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Taihape-Napier Road Corridor Management Plan

16 October 2020

CONFIDENTIAL



DRAFT FOR COMMENT



RANGITIKEI
DISTRICT COUNCIL



HASTINGS
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Abbreviations

ADT	Average Daily Traffic
AMP	Asset Management Plan
ATP	Audio Tactile Pavers
CAS	Crash Analysis System
CLoS	Customer Level of Service
CMP	Corridor Management Plan
DSI	Death and Serious Injury
GIS	Geographic Information Systems
FWP	Forward Works Programme
HCV	Heavy Commercial Vehicle
HDC	Hastings District Council
HPMV	High Productivity Motor Vehicles
IRR	Infrastructure Risk Rating
LTP	Long Term Plan
MBIE	Ministry of Business, Innovation and Employment
NZCT	New Zealand Cycle Trail
ONRC	One Network Road Classification
OTT	Ohakune-Taihape Trail
PoE	Point of Entry
RAMM	Road Assessment and Maintenance Management
RDC	Rangitikei District Council
RP	Road Position
RRPM	Raised Reflective Pavement Markers
SH	State Highway
TNZ	Tourism New Zealand
VPD	Vehicles Per Day

Disclaimers and Limitations

This report (**'Report'**) has been prepared by WSP exclusively for Rangitikei and Hastings District Councils (**'Client'**) in relation to the development of a Corridor Management Plan for Taihape-Napier Road (**'Purpose'**) and in accordance with the IPENZ Short Form Agreement dated 19th February 2020. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing the Report, WSP has relied upon data, surveys, analyses, designs, plans and other information (**'Client Data'**) provided by or on behalf of the Client. Except as otherwise stated in the Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable in relation to incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

Executive Summary

Purpose

The purpose of the Taihape-Napier Road Corridor Management Plan (CMP) is to assess corridor conditions and demand for access to guide future transport initiatives within the study area. The CMP provides an outline of the need for investment, and the proposed approach/implementation plan for resolving those issues or problems identified.

The CMP has been developed in a staged approach, as outlined within the following steps:

- Assess current corridor conditions and existing/future demand for access within the study area, how it is (or will be) expected to perform, against its ONRC expectations;
- Identify constraints and opportunities for implementing improvements to the study area; and locations where customer expectations, desirable standards and guidelines are not being met;
- Identify how Council should respond to problems, through the identification, development and testing of options;
- Recommend an optimised series of investment solutions to resolve the identified problem(s) and develop an associated phased implementation plan.

The key outputs of the CMP process are to create an integrated transport and land use strategy, and an associated phased implementation plan that will outline how the corridor could respond to forecast changes over the next 30+ years. It is intended that the outputs of the CMP are to be used by Rangitikei District Council (RDC) and Hastings District Council (HDC) to identify and support future investment decisions within the road network.

Study Area

The study area included within the CMP comprises of the full length of the Taihape-Napier Road journey (see *Figure 0-1*), running between the Taihape township within the Rangitikei District on its western extent to SH50 at Omaha in the Hastings District on the eastern extent. The road corridors included within the CMP are approximately 133km in length, which typically takes two and a half hours to drive.



Figure 0-1: Taihape-Napier Road Study Area (Source: Waka Kotahi State Highway Maps)

For the purposes of the CMP study, the existing route has been divided into six sections as shown within *Table O-1*. The corridor sections have been identified based on similar road characteristics, challenges and land-uses. Sections 1 to 4 are located within the Rangitikei District, with Sections 5 and 6 passing through the Hastings District.

Table O-1: Taihape-Napier Route Segmentation

	DESCRIPTION	DISTRICT COUNCIL	FROM (MOBILE ROADS)	TO (MOBILE ROADS)	LENGTH (KM)
Section 1	Taihape to Moawhango	RDC	Hautapu Street/0.015	Taihape-Napier Rd 1/0.310	17.3
Section 2	Moawhango to Springvale Suspension Bridge	RDC	Taihape-Napier Rd 1/0.310	Taihape-Napier Rd 1/23.190	22.9
Section 3	Springvale Suspension Bridge to Ngamatea Plateau Rest Stop	RDC	Taihape-Napier Rd 1/23.190	Taihape-Napier Rd 2/15.735	15.8
Section 4	Ngamatea Plateau Rest Stop to Ngaruroro River	RDC	Taihape-Napier Rd 2/15.735	Taihape-Napier Rd 2/35.580	19.8
Section 5	Ngaruroro River to Waiwhare	HDC	Taihape-Napier Rd 2/35.580	Taihape Road/36.28	20.7
Section 6	Waiwhare to Fernhill	HDC	Taihape Road/36.28	Taihape Road/0.005	36.3
TOTAL					133

Assessment Against Performance Expectations

The existing and anticipated future route performance of Taihape-Napier Road was assessed against the ONRC Customer Level of Service (CLOs) expectations for mobility, safety, amenity and accessibility to identify key route deficiencies and identify opportunities to enhance customer experience along the route. The key findings of the route performance against its ONRC expectations is summarised in Table O-2.

Table O-2: Analysis of Taihape-Napier Road Performance against ONRC Expectations

CATEGORY		LOS EXPECTATIONS
Mobility	Resilience	<ul style="list-style-type: none"> Resilience is important on Taihape-Napier Road given its economic importance in providing access for local businesses to regional markets. It also plays an important function as an alternative route in the event of a road closure on Napier-Taupo Road (SH5). Taihape-Napier Road is particularly vulnerable to closure from natural hazard events due to weather events (rain, snow and ice) and slips/drop-outs, particularly on winding/remote sections of the corridor. There are limited alternative parallel routes through remote sections of Taihape-Napier Road meaning when closures occur, travellers wishing to cross the Kaweka Ranges are required to either undertake significant re-routing via the state highway network or to "wait it out" until the connection is restored. Limited cell phone coverage reduces the ability to respond efficiently and effectively to vehicle crashes and natural hazard events that disrupt access.
	Optimal Speeds	<ul style="list-style-type: none"> The Taihape-Napier Road operates with a 100km/hr posted speed limit. Travel speeds are significantly lower than the posted speed limit along majority of the route. Analysis of the "safe and appropriate" speed limit indicates a reduced posted limit of between 60-80km/hr would be more desirable unless road conditions are improved.

CATEGORY	LOS EXPECTATIONS
<p>Safety</p>	<ul style="list-style-type: none"> • Since 2010, a total of 88 crashes have been recorded on the corridor with 24 of these resulting in serious outcomes. The majority of crashes with severe outcomes resulted from loss of control or head on crashes. • The route is identified as having a “low” collective crash risk but a medium-high to high personal crash risk, indicating whilst traffic volumes are low the risk of drivers having a crash with a severe outcome is over-represented. • Large sections of the corridor within the Rangitikei District are identified as having a “medium-high” infrastructure risk rating, indicating the carriageway and its surroundings create a poor roadside environment. • Spooners Hill Road is identified as a key section for safety improvements, as identified through Waka Kotahi’s DSI savings assessment.
<p>Amenity</p>	<ul style="list-style-type: none"> • The route is identified as a regional tourist and visitor route, and there are options to enhance its amenity through improving the journey experience for these users. • Identified opportunities to enhance journey conditions include improved rest areas, better signage / wayfinding and overtaking opportunities (where appropriate). • The existing and forecast traffic volumes indicate passing opportunities would not be warranted on sections of Taihape-Napier Road within the Rangitikei district; however, higher traffic volumes within Hastings District may warrant their provision. • There are several locations on the existing Taihape-Napier Road where both informal and rest areas exist; however, site visits observed that these are poorly signposted and lack basic amenities for visitors. • There is limited signage and wayfinding on the route to draw visitors to key points of interest along the route.
<p>Accessibility</p>	<ul style="list-style-type: none"> • The existing route is not currently classed as a 50Max capable route due to the need for strengthening of several bridges. Enabling 50Max access would enable more freight to be carried on less trucks, reducing freight volumes, safety risk and CO₂ emissions. • Taihape-Napier Road in its entirety forms a Heartland Ride in the NZCT (known as the “Gentle Annie” cycle route) connecting the Rangitikei District to the Hawke’s Bay. • With investment in cycle trails increasing nationwide it is anticipated that the continued growth of the cycling tourism market (both domestic and international) will be reflected in an increase in the volume of cyclists along Gentle Annie. • At present, there is limited infrastructure for cycling along the majority of the route. warning for drivers to expect cyclists along the route. This is further compounded by narrow seal widths and winding alignments which restrict visibility. • There are opportunities to enhance existing roadside conditions to support safe access for touring cyclists, particularly on sections of the route in Hasting District where traffic volumes exceed 1,000 vpd.

Strategic Responses

The CMP has identified a range of measures that respond to key deficiencies in the existing routes performance, including a combination of both policy/planning initiatives and physical works.

The recommended policy and planning initiatives identified through the CMP include:

- Ensuring any new or modified vehicle accesses from adjacent land-uses are designed to support the safe and efficient operation of the network;
- Both Council’ should undertake regular monitoring of traffic volumes and crash data to support the future decision-making and prioritisation of future work programmes over the next 30 years;
- Engagement with national communication providers (i.e. Vodafone, Spark, 2degrees) with a view to improving cell phone coverage through the route in the long term;
- Investigate opportunities to enhance / promote the journey as a tourism themed route (like the Country Road within the Manawatu District) in co-ordination with relevant stakeholders such as MBIE and DoC; and

- Undertake a review of the existing speed limits along the full extent of the route, to ensure posted speeds align with the Waka Kotahi Speed Management Guide (2016).

The route strategy identifies physical works improvements that would enhance the performance of the corridor to better align with its ONRC CLoS expectations relating to mobility, safety, amenity and accessibility.

Whilst bulk of the physical works comprises safety improvements, options to improve access to economic opportunities have also been identified including improved access to markets by increasing the capability of bridges to support 50Max access and enhancing the attractiveness of the route for tourism and recreational opportunities.

The key physical work packages identified through the CMP include:

- Speed management improvements, including implementation of the findings of the proposed speed limit review and activated warning signs outside of schools;
- Delineation improvements, including edgemarkers posts, edgelines, centrelines, raised reflective pavement markers and centre audio tactile profiled (ATP) markings;
- Seal widening to achieve the desired minimum standard widths (7.0m);
- Intersection improvements such as enhanced signage, lighting, line marking and intersection controls;
- Curve enhancements including seal widening, chevron/advisory signage and roadside barriers;
- Bridge improvements, including strengthening existing bridging structures to support 50Max access and replacing existing one-way bridge structures to provide for two-way movement at the end of their design life; and
- Tourism enhancements, including provision of suitable rest areas and appropriate supporting amenities such as seating, and improved wayfinding along the route.

Implementation Plan

Each of the physical works activities identified within the strategy has been prioritised to identify projects that could be delivered in the short (2021-2024), medium (2024-2030) and long-term (2031+).

The majority of improvements identified within the corridor respond to safety concerns, given a number of sections of the route exhibit “high” personal crash risks. The prioritisation rationale seeks target investment on sub-sections of the corridor which exhibit the highest personal crash risk, with a key focus given to curve and safety improvements that respond to the loss of control crashes and head-on collisions.

The principles behind the process used to prioritise improvements is outlined in detail within Section 9.1 of the report. The identified infrastructure responses and indicative timeframes for implementation are summarised within Figure 10-1.



Figure 0-2: CMP Implementation Plan

Funding

The rough order cost for delivering the full suite of transport improvements is **\$36.2M**. A full list of costs associated with each Councils network is outlined within Table 0-3. It should be recognised that the rough order costs are indicative, and will need to be refined further as individual or groups of projects are developed. Most costs are associated with road widening and safety improvements at curves, particularly within the Rangitikei District.

Table 0-3: Forecast Programme Costs (by Council)

FUNDING PERIOD	RANGITIKEI DISTRICT COUNCIL	HASTINGS DISTRICT COUNCIL	TOTAL
Short-Term (2021-24)	\$3,097,000	\$861,136	\$3,958,388
Medium-Term (2025-31)	\$8,217,000	\$1,940,279	\$10,157,460
Long-Term (2032-51)	\$17,519,000	\$4,572,899	\$22,091,586
Total Costs	\$28,833,120	\$7,374,315	\$36,207,434

Most projects identified through the CMP are expected to be funded through respective Council's capital budget programmes through the National Land Transport Programme (NLTP), with funding contributions from Waka Kotahi via the Funding Assistance Rating for qualifying activities.

There are several additional funding opportunities that could be considered for supporting infrastructure development on the corridor, including (but not limited to):

- Provincial Growth Funding
- Tourism Infrastructure Funding

Summary of Next Steps

It is expected that the CMP will need to be reviewed and updated every three years to confirm the relevance of assumptions outlined within the report, as well as identify improvements that could be included within Councils' Long-Term Plans.

To support the future delivery of the CMP, it is recommended that:

- Councils consider opportunities for integrating physical works identified through the CMP with other forward work programmes where opportunities arise (i.e. maintenance works) to minimise delivery costs and community disruption, and provide best value for money;
- Both Councils develop a monitoring programme to establish annual growth trends and safety performance of the route. This will allow Councils to monitor traffic growth rates and confirm the relevance of assumptions outlined within the CMP, as well as allowing Councils to assess the effectiveness of improvements once delivered; and
- Councils develop a working group with representatives from key stakeholder organisations to oversee the development, co-ordination and implementation of broader initiatives and should be established early in the process.

1 Introduction

WSP was commissioned by Rangitikei District Council (RDC) and Hastings District Council (HDC) to develop a Corridor Management Plan (CMP) for the Taihape-Napier journey between Taihape township in the west to State Highway 50 (SH50) at Omahu in the east. The CMP's aim to develop a long-term strategic vision for the transport network, considering both existing and future land use and transport demands.

The roads that comprise the journey between Taihape township and State Highway 50 ("SH50") have been referred to collectively within this CMP as the "Taihape-Napier Road"; however, it should be noted that the route is inclusive of Spooners Hill Road (from Taihape township) and Moehau Road from Spooners Hill Road to Moawhango. The Taihape-Napier Road properly commences at Moawhango (Section 2) and extends to Kuripapango at the Rangitikei/Hastings District boundary, and where it becomes "Taihape Road" until its junction with State Highway 50 at Omahu.

The key outputs of the CMP process are to create an integrated transport and land use strategy, and an associated phased implementation plan that will outline how the corridor could respond to changes over the next 30+ years. The CMP has been developed in collaboration with technical stakeholders from RDC and HDC.

1.1 Purpose of CMP

The purpose of the CMP is to assess corridor conditions and demand for access to guide future transport initiatives within the study area. The CMP provides an outline of the need for investment, and the proposed approach/implementation plan for resolving issues or problems identified. It is intended that the outputs of the CMP are to be used by RDC and HDC to identify and support future investment decisions within the road network.

The CMP has been developed in a staged approach, as outlined within the following steps:

- Assess current corridor conditions and existing/future demand for access within the study area, how it is (or will be) expected to perform, what problems currently exist and whether interventions are required to achieve the desired future state;
- Identify constraints and opportunities for implementing improvements to the study area; and where customer expectations, desirable standards and guidelines are not being met;
- Identify how Council should respond to problems, through the identification, development and testing of options; and
- Recommend an optimised series of investment solutions to resolve the identified problem(s) and develop an associated phased implementation plan.

1.2 Strategic Background

In October 2019, 41 South facilitated a technical workshop with representatives from RDC, HDC and other technical stakeholders (including Waka Kotahi-NZ Transport Agency) to establish an initial "Point of Entry" (PoE) for the project. The PoE discussions identified several strategic challenges and opportunities, including (but not limited to):

- Land-use changes (e.g. lifestyle block growth)
- Economic growth / route productivity (i.e. HPMV access);
- Resilience;
- Safety; and
- Access.

