## Process for reviewing posted speed limits

#### Introduction

As a nation, we need to see a reduction in deaths and serious injuries on our roads whilst also moving people and goods efficiently around our transport network in a way that is aligned to the Safe System approach. The safe system approach acknowledges that there is a shared responsibility for the design and operation of a transport system, that people make mistakes and that people are vulnerable to high-impact forces in the event of a crash.

One aspect of that system is the speed of vehicles. Travel speeds that are aligned to the safe system approach are statistically proven to provide a significant reduction to both deaths and serious injuries. Speed management is required in order to achieve safe and appropriate speeds and requires input from policy makers, engineers, educators, communities and the Police to identify the right speeds for roads.

This document outlines the methodology for reviewing the speed limits within the Auckland Transport (AT) road network to enable safe and appropriate speeds.

#### What is a safe and appropriate speed?

Safe and appropriate speeds are travel speeds that reflect the function, design, safety and use of any given road. It is the ideal speed to be travelled along a road, considering safety, readability and efficiency. In reality, people do not always travel at the safe and appropriate speed due to the built road environment and/or posted speed limit.

As indicated by the name, there are two aspects to safe and appropriate speeds: (1) safety and (2) appropriateness. The safety aspect ensures that the travel speed is such that if a driver were to make a mistake, then the consequence should not result in death or serious injury. The appropriateness of the speed is to ensure readability, consistency and road efficiency (in particular around corridors of high economic importance).

In summary, setting a safe and appropriate speed is about aligning both the posted speed limit and the actual travel speed to reflect the road function, design, safety and use.

#### Identifying the safe and appropriate speed for any given road

The New Zealand Transport Agency (NZTA) Speed Management Guide was published in November 2016<sup>1</sup> as part of the Safer Journeys Safer Speeds Programme and in advance of the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule)<sup>2</sup>. The Speed Management Guide outlines a framework to assist Road Controlling Authorities (RCAs), such as AT, in identifying the safe and appropriate speeds on their local network and helping to prioritise investment. The guidance is evidence based, nationally consistent, prioritises improvements to safety and economic productivity, achieves value for money and contributes to the credibility of the speed management programme.

Another piece of national guidance is the Infrastructure Risk Rating (IRR) Manual<sup>3</sup> prepared by the NZTA and dated July 2016. The IRR is a road assessment methodology designed to assess road safety risk, primarily as an input to the speed management process. The road safety risk is assessed by entering each road and roadside feature into the IRR model so that a risk rating can be determined. The IRR Manual is referenced within the Speed Management Guide and discussed further below.

The Speed Management Guide outlines the following steps required in order to identify the safe and appropriate speed for any given road.

- 1. Determine the base information including:
  - a. One network road classification (ONRC), see Glossary for more information

<sup>&</sup>lt;sup>1</sup> <u>https://www.nzta.govt.nz/assets/Safety/docs/speed-management-resources/speed-management-guide-first-edition-201611.pdf</u>

<sup>&</sup>lt;sup>2</sup> <u>https://www.nzta.govt.nz/assets/resources/rules/docs/setting-speed-limits-2017.pdf</u>

<sup>&</sup>lt;sup>3</sup> https://www.pikb.co.nz/assets/Uploads/Documents/IRR-Manual-FINAL-Issued-13-07-2016.pdf

- b. Land use (i.e. the purpose and function of the surrounding land adjacent to the subject road)
- c. The existing posted speed limits
- d. The travel/operating speeds
- Calculate the Collective and Personal Risks (refer to Glossary for more information) by determining the following and using the NZTA's "Determining Safety Risk Practitioners Spreadsheet":
  - a. Number and type of injury crashes over a five-year period
  - b. Length of section (km)
  - c. Annual Average Daily Traffic volume
- 3. Calculate the IRR score by determining the following and applying a mathematical equation outlined in Section 3 of the IRR Manual:
  - a. Road stereotype (sealed vs unsealed, number of lanes, undivided vs divided)
  - b. Road alignment (straight, curved, winding, tortuous)
  - c. Carriageway width
  - d. Roadside hazards
  - e. Adjacent land use
  - f. Intersection density (per km)
  - g. Access density (per km)
  - h. Traffic volume
- 4. Once you have determined the above information, you can apply the ONRC, IRR score and road safety metrics (personal and collective risk) to Tables 2.1 and 2.2 of the Speed Management Guide to identify the recommended safe and appropriate speed (shown as Figure 1 and Figure 2 below). The criteria specified in the tables apply as follows:
  - a. Starting in the top row of the applicable table (urban or rural), the road section is assessed for meeting all criteria in each of the 'Function / Feature', 'Road Safety' and 'Infrastructure Risk Rating' assessment categories.
  - b. If the road section does not meet one or more of the criteria, then the next row and so on is considered until all criteria are satisfied.

Due to the function of the Speed Management Guide tables, there is some flexibility around the setting of safe and appropriate speeds for rural roads. For example, the table recommends a safe and appropriate speed less than 80 km/h for both sealed and unsealed roads that do not fall into any of the other categories. Further analysis and interpretation are required to determine whether the safe and appropriate speed is 40 km/h or 60 km/h. A speed of 50 km/h is not considered as it is only used in urban areas and rural townships. This is because people have difficulty differentiating speed limit differences of just 10 km/h. The advantage of using 20 km/h speed increments are that fewer and more recognizable speed categories are easier for people to understand and recall.

When determining whether the appropriate speed is 40 km/h or 60 km/h, engineering experts review the land use, network connectivity/ consistency, existing nature of the road and current travel speed to determine which safe and appropriate speed is suitable. This analysis is conducted on a case-by-case basis.

Generally speaking, the road stereotype (sealed versus unsealed) and existing travel speeds have the greatest impact on this decision, with unsealed roads often deemed to have a safe an appropriate speed of 40 km/h, and 60 km/h for sealed roads. However, it is important to remember that this is not always the case, and a holistic look at the road and all related features is required before the appropriate speed can be determined.

#### Determining the new posted speed limit

Once the safe and appropriate speed is identified using the process outlined above, the travel/operating speed for that section of road is compared to the safe and appropriate speed. Any future or planned modifications and additional local knowledge are considered at this stage.

According to the Speed Management Guide, there are then three potential intervention options that can be undertaken to align the posted speed limit with the safe and appropriate speed limit. These are:

- 1. Engineer up
- 2. Challenging conversations
- 3. Self-explaining

These interventions are discussed further below and the overall framework for this process has been summarised in Figure 3.

#### Engineer up

These are economically important roads where the safety performance is poor and there is a strong case for investment to bring the corridor up to the required standard to support existing or higher travel speeds. On these roads, travel speeds tend to be close to the existing speed limit or possibly higher. Therefore, decreasing the posted speed limit to match the safe and appropriate speed would be inappropriate, as drivers would not adhere to that speed limit, and so there would be no reduction of risk on the road.

As these roads have a low safety performance (i.e. high crash rate), leaving the existing speed limit as it stands with no changes is not acceptable. If the investment is justified for these roads, engineering design is required to improve the road safety performance. These are defined as 'engineering up' because substantial engineering design measures are required to bring the road safety performance of the road up to a standard that reflects the existing posted speed limit. Consequently, these changes would increase the safe and appropriate speed to then be in alignment with the posted speed limit.

#### **Challenging conversations**

These are corridors where current travel speeds and the speed limit are above the calculated safe and appropriate speed and the safety performance is poor. However, in these instances, the criteria for engineering up are not satisfied, even though the safety performance justifies some sort of intervention. In these instances, road users are travelling too fast for the safety conditions of the corridor and the intervention may require lowering of the current speed limit.

These are defined as 'challenging conversations' because discussions around lowering limits can often be challenging in areas where the travel speeds are not consistent with the safe and appropriate speed. In these situations, traffic calming measures may be required to enforce the reduced posted speed limit.

#### Self-explaining

These are corridors where the posted speed limit is higher than the safe and appropriate speed, but where road users are already travelling at (or even below) the safe and appropriate speed. These are high benefit opportunities, because lowering the speed limit will be self-explanatory and credible to the road users. Therefore, if the posted speed limit is reduced to align with the safe and appropriate speed then this is an understandable reduction for road users and creates a consistent and self-explaining speed environment for visiting drivers.

This helps to improve community understanding of safe and appropriate speeds, improves the credibility of speed limit setting and assists in explaining roads better to visiting drivers.

#### Consultation

Once a recommended speed limit has been determined, consultation with the public and local communities is undertaken to identify the views of interested persons or groups, consultation feedback is assessed and the proposed speed limit is adjusted, where necessary.

#### Methodology

The above methodology is in accordance with the Setting of Speed Limits Rule (in particular, sections 4.2(2) and 4.4(2)), the Speed Management Guide and the IRR Manual. For further information please refer to these documents.

Table 2.1: Proposed Safe and Appropriate Speeds classification method - Urban Roads			
Function / Feature	Road safety metric	Infrastructure Risk Rating	Safe and Appropriate Speed (km/h)
<ul> <li>ONRC is Class 1 or 2</li> <li>Identified as a Freight Priority Route in a Network Operating Framework</li> <li>Limited Access Road controls</li> <li>Median Divided</li> </ul>	• Personal Risk ≤ Low- Medium;	• 'Low' or 'Low Medium'	• 80
<ul> <li>ONRC is Class 1 or 2</li> <li>Non-commercial<sup>2</sup> adjacent land use</li> </ul>	<ul> <li>Personal Risk ≤ Medium;</li> </ul>	<ul> <li>"Low' or 'Low- Medium'</li> </ul>	• 60
<ul> <li>ONRC is Class 1 or 2</li> <li>Non-commercial<sup>2</sup> adjacent land use</li> </ul>	No road safety metric used in the assessment	Any IRR	• 50
<ul> <li>ONRC is Primary Collector</li> <li>Residential adjacent land use</li> </ul>	<ul> <li>Personal Risk ≤ Medium-High</li> </ul>	Low to     Medium	• 50
<ul> <li>Any ONRC</li> <li>Non-commercial and non-residential adjacent land use</li> </ul>	<ul> <li>Personal Risk ≤ Medium-High</li> </ul>	<ul> <li>"Low' to "Medium"</li> </ul>	• 50
Any ONRC     CBD/town centre     Residential     neighbourhoods	No road safety metric used in the assessment	<ul> <li>"low' to "Medium-High"</li> </ul>	• 40
<ul> <li>Any ONRC</li> <li>CBDs or town centres with high place function and concentration of active road users</li> </ul>	No road safety metric used in the assessment	• 'High'	• 30
• Parks	No road safety metric used in the assessment	<ul> <li>Any rating</li> </ul>	• 20
<ul> <li>Shared spaces with high place function and concentration of active road users</li> </ul>	No road safety metric used in the assessment	• Any rating	• 10
Car parks     Note 1: HRIC - N7 Transport Agen	cy High-Risk Intersection Cuide 20	13	
Note 2: Commercial land use exclu Note 3: No road safety metrics are 40km/h or less, but the corridor's	e used in the assessment of roads v look and feel should be conducive	vith a safe and appropria to achieving the safe and	ate speed of I appropriate

speeds.

Figure 1: Table 2.1 – Proposed Safe and Appropriate Speeds Classification Method for Urban Roads (as taken from the Speed Management Guide)

<ul> <li>Personal Risk ≤ Low- Medium;</li> <li>Collective Risk ≤</li> </ul>	• "Low'	<ul> <li>110<sup>7</sup></li> </ul>
Medium-High;		
<ul> <li>Personal Risk ≤ Medium;</li> <li>Collective Risk ≤ Medium-High;</li> </ul>	<ul> <li>"Low' or 'Low- Medium'</li> </ul>	• 100
<ul> <li>Personal Risk ≤ Medium- High;</li> </ul>	<ul> <li>"Low' to "Medium"</li> </ul>	• 80
No road safety metric used in the assessment	<ul> <li>"Low' to 'High'</li> </ul>	• <80
No road safety metric used in the assessment	<ul> <li>"Low' to 'High'</li> </ul>	• <80
<ul> <li>Personal Risk ≤ Low– Medium</li> <li>Collective Risk ≤ Medium–High</li> </ul>	<ul> <li>"Low' or 'Low- Medium'</li> </ul>	• 80
<ul> <li>Personal Risk ≤ Medium</li> </ul>	<ul> <li>"Low' to "Medium"</li> </ul>	• 60
<ul> <li>Personal Risk ≤ Medium- High,</li> </ul>	<ul> <li>"Low' to "Medium"</li> </ul>	• 50
No road safety metric used in the assessment	<ul> <li>"Low' to "Medium-High"</li> <li>Or 'High'</li> </ul>	• <50
	<ul> <li>Personal Risk ≤ Medium;</li> <li>Collective Risk ≤ Medium-High;</li> <li>Personal Risk ≤ Medium- High;</li> <li>No road safety metric used in he assessment</li> <li>No road safety metric used in he assessment</li> <li>Personal Risk ≤ Low- Medium</li> <li>Collective Risk ≤ Medium-High</li> <li>Personal Risk ≤ Medium- High,</li> <li>Personal Risk ≤ Medium- High,</li> <li>No road safety metric used in he assessment</li> </ul>	<ul> <li>Personal Risk ≤ Medium; Collective Risk ≤ Medium-High;</li> <li>Personal Risk ≤ Medium- High;</li> <li>Personal Risk ≤ Medium- he assessment</li> <li>"Low' to "Medium'</li> <li>"Low' to 'High'</li> <li>"Low' to 'High'</li> <li>"Low' to 'High'</li> <li>"Low' or 'Low- Medium</li> <li>"Low' or 'Low- Medium</li> <li>"Low' or 'Low- Medium</li> <li>"Low' or 'Low- Medium</li> <li>Collective Risk ≤ Low- Medium-High</li> <li>Personal Risk ≤ Medium</li> <li>"Low' to "Medium'</li> <li>Personal Risk ≤ Medium</li> <li>"Low' to "Medium'</li> <li>Personal Risk ≤ Medium- High,</li> <li>No road safety metric used in he assessment</li> <li>"Low' to "Medium'</li> <li>Or 'High'</li> <li>Or 'High'</li> </ul>

Note 1: HRIC – NZ Transport Agency High-Risk Intersection Cuide, 2013 Note 2: Not classified as Urban according to Statistics New Zealand definition.

<sup>&</sup>lt;sup>2</sup> Several sections of the Roads of National Significance would safely support travel speeds of up to 110km/h. Setting limits higher than 100km/h is currently not permitted, but a change to the law (Land Transport Rule: Setting of Speed Limits, 2003) is under consideration.

*Figure 2: Table 2.2 – Proposed Safe and Appropriate Speeds Classification Method for Rural Roads (as taken from the Speed Management Guide)* 

#### **ATTACHMENT 1**

		DETER	MINE BASE	INFORM,	ATION			
One Networ Classificatior	k Road n (ONRC)	Land Use		Existing po limits	ixisting posted speed Training posted speed Spee		Travel / operating speeds	
		DETERN	NINE ROAD	SAFETY N	<b>AETRICS</b>			
Personal Risk				Collective	Risk			
			Ł	7				
			CALCULA	TE THE IRR	R			
Road Stereotype	Alignment	Carriage way widths	Roadside Hazards	Land Use	Intersection density	n Access density	Traffic volume	
IDENTIFY THE SAFE AND APPROPRIATE SPEED USING SPEED MANAGEMENT GUIDE TABLES								
	IDENTIF	Y THE INTE	ERVENTION	N AND PO	STED SPEE	D LIMIT		
<b>Engine</b> investme higt	<b>er Up</b> – Justify nt at current ner speed	y t or Challenging Conversations – Interim lowering of speed limit speed limit		duce the				

Figure 3: Summary of Speed Setting Framework

# Glossary

Term	Description
Collective Risk	Collective Risk can be thought of as 'crash density' and is related to the
	crash history of the section of road. Collective Risk is a measure of the
	number of deaths and serious injuries (DSIs) per km that can be
	expected on a road segment over the next five years.
	There are five risk levels (High, Medium-High, Medium, Low-Medium,
	and Low), and the threshold levels for the overall collective risk level
	vary based on corridor length and urban versus rural.
High-risk road	A high-risk road (or road section) is a road that has either a 'High' or
	'Medium-High' Collective Risk, Personal Risk, or Infrastructure Risk
	Rating.
Infrastructure Risk	IRR is based on nine variables that have a significant influence on
Rating (IRR)	determining road safety risk. It is determined independently of crash
	history (unlike Collective Risk and Personal Risk) and represents the
	underlying risk inherent to the road. The variables assessed are:
	Road stereotype
	Alignment
	<ul> <li>Carriageway width (lane and sealed shoulder)</li> </ul>
	Roadside hazards
	<ul> <li>Land use</li> </ul>
	<ul> <li>Intersection density</li> </ul>
	Access density
	Traffic volume
	There are five risk levels (High Medium-High Medium Low-Medium
	and Low) The threshold levels for the risk levels vary based on urban or
	rural adjacent land use
One Network Road	The ONRC is the New Zealand Transport Agency's classification system
Classification (ONRC)	which divides New Zealand's roads into six categories based on how
classification (ertite)	busy they are, whether they connect to important destinations or if they
	are the only route available. Primary collectors, secondary collectors and
	access roads are pertinent to this case.
	• <b>National</b> : These roads make the largest contribution to the social
	and economic wellbeing of New Zealand by connecting major
	population centres, major ports or international airports, and
	have high volumes of heavy commercial vehicles or general
	traffic.
	Arterial: These roads make a significant contribution to social
	and economic wellbeing, linking regionally significant places.
	industries, ports or airports. They may be the only route
	available to important places in a region, performing a 'lifeline'
	function.
	Regional: These roads make a major contribution to the social
	and economic wellbeing of a region and connect to regionally
	significant places industries ports and airports. They are major
	connectors between regions and, in urban areas, may have
	substantial passenger transport movements
L	

Term	Description
	• Primary collector: These are locally important roads that provide
	a primary distributor/collector function, linking significant local
	economic areas or population areas.
	• <b>Traffic volumes</b> : more than 3,000 vehicles per day (vpd)
	• in urban areas, and more than 1,000 vpd in rural areas.
	Greater than 150 heavy commercial vehicles (HCV) per
	day.
	• <b>Connectivity</b> : Links places with populations greater than
	2,000 people.
	• <b>Speed</b> : Generally moderate speed environment in urban
	areas. Moderate to high speed in rural areas.
	• Access: Access primarily to adjoining property.
	• Secondary collector: These roads link local areas of population
	and economic sites. They may be the only route available to
	some places within this local area.
	• <b>Traffic volumes:</b> more than 1,000 vpd in urban areas,
	and more than 200 vpd in rural areas. Greater than 25
	HCV per day.
	• <b>Connectivity:</b> Links places with populations greater than
	250 people.
	• <b>Speed</b> : Generally moderate to low speed environment.
	• Access: Access primarily to adjoining property.
	Access: This is often where your journey starts and ends. These
	roads provide access and connectivity to many of your daily
	journeys.
	<ul> <li>Traffic volumes: less than 1,000 vpd in urban areas, and</li> </ul>
	less than 200 vpd in rural areas. Less than 25 HCV per
	day (if any).
	• <b>Connectivity:</b> Links places with populations less than 250
	people. Collect and distribute traffic to/from local
	properties within an area.
	• <b>Speed:</b> Generally moderate to low speed environment.
	• Access: Significant access to adjoining properties.
Mean Operating	The average free-flow speed based on TomTom data.
Speed	The average speed that vehicles actually travel on that section of road.
Personal Risk	Personal Risk can be thought of as 'crash rate' and is related to the crash
	nistory of the section of road. Personal Risk is a measure of the risk of an
	individual dying or being seriously injured on a road corridor. It is
	calculated by dividing the collective RISK by traffic volume exposure.
	and Low)
Doctod Coood Limit	dilu LUW). The period speed limit is the speed limit shown on speed limit sizes
Fosted Speed Limit	The posted speed limit is the speed limit shown on speed limit signs.
Sale and Appropriate	The SAAS is the travel speed that is determined to be sale and
speeu (SAAS)	appropriate for a road segment based on the road function, design,
Traval Speed	Salely and use.
navel speed	The average speed vehicles actually traver on that section of rodu.

