



Transport Planning and Design  
Level 1, 284 Kilmore Street

# Taupō District Speed Management Plan



Report prepared for  
Taupō District Council  
December 2021



This document has been prepared for the benefit of Taupō District Council. No liability is accepted by ViaStrada Ltd, or any of its employees or sub-consultants with respect to its use by any other party.

Quality Assurance Statement	
ViaStrada Ltd Level 1, 284 Kilmore Street PO Box 22 458 Christchurch 8140 New Zealand Phone: (03) 366-7605 <a href="http://www.viastrada.nz">www.viastrada.nz</a> <a href="mailto:info@viastrada.nz">info@viastrada.nz</a>	Project manager: Glen Koorey, BE, ME (Civil), BSc, PhD Director – Senior Transportation Engineer & Transportation Planner 027 739 6905 <a href="mailto:glen@viastrada.nz">glen@viastrada.nz</a>
	Prepared by: Gemma Dioni, MSc, BSc Senior Transportation Engineer  John Lieswyn, MET Director – Senior Transportation Planner
	Reviewed by: Glen Koorey, BE, ME (Civil), BSc, PhD Director – Senior Transportation Engineer & Transportation Planner 027 739 6905 <a href="mailto:glen@viastrada.nz">glen@viastrada.nz</a>
Project number: Project name:	1158-01 Taupō District
Document version	Date
Final report	FinalDate
V2 draft – partial completion of Appendix D Priority 1 tables	02/12/2021
V1 draft	19/11/2021



## Executive Summary

ViaStrada Limited has been commissioned by Taupō District Council (TDC) to prepare a speed management plan for the Taupō District. The Speed Management Plan is based on the Waka Kotahi (NZ Transport Agency) Speed Management Guide and will lead to the creation of an implementation plan for safer speeds in Taupō.

Following review of the relevant local, regional and national policies, and in discussion with TDC staff, a series of speed management principles were developed to establish criteria for using different speed limits for different road environment situations.

A prioritisation process was developed to group changes on the Taupō network into three priority categories for implementation. The main focus for Priority 1 changes (within the next two years) are:

- streets around schools
- rural roads with high safety issues or community concerns
- redevelopment of the Taupō township centre
- community centres in Kinloch and Turangi
- ratification of new or unclassified roads (including new subdivisions)
- additional roads adjacent to these to provide logical network completeness

Other roads, including those requiring additional engineering measures to support changed speed limits, will be implemented at a later date.



## Table of Contents

<b>Executive Summary</b>	<b>iii</b>
<b>1 Introduction</b>	<b>2</b>
<b>2 What is Speed Management and why do we need it?</b>	<b>2</b>
2.1 <i>A safe system</i>	2
2.2 <i>Strategic context</i>	3
2.3 <i>Council's obligations for setting of speed limits</i>	3
2.4 <i>Speed Management Guide and the Speed Management Framework</i>	4
<b>3 Development of the plan</b>	<b>5</b>
3.1 <i>What are the existing issues for Taupō?</i>	5
3.2 <i>What has Taupō done on speed management in the past?</i>	6
3.3 <i>Engagement undertaken</i>	7
3.4 <i>Projects undertaken</i>	7
<b>4 Speed management principles for Taupō</b>	<b>7</b>
<b>5 Speed management priorities for Taupō</b>	<b>8</b>
5.1 <i>Prioritisation method</i>	9
5.2 <i>Speed Management Toolbox</i>	9
5.2.1 <i>Engineering and Infrastructure</i>	9
5.2.2 <i>Stakeholder and Community Engagement</i>	13
5.2.3 <i>Education &amp; Enforcement</i>	13
<b>6 The proposed plan for Taupō</b>	<b>14</b>
6.1 <i>Schools</i>	15
6.2 <i>Rural roads</i>	15
6.2.1 <i>Poihipi Road</i>	15
6.2.2 <i>Mapara Road</i>	16
6.2.3 <i>Whangamata Road</i>	17
6.2.4 <i>Broadlands Road</i>	18
6.3 <i>Taupō township</i>	18
6.4 <i>Other Urban Settlements</i>	19
6.4.1 <i>Kinloch</i>	19
6.4.2 <i>Tūrangi</i>	21
6.4.3 <i>Wairakei and Whareroa</i>	22
6.5 <i>Ratification of new or unclassified roads</i>	23
<b>7 Next steps</b>	<b>23</b>



## List of Appendices

<b>Appendix A</b>	<b>Strategic context</b>	<b>A-1</b>
A.1	<i>Government Policy Statement on Land Transport 2021/22 - 2030/31</i>	A-1
A.2	<i>Vision Zero and the Safe System</i>	A-2
A.3	<i>Road to Zero 2020-2030</i>	A-3
A.4	<i>Arataki</i>	A-4
A.5	<i>Road to Zero for the Waikato 2020-2030 and Land Transport Plan</i>	A-6
A.6	<i>One Network Road Classification/One Network Framework</i>	A-9
<b>Appendix B</b>	<b>Crash information for the Taupō District</b>	<b>B-12</b>
B.1	<i>Fatal Crashes</i>	B-13
B.2	<i>Serious Crashes</i>	B-13
B.3	<i>Taupō Central</i>	B-15
B.4	<i>Taupō Townships</i>	B-16
<b>Appendix C</b>	<b>MegaMaps for the Taupō District</b>	<b>C-18</b>
C.1	<i>Posted Speed Limits</i>	C-18
C.2	<i>Mean Operating Speeds</i>	C-19
C.3	<i>Safe and Appropriate Speeds</i>	C-19
C.4	<i>Risk Metrics</i>	C-20
C.5	<i>High Benefit Speed Management</i>	C-23
<b>Appendix D</b>	<b>Schools in the Taupō District</b>	<b>D-25</b>
<b>Appendix E</b>	<b>Proposed Priority 1 Speed Limit Changes</b>	<b>E-26</b>
<b>Appendix F</b>	<b>Rationale where recommended speed is different from SAAS</b>	<b>F-33</b>
<b>Appendix G</b>	<b>Infrastructure and Costs</b>	<b>G-38</b>

# 1 Introduction

A road network needs to have an appropriate balance between providing an efficient system for moving people and goods to various destinations, and a safe system that protects road users and other people nearby. It also needs to take into account other considerations such as amenity, environment, travel behaviour change, and the overall views of the local community. A speed management plan is a key tool to help achieve many of these objectives.

By having a consistent speed management strategy for Taupō, it will be easier to communicate the key issues requiring attention and to present a common rationale to the public and elected members.

Road safety risk can be reduced by investing in infrastructure improvements to make a road safer at current speeds, or by managing speeds down through a combination of road design, risk targeted enforcement and education on safe behaviour, all reinforced by speed limits appropriate for the roads. Infrastructure improvements can be costly and not justified on lesser roads; therefore lower speed limits can provide a cost-effective way to achieve significant safety gains across a network at minimal expenditure.

The plan sets out what work needs to be done, by who, where and finally an indication of funding to implement this work, with a focus on the next three financial years of the 2021-24 National Land Transport Programme (NLTP).

## 2 What is Speed Management and why do we need it?

### 2.1 A safe system

The management of vehicle speed is a crucial element of the Safe System. Travel speed leading up to a potential crash directly impacts upon both the likelihood and severity of a crash<sup>1</sup>. One way to reduce the rate of death and serious injury is to set safe and appropriate speeds, recognising that the traditional default 50 km/h and 100 km/h speed limits are no longer fit for purpose.

At lower speeds, the available travel time between recognising a hazard and avoiding a collision increases, providing the driver with greater chance of avoiding a collision or minimising crash speed. If there is a collision, there is less impact energy involved and this will result in less severe injuries. A reduction of as little as 1–2% of the average speed can result in substantially greater reductions in fatalities and serious injuries.

The chance of surviving a crash (or not suffering serious injuries) decreases markedly above certain speeds, depending on the crash type. The critical crash speeds for various crash types are:

- pedestrian struck by vehicle = 30 km/h
- motorcyclist struck by vehicle = 30 km/h
- vehicle striking a pole or tree = 40 km/h
- side impact vehicle-to-vehicle crash = 50 km/h
- head-on vehicle-to-vehicle (equal mass) crash = 70 km/h.

Managing the inter-relationship between travel speed, road infrastructure design and vehicle safety is central to the Safe System approach. Speed management considers the function of the road within the transport network along with how the road is designed, managed and used.

---

<sup>1</sup> [https://austroads.com.au/publications/road-safety/agrs01/media/AGRS01-21\\_Guide\\_to\\_Road\\_Safety\\_Part\\_1\\_Introduction\\_Safe\\_System.pdf](https://austroads.com.au/publications/road-safety/agrs01/media/AGRS01-21_Guide_to_Road_Safety_Part_1_Introduction_Safe_System.pdf)



## 2.2 Strategic context

Speed management plans are long-term plans that work in line with the development of regional land transport plans. Regional Speed Management Plans should cover interactions with the National Speed Management Plan and the Regional Speed Management Plans of adjacent regions. They should:

- take a whole-of-network approach, consider speed limits and engineering changes in the relevant region,
- address Government outcomes outlined in the Road to Zero strategy, Action Plan and Government Policy Statement (GPS),
- generally align with the calculated “Safe and Appropriate Speed” (SAAS) for travel,
- be consulted on by Regional Transport Committees/RCA, and
- outline how they will be implemented.

The Road to Zero for Waikato Strategy envisions “accessible journeys free of deaths and serious injuries”.

*Refer to Appendix A for more of the important strategic context underpinning speed management*

This approach has been used to develop the Taupō District Speed Management Plan. Appendix A summarises how this Plan aligns with other local, regional and national strategies and plans.

## 2.3 Council’s obligations for setting of speed limits

The *Land Transport Act 1998*, the *Land Transport Management Act 2003*, and the *Land Transport Rule: Setting of Speed Limits 2017* set out Council’s current obligations and requirements for setting speed limits.

The proposed Tackling Unsafe Speeds programme<sup>2</sup>, will include a framework to improve how councils and Waka Kotahi (NZ Transport Agency) plan for, consult on and implement speed management changes. It will also mean lowering speed limits around schools and a new approach to using safety cameras for enforcement.

This framework will introduce a more consistent and transparent process to how speed limits are planned, managed, and put in place through State highway and regional speed management plans. It also formalises and streamlines the regional approach to speed management Waka Kotahi is taking with RCAs and aligns decisions about speed limit changes with investment in road safety infrastructure.

Under the framework, RCAs will introduce safer speed limits around schools over the 10 years of the Road to Zero strategy, which will include reducing speed limits:

- around urban schools to 30 km/h, with the option of allowing 40 km/h speed limits if appropriate
- around rural schools to a maximum of 60 km/h.

In addition, ownership and operation of the camera network will transfer from the police to Waka Kotahi, and safety cameras will be located on the highest risk parts of the network and have clear signage.

<sup>2</sup> See <https://www.transport.govt.nz/area-of-interest/safety/tackling-unsafe-speeds/>

## 2.4 Speed Management Guide and the Speed Management Framework

The *Speed Management Guide 2016*<sup>3</sup> was created to ensure a consistent sector wide approach is adopted to manage speeds so they are safe and appropriate. It ties in with the ONRC so travel speeds are appropriate for the road function, design, safety and use. Speed management should be targeted to two areas:

- Where there is greatest potential to reduce death and serious injuries; and
- Where there are high benefit opportunities to improve the credibility of speed limits.

The Speed Management Guide draws on four key principles:

1. **Functionality** – Differentiate speeds and speed limits according to a hierarchical classification, with clear differences between levels, to support self-explaining road systems.
2. **Predictability and consistency** – Support road user expectations through consistency and continuity of design, speed limit setting, enforcement, communication, adherence to standards and collaboration between partners.
3. **Homogeneity** – Keep like with like (mode separation) and encourage speeds within a narrow band to increase both safety and efficiency.
4. **Credibility** – Identify and manage safe and appropriate speeds for an entire route (and manage out of context risks by exception) to support the overall credibility of the limits and of enforcement.

The Guide sets out safe and appropriate speed ranges which consider road function, design, safety and use. The proposed safe and appropriate speeds for different types of road fall within the ranges shown in Table 1. The ranges are not themselves speed limits.

**Table 1: Safe and appropriate speed ranges (adapted<sup>4</sup> from the Speed Management Guide 2016)**

Classification	Straight open road / urban motorways	Curved open road	Winding open road	Urban (not motorways)
<b>Class 1</b> High volume national	<b>100-110 km/h</b> Depends on design and safety risk (e.g. divided 4-5 star, grade separated intersections, safety barriers) and factoring in enforcement thresholds			N/A
<b>Class 2</b> National Regional, Arterial	<b>80 – 100 km/h</b> Depends on safety risk and whether volumes justify investment to bring the road up to 3-star equivalent, also enforcement thresholds		<b>60-80 km/h</b>	<b>50 km/h</b> generally <b>60-80 km/h</b> where safety risk allows, e.g. fewer intersections, mode separation for active users
<b>Class 3</b> Primary and secondary collector				<b>30 – 50 km/h</b>
<b>Class 4</b>	<b>60-80 km/h</b>			<b>30 km/h</b> if high volumes of cyclists/pedestrians

<sup>3</sup> <https://www.nzta.govt.nz/assets/Safety/docs/speed-management-resources/speed-management-guide-first-edition-201611.pdf>

<sup>4</sup> The table has been adjusted to remove the erroneous colour from the first column of road classes, because the intention is to read across all columns (e.g., a Class 2 road may be 50 km/h or 100 km/h).





Access and low volume access All winding / tortuous	Depending on roadside development, pedestrian and cyclist volumes, whether sealed or not		Recognise access and place <b>10 km/h</b> for shared spaces
--	--	--	---

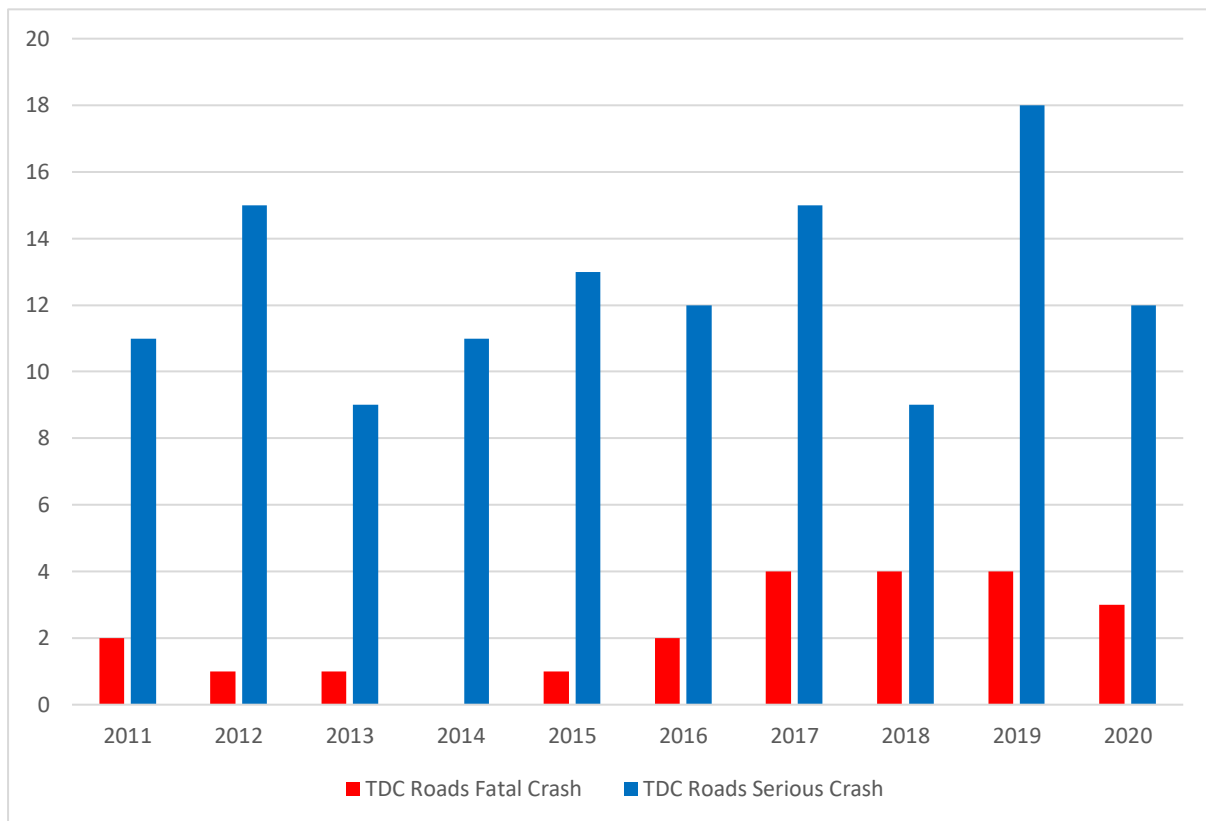
The Speed Management Guide is supported by “MegaMaps”, which is an online information mapping system, developed and maintained by Waka Kotahi to capture key safety, risk and speed management metrics. Appendix C summarises the key MegaMaps information for Taupō District.

### 3 Development of the plan

#### 3.1 What are the existing issues for Taupō?

In the Taupō District, the movement network comprises both rural roads that are winding, hilly and usually two-lane, and also urban streets from central city shopping streets and local residential neighbourhoods to those that move more strategic traffic around the district. There are also many different road users, including pedestrians, cyclists, horses, campervans and tourist vehicles, agricultural vehicles, and heavy vehicles.

A review of the past 10 years (2011-2020) from the Crash Analysis System shows that on Taupō District roads (excluding State Highways) there have been 147 crashes resulting in fatal injury (22) and serious injury (125), including 27 fatalities (see Figure 1).



**Figure 1 Deaths and Serious Injuries on Taupō District roads 2011-20**

The number of fatalities peaked in 2017-2019 when the numbers rose from 0-1 a year to 4 a year consistently for 3 years before coming down to 3 fatalities in 2020. 2019 was the worst year for serious injury crashes with a peak of 18, with an average of 12.5 serious crashes occurring a year for the past 10 years. More detail is provided in Appendix B.

Speed was reported to have played a factor in 36% of the fatal and 20% of the serious crashes.

### 3.2 What has Taupō done on speed management in the past?

In May 2018, Taupō District Council consulted on proposed speed limit changes<sup>5</sup> and the changes came into effect on 1 December 2018<sup>6</sup>.

Over 20 maps were used to show the proposed speed limits for the different urban areas of the District and the rural roads that connect the communities. The changes to high-risk roads were publicised as shown in Figure 2.

Area	Road	Was	Dec 1
Mangakino	Lake Rd and Rangatira Dr	100 →	80
	Lake Rd existing 50km extended towards Waipapa Rd		50
Kinloch	Kinloch Rd extended 50km/h towards Whangamata Rd		50
Aratlatia	Rapids Rd - reduced to 80km/h	100 →	80
Acacia Bay	Wakeman Rd extended existing 50 km/h zone		50
	Acacia Bay Straight - reduced to 80km/h	100 →	80
	Poihipi Rd from existing 80km/h sign to Tukairangi Rd	100 →	80
	Poihipi Rd from Wairakei Dr to existing 80km sign	80 →	50
Wairakei	Wairakei Dr - reduced to 80km/h	100 →	80
	Huka Falls Rd, Huka Falls Loop Rd, Clearwater Ln, Ferndale Way	80 →	50
	Karetoto Rd - reduced to 50km/h		50
Western Bays	Omori Rd - extend existing 50km/h		50
	Omori Rd - reduced to 60km/h	100 →	60
	Pukawa Rd - reduced to 60km/h	100 →	60
Taupō	Tauhara Rd - Rifle Range Rd to Miro St	70 →	50
	Lake Terrace - Airport roundabout to Rainbow Dr	100 →	80
	Lake Terrace - Rainbow Dr to Hawai St (no holiday speed limit)		50
	Centennial Dr - extend 60km zone to Owen Delany Park		60
	Napier Rd - roundabout to De Brett's	100 →	80
	Napier Rd - De Brett's to Lake Terrace	80 →	50
	Crown Rd - 50km extended, 80km at Napier Rd end		80
	Kiddle Dr reduced to 50km/h	80 →	50

**Figure 2 Recommended Safe and Appropriate speed ranges for road classes**

<sup>5</sup> <https://www.taupodc.govt.nz/repository/libraries/id:25026fn3317q9slqygyim/hierarchy/our-council/consultation/documents/speed-limit-changes/TDC%20Speed%20Limit%20Changes%20Consultation%20Document.pdf>

<sup>6</sup> <https://www.taupodc.govt.nz/repository/libraries/id:25026fn3317q9slqygyim/hierarchy/Rules-regulations-and-licences/Bylaws/Speed%20Limits%20Bylaw%202018.pdf>



### 3.3 Engagement undertaken

Taupō District Council have ongoing conversations with the community around speed. The Customer Service Requests received show that the community is concerned about speed, with over 30 concerns raised with Council in the past year alone. There has also recently been a petition for a speed reduction on Hirangi Road, Tūrangi (86 signatures).

### 3.4 Projects undertaken

Taupō District Council have been undertaking (or planning to undertake) projects to improve safety in the District. These are as follows:

- Taupō Town Centre Transformation
- Kiddle Drive / Napier Road Roundabout
- Broadlands Road upgrades
- Poihipi Road upgrades
- Whangamata Road upgrades

## 4 Speed management principles for Taupō

Safety is Taupō District Council's top transport priority, and council is committed to reduce harm on their roads and streets.