With consideration to these challenges, the CMP assesses the route's existing or expected performance against the desired Customer Level of Service (CLoS) expectations based on its One

Network Road Classification (ONRC). This effectively operates as a “gap analysis” to identify any areas of particular focus within the option development phase.

Evidence to support the findings of this CMP has been gathered from a range of sources, including:

- Technical content provided within historical transport studies;
- Historical traffic count data to establish traffic growth and composition trends across the network;
- Review of crash history and existing roadside conditions (i.e. form);
- Proposals for improvements in Council’s Long Term Plans (LTPs) or Forward Works Programme (FWP);
- Observations and comments made during site visits.

1.3 Study Area

The study area included within the CMP comprises of the full length of the Taihape-Napier Road journey (see Figure 1-1), running between the Taihape township within the Rangitikei District on its western extent to SH50 at Omahu in the Hastings District on the eastern extent. The road corridors included within the CMP are approximately 133km in length, and typically takes two and a half hours to drive in a motor vehicle.



Figure 1-1: Taihape-Napier Road Study Area (Source: Waka Kotahi State Highway Maps)

1.4 Route Segmentation

For the purposes of the CMP study, the existing route has been divided into six sections as shown within Table 1-1. The corridor sections have been identified based on similar road characteristics, challenges and land-uses. Sections 1 to 4 are located within the Rangitikei District, with Sections 5 and 6 passing through the Hastings District.

Table 1-1: Taihape - Napier Route Segmentation

DESCRIPTION		DISTRICT COUNCIL	FROM (MOBILE ROADS)	TO (MOBILE ROADS)	LENGTH (KM)
Section 1	Taihape to Moawhango	RDC	Hautapu Street/0.015	Taihape-Napier Rd 1/0.310	17.3
Section 2	Moawhango to Springvale Suspension Bridge	RDC	Taihape-Napier Rd 1/0.310	Taihape-Napier Rd 1/23.190	22.9
Section 3	Springvale Suspension Bridge to Ngamatea Plateau Rest Stop	RDC	Taihape-Napier Rd 1/23.190	Taihape-Napier Rd 2/15.735	15.8
Section 4	Ngamatea Plateau Rest Stop to Ngaruroro River	RDC	Taihape-Napier Rd 2/15.735	Taihape-Napier Rd 2/35.580	19.8
Section 5	Ngaruroro River to Waiwhare	HDC	Taihape-Napier Rd 2/35.580	Taihape Road/36.28	20.7
Section 6	Waiwhare to Fernhill	HDC	Taihape Road/36.28	Taihape Road/0.005	36.3
TOTAL					133

The geography of the region has strongly influenced the alignment of the Taihape-Napier route which largely follows the original pioneering tracks, resulting in a challenging vertical and horizontal alignment.

Commencing from Taihape (an elevation of 440m above sea level) the route gradually increases in elevation to a high point of approximately 970m (within Section 3) (see Figure 1-2); albeit with large valleys defined by the multiple rivers that bisect the route which largely are the key defining features between the identified Sections. The alignment then slowly winds down as the route approaches the Heretaunga Plains, finishing at an elevation of approximately 30m above sea level in Fernhill (Omahu).

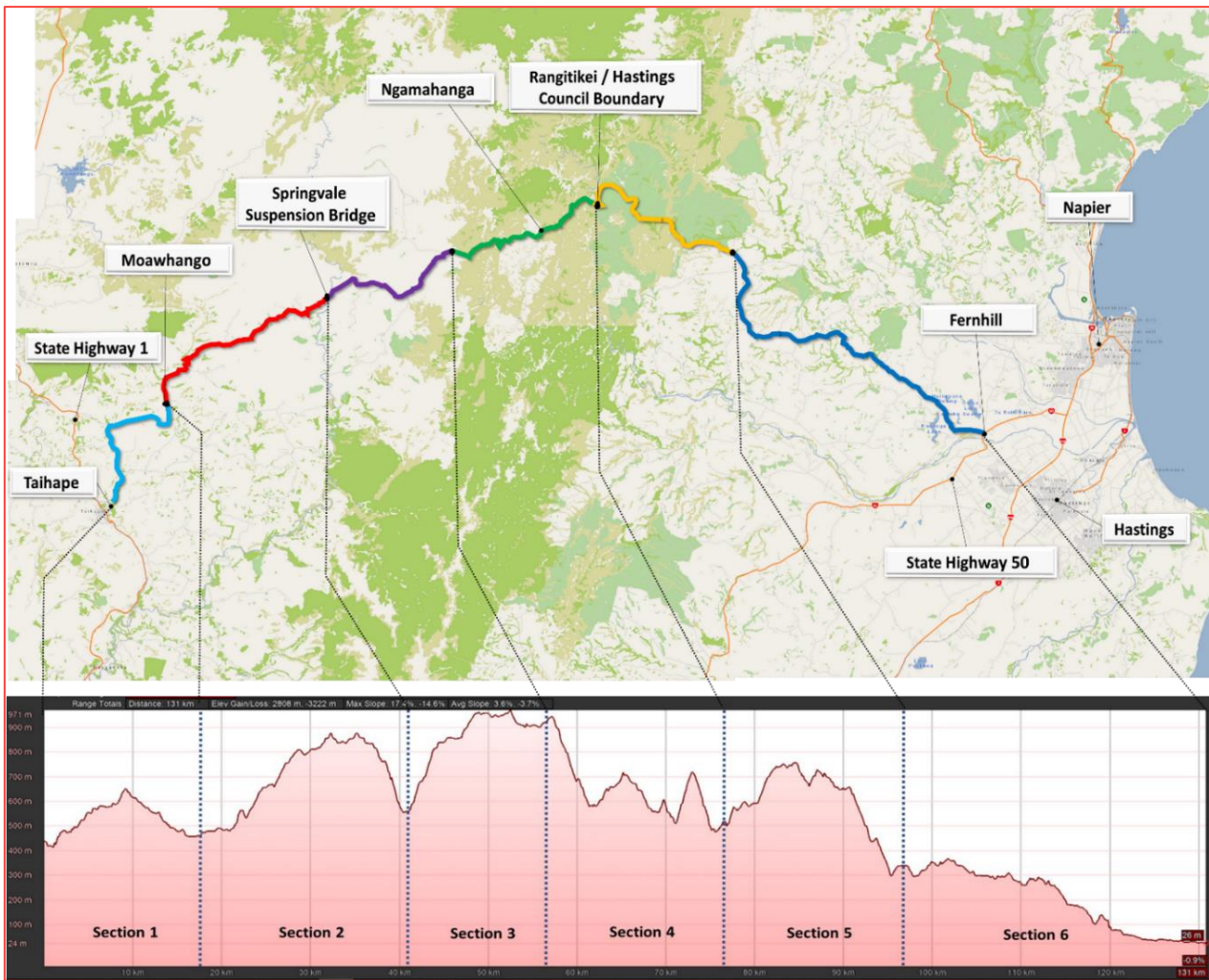


Figure 1-2: Route Segmentation and Elevation – Taihape-Napier Road

1.5 Information Sources

This following information sources have been used as a basis for developing the CMP:

- **Mobile Roads Software**

This road industry desktop and mobile app converts your nearest GPS (Global Positioning System) coordinates to the nearest Route Position (RP). The software also holds a data base of Annual Average Daily Traffic (AADT), road widths, One Network Road Classification (ONRC) information and surfacing information.

- **RAMM Database**

The RAMM database also provides Annual Daily Traffic (ADT) and heavy vehicle figures for the local road network within the Hastings and Rangitikei districts. This has been used to estimate current traffic volumes and historical traffic growth rates on the road network, as well as providing an indication of existing network conditions (i.e. pavement depth, carriageway conditions etc).

- **Waka Kotahi’s Crash Analysis System (CAS)**

Crash statistics on the Taihape - Napier Road were obtained from the Waka Kotahi’s Crash Analysis System database (CAS).

- **Google Maps (Online)**

Google maps has been used to approximate the travel times and distances between trip origins and destinations.

- **Waka Kotahi – Mega Maps**

Waka Kotahi's Megamap system has been used to assist with identifying the current level of service performance of the corridor.

1.6 Report Content

The remainder of the CMP has been structured as follows:

Part A: Strategic Context

- **Section 2 – Existing Conditions:** Provides a summary of the existing site and local transportation conditions, and an indication of the future wider transportation network operations;
- **Sections 3-6 – Performance against ONRC Expectations:** Provides a summary of the corridors performance against mobility, safety, amenity and accessibility expectations of the ONRC;

Part B: Corridor Strategy

- **Sections 7-8 – Route Strategy and Interventions:** Provides an outline of the recommended policy, planning and physical works improvements to enhance the performance of the existing road corridor;
- **Section 9 – Implementation Plan:** Provides a summary of the identified programme of activities, including delivery costs and proposed rationale for prioritising investment; and
- **Section 10 – Conclusions:** Provides a summary of the corridor strategy and the recommended next steps for the project.

Part A – Strategic Context

2 Existing Conditions

2.1 Transport Context

At a strategic level, the Taihape-Napier Road corridor provides for both inter district and inter regional movement connecting the Rangitikei and Hastings Districts, and the Hawkes Bay and Manawatu-Wanganui regions. The Taihape-Napier Road provides access between population centres of the Hawke's Bay area and recreational areas of the central North Island, as well as key townships within the Manawatu-Whanganui district such as Mangaweka, Waiouru, Ohakune and Taihape. Recent census figures show the combined Napier-Hastings population is the sixth largest within New Zealand with a combined population of 134,500 whilst the township of Taihape has a residential population of 1,790.

The Taihape-Napier Road provides access from Rangitikei, Ruapehu and the northern Manawatu Districts to export markets via the Port of Napier (the ports economic catchment areas are outlined in **Appendix A**). It is a route of interregional importance providing a link for the transportation of fertiliser, livestock and other agricultural and wood products produced within the Central North Island to key markets on the east coast.

The Taihape-Napier Road also functions as a connector to regionally significant tourism and recreation opportunities across the Central North Island such as the Mount Ruapehu ski fields. The route also connects recognised State Highway themed regional tourism routes within the North Island, including the Thermal Explorer Highway, Pacific Coast Highway and the Classic New Zealand Wine Trail.

The route itself is also a destination in its own right as a picturesque alternative to other east-west routes into Napier for tourists and visitors, with stunning scenic vistas, viewing areas and heritage designations such as the Springvale Suspension bridge. The route follows the Inland Patea Heritage Trail, retracing an ancient Māori route between Hawke's Bay and the Inland Patea district, around the headwaters of the Rangitikei River and its main tributaries the Moawhango and Hautapu Rivers. It is recognised and actively promoted as part of the NZ Cycle Trail (NZCT).

As shown on Figure 2-1, there are very few east-west road connections between the Manawatu-Wanganui and Hawke's Bay regions. Taihape-Napier Road bisects one of the largest areas of the North Island not served by a State Highway. The North Island State Highway Network Map shows that the nearest alternative State Highway routes to the Taihape-Napier Road are via the Manawatu Gorge (SH2, SH3 and SH1) to the south or the Napier-Taupo Road (SH5 and SH2) to the north.

The strategic nature of the route has historically led to the corridor being considered by Hastings and Rangitikei District Councils as a potential candidate for upgrading to a State Highway status. Applications to declare the route a State Highway were made in 1990, 1995 and 2001 to Waka Kotahi (formerly Transit NZ); however, all previous applications have been declined.



Figure 2-1: Taihape-Napier Road Strategic Context (Source: Waka Kotahi State Highway Maps)

The 2006 Walbran Report identified the “catchment” of the surrounding area that is reliant on the Taihape-Napier Road for inter-regional travel between Hawke’s Bay and Whanganui-Manawatu (see *Figure 2-2*). The report identified the catchment of the route being approximately 130,614 hectares of land, of which 11,504ha is farmland, 8,735ha is forestry and 995ha is vineyards and horticulture.

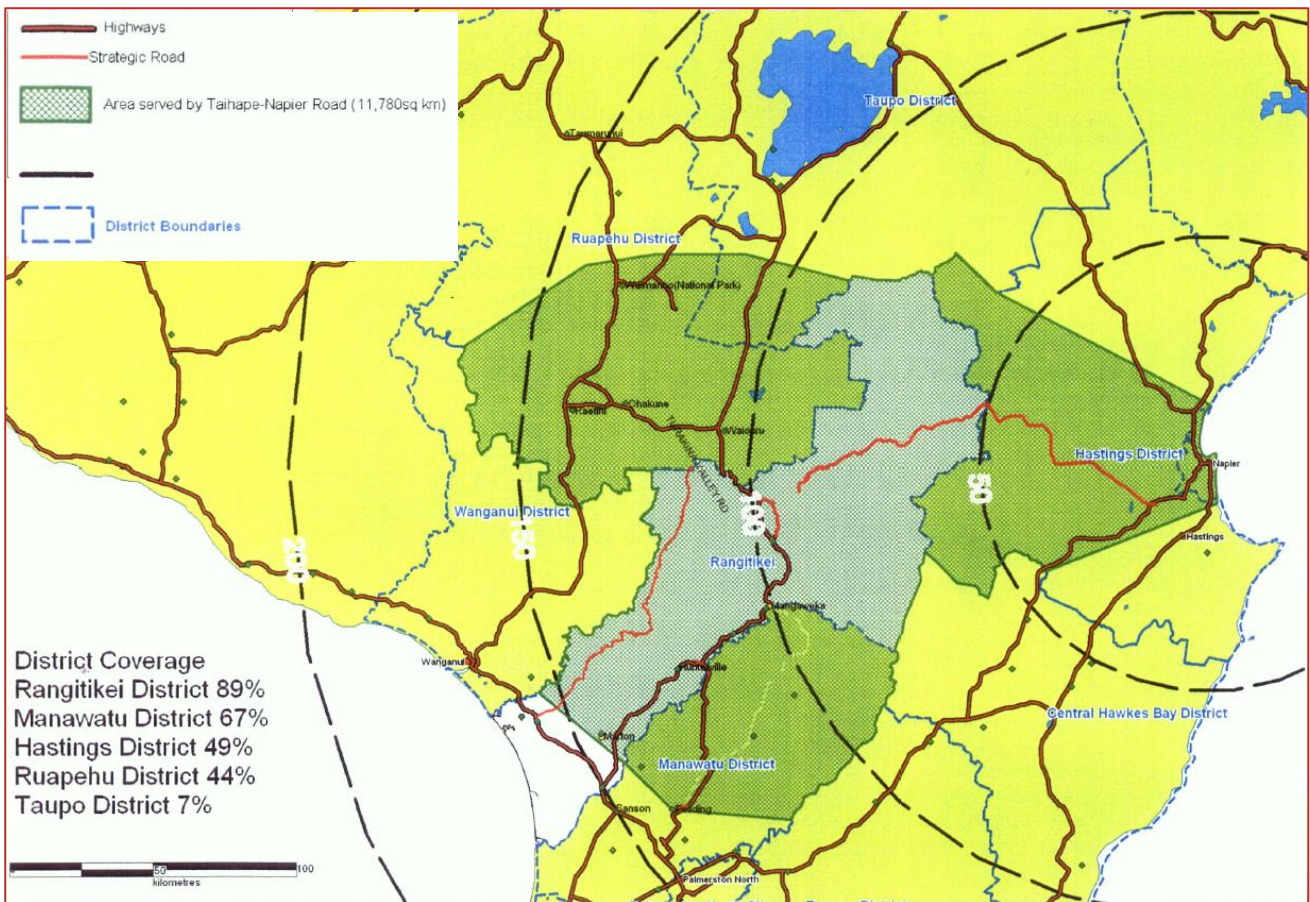


Figure 2-2: Catchment of Taihape-Napier Road (Green) (Source: Walbran Report, 2006)

The GIS analysis undertaken in the Walbran Report indicated that the Taihape-Napier Road route is the shortest route (in terms of distance) to Hastings/Napier for 89% (by land area) of Rangitikei District, 67% of Manawatu District, 44% of Ruapehu District and 7% of Taupo District. It is also the shortest route to the Central Plateau for 49% of Hastings District and all of Napier City. This indicates that the total area serviced by the Taihape-Napier Road is 11,780 sq km (or 1,178,000 ha).