# <u>Speed Limit Review</u> – Baddeleys Beach Road (Tawharanui Peninsula)

Baddeleys Beach Road, Tawharanui Peninsula, is divided into two sections as shown on the attached brochure and outlined as follows<sup>1</sup>:

- 1. Section 1: Baddeleys Beach Road between Takatu Road and 730 m north of Clinton Road
- 2. Section 2: Baddeleys Beach Road between 730 m north of Clinton Road and the southern end of Baddeleys Beach Road

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections. The location of existing speed limits was also considered when determining the appropriate speed limit review sections.

Both sections of Baddeleys Beach Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
(a) the information about speed management developed and maintained by the Agency; and	<ul> <li>New Zealand Transpondent Guide 2016</li> <li>Infrastructure Risk Rating</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for</li> </ul>	port Agency (NZTA) Speed Manual 2016 (IRR) r further information	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	There are no pedestrian or cyclist amenities along this section of Baddeleys Beach Road, nor is there any on-street parking. However, pedestrian activity was observed on site. The main function of the road is to provide access to the township at Baddeleys Beach and the rural residential properties along the road.		
	Under the one network road classification (ONRC) this section of Baddeleys Beach Road is classified as a Secondary Collector. It provides a connection from Takatu Road to Baddeleys Beach, and the Baddeleys Beach township. The length of this section of road is 970 m.	<ul> <li>Under the ONRC this section of Baddeleys Beach Road is classified as:</li> <li>A Secondary Collector road between 730 m north of Clinton Road and 100 m north of Clinton Road</li> <li>An Access road between 100 m north of Clinton Road and the southern road end</li> <li>This section of road terminates at the Baddeleys Beach</li> </ul>	

<sup>1</sup> It is acknowledged that the ONRC and MegaMaps sections differ from AT's proposed sections. The reasons are provided above.

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
		Reserve and boat ramp/ beach access. The length of this section of road is 1,060 m.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. Baddeleys Beach Road therefore has no Death and Serious Injuries (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
(e) the characteristics of the road and roadsides; and	The characteristics for both sections of Baddeleys Beach Road were determined using a combination of site drive-over footage and geomaps information.		
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Curved</li> <li>Carriageway width: Medium lane (3.0 m to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll- over slopes and vegetation</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Winding</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: Severe and includes drainage ditches, water hazards, roll over slopes, and non-frangible trees, buildings, and poles within 5 m</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	The adjacent land use is classified as Rural Towns using drive over footage. The IRR defines Rural Towns as "Rural town with mixture of residential and some shops. Some intersections and accesses are present. Some pedestrian and cyclist activity may also be present."	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed the intersection density and access density for both sections.		
	<ul> <li>Intersection Density: &lt;1 intersection per km</li> <li>Access Density: 5 to &lt;10 accesses per km</li> </ul>	<ul> <li>Intersection Density: 1 to &lt;2 intersections per km</li> <li>Access Density: 20+ accesses per km</li> </ul>	

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
(h) traffic volume; and	Average daily traffic (ADT) for this section of road was determined from MegaMaps as 235 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 296 vpd (survey started on 29/03/2019). This level of traffic volume is consistent with the nature of this road.	The ADT for this section of road was determined from MegaMaps as 113 vpd. This level of traffic volume is consistent with the nature of this road. There was no AT count data available for this section of road.	
(i) any planned modification to the road; and	There are no known planned modifications to Baddeleys Beach Road.		
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Baddeleys Beach Road, six of the responses supported the suggested speed limit changes in the wider area.		

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

Table 2: Additional Relevant Factors to Consider

Factor	Comment
Current Speed Limit	<ul> <li>The existing speed limits on this road are:</li> <li>100 km/h (between Takatu Rd and 730 m north of Clinton Road)</li> <li>50 km/h (between 730 m north of Clinton Road and the southern end of Baddeleys Beach Road)</li> </ul>
MegaMaps Mean Operating Speed (km/h)	<ul> <li>Baddeleys Beach Road has a mean operating speed of:</li> <li>45-49 km/h (between Takatu Rd and 730 m north of Clinton Road)</li> <li>35-39 km/h between 730 m north of Clinton Road and Clinton Road</li> <li>&lt;30 km/h south of Clinton Road</li> </ul>
Speed Limits on Adjoining Roads	<ul> <li>The existing speed limits on adjoining roads is:</li> <li>Takatu Road: 100 km/h (but simultaneously proposed for a speed limit change to 80 km/h)</li> <li>Clinton Road: 50 km/h (but simultaneously proposed for a speed limit change to 40 km/h)</li> </ul>

Required Information for safety metrics calculations	Section 1	Section 2
Crash Analysis Period (years)	5	5
Total injury crashes during period	0	0
DSI Equivalents	0	0
Corridor Length (km)	0.97	1.06
Annual Daily Traffic	235	113

- Section 1
  - $\circ$  The Collective Risk score is 0.00. This corresponds to a Collective Risk band of Low
  - The Personal Risk score is 0.00. This corresponds to a Personal Risk band of Low
- Section 2
  - The Collective Risk score is 0.00. This corresponds to a Collective Risk band of Low
  - The Personal Risk score is 0.00. This corresponds to a Personal Risk band of **Low**

#### Step 3: Calculate the IRR score

Feature	Section 1		Section 2	
	Category	Risk Score	Category	Risk Score
Road stereotype	Two lane undivided	3.70	Two lane undivided	3.70
Road alignment	Curved	1.80	Winding	3.50
Carriageway width	Medium lane, very narrow shoulder	1.79	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71	Severe, Moderate	4.23
Adjacent land use	Rural Residential	1.50	Rural Town	2.50
Intersection density (per km)	<1	1.00	1 to <2	1.15
Access density (per km)	5 to <10	1.06	20+	1.30
Traffic volume	<1,000 vpd	1.00	<1,000 vpd	1.00

- Section 1: The Infrastructure Risk Rating Score is 1.55. For rural areas this corresponds to an IRR band of **Medium**.
- Section 2: The Infrastructure Risk Rating Score is 2.31. For urban areas<sup>2</sup> this corresponds to an IRR band of **Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

<sup>&</sup>lt;sup>2</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- 80 km/h between Takatu Road and 730 m north of Clinton Road (Section 1)
- Less than 50 km/h between 730 m north of Clinton Road and the southern end of Baddeleys Beach Road (Section 2)

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 80 km/h between Takatu Road and 730 m north of Clinton Road (Section 1)
- 40 km/h between 730 m north of Clinton Road and the southern end of Baddeleys Beach Road (Section 2)

Baddeleys Beach Road is a self-explaining road as the mean operating speeds (45-49 km/h and <40 km/h) are already at, or below, the proposed safe and appropriate speeds, despite the existing posted speed limits of 100 km/h and 50 km/h. Engineering up of Baddeleys Beach Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 80 km/h was selected for section one (between Takatu Road and 730 m north of Clinton Road) primarily due to its curved nature and to provide consistency with the proposed speed limit for Takatu Road. Despite the curved and high severity roadside hazards on this section of Baddeleys Beach Road it is a relatively low risk section of road with a 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk.

A proposed speed limit of 40 km/h was selected for section two (between 730 m north of Clinton Road to the southern end of Baddeleys Beach Road) primarily due to the surrounding rural township area, and the concentration of active road users that can be found in the Baddeleys Beach township. This section of Baddeleys Beach Road is also relatively low risk, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk.

The lower risk nature of the road is reflected in its crash history, with no crashes recorded over the past five years. This is likely due to the existing low mean operating speeds.

After considering all the above factors, the existing speed limits of 100 km/h and 50 km/h on Baddeleys Beach Road in Tawharanui, are not considered to be safe and appropriate speed limits for the respective sections of Baddeleys Beach Road.

The recommended safe and appropriate speed limits for Baddeleys Beach Road, Tawharanui are:

- 80 km/h between Takatu Road and 730 m north of Clinton Road
- 40 km/h between 730 m north of Clinton Road and the southern end of Baddeleys Beach Road

This aligns with the Speed Management Guide (80 km/h and <50 km/h) and the low operating speeds (<50 km/h) also support the reductions.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

### Speed Limit Review – Birdwood Road (Massey West)

The speed limit on Birdwood Road, Massey West (between Red Hills Road and 190 m northwest of Crows Road, as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments		
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>		
	Refer to the Process Summary for further information.		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Birdwood Road is classified as a primary collector road under the one network road classification (ONRC).		
	Birdwood Road is a torturous, two-lane*, undivided and sealed road. Birdwood Road provides connection between Red Hills Road, Massey West, and Glen Road, Ranui.		
	Birdwood Road has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this road is to provide access to rural residential properties and wider connectivity. This section of Birdwood Road is approximately 2.4 km in length.		
	*mostly two lane except for a one lane bridge near Yelash Road		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records 24 crashes for this section of road between 2015 to 2019: two serious injury crashes, seven minor injury crashes, and 15 non-injury crashes. This has resulted in in two Deaths and Serious Injuries (DSI) on Birdwood Road. CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
	Birdwood Road is also identified as one of the top 10% DSI saving network sections for New Zealand.		
(e) the characteristics of the road and roadsides; and	The following characteristics for Birdwood Road were determine using a combination of site drive-over footage and geomap information.		
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Medium (3.0 to 3.5 m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: Severe with dense vegetation, and frequent power poles and trees within 5 m of the road.</li> </ul>		

Requirement	Comments
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as a "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density: 1 to &lt;2 intersections per km</li> <li>Access density: 2 to &lt;5 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 2,604 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 2,794 vpd (survey started on 01/04/2019). This level of traffic volume is consistent with the nature of this road.
(i) any planned modification to the road; and	There are no known planned modifications to Birdwood Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Only one response was received regarding the proposed speed limit changes in the Massey West area, and it supported the proposed changes. However, the response did not specifically mention Birdwood Road.

In addition to the factors outlined in Table 1, further relevant information was sought as summarised in Table 2 below.

Table 2: Additional Relevant Factors

Factor	Comment
Current speed limit	The existing speed limit on Birdwood Road (between Red Hills Road and 190 m northwest of Crows Road) is 100 km/h.
MegaMaps Mean Operating Speed (km/h)	Birdwood Road has a mean operating speed in the range of 45-49 km/h.
Speed limits on adjoining roads	<ul> <li>The existing speed limits on immediately adjoining roads are:</li> <li>Red Hills Road: 70 km/h</li> <li>Mudgeways Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Chamberlain Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> <li>Yealsh Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Birdwood Road (from 190 m northwest of Crows Road to Swanson Road): 50 km/h</li> </ul>

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	9
DSI equivalents	4.54
Corridor Length (km)	2.40
Annual Daily Traffic	2,604

The Collective Risk score is 0.38, and the Personal Risk score is 39.8. For rural areas this corresponds to a Collective Risk band of **High**<sup>1</sup>, and a Personal Risk band of **High**.

Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Tortuous	6.00
Carriageway width	Medium lane, very narrow shoulder	1.79
Roadside hazards	Sever, High	5.08
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	1 to <2	1.15
Access density (per km)	2 to <5	1.03
Traffic volume	1,000 to <6,000 vpd	1.40

The Infrastructure Risk Rating Score is 2.40. For rural areas this corresponds to an IRR band of High.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

<sup>&</sup>lt;sup>1</sup> The Collective Risk score for rural roads generally does not exceed 0.50 and the risk banding reflects this. For further information please refer to the "High safety risk – corridors" section of the NZTA's <u>Safety risk</u> <u>definitions for results alignment</u> webpage.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 60 km/h

Birdwood Road is a self-explaining road as the mean operating speed (45-49 km/h) is already at the proposed safe and appropriate speed, despite the existing 100 km/h posted speed limit. Engineering up of Birdwood Road was considered but dismissed due to the substantial and costly upgrades that would be required for what is a low classification road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 60 km/h was selected due to the narrow, winding and hazardous nature of the road, and its existing low operating speed (<50 km/h). The narrow, tortuous and hazardous nature of Birdwood Road contributes to the roads 'High' IRR score, 'High' Collective Risk and 'High' Personal Risk, making it a high risk road.<sup>2</sup> As well as being a high risk road, Birdwood Road is identified as one of the top 10% DSI saving network sections for New Zealand. Over the past five years 24 crashes have been recorded on this section of road, resulting in two DSIs. This suggests that the torturous and hazardous nature of the road does not allow for when people make mistakes

After considering all the above factors, the existing speed limit of 100 km/h on Birdwood Road (between Red Hills Road and 190 m northwest of Crows Road) in Massey West, is not considered to be a safe and appropriate speed limit.

Balancing all factors, the recommended safe and appropriate speed limit for Birdwood Road, Massey West is 60 km/h between Red Hills Road and 190 m northwest of Crows Road. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<50 km/h) supports the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

<sup>&</sup>lt;sup>2</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

## **Bishop Lane**

### Speed Limit Assessment – Bishop Lane (Tawharanui Peninsula)

The speed limit on Bishop Lane, Tawharanui Peninsula, (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule) and the NZTA Speed Management Guide. The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

 Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the agency that has been included is listed below:</li> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for further information.</li> </ul>
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.
(c) the function and use of the road; and	Bishop Lane functions as an Access road under the one network road classification (ONRC). Bishop Lane is a two way, unsealed, dead end road which provides a connection from Whitmore Road to a small number of rural residential properties.
	Bishop Lane has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this section of road is to provide access to rural residential properties. Bishop Lane is approximately 750 m in length.
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records zero crashes between 2015 and 2019. Bishop Lane therefore has no Death and Serious Injuries (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.
(e) the characteristics of the road and roadsides; and	The following characteristics for Bishop Lane were determined using a combination of site drive-over footage and geomaps information:
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Straight</li> <li>Carriageway width: medium lane (3.0 m to 3.5 m) and very narrow shoulder (&lt;0.5 m)</li> <li>Roadside hazards: Moderate and includes roll-over slopes</li> </ul>
(f) adjacent land use; and	The adjacent land use is classified as Remote Rural using geomaps and Google Street View. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry." It should be noted that the end of the road terminates into a private access road that serves eight properties.

Requirement	Comments
(g) the number of intersections and property accessways; and	The following were determined using a combination of site drive over footage and geomaps information:
	<ul> <li>Intersection density: 1 to &lt;2 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as 45 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Bishop Lane.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Bishop Lane, six of the responses supported the suggested speed limit changes.

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

Table 2: Additional Relevant Factors to Consider

Factor	Comment
Current speed limit	The existing posted speed limit on this road is 100 km/h.
MegaMaps Mean Operating Speed (km/h)	Bishop Lane has a mean operating speed of less than 30 km/h.
Speed limits on adjoining roads	The speed limit on Whitmore Road is 100 km/h and 50 km/h, but is proposed to be lowered to 60 km/h and 40 km/h respectively (as discussed separately).

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.75
Annual Daily Traffic	45

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Straight	1.00
Carriageway width	Medium lane, very narrow shoulder	1.79
Roadside hazards	Moderate (both sides)	2.86
Adjacent land use	Remote Rural	1.00
Intersection density (per km)	1 to <2	1.15
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 1.49. For rural areas this corresponds to an IRR band of **Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Bishop Lane is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h posted speed limit. Engineering up of Bishop Lane was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

Bishop Lane is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. This is also shown in the crash history as there have been no recorded crashes on Bishop Lane over the past five years. The low crash volume is likely due to the very low average daily traffic volume (45 vpd) and existing low mean operating speeds.

After considering all the above factors, the existing posted speed limit of 100 km/h on Bishop Lane in Tawharanui Peninsula, is not considered to be a safe and appropriate speed limit for this section of road.

The recommended safe and appropriate speed limit for Bishop Lane, Tawharanui Peninsula is 40 km/h. This is lower than the speed recommended by the Speed Management Guide, however, aligns with the low operating speed (less than 30 km/h).