The overall vision for the Connecting Taupō 2020-2050 - Taupō Transport Strategy (Dec 2020) is:

*Making it easier to get to the people and places we want, safely and sustainably.*

In order of priorities safety remains the top priority. The strategy states:

*Deaths and injuries on our roads are a huge trauma for the people and families involved – and a massive social and economic toll for our communities. Although most fatal and serious crashes in Taupō District occur on State Highways, which are the responsibility of Waka Kotahi (the NZ Transport Agency), the local impacts are significant. Local communities should not have to fear for their safety. We want Taupō to be a safe district for people to live and visit.*













There are six deliverables in the strategy:

- Work in partnership with central government and Waka Kotahi (the NZ Transport Agency) to address unsafe or not fit-for-purpose State highways (Short-term).
- Undertake rural road safety assessments and deliver a Rural Road Safety Programme of works (ongoing).
- undertake urban road safety assessments and deliver an Urban Road Safety Programme of works (ongoing).
- **Implement and regularly review a district wide speed management plan (short-term).**
- Deliver a programme of safety awareness and education (ongoing).
- Play an active role in road safety, alongside our road safety partners (ongoing).

Following on from the national and regional strategy, Taupō District Council do not believe any loss of life is acceptable on the network. Based on the strategic principles summarised in Appendix A.5 of this report (including the safe and appropriate speed ranges shown in Table 1 on page 4), the speed limits and accompanying typical situations are listed in Table 2.

The changes need to be logical and consistent so that users know how to behave in the different speed zones.

**Table 2: Proposed speed limit principles**

Speed limit	Typical situations
	Town centres or other community areas with high concentrations of pedestrians, cyclists, and “place” functions (e.g. community shopping centres)
	Urban residential streets; may include rural town residential streets if the alignment and road stereotype is suitable, and some streets near to schools.
   	School variable speed limits <sup>7</sup> – often a static sign for cost reasons. The following are starting points. If it is a high priority school location, a lower limit may be adopted. A 30 km/h speed may be applied during school times where the normal speed limit is higher.
	Urban and rural town collector and arterial streets, where the movement function and/or road stereotype (alignment, land use, intersection density etc) are not aligned with a 40 km/h speed limit. May require appropriate pedestrian and cyclist facilities (crossings, cycle lanes).
	Rural local roads [depending on their function, safety and infrastructure risk profiles]. Typically have a winding or tortuous alignment and includes most unsealed roads. May have high community safety concerns.
	70 km/h is a traditional semi-rural speed limit. Following speed reviews, most of these segments should be either up-rated to 80 km/h (with any required engineering) or down-rated to 60 km/h (subject to appropriate road safety measures).
	Rural local roads [depending on their function, safety and infrastructure risk profiles]. Typically straight/curved undivided roads with few hazards but limited protection such as barriers.
	Interim 90 km/h speed limit on economically important state highways and rural arterial roads where MegaMaps recommends a lower safe and appropriate speed, until such time as these roads can be engineered up to appropriate standards. In practice most such roads should be 80 km/h.
	100 km/h for roads with good alignments and accompanied by suitable engineering such as shoulders, clear zones, horizontal separation (barriers).

## 5 Speed management priorities for Taupō

This plan aims to provide *an implementation programme for the next 10 year including:*

- *The proposed changes to speed limits*
- *Infrastructure to support SAAS limits*
- *A timeframe when each change will occur*
- *A more detailed programme for the first 3 years*
- *Overview of the programme from year 3 to year 10 of the plan*

<sup>7</sup> The current setting of speed limits around schools is set in accordance with the Land Transport Rule: Setting of Speed Limits (Rule 54001/2017), the NZ Speed Management Guide (November 2016) and Traffic Note 37. Under the proposed Tackling Unsafe Speeds change to the legislation, 30 km/h zones are being encouraged around schools. It is proposed to seek feedback on this speed at school locations. A new “KURA – SCHOOL” sign (shown here) is also currently out for public consultation to replace the existing “school zone” signs.



## 5.1 Prioritisation method

Table 3 outlines the methods proposed to assign relative priority to speed management measures in Taupō over the next decade; roughly aligning with the next three 3-years NLTP periods. The initial focus is on roads where need has been identified by safety and community demands, particularly where they are already “self-explaining” and thus not requiring considerable engineering or community buy-in to successfully introduce them. There is also a need to formally ratify speed limits for newly created roads, such as subdivisions.

The delivery needs to be prioritised to align with funding for delivery. Initial changes do not have to be expensive (e.g. just road marking and signage) to establish new speed management zones, while other more expensive infrastructure can be provided later, when funding can be sought, to help reinforce proposed speeds for other sections.

**Table 3: Priority assignment method**

Priority	Timeframe		Typical situations
	Consult	NLTP Implementation	
1	2021/22	Years 1-3 (2021/22 – 2023/24)	<ul style="list-style-type: none"> <li>• Town centres / <b>high</b> people “place” function</li> <li>• School frontages / accesses</li> <li>• Top 10% DSI saving network sections</li> <li>• High level of public service requests</li> <li>• Logical network implementation (e.g. adjacent/parallel to other Priority 1 roads)</li> <li>• Confirmation of new subdivision speed limits</li> </ul>
2	2023/24	Years 4-6 (2024/25 – 2026/27)	<ul style="list-style-type: none"> <li>• Self-explaining roads not in Priority 1</li> <li>• Next 10% DSI saving network sections</li> <li>• Priority roads requiring engineering to achieve SAAS</li> </ul>
3	2026/27	Years 7+ (2027/28 onwards)	<ul style="list-style-type: none"> <li>• Remote rural roads to align with SAAS, including unsealed roads</li> <li>• Other roads requiring engineering to achieve SAAS</li> <li>• Other remaining roads identified for change</li> </ul>

## 5.2 Speed Management Toolbox

The Waka Kotahi Speed Management Toolbox<sup>8</sup> identifies key treatment philosophies as infrastructure improvements, enforcement methods, education and vehicle technology based on level of risk, road classification and the key crash types. Effective speed management is likely to be because of a combination of measures.

### 5.2.1 Engineering and Infrastructure

These measures are effective treatments in helping manage speeds and severity outcomes. When developing the plan, the treatment must be location specific but there are a wide range of tools that can be applied.

These can be corridor applications for neighbourhood areas such as slow streets (30 km/h or 40 km/h) and cycle lanes or can be for individual spots such as raised platforms, signalised crossings, or a combination of the two. Figure 3 to Figure 6 illustrate some of the possible treatments that can be used.

<sup>8</sup> <https://www.nzta.govt.nz/assets/planning-and-investment/knowledge-base/Uploads/Documents/Speed-Management-Toolbox-and-Appendices-combined-Final-July-2016.pdf>





*Figure 3 Low speed street with raised platform and markings*

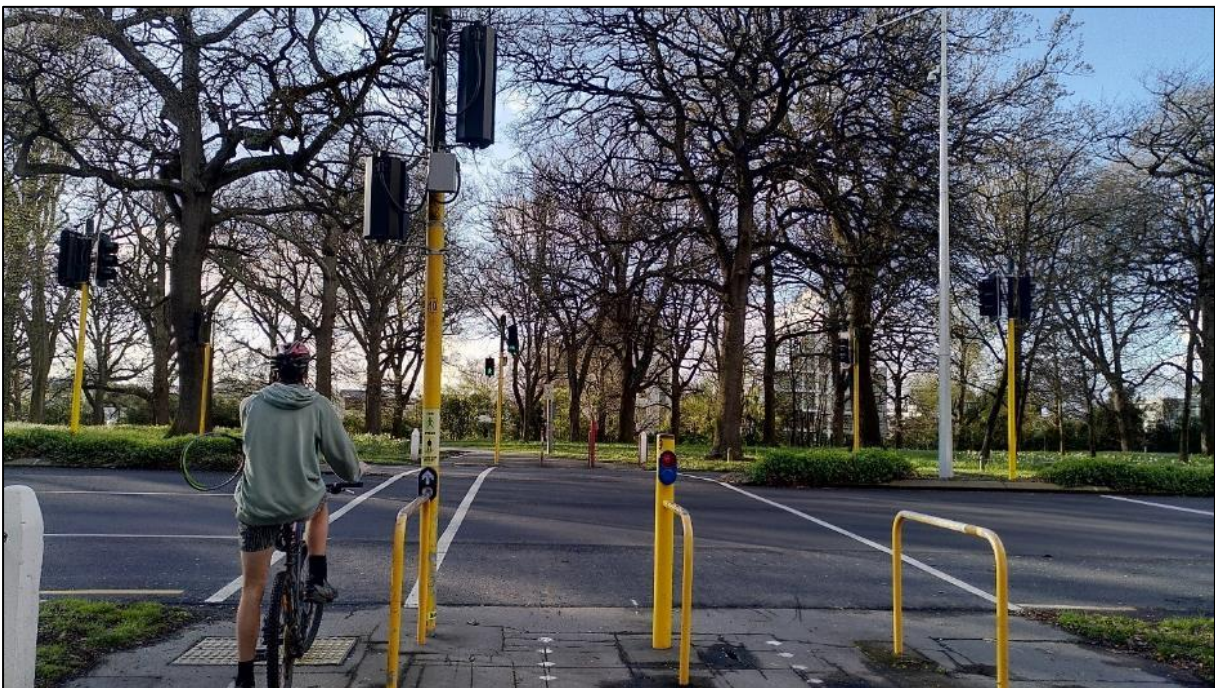


*Figure 4 Separated cycle facilities*





**Figure 5 Raised platform priority crossing**



**Figure 6 Signal controlled crossing for people walking and cycling**

In rural locations and more traffic dominated/high speed environments, other tools such as barrier systems may be applied, in addition to gateways/thresholds for rural townships to alert drivers to the change in environment (see Figure 7 and Figure 8). If the safety issue is largely confined to isolated intersections, then dynamic speed reduction signs triggered by side road traffic (see Figure 9) could be a more targeted solution.

Road marking measure are a low-cost method to influence existing road user speeds on roads. For example, removal of centrelines (see Figure 10) has been shown to reduce observed travel speeds – as well as having the advantage of reducing marking maintenance costs.





**Figure 7 Flexible road safety barrier and guardrail on rural roads (Waka Kotahi)**



**Figure 8 Gateways to townships on rural roads**



**Figure 9 Rural intersection activated warning signs (RIAWS)**



**Figure 10 Removal of centreline on rural road**



Appendix G summarises the estimated capital and operating costs for the Priority 1 sites. These costs include new static and variable message signs, associated road-marking, traffic calming measures, and pedestrian crossing upgrades.

### 5.2.2 Stakeholder and Community Engagement

To change speed limits on the network or to introduce speed calming measures TDC work closely with the community and stakeholders (businesses, schools, organisations) to inform people and seek feedback on the proposals.

For changing the speed limits, a set process is included within the Setting of Speed Limits Rule. This process will be followed for the Speed Management Plan, and initial discussions have been held with interest groups, Community Boards and the Council.

### 5.2.3 Education & Enforcement

TDC work with road safety partners to deliver a number of campaigns across the network to educate people about road safety and reducing speed whilst travelling (see Figure 11). The latest campaigns are targeted to the following:

- Driving courses and workshops
- Sharing the road
- Cycling courses
- Distractions
- Drive straight campaign
- Be prepared
- Intersections
- Motorcycle safety
- Pedal Safe cycle and road safety skills
- Speed is one risk good drivers can minimise
- Young drivers

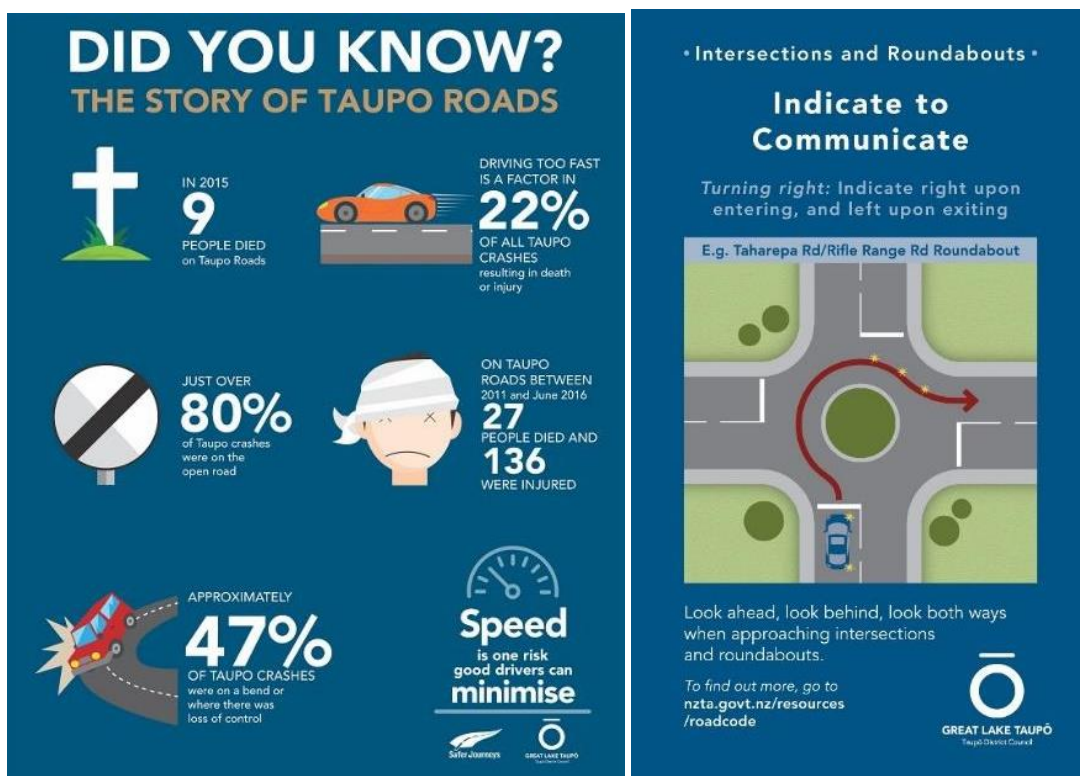
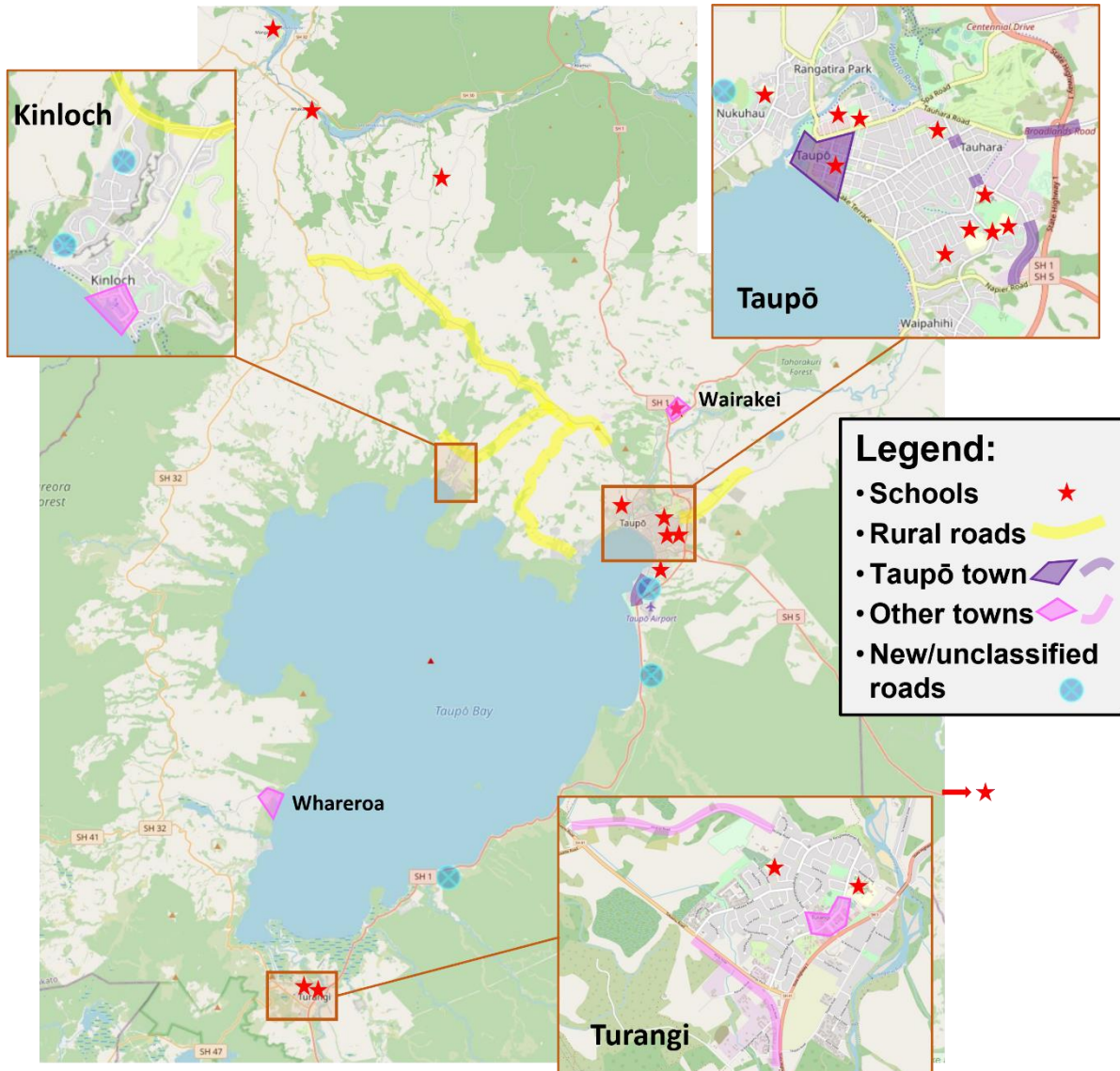


Figure 11 Recent publications for road safety programmes

## 6 The proposed plan for Taupō

As well as seeking agreement on the speed management principles for the District outlined in Section 4, this first Plan also proposes identifying the initial suite of “priority 1” speed management changes for implementation in the 2022-24 period, based on the priorities identified in Section 5.1. Figure 12 provides an overview of the Priority 1 speed management changes. The sections below discuss the areas considered for consultation in this first phase.

Other areas of the District warranting changes will be rolled out in the subsequent priority periods. This Plan will be updated in 2024 and 2027 to provide specific details of the implementation for Priority 2 and 3 roads respectively.



**Figure 12 Overview of Priority 1 speed management proposals**

Appendix E lists the relevant roads/sections proposed for change.

This priority plan does not highlight sections of State Highway in the District warranting speed limit changes, e.g. parts of SH41 near Tokaanu. Discussion with Waka Kotahi should be undertaken to align any relevant local road changes with adjacent state highway ones.

## 6.1 Schools

Appendix D summarises all of the schools in the Taupō district; most of them are in urban areas including smaller towns, with five on rural routes. Three are on state highways, including two in rural areas, and so discussion would be needed with Waka Kotahi regarding changes to speed limits at these locations.



*Figure 13 Tauhara Primary School along Taharepa Road*

Depending on their location and other adjacent land uses, some streets adjacent to schools will warrant permanent speed limit changes, e.g., Kotare Street adjacent to both Taupō Intermediate and Taupō Hospital. For others, a part-time variable speed limit might be more appropriate on busier roads, e.g., Spa Road near Taupō-nui-a-Tia College, Taharepa Road near Tauhara Primary School (see Figure 13).

## 6.2 Rural roads

Four specific sections of rural corridor with high safety concerns have been identified for Priority 1 treatment. At the same time, any adjacent cul de sac side-roads off these routes will also be changed to the same speed limit, if not already changed.

### 6.2.1 Poihipi Road

Poihipi Road is identified as one of the top 10% DSI reducing roads in MegaMaps. However, the section analysed is one continuous section approximately 25 km long (probably explaining why it garnered enough expected DSI reductions over its length), which does not accurately reflect the differences in road geometry and crash history along it.





**Figure 14 Western end of Poihipi Road**

The westernmost section from SH32 to Wereta Road is relatively narrow and winding with a moderate crash history, and thus easily justified in being reduced to an 80 km/h speed limit (see Figure 14). The section east of this to the current 80 km/h limit at Tukairangi Road is largely of a better geometric standard (with further plans to improve this corridor) and may be hard to get support for introducing a lower speed limit, despite a reasonable cluster of crashes between Whangamata and Oruanui Roads.

One alternative option is to retain the existing 100 km/h limit (or a 90 km/h speed limit if allowed) together with the installation of 70 km/h activated intersection warning signs at the problematic intersections of Whangamata, Mapara and Oruanui Roads. For now, the proposal is to introduce an 80 km/h section at the easternmost end (~5 km) until the Kinloch turn-off (Whangamata Road) and the westernmost section (~9 km) until Tirohanga Road, with the section in between (~13 km) being posted at 90 km/h.

### **6.2.2 Mapara Road**

The southernmost section of this route near Acacia Bay was reduced from 100 km/h to 70 km/h in 2006; however the immediately adjacent 1 km section is identified as a top 10% DSI saving section, and land use intensity is increasing here. In addition, at least three service requests for traffic calming or speed limit changes have been made along the rural section of this road. The northern section from Poihipi Road is relatively narrow and winding, and an 80 km/h limit is recommended here (see Figure 15). Approaching Acacia Bay, we suggest a 60 km/h limit until reaching the existing 50 km/h limit.





*Figure 15 Mapara Road south of Poihipi Road*

### 6.2.3 Whangamata Road

This is the main route into Kinloch from Taupō and is currently posted at 100 km/h. As well as a few service requests, there have been a handful of crashes recorded through to the turnoff to the township. We propose an 80 km/h speed limit from the turn-off at Poihipi Road to west of Oakdale Drive and the turn-off to Ruru Lodge, to reflect the level of peri-urban development in the vicinity of Kinloch (Figure 16).



*Figure 16 Whangamata Road just east of Kinloch*



### 6.2.4 Broadlands Road

The growing level of development on the fringe of Taupō warrants extending the current 50 km/h limit to the Eastern Arterial (SH1). Further north-east, the level of peri-urban development and some crashes warrant having an 80 km/h speed limit to the View Road intersection.