Whilst the route provides the shortest route between the Central Plateau and Hawke’s Bay in terms of travel distance, the challenging and winding terrain results in much slower travel speeds and thus longer travel times compared with alternative State Highway routes for most regional journeys (see *Table 2-1* and *Figure 2-3*). This indicates the regional catchment of the route within Rangitikei is most likely to be limited to Mangaweka to the south, Waiouru to the north and Ohakune to the west.

The development of a new State Highway connection (Te Ahu a Turanga Highway) through the Manawatu Gorge is also expected to reduce journey times compared with the previous State Highway by up to five minutes, further eroding the catchment of the Taihape-Napier Road corridor. Given the inter-regional travel time savings from using alternative State Highway routes, the Taihape-Napier Road is mainly used for local access by communities located along the route (including both commercial and residential development) and for access to key destinations by visitors or tourists.

Table 2-1: Journey Distances and Travel Times for Key Trips on Taihape-Napier Road and Alternative Routes (Source: GoogleMaps)

JOURNEY	ROUTE	DISTANCE	TRAVEL TIME	AVE SPEED
Turangi to Napier	SH1-SH5	184 km	2hrs 19mins	79
	SH1-Taihape Napier Rd	227 km	3hrs 46mins	60
	SH1-SH54-SH2-SH50*	353 km	4hrs 27mins	79
Waiouru to Napier	SH1-SH5	246km	3hrs 8mins	79
	SH1-Taihape Napier Rd	164km	2hrs 59mins	55
	SH1-SH54-SH2-SH50*	290km	3hrs 42mins	78
Ohakune to Napier	SH1-SH5	269km	3hrs 24mins	79
	SH1-Taihape Napier Rd	191km	3hrs 19mins	58
	SH1-SH54-SH2-SH50*	317km	4hrs 2mins	79
Taihape to Napier	SH1-SH5	277km	3hrs 29mins	75
	SH1-Taihape Napier Rd	153km	2hrs 55mins	52
	SH1-SH54-SH2-SH50	261km	3hrs 22mins	78
Mangaweka to Napier	SH1-SH5	295km	3hrs 42mins	80
	SH1-Taihape Napier Rd	172km	3hrs 9mins	55
	SH1-SH54-SH2-SH50*	242km	3hrs 8mins	78

+ Note, the SH1-SH54-SH2-SH50 travel times include crossing the Saddle, which is expected to take significantly longer compared with the new proposed Gorge alignment.

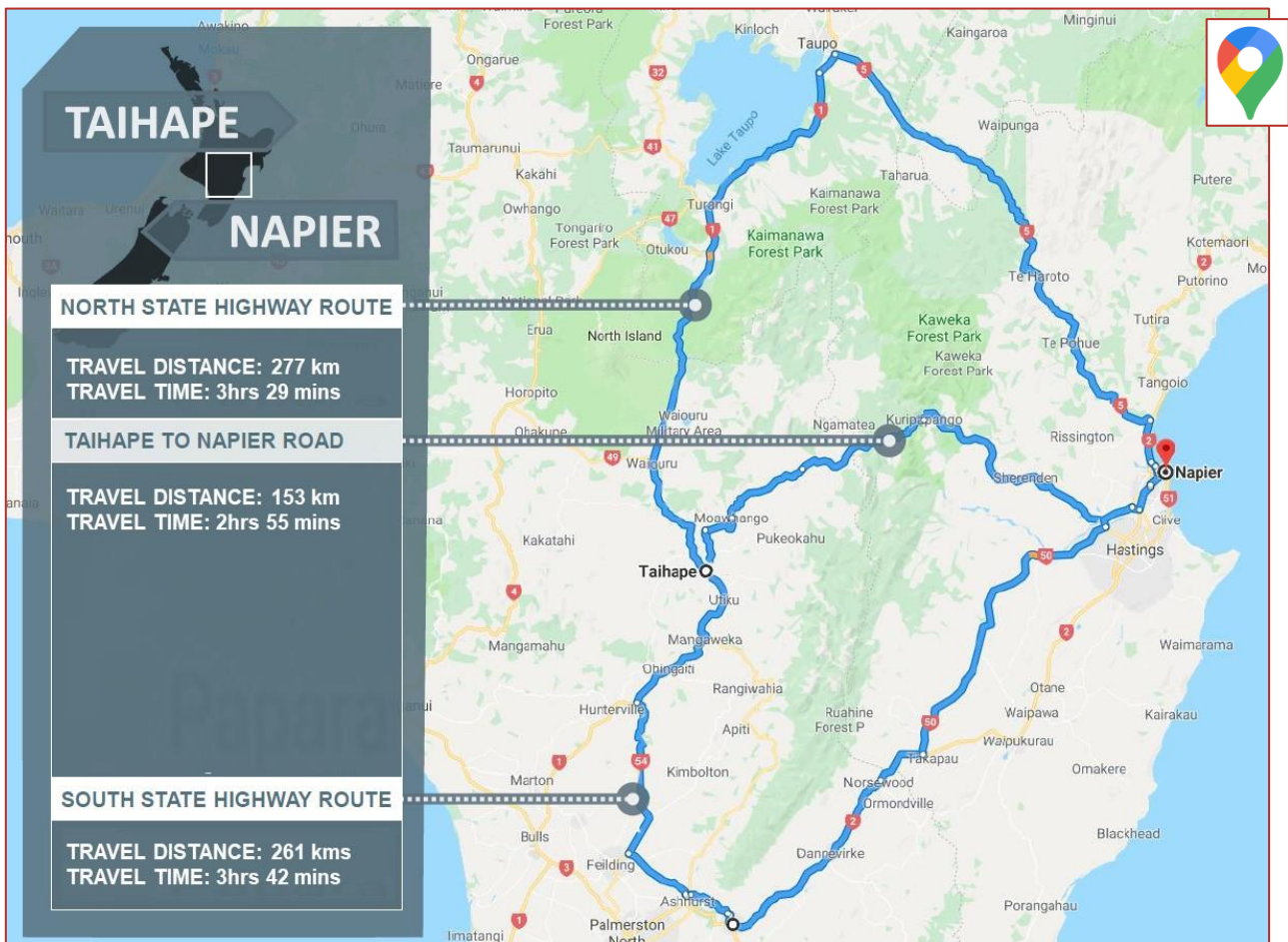


Figure 2-3: Key Journeys and Travel Data (Source: GoogleMaps, modified from 41South Report)

2.2 Surrounding Environment and Land Use

The boundary of the Rangitikei and Hastings Districts are defined by the mountainous terrain of the Kaweka Ranges, which roughly denote the central midpoint of the Taihape-Napier Road journey. The ranges form part of the mountainous spine of the North Island which runs from Wellington to East Cape, including the Tararua and Ruahine ranges. The ranges provide a number of tourist and visitor related outdoor activities and pursuits, including camping, tramping, fishing and rafting.

Land-use along Taihape-Napier Road is primarily productive rural hinterland comprising both farming and forestry activities. A number of large sheep stations are located on sections of the corridor to the west of the Kaweka Ranges (within the Rangitikei district). In addition to providing access for transporting stock to markets, the road is used by local farmers to move stock between paddocks.

Land-use to the east of the ranges includes large forestry blocks, much of which is actively being harvested at present. The Taihape-Napier Road provides direct linkages between these forestry blocks to State Highway 50 on the routes eastern extent, for onward transportation to key destinations such as Pan Pac Mill (Whirinaki) and Napier Port where logs are exported to international markets. The State Highway also provides further connections to a number of key destinations for local industry, including a significant regional airport (Hawkes Bay Airport) and a major international container port (Port of Napier Ltd).

Sensitive land-uses and key destinations along the corridor as detailed within *Table 2-2*.

Table 2-2: Community Facilities on Taihape-Napier Road

LAND-USE TYPE	NAME
Schools	Sherenden and Districts School
	Pukehamoamo School
	Omahu School
Community Facilities	Opaea Marae
	Moawhango Marae
	Runagna Marae
	Te Awahina Marae
	Omahu Marae
	Whitikaupeka Church
St Johns Church (Omahu)	
Townships/ Settlements	Moawhango (RDC)
	Kuripapango (RDC/HDC Boundary)
	Waiwhare (HDC)
	Otamauri (HDC)
	Sherenden (HDC)
	Omahu (HDC)

2.3 One Network Road Classification

The One Network Road Classification (ONRC) divides New Zealand's roads into six categories based on factors such as how busy they are, whether they connect to important destinations, or are the only route available. The categories are National, Arterial, Regional, Primary Collector, Secondary Collector and Access. The route from Taihape to Fernhill is classified as either a Primary Collector or Secondary Collector as indicated in Table 2-3.

Table 2-3: ONRC Rating on Taihape - Napier Road

DESCRIPTION	DISTRICT COUNCIL	ONRC	LENGTH (KM)
Taihape to Moawhango	Rangitikei DC	Primary Collector	17.3
Moawhango to Springvale Suspension Bridge		Secondary Collector	22.9
Springvale Suspension Bridge to Ngamatea Plateau Rest Stop		Secondary Collector	15.8
Ngamatea Plateau Rest Stop to Ngaruroro River		Secondary Collector	19.8
Ngaruroro River to Waiwhare	Hastings DC	Primary Collector	20.7
Waiwhare to Fernhill		Primary Collector	36.3

Primary collectors are described as “Locally important roads that provide a primary collector/distributor function, linking significant local economic areas or population areas”. Secondary collectors are described as “Roads that link local areas of population and economic sites. They may be the only route available to some places within this local area.”

The ONRC criteria in Table 2-4 apply to rural Collector and Access roads. The criteria for Arterial routes has also been provided for comparative purposes. Primary and Secondary Collectors must meet at least one of the movement criteria (ADT or HCV), whilst arterials are required to meet at least 2 criteria (of which one is traffic/HCV volumes). The other criteria are then considered to provide a local ‘ground truthing’ check. According to the ONRC, in some instances by considering these criteria this may result in a road moving up or down a category to reflect the function of the road.

Table 2-4: ONRC Criteria for Collector and Access Roads¹

CATEGORY	MOVEMENTS			LINK AND PLACE		
	ADT	HCV (daily)	Active modes	Linking Places	Freight – Inland Port(s)	Tourism
Arterial	>3,000	>300	Part of an identified cycling or walking network	>10,000 population	> 1m tonnes per annum	Regionally or locally significant tourist destinations or significant scenic routes
Primary Collector	>1,000	>150		>2,000 population	<1 million tonnes per annum	
Secondary Collector	>200	>25		>250 population		
Access Road	<200	<25		<250 population		

The ONRC road categories are strongly influenced by traffic demands. The average daily traffic volume of 460 vpd and 92 HCVs along its length, indicates that against the existing ONRC criteria, rural sections of the Taihape-Napier Road do not meet the daily traffic volume criteria of greater than 1,000 vpd and/or 150 HCVs required to be classed as a Primary Collector. A 65% increase in HCV traffic would achieve one of the movement criteria for a Primary Collector, and a 120% increase in general traffic (with at least 15% HCVs) would be required to achieve both movement criteria.

The ONRC states that “In the Primary / Secondary Collector and Access road categories, we propose that the criteria other than Typical Daily Traffic, Heavy Commercial Vehicles, Bus Urban Peak can be used to move a road up a category on the basis of local knowledge. For example, an Access Road may provide critical connectivity or provide access to a regionally or locally significant tourist destination warranting it moving up a category to Secondary Collector even though it does not conform to the movement criteria for that category”.

¹ <https://www.nzta.govt.nz/assets/Road-Efficiency-Group-2/docs/onrc-guidelines.pdf>

2.3.1 Customer Level of Service Expectations

The ONRC General Guide states that once a road has been classified under the ONRC, it should be maintained to the Customer Level of Service (CLOs) for roads of its type. The Customer Levels of Service relate to:

- Mobility (travel time reliability, resilience of the route)
- Safety
- Amenity (travel quality and aesthetics)
- Accessibility (land access and road network connectivity)

Performance measures are used to address the CLOs. There are three types of performance measure, namely:

- Customer outcome
- Technical output
- Cost efficiency

Together these measure a Road Controlling Authority's efficiency and effectiveness at meeting the Customer Levels of Service. The ONRC and its performance measures enable the performance of each RCAs network to be comparatively benchmarked, and allow RCAs to support business cases for national funding. While some provisional targets have been developed for some performances for each road category, the development of performance measure targets is still a work in progress.

Table 2-5 summarises the LOS customer expectation criteria for primary and secondary collector roads.

Table 2-5: ONRC Criteria – LOS Performance Expectations

CATEGORY		LOS EXPECTATIONS	
		PRIMARY COLLECTOR	SECONDARY COLLECTOR
Mobility	Travel time reliability	Generally, road users experience consistent travel times except where affected by other road users (all modes) or weather conditions	Road users travel times may vary because of other road users (all modes), weather conditions or the physical condition of the road.
	Resilience	Route is nearly always available except in major weather events or emergency event and alternatives may exist. Clearance of incidents affecting road users will have a moderate priority. Road users may be advised of issues and incidents	
	Optimal Speeds	Travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users	
Safety		Variable road standards and alignment. Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Road user safety guidance provided at high risk locations.	
Amenity		Moderate level of comfort, occasional areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use.	Moderate level of comfort, longer areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use.
Accessibility		Landuse access for road users generally permitted but some restrictions may apply. Road user connection at junctions with Arterial or Collector roads, and some restrictions may apply in urban areas to promote Arterials. Traffic on higher classification roads generally has priority over lower classification roads. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed.	Land-use access for road users generally permitted but some restrictions may apply. Road user connection at junctions with other Collectors or Access roads. Collector road traffic generally has priority over Access road traffic. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Provision of quality information relevant to Collector road user needs.

CATEGORY	LOS EXPECTATIONS	
	PRIMARY COLLECTOR	SECONDARY COLLECTOR
	Provision of quality information relevant to Collector road user needs.	

2.4 Transport Characteristics

2.4.1 Road Form and Operation

The corridor comprises two-lane sealed carriageways which over a large proportion is winding, narrow and rural in nature. In places, the winding and challenging alignment includes tight curves and poor sight lines which can force vehicles into the centre of the road creating a significant safety hazard for road users.

The corridor operates with a posted speed limit of 100 km/hr; with the exception of sections that pass through urbanised areas of Taihape on its western extent and Omahu on its eastern extent. Variable speed limits are operational adjacent to “Sherenden and Districts School” to support school safety during pick-up and drop-off times.

As the route crosses the Ruahine Mountain Range, the topography changes from rolling terrain to very steep sections with an array of horizontal curves present. A more detailed description of the geometry of the route, broken down into the proposed segments, can be found in Table 2-6. The average carriageway widths range between 6.0m-7.0m across all sections; however, in some places the carriageway width is less than 5.5m. This becomes especially problematic should two heavy vehicles in opposite directions pass each other.

The road alignment (horizontal and vertical) has been categorised as follows:

- Easy Little to no challenging curves. Flat to hilly vertical alignment.
- Moderate Some challenging curves. Hilly to moderately steep grades.
- Severe High number of challenging curves and steep gradients.

