schools and on arterial routes, this could also encourage more tamariki and whānau to cycle and receive the benefits of this important source of exercise, recreation and transportation. [98]

97. For more information, see 'Shocking rate of trauma deaths amongst NZ kids revealed' by Nicole Bremner, 1News reporter, November 15, 2023. https://www.1news.co.nz/2023/11/15/shocking-rate-of-trauma-deaths-among-nz-kids-revealed/
98. For more information see Safekids (2012). Child cycling injury prevention – Factsheet.

Making driveways safer for tamariki

In the years 2014 to 2018, 11 out of 15 'other pedestrian' deaths were for tamariki aged 0 to 4 years who died in an off-road collision with a motor vehicle. Tamariki Māori had the highest rates of hospitalisation from non-fatal crash for 'other pedestrian' injury (rate of 7.2 per 100,000), followed by Pacific children (4.1 per 100,000). This suggests that driveway safety, especially for tamariki Māori and Pacific children aged 0 to 4 years should be a priority for government policy, in addition to continuing to educate drivers, parents, and caregivers about driveway safety. In particular we recommend that a lead government agency, supported by cross-agency collaboration be identified and given the mandate to oversee work on driveway safety, including overseeing the collection of data and exploring the adoption of property design and driveway safety design principles for all rental properties and new properties in Aotearoa. As set out in Housing New Zealand's *A guide to driveway safety for property owners there are three main design principles for property owners* [99] to follow.

- Provide a secure play area for young children, separate from driveways
- Provide pedestrians with a safe route to the building, separated from the driveway and vehicles
- Provide clear lines of sight for vehicles when entering and exiting the property.

99. The Housing New Zealand brochure, developed in partnership with Safekids Aotearoa, Waka Kotahi, NZ Police and Roadsafe Nelson Bays, is available online at: https://kaingaora.govt.nz/assets/Tenants-and-communities/Documents/