## 6.3 Taupō township

The immediate areas of focus for the first phase of speed limit changes are:

*The central town area (see Figure 17 Te Heu Heu Street in central Taupō)*

- Various streets adjacent to schools, as discussed in section 6.1.
- Some community shopping centres, especially those in proximity to schools, pedestrian crossings, and other areas with high people use.
- The southernmost sections of Crown Road and Lake Terrace, which are both seeing increasing levels of adjacent development and accompanying intersections.
- ), in conjunction with the Town Transformation works (generally all streets west of Titiraupenga Street and south of Spa Road). For consistency, this should also include the tourist park areas of Ferry Road, Redoubt Street and Story Place.



**Figure 17 Te Heu Heu Street in central Taupō**

- Various streets adjacent to schools, as discussed in section 6.1.
- Some community shopping centres, especially those in proximity to schools, pedestrian crossings, and other areas with high people use.
- The southernmost sections of Crown Road and Lake Terrace, which are both seeing increasing levels of adjacent development and accompanying intersections.

A case could be made to also introduce a lower (40 km/h) speed limit on Lake Terrace along the shoreline section in town (approximately west of Taharepa Road), particularly in light of the most recent double-fatality there.

## 6.4 Other Urban Settlements

### 6.4.1 Kinloch

Many new residential streets in Kinloch have wide cross sections and gentle curves. Although nearly all Kinloch streets are classified “access” in the ONRC, the network pattern is comprised of collectors and culs-de-sac. While MegaMaps treats them all uniformly with a SAAS of 40 km/h, it will be very difficult to achieve an operating speed substantially below 60 km/h on those functioning as collectors (e.g. Kenrigg Road and Oakdale Drive – see Figure 18) while the culs-de-sacs are typically so short that 30 km/h would be achievable (see Figure 19).

Signposting a variety of speed limits could be confusing and lead to a “forest” of signs, yet achieving a safer residential speed environment could require substantial and costly traffic calming.



**Figure 18: rural residential roads like Oakdale Drive have a rural cross section and again will be difficult to achieve operating speeds of even 50 km/h**





**Figure 19: New short/narrow streets like Sherwood Way have tighter curves and pedestrians walking in the street, hence may have low operating speeds and be “self-explaining” at 40 km/h or less**

Options for setting lower and safer speed limits in Kinloch include:

- **Set differential limits with collectors retaining 50 km/h and narrower/shorter streets at 40 km/h<sup>9</sup>.** With this option, the community should be consulted regarding Mata Place, Marina Terrace and Kinloch Esplanade (see Figure 20). These streets have a high density of driveways compared to the newer subdivisions and “feel” slower, as well as many pedestrians near the lakeshore. However, drivers accessing the marina may not be locals as invested in community safety so achieving a lower speed limit while minimising noise may require a number of horizontal deflection devices.
- **Make the majority of the town 40 km/h.** This is easy to understand and can be achieved with gateway signs on Kinloch Road and Oakdale Drive. As previously noted, the design of many streets communicates a higher operating speed and therefore substantially more traffic calming treatments will be required.

<sup>9</sup> This is the option displayed in the current version of the online map





**Figure 20: Mata Place, adjacent to the marina, will have a lot of activity happening during the summer periods**

**Timing:** while a few roads are already self-explaining (e.g. Candu Lane), it is recommended to consider changes in phase 3 as most roads fall into the prioritisation category of “other roads requiring engineering to achieve SAAS”. As a priority 1 initiative, we propose a 30 km/h for the streets bordering the marina, and recording the new subdivision roads not already captured in the speed limits register.

#### 6.4.2 Tūrangi

As with Kinloch, most urban residential roads are fairly wide and have gentle curves. Unlike Kinloch, most Tūrangi roads are generally flat with excellent sight lines. Therefore, immediate attention is focused on the sections of road where concerns have been raised, namely:

- Te Rangitautahanga Road near Tongariro School
- Hirangi Road from SH41 to the urban limit (see Figure 21)
- Atirau Road near the industrial area and UCOL





**Figure 21: Hirangi Road on the outskirts of Tūrangi**

The central shopping area also warrants a lower speed limit to reflect the level of activity there, and this is well supported by the road cross-section (see Figure 22). For consistency, connecting this with the section adjacent to Tongariro School makes sense.



**Figure 22: Te Rangitautahanga Road through the centre of Tūrangi**

#### 6.4.3 Wairakei and Whareroa

It is proposed to trial (in the first tranche of changes to be consulted this year) a wholesale lowering of speed limits across two entire villages as a pilot for the wider application of the Safe and Appropriate Speed approach. Wairakei has been selected because it is relatively homogenous, small, and has generally narrow streets that are “self-explaining” (feel slower) to drivers. With only two access streets, signposting should be straightforward and may be accompanied by new welcome signage incorporating cultural elements. Whareroa, in the western bays of Lake Taupō, has only one road access, but the streets are wider.



## 6.5 Ratification of new or unclassified roads

There are a number of roads in the Taupō network that do not yet formally have a specified speed limit in the current Council register. Typically they fall into three categories:

- New subdivisions recently constructed, where the speed limits have yet to be confirmed, e.g. Ngāroto Estate (Wharewaka, south Taupō), Oakdale and Okaia Drive / Sherwood Way (Kinloch). Typically they will be 30-50 km/h.
- Some minor rural roads (often unsealed) not captured by the existing bylaws, e.g. Rotongaio Road and Blake Road (Waitahanui) and streets within Waitetoko. There are also some paper roads identified in the network that have not been made into formed roads to date, e.g. Okahuroa Road south of Waitetoko.
- Private roads not captured by existing bylaws, typically either small residential lanes (e.g. Hansen Court, Birchwood Lane) or forestry roads (e.g. Tram Rd, Kaiangaroa Off-road Highway). Technically it is the responsibility of the relevant road owner to determine an appropriate speed limit on each of these roads.

Under the forthcoming proposed 2021 Setting of Speed Limits Rule, a default speed limit is allowed to apply if speed limit is not recorded either under the new speed limit register or an existing bylaw. We recommend that a default limit of 30 km/h apply to any new road in the future until the appropriate limit is confirmed.

## 7 Next steps

This Plan has been developed in conjunction with Taupō District Council staff and informed by preliminary feedback from a full Council workshop (Oct 2021). Feedback was also sought from staff at Waka Kotahi (NZ Transport Agency) and the Regional Safe Network Working Group (supported by RATA, the Regional Asset Technical Accord).

Following presentation of the draft Speed Management Plan and Priority 1 roads for consultation to Council in February 2022, the draft Plan will go out for public consultation, with an expected consultation period through to May 2022.

Following any changes identified to the draft Plan, it is expected that the final Plan will be presented to Council for approval in June 2022, with implementation of the Priority 1 works in the financial year from 1 July 2022.

In keeping with the likely process outlined in the draft Setting of Speed Limits Rule 2021, the Plan will be updated in 2023/24, with current Priority 2 speed management works (amended if necessary) targeted for implementation from 1 July 2024. A similar cycle is proposed for three years later when the Plan will be further updated, and the current Priority 3 works implemented.

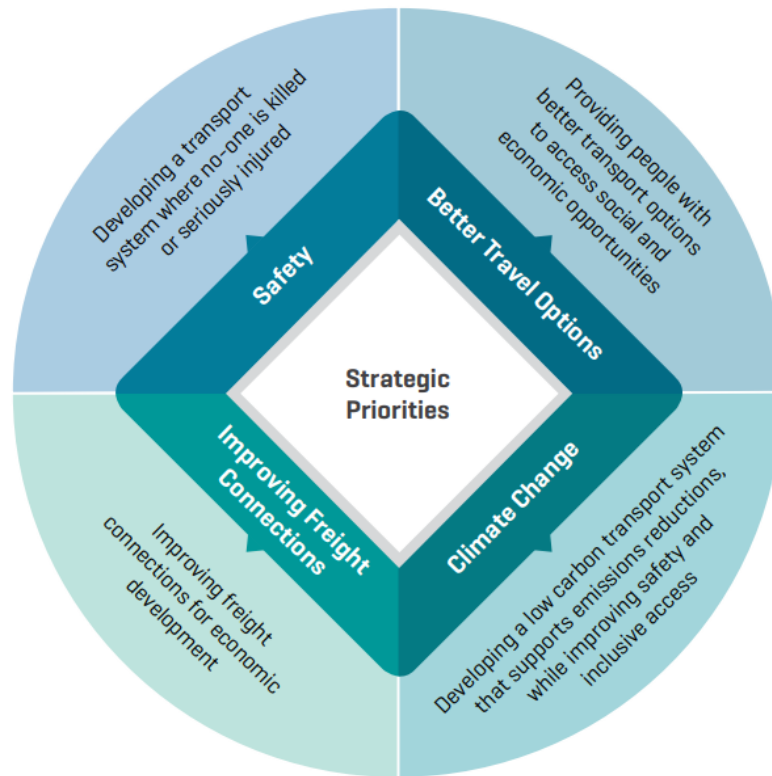


## Appendix A Strategic context

### A.1 Government Policy Statement on Land Transport 2021/22 - 2030/31

The Government Policy Statement<sup>10</sup> sets out how investment is allocated towards achieving the Government’s transport priorities.

The Government has identified four strategic priorities for land transport investment to best contribute to improving our communities’ wellbeing and liveability. These are summarised in Figure 23.



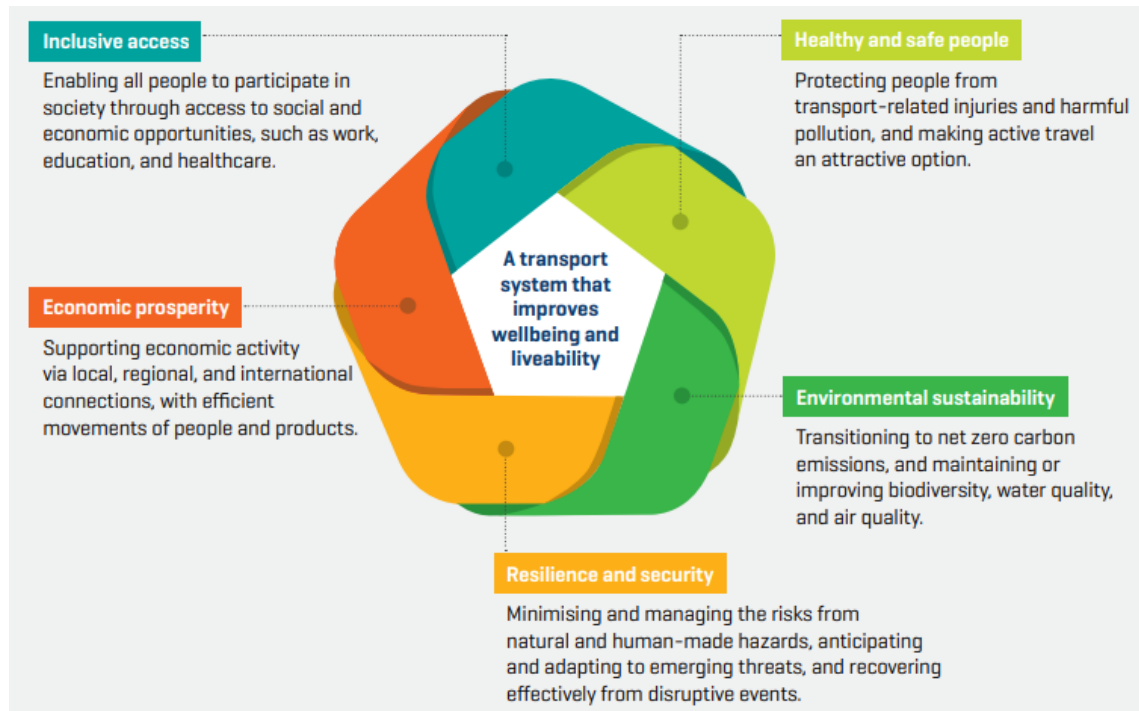
**Figure 23 Government Strategic priorities**

The purpose of the transport system is to improve people’s wellbeing, and the liveability of places. It does this by contributing to five key outcomes, identified in the Ministry of Transport’s Transport Outcomes Framework<sup>11</sup>, as shown in Figure 24.

<sup>10</sup> See <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport/>

<sup>11</sup> See <https://www.transport.govt.nz/area-of-interest/strategy-and-direction/transport-outcomes-framework/>





**Figure 24 Transport Outcomes Framework**

The primary focus of the safety priority is to develop a transport system that advances New Zealand’s vision that no-one is killed or seriously injured while travelling. New Zealand roads will be made substantially safer. Safer travel will also improve wellbeing and liveability through providing inclusive access, economic prosperity and resilience.

## A.2 Vision Zero and the Safe System

Vision Zero is a global movement to end traffic-related fatalities and serious injuries by taking a systemic approach to road safety<sup>12</sup>. The premise of this strategy is that road deaths and injuries are unacceptable and preventable. First implemented as the national road policy in Sweden in 1997, Vision Zero has now been adopted by more than 20 cities around the world.

Underlying the Vision Zero strategy is the Safe System – a holistic safety approach that shifts responsibility from the people using roads to the people designing them, integrating core management and action areas to create a safe mobility system forgiving of human error. The structure of an effective Vision Zero strategy embodies the Safe System approach. As the policy concept of Vision Zero gains traction, cities must ensure that the Safe System’s key principles and action areas are applied to each new context, considered holistically both in policy documents and practical implementation as cities develop their road safety strategies.<sup>13</sup>

The Safe System approach seeks to create a safe and forgiving road system that makes the safety of people a priority. It does this through four guiding principles:

- We promote good choices but plan for mistakes.
- We design for human vulnerability.
- We strengthen all parts of the road transport system.

<sup>12</sup> See <https://www.nzta.govt.nz/safety/what-waka-kotahi-is-doing/nz-road-safety-strategy/road-to-zero-resources/vision-zero-for-system-designers/>

<sup>13</sup> <https://visionzerochallenge.org/vision-zero>



- We have a shared responsibility.

### A.3 Road to Zero 2020-2030

Road to Zero<sup>14</sup> is the Government’s road safety strategy 2020-2030 and replaces the Safer Journeys Strategy 2010-2020. It sets out a vision of a New Zealand where no one is killed or seriously injured in road crashes. This means that no death or serious injury while travelling on our roads is acceptable.

There are five key focus areas under Road to Zero (summarised in Figure 25):

- Infrastructure improvements and speed management
- Vehicle safety
- Work-related road safety
- Road user choices
- System management



<sup>14</sup> See <https://www.transport.govt.nz/area-of-interest/safety/road-to-zero/>

**Figure 25 Five focus areas for Road to Zero**

There is a need to strengthen all parts of the system so that, if one part fails, other parts will still protect the people involved.

**A.4 Arataki**

Arataki<sup>15</sup> tells the national story of the land transport system and is made up of three pan-regional and 14 regional, place-based summaries. The Government Policy Statement sets out how investment is allocated towards achieving the Government's transport priorities.

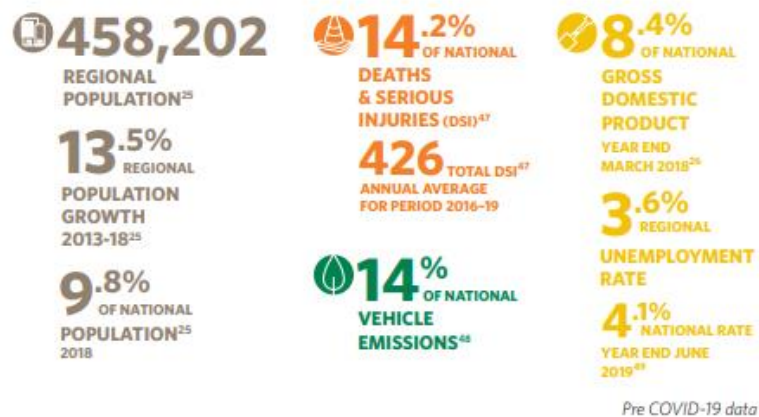
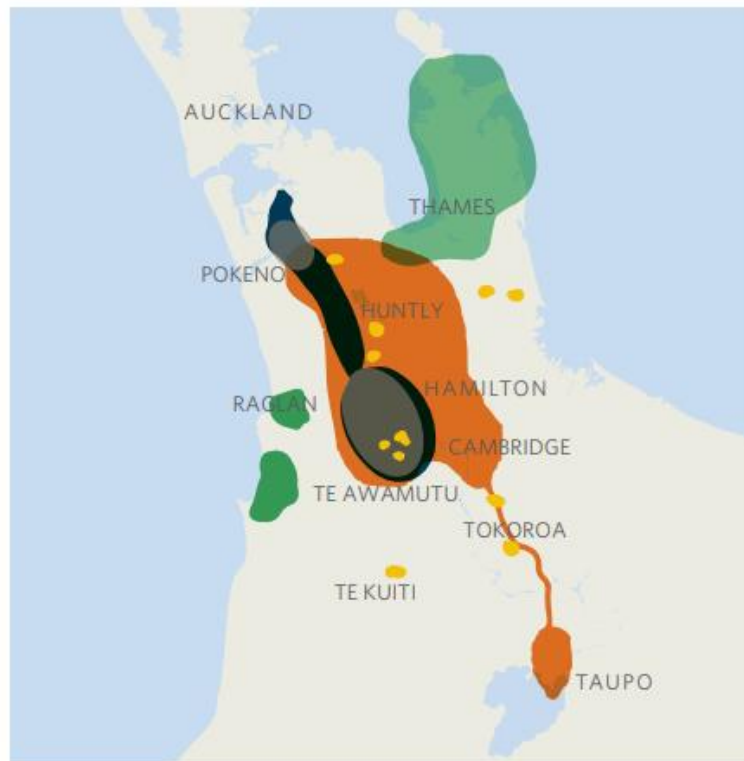
The regional summary for the Waikato<sup>16</sup> states that the region has a very poor safety record, with issues around crashes at intersections, runoff road and head-on crashes, and crashes involving vulnerable road users, speeding, alcohol and drug impairment, and people not wearing seatbelts. These are exacerbated by the complexity of the network and high proportion of road transport movements through and within the region (see Figure 26).

---

<sup>15</sup> See <https://www.nzta.govt.nz/planning-and-investment/planning/arataki/>

<sup>16</sup> See <https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/regional-summary-waikato-august-2020.pdf>





**Figure 26 Regional Issues for Waikato**

The area of focus recommends supporting the implementation of the Road to Zero: New Zealand’s road safety strategy 2020–2030 and the associated Action plan 2020– 2022, and regional safety strategies, with a particular emphasis on:

- continuation of safety treatments targeting high-risk intersections, and run-off road and head-on crashes on high-risk rural roads (rural roads are roads with speed limits >80 km/h)
- separated facilities and infrastructure improvements in areas with significant levels of walking and cycling
- road policing and behaviour change programmes with a focus on alcohol and drug impairment, people not wearing seatbelts and speeding
- safety treatments on high-risk motorcycle routes

## A.5 Road to Zero for the Waikato 2020-2030 and Land Transport Plan

The Road to Zero for the Waikato strategy<sup>17</sup> sets out a vision of “accessible journeys free of deaths and serious injuries” (see Figure 27).



*Figure 27 Waikato Region Strategic Guidance*

This means:

- in the long term no one dies or is seriously injured moving around our region on the transport network;
- residents and visitors can make safe transport choices that are appropriate to their needs, abilities and circumstances.

The national Road to Zero interim target is a 40 per cent reduction in deaths and serious injuries (from 2018 levels) by 2030. The regional target is the same. As part of the Safer Roads priority, the regional response (see Figure 28) is to implement infrastructure improvements and consistent speed management which targets highest risk, which means applying safe and appropriate speeds across the regional network through speed management plans.

<sup>17</sup> See <https://www.waikatoregion.govt.nz/council/policy-and-plans/transport-policy/road-safety-strategy/>



Figure 28 Road to Zero for the Waikato

The overall Waikato Regional Speed Management **objectives** for the management plan, agreed as part of the Regional Transport Committee Meeting (1 July 2019), are:

- To plan for and implement speed management on both state highways and local roads, to reduce deaths and serious injuries.
- To work collaboratively to support the Waikato Region to achieve a regionally consistent approach to speed management in the region to reduce the risk of death and serious injury, in line with the Regional Road Safety Strategy targets.
- To bring stakeholders and the community along the speed management journey, using and providing new approaches to change the conversation on speed, and taking a common sense approach so that speed management changes have strong public acceptance and support.
- Plan, programme and implement the highest benefit speed opportunities for the top 10% high risk parts of the regional roading network by 2021.

The following regional speed management **principles** outline how speeds are to be managed and the changes implemented:

- We will work with stakeholders in partnership to engage with our communities to implement positive speed management outcomes across the region and influence positive behaviour change.