Table 2-6: Average Road Widths and Alignment

DESCRIPTION	DISTRICT COUNCIL	ROAD SURFACE WIDTH	ROAD ALIGNMENT	LENGTH (KM)
Taihape to Moawhango	RDC	Varying between 5.7m and 6.9m.	Moderate	17.3
Moawhango to Springvale Suspension Bridge	RDC	Varying between 5.6m and 6.0m	Easy	22.9
Springvale Suspension Bridge to Ngamatea Plateau Rest Stop	RDC	Varying between 5.8m and 6.3m	Moderate	15.8
Ngamatea Plateau Rest Stop to Ngaruroro River	RDC	Varying between 5.9m and 6.3m	Severe	19.8
Ngaruroro River to Waiwhare	HDC	Varying between 7.4m and 8.5m	Severe	20.7
Waiwhare to Fernhill	HDC	Varying between 6.3m and 7.3m	Easy	36.3

2.4.2 Traffic Volumes

The existing traffic volumes on Taihape - Napier Road across each of the route sections identified through traffic count data available on MobileRoad Software (counts updated in February 2019) and the most recent traffic count data made available by Hastings District Council and Rangitikei District Council. The estimated Average Annual Daily Traffic (AADT) across the route segments are shown within Table 2-7.

Table 2-7: Average Annual Daily Traffic (AADT) per route segment

DESCRIPTION	DISTRICT COUNCIL	AADT	LENGTH (KM)
Section 1: Taihape to Moawhango	RDC	375	17.3
Section 2: Moawhango to Springvale Suspension Bridge		250	22.9
Section 3: Springvale Suspension Bridge to Ngamatea Plateau Rest Stop		180	15.8
Section 4: Ngamatea Plateau Rest Stop to Ngaruroro River		150	19.8
Section 5: Ngaruroro River to Waiwhare	HDC	305	20.7
Section 6: Waiwhare to Fernhill		1,000*2	36.3

The data indicates traffic volumes are generally higher within Section 1 and Section 6, with the lowest volumes being in the central section between the Springvale Suspension Bridge and the Ngaruroro River. The highest average traffic volumes are experienced on the eastern extent (Section 6) of the route reflecting an increase in local settlements on approach to Napier and Hastings. Traffic volumes through Omahu township (Section 6) have recorded close to 3,000 vehicles per day in most recent counts.

Heavy vehicle traffic as a proportion of all traffic demand remains relatively high along rural sections of the route, accounting for approximately 18%-24% of AADT. It should be noted that the heavy vehicle proportions decline significantly on approach to SH50 due to increased general traffic from residential areas and smaller settlements surrounding Omahu. The relatively high proportion of freight demands on the rural sections reflects the remoteness of the environment and the economic importance of the route for local forestry and agricultural activities.

2.4.3 Traffic Growth

Historical traffic tube count data on Taihape - Napier Road has been analysed to provide an indication of long-term traffic growth rates on the corridor since 2000. The analysis has focused on three key strategic locations on the corridor given limited availability of quality data (see Table 2-8).

Table 2-8: Seasonal Traffic Growth Rates and Forecast Volumes (2050)

LOCATION	SUMMER GROWTH		WINTER GROWTH	
	Growth Rate	2050 Forecast	Growth Rate	2050 Forecast
Springvale Suspension Bridge	2.3% per annum	300 vpd	1.7% per annum	200 vpd
Kuripapanga	2.3% per annum	280 vpd	1.4% per annum	215 vpd
Omahu	2.0% per annum	4,660 vpd	1.5% per annum	3,750 vpd

The analysis indicates traffic volumes have increased during both winter and summer periods, with higher traffic volumes and growth rates observed during the summer periods (ranging between 2.0%-2.3%) compared with winter (ranging between 1.4%-1.7%). The data also indicates traffic volumes have increased between 30%-50% on remote sections of the corridor during the summer compared to the winter, reflecting increased levels of tourism/visitation activities and economic activities associated with primary industries.

² On average traffic volumes on this sections are approximately 1,000 vpd; however, these increase significantly on approach to SH50 on the eastern extent of the route.

The available traffic count data for the past 20 years for each of the sites has been extrapolated to predict future growth (2050 forecasts). The forecast traffic volumes on Taihape-Napier Road do not indicate the function of the corridor as a collector route will change, nor is it expected to experience capacity issues over the horizon of this CMP (the next 30 years) based on forecast traffic volumes.

3 Mobility Performance

As shown within Table 3-1, the ONRC places relatively low importance on travel time reliability on collector roads compared with arterial or strategically significant routes; however, higher importance is placed on route resilience and optimal travel speeds which are considered further below.

Table 3-1: CLoS Expectations for Mobility

CATEGORY		LOS EXPECTATIONS	
		PRIMARY COLLECTOR	SECONDARY COLLECTOR
Mobility	Travel time reliability	Generally road users experience consistent travel times except where affected by other road users (all modes) or weather conditions	Road users travel times may vary because of other road users (all modes), weather conditions or the physical condition of the road.
	Resilience	Route is nearly always available except in major weather events or emergency event and alternatives may exist. Clearance of incidents affecting road users will have a moderate priority. Road users may be advised of issues and incidents	
	Optimal Speeds	Travel speeds depend on assessed level of risk and recognise mixed use, schools, shopping strips and concentrations of active road users	

3.1 Resilience

Resilience in a transport context relates to the ability to keep roads open (as much as possible) during an unplanned event so people and businesses can make the trips they need. Resilience considers the ability of routes to respond to a range of events that impact on the ability of a route to function properly such as extreme weather, road crashes and equipment / infrastructure failures, but does not include congestion or traffic jams.

The Taihape-Napier Road provides vital connections for local communities for both inter- and inter-regional destinations, linking residents to key services such as health, education, employment and supermarkets. Route closures that limit access can have a significant impact on the ability for communities to access these services.

Primary industries rely on the road network being available to send products to market and maintain sustainable/viable businesses. The loss of transport connections within both the local and regional network results in financial loss for local industries, impacting on the productivity and competitiveness of the region. Many local industries operate on a just-in-time basis that relies on accessible and reliable transport connections. Unreliable transport connections result in a loss of business confidence for both existing and prospective investors within the region, inhibiting potential for economic growth and business profitability.

The majority of local roads that connect to Sections 4 and 5 of Taihape-Napier Road operate as access routes to adjacent forestry or farms (see *Figure 3-1*). As local access roads, they lack connectivity or permeability meaning there is no alternative parallel route to Taihape - Napier Road to support access in the event of a route closure.

Should a closure occur on these sections of the route, communities and businesses would either be required to wait for the closure to be resolved or undertake significant detours to access their destinations. The lack of alternative “local” routes therefore places a high dependence on the routes availability to ensure movement of goods and critical assets (including forestry, time-sensitive products and perishable produce).

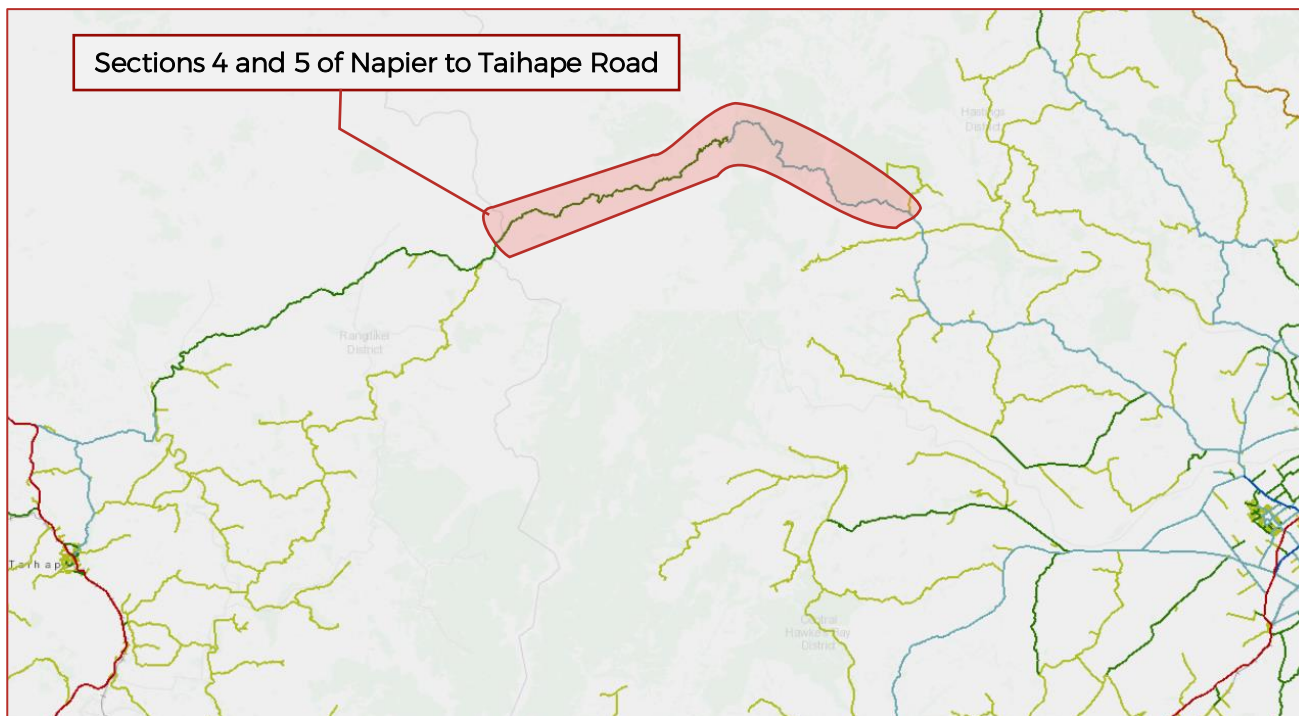


Figure 3-1: Taihape-Napier Road and Adjacent Roding Connections

Rangitikei and Hastings District Council staff have identified several natural hazards risks on Section 4 and 5 that impact on the availability of the route:

- The route is susceptible to slips and dropouts which reduce the available width of the route for drivers. These are typically localised and do not result in full route closures; therefore, impacts on route availability are generally relatively minor, and managed under the existing maintenance contracts;
- The high elevation of the route as it traverses through the Ranges means it is regularly closed because of adverse weather events, ice and snow. This was most recently experienced in July 2020, when snow closed the route for three days (see Figure 3-2)³. This is the most common cause of full road closures on the route; and
- Taihape-Napier Road crosses several rivers which are prone to flooding during major weather events. These may require maintenance to reduce the impact of heavy rain events and to protect structural integrity.

The ability to respond to resilience events (both natural hazards and vehicle crashes) is also restricted by the remote nature of the route and the lack of adequate cell phone coverage to report incidents. The topography around the Kaweka Ranges results in coverage dead spots (as highlighted in Figure 3-3). This makes it difficult to get calls to emergency services and maintenance crews enabling quick response to events on the network.

³ <https://www.rangitikei.govt.nz/news/2020/taihape-napier-road-closed>



Figure 3-2: Recent Closure of Taihape-Napier Road due to Snow (July 2020)

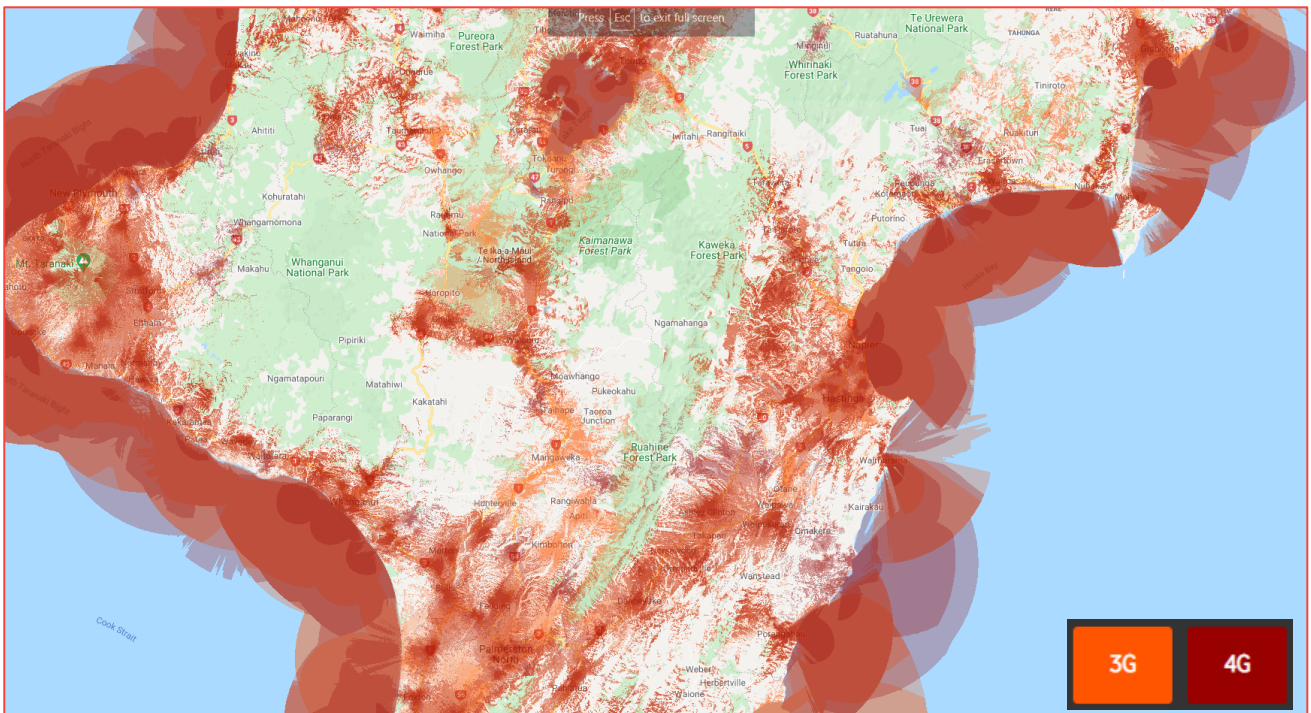


Figure 3-3: Vodafone Mobile Phone Coverage (3G/4G) within the vicinity of Taihape - Napier Road

There is limited data available to the project team at present to confirm the frequency and duration of closures on Taihape-Napier Road; however, previous studies have indicated the route is closed approximately two days per year⁴, which is comparable with the frequency of snow and ice closures on the Napier-Taupo Road (three days per year) and significantly less than the Desert Road section of SH1.

At a regional level, Taihape-Napier Road is also identified by Waka Kotahi as an alternative regional route when closures occur on Napier-Taupo Road (SH5) (see excerpt from the “Detour Selector” tool shown in *Figure 3-4*). SH5 also has limited alternative local routes that can be used as viable detours in the event of a route closure. As such, any closure or outage on SH5 between Taupo and Rawhiti is expected to increase access demands on Taihape - Napier Road, particularly if the closure has a longer duration.