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

### Speed Limit Assessment – Buckleton Road (Tawharanui)

The speed limit on Buckleton Road, Tawharanui (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments
4.2(2) (a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the agency that has been included is listed below:</li> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for further information.</li> </ul>
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.
(c) the function and use of the road; and	Buckleton Road functions as an access road under the one network road classification (ONRC). It is a two-way, two-lane, undivided, unmarked and sealed road. Buckleton Road is a cul-de-sac road which provides access to residential properties and Buckleton Beach.
	Buckleton Road has no pedestrian or cyclist amenities and very narrow shoulders. There is no marked on-street parking on Buckleton Road, however some residents do park vehicles, boats, etc on the street. It is not possible to park vehicles on both sides of the road and still allow for easy vehicle movements. Pedestrian activity was observed on site.
	The primary use of this road is to provide access to rural township properties, and access to Buckleton Beach. Buckleton Road is approximately 400 m in length.
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.
(e) the characteristics of the road and roadsides; and	The following characteristics for Buckleton Road were determined using a combination of Google Street View and geomaps information:
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Curved</li> <li>Carriageway width: Medium lane (3.0 m to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: Severe/ moderate and includes non-frangible structures, and parked vehicles within 5 m, and buildings between 5 m and 10 m.</li> </ul>

Requirement	Comments
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using Google Street View and geomap. The IRR defines Rural Towns as a <i>"Rural</i> <i>town with mixture of residential and some shops. Some intersections</i> <i>and accesses are present. Some pedestrian and cyclist activity may</i> <i>also be present."</i>
	Buckleton Road was observed to have frequent residential accesses and occasional intersections.
(g) the number of intersections and property accessways; and	The following were determined using a combination of Google Street View and geomaps information:
	<ul> <li>Intersection density: 1 to &lt;2 intersection per km</li> <li>Access density: 20+ accesses per km</li> </ul>
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as 114 vehicles per day (vpd). No AT traffic count data is available for this road.
(i) any planned modification to the road; and	There are no known planned modifications to Buckleton Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Buckleton Road, six of the responses supported the suggested speed limit changes.

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

Table 2: Additional Relevant Factors to Consider

Factor	Comment
Current Speed Limit	The existing posted speed limit of Buckleton Road is 50 km/h.
MegaMaps Mean Operating Speed (km/h)	Buckleton Road has a mean operating speed in the range of <30 km/h.
Speed limits on adjoining roads	The existing posted speed limit on Whitmore Road, immediately adjacent to Buckleton Beach Road is 50 km/h but is proposed to be lowered to 40 km/h in proximity to Buckleton Road (discussed separately).

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0

Required Information for safety metrics calculations	Data
Corridor Length (km)	0.40
Annual Daily Traffic	114

The Collective Risk score is 0.00, as is the Personal Risk. This corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Curved	1.80
Carriageway width	Medium lane, very narrow shoulder	1.79
Roadside hazards	Severe, Moderate	4.23
Adjacent land use	Rural Town	2.50
Intersection density (per km)	1 to <2	1.15
Access density (per km)	20+	1.30
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 1.97. For urban areas<sup>1</sup> this corresponds to an IRR band of **Low Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 50 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Buckleton Road is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h speed limit. Engineering up of Buckleton Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

<sup>&</sup>lt;sup>1</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

A proposed speed limit of 40 km/h was selected due to the short road length, surrounding rural township area, and the concentration of active road users that can be found in the Buckleton Beach township. Buckleton Road is a relatively low risk road, and this is reflected in the 'Low-Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There have been no recorded crashes on Buckleton Road over the past five years. The low crash volume is likely due to the low average daily traffic and low operating speeds.

After considering all the above factors, the existing speed limit of 50 km/h on Buckleton Road in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Buckleton Road, Tawharanui is 40 km/h. This aligns with the Speed Management Guide (<50 km/h) and the low operating speed (<30 km/h) supports the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

## **Campbell Road**

### Speed Limit Assessment – Campbell Road (Tawharanui Peninsula)

The speed limit on Campbell Road, Tawharanui Peninsula (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments	
4.2(2) (a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the agency that has been included is listed below:</li> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Relet to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Campbell Road is classified as an access Road under the one network road classification (ONRC). It is a two-way, narrow two-lane, undivided, unmarked and sealed road. Campbell Road is a cul-de- sac road which provides access to residential properties at Baddeleys Beach, and the local playground and boat ramp.	
	Campbell Road has no pedestrian or cyclist amenities and very narrow shoulders. There is no on street parking on Campbell Road, however some residents do park vehicles, boats, etc on the street/ verge area. It is not possible to park vehicles on both sides of the road and still allow for easy vehicle movements. However, pedestrian activity was observed on site.	
	The primary use of this road is to provide access to rural township properties. Campbell Road is approximately 350 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019.CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Campbell Road were determined using a combination of Google Street View and geomaps information:	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Curved</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High/ moderate and includes frequent non-frangible point hazards within 5 m</li> </ul>	

Requirement	Comments
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using Google Street View and geomaps. The IRR defines Rural Towns as a <i>"Rural</i> <i>town with mixture of residential and some shops. Some intersections</i> <i>and accesses are present. Some pedestrian and cyclist activity may</i> <i>also be present."</i>
	Campbell Road was observed to have frequent residential accesses and occasional intersections. Some pedestrian and cyclist activity may also be present. There is also likely to be young children in the area due to the playground.
(g) the number of intersections and property accessways; and	The following were determined using a combination of Google Street View and geomaps information:
	<ul> <li>Intersection density: 2 to &lt;3 intersection per km</li> <li>Access density: 20+ accesses per km</li> </ul>
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as 149 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature / beach town of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Campbell Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Campbell Road, six of the responses generally supported the suggested speed limit changes.

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

Table 2: Additional Relevant Factors to Consider

Factor	Comment
Current Speed Limit	The existing speed limit for this road is 50 km/h.
MegaMaps Mean Operating Speed (km/h)	<ul> <li>Campbell Road has a mean operating speed in the range of:</li> <li>&lt;30 km/h south of Clinton Road</li> <li>40-44 km/h north of Clinton Road</li> </ul>
Speed limits on adjoining roads	<ul> <li>The speed limits on adjoining roads are as follows:</li> <li>Clinton Road: has an existing posted speed limit of 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>

Step 2:	Determine	the road	safety	metrics

Data

Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.35
Annual Daily Traffic	149

The Collective Risk score is 0.00, as is the Personal Risk. This corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Curved	1.80
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, Moderate	4.23
Adjacent land use	Rural Town	2.50
Intersection density (per km)	2 to <3	1.25
Access density (per km)	20+	1.30
Traffic volume	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

The Infrastructure Risk Rating Score is 2.06. For urban areas<sup>1</sup> this corresponds to an IRR band of **Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 50 km/h.

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation = 40 km/h

Campbell Road is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h posted speed limit. Engineering up

<sup>&</sup>lt;sup>1</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

of Campbell Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the very narrow and short road, the surrounding rural township area, and the concentration of active road users that can be found in the Baddeleys Beach township. Campbell Road is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There have been no recorded crashes on Campbell Road over the past five years. The low crash volume is likely due to the low average daily traffic and low operating speeds.

After considering all the above factors, the existing posted speed limit of 50 km/h on Campbell Road in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

The recommended safe and appropriate speed limit for Campbell Road, Tawharanui is 40 km/h. This aligns with the Speed Management Guide (<50 km/h) and the low operating speed (<30 km/h) supports the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

### Speed Limit Review - Chamberlain Road (Massey West)

The speed limit on Chamberlain Road, Massey West, between 950 m southwest of Tiriwa Drive and Birdwood Road (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Chamberlain Road is classified as an Access road under the one network road classification (ONRC), however, the road functions more as a secondary collector.	
	Chamberlain Road is a two-way, torturous, two-lane, undivided and sealed road. Chamberlain Road provides connection between Don Buck Road and Birdwood Road.	
	Chamberlain Road has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this road is to provide access to rural residential properties and wider connectivity. Chamberlain Road is approximately 1.87 km in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records two crashes between 2015 to 2019: both of which were non-injury crashes. Chamberlain Road therefore has no Death and Serious Injury (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Chamberlain Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Medium (3.0 to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High with dense vegetation, roll over slopes.</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as a "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	

Requirement	Comments
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 2 to &lt;5 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 351 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 216 vpd (survey started on 23/07/20198). This level of traffic volume is consistent with the nature of this road.
(i) any planned modification to the road; and	There are no known planned modifications to Chamberlain Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Only one response was received regarding the proposed speed limit changes in the Massey West area, and it supported the proposed changes. However, the response did not specifically mention Chamberlain Road.

In addition to the factors outlined in Table 1, further relevant information was sought as summarised in Table 2 below.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The existing speed limit on Chamberlain Road is:
	<ul> <li>50 km/h between Don Buck Road and 950 m southwest of Tiriwa Drive (UTA Boundary)</li> <li>100 km/h between 950 m southwest of Tiriwa Drive and Birdwood Road (UTA Boundary)</li> </ul>
	Prior to the 2019 speed bylaw implementation the legal and posted speed limit was:
	<ul> <li>50 km/h between Don Buck Road and 50 m west of Tiriwa Drive</li> <li>100 km/h between 50 m west of Tiriwa Drive and Birdwood Road</li> </ul>
MegaMaps Mean Operating Speed (km/h)	Chamberlain Road has a mean operating speed in the range of 35- 39 km/h.
Speed limits on adjoining roads	<ul> <li>The existing speed limits on immediately adjoining roads are:</li> <li>Birdwood Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> <li>Chamberlain Road: 50 km/h</li> </ul>

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	1.87
Annual Daily Traffic	351

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.7
Road alignment	Tortuous	6.0
Carriageway width	Medium lane, very narrow shoulder	1.79
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	<1	1.00
Access density (per km)	2 to <5	1.03
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.06. For rural areas this corresponds to an IRR band of High.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation = 60 km/h

Chamberlain Road is a self-explaining road as the mean operating speed (<40 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of

Chamberlain Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume road. The cost to do this would substantially outweigh any benefits.

The existing posted speed limit between Don Buck Road and 950 m southwest of Tiriwa Drive (UTA Boundary) is 50km/h as implemented within the 2019 bylaw in order to account for future urban growth in this area. There is no proposed change to the speed limit of 50 km/h for the first section of road as it is within the new Urban Traffic Area boundary. This is also consistent with the existing speed limits on the adjacent sections of Chamberlain Road and Don Buck Road.

A proposed speed limit of 60 km/h was selected for the remainder of Chamberlain Road (950 m southwest of Tiriwa Drive to Birdwood Road) due to the tortuous and hazardous nature of the road, and its existing low operating speed (<40 km/h). The tortuous and hazardous nature of Chamberlain Road also contribute to the roads 'High' IRR score, making it a high risk road.<sup>1</sup>. Despite the high risk nature of the road, there have only been two non-injury crashes recorded over the past five years. This is likely due to the existing low traffic volumes (351 vpd) and low operating speeds.

After considering all the above factors, the speed limit of 100 km/h (between 950 m west of Tiriwa Drive and Birdwood Road) on Chamberlain Road in Massey West, is not considered to be a safe and appropriate speed limit.

Balancing all factors, the recommended safe and appropriate speed limit for Chamberlain Road (between 950 m southwest of Tiriwa Drive and Birdwood Road), Massey West is 60 km/h. This aligns with the speed suggested by the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

### Speed Limit Review – Christian Road (Swanson)

Christian Road, Swanson, is divided into two sections as shown on the attached brochure and outlined as follows<sup>1</sup>:

- 1. Section 1: Christian Road (between Swanson Road and 65 m southwest of Mettam Drive (UTA Boundary)); and
- 2. Section 2: Christian Road (between 65 m southwest of Mettam Drive (UTA Boundary) and the southwest end of Christian Road).

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections. The locations of existing speed limits were also considered when creating the sections.

Both sections of Christian Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transpondent Guide 2010</li> <li>Infrastructure Risk Rating</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for</li> </ul>	port Agency (NZTA) Speed 6 g Manual 2016 (IRR) pr further information
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management G consideration of the speed limit.	Guide was used for the review and
(c) the function and use of the road; and	Both sections of Christian Road are classified as a primary collector road under the one network road classification (ONRC), however, the road functions more as a secondary collector road given the recorded traffic volumes (500 vehicles per day).	
	The full length of Christian Road and sealed.	is two-way, two-lane, undivided
	This section of Christian Road provides connection from Swason Road to the new subdivision at Mettam Drive.	This section of Christian Road provides connection from Mettam Drive to O'Neills Road and Welsh Hills Road. The southern end of Christian Road
	cyclist amenities along this section of Christian Road, nor is	terminates at the Waitakere Filter Station.
	there any on-street parking. The main function of this section of road is to provide connection between Swanson Road and	There are no pedestrian or cyclist amenities along this section of Christian Road, nor is there any on-street parking. The

<sup>&</sup>lt;sup>1</sup> It is noted that the ONRC and MegaMaps sections differ from the proposed road sections. This is because AT has chosen to align the proposed speed limit changes with new UTA boundaries.

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
	the development at Mettam Drive. The length of this section of road is 550 m.	main function of this section of road is to provide access to rural residential properties and wider rural connectivity. The length of this section is 3.26 km.
(d) crash risk for all road users; and	NZTA's Crash Analysis System ( crash history between 2015 and all road users and therefore the considered.	CAS) was used to determine the 2019. CAS includes crashes for crash risk for all road users was
	One minor crash was recorded on this section of Christian Road.	Seven crashes have been recorded on this section of Christian Road: one serious crash, two minor injury crashes and four non-injury crashes. This section of Christian Road therefore has one Death and Serious Injury (DSI).
(e) the characteristics of the road and roadsides; and	The following characteristics for Christian Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Curved</li> <li>Carriageway width: Medium and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes several non- frangible point hazards</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Winding</li> <li>Carriageway width: Medium and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll- over slopes and vegetation</li> </ul>
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as <i>"Rural area with accesses</i> present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements." It is noted that a water treatment facility is located at the southern end of Christian Road.

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
(g) the number of intersections and property accessways; and	A combination of site drive over f revealed:	ootage and geomaps information
	<ul> <li>Intersection density: 5 to &lt;10 intersection per km<sup>2</sup></li> <li>Access density: 10 to &lt;20 accesses per km</li> </ul>	<ul> <li>Intersection density:1 to &lt;2 intersection per km</li> <li>Access density: 10 to &lt;20 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 500 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 696 vpd (survey started on 01/04/2019). This level of traffic volume is lower than anticipated for a primary Collector Road hence why it is more likely that the road operates as a secondary collector.	
(i) any planned modification to the road; and	There are no known planned modifications to this section of Christian Road. However, the adjacent land use is gradually converting to urban density residential and some frontage works may occur as part of subdivisions.	There are no known planned modifications to this section of Christian Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Four responses were received regarding the suggested speed limit changes in the Swanson South area, and all responses were supportive of the suggested speed limit changes.	
	proposed speed limit reduction to	cally mentioned supporting the Christian Road.

In addition to the factors outlined in Table 1, further relevant information was sought as summarised in Table 2 below.

#### Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	<ul><li>The existing speed limit on this road is:</li><li>80km/h for the full length of Christian Road</li></ul>
MegaMaps Mean Operating Speed (km/h)	Christian Road has a mean operating speed in the range of 45-49 km/h.
Speed limits on adjoining roads	The speed limits on immediately adjoining roads are as follows:
	Tram Valley Road:

 $<sup>^{\</sup>rm 2}$  There are only three intersections on this section of road, however the short length of the section increases the intersections per km
AT also had regard to	
	<ul> <li>50 km/h but proposed to be lowered to 60 km/h for the entire length (as will be discussed separately).</li> <li>Mettam Drive: 50 km/h</li> <li>O'Neills Road: 100 km/h but proposed to be lowered to 60 km/h for the immediate adjacent section (as will be discussed separately)</li> <li>Welsh Hills Road: 80 km/h but proposed to be lowered to 60 km/h (as will be discussed separately).</li> </ul>

## Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Section 1	Section 2
Crash Analysis Period (years)	5	5
Total injury crashes during period	1	3
DSI equivalents	0.82	0.91
Corridor Length (km)	0.54	3.26
Annual Daily Traffic	500	500

- Section 1
  - $\circ~$  The Collective Risk score is 0.30. For rural areas this corresponds to a Collective Risk band of Medium High^3 ~
  - $\circ~$  The Personal Risk score is 166.40<sup>4</sup>. For rural areas this corresponds to a Personal Risk band of **Medium**
- Section 2
  - The Collective Risk score is 0.06. For rural areas this corresponds to a Collective Risk band of Low Medium
  - The Personal Risk score is 30.6. For rural areas this corresponds to a Personal Risk band of **High**

<sup>&</sup>lt;sup>3</sup> The Collective Risk score for rural roads generally does not exceed 0.50 and the risk banding reflects this. For further information please refer to the "High safety risk – corridors" section of the NZTA's <u>Safety risk</u> <u>definitions for results alignment</u> webpage.

<sup>&</sup>lt;sup>4</sup> Where Personal Risk is >=20, and has only 1 injury crash, Personal Risk is categorised as "Medium".

## Step 3: Calculate the IRR score

Feature	Section 1		Section 2	
	Category	Risk Score	Category	Risk Score
Road stereotype	Two lane undivided	3.70	Two lane undivided	3.70
Road alignment	Curved	1.80	Winding	3.50
Carriageway width	Medium lane, very narrow shoulder	1.79	Medium lane, very narrow shoulder	1.79
Roadside hazards	High, Moderate	3.71	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50	Rural Residential	1.50
Intersection density (per km)	5 to <10	2.60	<1	1.00
Access density (per km)	10 to <20	1.10	10 to <20	1.10
Traffic volume	<1,000 vpd	1.00	<1,000 vpd	1.00

- Section 1: The Infrastructure Risk Rating Score is 1.98. For rural areas this corresponds to an IRR band of **Medium High**.
- Section 2: The Infrastructure Risk Rating Score is 1.85. For rural areas this corresponds to an IRR band of **Medium High**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- Less than 80 km/h between Swanson Road and 65 m southwest of Mettam Drive (UTA Boundary) (Section 1)
- Less than 80 km/h between 65 m southwest of Mettam Drive (UTA Boundary) and the southwest end of Christian Road (Section 2)

## Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 50 km/h between 140m south of Swanson Road and 65 m southwest of Mettam Drive (UTA Boundary)
- 60 km/h between 65 m southwest of Mettam Drive (UTA Boundary) and the southwest end of Christian Road

Christian Road is a self-explaining road as the mean operating speed (<50 km/h) is already below the proposed safe and appropriate speeds, despite the existing posted speed limit of 80 km/h. Engineering up of Christian Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 50 km/h was selected for the section of road *between 140m south of Swanson Road and 65 m southwest of Mettam Drive (UTA Boundary)* as it is within the new Urban Traffic Area boundary. This is also consistent with the existing speed limits on the adjacent section of Mettam Drive.