- *We will use the Safe System approach, focusing on the three pillars of safe speeds, safe road use, and safe roads and roadsides, working towards zero deaths and serious injuries on the region's roads.*
- *We will work together to ensure consistent and accelerated implementation of safe and appropriate speeds across the region, prioritising the highest risk parts of our roading network that deliver the highest benefits in death and serious injuries savings.*
- *We will address wider parts of the roading network where appropriate, taking a logical area wide approach to speed management which is self-explaining to road users.*
- *We will manage speeds that are safe and appropriate to rural and urban environments and safe and appropriate for all users of the roading network.*
- *We will implement speed management in accordance with legislative requirements and in line with best practice guidance.*

The following regional speed management **policies were** set by the Regional Transport Committee:

- *Speed management across the Waikato region will be coordinated by Waikato Regional Council and the NZ Transport Agency, in partnership with territorial authorities and the NZ Police, via the Waikato Regional Speed Management Plan.*
- *The speed management component of the NZ Transport Agency's Safe Network Programme will be implemented in the Waikato region through the Waikato Regional Speed Management Plan.*
- *A holistic approach to speed management will be applied, supplementing speed limit changes with other speed management tools including engineering interventions where appropriate.*
- *An area or catchment based approach incorporating both state highways and local roads (One Network Approach) will be used when addressing the top 10 percent benefit sites to ensure we get the highest benefit from speed management interventions.*
- *Speed management will be coordinated via a [to be determined] approach that improves decision making and saves both costs and time. [Note: holding policy for outcome of institutional arrangement review].*
- *The region will use a consistent communications and engagement approach, as outlined in the Waikato Regional Speed Management Plan.*
- *The approach to speed management in the Waikato region, as outlined in the Waikato Regional Speed Management Plan, is flexible and responsive to incorporate changes to national policy on speed management.*
- *A consistent speed management regime will be applied across the region that is self-explaining to road users.*
- *Speed Limits will be set in accordance with the Land Transport Rule: Setting of Speed Limits (Rule 54001/2017) and the NZ Speed Management Guide (November 2016). For the Waikato region the following speed limit regimes are recommended to ensure a consistent speed management approach across the region:*
  - *A 30 km/h speed limit for CBD/town centres with high concentrations of pedestrians and/or cyclists.*
  - *A 40 km/h speed limit for urban residential areas.*
  - *An 80 km/h or 60 km/h speed limit regime on local roads in rural areas [depending on their function, safety and infrastructure risk profiles].*
  - *Roads should not have speed limits higher than 80 km/h without physical separation*





- *Speed limits around schools will be set in accordance with the Land Transport Rule: Setting of Speed Limits (Rule 54001/2017), the NZ Speed Management Guide (November 2016) and Traffic Note 37. For the Waikato region the following speed limit regimes are recommended to ensure a consistent speed management approach around schools in the region:*
  - *A permanent or variable 40 km/h speed limit for schools in urban residential areas<sup>18</sup>*
  - *A permanent or variable 60 km/h speed limit for schools in rural areas.<sup>1920</sup>*

Note: The last point around speed limits at schools is subject to change due to the proposals consulted on in 2020/2021 around tackling unsafe speeds.

## A.6 One Network Road Classification/One Network Framework

The One Network Road Classification (ONRC) is a classification system. It divides New Zealand's roads into eight categories based on how busy they are, whether they connect to important destinations, or are the only route available. Figure 29 illustrates graphically how the system works.

---

<sup>18</sup> The 40 km/h variable speeds apply at times of greatest risk (before and after school) and have general approval by NZTA (conditions apply). Current national policy is for 40 km/h speed around schools in urban areas but 30 km/h is under active consideration at national and regional level.

<sup>19</sup> The 60 km/h variable speed limit applies at times of greatest risk (before and after school) and only applies where there is turning traffic risk. 60 km/h variable speed limits require specific site approval by NZTA

<sup>20</sup> Road controlling authorities must currently aim to achieve mean operating speeds less than 10% above permanent speed limits at all times (e.g. 44 km/h for 40 km/h speed limits and 66 km/h for 60 km/h speed limits), and variable speed limits while operating (clause 4.4(2)(c) of the Rule).

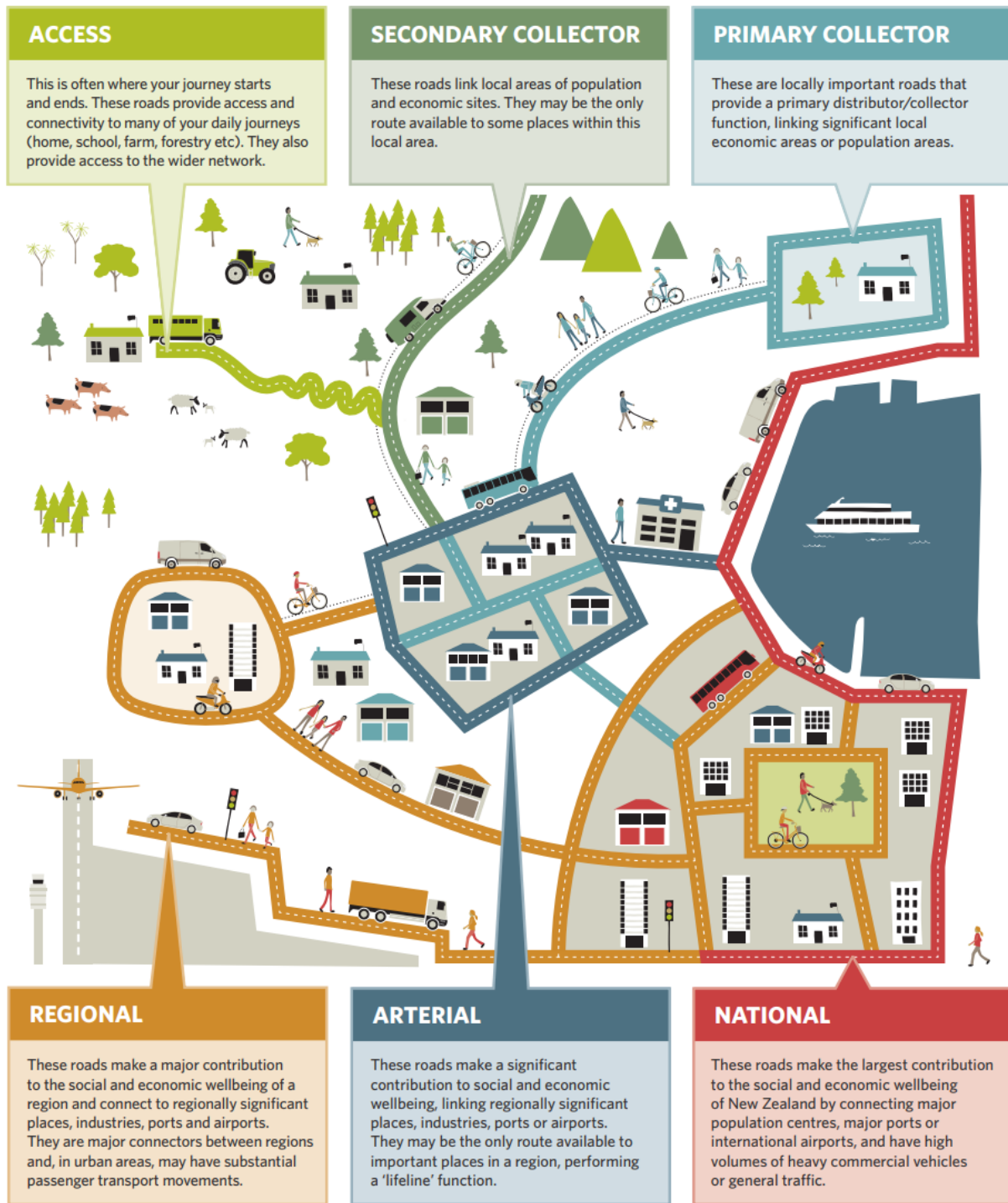
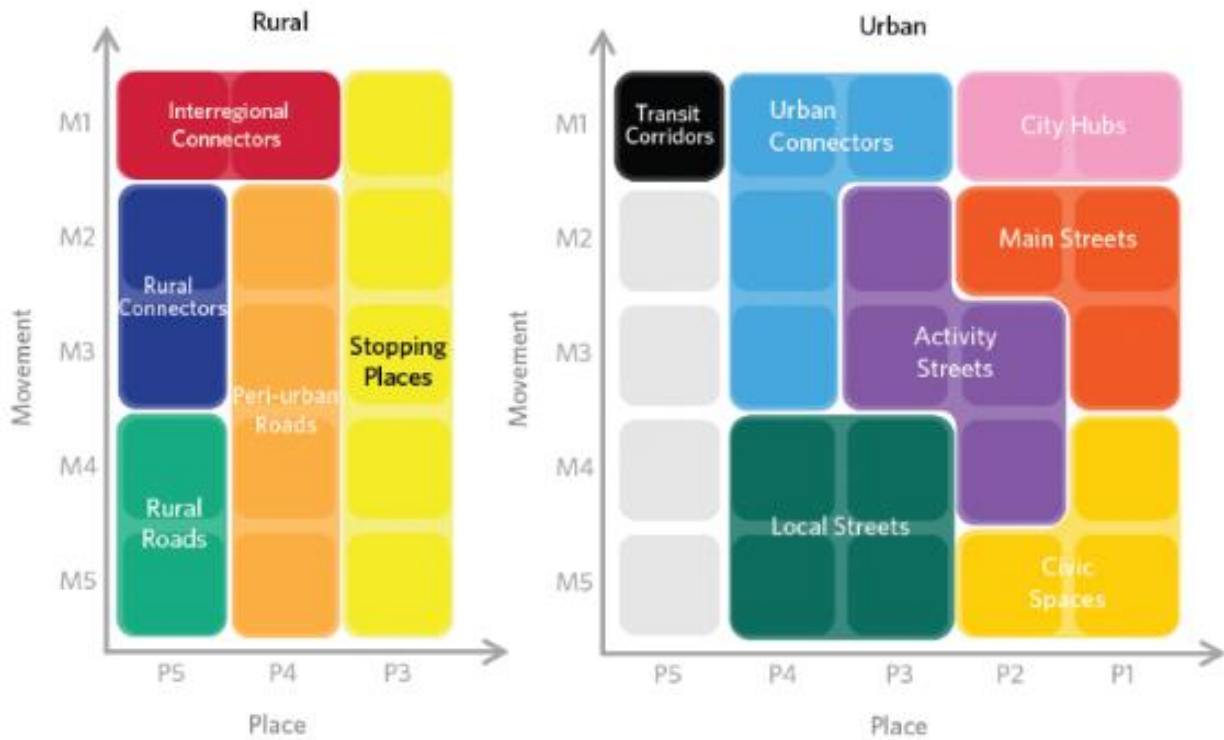


Figure 29 One Network Road Classification (ONRC)

The ONRC is being replaced by the One Network Framework (full implementation is due by 2024<sup>21</sup>). The new One Network Framework acknowledges the transport network also has a 'Place' function. This means roads and streets are destinations for people, as well as transport corridors. The new framework also introduces classifications for different modes of transport, recognising that our roads and streets

<sup>21</sup> <https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/one-network-framework/about-the-onf/the-journey/stage-3/>

have different functions for different modes. Figure 30 illustrates the new ONF categories that will be introduced.

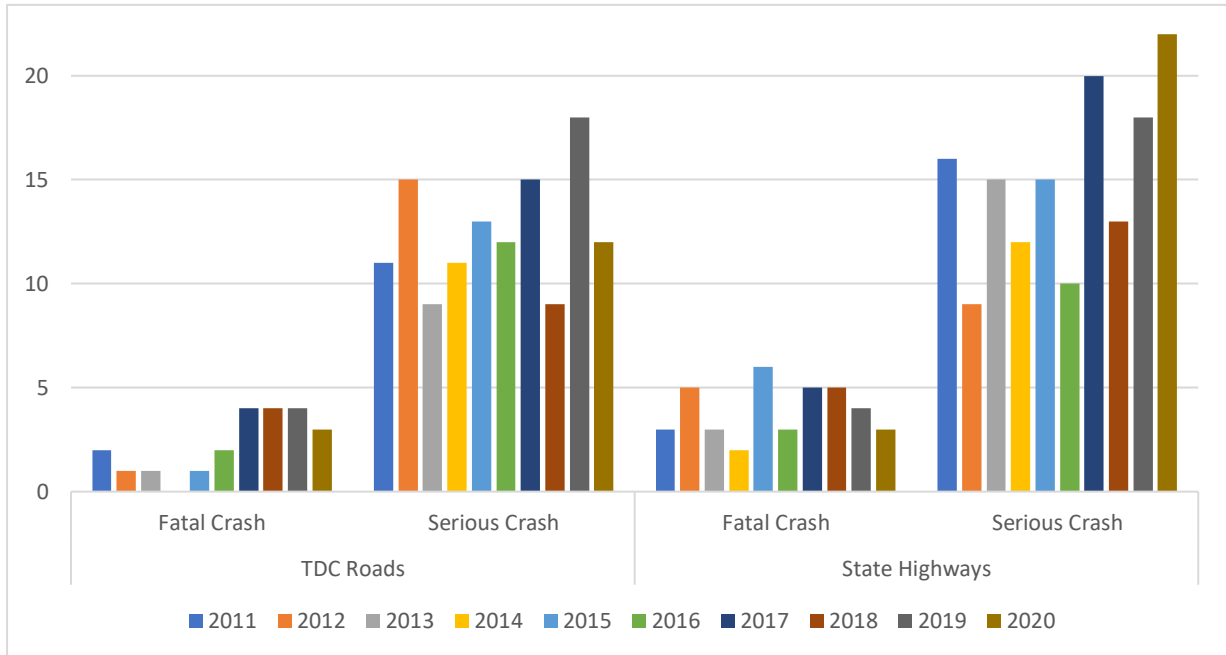


**Figure 30 One Network Framework (ONF)**

The evolution of the ONRC responds to the recognition that shared, integrated planning approaches between transport and land use planners will result in better outcomes. ‘Systems thinking’ allows us to link strategies and policies together and support more holistic decision-making that in turn improves the liveability of places. Until full adoption of the One Network Framework, terminology used in the ONRC will be used.

## Appendix B Crash information for the Taupō District

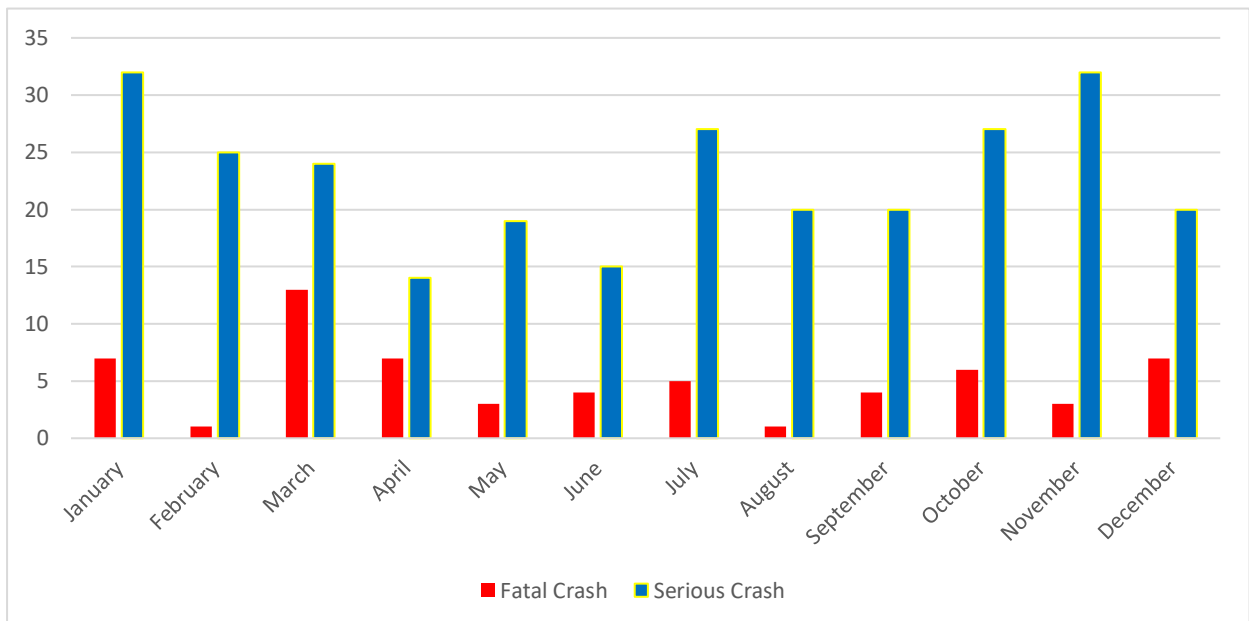
A review has been undertaken of the Waka Kotahi Crash Analysis System (CAS) for the Taupō District for a 10-year period (2011-2020).



**Figure B-31: Fatal and Serious crashes in Taupō District**

There have been 336 crashes in the ten-year period covering the Taupō District including State Highway roads. Of the 336 crashes, 61 have been reported as fatal crashes and 275 have been recorded as serious crashes. There have been more fatal and serious crashes on the State Highway network.

Reported crashes are those that are attended by police and a Traffic Crash Report (TCR) is completed. It is unlikely that all crashes in the District are recorded (particularly less severe crashes) due to under-reporting rates in both rural areas but also crashes involving vulnerable road users in urban areas.



**Figure B-32: Fatal and Serious crashes in Taupō District by month**





As shown in Figure A-2 Crash rates are generally higher during Spring and Summer months (and July), when it is likely that there are increases in the number of visitors to the area.

## B.1 Fatal Crashes

There have been 22 fatal crashes on TDC roads in the last 10 years, resulting in 27 fatalities and 17 other injuries; see Table B-1. There are two hotspots identified in the fatal crash data, being Broadlands Road (Reporoa – Taupō) and Tirohanga Road (Atiamuri – Poihipi Road). The two roads have a posted speed of 100km/h and crashes were as a result of loss of control (bend and straight) and then head on.

*Table B-1: Fatal locations*

Row Labels	Number of Fatal Crashes	Sum of Fatal injury count	Sum of Serious injury count	Sum of Minor injury count	Sum of Non-injury count
ACACIA HEIGHTS DRIVE	1	1	0	1	0
BROADLANDS ROAD	4	4	2	1	0
CENTENNIAL DRIVE	1	1	0	1	0
FOREST ROAD	1	1	0	0	1
MAPARA ROAD	1	1	0	0	0
MATEA ROAD	1	1	0	0	0
MAUNGATERA ROAD	1	1	2	0	1
POIHIPI ROAD	1	1	0	0	1
RIFLE RANGE ROAD	1	1	0	0	1
TAMAMUTU STREET	1	1	0	0	1
TAUTAHANGA ROAD	1	1	0	1	0
TE RANGITAUTAHANGA ROAD	1	1	2	0	0
TIROHANGA ROAD	4	9	1	1	1
WAIPAPA ROAD MANGAKINO	1	1	1	4	1
WAIRAKEI DRIVE	1	1	0	0	3
WHANGAMATA ROAD	1	1	0	0	1
<b>Grand Total</b>	<b>22</b>	<b>27</b>	<b>8</b>	<b>9</b>	<b>11</b>

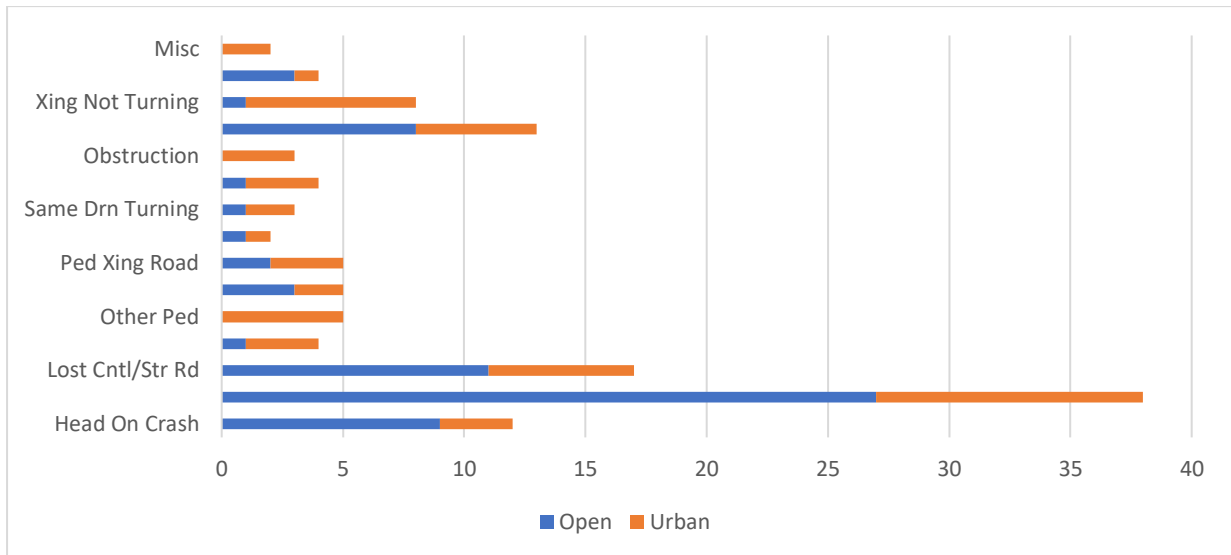
The fatalities included two pedestrians, two cyclists and two motorcyclists. Eight of the crashes had speed identified as a contributing factor, although typically travel speed plays an important part in the ultimate severity of a crash. Alcohol/drugs were also a contributing factor in 11 fatal crashes.