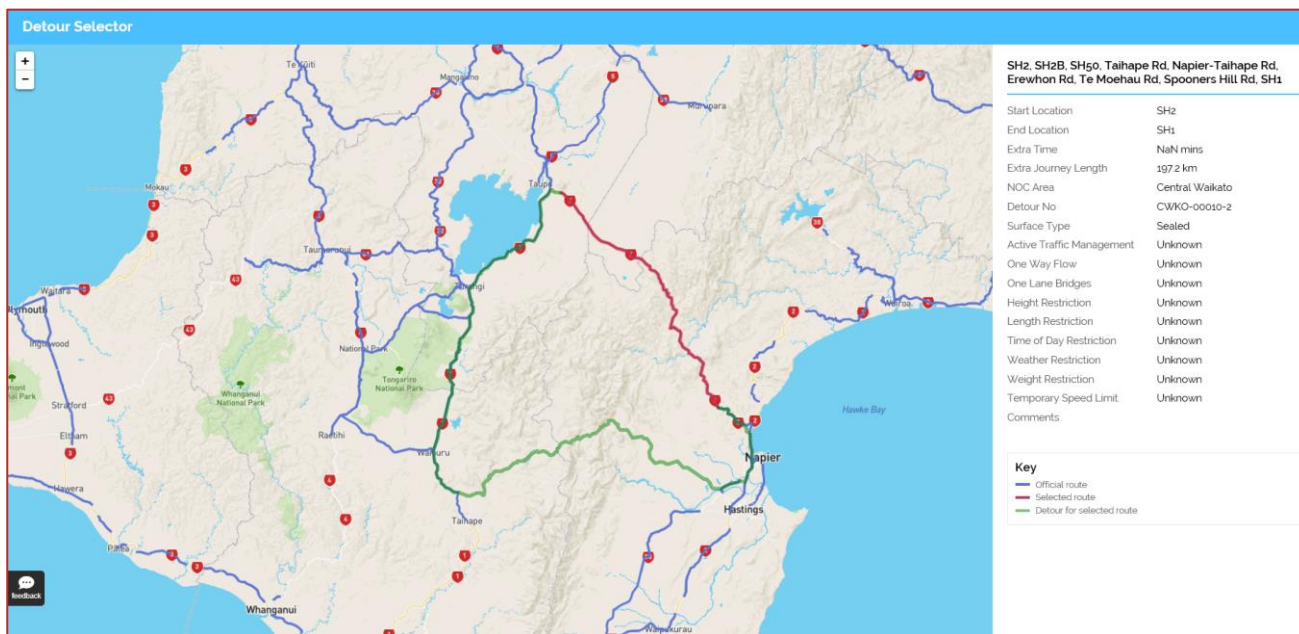


Figure 3-4: Detour Selector for Closures on State Highway 5 (Source: Waka Kotahi, MegaMaps)

Improvements that support route resilience by reducing susceptibility to unplanned network disruptions (both frequency and duration) would provide benefits not only to local industries but also wider community access to economic and social opportunities.

3.2 Optimal Speeds

The ONRC recognises speed limits must be safe and appropriate for a road with consideration given to the function, nature and use of the road, its environment, land use patterns, recognising whether the road is in an urban traffic area or a rural area. At present, most of the corridor operates with a posted speed limit of 100km/hr, except for a small section through the Omahu township which operates with a 50km/hr posted speed limit, and the variable speed limits that operate outside schools on the corridor.

The challenging and winding nature of the existing road corridor mean the posted speeds are difficult to achieve along its full length. As shown within Table 3-2 and Figure 3-5, the corridor operates with average speeds significantly lower than the posted speed limit.

⁴ Taihape-Napier Road Study/Walbran Report (2006)

Table 3-2: Optimal Speeds - Taihape - Napier Road

SAFETY FACTOR	SECTION 1		SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6
	Spooners Hill Rd	Te Moehau Rd					
Posted Speed	100km/hr		100km/hr	100km/hr	100km/hr	100km/hr	100km/hr (50km/hr urban)
Mean Speed ⁵	70-74km/hr	65-69km/hr	65-69km/hr	65-69km/hr	65-69km/hr	65-69km/hr	80-84km/hr
Safe and Appropriate	80km/hr	60km/hr	60km/hr	60km/hr	80km/hr	80km/hr	80km/hr (60km/hr urban)

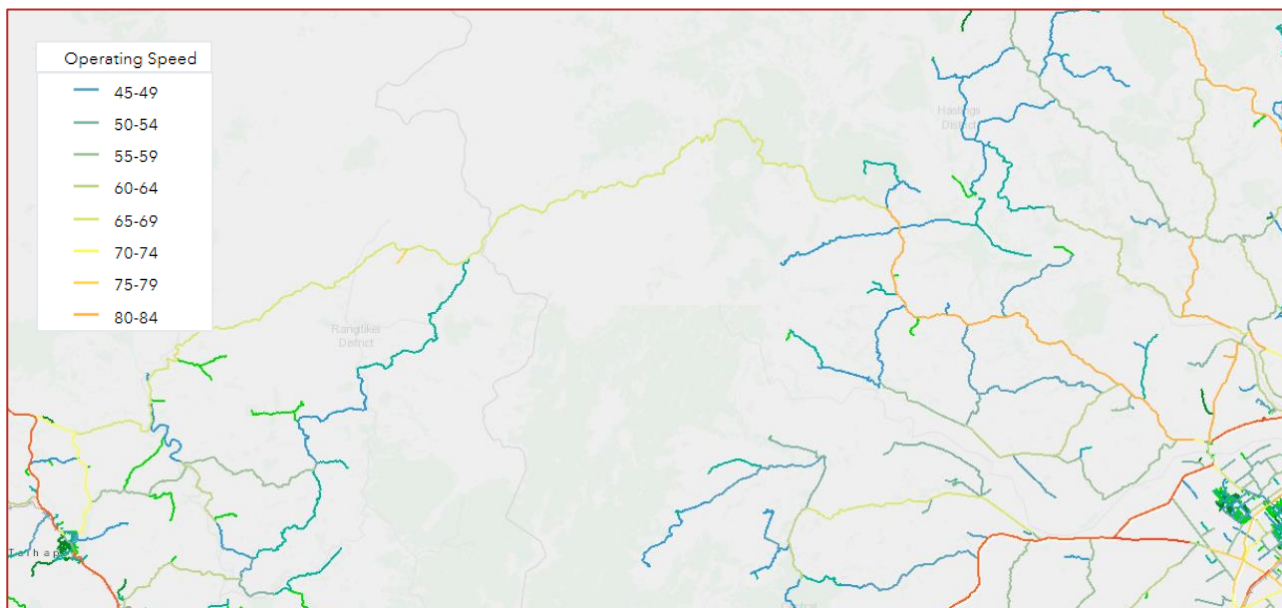


Figure 3-5: Mean Operating Speeds on Taihape - Napier Road (Source: Waka Kotahi MegaMaps)

The NZ Transport Agency’s MegaMaps indicate the “safe and appropriate”⁶ speed limit for the corridor is between 60km/hr and 80km/hr, significantly lower than current posted speed limits (see Figure 3-6). This is primarily because of the poor surrounding roadside conditions score⁷.

⁵ These are higher than those shown in Table 2-1 as the route only accounts for the Taihape - Napier Road corridor itself

⁶ Based on Waka Kotahi’s Speed Management Guide:
<https://www.nzta.govt.nz/assets/Safety/docs/speed-management-resources/speed-management-guide-first-edition-201611.pdf>

⁷ Demonstrated through the corridor’s medium-to-high and high infrastructure risk rating

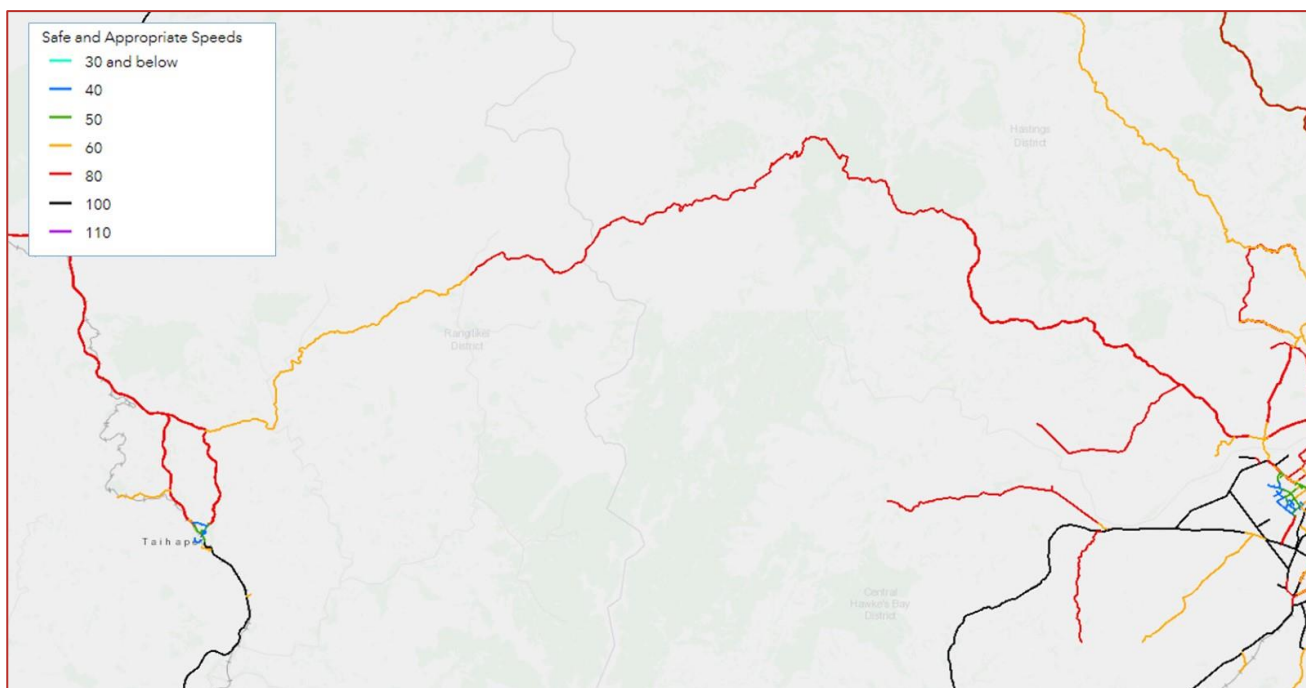


Figure 3-6: Safe and Appropriate Speeds on Taihape - Napier Road (Source: Waka Kotahi MegaMaps)

3.3 Key Findings

The CMP recognises that the existing Taihape-Napier Road corridor has several “deficiencies” that poorly align with Waka Kotahi’s CLoS expectations for mobility on “collector” roads. These are summarised within Table 3-3, with potential responses investigated in further detail within Section 8.1 of the report.

Table 3-3: Taihape-Napier Road Mobility Performance Assessment Summary

MOBILITY PERFORMANCE SUMMARY	
KEY ISSUES	DISCUSSION
Resilience	<ul style="list-style-type: none"> Resilience is important on Taihape - Napier Road given its economic importance in providing access for local businesses to regional markets. It also plays an important function as an alternative route in the event of a road closure on Napier-Taupo Road (SH5). Taihape-Napier Road is particularly vulnerable to closure from natural hazard events due to weather events (rain, snow and ice) and slips/drop-outs, particularly on winding/remote sections of the corridor. There are limited alternative parallel routes through remote sections of Taihape-Napier Road meaning when closures occur, travellers wishing to cross the Kaweka Ranges are required to either undertaken significant re-routing via the state highway network or to “wait it out” until the connection is restored. Limited cell phone coverage reduces the ability to respond efficiently and effectively to vehicle crashes and natural hazard events that disrupt access.
Speed Limits	<ul style="list-style-type: none"> The Taihape - Napier Road operates with a 100km/hr posted speed limit. Travel speeds are significantly lower than the posted speed limit along majority of the route. Analysis of the “safe and appropriate” speed limit indicates a reduced posted limit of between 60-80km/hr would be more desirable unless roadside conditions are improved.

4 Safety Performance

The Customer Level of Service expectations relating to road safety for both primary and secondary collectors are outlined within Table 4-1. As shown within the table, the safety expectations are consistent between both primary and secondary collector roads.

Table 4-1: CLoS for Safety

CATEGORY	LOS EXPECTATIONS	
	PRIMARY COLLECTOR	SECONDARY COLLECTOR
Safety	Variable road standards and alignment. Lower speeds and greater driver vigilance required on some roads/sections particularly depending on topography, access, density and use. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Road user safety guidance provided at high risk locations.	

4.1 Crash History

The Waka Kotahi (NZ Transport Agency) Crash Analysis System (CAS) was used to determine the number of crashes and crash types along this route over the last 10 years (January 2010- September 2020).

A total of 88 crashes have been recorded over this period, of which 42 have resulted in an injury. 23 of these crashes (26% of all crashes) have resulted in a death or serious injury (DSI), leading to 5 deaths and 20 serious injuries. Of the DSI crashes, 78% involved single parties reflective of the winding and challenging nature of the road environment. The clear majority of all crashes have occurred on mid-block sections of the route, with only 8% of crashes occurring at intersections or driveways.

Table 4-1 provides a summary of the crash types for the route within the Rangitikei District and Table 4-2 is a summary of the crash types on the route in Hastings District. The crashes have been grouped into non-injury, minor injury and death and serious injury (DSI) crashes and further divided into movements; cornering crashes, head-on crashes and other (including intersection and miscellaneous crashes). The main type of crash was loss of control on bends (64%), with the top two causes relating to poor handling (40%) and driving too fast (25%).

Table 4-2: Taihape to RDC boundary - 10-year Crash Type Summary (Total Recorded Crashes between January 2010 and September 2020)

VEHICLE MOVEMENT	NON-INJURY	MINOR INJURY	DSI	TOTAL
Cornering	9	4	9	22
Head-On	3	1	0	4
Other	6	1	0	7
Total	18	6	9	33

Table 4-3: HDC Boundary to Fernhill - 10-year Crash Type Summary (Total Recorded Crashes between January 2010 and September 2020)

VEHICLE MOVEMENT	NON-INJURY	MINOR INJURY	DSI	TOTAL
Cornering	18	9	9	36
Head-On	3	0	3	6
Other	7	4	2	13
Total	28	13	14	55

The recorded crash locations on the corridor as identified within CAS are shown in Figure 4-1. The crash analysis indicates sections of the road with the highest crash rates are on the eastern extent,

where the route passes through urban areas with higher traffic volumes. Two of the fatal crashes occurred in close proximity to each other on Section 6, approximately 4km west of the intersection with SH50. The third fatality occurred on the western approach to the Rangitikei River crossing with the fourth and most recent crash (2020) on Spooners Hill Road just north of Taihape.

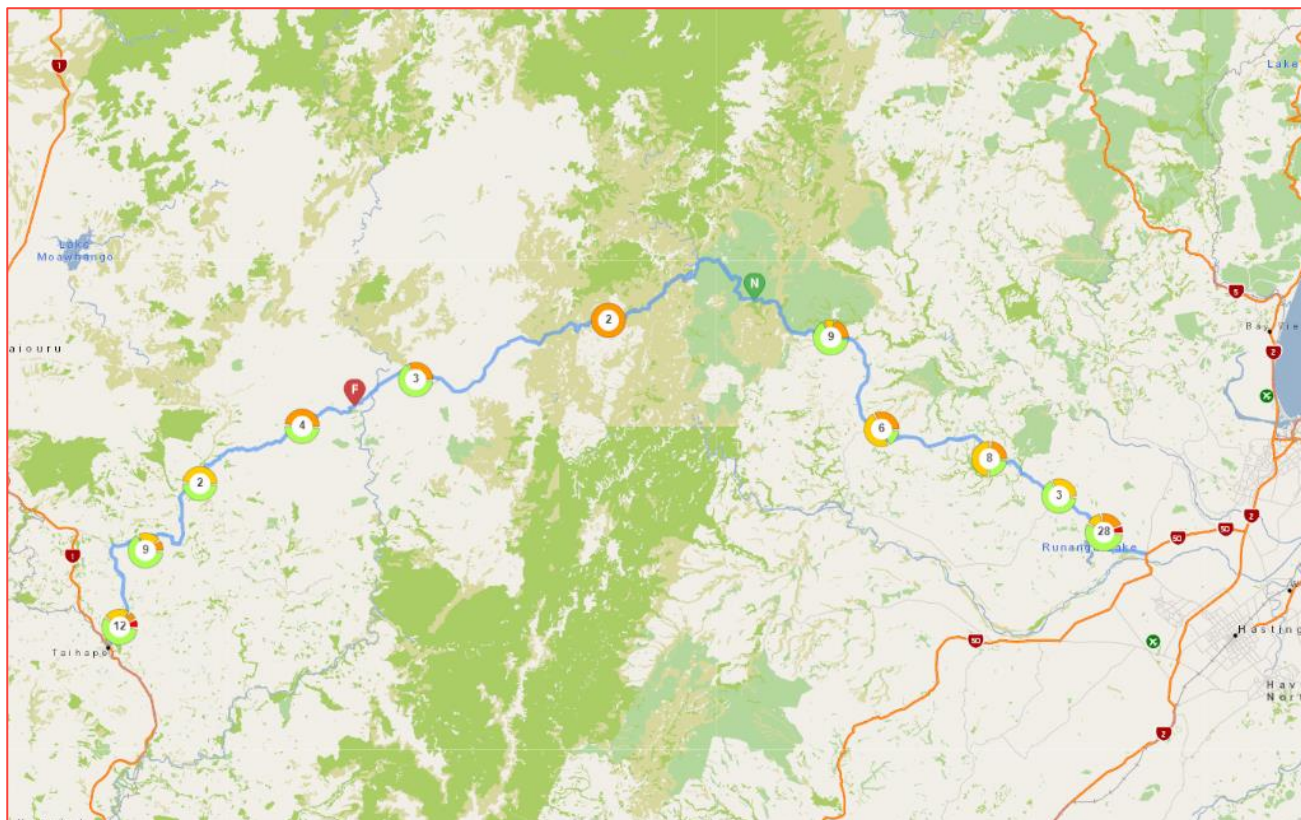


Figure 4-1: Crash Locations – Taihape - Napier Road

Based on the June 2018 figures prepared by the Ministry of Transport, the average social cost of a fatality is \$4.37 million, \$458,000 per serious injury and \$24,700 per minor injury³. It follows that the total social cost of all injuries on Taihape - Napier Road over the 10 years has been \$31.54M (\$2018) or \$3.15M a year. This figure does not include damage only crashes.