A proposed speed limit of 60 km/h was selected for the second section of road between 65 m southwest of Mettam Drive (UTA Boundary) and the southwest end of Christian Road as it is within a more rural residential land use area and is a sealed but winding and hazardous road.

The winding and hazardous nature of Christian Road contributes to the roads 'Medium-High' IRR score, making it a high risk road.<sup>5</sup> This section of road also has a 'High' Personal Risk. This risk is reflected in the seven crashes, including one DSI that have occurred over the past five years.

After considering all the above factors, the existing speed limit of 80 km/h on Christian Road in Swanson, is not considered to be a safe and appropriate speed limit.

Balancing all factors, the recommended safe and appropriate speed limit for Christian Road, Swanson is as follows:

- 50 km/h between Swanson Road and 65 m southwest of Mettam Drive (UTA Boundary)
- 60 km/h between 65 m southwest of Mettam Drive (UTA Boundary) and the southwest end of Christian Road

This aligns with the suggested by the Speed Management Guide (<80 km/h) and the low operating speed (<50 km/h) supports the reduction.

<sup>&</sup>lt;sup>5</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

# Speed Limit Review - Clinton Road (Tawharanui)

The speed limit on Clinton Road, Tawharanui (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

## Step 1: Determine the base information

Requirement	Comments		
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>		
	Refer to the Process Summary for further information.		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Clinton Road is classified as a secondary collector road under the one network road classification (ONRC), however, functions more like an Access road.		
	Clinton Road is a two-way, two-lane, undivided and sealed road. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Clinton Road. However, pedestrian activity was observed on site.		
	Clinton Road connects to Baddeleys Beach Road to the west, and Kookaburra Drive and Campbell Road in the east. The primary use of the road is to provide access to rural residential properties, and the beach via Campbell Road. Clinton Road is approximately 750 m in length.		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) has recorded one crash between 2015 and 2019: a non-injury crash. Clinton Road therefore has no Death and Serious Injuries (DSIs). CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
(e) the characteristics of the road and roadsides; and	The following characteristics for Clinton Road were determined using a combination of Google Street View and geomaps information.		
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Straight</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: Severe/ moderate and includes non-frangible poles and trees within 5 m of the edge of road</li> </ul>		
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using Google Street View and geomaps. The IRR defines Rural Towns as a <i>"Rural</i> <i>town with mixture of residential and some shops. Some intersections</i> <i>and accesses are present. Some pedestrian and cyclist activity may</i> <i>also be present."</i>		

Requirement	Comments	
(g) the number of intersections and property accessways; and	A combination of Google Street View and geomaps information revealed:	
	<ul> <li>Intersection density: 5 to &lt;10 intersection per km</li> <li>Access density: 20+ accesses per km</li> </ul>	
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 240 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature / beach town of the road.	
(i) any planned modification to the road; and	There are no known planned modifications to Clinton Road.	
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Clinton Road, six of the responses generally supported the suggested speed limit changes.	

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The existing posted speed limit on Clinton Road is 50 km/h.	
MegaMaps Mean Operating Speed (km/h)	Clinton Road has a mean operating speed of <30 km/h.	
Speed limits on adjoining roads	The existing speed limits on adjoining roads are:	
	<ul> <li>Baddeleys Beach Road: 50 km/h (proposed to be lowered to 40 km/h in proximity to Clinton Road, discussed separately)</li> <li>Campbell Road: 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Kookaburra Drive: 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Corridor Length (km)	0.75
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Annual Daily Traffic	240

The Collective Risk score is 0.00, as is the Personal Risk. This corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Straight	1.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, Moderate	4.23
Adjacent land use	Rural Town	2.50
Intersection density (per km)	5 to <10	2.60
Access density (per km)	20+	1.30
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.12. For urban areas<sup>1</sup> this corresponds to an IRR band of **Medium**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

**The** safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 50 km/h.

<sup>&</sup>lt;sup>1</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Clinton Road is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h posted speed limit. Engineering up of Clinton Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the very narrow road width, the surrounding rural township area, and the concentration of active road users that can be found in the Baddeleys Beach township. Clinton Road is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There has been one non-injury crash on Clinton Road over the past five years. The low crash volume is likely due to the low average daily traffic and low operating speeds.

After considering all the above factors, the existing posted speed limit of 50 km/h on Clinton Road in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Clinton Road, Tawharanui is 40 km/h. This aligns with the Speed Management Guide (<50 km/h) and the low operating speed (<30 km/h) supports the reduction.

# Speed Limit Review -- Edwards Road (Warkworth)

The speed limit on Edwards Road, Warkworth (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

## Step 1: Determine the base information

Requirement	Comments		
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>		
	Refer to the Process Summary for further information.		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Edwards Road is classified as an access road under the one network road classification (ONRC). Edwards road is a two-way, two-lane, undivided and unsealed cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Edwards Road.		
	Edwards Road connects to Hepburn Creek Road and Hodgart Road to the north. The primary use of the road is to provide access to rural farming properties. Edwards Road is approximately 930 m in length.		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
(e) the characteristics of the road and roadsides; and	The following characteristics for Edwards Road were determined using a combination of site drive-over footage and geomaps information.		
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll-over slopes and vegetation</li> </ul>		
(f) adjacent land use; and	The adjacent land use is classified as Remote Rural using the drive over footage. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry."		
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:		
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 1 to &lt;2 accesses per km</li> </ul>		
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 25 vehicles per day (vpd). No AT traffic count data is available for this		

Requirement	Comments
	road. However, this level of traffic volume is consistent with the rural, cul-de-sac nature of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Edwards Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Two responses were received regarding speed limit changes in South East Warkworth. Both responses generally supported the lowering of the speed limit, although neither mentioned Edwards Road specifically.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The existing speed limit on Edwards Road is 100 km/h.
MegaMaps Mean Operating Speed (km/h)	Edwards Road has a mean operating speed in the range of 35-39 km/h.
Speed limits on adjoining roads	<ul> <li>The speed limits on adjoining roads are:</li> <li>Hepburn Creek Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Hodgart Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>

# Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.93
Annual Daily Traffic	25

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
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Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High (both sides)	4.56
Adjacent land use	Remote Rural	1.00
Intersection density (per km)	<1	1.00
Access density (per km)	1 to <2	1.01
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.44. For rural areas this corresponds to an IRR band of High.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

# Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Edwards Road is a self-explaining road as the mean operating speed (<40 km/h) is already at the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Edwards Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the narrow, unsealed and torturous nature of the road, and its existing low operating speed (<40 km/h). The narrow, unsealed and torturous nature of Edwards Road also contribute to the roads "High" IRR score, making it a high risk road.<sup>1</sup> Despite this, there are no recorded crashes on Edwards Road over the past five years. The low crash volume is likely due to the very low vehicle numbers (25 vpd) and low operating speeds.

After considering all the above factors, the existing speed limit of 100 km/h on Edwards Road in Warkworth, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Edwards Road, Warkworth is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

# Speed Limit Review - Govan Wilson Road (Whangaripo)

The speed limit on Govan Wilson Road, Whangaripo (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

## Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Govan Wilson Road is classified as a secondary collector road under the one network road classification (ONRC), however, functions more as an Access Road. Govan Wilson road is a two-way, two-lane, undivided and unsealed cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Govan Wilson Road.	
	Govan Wilson Road connects to Matakana Valley Road to the east and provides access to residential properties. The primary use of the road is to provide access to rural residential properties. Govan Wilson Road is approximately 3.5 km in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Govan Wilson Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll-over slopes and vegetation</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Remote Rural using the drive over footage. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry."	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:	
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>	

Requirement	Comments
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 262 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 277 vpd (survey started on 22/05/2019). This level of traffic volume is consistent with the rural, cul-de-sac nature of the road.
(i) any planned modification to the road; and	There are no planned modifications at this time. However, it is noted that Govan Wilson Road is eleventh on the seal extension programme priorities and may potentially be sealed in 2-3 years' time.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. 12 responses were received regarding speed limit changes in Matakana North. One response specifically mentioned Govan Wilson Road and was supportive of a speed reduction.
	Overall, four responses supported the suggested changes to the Matakana North area, three opposed the suggested changes, and five had suggestions for speed changes outside of the scope.

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The existing speed limit on Govan Wilson Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Govan Wilson Road has a mean operating speed in the range of 35-39 km/h.	
Speed limits on adjoining roads	The existing speed limits on adjoining roads are:	
	<ul> <li>Matakana Valley Road: 100 km/h (but simultaneously proposed for a speed limit change to 60 km/h)</li> </ul>	

# Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	3.5
Annual Daily Traffic	262

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

## Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High (both sides)	4.56
Adjacent land use	Remote Rural	1.00
Intersection density (per km)	<1	1.00
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.44. For rural areas this corresponds to an IRR band of High.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

## Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Govan Wilson Road is a self-explaining road as the mean operating speed (<40 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Govan Wilson Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the unsealed, narrow and torturous nature of the road, and its existing low operating speed (<40 km/h). The unsealed, narrow and torturous nature of Govan Wilson Road also contributes to the roads 'High' IRR score, making it a high risk road.<sup>1</sup> Despite this, there have been no recorded crashes on Govan Wilson Road over the past five years. The low crash volume is likely due to the lower traffic volumes and low operating speed.

After considering all the above factors, the existing speed limit of 100 km/h on Govan Wilson Road in Whangaripo, is not considered to be a safe and appropriate speed limit for this road.

Balancing all factors, the recommended safe and appropriate speed limit for Govan Wilson Road, Whangaripo is 40 km/h. This is in alignment with the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

# Speed Limit Review -- Haywood Lane (Tawharanui)

The speed limit on Haywood Lane, Tawharanui (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

## Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Haywood Lane is classified as an access road under the one network road classification (ONRC). Haywood Lane is a two-way, one-lane, undivided and unsealed cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Haywood Lane.	
	Haywood Lane connects to Whitmore Road to the east and provides access to residential properties. The primary use of the road is to provide access to rural residential properties. Haywood Lane is approximately 200 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Haywood Lane were determined using a combination of site drive-over footage and geomaps information.  • Road stereotype: Unsealed	
	<ul> <li>Road alignment: Straight</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: Severe/ moderate and includes very frequent non-frangible point hazards within 5 m on one side and between 5-10 m on the other.</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>	

Requirement	Comments
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density: 5 &lt;10 intersection per km (this is due to the short nature of the road, there is only one intersection)</li> <li>Access density: 10 to &lt;20 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 32 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is considered low, despite the rural, cul-de-sac nature of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Haywood Lane.
(j) the views of interested persons and groups.	Potential changes to the speed limits in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Haywood Lane, six of the responses generally supported the suggested speed limit changes.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The speed limit on Haywood Lane is 100 km/h.
MegaMaps Mean Operating Speed (km/h)	Haywood Lane has a mean operating speed in the range of <30 km/h.
Speed limits on adjoining roads	<ul> <li>The speed limits on adjoining roads are:</li> <li>Whitmore Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> </ul>

# Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.20
Annual Daily Traffic	32

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Straight	1.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, Moderate	4.23
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	5 to <10	2.60
Access density (per km)	10 to <20	1.10
Traffic volume	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

The Infrastructure Risk Rating Score is 2.26. For rural areas this corresponds to an IRR band of High.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation: 60 km/h

Haywood Lane is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h posted speed limit. Engineering up of Haywood Lane was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 60 km/h was selected to provide consistency with the proposed speed limit for Whitmore Road and to manage the risk presented by the nearby hazards. A lower speed limit is not proposed due to the very short length of Haywood Lane (200 m) and the additional signage requirements that would entail. Haywood Lane has a 'High' IRR score<sup>1</sup>, but a 'Low' Collection Risk and Personal Risk. Despite the 'High' IRR score, there have been no recorded crashes on Haywood Lane over the past five years. The low crash volume is likely due to the very low average daily traffic and low mean operating speeds.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

After considering all the above factors, the existing speed limit of 100 km/h on Haywood Lane in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Haywood Lane, Tawharanui is 60 km/h. This aligns with the suggested speed by the Speed Management Guide (<80 km/h), the adjoining proposed speed limit on Whitmore Road (60 km/h) and the low operating speed (<30 km/h) supports the reduction.

# Speed Limit Review -- Hepburn Creek Road (Warkworth)

The speed limit on Hepburn Creek Road, between 540 m south of Wilson Road (UTA Boundary) and Edwards Road, Warkworth (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

## Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Hepburn Creek Road is classified as a secondary collector road under the one network road classification (ONRC). Hepburn Creek road is a two-way, two-lane, undivided and mostly unsealed road (the first 260 m of the road section are sealed). There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Hepburn Creek Road.	
	Hepburn Creek Road connects to Hodgart Road and Edwards Road, at the southern end of Hepburn Creek Road. The primary use of the road is to provide access to rural residential properties. This section of Hepburn Creek Road is approximately 3.42 km in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records two crashes between 2015 and 2019: one serious crash, and one minor injury crash. Hepburn Creek Road therefore has one Death and Serious Injury (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Hepburn Creek Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Majority Unsealed</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High/moderate and includes frequent roll-over slopes and vegetation, with non-frangible trees and poles between 5-10 m from the edge.</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>	

Requirement	Comments
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 246 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 298 vpd (survey started on 13/12/2019). This level of traffic volume is consistent with the nature of this road.
(i) any planned modification to the road; and	There are no known planned modifications to Hepburn Creek Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Two responses were received regarding the suggested speed limit changes in South-East Warkworth. Both responses specifically mentioned Hepburn Creek Road, and were supportive of the suggested speed limit changes.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The existing speed limit on Hepburn Creek Road as of the 30/06/2020 is:
	<ul> <li>50 km/h between Wilson Road and 540 m south of Wilson Road (UTA Boundary)</li> <li>100 km/h between 540 m south of Wilson Road (UTA Boundary) and Edwards Road</li> </ul>
	Prior to 30/06/2020 the speed limit was 100 km/h for the full length of the road.
MegaMaps Mean Operating Speed (km/h)	Hepburn Creek Road has a mean operating speed in the range of 35-39 km/h.
Existing Speed limits on adjoining roads	<ul> <li>The existing speed limits on adjoining roads are:</li> <li>Pulham Road: 50km/h</li> <li>Wilson Road (to the west): 50km/h</li> <li>Wilson Road (to the east): 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Hodgart Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Edwards Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	1
DSI equivalents	0.33
Corridor Length (km)	3.42
Annual Daily Traffic	246

The Collective Risk score is 0.02, and the Personal Risk score is 21.5. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Medium**.

Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	<1	1.00
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.55. For rural areas this corresponds to an IRR band of **High**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

## Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 50 km/h between 540 m south of Wilson Road (UTA Boundary) and 610 m south of Wilson Road (50 m east of the UTA Boundary)
- 40 km/h between 610 m south of Wilson Road (50 m east of the UTA Boundary) and Edwards Road

Hepburn Creek Road is a self-explaining road as the mean operating speed (<40 km/h) is already below the proposed safe and appropriate speeds, despite the existing 100 km/h speed limit. Engineering up of Hepburn Creek Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume, low classification road. The cost to do this would substantially outweigh any benefits.

The existing speed limit between Wilson Road and 540 m south of Wilson Road (UTA Boundary) is 50 km/h as implemented within the 2019 bylaw in order to account for future urban growth in this area. There is no proposed change in the speed limit of 50 km/h for the first section of road as it is within the new Urban Traffic Area boundary. This is also consistent with the existing speed limits on Wilson Road West. It is proposed to extend the 50 km/h zone 50 m past the UTA Boundary to ensure safe signage visibility, as the UTA Boundary is on a tight corner with very limited visibility.

A proposed speed limit of 40 km/h was selected due to the narrow, largely unsealed and torturous nature of the road, and its existing low operating speed (<40 km/h). The narrow, unsealed and torturous nature of Hepburn Creek Road also contribute to the roads "High" IRR score, making it a high risk road.<sup>1</sup>

After considering all the above factors, the speed limit of 100 km/h on Hepburn Creek Road (between 540 m south of Wilson Road (UTA Boundary) and Edwards Road) in Warkworth, is not considered to be a safe and appropriate speed limit for this road.

The recommended safe and appropriate speed limit for Hepburn Creek Road is

- 50 km/h between 540 m south of Wilson Road (UTA Boundary) and 610 m south of Wilson Road (50 m east of the UTA Boundary)
- 40 km/h between 610 m south of Wilson Road (50 m east of the UTA Boundary) and Edwards Road

This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

# Speed Limit Review -- Hodgart Road (Warkworth)

The speed limit on Hodgart Road, Warkworth (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

## Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Hodgart Road is classified as an access road under the one network road classification (ONRC). Hodgart road is a two-way, two-lane, undivided and unsealed cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Hodgart Road.	
	Hodgart Road connects to Hepburn Creek Road and Edwards Road to the north. The primary use of the road is to provide access to rural farming properties. Hodgart Road is approximately 760 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Hodgart Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll-over slopes and vegetation</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Remote Rural using the drive over footage. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry."	
(g) the number of intersections and property accessways; and	<ul> <li>A combination of site drive over footage and geomaps information revealed:</li> <li>Intersection density: &lt;1 intersection per km</li> </ul>	
	Access density: 1 to <2 accesses per km	
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 25 vehicles per day (vpd). No AT traffic count data is available for this	

Requirement	Comments
	road. This level of traffic volume is low despite the rural, cul-de-sac nature of the road.
<ul><li>(i) any planned modification to the road; and</li></ul>	There are no known planned modifications to Hodgart Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Two responses were received regarding speed limit changes in South East Warkworth. Both responses generally supported the lowering of the speed limit, although neither mentioned Hodgart Road specifically.

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The speed limit on Hodgart Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Hodgart Road has a mean operating speed in the range of 35-39 km/h.	
Speed limits on adjoining roads	<ul> <li>The speed limits on adjoining roads are:</li> <li>Hepburn Creek Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Edwards Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>	

# Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.76
Annual Daily Traffic	25

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
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Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High (both sides)	4.56
Adjacent land use	Remote Rural	1.00
Intersection density (per km)	<1	1.00
Access density (per km)	1 to <2	1.01
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.44. For rural areas this corresponds to an IRR band of **High**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

## Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Hodgart Road is a self-explaining road as the mean operating speed (<40 km/h) is already at the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Hodgart Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the narrow, unsealed and torturous nature of the road, and its existing low operating speed (<40 km/h). The narrow, unsealed and torturous nature of Hodgart Road also contribute to the roads "High" IRR score, making it a high risk road.<sup>1</sup> Despite this, there are no recorded crashes on Hodgart Road over the past five years. The low crash volume is likely due to the very low vehicle numbers (25 vpd) and low operating speeds.