## B.2 Serious Crashes

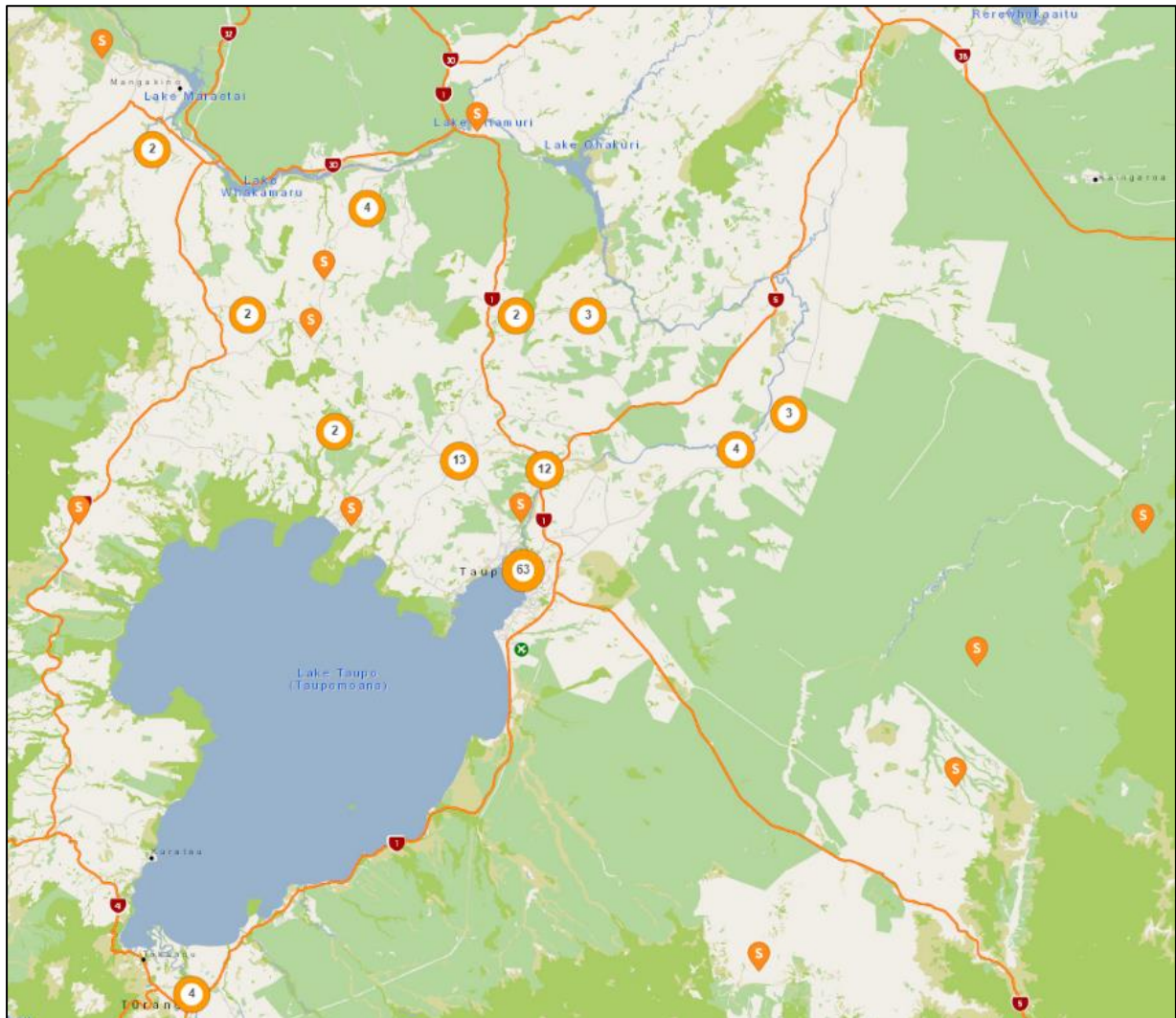
Across the Taupō District including on State Highways, there were 275 reported serious crashes. The main contributing factors are as follows:

- Alcohol/drugs 36%
- Lost control 32%
- Position on road 23%
- Speed (inappropriate/misjudged – 20%)

Of the 125 serious crashes that occurred on TDC roads, the primary crash type again is the loss of control on open roads.



**Figure B-33: Serious crashes on open and urban Taupō District Roads**



**Figure B-34: Serious crashes on open and urban Taupō District Roads**

The greatest proportion of serious crashes occurred in central Taupō township, with two smaller clusters to the west of the SH1/SH5 intersection on or around Wairakei Drive, Poihipi Road, and Oruanui Road.



### B.3 Taupō Central

Figure A-5 shows the serious crashes that have been reported in central Taupō. There are some clusters, mainly at intersections including Wairakei Drive/Poihipi Road and Tauhara Road/Spa Road, and then on links in the central city area including Lake Terrace, Spa Road, Tamamutu Street and then Mere Road to the east.

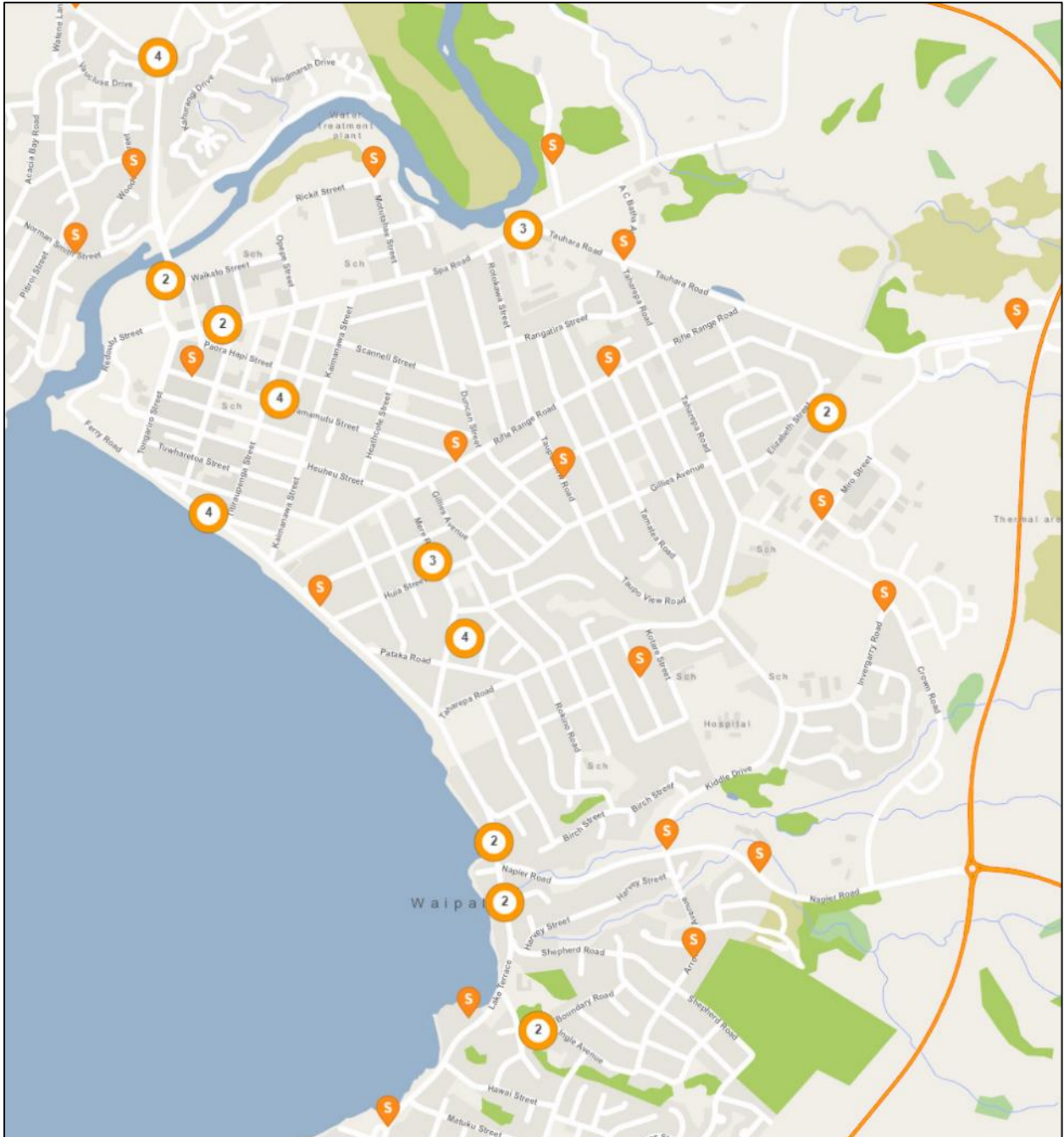
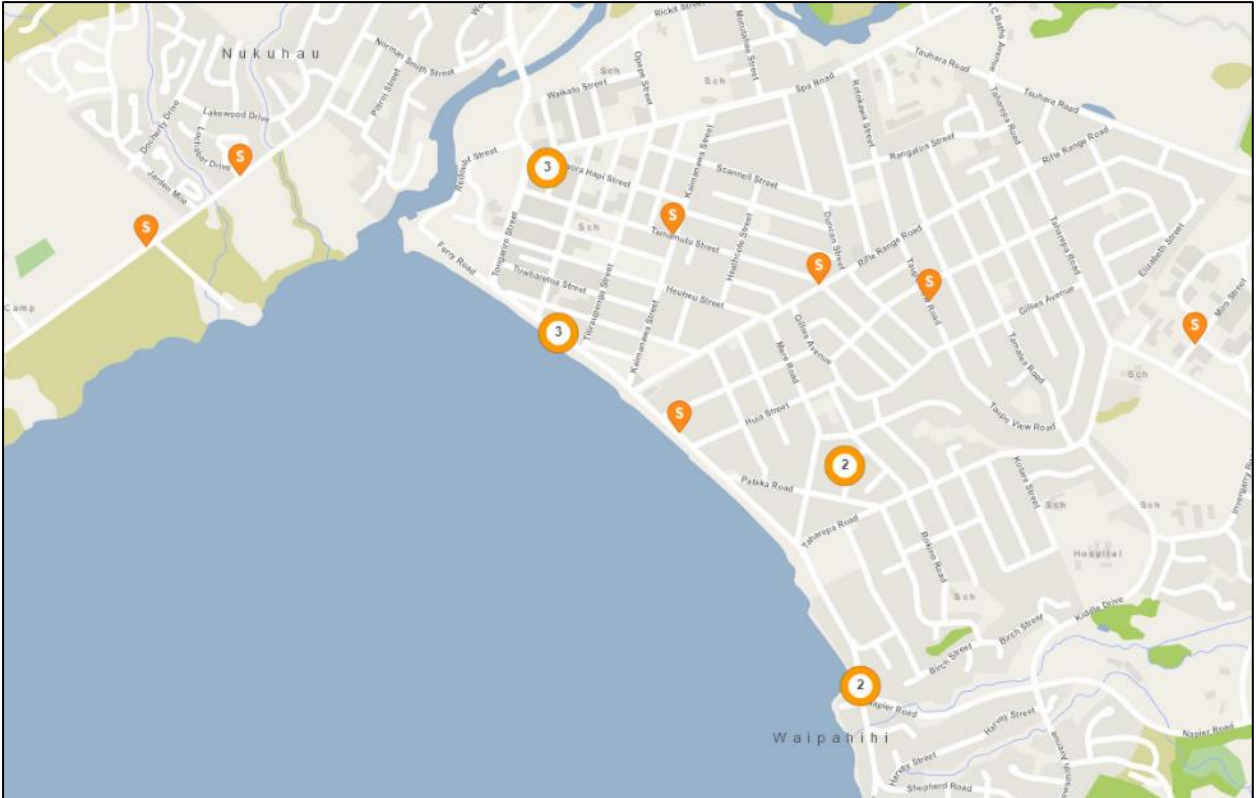


Figure B-35: Serious crashes in Central Taupō township

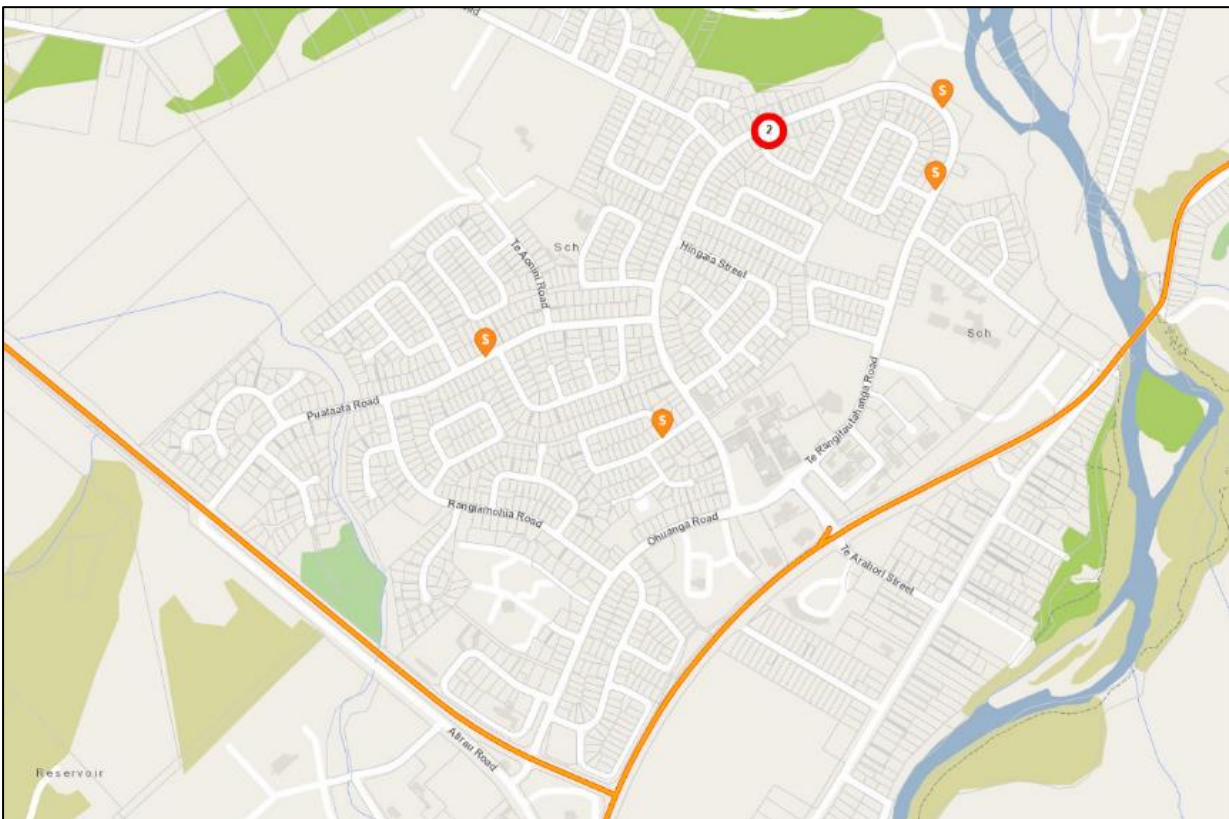




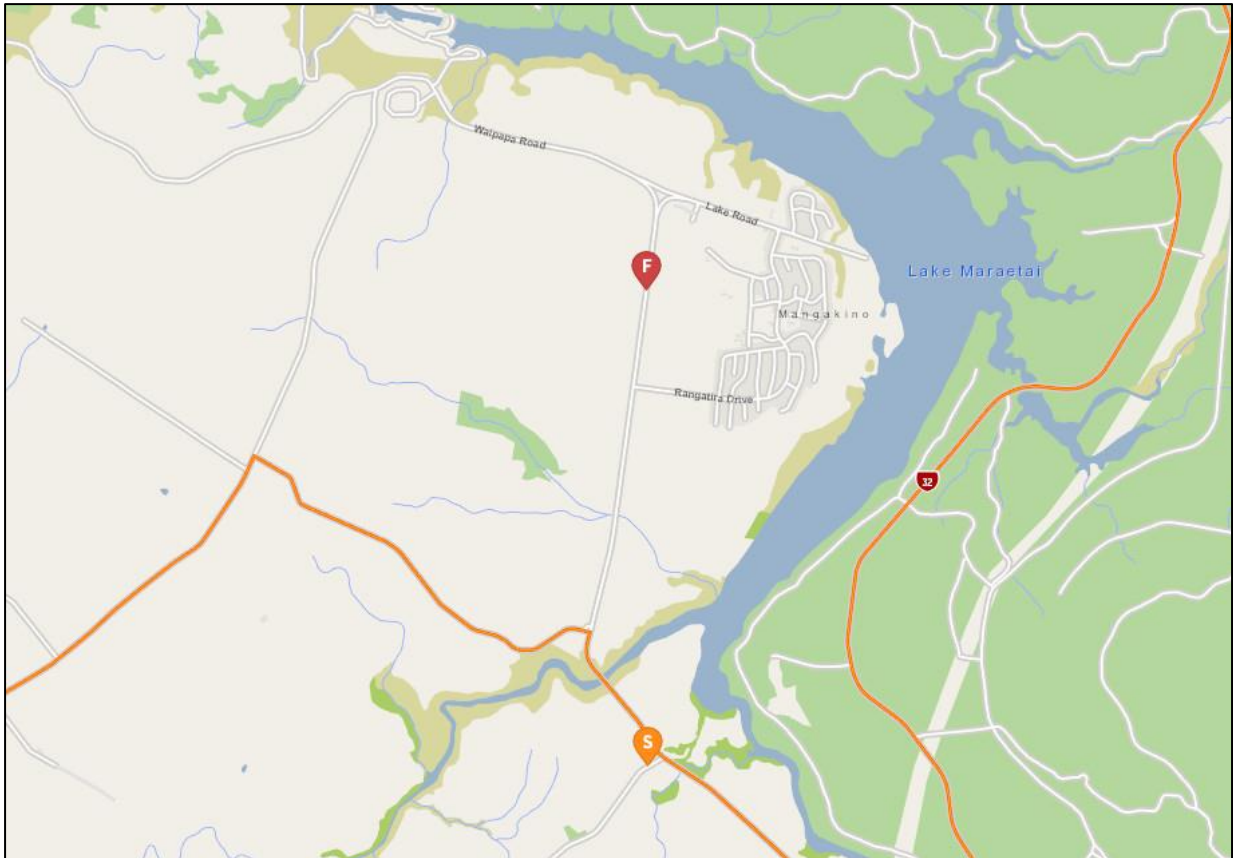
**Figure B-36: Serious crashes in Central Taupō township for walking/cycling road users**

#### B.4 Taupō Townships

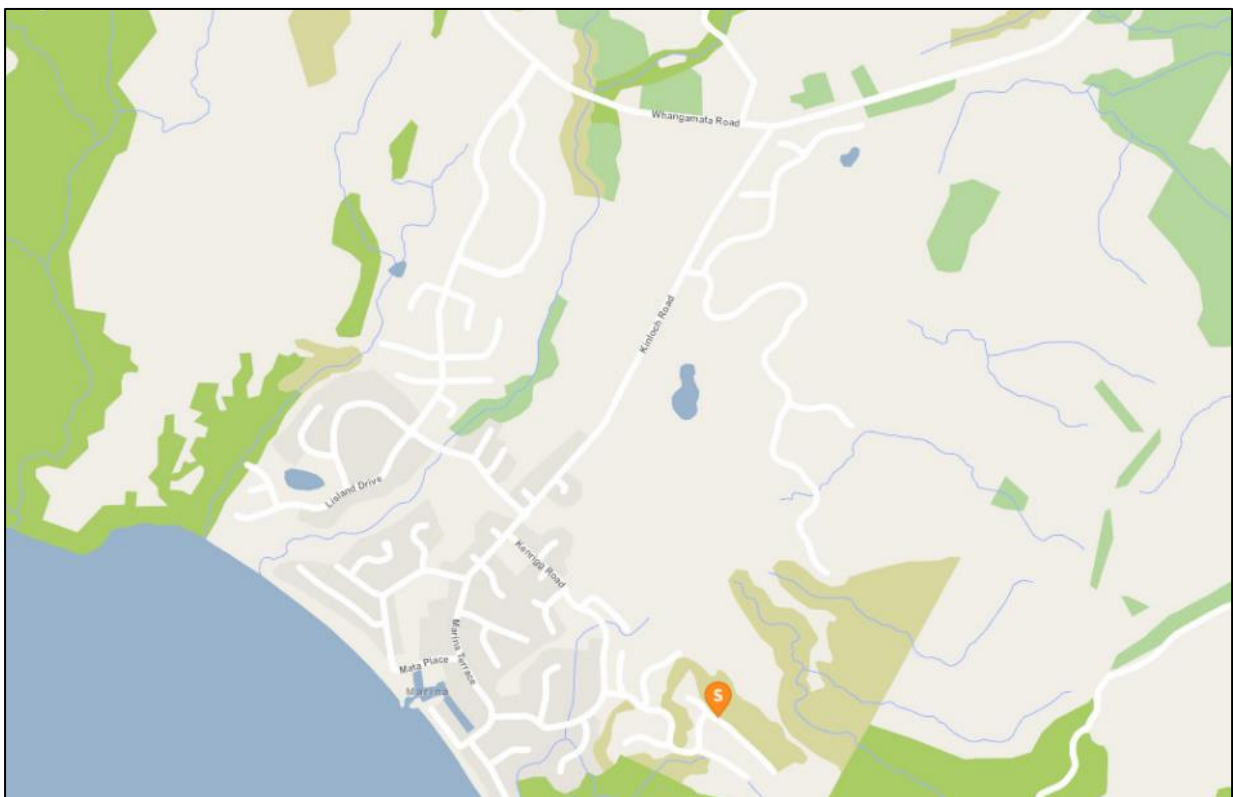
There are a number of townships in the Taupō District. Fatal and serious crashes have occurred in these locations (excludes state highways), except for in Kuratau, Omori & Pukawa, Tokaanu or Motuoapa.



**Figure B-37: Fatal and serious crashes in Tūrangi**



**Figure B-38: Fatal and serious crashes in Mangakino**



**Figure B-39: Fatal and serious crashes in Kinloch**



## Appendix C MegaMaps for the Taupō District

Developed and maintained by Waka Kotahi (NZ Transport Agency), MegaMaps is the primary data source to support the development of the speed management plan.

### C.1 Posted Speed Limits

The posted speed limit layer shows that roads are mainly 100 km/h in rural areas and 50 km/h in urban areas with some 70 km/h sections. A few 60 and 80 km/h sections were introduced in late 2018.