The most common crash type along this route is loss of control on bend or head-on crashes, comprising of 73% of all crashes on the corridor. Other crash causes included rear-end/obstructions (10%), loss of control/head-on collisions on straight sections of the road (8%) and overtaking related crashes (6%). It also noted that 93% of crashes resulted from driver error.

Other crash statistics are shown in Figure 4-2 to Figure 4-4 below. Notably, 21% of all crashes have involved motorbikes, which appears to be overrepresented on this route. Enhancing the environment for motorbikes could be investigated through the CMP process.

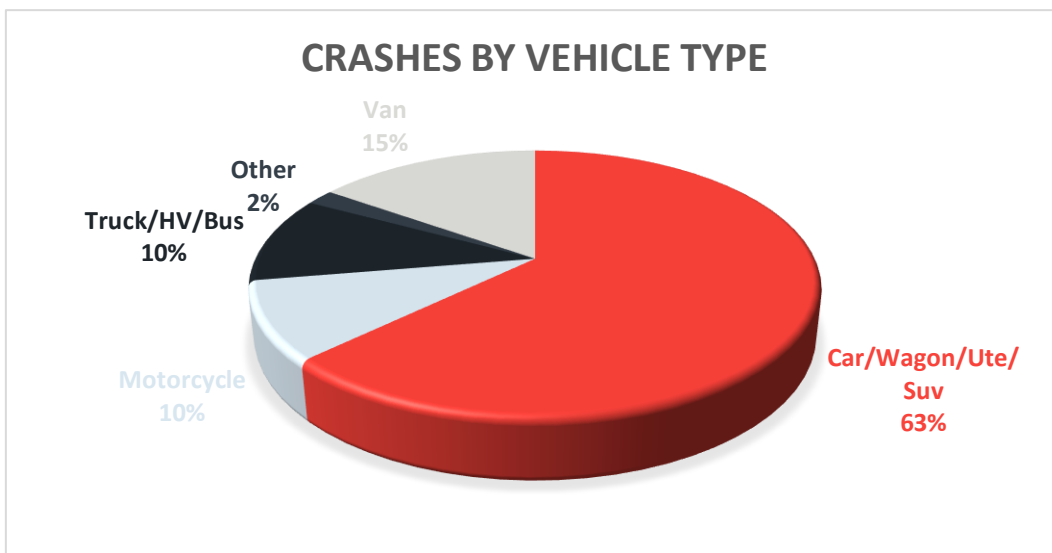


Figure 4-2: Crashes by Vehicle Type

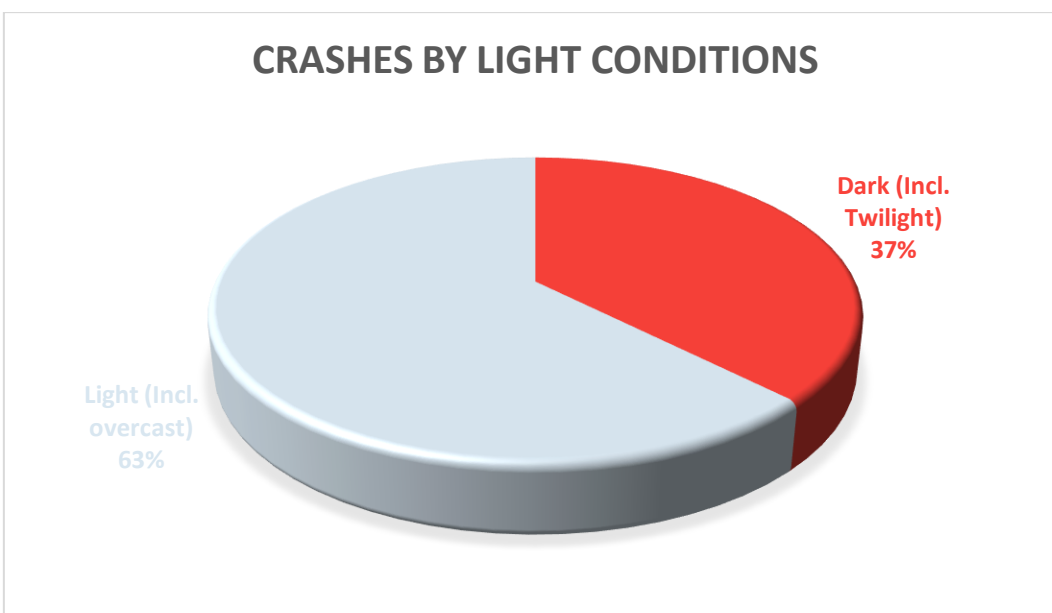


Figure 4-3: Crashes in the Dark

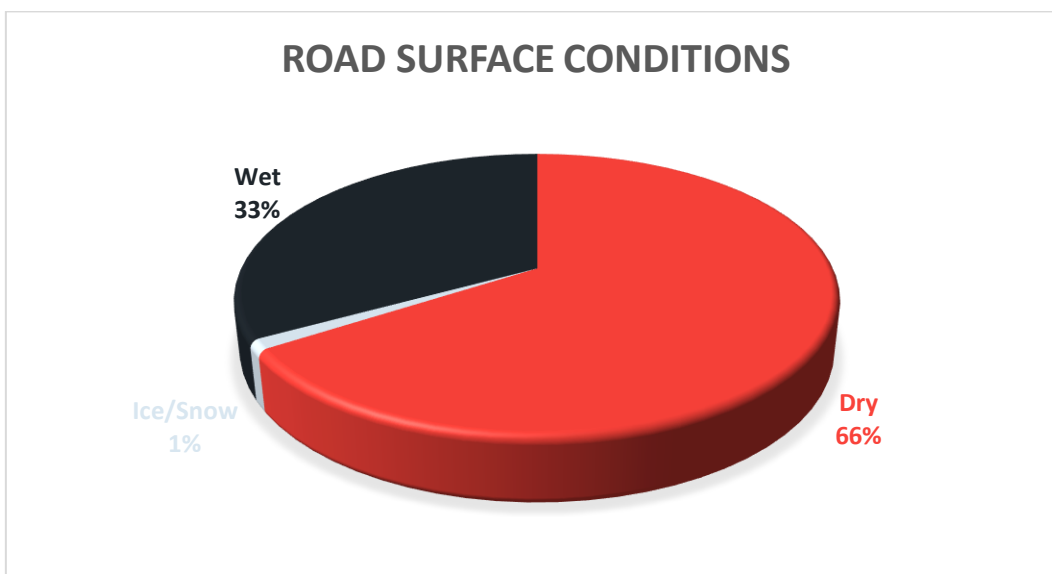


Figure 4-4: Crashes by Surface Condition

4.2 Safety Performance (Crash Risk)

Using injury crashes only and severity index factors and processes outlined within the “High Risk Rural Roads Guidelines”, the Collective Risk and Personal Risk has been determined, based on corridor crash histories and traffic volumes.

The definitions for each of the risk metrics are as follows:

- **Collective Risk** (also known as crash density) which provides a measure of the number of high-severity (fatal and serious) crashes that have happened per kilometre of road per year; and
- **Personal Risk** (or crash rate) which provides a measure of the number of high-severity (fatal and serious) crashes that have happened per 100 million vehicle kilometres of travel on the road.

The Infrastructure Risk Rating (IRR) has also been extracted from the NZ Transport Agency’s MegaMaps online tool to provide an indication of safety risks associated with existing roadside environment.

The findings are summarised in *Table 4-4*.

Table 4-4: Safety Performance on Taihape - Napier Road

SAFETY FACTOR	SECTION 1 ⁸		SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6
	Spooners Hill Rd	Te Moehau Rd					
Infrastructure Risk Rating	Medium	Medium-High	Medium-High	Medium	Medium	Medium	Medium
DSI’s	3		3	1	2	2	12
Traffic Volumes	375		250	180	150	305	1,000
Length of Section	17.3km		22.9km	15.8km	19.8km	20.7km	36.3km
Collective Risk	Low-Medium (0.016)		Low (0.013)	Low (0.006)	Low (0.010)	Low (0.010)	Low-Medium (0.030)
Personal Risk	Medium-High (11.78)		High (14.36)	Medium-High (9.63)	High (18.08)	Medium-High (8.89)	Medium-High (8.84)

The IRR has been scored medium-high on Te Mohau Road and Section 2 of the Taihape-Napier Road; whilst the remainder of the route (including all sections within the Hastings district) have a “medium” IRR rating. The high IRR scores stem from a combination of the road’s winding alignment, narrow lane and shoulder widths and high proportion of roadside hazards.

⁸ This is the only section where two different IRR ratings are provided, thus the route has been divided into two parts in this table.

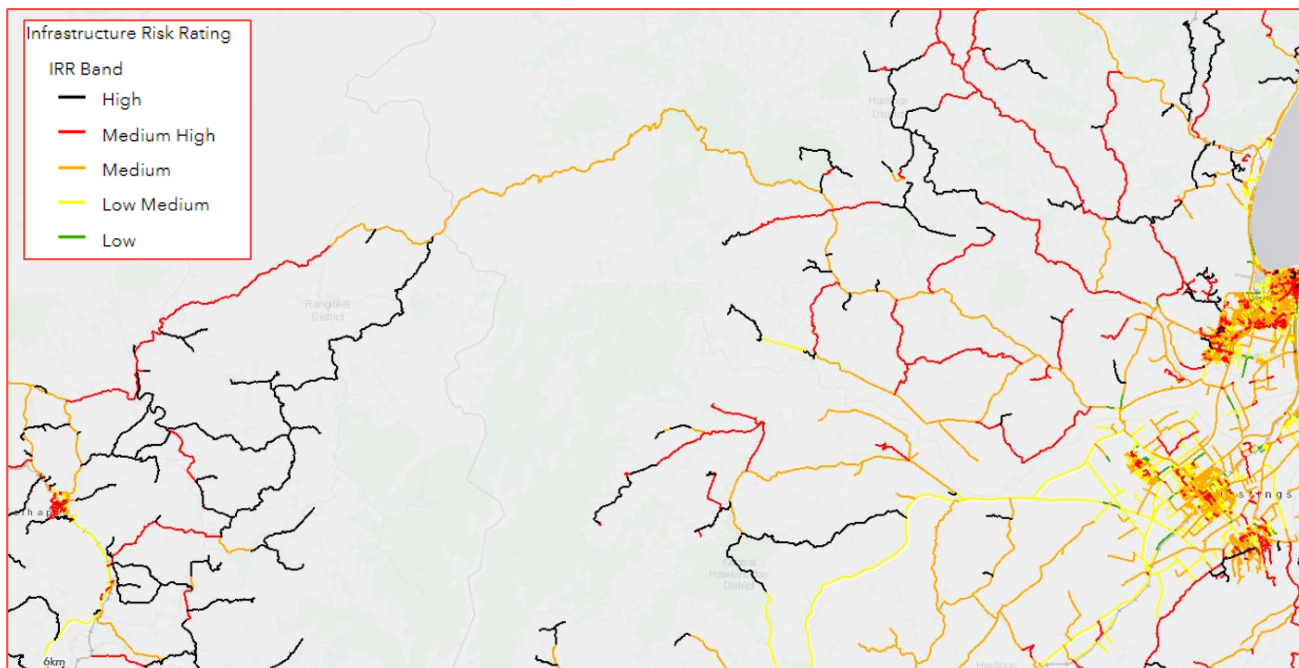


Figure 4-5: Taihape-Napier Road Infrastructure Risk Rating (Source: Waka Kotahi, MegaMaps)

Analysis of DSI crashes across the corridor (in its entirety) results in the route operating at a “high” personal risk and “low” collective risk. The low collective crash risk is reflective of the low volumes of traffic on the route. Although the section of the route on the Rangitikei District Council side is longer than the route on Hastings District Council side (76km compared to 57km) it has lower crash numbers; however, there is an over-representation in the number of DSIs, when considering traffic volumes on this section of the road.

This is reflected in the detailed crash risk analysis of the route at a segment level, which indicates a large proportion of the corridor within the Rangitikei District (between Moawhango and Kuripapango) has a “high” personal crash risk whilst the remainder classed as a “medium-high” risk. Of note, Spooners Hill Road (Section 1) has been identified as part of the Waka Kotahi’s Top 10% DSI savings network sections.

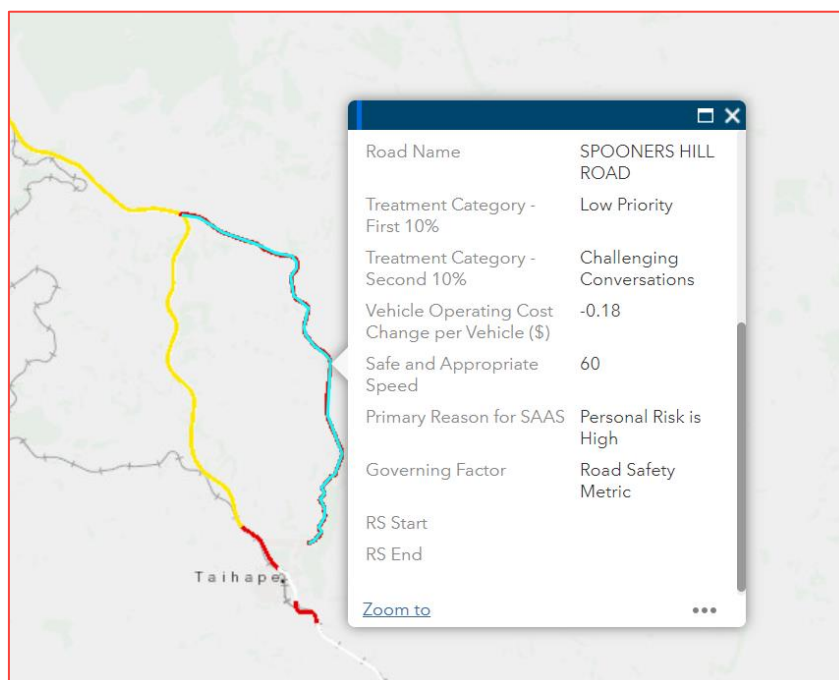


Figure 4-6: Section of Taihape-Napier Road identified as part of Top 10% DSI Savings (Source: Waka Kotahi)

4.3 Key Findings

The CMP recognises that the existing Taihape-Napier Road corridor has several “deficiencies” that poorly align with Waka Kotahi’s CLoS expectations for safety on “collector” roads. These are summarised within Table 4-5, with potential responses investigated in further detail within Section 8.2 of the report.