The mean operating speed on Hodgart Road is <40 km/h despite the existing 100 km/h speed limit. This means that the road is "self explaining" and drivers already recognise the existing speed limit is not suitable.

After considering all the above factors, the existing speed limit of 100 km/h on Hodgart Road in Warkworth, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Hodgart Road, Warkworth is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

# Speed Limit Review – Kookaburra Drive, Tawharanui

The speed limit on Kookaburra Drive, Tawharanui (as shown on the brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

## Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Kookaburra Drive is classified as an Access Road under the one network road classification (ONRC). Kookaburra Drive is a two-way, two-lane, undivided and sealed road. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Kookaburra Drive. However, pedestrian activity was observed on site.	
	Kookaburra Drive connects to Clinton Road to the south and Pigeon Place in the north. The primary use of the road is to provide access to residential properties. Kookaburra Drive is approximately 150 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) has recorded no crashes between 2015 and 2019. Kookaburra Drive therefore has no Death and Serious Injuries (DSIs). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Kookaburra Drive were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Straight</li> <li>Carriageway width: Narrow lane (&lt;3.0m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: Severe/ moderate and includes non-frangible poles and trees within 5 m of the edge of road</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using the drive over footage. The IRR defines Rural Towns as a <i>"Rural town with</i> <i>mixture of residential and some shops. Some intersections and</i> <i>accesses are present. Some pedestrian and cyclist activity may also</i> <i>be present."</i>	

Requirement	Comments
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density: 5 to &lt;10 intersection per km (due to the short length of the road, there are only two intersections)</li> <li>Access density: 20+ accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 62 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature / beach town of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Kookaburra Drive.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Kookaburra Drive, six of the responses generally supported the suggested speed limit changes.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The speed limit on Kookaburra Drive is 50 km/h.
MegaMaps Mean Operating Speed (km/h)	Kookaburra Drive has a mean operating speed of <30 km/h.
Speed limits on adjoining roads	<ul> <li>The existing speed limits on adjoining roads are:</li> <li>Clinton Road: 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Pigeon Place: 50 km/h (proposed to be lowered to 40 km/hr, discussed separately)</li> </ul>

## Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.15
Annual Daily Traffic	62

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	
Road alignment	Straight	1.00
Carriageway width	Narrow lane, very narrow shoulder	
Roadside hazards	Severe, Moderate	
Adjacent land use	Rural Town	
Intersection density (per km)	5 to <10	
Access density (per km)	20+	
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.06. For urban areas<sup>1</sup> this corresponds to an IRR band of **Medium**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 50 km/h.

<sup>&</sup>lt;sup>1</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation: 40 km/h

Kookaburra Drive is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h posted speed limit. Engineering up of Kookaburra Drive was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the very narrow and short road, the surrounding residential area, and the concentration of active road users that can be found in the Baddeleys Beach township. Kookaburra Drive is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There have been no recorded crashes on Kookaburra Drive over the past five years. The low crash volume is likely due to the low average daily traffic and low operating speeds.

After considering all the above factors, the existing speed limit of 50 km/h on Kookaburra Drive in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Kookaburra Drive, Tawharanui is 40 km/h. This aligns with the Speed Management Guide (<50 km/h) and the low operating speed (<30 km/h) supports the reduction.

# Speed Limit Assessment - Matakana Valley Road (Matakana)

Matakana Valley Road, Matakana, is divided into three sections as shown on the attached brochure and outlined as follows:<sup>1</sup>

- 1. Section 1: Matakana Valley Road between 950 m northwest of Leigh Road (UTA Boundary) and 20 m south of Smith Road
- 2. Section 2: Matakana Valley Road between 20 m south of Smith Road and 2,720 m south of Pakiri Road
- 3. Section 3: Matakana Valley Road between 2,720 m south of Pakiri Road and Pakiri Road

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections.

All sections of Matakana Valley Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Requirement	Comments			
	Section 1 (as applicable)	Section 1 (as applicable)	Section 1 (as applicable)	
(a) the information about speed management developed and maintained by the Agency; and:	The information provide below: New Zealand Guide 2016 Infrastructure Ri NZTA MegaMap Refer to the Process Sur	d by the agency that has Transport Agency (NZT/ sk Rating Manual 2016 (IF os tool mmary for further informat	s been included is listed A) Speed Management RR) ion.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.			
(c) the function and use of the road; and	This section of Matakana Valley Road is classified as an Arterial under the one network road classification (ONRC). This section is 2.60 km in length	<ul> <li>This section of Matakana Valley Road is classed as the following under the ONRC:</li> <li>Arterial: between 20 m south of Smith Road and Govan Wilson Road</li> <li>Primary Collector: between Govan Wilson Road and</li> </ul>	This section of Matakana Valley Road is classified as a Primary Collector under the ONRC. This section is 2.72 km in length	

<sup>&</sup>lt;sup>1</sup> It is noted that the ONRC and MegaMaps sections differ from the proposed road sections. This is because AT has chosen to align the proposed speed limit changes with sections of similar road alignment (i.e tortuous vs curved) as specified within the IRR.

Requirement	Comments				
	Section 1 (as applicable)	Section 1 (as applicable)	Section 1 (as applicable)		
		2,420 m south of Pakiri Road			
		This section is 4.36 km in length			
	Matakana Valley Road is a two-way, two-lane, undivided and sealed road. There are no pedestrian or cyclist amenities along this road, and there is no on-street parking along Matakana Valley Road.				
	Matakana Valley Road primarily used as a thro residential properties alo	connects Matakana and V bugh route, although ther ong its length.	Vhangaripo. The road is e are a number of rural		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) was used to determine the crash history between 2015 and 2019. CAS includes crashes for all road users and therefore the crash risk for all road users was considered.				
	CAS records four crashes on this section of Matakana Valley Road: one non-injury crash, two minor injury crashes and one serious injury crash. The crashes on Matakana Valley Road have resulted in two Death and Serious Injuries (DSIs). This section of Matakana Valley Road is identified as one of the top 10% DSI saving network sections for New Zealand.	CAS records six crashes on this section of Matakana Valley Road: three non-injury crashes, two minor injury crashes and one serious injury crash. The crashes on Matakana Valley Road have resulted in one DSI. Part of this section of Matakana Valley Road (20 m south of Smith Road to Govan Wilson Road) is identified as one of the top 10% DSI saving network sections for New Zealand.	CAS records zero crashes on this section of Matakana Valley Road. Therefore, there are no DSIs.		
(e) the characteristics of the road and roadsides; and	The following character were determined using geomaps information	istics for each section of a combination of site	Matakana Valley Road drive-over footage and		
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road Alignment: Curved</li> <li>Carriageway Width: Medium lane (3.0 to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside Hazards:</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road Alignment: Tortuous</li> <li>Carriageway Width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside Hazards: High</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road Alignment: Curved</li> <li>Carriageway Width: Medium lane (3.0 to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside Hazards:</li> </ul>		

Requirement	Comments				
	Section 1 (as applicable)	Section 1 (as applicable)	Section 1 (as applicable)		
	Moderate and includes regular non-frangible point hazards	and includes frequent roll-over slopes and vegetation	Moderate and includes regular non-frangible point hazards		
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using drive-over footage and geomaps. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	The adjacent land use is classified as Remote Rural using drive-over footage and geomaps. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry." It should be noted that the end of the road terminates into a private access road that serves eight properties.	The adjacent land use is classified as Rural Residential using drive-over footage and geomaps. The IRR defines Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."		
(g) the number of intersections and	of The following were determined using a combination of site drive ove d footage and geomaps information:				
and	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 10 to &lt;20 access per km</li> </ul>	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 2 to &lt;5 access per km</li> </ul>	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>		
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as 5,443 vehicles per day (vpd).	The traffic volume in ADT was determined from MegaMaps as 500 vpd.	The traffic volume in ADT was determined from MegaMaps as: 652 vpd.		
(i) any planned modification to the road; and	There are currently no known planned modifications to Matakana Valley Road.				
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. 12 responses were received regarding speed limit changes in Matakana North. Of these, seven responses specifically mentioned Matakana Valley Road. Four responses were in support of the suggested speed limit changes, and three opposed the suggested changes.				
	Matakana Village.	ponses nau suggestions	ioi speed changes III		

Table 2: Additional Relevant Factors to Consider

Factor	Comment		
Existing Speed Limit	The speed limit on Matakana Road is 100 km/h from 950 m northwest of Leigh Road to Pakiri Road		
MegaMaps Mean Operating Speed (km/h)	<ul> <li>Matakana Valley Road has a mean operating speed of:</li> <li>55-59 km/h between Leigh Road and Govan Wilson Road</li> <li>45-49 km/h between Govan Wilson Road and 2,720 m south of Pakiri Road</li> <li>75-79 km/h between 2,720 m south of Pakiri Road and Pakiri Road</li> </ul>		
Speed Limit on Adjoining Roads	<ul> <li>The speed limits in the adjacent road network are:</li> <li>Leigh Road: 50 km/h</li> <li>Ward Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Smith Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Govan Wilson Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Govan Wilson Road: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Pakiri Road: 100 km/h (80 km/hr in 2019 Bylaw)</li> <li>Whangaripo Valley Road: 100 km/hr</li> </ul>		

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Section 1	Section 2	Section 3
Crash Analysis Period (years)	5	5	5
Total injury crashes during period	3	3	0
DSI equivalents	1.05	1.32	0
Corridor Length (km)	2.60	4.36	2.72
Annual Daily Traffic	5,443	500	652

• Section 1

 $_{\odot}$  The Collective Risk score is 0.08. For rural areas this corresponds to a Collective Risk band of  $Medium^2$ 

<sup>&</sup>lt;sup>2</sup> The Collective Risk score for rural roads generally does not exceed 0.50 and the risk banding reflects this. For further information please refer to the "High safety risk – corridors" section of the NZTA's <u>Safety risk</u> <u>definitions for results alignment</u> webpage.

- The Personal Risk score is 4.10. For rural areas this corresponds to a Personal Risk band of Low Medium
- Section 2
  - The Collective Risk score is 0.06. For rural areas this corresponds to a Collective Risk band of **Low Medium**
  - The Personal Risk score is 33.2. For rural areas this corresponds to a Personal Risk band of **High**
- Section 3
  - $\circ~$  The Collective Risk score is 0.00. For rural areas this corresponds to a Collective Risk band of  ${\bf Low}$
  - The Personal Risk score is 0.00. For rural areas this corresponds to a Personal Risk band of Low

Feature	Section 1		Section2		Section3	
	Category	Score	Category	Score	Category	Score
Road stereotype	Two Lane Undivided	3.70	Two Lane Undivided	3.70	Two Lane Undivided	3.70
Road alignment	Curved	1.80	Tortuous	6.00	Curved	1.80
Carriageway width	Medium lane, very narrow shoulder	1.79	Narrow lane, very narrow shoulder	2.01	Medium lane, very narrow shoulder	1.79
Roadside hazards	Moderate (both sides)	2.86	High (both sides)	4.56	Moderate (both sides)	2.86
Adjacent land use	Rural Residential	1.50	Remote Rural	1.00	Rural Residential	1.50
Intersection density (per km)	<1	1.00	<1	1.00	<1	1.00
Access density (per km)	10 to <20	1.10	2 to <5	1.03	5 to <10	1.06
Traffic volume	1,000 to <6,000	1.40	<1,000 vpd	1.00	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

- Section 1: The Infrastructure Risk Rating Score is 1.60. For rural areas this corresponds to an IRR band of **Medium**.
- Section 2: The Infrastructure Risk Rating Score is 2.02. For rural areas this corresponds to an IRR band of **High**.
- Section3: The Infrastructure Risk Rating Score is 1.43. For rural areas this corresponds to an IRR band of **Medium**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- 80 km/h between 950 m northwest of Leigh Road to 20 m south of Smith Road (Section 1)
- Less than 80 km/h between 20 m south of Smith Road and 2,720 m south of Pakiri Road (Section 2)
- 80 km/h between 2,720 m south of Pakiri Road and Pakiri Road (Section 3)

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 80 km/h between 950 m northwest of Leigh Road to 20 m south of Smith Road (Section 1)
- 60 km/h between 20 m south of Smith Road and 2,720m south of Pakiri Road (Section 2)
- 80km/hr between 2,720m south of Pakiri Road and Pakiri Road (Section 3)

Matakana Valley Road is a self-explaining road as the mean operating speeds are already at, or below, the proposed safe and appropriate speeds, despite the existing 100 km/h speed limit. Engineering up of Matakana Valley Road was considered, but dismissed due to the substantial and costly upgrades that would be required. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 80 km/h was selected for the first section of road due to the curved nature of the road, moderate road side hazards and low mean operating speeds (<60 km/h). This section of Matakana Valley Road is identified as one of the top 10% DSI saving network sections for New Zealand.

A proposed speed limit of 60 km/h was selected for the second section of road due to the narrow, torturous and hazardous nature of the road, regular curve advisory signs 25 km/h around bends and the low mean operating speed (<60 km/h). The narrow, torturous and hazardous nature of this section of Matakana Valley Road contributes to the sections 'High' IRR score, making it a high risk section of road.<sup>3</sup> This section is also one of the top 10% DSI saving network sections for New Zealand.

A proposed speed limit of 80 km/h was selected for the third section of road as the curved nature of the road and moderate roadside hazards allow for higher mean operating speeds (75-79 km/h), and to ensure consistency with the surrounding network. This section of Matakana Valley Road is relatively low risk compared to the rest of the road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk.

The high risk nature of Matakana Valley Road is reflected in its crash history. Over the past five years 10 crashes have been recorded, resulting in three DSIs. This suggests that the narrow, torturous and hazardous nature of the road does not allow for when people make mistakes.

After considering all the above factors, the existing speed limit of 100 km/h on Matakana Valley Road in Matakana, is not considered to be a safe and appropriate speed limit for this section of road.

The recommended safe and appropriate speed limits for Matakana Valley Road, Matakana are:

- 80 km/h between 950 m northwest of Leigh Road to 20 m south of Smith Road
- 60 km/h between 20 m south of Smith Road and 2,720m south of Pakiri Road
- 80km/hr between 2,720m south of Pakiri Road and Pakiri Road

This aligns with the Speed Management Guide and the low operating speeds support the reduction.

<sup>&</sup>lt;sup>3</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High
### Speed Limit Review – Mudgeways Road (Massey West)

The speed limit on Mudgeways Road, Massey West (full length, as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Requirements	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Mudgeways Road is classified as a secondary collector road under the one network road classification (ONRC).	
	Mudgeways Road is a two-way, narrow two-lane, undivided and sealed road. Mudgeways Road is a dead end road which provides connection from Birdwood Road to rural residential properties.	
	Mudgeways Road has no pedestrian or cyclist amenities and very narrow shoulders. There are no centre line road markings and an advisory curve warning sign of 25 km/h is present. The primary use of this section of road is to provide access to rural residential properties. Mudgeways Road is approximately 700 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records one crash between 2015 to 2019: one non-injury crashes. Mudgeways Road therefore has no Death and Serious Injury (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Mudgeways Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Winding</li> <li>Carriageway width: Narrow (approximately 4.5 m) and very narrow shoulder (0 to &lt;0.5 m). There are also no centre line road markings.</li> <li>Roadside hazards: Severe with dense vegetation, poor visibility, roll over slopes and power poles.</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>	

Requirements	Comments
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density:1 to &lt;2 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 400 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Mudgeways Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Only one response was received regarding the proposed speed limit changes in the Massey West area, and it supported the proposed changes. However, the response did not specifically mention Mudgeways Road.

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The speed limit on Mudgeways Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Mudgeways Road has a mean operating speed in the range of 35-39 km/h.	
Speed limits on adjoining roads	The speed limits on immediately adjoining roads are:	
	• <b>Birdwood Road</b> : 100 km/h. However, it is proposed to be lowered to 60 km/h (as will be discussed separately).	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.70
Annual Daily Traffic	400

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Winding	3.50
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, High	5.08
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	1 to <2	1.15
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.08. For rural areas this corresponds to an IRR band of High.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Mudgeways Road is a self-explaining road as the mean operating speed (<35 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Mudgeways Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the narrow, winding, self explaining and hazardous nature of the road, and its existing low operating speed (<35 km/h). The narrow, winding, and hazardous nature of Mudgeways Road also contribute to the roads 'High' IRR score, making it a high risk road.<sup>1</sup>. Despite the high risk nature of the road, there has only been one non-injury crash recorded over the past five years. This is likely due to the existing low operating speeds.

The mean operating speed on Mudgeways Road is <40 km/h despite the existing 100 km/h speed limit. This means that the road is 'self-explaining' and drivers already recognise the existing speed limit is not suitable.

After considering all the above factors, the existing speed limit of 100 km/h on Mudgeways Road in Massey West, is not considered to be a safe and appropriate speed limit for this road.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

Balancing all factors, the recommended safe and appropriate speed limit for Mudgeways Road, Massey West is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<40 km/h) supports the reduction.

### Speed Limit Review - O'Neills Road (Swanson)

O'Neills Road, Swanson, is divided into two sections as shown on the attached brochure and outlined as follows:

- 1. Section 1: O'Neills Road (between urban traffic area boundary (Auckland Isthmus) and Drower Road); and
- 2. Section 2: O'Neills Road (between Drower Road and Christian Road).

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections. The location of existing speed limits was also considered when creating the sections.

Both sections of O'Neills Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for further information</li> </ul>		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Both sections of O'Neills Road are classified as a primary collector road under the one network road classification (ONRC), however, the road functions more as a secondary collector road given the recorded traffic volumes.		
	O'Neills Road is a two-way, two-lane, undivided and sealed road for both sections. O'Neills Road provides connection from Pooks Road to Christian Road.		
	Section 1 of O'Neills Road (between urban traffic area boundary (Auckland Isthmus) and Drower Road) is predominantly urban residential with limited footpaths and no cyclist amenities. This section of road is a transition section from urban to rural residential and therefore has a higher land use density than Section 2 of O'Neills Road.	Section 2 of O'Neills Road (between Drower Road and Christian Road) has no pedestrian or cyclist amenities. The primary use of this section of road is to provide access to rural residential properties and wider rural connectivity. This section is 1.09 km in length.	
	This section of road is 340 m in length.		