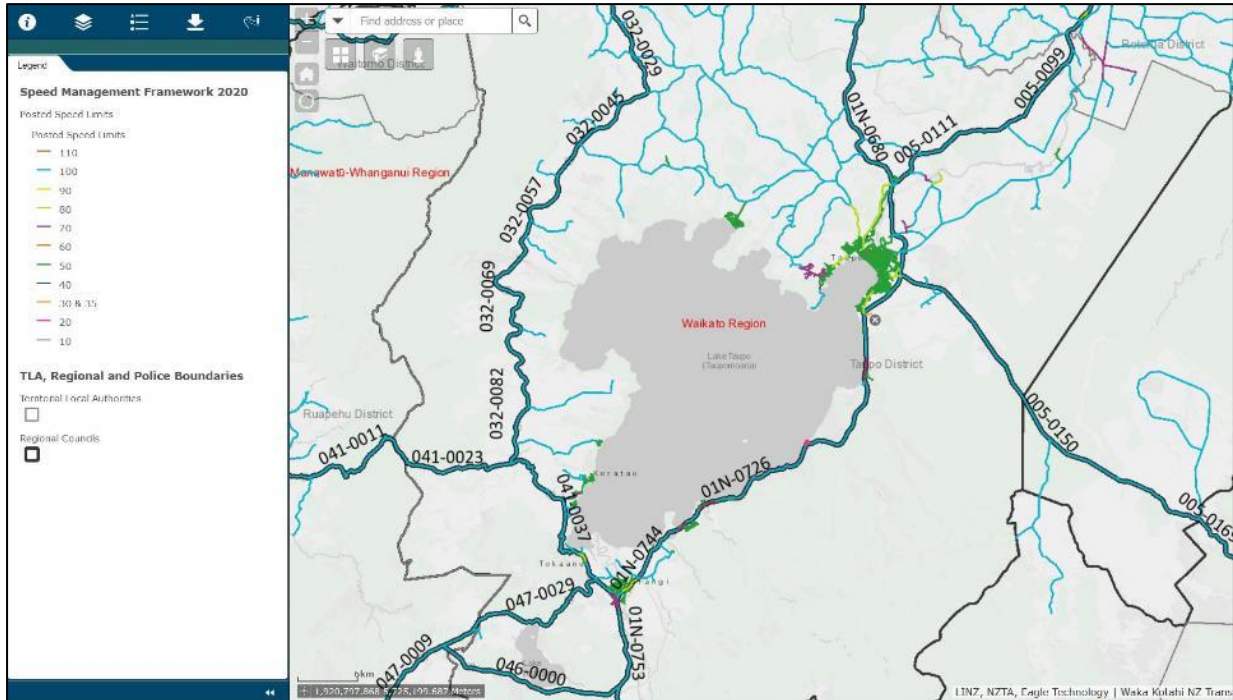


Figure C-1: Posted speed limits in Taupō District

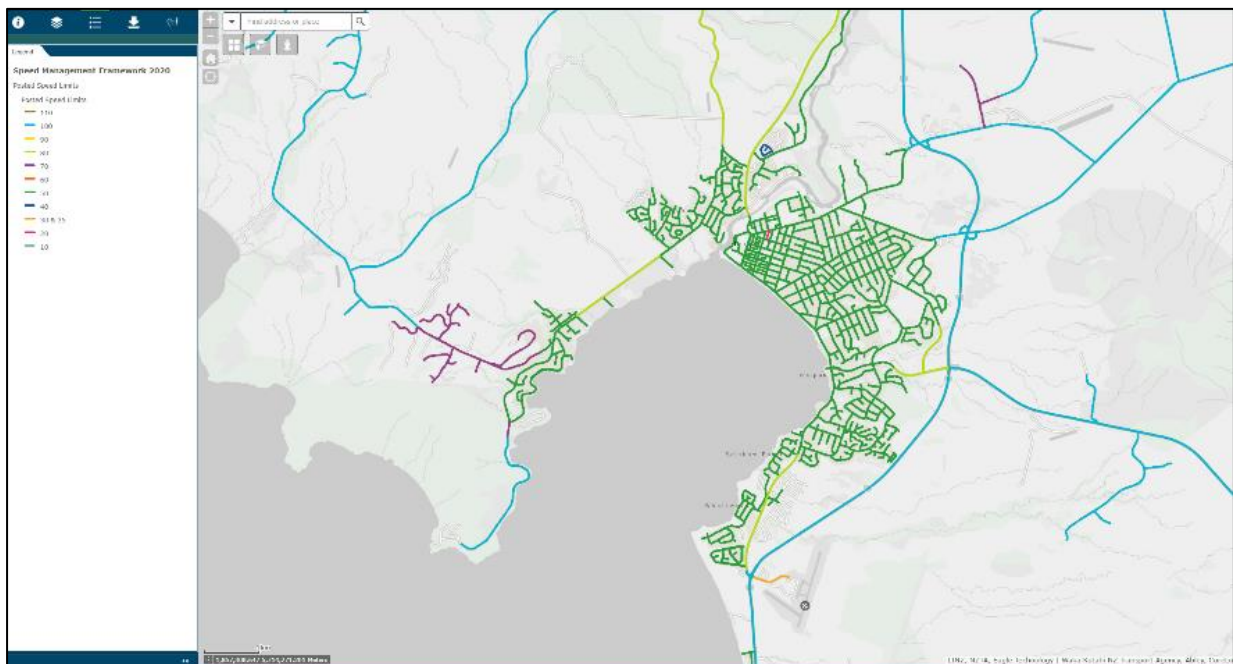


Figure C-2: Posted speed limits in Taupō Central



## C.2 Mean Operating Speeds

The mean operating speed layer already shows that drivers are already driving at lower speeds than the posted speeds particularly on the roads between State Highway 32 and State Highway 1.

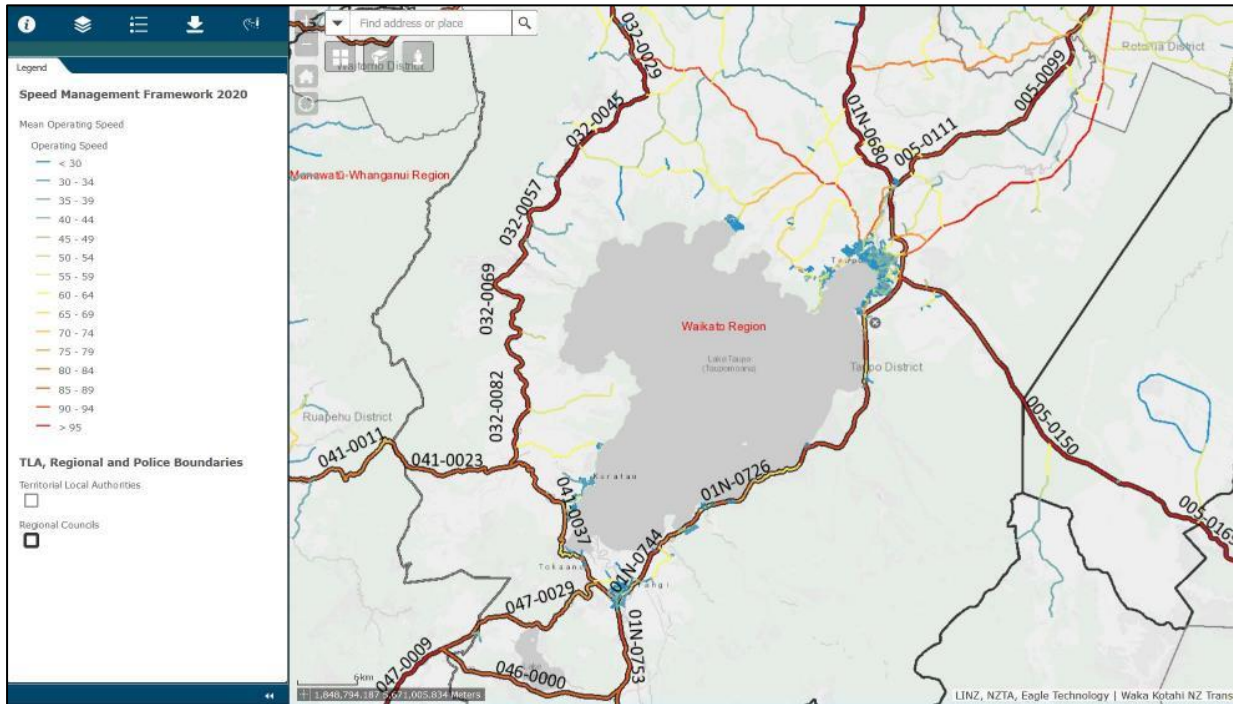


Figure C-1: Appendix Posted speed limits in Taupō District

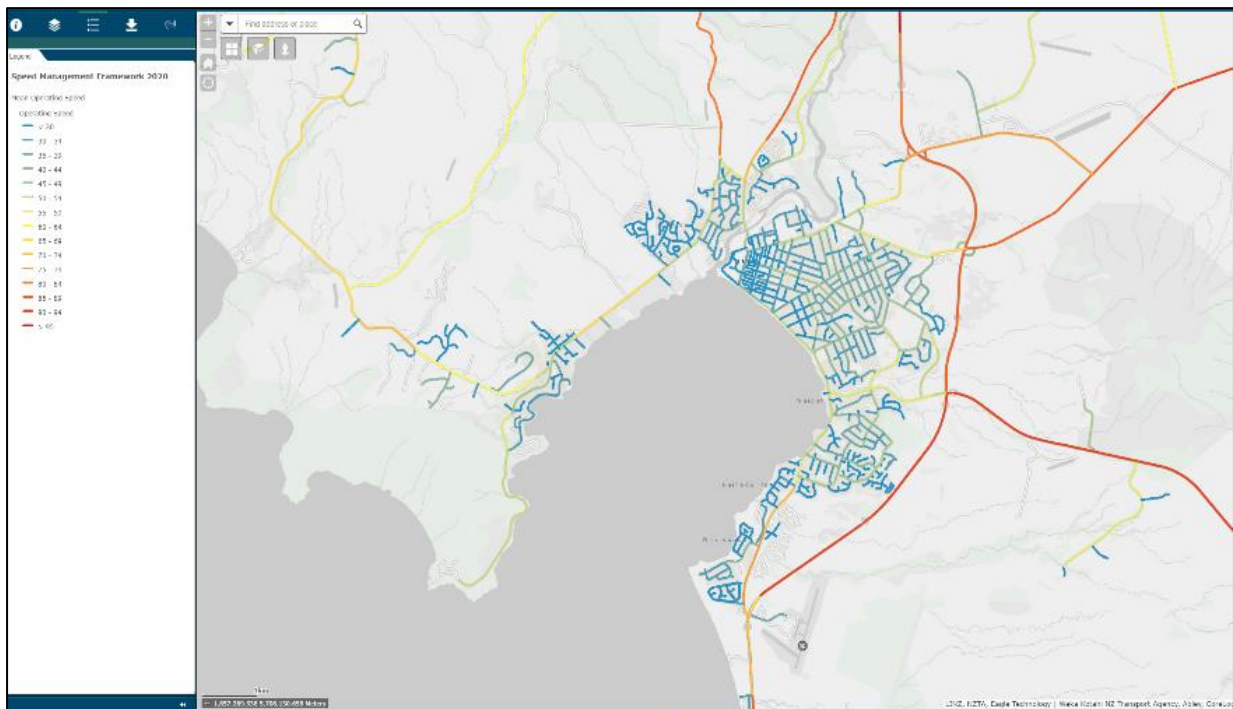


Figure C-2: Appendix Posted speed limits in Taupō Central

## C.3 Safe and Appropriate Speeds

The safe and appropriate speed is based on a speed being appropriate for the road function, design safety and use (takes both safety and efficiency into account).

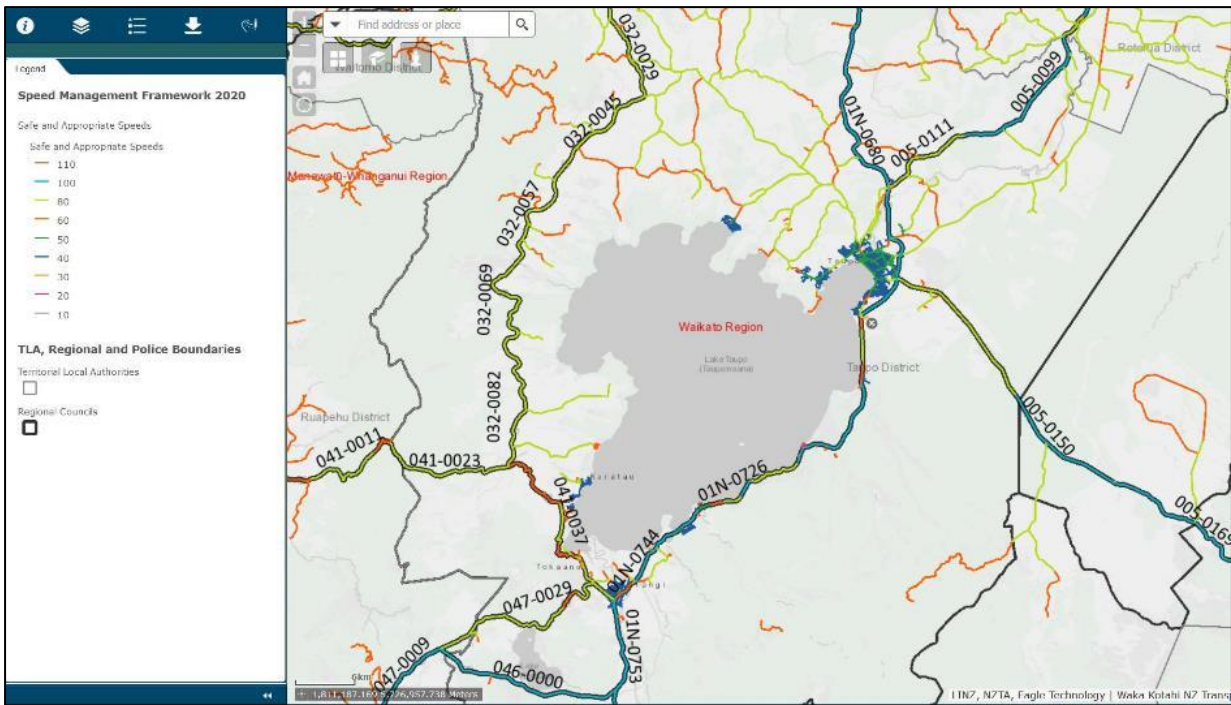


Figure C-3: Safe and Appropriate Speeds in Taupō District

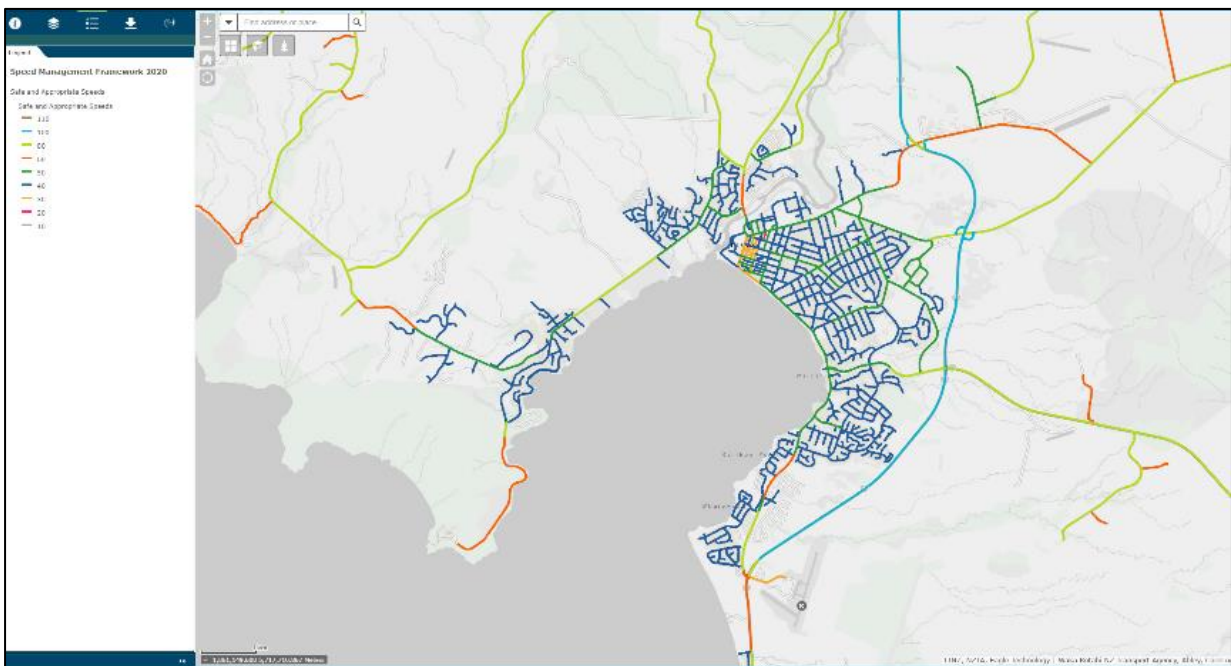


Figure C-4: Safe and Appropriate Speeds in Taupō Central

#### C.4 Risk Metrics

The safe and appropriate speed combines the infrastructure risk rating score with the collective and personal risk metrics.

The Infrastructure Risk Rating (IRR) is a predictive road assessment methodology designed to proactively assess road safety risk and is a significant input to the speed management framework. The IRR uses eight key features that impact safety risk including road stereotype, alignment, carriageway width, hazards, land-use, intersection and access density and traffic volume.

Collective and personal risks along a corridor are used to incorporate crash risk. **Personal risk** represents the crash risk exposure to each individual vehicle travelling along a corridor. It is the **governing road**





**safety metric in classifying safe and appropriate speeds. Collective risk** is a measure of crash density at a network level and is one of the **governing factors in prioritising corridors** where speed management is likely to reduce DSI's. It is a secondary factor in classifying safe and appropriate speeds on higher speed rural roads.