Table 4-5: Taihape-Napier Road Safety Performance Assessment Summary

SAFETY PERFORMANCE SUMMARY	
KEY ISSUES	DISCUSSION
Crash History (2010-2020)	<ul style="list-style-type: none"> • Since 2010, a total of 88 crashes have been recorded on the corridor with 24 of these resulting in serious outcomes (deaths or serious injury). • The majority of crashes with severe outcomes resulted from loss of control or head on crashes on curves.
Safety Metrics	<ul style="list-style-type: none"> • The route is identified as having a “low” collective crash risk but a medium-high to high personal crash risk, indicating whilst traffic volumes are low the risk of drivers having a crash with a severe outcome is over-represented. • Spooners Hill Road is identified as key section of the route requiring safety improvements, as identified through Waka Kotahi’s top 10% DSI savings analysis.
Infrastructure Risk Rating	<ul style="list-style-type: none"> • Large sections of the corridor within the Rangitikei District are identified as having a “medium-high” infrastructure risk rating, indicating the carriageway and its surroundings create a poor roadside environment.

5 Amenity Performance

The Customer Level of Service expectations relating to amenity for collector routes are outlined within Table 5-1. Improvements that seek to improve safety and resilience will contribute towards the quality of journey experience for general road users; however, there are specific opportunities to enhance amenity for tourism and recreational users of the corridor.

Table 5-1: CLoS Expectations for Amenity

CATEGORY	LOS EXPECTATIONS	
	PRIMARY COLLECTOR	SECONDARY COLLECTOR
Amenity	Moderate level of comfort, occasional areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use.	Moderate level of comfort, longer areas of roughness. Aesthetics of adjacent road environment reflects journey experience needs of all road users and adjacent land use.

5.1 Road Surface Condition

The sealing of sections of Taihape-Napier Road in the mid-2000s has provided consistency in road surface conditions for users along the route's entirety; providing benefits such as improved access for both existing and future residents, increased tourism and visitation, and improved access for businesses based within the Southern Plateau to key destinations such as Napier Port.

During the route drive over, the project team observed several sections with deteriorating road surface across both District Council's sections, including surface cracking, reduced skid resistance, potholing and shoulder breaks. Councils are responsible for maintaining levels of service relating to comfort and roughness based on the routes strategic function.

Asset Management Plan's (AMPs) developed by each Council outlines expectations in terms of maintenance and route performance, primarily driven by its status within the road hierarchy. As the route is identified as a secondary arterial through the Rangitikei District and a primary collector through the Hastings district, there may be a disconnect between Council's expectation for the routes performance. AMPs also provide opportunities to identify and plan maintenance activities with other capital improvements identified through the CMP process.

5.2 Tourism and Recreation

Previous studies undertaken in the mid-2000s included interviews with tourists, who had specifically included the road on their itinerary due to its scenic value (Walbran Report, 2006). Many had included through route as part of a round trip from the Auckland area as it links the central North Island volcanic plateau and the Hawke's Bay region.

Taihape - Napier Road has been identified as a key route for tourism and regional visitation, given the range of outdoor pursuits, its regional connectivity to the Central Plateau and the routes role as a recognised NZ Cycle Trail. Journey experience is particularly important in these sectors, and enhanced route amenity would improve the attractiveness of visitation which in turn would provide potential economic benefits for the region(s).

Key challenges relating to growth in visitation and tourism on Taihape-Napier Road relate to balancing increased user demand with other key users including heavy vehicles, which currently comprise approximately 20% of all access demands. Potential opportunities to enhance access on Taihape - Napier Road to support accessibility to existing and future land-use along the corridor, include the provision of:

- Passing opportunities where informal passing opportunities are restricted or unsafe;
- Rest areas and associated amenities at strategic locations; and
- Enhanced signage, wayfinding and information for visitors.

These are discussed further in the context of Taihape - Napier Road below.

5.2.1 Passing Opportunities

The relatively high proportion of freight vehicles, campervans and unfamiliar drivers (who may drive slower) creates conflicts between slower and faster vehicles. This, coupled with the routes challenging terrain, results in infrequent opportunities for safe overtaking particularly on approaches to or leaving winding “tortuous” sections of the route alignment. The provision of suitably positioned passing lanes can provide:

- A reduction in frustration for road users that lead to unsafe passing activities, reducing the potential for overtaking head on or loss of control crashes;
- Enhanced experience for visitors, tourists or those less familiar with road conditions due to reduced conflicts with other users; and
- A more cost effective option to improve efficiency through better travel time reliability and reduced average journey times (particularly through slow or challenging sections of the route) compared with larger capital projects such as route realignments.

The Austroads Research Report AP-R596-19 (2019) outlines the warrants for providing short and low-cost passing lanes at 10 to 15 km spacing (or more) based on route characteristics, traffic volumes and slow vehicle volumes. (see Table 5-2). Based on the existing heavy vehicle component (approximately 20%), the absolute minimum two-way ADT volumes to warrant passing opportunities are 670 vehicles per day.

Table 5-2: Traffic Volumes Warrant Guidelines for Passing Lanes (10 to 15km Spacing's)

Overtaking opportunities over the preceding 5 km		Current year design volume (AADT, two-way)		
Description	Per cent length providing overtaking	Percentage of slow vehicles		
		5	10	20
Excellent	70–100	5670	5000	4330
Good	30–70	4330	3670	3330
Moderate	10–30	3130	2800	2470
Occasional	5–10	2270	2000	1730
Restricted	0–5	1530	1330	1130
Very restricted	0	930	800	670

The existing and forecast traffic volumes (detailed within Section 2.4.3) indicate that even with anticipated future traffic growth, passing opportunities would not be warranted on sections of Taihape-Napier Road within the Rangitikei district; however, higher traffic volumes within Hastings District (in particular Section 6) may warrant their provision.

5.2.2 Rest Areas

A “rest area” is a location that is accessible from the roadway in which a driver can safely stop their vehicle, without blocking the flow of traffic, and rest for a period of time suitable for meeting their fatigue needs. Ideally, these sites provide a reasonably quiet location with adequate separation from the road, and appropriate facilities to allow drivers to achieve effective rest⁹.

An ‘informal’ rest area could be categorised as one which has not been purposely formed as such, but maybe used as a pull over bay – e.g. a stockpile, remaining sealed area formed following a road realignment or gravel area. A ‘formal’ rest area is one that has been recognised by the Local Authority as having existing amenities (including signage) and is suitably maintained.

⁹ Rest Areas and Rest areas – Location, Design and Facilities (2014), Queensland Government

For the freight industry, a network of safe and secure truck stops with good facilities (such as toilets, ample parking and lighting) will mean that drivers can adequately adhere to the worktime and logbook requirements without the need to pull over onto the shoulder of the road.

For visitors, rest areas have the potential to make the journey safer and to add to the overall journey experience; however, they need to be in places where people want to stop and need to provide the right facilities. In terms of the visitor experience, rest areas can play two roles – either as a destination (e.g. a ‘photo stop’ / connection to a walking trail), or as a means of showcasing the routes culture by storytelling through urban design and information boards

There are several locations on the existing Taihape - Napier Road where both informal and rest areas are currently provided (see *Figure 5-1*); however, site visits observed that these are poorly signposted and lack basic amenities for visitors. Options for formalising facilities and improving amenities at key locations on the corridor have been identified through the CMP process.



Figure 5-1: Rest Area – Springvale Suspension Bridge (Left) and the Kaweka Range (Right)

5.2.3 Signage and Wayfinding Provisions

Visitors get information about a destination from a variety of sources before and during their visit including online, printed material, information centres, word of mouth and from road signs. Wayfinding and route signage facilitates safe journeys by providing users with clear directions.

Wayfinding provides opportunities to raise awareness of the area’s attractions and features and encourage people to stop and visit. It can provide direction for visitors to scenic routes, historic and cultural places, cycle ways and public amenities, and therefore can promote tourism on the route. Enabling visitors to more confidently navigate the route also means less erratic behaviour (e.g. not making unsafe turns or last-minute manoeuvres to get to their desired attraction or destination).

Clear and efficient wayfinding is considered an essential part of visitors' experiences. Wayfinding using maps, signage and online information provides opportunities to raise awareness of attractions and features that encourage people to see and do more when they visit. Whilst information boards are provided at some key destinations, there is limited information on the route corridor itself that direct tourists and visitors to the destinations themselves.

The benefits of wayfinding signage are difficult to measure; however, signage is relatively low cost when compared to other types of infrastructure. While wayfinding signage stimulates economic growth by drawing visitors to places and attractions, the visitors need to be provided with suitable infrastructure, public amenities and digital connections for them to stay longer and do more at desired destinations.

5.3 Key Findings

The CMP recognises that the existing Taihape-Napier Road corridor has several “deficiencies” that poorly align with Waka Kotahi’s CLoS expectations for amenity on “collector” roads. These are summarised within Table 5-3, with potential responses investigated in further detail within Section 8.3 of the report.

Table 5-3: Taihape-Napier Road Amenity Performance Assessment Summary

AMENITY PERFORMANCE SUMMARY	
KEY ISSUES	DISCUSSION
Road Surface Condition	<ul style="list-style-type: none"> Unsealed sections of Taihape-Napier Road corridor were completed in the 2000s, providing a fully connected/sealed route between Rangitikei and Hastings District Council.
Amenity for Visitors	<ul style="list-style-type: none"> The route is identified as a regional tourist and visitor route, and there are options to enhance its amenity through improving the journey experience for these users. Identified opportunities to enhance journey conditions for include improved rest areas, better signage / wayfinding and overtaking opportunities (where appropriate). The existing and forecast traffic volumes indicate passing opportunities would not be warranted on sections of Taihape-Napier Road within the Rangitikei district; however, higher traffic volumes within Hastings District may warrant their provision. There are several locations on the existing Taihape - Napier Road where both informal and rest areas are currently; however, site visits observed that these are poorly signposted and lack basic amenities for visitors. There is limited signage and wayfinding on the route to draw visitors to key points of interest along the route.

6 Accessibility Performance

The Customer Level of Service expectations relating to accessibility for both primary and secondary collectors are outlined within Table 6-1. The route aligns with CLoS expectations relating to accessibility by providing connections from local access roads onto regionally significant routes and arterial roads; however, there are opportunities to enhance access to existing and future corridor demands, including:

- Enabling and improving the efficiency movement of goods and services; and
- Supporting access for tourists and visitors travelling on the NZ Cycle Trail.

Table 6-1: CLoS Expectations for Accessibility

CATEGORY	LOS EXPECTATIONS	
	PRIMARY COLLECTOR	SECONDARY COLLECTOR
Accessibility	Land-use access for road users generally permitted but some restrictions may apply. Road user connection at junctions with Arterial or Collector roads, and some restrictions may apply in urban areas to promote Arterials. Traffic on higher classification roads generally has priority over lower classification roads. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Provision of quality information relevant to Collector road user needs.	Land-use access for road users generally permitted but some restrictions may apply. Road user connection at junctions with other Collectors or Access roads. Collector road traffic generally has priority over access road traffic. Active road users should expect mixed use environments with some variability in the road environment, including vehicle speed. Provision of quality information relevant to Collector road user needs.

6.1 50Max Capability

Most economic activity along the corridor is related to primary industry which is reliant on the movement of goods and services by truck. Allowing larger trucks on the road network reduces the number of truck trips needed to move the same amount of freight. The movement of more freight on fewer trucks provides improved productivity through a reduction of transport operating costs which flows through to the producers, their communities and the customer.

50Max vehicle combinations have one more axle than conventional 44-tonne vehicles combinations, meaning the overall truck load is spread further and there is no additional wear on roads per tonne of freight. This allows 50Max trucks to operate at 50 tonnes maximum total weight (hence 50Max). The additional payload capacity allows more freight to be carried per vehicle on the network.

50Max gives freight operators the option to carry increased payloads on parts of the network that, while economically important to New Zealand, are unable to carry HPMVs. The neutral impact on roads allows greater network access, particularly on the extensive local road network where pavement strengths are insufficient to allow higher axle loads.

It is estimated 50Max vehicles could achieve an 8-12% reduction in operating costs compared with standard 44-tonne combinations. This also has benefits for improved safety through reduced crash risk exposure and environmental benefits through reduced vehicle emissions.

The ability to permit heavy vehicles along the route is constrained by the capability of the existing bridges to support 50MAX loads. At present, the weight restrictions on some bridges on Taihape-Napier Road which restricts the ability of local industry (including forestry) to utilise 50Max vehicles.

As outlined within the RDC Asset Management Plan (2018-2021), a review of all bridge structures was undertaken to ensure they complied with heavy vehicle weight limits of the 2010 Vehicle Dimension Mass Rule. The study identified three bridges on the road corridor within RDC that would

require additional strengthening to make the route 50Max capable (see Table 6-2). Two bridges have been identified within the Hastings District through Waka Kotahi 50Max bridge restriction maps.

Table 6-2: Bridges on Taihape - Napier Road not 50Max Capable

TLA	SECTION	BRIDGE NAME	LOCATION	AGE	LENGTH
RDC	Section 1-2 Bdy	Moawhango	Te Moehau Rd (RP 8.3)	1955	42m
	Section 3-4 Bdy	Springvale	Taihape-Napier Rd 2 (RP: 0.0)	1970	88m
RDC/HDC	Section 4-5 Bdy	Kuripapango	Taihape-Napier Rd 2 (RP: 35.6)	1961	59m
HDC	Section 6	Pukehamoamo	Taihape Road (RP. 8.8)	1954	41m
	Section 6	Kawera	Taihape Road (RP. 7.3)	1951	44m

6.2 National Cycling Route

Taihape - Napier Road in its entirety forms a Heartland Ride in the NZCT (known as the “Gentle Annie” route) connecting the Rangitikei District to the Hawke’s Bay. The Gentle Annie route is a two day cycle tour, covering a length of 136km and described as “a challenging but rewarding ride across remote hill country”. The route connects with two other Heartland rides on either side: Route 52 through to the Wairarapa in the east and the Ohakune-Taihape Trail (OTT) to the west.

It is also used for cycle sporting events such as the Gentle Annie Bike Ride, an annual fixture on the cycling calendar since the road was fully sealed in 2011 (see Figure 6-2). NZCT is working with Tourism New Zealand (TNZ) to attract international visitors by developing awareness of New Zealand as a cycling destination through marketing and advertising. With investment in cycle trails increasing nationwide it is anticipated that the continued growth of the cycling tourism market will be reflected in an increase in the volume of cyclists along Gentle Annie.



Figure 6-1: Cyclists Travelling on Gentle Annie

The existing road form provides several challenges to cyclists on the journey:

- The existing seal width is below desired minimum width standards (< 7.0m) meaning there is little space vehicles to safely overtake cyclists without using the opposing traffic lane.
- The winding nature of the route also provides limited forward visibility in places, restricting the ability to see slower moving cyclists ahead.
- Steep gradients also reduce the operating speeds of touring cyclists, creating speed differentials with other road users, and encouraging inappropriate overtaking activity on the corridor.
- There is also limited promotion or signage along the route to raise awareness of the presence of touring and recreational cyclists.

- The high proportion of heavy vehicles (trucks, buses and camper vans) travelling along the route also create key challenges for cycle safety, as these vehicles are wider than cars and cause more discomfort to cyclists in terms of side drafts, noise and vibration.



Figure 6-2: Cyclists Participating in the Gentle Annie Bike Ride

6.3 Key Findings

The CMP recognises that the existing Taihape-Napier Road corridor has several “deficiencies” that poorly align with Waka Kotahi’s CLoS expectations for accessibility on “collector” roads. These are summarised within Table 6-3, with potential responses investigated in further detail within Section 8.4 of the report.