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) was used to determine the crash history between 2015 and 2019. CAS includes crashes for all road users and therefore the crash risk for all road users was considered.		
	One minor crash was recorded on Section 1 of O'Neills Road	One non-injury crash was recorded on Section 2 of O'Neills Road	
(e) the characteristics of the road and roadsides; and	The characteristics for both sections of Baddeleys Beach Road were determined using a combination of site drive-over footage and geomaps information.		
	The characteristics for Section 1 are as follows:	The characteristics for Section 2 are as follows:	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Curved</li> <li>Carriageway width: Medium and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: Severe due to high urban hazards such as buildings and power poles</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Winding</li> <li>Carriageway width: Narrow and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll- over slopes and vegetation</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using drive over footage. The IRR defines Rural Towns as <i>"Rural</i> <i>town with mixture of residential</i> <i>and some shops. Some</i> <i>intersections and accesses are</i> <i>present. Some pedestrian and</i> <i>cyclist activity may also be</i> <i>present."</i>	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed the intersection density and access density for both sections.		
	<ul> <li>Intersection density:2 to &lt;3 intersection per km</li> <li>Access density: 20+ accesses per km</li> </ul>	<ul> <li>Intersection density:1 to &lt;2 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>	

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
(h) traffic volume; and	Average daily traffic (ADT) for both sections of road was determined from MegaMaps as 511 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 492 vpd (survey started on 08/05/2019). This level of traffic volume is lower than anticipated for primary Collector Road hence why it is more likely that the road operates as a secondary collector.		
(i) any planned modification to the road; and	There are no known planned modifications to O'Neills Road.		
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September to 14 October 2018. Four responses were received regarding the suggested speed limit changes in the Swanson South area, and all responses were supportive of the suggested speed limit changes.		
	Two of the responses specifically mentioned supporting the proposed speed limit reduction to O'Neills Road.		

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The speed limit on O'Neills Road is:
	<ul> <li>50 km/h between Pooks Road and the Auckland Isthmus/ UTA boundary (495 m south of Pooks Road)</li> <li>70 km/h between the Auckland Isthmus/ UTA boundary and Drower Road</li> <li>100 km/h between Drower Road and Christian Road.</li> </ul>
	Prior to 30/06/2020 the speed limit was:
	<ul> <li>70 km/h between Pooks Road and 45 m north of Drower Road</li> <li>100 km/h between 45 m north of Drower Road and Christian Road.</li> </ul>
MegaMaps Mean Operating Speed (km/h)	O'Neills Road has a mean operating speed in the range of 45-49 km/h between Pooks Road and Drower Road and 50-54 km/h between Drower Road to Christian Road.
Speed limits on adjoining roads	<ul> <li>The speed limits on immediately adjoining roads are as follows:</li> <li>Christian Road: 80 km/h (proposed to be lowered to 60 km/h, as will be discussed separately)</li> </ul>

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Section 1	Section 2
Crash Analysis Period (years)	5	5
Total injury crashes during period	1	0
DSI Equivalents	0.33	0
Corridor Length (km)	0.34	1.09
Annual Daily Traffic	511	511

- Section 1
  - $\circ~$  The Collective Risk score is 0.16. This corresponds to a Collective Risk band of  ${\rm Low}~{\rm Medium}$
  - The Personal Risk score is 88.3. This corresponds to a Personal Risk band of **Medium**<sup>1</sup> ction 2
- Section 2
  - $\circ$   $\;$  The Collective Risk score is 0.00. This corresponds to a Collective Risk band of Low
  - $\circ$  The Personal Risk score is 0.00. This corresponds to a Personal Risk band of Low

#### Step 3: Calculate the IRR score

Feature	Section 1		Section 2	2
	Category	Risk Score	Category	Risk Score
Road stereotype	Two lane undivided	3.70	Two lane undivided	3.70
Road alignment	Curved	1.80	Winding	3.50
Carriageway width	Medium lane, very narrow shoulder	1.79	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, Moderate	4.23	High, Moderate	3.71
Adjacent land use	Rural Towns	2.50	Rural Residential	1.50
Intersection density (per km)	2 to <3	1.25	1 to <2	1.15
Access density (per km)	20+	1.30	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00	<1,000 vpd	1.00

<sup>&</sup>lt;sup>1</sup> Where Personal Risk is >=20, and has only 1 injury crash, Personal Risk is categorised as "Medium".

- Section 1: The Infrastructure Risk Rating Score is 2.01. For urban areas<sup>2</sup> this corresponds to an IRR band of **Medium**.
- Section 2: The Infrastructure Risk Rating Score is 1.95. For rural areas this corresponds to an IRR band of **Medium High**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- 60 km/h between the urban traffic area boundary (Auckland Isthmus) and Drower Road (Section 1)
- Less than 80 km/h between Drower Road and Christian Road (Section 2)

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 50 km/h between the urban traffic area boundary (Auckland Isthmus) and Drower Road (Section1)
- 60 km/h between Drower Road and Christian Road (Section 2)

O'Neills Beach Road is a self-explaining road as the mean operating speeds (45-49 km/h and 50-54 km/h) are already at, or below, the proposed safe and appropriate speeds, despite the existing 70 km/h and 100 km/h speed limits. Engineering up of O'Neills Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 50 km/h is recommended for the first section of O'Neills Road, despite the Speed Management Guide recommendation of 60 km/h. This is because it is within a high residential growth area, with severe hazards due to the number and location of urban point hazards (houses, power poles, etc), and the low operating speeds (<50 km/h). It is also a very short section of road (340 m), so continuing the 50 km/h zone to Drower Road makes sense.

A proposed speed limit of 60 km/h is recommended for the second section of road as it is within a more rural residential land use area and has mean operating speeds of (<55 km/h).

The hazardous and winding nature of the second section of O'Neills Road also contribute to the roads 'Medium High' IRR score, making it a high risk road.<sup>3</sup> Despite this, there have only been two crashes recorded on O'Neills Road over the past five years: one minor injury crash and one non-injury crash. The low crash volume is likely due to the low vehicle numbers (511 vpd) and low operating speeds.

After considering all the above factors, the existing speed limits of 70 km/h and 100 km/h on O'Neills Road in Swanson, are not considered to be safe and appropriate speed limits.

The recommended safe and appropriate speed limits for O'Neills Road, Swanson are as follows:

- 50 km/h between urban traffic area boundary (Auckland Isthmus) and Drower Road
- 60 km/h between Drower Road and Christian Road

This aligns with the Speed Management Guide and the low operating speed (<60 km/h) supports the reduction.

<sup>&</sup>lt;sup>2</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

<sup>&</sup>lt;sup>3</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

### Speed Limit Review - Pigeon Place, Tawharanui

The speed limit on Pigeon Place, Tawharanui (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

#### Step 1: Determine the base information

Requirements	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Pigeon Place is classified as an Access Road under the one network road classification (ONRC). Pigeon Place is a two-way, two-lane, undivided and sealed cul-de-sac road. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Pigeon Place. However, pedestrian activity was observed on site.	
	Pigeon Place connects to Kookaburra Drive to the West. The primary use of the road is to provide access to residential properties. Pigeon Place is approximately 70 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) has recorded no crashes between 2015 and 2019. Pigeon Place therefore has no Death and Serious Injuries (DSIs). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Pigeon Place were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Straight</li> <li>Carriageway width: Narrow lane (&lt;3.0m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: Severe/ moderate and includes non-frangible poles and trees within 5 m of the edge of road</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Towns using the drive over footage. The IRR defines Rural Towns as a <i>"Rural town with</i> <i>mixture of residential and some shops. Some intersections and</i> <i>accesses are present. Some pedestrian and cyclist activity may also</i> <i>be present."</i>	

Requirements	Comments	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:	
	<ul> <li>Intersection density: 5 to &lt;10 intersection per km (due to the short length of the road, there is only one intersection)</li> <li>Access density: 20+ accesses per km</li> </ul>	
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 62 vehicles per day (vpd). No AT traffic count data is available for this road. However, this level of traffic volume is consistent with the rural residential nature / beach town of the road.	
(i) any planned modification to the road; and	There are no known planned modifications to Pigeon Place.	
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed in XXXX. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. While none of the responses specifically mentioned Pigeon Place, six of the responses generally supported the suggested speed limit changes.	

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The posted speed limit on Pigeon Place is 50 km/h.	
MegaMaps Mean Operating Speed (km/h)	Pigeon Place has a mean operating speed of <30 km/h.	
Speed limits on adjoining roads	The existing speed limits on adjoining roads are:	
	• Kookaburra Drive: Posted at 50 km/h (proposed to be lowered to 40 km/h, discussed separately)	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.07
Annual Daily Traffic	62

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Straight	1.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	Severe, Moderate	4.23
Adjacent land use	Rural Town	2.50
Intersection density (per km)	5 to <10	2.60
Access density (per km)	20+	1.30
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.03. For urban areas<sup>1</sup> this corresponds to an IRR band of **Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 50 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Pigeon Place is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h posted speed limit. Engineering up of Pigeon Place was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a very short, low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the very narrow and very short road, the surrounding rural township area, and the concentration of active road users that can be found in the Baddeleys Beach township. Pigeon Place is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There have been no recorded crashes on Pigeon Place over the past five years. The low crash volume is likely due to the low average daily traffic and low operating speeds.

After considering all the above factors, the existing posted speed limit of 50 km/h on Pigeon Place in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

<sup>&</sup>lt;sup>1</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

Balancing all factors, the recommended safe and appropriate speed limit for Pigeon Place, Tawharanui is 40 km/h. This aligns with the Speed Management Guide (<50 km/h) and the low operating speed (<30 km/h) supports the reduction.

### Speed Limit Review -- Smith Road (Matakana)

The speed limit on Smith Road, Matakana (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached

#### Step 1: Determine the base information

Requirement	Comments	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:	
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>	
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 100 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 170 vpd (survey started 27/09/2012). This level of traffic volume is consistent with the nature of this road.	
(i) any planned modification to the road; and	There are no known planned modifications to Smith Road.	
(j) the views of interested persons and groups.	ed Potential changes to the speed limit in this area were discusse XXXXXX. 12 responses were received regarding speed changes in Matakana North. Two responses specifically mention Smith Road and were supportive of the suggested speed reduct	
	Overall, four responses supported the suggested changes to the Matakana North area, three opposed the suggested changes, and five had suggestions for speed changes outside of the scope.	

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The existing speed limit on Smith Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Smith Road has a mean operating speed in the range of <30 km/h.	
Speed limits on adjoining roads	The existing speed limits on adjoining roads are:	
	• Matakana Valley Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	1.53
Annual Daily Traffic	100

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	<1	1.00
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

The Infrastructure Risk Rating Score is 2.55. For rural areas this corresponds to an IRR band of High.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Smith Road is a self-explaining road as the mean operating speed (<30 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Smith Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the narrow and torturous nature of the road, its existing low operating speed (<30 km/h) and being mostly unsealed. The narrow and torturous nature of Smith Road also contribute to the roads 'High' IRR score, making it a high risk road.<sup>1</sup> Despite this, there have been no recorded crashes on Smith Road over the past five years. The low crash volume is likely due to the low traffic volumes (100 vpd) and low operating speed.

The mean operating speed on Smith Road is <30 km/h despite the existing 100 km/h speed limit. This means that the road is 'self-explaining' and drivers already recognise the existing speed limit is not suitable.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

After considering all the above factors, the existing speed limit of 100 km/h on Smith Road in Matakana, is not considered to be a safe and appropriate speed limit for this road.

Balancing all factors, the recommended safe and appropriate speed limit for Smith Road, Matakana is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<30 km/h) supports the reduction.

## Speed Limit Assessment – Takatu Road (Tawharanui)

Takatu Road, Tawharanui is divided into two sections as shown on the attached brochure and outlined as follows<sup>1</sup>:

- 1. Section 1: Takatu Road between Leigh Road and 2,000 m east of Baddeleys Beach Road
- 2. Section 2: Takatu Road between 2,000 m east of Baddeleys Beach Road and Tawharanui Regional Park

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections. The location of existing speed limits were also considered when creating the sections.

Both sections of Takatu Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The location of existing speed limits were also considered when creating the sections.

#### Step 1: Determine the base information

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
4.2(2) (a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the alisted below:</li> <li>New Zealand Transpondenagement Guide 2016</li> <li>Infrastructure Risk Rating</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for</li> </ul>	agency that has been included is port Agency (NZTA) Speed 3 g Manual 2016 (IRR) pr further information.
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	<ul> <li>Takatu Road is a two-way, two-I There are no pedestrian or cyclis there is no on-street parking alon</li> <li>This section of Takatu Road is classed as the following under the one network road classification (ONRC):</li> <li>Primary Collector: between Leigh Road and Whitmore Road</li> <li>Secondary Collector: between Whitmore Road and 2 km east of Baddeleys Beach Road</li> </ul>	ane, undivided and sealed road. st amenities along this road, and g Takatu Road. This section of Takatu Road is classed as a secondary collector under the ONRC. This section of Takatu Road provides a connection to the Tawharanui Peninsula and other rural properties in the area. The primary use of this section of road is to provide access Tawharanio Regional Park and any residential properties.

<sup>&</sup>lt;sup>1</sup> It is noted that the ONRC and MegaMaps sections differ from the proposed road sections. This is because AT has chosen to align the proposed speed limit changes with sections of similar road alignment (i.e. winding vs tortuous) as specified in the IRR.

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
	This section of Takatu Road provides a connection between Leigh Road and Matakana to two beachside townships.	The length of this section of road is 5.21 km.
	The primary use of the road is to provide connection to and from the roads used to access small rural communities	
	The length of this section of road is 6.89 km.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) was used to determine the crash history between 2015 and 2019. CAS includes crashes for all road users and therefore the crash risk for all road users was considered.	
	CAS records 10 crashes on this section of Takatu Road: six non- injury crash, two minor injury crashes and two serious injury crashes. The crashes on Takatu Road have resulted in four Death and Serious Injuries (DSIs).	CAS records one non-injury crash on this section of Takatu Road. Therefore, there are no DSIs.
(e) the characteristics of the road and roadsides; and	The following characteristics for using a combination of site du information.	r Takatu Road were determined rive-over footage and geomaps
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Winding</li> <li>Carriageway width: Medium lane (3.0 m to 3.5 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High/ moderate and includes frequent roll-over slopes and non-frangible point hazards between 5-10 m from road edge</li> </ul>	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent rollover slopes and some cliffs not covered by guardrail</li> </ul>

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	The adjacent land use is classified as Remote Rural using drive over footage. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry."
(g) the number of intersections and property accessways; and	<ul> <li>A combination of site drive over footage and geomaps information revealed the intersection density and access density for both sections.</li> <li>Intersection density: &lt;1 Intersection density: &lt;1 intersection per km</li> </ul>	
	Access Density: 5 to <10     access per km	Access density: 2 to <5     access per km
(h) traffic volume; and	<ul> <li>The traffic volume in average daily traffic (ADT) was determined from MegaMaps as:</li> <li>1,493 vehicles per day (vpd) between Leigh Road and Whitmore Road</li> <li>503 vpd between Whitmore Road and 2 km east of Baddeleys Beach Road</li> </ul>	The traffic volume in ADT was determined from MegaMaps as 171 vpd
(i) any planned modification to the road; and	There are currently no known planned modifications to Takatu Road.	
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula. One response specifically mentioned Takatu Road and was supportive of the proposed speed change.	
	Overall, six of the seven response speed limit changes for the area.	onses supported the suggested

Table 2: Additional Relevant Factors to Consider

Factor	Comment
Existing Speed Limit	The existing speed limit on Takatu Road is 100 km/h
MegaMaps Mean Operating Speed (km/h)	<ul> <li>Takatu Road has a mean operating speed in the range of:</li> <li>55-59 km/h between Leigh Road and Whitmore Road</li> <li>60-64 km/h between Whitmore Road and 2 km east of Baddeleys Beach Road</li> <li>40-44 km/h between 2 km east of Baddeleys Beach Road and Tawharanio Regional Park</li> </ul>
Speed Limit on Adjoining Roads	<ul> <li>The speed limits in the adjacent road network are:</li> <li>Leigh Road: 100 km/h (80 km/h in the 2019 bylaw)</li> <li>Omaha Flats Road: 80 km/h</li> <li>Whitmore Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> <li>Baddeleys Beach Road: 100 km/h (proposed to be lowered to be lowered to 80 km/h, discussed separately)</li> </ul>

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Section 1	Section 2
Crash Analysis Period (years)	5	5
Total injury crashes during period	4	0
DSI equivalents	1.81	0
Corridor Length (km)	6.89	5.21
Annual Daily Traffic	503 <sup>2</sup>	171

- Section 1
  - $\circ~$  The Collective Risk score is 0.05. For rural areas this corresponds to a Collective Risk band of Low Medium
  - $\circ~$  The Personal Risk score is 19.20. For rural areas this corresponds to a Personal Risk band of  ${\rm Medium~High}$
- Section 2
  - The Collective Risk score is 0.00. For rural areas this corresponds to a Collective Risk band of Low
  - $\circ~$  The Personal Risk score is 0.00. For rural areas this corresponds to a Personal Risk band of  ${\rm Low}$

<sup>&</sup>lt;sup>2</sup> This ADT is used in the calculation of Collective Risk, Personal Risk and IRR as it accounts for the majority of the section length and is a more accurate representation.