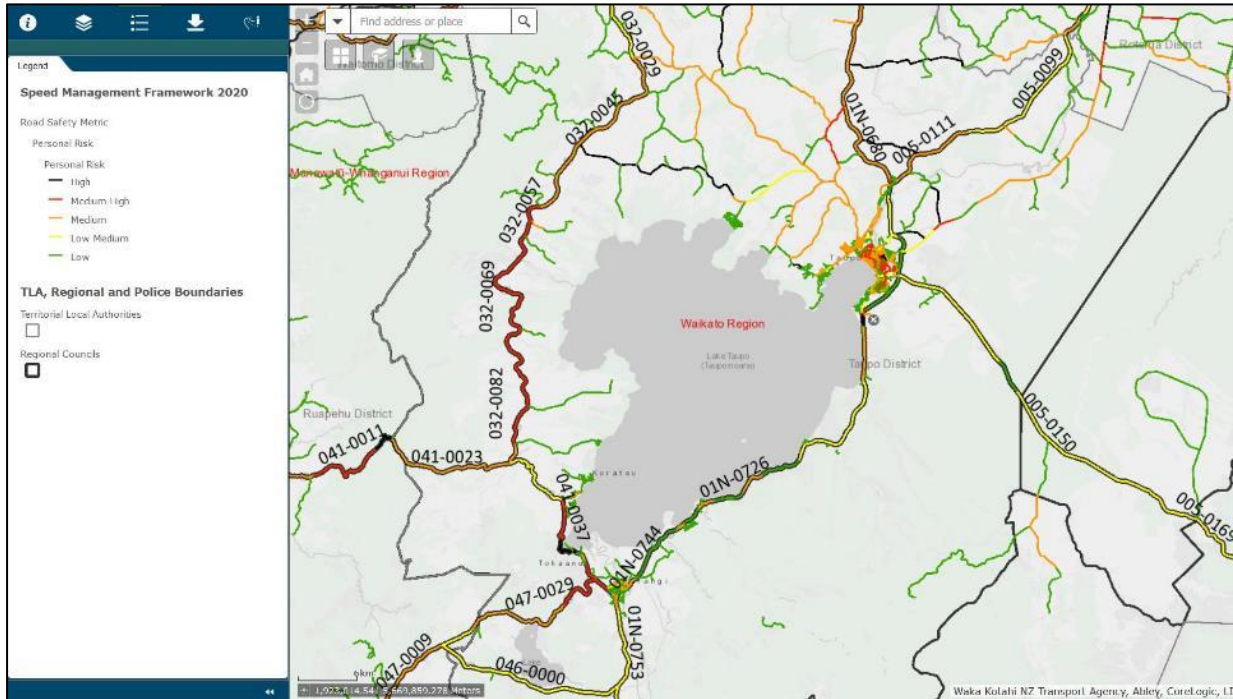


Figure C-5: Personal Risk Ratings in Taupō District

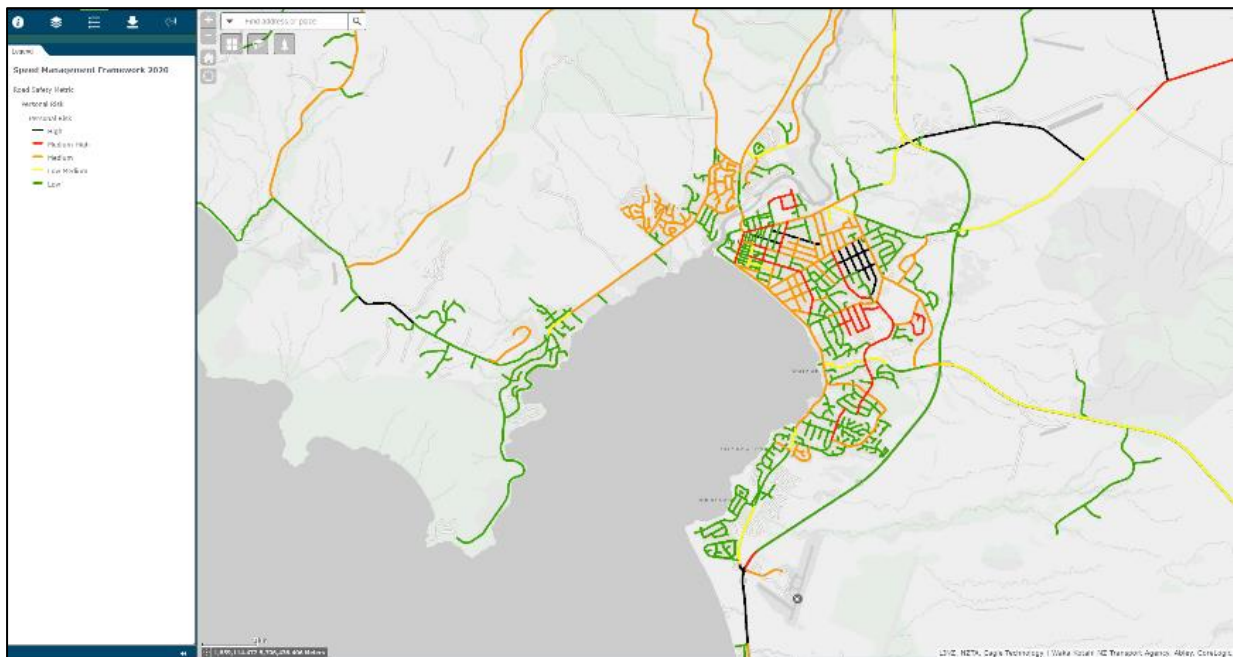


Figure C-6: Personal Risk Ratings in Taupō Central



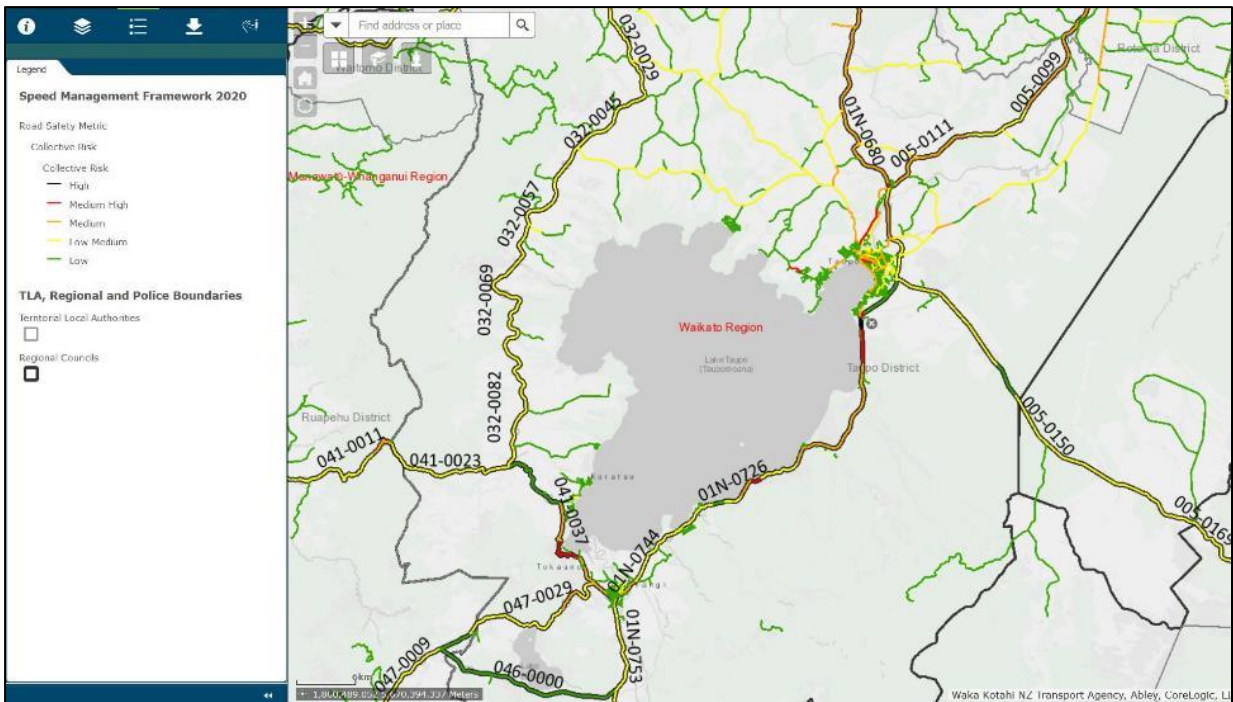


Figure C-7: Collective Risk Ratings in Taupō District

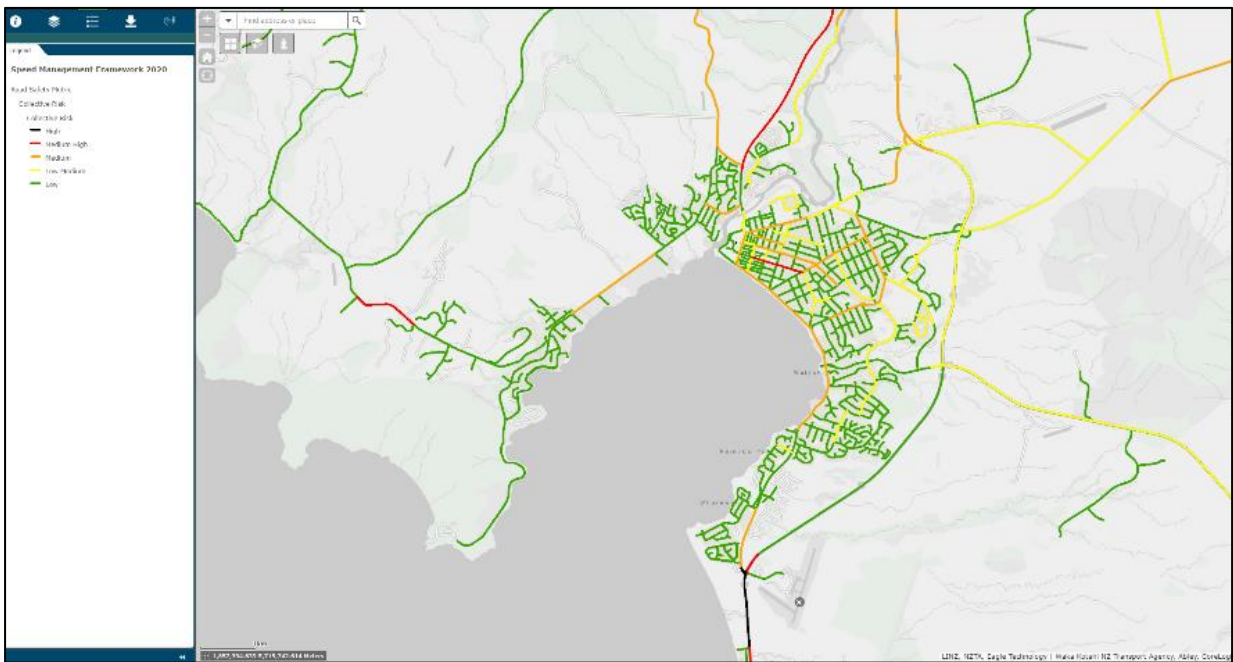


Figure C-8: Collective Risk Ratings in Taupō Central

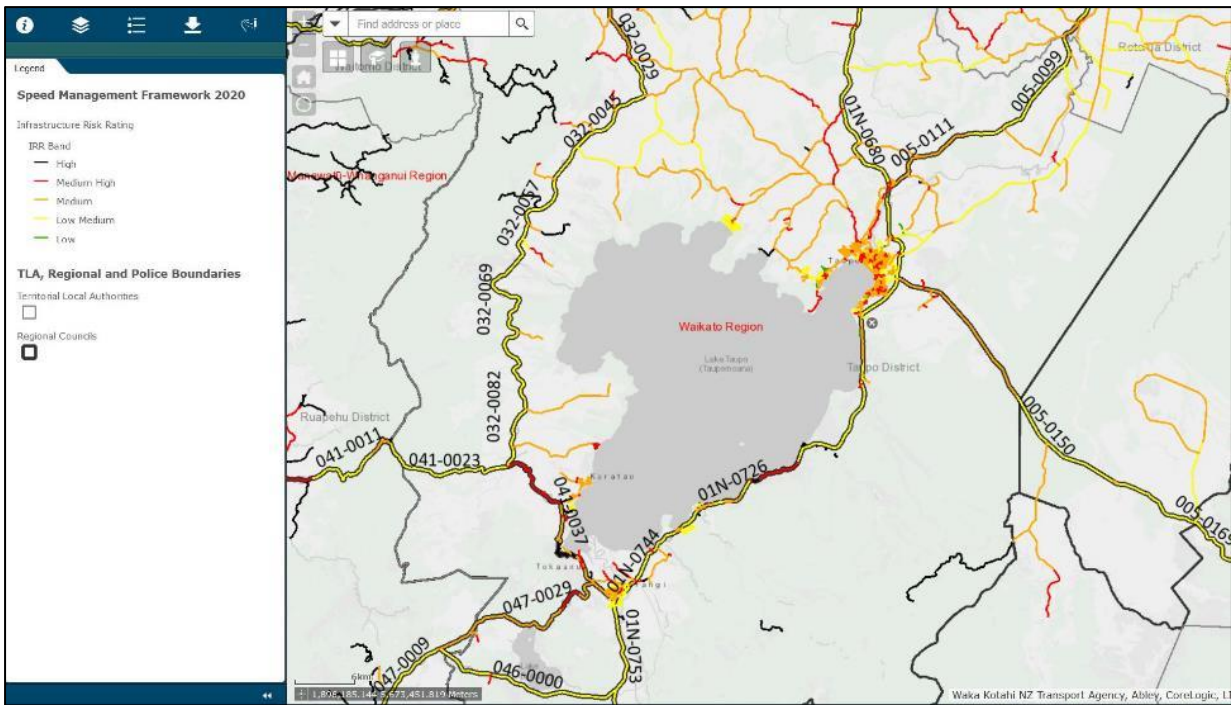


Figure C-9: IRR Ratings in Taupō District

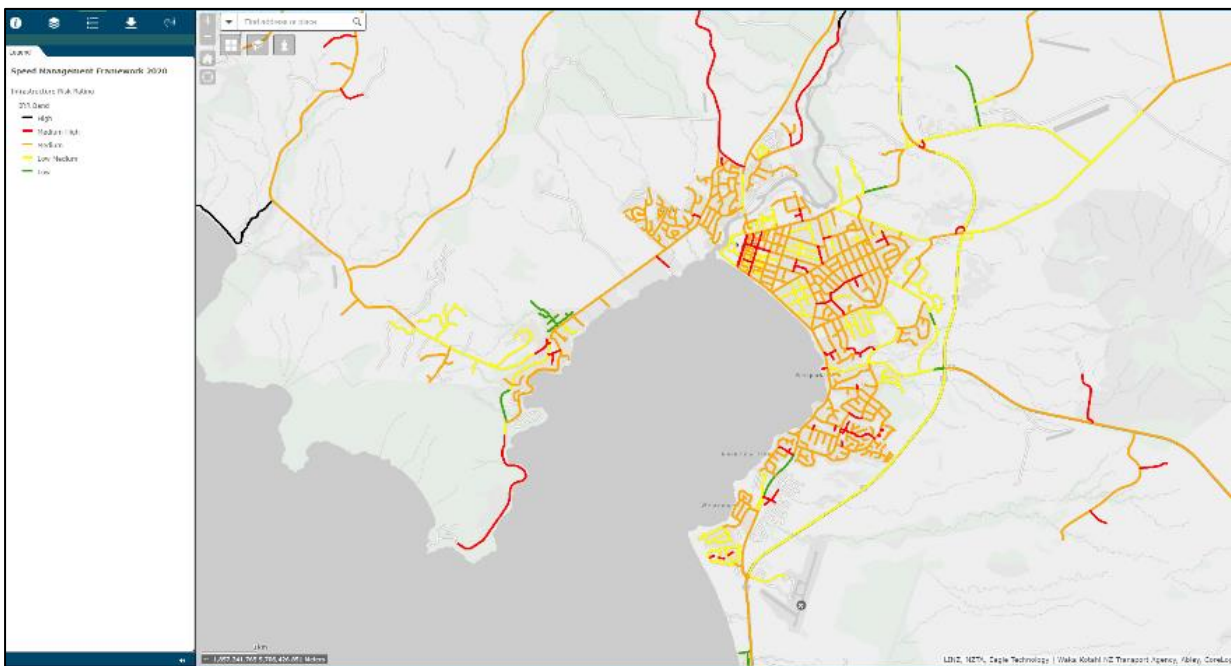


Figure C-10: IRR Ratings in Taupō Central

### C.5 High Benefit Speed Management

The “top 10% DSI Savings” on the network have also been mapped in MegaMaps. These are the roads around the national network that would generate the 10% highest savings in deaths & serious injuries (DISs) due to a reduction in existing speed limits. A small handful of roads on the Taupō network feature on this, including a large part of Poihipi Road.

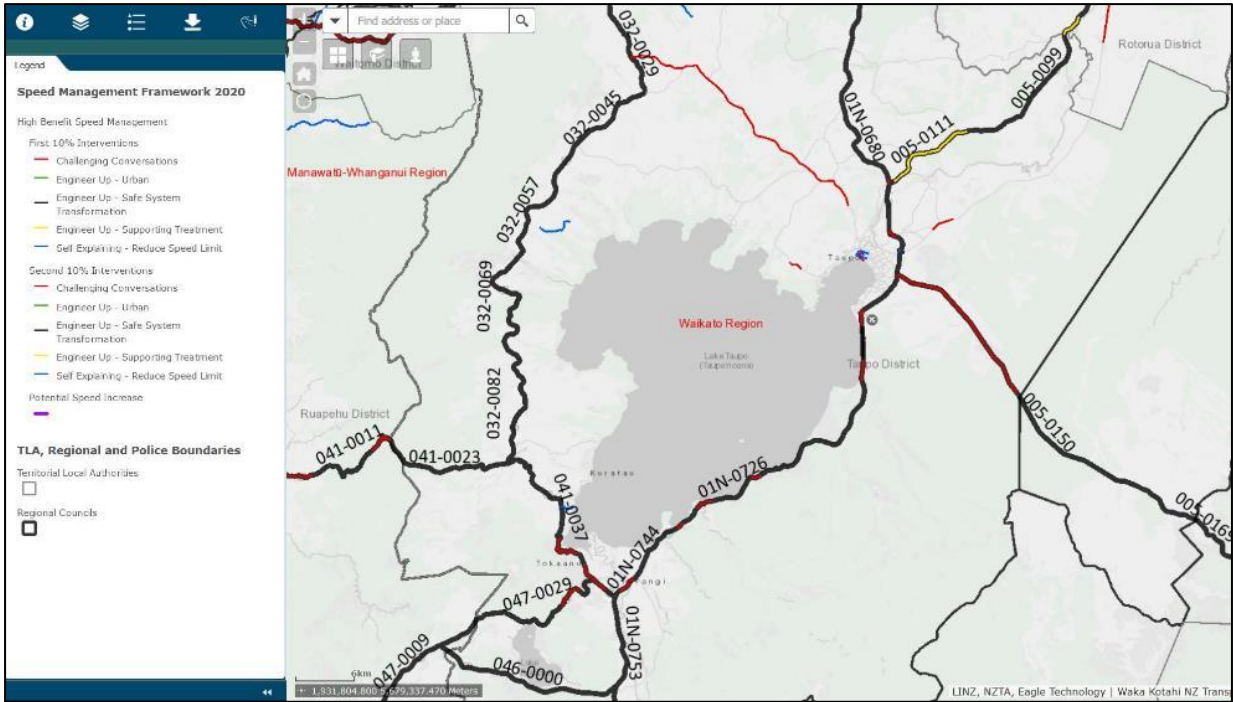


Figure C-11: Top 10% DSI Savings on the network in Taupō District

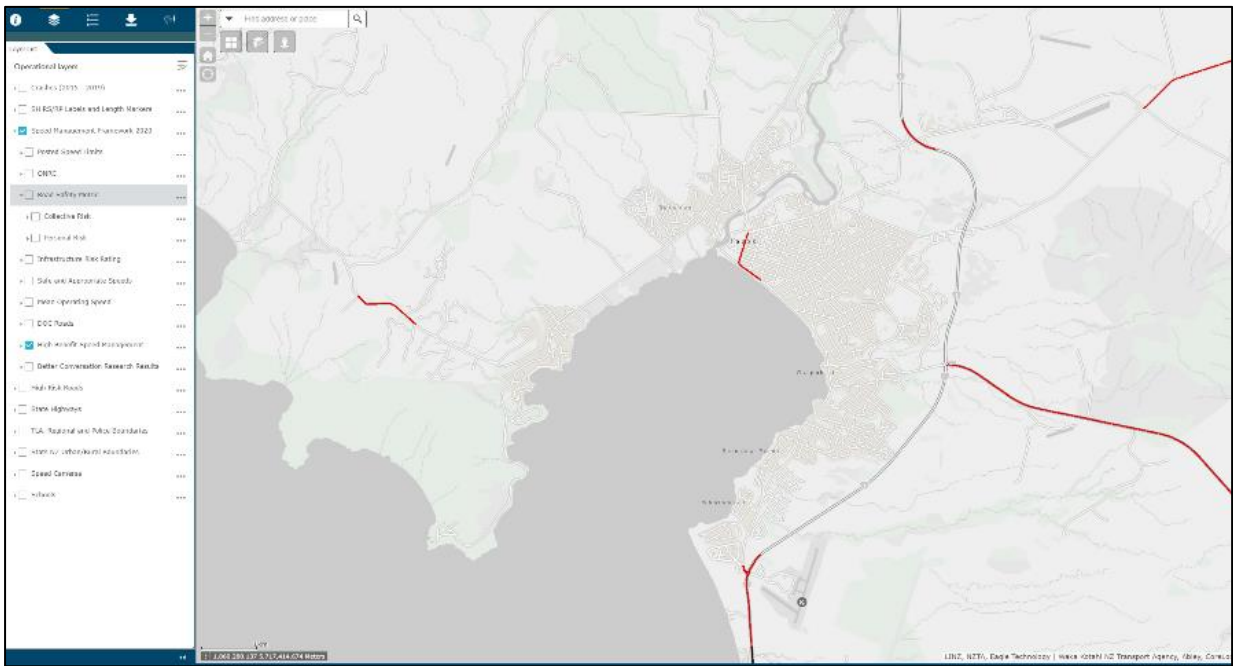


Figure C-12: Top 10% DSI Savings on the network in Taupō District





## Appendix D Schools in the Taupō District







The table includes all the schools in the Taupō District where speeds should be assessed.

Name	Location	Type
ADDI Enrichment Academy	16 Opepe Street, Taupō	Composite, Co-Educational
Hilltop School	88 Rokino Road, Taupō	Full Primary, Co-Educational
<i>*Kuratau School</i>	<i>2244 State Highway 41, Kuratau</i>	<i>Full Primary, Co-Educational</i>
Lake Taupō Christian School	42 Kiddle Drive, Taupō	Composite, Co-Educational
Mangakino Area School	55 Karamū Street, Mangakino	Composite, Co-Educational
<i>*Marotiri School</i>	<i>1569 State Highway 32, Marotiri</i>	<i>Full Primary, Co-Educational</i>
Mountview School	31 Rangatira Street, Taupō	Full Primary, Co-Educational
<i>*Rangitaiki School</i>	<i>27 Rangitaiki School Road, Rangitaiki</i>	<i>Full Primary, Co-Educational</i>
St Patrick's Catholic School (Taupō)	86 Acacia Bay Road, Taupō	Full Primary, Co-Educational
Tauhara College	Invergarry Road, Taupō	Secondary (Year 9-15), Co-Ed
Tauhara Primary School	90 Crown Road, Taupō	Contributing, Co-Educational
Taupō Intermediate	22 Kōtare Street, Taupō	Intermediate, Co-Educational
Taupō-nui-a-Tia College	122 Spa Road, Taupō	Secondary (Year 9-15), Co-Ed
Taupō School	Tamamutu Street, Taupō	Contributing, Co-Educational
Te Kura o Hirangi	29 Mawake Place, Tūrangi	Composite, Co-Educational
Te Kura o Waitahanui	107 State Highway 1, Waitahanui	Contributing, Co-Educational
TKKM o Whakarewa   Te Reo Ki Tuwharetoa	56 Waikato Street, Taupō	Composite, Co-Educational
<i>*Tirohanga School</i>	<i>851 Tirohanga Road, Tirohanga</i>	<i>Full Primary, Co-Educational</i>
Tongariro School	Waipapa Road, Tūrangi	Composite, Co-Educational
Waipahihi School	20 Parata Street, Taupō	Contributing, Co-Educational
Wairakei School	2 Kauri Drive, Wairakei Village	Contributing, Co-Educational
<i>*Whakamaru School</i>	<i>42 Kaahu Road, Whakamaru</i>	<i>Full Primary, Co-Educational</i>

*\*Indicates school in rural area (speed limit ≥ 70 km/h)*

NB: schools on State Highways have not been included in this Plan.