#### Step 3: Calculate the IRR score

Feature	Section 1		ture Section 1		Section 2	2
	Category	Risk Score	Category	Risk Score		
Road stereotype	Two lane undivided	3.70	Two lane undivided	3.70		
Road alignment	Winding	3.50	Tortuous			
Carriageway width	Medium lane, very narrow shoulder	1.79	Narrow lane, very narrow shoulder	2.01		
Roadside hazards	High, Moderate	3.71	High (both sides)	4.56		
Adjacent land use	Rural Residential	1.50	Remote Rural	1.00		
Intersection density (per km)	<1	1.00	<1	1.00		
Access density (per km)	5 to <10	1.06	2 to <5	1.03		
Traffic volume	<1,000 vpd	1.00	<1,000 vpd	1.00		

- Section 1: The Infrastructure Risk Rating Score is 1.83. For rural areas this corresponds to an IRR band of **Medium High**.
- Section 2: The Infrastructure Risk Rating Score is 2.02. For rural areas this corresponds to an IRR band of **High**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- Less than 80 km/h between Leigh Road and 2 km east of Baddeleys Beach Road (Section 1)
- Less than 80 km/h between 2 km east of Baddeleys Beach Road and Tawharanui Regional Park (Section 2)

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 80 km/h between Leigh Road and 2,000 m east of Baddeleys Beach Road (Section 1)
- 60 km/h between 2,000 m east of Baddeleys Beach Road and Tawharanui Regional Park (Section 2)

Takatu Road is a self-explaining road as the mean operating speeds (<65 km/h and <45 km/h) are already below the proposed safe and appropriate speeds, despite the existing 100 km/h speed limit. Engineering up of Takatu Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume road. The cost to do this would substantially outweigh any benefits.

An 80 km/h speed limit is proposed for the first section of Takatu Road, despite the Speed Management Guide recommendation of less than 80 km/h to ensure consistency with the surrounding network (Leigh Road and Omha Flats Road), provide differentiation from the more torturous and hazardous section of Takatu Road (Section 2), and ensure compliance with the new speed limit. A reduction to 80 km/h is warranted due to the winding nature of this section of Takatu Road, the mean operating speed (<65 km/h), and the 85<sup>th</sup> percentile operating speed of 75 km/h. The nature of the

road contributes to the sections 'Medium-High' IRR score, 'Low-Medium' Collective Risk and 'Medium-High' Personal Risk. making it a high risk section of road.<sup>3</sup>

A proposed speed limit of 60 km/h was selected for 2 km east of Baddeleys Beach Road to Tawharanui Regional Park due to the narrow, torturous and hazardous nature of the road, regular curve advisory signs of 35 km/h around bends and the low mean operating speed (<45 km/h). The narrow, torturous and hazardous nature of this section of Takatu Road contributes to the sections 'High' IRR score, making it a high risk section of road.

The high risk nature of Takatu Road is reflected in its crash history. Over the past five years 11 crashes have been recorded, resulting in four DSIs. This suggests that the narrow, torturous and hazardous nature of the road does not allow for when people make mistakes.

After considering all the above factors, the existing speed limit of 100 km/h on Takatu Road in Tawharanui, is not considered to be a safe and appropriate speed limit for this section of road.

The recommended safe and appropriate speed limits for Takatu Road, Tawharanui are:

- 80 km/h between Leigh Road and 2 km east of Baddeleys Beach Road
- 60 km/h between 2 km east of Baddeleys Beach Road and Tawharanui Regional Park

<sup>&</sup>lt;sup>3</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

### Speed Limit Review - Tram Valley Road (Swanson)

The speed limit on Tram Valley Road, Swanson (full length, as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule) and is in alignment with the Process Summary document attached.

Tram Valley Road has been assessed as one section for the entire length of road.

The reason for this is align with the appropriate and self-explaining philosophy outlined within the Speed Management Guide and IRR. The 50 km/h section between Christian Road and 430 m southwest of Christian Road (UTA Boundary), outlined in the 2019 bylaw, only represents a small section of Tram Valley Road in order to accommodate future potential development growth surrounding Christian Road. It has not taken into consideration the homogeneity of Tram Valley Road. For example, the first 430m of Tram Valley Road is similar in characteristics to the rest of Tram Valley Road and therefore it is not consistent for drivers travelling this road.

#### Step 1: Determine the base information

Requirement	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Tram Valley Road is classified as a primary collector road under the one network road classification (ONRC). However, the road functions as a secondary collector road due to its connectivity.	
	Tram Valley Road is a two-way, narrow two-lane, undivided and sealed road. Tram Valley Road is a dead-end road which provides connection from Christian Road to rural residential properties.	
	Tram Valley Road has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this section of road is to provide access to rural residential properties. Tram Valley Road is approximately 2.4 km in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records one minor injury crash between 2015 to 2019. Tram Valley Road therefore has no Death and Serious Injury (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Tram Valley Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High with dense vegetation, poor visibility, narrow sections, roll over slopes and power poles.</li> </ul>	

Requirement	Comments
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. Tram Valley Road was observed to have only occasional intersections and numerous accesses present. Surrounding land is rural with accesses to rural houses and a number of residential accesses at the termination point. The IRR defines Rural Residential as <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	Access density: 5 to <10 accesses per km
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 1,615 vehicles per day (vpd). No AT traffic count data is available for this road
(i) any planned modification to the road; and	There are no known planned modifications to Tram Valley Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September to 14 October 2018. Four responses were received regarding the suggested speed limit changes in the Swanson South area, and all responses were supportive of the suggested speed limit changes.
	None of the responses specifically mentioned Tram Valley Road.

#### Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The existing speed limit on Tram Valley Road, is:	
	<ul> <li>50 km/h between Christian Road and 430 m southwest of Christian Road (UTA Boundary)</li> <li>100 km/h between 430 m southwest of Christian Road (UTA Boundary) and southwest end of Tram Valley Road</li> <li>Prior to the 2019 speed bylaw implementation the speed limit was 100 km/h</li> </ul>	
MegaMaps Mean Operating Speed (km/h)	Tram Valley Road has a mean operating speed in the range of 45-49 km/h.	
Speed limits on adjoining roads	The speed limit on the immediately adjoining road, Christian Road, is 50 km/h.	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	1
DSI equivalents	0.33
Corridor Length (km)	2.40
Annual Daily Traffic	

The Collective Risk score is 0.03, and the Personal Risk score is 4.70. For rural areas this corresponds to a Collective Risk band of **Low Medium**, and a Personal Risk band of **Low Medium**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane and very narrow shoulder (0 to <0.5m)	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	<1	1.00
Access density (per km)	5 to <10	1.06

Feature	Category	Risk Score
Traffic volume	1,000 to <6,000 vpd	1.40

The Infrastructure Risk Rating Score is 2.27. For rural areas this corresponds to an IRR band of High.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation = 60 km/h for the entire length of Tram Valley Road

Tram Valley Road is a self-explaining road as the mean operating speed (<50 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Tram Valley Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 60 km/h was selected due to the narrow, sealed and torturous nature of the road, and its existing low operating speed (<50 km/h). The narrow, torturous and hazardous nature of Tram Valley Road also contribute to the roads "High" IRR score, making it a high risk road.<sup>1</sup> Despite this, there has only been one recorded crash (minor injury) on Tram Valley Road over the past five years. The low crash volume is likely due to low operating speeds, and people taking care along the road.

It is not proposed to keep the 50 km/h speed limit on the first section of Tram Valley Road due to its rural nature (despite that section being in the Urban Traffic Area), and to ensure consistency with other rural speed limits and the Speed Management Guide. In particular, the speed limit of 50km/h is not considered safe or appropriate in relation to the remaining length of Tram Valley Road.

After considering all the above factors, the speed limit of 50km/h and 100 km/h on Tram Valley Road in Swanson, is not considered to be a safe and appropriate speed limit.

Balancing all factors, the recommended safe and appropriate speed limit for Tram Valley Road, Swanson is 60 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<50 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

### Speed Limit Review -- Ward Road (Matakana)

The speed limit on Ward Road, Matakana (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Requirements	Comments	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Ward Road is classified as an access road under the one network road classification (ONRC). Ward Road is a narrow, two-lane*, undivided cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Ward Road.	
	Ward Road connects to Matakana Valley Road to the west and provides access to residential properties. The primary use of the road is to provide access to rural residential properties. Ward Road is approximately 650 m in length.	
	*with one lane bridges	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 and 2019. CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Ward Road were determined using a combination of site drive-over information and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided</li> <li>Road alignment: Straight</li> <li>Carriageway width: Narrow lane (&lt;3.0m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: High and includes non-frangible trees and poles within 10m of the road edge.</li> </ul>	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using a combination of site drive-over information and geomaps information. The IRR defines Rural Residential as <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>	

Requirements	Comments
(g) the number of intersections and property accessways; and	A combination of Google Street View and geomaps information revealed:
	<ul> <li>Intersection density: 1 to &lt;2 intersection per km</li> <li>Access density: 20+ accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 112 vehicles per day (vpd). No AT traffic count data is available for this road. This level of traffic volume is consistent with the rural, cul-de-sac nature of the road.
(i) any planned modification to the road; and	There are no known planned modifications to Ward Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. 12 responses were received regarding speed limit changes in Matakana North. One response specifically mentioned Ward Road and was supportive of the suggested speed reduction.
	Overall, four responses supported the suggested changes to the Matakana North area, three opposed the suggested changes, and five had suggestions for speed changes outside of the scope.

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The existing speed limit on Ward Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Ward Road has a mean operating speed in the range of 30-34 km/h.	
Speed limits on adjoining roads	The existing speed limits on adjoining roads are:	
	<ul> <li>Matakana Valley Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> </ul>	

### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.65
Annual Daily Traffic	112

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Straight	1.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	1 to <2	1.15
Access density (per km)	20+	1.30
Traffic volume	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

The Infrastructure Risk Rating Score is 1.49. For rural areas this corresponds to an IRR band of **Medium**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation = 40 km/h

Ward Road is a self-explaining road as the mean operating speed (<35 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Ward Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the short, narrow, and residential nature of the road, and its existing low operating speed (<35 km/h). Ward Road is a relatively low risk road, and this is reflected in the 'Medium' IRR score, 'Low' Collective Risk and 'Low' Personal Risk. There have been no recorded crashes on Ward Road over the past five years. The low crash volume is likely due to the low traffic volumes (112 vpd) and low operating speed.

After considering all the above factors, the existing speed limit of 100 km/h on Ward Road in Matakana, is not considered to be a safe and appropriate speed limit for this road.

Balancing all factors, the recommended safe and appropriate speed limit for Ward Road, Matakana is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (30-34 km/h) also supports the reduction.

### Speed Limit Review - Welsh Hills Road (Swanson)

The speed limit on Welsh Hills Road, Swanson (full length, as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Requirement	<u>Comments</u>	
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>	
	Refer to the Process Summary for further information.	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	
(c) the function and use of the road; and	Welsh Hills Road is classified as Primary Collector road under the one network road classification (ONRC). However, it functions more as an access road.	
	Welsh Hills Road is a two-way, narrow two-lane, undivided, unmarked and sealed road. Welsh Hills Road is a dead-end road which provides connection from Christian Road to rural residential properties. A private access is located at the end of the road which is unsealed and has a recommended speed limit of 30 km//h (not a public road and therefore not enforceable).	
	Welsh Hills Road has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this section of road is to provide access to rural residential properties. Welsh Hills Road is approximately 300 m in length.	
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records no crashes between 2015 to 2019.CAS includes crashes for all road users and therefore crash risk for all road users were considered.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Welsh Hills Road were determined using a combination of site drive-over footage and geomaps information.	
	<ul> <li>Road stereotype: Two lane undivided road,</li> <li>Road alignment: Curved</li> <li>Carriageway width: Narrow and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: High with vegetation and roll over slopes.</li> </ul>	

Requirement	<u>Comments</u>
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."
	Welsh Hills Road was observed to have only occasional intersections and numerous accesses present. Surrounding land is rural with accesses to rural houses and a number of residential accesses at the termination point. As stated, the road is narrow with virtually no shoulders or berms.
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:
	<ul> <li>Intersection density:2 to &lt;3 intersection per km</li> <li>Access density: 10 to &lt;20 accesses per km</li> </ul>
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 1,277 vehicles per day (vpd). No AT traffic count data was available for this road. This is thought to be quite high for a dead-end road, and we would expect it to be less than 1,000 vpd.
(i) any planned modification to the road; and	There are no known planned modifications to Welsh Hills Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September to 14 October 2018. Four responses were received regarding the suggested speed limit changes in the Swanson South area, and all responses were supportive of the suggested speed limit changes.
	None of the responses specifically mentioned Welsh Hills Road.

Table 2: Additional Relevant Factors

AT also had regard to		
Current speed limit	The speed limit on Welsh Hills Road is 80 km/h.	
MegaMaps Mean Operating Speed (km/h)	Welsh Hills Road has a mean operating speed in the range of 35-39 km/h.	
Speed limits on adjoining roads	The speed limits on immediately adjoining road, Christian Road is 80 km/h. However, it is proposed to be lowered to 60 km/h (as will be discussed separately).	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	0
DSI equivalents	0
Corridor Length (km)	0.30
Annual Daily Traffic	1,277

The Collective Risk score is 0.00, as is the Personal Risk. For rural areas this corresponds to a Collective Risk band of **Low**, and a Personal Risk band of **Low**.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Two lane undivided	3.70
Road alignment	Curved	1.80
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	2 to <3	1.25
Access density (per km)	10 to <20	1.10
Traffic volume	1,000 to <6,000 vpd	1.40

The Infrastructure Risk Rating Score is 1.86. For rural areas this corresponds to an IRR band of **Medium High**.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 60 km/h

Welsh Hills Road is a self-explaining road as the mean operating speed (<40 km/h) is already below the proposed safe and appropriate speed, despite the existing 80 km/h speed limit. Engineering up of

Welsh Hills Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a relatively low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 60 km/h is recommended due to the narrow, unmarked and undivided nature of the road. The narrow, curved and hazardous nature of Welsh Hills Road, along with its high access density, contribute to the roads "Medium-High" IRR score, making it a high risk road.<sup>1</sup> Despite this, there are no recorded crashes on Welsh Hills Road over the past five years. The low crash volume is likely due to low operating speeds.

After considering all the above factors, the existing speed limit of 80km/h on Welsh Hills Road in Swanson, is not considered to be a safe and appropriate speed limit.

Balancing all factors, the recommended safe and appropriate speed limit for Welsh Hills Road, Swanson is 60 km/h. This aligns with the suggested by the Speed Management Guide (60km/h) and the low operating speed (<40 km/h) supports the reduction.

<sup>&</sup>lt;sup>1</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High
## Speed Limit Assessment – Whitmore Road (Tawharanui)

Whitmore Road, Tawharanui was divided into two sections as shown on the attached drawing brochure and outlined as follows:

- 1. Section 1: Whitmore Road between Takatu Road and 1,040 m north of Buckleton Road
- 2. Section 2: Whitmore Road between 1,040 m north of Buckleton Road and Buckleton Road

These sections were chosen to create homogenous road sections that have consistent features (adjacent land use, access density, nature of the road, etc). Therefore, people can understand the reason for a speed limit change when they move between sections. The location of existing speed limits was also considered when creating the sections.

Both sections of Takatu Road have been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments	
	Section 1 (as applicable)	Section 2 (as applicable)
4.2(2) (a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the agency that has been included is listed below:</li> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for further information.</li> </ul>	
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.	

Requirement	Comments		
	Section 1 (as applicable)         Section 2 (as applicable)		
(c) the function and use of the road; and	Whitmore Road is classed as the following under the one network road classification (ONRC):		
	<ul> <li>Secondary Collector: between Takatu Road and 1.2 km north of Bishop Lane (in Section 1)</li> <li>Access: between 1.2 km north of Bishop Lane and Buckleton Road (in Section 1 and Section 2)</li> </ul>		
	Previously the road seal ended at 1.2 km north of Bishop Lane, hence the ONRC classification boundary however it is now it is sealed its entire length. Other features change approx. 1,040 m north of Buckleton Road, hence the new proposed speed limit division.		
	Whitmore Road is a two-way, two-lane, undivided road. Following recent seal extensions, it is sealed for its entire length. There are no pedestrian or cyclist amenities along this road, and there is no on-street parking along Whitmore Road.		
	The main purpose of the road is to provide a connection between Takatu Road to Buckleton Beach and the Buckleton Beach township. It also provides access to the rural residential properties on the road. Pedestrian activity was observed on site within the township.		
	This section of Whitmore Road is 3.83 km in length.This section of Whitmore Road is 1.04 km in length.		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) was used to determine the crash history between 2015 and 2019. CAS includes crashes for all road users and therefore the crash risk for all road users was considered.		
	CAS records three crashes on this section of Whitmore Road: two non-injury crashes, and one minor injury crash. These crashes have not resulted in Death or Serious Injury (DSI).	CAS records one minor crash on this section of Whitmore Road. There have been no DSIs.	
(e) the characteristics of the road and roadsides; and	The following characteristics for Whitmore Road were determined using a combination of site drive-over footage and geomaps information:		
	<ul> <li>Road Stereotype: Two lane undivided</li> <li>Road Alignment: Winding</li> <li>Carriageway Width: Medium lane (3.0m to 3.5m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside Hazards: High/ moderate and includes frequent roll-over slopes and non-frangible point hazards between 5-10m from road edge</li> </ul>	<ul> <li>Road Stereotype: Two lane undivided</li> <li>Road Alignment: Curved</li> <li>Carriageway Width: Medium lane (3.0m to 3.5m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside Hazards: Severe/ moderate and includes residential properties and non- frangible point hazards</li> </ul>	

Requirement	Comments		
	Section 1 (as applicable)	Section 2 (as applicable)	
		within 5m of the road edge and roll over slopes	
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using drive over footage. The IRR defines Rural Residential as "Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."	The adjacent land use is classified as Rural Towns using drive over footage. The IRR defines Rural Towns as <i>"Rural</i> <i>town with mixture of residential</i> <i>and some shops. Some</i> <i>intersections and accesses are</i> <i>present. Some pedestrian and</i> <i>cyclist activity may also be</i> <i>present."</i>	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed the intersection density and access density for both sections.		
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 10 to &lt;20 access per km</li> </ul>	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 20+ access per km</li> </ul>	
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as:	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as:	
	<ul> <li>215 vehicles per day (vpd) between Takatu Road and 1.2 km north of Bishop Lane</li> </ul>	<ul> <li>135 vpd between 1.2 km north of Bishop Lane and 350 m north of Buckleton Road</li> <li>114 vpd between 350 m north of Buckleton Road and Buckleton Road</li> </ul>	
(i) any planned modification to the road; and	There are no known planned modifications to Whitmore Road.		
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Seven responses were received regarding the suggested speed limit changes in the Tawharanui Peninsula, and all seven responses specifically mentioned Whitmore Road. Four responses supported the proposed changes, two supported the changes but suggested an 80km/h speed limit, and one response opposed the proposed speed limit changes.		