## Appendix E Proposed Priority 1 Speed Limit Changes

Location of priority 1 speed change		Current speed limit	Actual travel speed <sup>22</sup>	Proposed speed limit
<b>Schools</b>				
<ul style="list-style-type: none"> <li>- <b>Hilltop School</b> (Kurupae Road, Ngamotu Road, Rokino Road)</li> <li>- <b>Mountview School</b> (Leslie Street, Rangatira Street, Simkin Street, Taharepa Road)</li> <li>- <b>Tauhara College</b> (Invergarry Road)</li> <li>- <b>Taupō Intermediate and Taupō Hospital</b> (Kotare Street, Liston Avenue, Tawa Street)</li> <li>- <b>Taupō-nui-a-Tia College</b> (Motutere Avenue, Waikato Street)</li> <li>- <b>Taupō School</b> (Horomātangi Street, Tamamutu Street, Ruapehu Street)</li> <li>- <b>Te Kura o Hirangi</b>, Tūrangi (Mawake Place)</li> </ul>	<ul style="list-style-type: none"> <li>- <b>TKKM o Whakarewa I Te Reo Ki Tuwharetoa, ADDI Enrichment Academy &amp; Taupo-nui-a-Tia College</b> (Ōpepe Street, Waikato Street)</li> <li>- <b>Tongariro School</b>, Tūrangi (Hinerangi Street, Katopu Street, Te Rangikahekewaho Place, Te Rangitautahanga Road, Te Rewha Street, Waipapa Road)</li> <li>- <b>Waipahihi School</b> (Frederick Street, Parata Street)</li> </ul>			
<ul style="list-style-type: none"> <li>- <b>St Patrick's Catholic School</b> (Acacia Bay Road)</li> <li>- <b>Tauhara College and Lake Taupo Christian School</b> (Kiddle Drive)</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Tauhara Primary School</b> (Taharepa Road, Crown Road)</li> <li>- <b>Taupō School</b> (Titīraupenga Street)</li> </ul>			





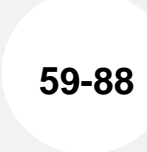










<sup>22</sup> Mean operating speeds as captured by MegaMaps TomTom data. In some cases, this data may be an average of a long section of road.













- Taupō-nui-a-Tia College (Spa Road)			
- Mangakino School, Mangakino (Karamu Street, Wairenga Road)			
- Rangitaiki School, Rangitaiki (Rangitaiki School Road)			
- Tirohanga School, Tirohanga (Tirohanga Road)			 
- Wairakei School, Wairakei (Kauri Drive, Rata Street)			
- Whakamaru School, Whakamaru (Kaahu Road)			 
<b>Rural Road</b>			













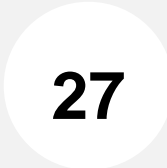


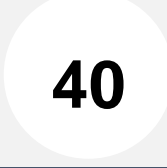



<ul style="list-style-type: none"> <li>- <b>Broadlands Road</b> (Miro Street – SH5)</li> </ul>			
<ul style="list-style-type: none"> <li>- <b>Broadlands Road</b> (SH5 – View Road)</li> <li>- Grant Road</li> <li>- Hitiri Road</li> <li>- Kaiapo Road</li> <li>- Katelyn Place</li> <li>- King Road</li> <li>- <b>Mapara Road</b> (Poihipi Road – Acacia Bay)</li> </ul>			
<ul style="list-style-type: none"> <li>- <b>Poihipi Road</b> (Whangamata Road – Tirohanga Road)</li> </ul>			
<ul style="list-style-type: none"> <li>- <b>Mapara Road, Acacia Bay</b></li> <li>- Acacia Heights Drive</li> <li>- Blue Ridge Drive</li> <li>- Dalmore Way</li> <li>- Glenlochry Rise</li> <li>- Glen Mohr</li> <li>- Gillespie Place</li> </ul>			
<ul style="list-style-type: none"> <li>- Blake Road, Waitahanui</li> </ul>			















- Rotongaio Road, Waitahanui		36	
<b>Taupō Township</b>			
- Lake Terrace (Tongariro – Ruapehu) – proposed pedestrian street		41	
- Roberts Street (west of Ruapehu Street)		20	
- Ferry Road - Gallagher Street - Gascoigne Street - Heuheu Street - Lake Terrace (east of Ruapehu) - Marama Arcade - Pāora Hapi Street - Redoubt Street	- Roberts Street (Ruapehu east) - Ruapehu Street - Starlight Arcade - Story Place - Tamamutu Street - Taniwha Street - Tongariro Street - Tūwharetoa Street		20-36 
<b>Paetiki Shopping Centre:</b> - Taharepa Road - Rifle Range Road <b>Tauhara Shopping Centre:</b> - Taharepa Road		44	











		- Crown Road (Napier Road – south of Ashwood Ave)			
Wharewaka	- Harakeke Drive	- Poroporo Way			
	- Kiwai Place	- Puna Rise			
	- Kohia Place	- Raupo Crescent			
	- Kopakopa Crescent	- Roto Close			
	- Maru Terrace	- Tawhai Crescent			
	- Maunganamu Drive	- Tutu Place			
	- Makomako Crescent	- Uky Way			
	- Patete Place	- Wai Terrace			
<b>Taupō Surroundings</b>					
Waitetoko	- Mua Street	- Rawhira Road			
	- Okahuroa Road	- Waitetoko Road			
	- Otaiatua Street	- Wharewera Street			
Wairakei	- Hinau Crescent	- Nikau Street			
	- Kamu Crescent	- Rangiora Crescent			
	- Kauri Drive (NE of school)	- Rata Street			
	- Maire Street	- Raukawa Crescent			
	- Ngaio Place	- Tawa Place			
	- Kauri Drive (SH5 – urban boundary)				





Tūrangi	<b>Tūrangi town centre</b> - Pihanga Road - Te Rangitautahanga Road			20-38	
	- Atirau Road (Southeast) - Gibson Street - Kahurau Drive - Ohuanga Road - Tukehu Street	- Ngaumu Street - Torouka Street - Manawa Street - Katarina Street		27-36	
	- Atirau Road (Northwest)			54-60	
	- Hirangi Road - Te Awamate Road			60	
Kinloch	- Kinloch Esplanade - Marina Terrace - Mata Place - Kinloch Road			28	
	- Kānuka Grove - Ribbonwood Lane - Lancewood Way - Kahikatea Drive	- Pukatea Lane - Karaka Place - Okaia Drive - Sherwood Way		n/a	



	- Oakdale Drive <sup>1</sup>			n/a	
Whareroa	- Whareroa Road (East)	- Hinekapi Terrace		23-42	
	- Turangitukua Terrace	- Te Amio Place			
	- Ngāti Parekaawa Drive	- Piripi Place		60	
	- Ani Patena Place	- Poriwira Drive			
	- Whareroa Road (West)				
Whakamaru	- Pokuru Road N			43	

Note 1. For confirmation of current speed limit (currently enacted but need to ensure this is fit for purpose as per transport law)



## Appendix F Rationale where recommended speed is different from SAAS

This table identifies any proposed changes to recommended speed limits from what is calculated by MegaMaps, with reasons given for the changes.

Road Names	Difference <sup>23</sup> (km/h)	Reasoning
- Karetoto Road (North)	<b>10</b>	Curvilinear, narrow, hidden driveways and low FFS.
- Karetoto Road (South)		Urban development, tourism, and vulnerable users.
- Lake Terrace		High active travel
- Mata Place		Self-explaining roads
- Wairakei Drive		Intersections (engineer up and increase speed limit after).
- Pāora Hapi Street		Town centre strategy
- Kotare Street      - Liston Avenue		School and hospital
- Kinloch Esplanade      - Marina Terrace		Network function (signpost entire area at 40 starting from Kinloch Road junction)
- Motutere Avenue      - Waikato Street		SAAS and School
- Rangikatea Road      - Rangitukua Drive		Rural residential
- Heuheu Street      - Tamamutu Street		Town centre strategy
- Horomātangi Street      - Taniwha Street		
- Roberts Street      - Tongaririo Street (town centre)		
- Ruapehu Street      - Tuwharetoa Street		
- Ferry Road      - Rakaunui Road	Consistent with other nearby speed change	
- Kahurangi Drive      - Redoubt Street		

<sup>23</sup> Difference = {Safe & Appropriate Speed} – {Recommended Speed Limit}





Road Names		Difference <sup>23</sup> (km/h)	Reasoning
- Kaimanawa Street	- Tautahanga Road		Agree with existing limit (already different from SAAS)
- Kinloch Road	- Mihianga Road		
- Lake Terrace (near SH1)	- Te Aro Road		
- Loop Road	- Tongaririo Street		Reflect residential place function
- Kopu Street	- River Road		
- Mangaroa Street	- Tariao Street		
- Matariki Street	- Waitapu Road		
- Puanga Street	- Atutahi Street	-10	Road stereotype
- Acacia Bay Road			Separate W&C facilities or shoulder; close to FFS
- Centennial Drive			Wide road with collector function despite classification, would need engineering to achieve SAAS
- Lisland Drive			Public requests for lower speeds or traffic calming
- Mapara Road			Network function - Marina; alignment. Alternative for consultation: signpost entire area at 40 starting from Kinloch Road junction
- Marina Terrace			Top 10% DSi Saving, alignment good but roadside hazards, challenging conversations
- Poihipi Road			Potential 50 step down from rural straight to town 40
- Rangatira Drive			Rural residential
- Rangikatea Road			Urban and rural town collector
- Taharepa Road			Nearby Shcool
- Waipapa Road			Consistent with other nearby speed change
- Atirau Road	- Rongopai Street		
- Dekker Drive	- Te Urunga Place		
- Gibson Street	- Tongariro Street (near Redoubt Street)		



Road Names	Difference <sup>23</sup> (km/h)	Reasoning	
<ul style="list-style-type: none"> <li>- Katarina Street</li> <li>- Manawa Street</li> <li>- Ngaumu Street</li> </ul>	<ul style="list-style-type: none"> <li>- Torouka Street</li> <li>- Tukehu Street</li> <li>- Wharetuku Street</li> </ul>		
<ul style="list-style-type: none"> <li>- Heuheu Street</li> <li>- Mere Road</li> </ul>	<ul style="list-style-type: none"> <li>- Rifle Range Road</li> </ul>	Streets are to become the new arterial route	
<ul style="list-style-type: none"> <li>- Mapara Road (near Acacia Bay Road)</li> <li>- Kiddle Drive</li> <li>- Wakeman Road</li> </ul>		SAAS seems too low for environment	
<ul style="list-style-type: none"> <li>- Acacia Bay Road</li> </ul>	<b>20</b>	2018 consultation suggested 50 here. Context suggests 80 or 70 as per posted speed, would this be too many different speeds? High risk intersection present.	
<ul style="list-style-type: none"> <li>- Ani Patena Place</li> </ul>		Aligns with framework	
<ul style="list-style-type: none"> <li>- Kepa Road</li> </ul>		Not in MegaMaps. Narrow, turns unsealed and short length.	
<ul style="list-style-type: none"> <li>- Pihanga Road</li> </ul>	<b>20</b>	Commercial area, pedestrian courtesy crossings	
<ul style="list-style-type: none"> <li>- Rangitaiki School Road</li> </ul>		Full time 60, partly unsealed, school engagement to confirm.	
<ul style="list-style-type: none"> <li>- Roberts Street</li> </ul>		Shared street	
<ul style="list-style-type: none"> <li>- Aratiatia Road</li> </ul>		Consistent with other nearby speed change	
<ul style="list-style-type: none"> <li>- Hinekapi Terrace</li> <li>- Ngati Parekawa Drive</li> <li>- Piripi Place</li> </ul>		<ul style="list-style-type: none"> <li>- Te Amino Place</li> <li>- Turangitukua Terrace</li> <li>- Whareroa Road</li> </ul>	Reflect residential place function
<ul style="list-style-type: none"> <li>- Lake Terrace</li> <li>- Taniwha Street</li> </ul>			Town centre strategy
<ul style="list-style-type: none"> <li>- Aratiatia Road</li> </ul>			Good sightlines and clear zones. If View Rd is lowered to 60, then for consistency this should also be 60.



Road Names	Difference <sup>23</sup> (km/h)	Reasoning	
- Broadlands Road	<b>-20</b>	Alignment and cross section are suitable for existing speed limit to be retained (for now)	
- Highland Drive		Consistent with adjacent spd change, no exit, alignment tortuous and steep	
- Hirangi Road		Consistent with environment	
- Kinloch Road		Good alignment and separate path	
- Mapara Road		Speed reduction requests from community and transition from 100km/h	
- Matea Road		Surface unsealed, alignment better than the other segment, but needs differentiation from the winding segment	
- Oruanui Road		SAAS too low, shoulders and alignment are better than 60	
- River Road		Alignment, absence of driveways	
- Tirohanga Road		Very straight alignment. Could then step down before the curves to the west, school.	
- View Road		Most of this road has good horizontal alignment (consult)	
- Waipapa Road		Disagree with MegaMaps, aim for consistency with adjacent links	
- Wakeman Road	<b>-20</b>	2018 consultation suggested 50 here. Context suggests 80 or 70 as per posted speed, would this be too many different speeds? High risk intersection present.	
- Whangamata Road		Roadside hazards, SAAS too low given width, centreline, and mostly good visibility around curves; minor improvements to improve sightlines further.	
- Acacia Heights Drive		- Lake Terrace - Awamate Road	Consistent with other nearby speed change
- Blueridge Drive		- Loch Views Road	Good sightlines, clear zones, lifestyle blocks. Requires engineering to achieve SAAS.
- Dalmore Way		- Lomond Grove	
- Gillespie Place	- Morel Place		



Road Names	Difference <sup>23</sup> (km/h)	Reasoning
- Glen Mohr - Glenlochry Rise	- Ramsay Drive - Stewart Glen	
- Pokuru Road	- Spencer Road	Second 10% DSI saving. Very minor road likely to be used by locals who know the conditions. Could engineering up to 80 or consult about reducing speed limit to SAAS 60.
- Palmer Mill Road	- Waiotaka Road	Rural local road
- Acacia Bay Road		Entry to township
- Lake Terrace		Pedestrian street
- Riverpark Drive		Rural residential
- Robert Street		Shared street
- Wairakei Drive		Urban fringe, high free flow lack of shoulders, but also lack of driveways. Engineer up and increase speed limit.
- Whakamaru Road		More logical step change if rural adjacent link is changed to 80, consistent with township, fewer signs.
- Borderland Road	- Huka Falls Road	Urban growth, consistency with adjacent urban roads (agree with posted)
- Lake Road		Straight alignment, stay with previous consulted limit
- Lake Terrace		To further reduce, would need engineering given the free flow speed
- Poihipi Road		Alignment good but roadside hazards

Note 1. SAAS – Recommended speed limit = Difference





## Appendix G Infrastructure and Costs

Note that these costs are for Priority 1 speed management proposals; costs for priority 2 and 3 proposals have been developed independently.

<b>Taupō Speed Mngmt Costs</b>		<b>Total \$</b>	<b>\$63,600</b>	<b>\$19,800</b>	<b>\$18,000</b>	<b>\$21,200</b>	<b>\$117,000</b>	<b>\$1,500</b>	<b>\$30,000</b>	<b>\$100,000</b>	<b>\$10,000</b>	<b>\$373,300</b>	<b>\$20,450</b>	<b>\$11,700</b>	<b>\$2</b>	
		Rate:	\$300	\$300	\$1,000	\$100	\$9,000	\$500	\$10,000	\$50,000	\$20,000		\$50	\$900	\$1	
<b>Road / Area</b>	<b>Locality</b>	<b>Length (km)</b>	<b>Treatments</b>	<b>Basic Spd Sign</b>	<b>Repeater Spd Signs</b>	<b>Threshold Spd Sign</b>	<b>Addit'nal Paint Markings</b>	<b>Electronic School VMS</b>	<b>Static School VMS</b>	<b>Ped'n Crossing</b>	<b>Traf. calm urban (km)</b>	<b>Traf. calm rural (km)</b>	<b>TOTAL CAP. COSTS</b>	<b>Sign/Mrks Maint / yr</b>	<b>VMS Maint per year</b>	<b>Traf. Ma</b>
Hilltop School	Taupō		50 > 30	8			8						\$3,200	16		
Lake Taupō Christian School	Taupō		50 > 30VMS	2			2	2					\$18,800	4	2	
Mangakino Area School	Mangakino		50 > 30	6			6						\$2,400	12		
Mountview School	Taupō		50 > 30	6			6			1			\$12,400	12		
*Rangitaiki School	Rangitaiki		100 > 30	2			2						\$800	4		
St Patrick's Catholic School	Taupō		50 > 30VMS	3			3	2	1				\$19,700	7	2	
Tauhara College	Taupō		50 > 30	4			4						\$1,600	8		
Tauhara Primary School	Taupō		50 > 30VMS	2			2	3	1				\$28,300	5	3	
Taupō Intermediate	Taupō		50 > 30	4			4						\$1,600	8		
			50 > 30, 40VMS > 30VMS	3			3		1				\$1,700	7		
Taupō School	Taupō		50 > 30VMS	2			2	2					\$18,800	4	2	
Te Kura o Hirangi	Tūrangi		50 > 30	2			2				0.5		\$25,800	4		
TKKM o Whakarewa / ADDI Academy	Taupō		50 > 30	6			6						\$2,400	12		
			100 > 80, 30VMS	4			4	2				0.5	\$29,600	8	2	
*Tirohanga School	Tirohanga	0.5	30VMS	4			4	2					\$29,600	8	2	
Tongariro School	Tūrangi		50 > 30	8			8						\$3,200	16		
Waipahihi School	Taupō		50 > 30	6			6						\$2,400	12		
Wairakei School	Wairakei		50 > 30	6			6						\$2,400	12		
	Whakamaru		70 > 60, 30VMS	8			8	2					\$21,200	16	2	
*Whakamaru School + Pokuru Rd	u		30VMS	8			8	2					\$21,200	16	2	
Broadlands Rd (Miro St – SH5)	Taupō	0.5	100 > 50	2		2	2						\$2,800	6		
Broadlands Rd (SH5 – View Rd)	Rural	4.7	100 > 80	6	4		6						\$3,600	12		



**Taupō Speed Mngmt Costs**

		<i>Total \$</i>	<i>\$63,600</i>	<i>\$19,800</i>	<i>\$18,000</i>	<i>\$21,200</i>	<i>\$117,000</i>	<i>\$1,500</i>	<i>\$30,000</i>	<i>\$100,000</i>	<i>\$10,000</i>	<b>\$373,300</b>	<i>\$20,450</i>	<i>\$11,700</i>	<i>\$2</i>	
		Rate:	\$300	\$300	\$1,000	\$100	\$9,000	\$500	\$10,000	\$50,000	\$20,000		\$50	\$900	\$1	
Road / Area	Locality	Length (km)	Treatments	Basic Spd Sign	Repeater Spd Signs	Threshold Spd Sign	Addit'nal Paint Markings	Electronic School VMS	Static School VMS	Ped'n Crossing	Traf. calm urban (km)	Traf. calm rural (km)	TOTAL CAP. COSTS	Sign/Mrks / yr	VMS Maint per year	Traf. M
Mapara Rd (Poihipi Rd – Acacia Bay)	Rural	11.5	100 > 80	4	10		4						\$4,600	8		
Poihipi Rd (SH32 – Tirohanga Rd)	Rural	9.4	100 > 80	12	8		12						\$7,200	24		
Poihipi Rd (Whangamata - Tukairangi)	Rural	5.6	100 > 80	6	4		6						\$3,600	12		
Tukairangi Rd	Rural	9.7	100 > 80	4	8		4						\$4,000	8		
Whangamata Rd (Poihipi Rd – Kinloch)	Rural	8.8	100 > 80	8	8		8						\$5,600	16		
Poihipi Rd (Whangamata – Tirohanga)	Rural	13.2	100 > 90	6	12		6						\$6,000	12		
Mapara Rd, Acacia Bay + others	Acacia Bay	2.8	70 > 60	4	2		4						\$2,200	8		
Blake Rd, Waitahanui	Taupō		50 > 40	2			2						\$800	4		
Rotongaio Rd, Waitahanui	Taupō	0.5	100 > 60	2			2						\$800	4		
Lake Terrace (Tongariro – Ruapehu)	Taupō		50 > ped													
Roberts St (west of Ruapehu St)	Taupō		50 > 10													
Taupo Town Centre	Taupō		50 > 30													
Paetiki Shopping Centre	Taupō		50 > 30	4		4	4			1			\$15,600	12		
Tauhara Shopping Centre	Taupō		50 > 30	2		2	2			1			\$12,800	6		
Lake Terrace (SH1 to 50km/h)	Taupō	2.3	80 > 60	14	2		14									
Crown Rd (Napier Rd - Ashwood Ave)	Taupō	0.8	80 > 60	4			4									
Ngāroto Estate	Wharewaka		50 > 40	2			2						\$800	4		
Waitetoko	Waitetoko		50 > 40	2		2	2						\$2,800	6		
Wairakei	Wairakei		50 > 40, 100 > 60	4	8		4				1.5		\$79,000	8		
Tūrangi town centre	Tūrangi		50 > 30	6		6	6						\$8,400	18		
Tūrangi industrial area	Tūrangi		70 > 60, 100 > 60	8			8						\$3,200	16		
Hirangi Rd + others	Tūrangi		100 > 80	4			4						\$1,600	8		



**Taupō Speed Mngmt Costs**

		<i>Total \$</i>	<i>\$63,600</i>	<i>\$19,800</i>	<i>\$18,000</i>	<i>\$21,200</i>	<i>\$117,000</i>	<i>\$1,500</i>	<i>\$30,000</i>	<i>\$100,000</i>	<i>\$10,000</i>	<b>\$373,300</b>	<i>\$20,450</i>	<i>\$11,700</i>	<i>\$20,450</i>	
		Rate:	\$300	\$300	\$1,000	\$100	\$9,000	\$500	\$10,000	\$50,000	\$20,000		\$50	\$900	\$1	
Road / Area	Locality	Length (km)	Treatments	Basic Spd Sign	Repeater Spd Signs	Threshold Spd Sign	Addit'nal Paint Markings	Electronic School VMS	Static School VMS	Ped'n Crossing	Traf. calm urban (km)	Traf. calm rural (km)	TOTAL CAP. COSTS	Sign/Mrks Maint / yr	VMS Maint per year	Traf. M
Kinloch Esplanade	Kinloch	50 > 30		8			8						\$3,200	16		
Kinloch new subdivisions	Kinloch	50 > 40		14			14						\$5,600	28		
Whareroa village	Whareroa	50 > 40, 100 > 60		2		2	2						\$2,800	6		