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

#### Table 2: Additional Relevant Factors to Consider

Factor	Comment	
Existing Speed Limit	<ul> <li>The current speed limit on Whitmore Road is:</li> <li>100 km/h between Takatu Road and 1.2km north of Bishop Lane</li> <li>50 km/h between 1.2km north of Bishop Lane and Buckleton Road</li> </ul>	
MegaMaps Mean Operating Speed (km/h)	<ul> <li>Whitmore Road has a mean operating speed in the range of:</li> <li>40-44 km/h between Takatu Road and 1.2 km north of Bishop Lane</li> <li>35-39 km/h between 1.2 km north of Bishop Lane and 350 m north of Buckleton Road (data predates seal extension)</li> <li>&lt;30 km/h between 350 m north of Buckleton Road and Buckleton Road</li> </ul>	
Speed Limit on Adjoining Roads	<ul> <li>The speed limits in the adjacent road network are:</li> <li>Takatu Road: 100 km/h (proposed to be lowered to 80 km/h, discussed separately)</li> <li>Haywood Lane: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> <li>Bishop Lane: 100 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> <li>Buckleton Road: 50 km/h (proposed to be lowered to 40 km/h, discussed separately)</li> </ul>	

#### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Section 1	Section 2
Crash Analysis Period (years)	5	5
Total injury crashes during period	1	1
DSI equivalents	0.33	0.26
Corridor Length (km)	3.83	1.04
Annual Daily Traffic	215	135

- Section 1
  - $_{\odot}$   $\,$  The Collective Risk score is 0.02. This corresponds to a Collective Risk band of Low
  - $\circ~$  The Personal Risk score is 22.00. This corresponds to a Personal Risk band of  $Medium^1$
- Section 2

<sup>&</sup>lt;sup>1</sup> Where Personal Risk is >=20, and has only 1 injury crash, Personal Risk is categorised as "Medium".

- The Collective Risk score is 0.05. For rural areas this corresponds to a Collective Risk band of Low Medium
- The Personal Risk score is 101.50. For rural areas this corresponds to a Personal Risk band of Medium<sup>2</sup>

#### Step 3: Calculate the IRR score

Feature	Section 1		Section 2	
	Category	Risk Score	Category	Risk Score
Road stereotype	Two lane undivided	3.70	Two lane undivided	3.70
Road alignment	Winding	3.50	Curved	1.80
Carriageway width	Medium lane, very narrow shoulder	1.79	Medium lane, very narrow shoulder	1.79
Roadside hazards	High, Moderate	3.71	Severe, Moderate	5.08
Adjacent land use	Rural Residential	1.50	Rural Town	2.50
Intersection density (per km)	<1	1.00	<1	1.00
Access density (per km)	10 to <20	1.10	+20	1.30
Traffic volume	<1,000 vpd	1.00	<1,000 vpd	1.00

- Section 1: The Infrastructure Risk Rating Score is 1.85. For rural areas this corresponds to an IRR band of **Medium High**.
- Section 2: The Infrastructure Risk Rating Score is 1.97. For urban areas<sup>3</sup> this corresponds to an IRR band of **Low Medium**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is:

- Less than 80 km/h between Takatu Road and 1,040 m north of Buckleton Road
- Less than 50 km/h between 1,040 m north of Buckleton Road and Buckleton Road

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation:

- 60 km/h between Takatu Road and 1,040 m north of Buckleton Road (Section 1)
- 40 km/h between 1,040 m north of Buckleton Road and Buckleton Road (Section 2)

<sup>&</sup>lt;sup>2</sup> As above

<sup>&</sup>lt;sup>3</sup> The Infrastructure Risk Rating (IRR) Manual states that "Urban thresholds are applied to corridors that are coded with the following land use categories: Commercial Big Box/ Industrial, Commercial Strip Shopping, Urban Residential, Controlled Access, and Rural Town."

Whitmore Road is a self-explaining road as the mean operating speed (<45 km/h) is already at, or below, the proposed safe and appropriate speeds, despite the existing posted speed limits of 100 km/h and 50 km/h. Engineering up of Whitmore Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 60 km/h was selected for Whitmore Road, between Takatu Road and 1,040 m north of Buckleton Road, due to its winding and hazardous nature, and the low mean operating speed (<45 km/h), and the recent seal extension. The winding and hazardous nature of this section of Whitmore Road also contributes to the sections 'Medium-High' IRR score, making it a high-risk section of road.<sup>4</sup>

A proposed speed limit of 40km/h was selected for Whitmore Road, between 1,040m north of Buckleton Road and Buckleton Road, due to the changing surrounding land use, growth in residential development and proximity to the existing township. The growth in residential development has led to more driveway accesses and greater likelihood of pedestrians using the road edge to access the beach. The township itself also has a concentration of active road users. This section of Whitmore Road is relatively low risk, and this is reflected in the 'Low-Medium' IRR score, 'Low' Collective Risk and 'Medium' Personal Risk.

Despite the majority of the road being classed as a high-risk road, there have only been four crashes recorded over the past five years, none of which resulted in any DSIs. This is likely due to the existing low mean operating speeds.

After considering all the above factors, the current speed limits on these sections of Whitmore Road are not considered to be a safe and appropriate speed limit for these sections.

Balancing all factors, the recommended safe and appropriate speed limits for Whitmore Road, Tawharanui are:

- 60 km/h between Takatu Road and 1,040 m north of Buckleton Road
- 40 km/h between 1,040 m north of Buckleton Road and Buckleton Road

This aligns with the Speed Management Guide (< 80 km/h and < 50km/h respectively) and the low operating speeds also support the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limits will also reduce the potential and severity of crash risk for all road users.

<sup>&</sup>lt;sup>4</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

### Speed Limit Review -- Wilson Road (Warkworth)

The speed limit on Wilson Road, Warkworth (the section of road from Hepburn Creek Road to the eastern end of Wilson Road, as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments		
(a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> </ul>		
	Refer to the Process Summary for further information.		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Wilson Road is classified as a secondary collector road under the one network road classification (ONRC), however, functions more as an Access Road. Wilson road is a two-way, two-lane, undivided and unsealed cul-de-sac. There are no pedestrian or cyclist amenities along this road. There is no on-street parking along Wilson Road. A heritage site (old cement works) and a small marina are located at the end of Wilson Road.		
	Wilson Road connects to Hepburn Creek Road to the west and provides access to residential properties and the Mahurangi River. The primary use of the road is to provide access to rural residential properties. Wilson Road is approximately 900 m in length.		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records seven crashes between 2015 and 2019: one serious crash, one minor injury crash and five non-injury crashes. Wilson Road therefore has one Death and Serious Injury (DSi). CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
(e) the characteristics of the road and roadsides; and	The following characteristics for Wilson Road were determined using a combination of site drive-over footage and geomaps information.		
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Tortuous</li> <li>Carriageway width: Narrow lane (&lt;3.0 m) and very narrow shoulder (0 to &lt;0.5 m)</li> <li>Roadside hazards: High and includes frequent roll-over slopes and vegetation</li> </ul>		

Requirement	Comments	
(f) adjacent land use; and	The adjacent land use is classified as Remote Rural using the drive over footage. The IRR defines Remote Rural as "Only occasional accesses and intersections are present. Surrounding land is rural with few houses and almost no industry."	
	Wilson Road was observed to have only occasional accesses and intersections present. Surrounding land is rural with few houses and almost no industry. A historic cement works is located at the end of Wilson Road.	
(g) the number of intersections and property accessways; and	A combination of site drive over footage and geomaps information revealed:	
	<ul> <li>Intersection density: &lt;1 intersection per km</li> <li>Access density: 1 to &lt;2 accesses per km</li> </ul>	
(h) traffic volume; and	Average daily traffic (ADT) was determined from MegaMaps as 149 vehicles per day (vpd). No AT traffic count data is available for this section of road. This level of traffic volume is consistent with the rural, cul-de-sac nature of the road.	
(i) any planned modification to the road; and	There are no known planned modifications to Wilson Road.	
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Two responses were received regarding speed limit changes in South East Warkworth. Both responses support the proposed lowering of the speed limit. Only one response specifically mentioned Wilson Road.	

In addition to the factors outlined in Table 1, further relevant information was sought as summarised in Table 2 below.

Table 2: Additional Relevant Factors

AT also had regard to	
Current speed limit	The existing speed limit on Wilson Road between Hepburn Creek Road and the eastern end of Wilson Road is 50 km/h.
MegaMaps Mean Operating Speed (km/h)	Wilson Road has a mean operating speed in the range of 30-34 km/h.
Speed limits on adjoining roads	The existing speed limit on the adjoining Hepburn Creek Road, Pulham Road, and Wilson Road West is 50 km/h.

### Step 2: Determine the road safety metrics

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	2

DSI equivalents	0.66
Corridor Length (km)	0.89
Annual Daily Traffic	149

The Collective Risk score is 0.15, and the Personal Risk score is 272.7. For rural areas this corresponds to a Collective Risk band of **Medium**<sup>1</sup>, and a Personal Risk band of **Medium High**<sup>2</sup>.

#### Step 3: Calculate the IRR score

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Tortuous	6.00
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Remote Rural	1.00
Intersection density (per km)	<1	1.00
Access density (per km)	1 to <2	1.01
Traffic volume	<1,000 vpd	1.00

The Infrastructure Risk Rating Score is 2.35. For rural areas this corresponds to an IRR band of **High**.

# Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

Proposed safe and appropriate speed limit recommendation = 40 km/h

Wilson Road is a self-explaining road as the mean operating speed (<35 km/h) is already below the proposed safe and appropriate speed, despite the existing 50 km/h posted speed limit. Engineering up of Wilson Road was considered, but dismissed due to the substantial and costly upgrades that would

<sup>&</sup>lt;sup>1</sup> The Collective Risk score for rural roads generally does not exceed 0.50 and the risk banding reflects this. For further information please refer to the "High safety risk – corridors" section of the NZTA's Safety risk definitions for results alignment webpage.

<sup>&</sup>lt;sup>2</sup> Where Personal Risk is >=20, and has only 2 injury crashes, Personal Risk is categorised as "Medium High".

be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected due to the narrow, unsealed and torturous nature of the road, and its existing low operating speed (<35 km/h). The narrow, unsealed and torturous nature of Wilson Road also contribute to the roads 'High' IRR score, making it a high risk road.<sup>3</sup> This is particularly apparent considering there have been seven crashes, resulting in one DSI, on this relatively short (0.89 km) and low volume (149 vpd) section of road over the past five years.

After considering all the above factors, the existing speed limit of 50 km/h on Wilson Road in Warkworth, is not considered to be a safe and appropriate speed limit for this section of road.

Balancing all factors, the recommended safe and appropriate speed limit for Wilson Road, Warkworth is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<35 km/h) supports the reduction.

Lowering the speed limit improves the credibility of speed limit setting and assists in explaining safe travel speeds better to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.

<sup>&</sup>lt;sup>3</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

## Speed Limit Review – Yelash Road (Massey West)

The speed limit on Yelash Road, Massey West (as shown on the attached brochure) has been reviewed in accordance with the Land Transport Rule: Setting of Speed Limits 2017 (Setting of Speed Limits Rule). The review process is outlined in the Process Summary document attached.

#### Step 1: Determine the base information

Table 1: Setting of Speed Limits Rule Summary of Relevant Requirements (4.2(2))

Requirement	Comments		
4.2(2) (a) the information about speed management developed and maintained by the Agency; and:	<ul> <li>The information provided by the agency that has been included is listed below:</li> <li>New Zealand Transport Agency (NZTA) Speed Management Guide 2016</li> <li>Infrastructure Risk Rating Manual 2016 (IRR)</li> <li>NZTA MegaMaps tool</li> <li>Refer to the Process Summary for further information.</li> </ul>		
(b) any relevant guidance on speed management provided by the Agency; and	The NZTA Speed Management Guide was used for the review and consideration of the speed limit.		
(c) the function and use of the road; and	Yelash Road is classified as an Access road under the one network road classification (ONRC). It is a two-way, narrow two-lane, undivided, unsealed road. Yelash Road is a dead-end road which provides connection from Birdwood Road to rural residential properties.		
	Yelash Road has no pedestrian or cyclist amenities and very narrow shoulders. The primary use of this section of road is to provide access to rural residential properties. Yelash Road is approximately 780 m in length.		
(d) crash risk for all road users; and	NZTA's Crash Analysis System (CAS) records one minor injury crash between 2015 to 2019, and no Deaths or Serious Injuries (DSI). CAS includes crashes for all road users and therefore crash risk for all road users were considered.		
(e) the characteristics of the road and roadsides; and	The following characteristics for Yelash Road were determined using a combination of site drive-over footage and geomaps information:		
	<ul> <li>Road stereotype: Unsealed</li> <li>Road alignment: Curved</li> <li>Carriageway width: Narrow lane (&lt;3.0m) and very narrow shoulder (0 to &lt;0.5m)</li> <li>Roadside hazards: High and includes frequent roll-over slopes and vegetation</li> </ul>		
(f) adjacent land use; and	The adjacent land use is classified as Rural Residential using the drive over footage. The IRR defines Rural Residential as a <i>"Rural area with accesses present to private dwellings and farms. There may be the occasional industry/ factory present. Some pedestrian and cyclist activity may also be present, particularly at certain times of the day, but with few crossing movements."</i>		

Requirement	Comments
(g) the number of intersections and property accessways; and	The following were determined using a combination of site drive over footage and geomaps information:
	<ul> <li>Intersection density: 1 to &lt;2 intersection per km</li> <li>Access density: 5 to &lt;10 accesses per km</li> </ul>
(h) traffic volume; and	The traffic volume in average daily traffic (ADT) was determined from MegaMaps as 254 vehicles per day (vpd). This is consistent with the AT traffic count data 7-day ADT of 237 vpd (survey started 09/11/2015). This level of traffic volume is consistent with the nature of this road.
(i) any planned modification to the road; and	There are no known planned modifications to Yelash Road.
(j) the views of interested persons and groups.	Potential changes to the speed limit in this area were discussed from 25 September 2018 to 14 October 2018. Only one response was received regarding the proposed speed limit changes in the Massey West area, and it supported the proposed changes. However, the response did not specifically mention Yelash Road.

In addition to the factors outlined in Table 1, further relevant information has been assessed and is summarised in Table 2 below.

Table 2: Additional Relevant Factors to Consider

Factor	Comment	
Current Speed Limit	The speed limit on Yelash Road is 100 km/h.	
MegaMaps Mean Operating Speed (km/h)	Yelash Road has a mean operating speed in the range of 30-34 km/h.	
Speed Limit on Adjoining	The speed limit on the adjacent road network is:	
Roads	<ul> <li>Birdwood Road: 100 km/h (proposed to be lowered to 60 km/h, discussed separately)</li> </ul>	

Step 2	2: [	Determine	the	road	safety	metrics
0100				1044	Juist	111011100

Required Information for safety metrics calculations	Data
Crash Analysis Period (years)	5
Total injury crashes during period	1
DSI equivalents	0.33
Corridor Length (km)	0.78
Annual Daily Traffic	254

The Collective Risk score is 0.08, and the Personal Risk score is 91.3. For rural areas this corresponds to a Collective Risk band of **Medium**<sup>1</sup>, and a Personal Risk band of **Medium**<sup>2</sup>.

Feature	Category	Risk Score
Road stereotype	Unsealed	10.00
Road alignment	Curved	1.80
Carriageway width	Narrow lane, very narrow shoulder	2.01
Roadside hazards	High, Moderate	3.71
Adjacent land use	Rural Residential	1.50
Intersection density (per km)	1 to <2	1.15
Access density (per km)	5 to <10	1.06
Traffic volume	<1,000 vpd	1.00

#### Step 3: Calculate the IRR score

The Infrastructure Risk Rating Score is 2.09. For rural areas this corresponds to an IRR band of High.

## Step 4: Identify the recommended safe and appropriate speed using the speed management guide tables

The safe and appropriate speed recommended by Table 2.2 of the Speed Management Guide is less than 80 km/h.

#### Step 5: Conclusion

#### Proposed safe and appropriate speed limit recommendation = 40 km/h

Yelash Road is a self-explaining road as the mean operating speed (<35 km/h) is already below the proposed safe and appropriate speed, despite the existing 100 km/h speed limit. Engineering up of Yelash Road was considered, but dismissed due to the substantial and costly upgrades that would be required for what is a low volume access road. The cost to do this would substantially outweigh any benefits.

A proposed speed limit of 40 km/h was selected primarily due to the narrow, unsealed, self explaining and hazardous nature of the road, and its existing low operating speed (<35 km/h). The narrow, unsealed and hazardous nature of Yelash Road also contributes to the roads 'High' IRR score, making it a high risk road.<sup>3</sup>. Despite the high risk nature of the road, there has only been one minor injury crash

<sup>&</sup>lt;sup>1</sup> The Collective Risk score for rural roads generally does not exceed 0.50 and the risk banding reflects this. For further information please refer to the "High safety risk – corridors" section of the NZTA's Safety risk definitions for results alignment webpage.

<sup>&</sup>lt;sup>2</sup> Where Personal Risk is >=20, and has only 1 injury crash, Personal Risk is categorised as "Medium".

<sup>&</sup>lt;sup>3</sup> A road is high risk if either the Personal Risk, Collective Risk, or Infrastructure Risk Rating is Medium-High or High

recorded over the past five years. This is likely due to low vehicle numbers (149 vpd) and low operating speeds.

After considering all the above factors, the existing speed limit of 100 km/h on Yelash Road in Massey West, is not considered to be a safe and appropriate speed limit for this road.

The recommended safe and appropriate speed limit for Yelash Road, Massey West is 40 km/h. This aligns with the Speed Management Guide (<80 km/h) and the low operating speed (<35 km/h) also supports the reduction.

Lowering the speed limit will improve the credibility of speed limit setting and assist in explaining safe travel speeds to visiting drivers. The reduced speed limit will also reduce the potential and severity of crash risk for all road users.