Table 6-3: Taihape-Napier Road Accessibility Performance Assessment Summary

ACCESSIBILITY PERFORMANCE SUMMARY	
KEY ISSUES	DISCUSSION
50Max Capability	<ul style="list-style-type: none"> • The existing route is not currently classed as a 50Max capable route due to the need for strengthening of several bridges. • Enabling 50Max access would enable more freight to be carried on less trucks, reducing freight volumes, safety risk and CO2 emissions. It would also provide equity of access for businesses located along the full extent of the route.
NZ Cycle Network Access	<ul style="list-style-type: none"> • Taihape - Napier Road in its entirety forms a Heartland Ride in the NZCT (known as the “Gentle Annie” route) connecting the Rangitikei District to the Hawke’s Bay. • With investment in cycle trails increasing nationwide it is anticipated that the continued growth of the cycling tourism market (both domestic and international) will be reflected in an increase in the volume of cyclists along Gentle Annie. • At present, there is limited infrastructure for cycling along the majority of the route. warning for drivers to expect cyclists along the route. This is further compounded by narrow seal widths and winding alignments which restrict visibility of users travelling along the route. • There are opportunities to enhance existing roadside conditions to support safe access for these users, particularly on sections of the route in Hasting District where traffic volumes exceed 1,000 vpd.

Part B – Corridor Strategy

7 Part B Overview

This part of the report identifies proposed strategic improvements on the Taihape - Napier Road corridor in response to the problems identified in Part A. The improvements identified within the strategy range comprise of both policy and planning based recommendations as well as a programme of physical works that could be implemented to improve the corridor performance to better align with its Customer Level of Service Expectations (CLOs) over the next 30-years.

As detailed within Part A, the existing road environment through sections of the Rangitikei District has a number of key deficiencies in its form compared with sections passing through the Hastings District, including narrow seal widths and inconsistent levels of roadside delineation. The philosophy of the CMP route strategy is to provide consistency of journey experience for all road users along the full extent of the route, to better align with user expectations (CLOs).

To assist in identifying and prioritising future programmes of work for the route strategy, each of the identified sections identified within Part A has been divided further into homogeneous sub-sections (see *Table 7-1*). These segments were reviewed to identify sections for which proposed treatments could be identified, grouped and prioritised for implementation (discussed further in Section 8).

Table 7-1: Sub Section Analysis for Corridor Option Development

SECTION	TA	SUB-SECTION	ROAD NAME	RP START	RP END	LENGTH (KM)
Section 1: Taihape to Moawhango	RDC	A	Spooners Hill Road	11.9	9.10	2.800
		B	Spooners Hill Road	9.10	3.34	5.760
		C	Te Moehau Rd	0.00	3.70	3.700
		D	Te Moehau Rd	3.70	0.31	5.085
Section 2: Moawhango to Springvale Suspension Bridge	RDC	A	Taihape-Napier Rd 1	0.31	7.21	6.900
		B	Taihape-Napier Rd 1	7.21	23.19	15.980
Section 3: Springvale Suspension Bridge to Ngamatea Rest Stop	RDC	A	Taihape-Napier Rd 2	23.19 (TN RD1)	7.76	7.819
		B	Taihape-Napier Rd 2	7.76	15.74	7.970
Section 4: Ngamatea Rest Stop to Ngaruroro River	RDC	A	Taihape-Napier Rd 2	15.74	29.61	13.875
		B	Taihape-Napier Rd 2	29.61	35.60	5.996
Section 5: Ngaruroro River to Waiwhare	HDC	A	Taihape Road	56.348	51.300	5.048
		B	Taihape Road	51.300	41.585	9.715
		C	Taihape Road	41.585	36.785	4.800
Section 6: Waiwhare to Fernhill	HDC	A	Taihape Road	36.785	27.800	8.985
		B	Taihape Road	27.800	19.920	7.880
		C	Taihape Road	19.920	8.770	11.150
		D	Taihape Road	8.770	1.775	6.995
		E	Taihape Road	1.775	0.005	1.770

The improvements and the proposed programme for implementation is recorded within the implementation plan (Section 9). The implementation plan provides a basis upon which Council can plan Forward Works Programmes on the corridor.

8 Route Strategy / Interventions

This section of the report provides an outline of the recommended route strategy for the Taihape-Napier Road corridor. The route strategy identifies improvements that would enhance the performance of the corridor to better align with its ONRC CLoS expectations, with consideration to mobility, safety, amenity and accessibility.

The responses identified within the route strategy comprise a combination of both policy, planning and physical route improvements, with the majority of physical works identified through the CMP process comprise of the following intervention themes:

- Speed management improvements;
- Delineation improvements;
- Seal widening;
- Intersection improvements;
- Curve enhancements;
- Bridge improvements; and
- Tourism enhancements.

Each of these works programmes and their alignment to the desired objectives of the ONRC CLoS are discussed further within this section. A detailed programme of recommended improvements along the corridor is also provided within **Appendix J**.

8.1 Mobility Strategy

Resilience is identified as a key issue for the mobility on the route, given its importance in providing local and regional connections for residents, businesses and visitors. The route is also identified as an important connection for regional resilience between the Waikato and Hawke's Bay, providing an alternative connection to SH5 in the event of route closures.

Given these potential economic and social consequences of unplanned route closures, and the implications of such closures freight logistical operations and community access, there is a strong need to ensure that any network resilience risks or threats to key transport connections are proactively managed to reduce the likelihood of closure and improve customers perception of the network. Improved access to information will also allow customers to make informed decisions about how and when to travel along the route.

The Taihape - Napier Road operates with a 100km/hr posted speed limit. Travel speeds are significantly lower than the posted speed limit along majority of the route. Analysis of the "safe and appropriate" speed limit indicates a reduced posted limit of between 60-80km/hr would be more desirable unless roadside conditions are improved.

8.1.1 *Enhancing Route Resilience*

Resilience issues on the route primarily relate to sections through the Ranges where no alternative route choices exist. Improved route resilience includes interventions that reduce the frequency (how often) and/or the duration (how long) of unplanned route closures when they occur. Whilst route resilience considerations typically focus on closures resulting from natural hazards, improved safety and a reduction in crashes resulting in severe outcomes would also minimise network disruptions.

Improved Cell Phone Coverage:

Communications along the corridor are poor with significant dead spots in cell phone coverage which can result in delays in reporting crashes or resilience issues along the route in a timely manner. It is recommended that Councils liaise with telecommunications providers to lobby for improved mobile phone coverage along the corridor. Not only will this facilitate more rapid response to

unplanned route closure events on the corridor, it will also enable improved monitoring and real-time communications to customers about the status of the route.

Improved Information Systems

Both Councils have systems in place to inform road users of closures along the route, including signage updating users of route status (see *Figure 8-1*) and providing up to date information on route status via media platforms. However, consideration could be given to upgrading existing boards to variable messaging systems to allow better dissemination of travel information to route users.



Figure 8-1: Route Availability Signage at Moawhango

The installation of variable messaging signs (VMS) could provide opportunities to keep drivers better informed. Such signs can provide motorists with up to date information on traffic congestion, accidents, network incidents, roadwork zones, or speed limits on a specific highway segment. VMS on Taihape-Napier Road could also be used to advise travellers of travel times, areas of limited mobile phone coverage along the route, and weather events to allow drivers to adjust their driving style to road conditions, better manage expectations of travel times and the journey experience and enable informed decision making about the journey.

Resilience Improvements

Route closures are primarily associated with weather events (i.e. snowfall) which cannot be prevented; however, there are opportunities to minimise closures resulting from natural hazard events such as slips and dropouts through preventative maintenance improvements.

As outlined though the recommended corridor strategy, a large programme of physical works has been identified on Taihape-Napier Road which provides opportunities to implement resilience improvements that reduce the risk of unplanned closures on the route (i.e. slips and drop outs). Site specific opportunities to reduce the susceptibility of the route to these types of closure events should be investigated and considered for delivery in combination with other physical works projects identified within the CMP programme.

Weather Station

Discussions with Council staff indicate the existing emergency response systems to weather related closures are well established and minimise the duration of closures when they occur.

Opportunities have been identified to potentially install a weather monitoring station within the Kaweka Ranges to monitor changes in weather patterns and temperatures across the Kaweka Ranges in real time. This would enable Council to better prepare for responding to adverse weather events, and allow information relating to weather conditions to be disseminated to drivers through proposed VMS systems (noted above).

The preferred location and access rights for implementing such a facility needs to be established.

8.1.2 *Speed Limit Review*

The background review indicates most the Taihape-Napier Road corridor currently operates with a posted speed limit (100km/hr) that exceeds the “safe and appropriate speeds” based on available data within Waka Kotahi MegaMaps and the NZ Speed Management Guidance. It is recommended that a co-ordinated review of the existing posted speed limit is undertaken by both Councils, with a view to providing consistency in journey experience for users of the route.

Identified safety improvements such as curve enhancements and widening the existing carriageway (discussed within Section 4) would improve the roadside condition along the route which is a key consideration in determining the recommended “safe and appropriate” speed. However, as noted throughout the route strategy, it is unlikely that a step change in the form of the road will be achieved in the short-term given the substantial amount of physical works required to achieve the “desired” minimum standards. Therefore reduced posted speed limits are recommended as an initial response to safety issues.

Existing active school warning signs are currently operational adjacent to Sherenden and Districts School within the Hastings District. A similar facility could be considered adjacent to Moawhango School within Section 2 of the route (Taihape-Napier Rd 1: RP. 0085 – 0.240) to raise awareness of the presence of the school, particularly during pick up and drop off periods.

MOBILITY ACTION SUMMARY

- Liaise with telecommunication providers to lobby for improved cell phone coverage along remote sections of the route.
- Consider implementation of variable messaging systems along the route to better inform customers of route status and journey expectations.
- Identify opportunities to implement resilience enhancements in co-ordination wider physical works programmes along the corridor to reduce route susceptibility to unplanned road closure events.
- Undertake a speed limit review of the full route extent in the short term, with a view to confirming the “safe and appropriate” speed limit for the corridor. Install signage based on the review findings.
- Investigate opportunities for enhancing safety adjacent to schools, including the development of an active warning sign system at Moawhango School.

8.2 Road Safety Strategy

As outlined within Section 4, most sections of the Taihape-Napier Road corridor are been identified as having a “high” to “medium-high” personal crash risk and “low” collective crash risk.

The NZ Transport Agency’s “High Risk Rural Road” guidelines suggest limited crash risk reduction benefits are generally achieved on routes with high personal crash risk but low traffic volumes; however, it recommends a “Safety Management” approach is undertaken, targeting improvements that focus around ensuring the highest levels of signage, delineation and road surface maintenance

and management (see Figure 8-2). These interventions generally comprise lower-cost measures that are most appropriate on lower-volume roads where higher-cost infrastructure measures such as solid median barriers and grade-separated intersections are not justified.

This approach is considered appropriate within the context of the corridor, as site visits identified a lack of sufficient road safety infrastructure including delineation, safety barriers and curve signage. Analysis of CAS data has also indicated a significant number of crashes occurring in the dark, which could be reduced by the implementation of sufficient delineation measures such as the addition of audio tactile profiles (ATP's) and raised reflective pavement markers (RRPM's).

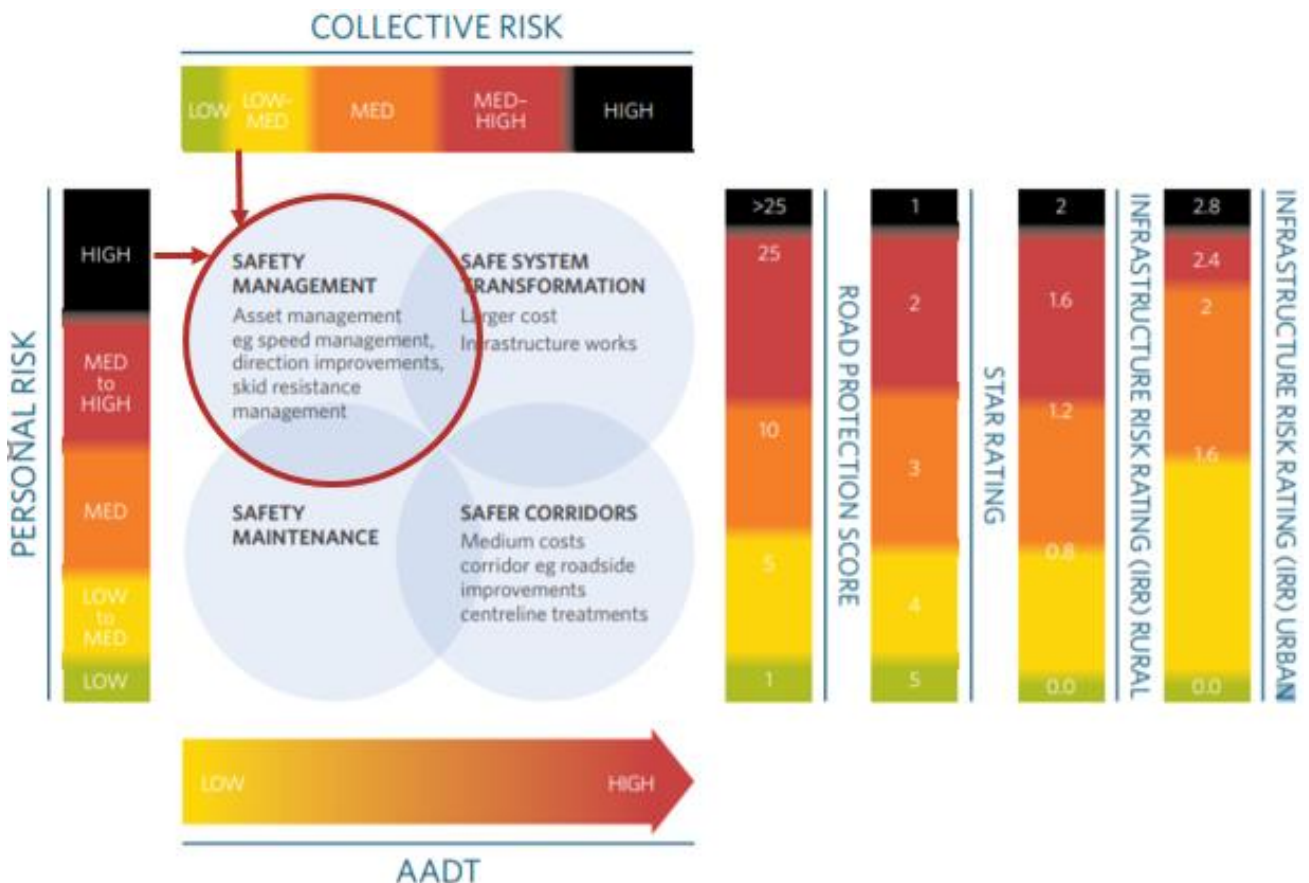


Figure 8-2: High Risk Rural Roads – Treatment Philosophy

A detailed assessment of the route delineation, seal widths and curve enhancements needs has been undertaken through the CMP process, with a view to:

- Providing consistency in carriageway widths which achieve the desired minimum standards;
- Provide consistency in terms of route delineation measures such as ATPs, RRPMs and edge line markers;
- Enhance safety at curves including improved signage and warning systems, delineation and widening (i.e. shoulder widening) where appropriate;
- Guard rail / barriers at critical sites; and
- Construction of pull over areas or passing opportunities where suitable (discussed further in Section 8.3).

As shown within Figure 8-3, the majority of the interventions identified on Taihape-Napier Road to improve safety align with the recommended safety management treatments within Waka Kotahi’s Standard Safety Intervention Toolkit (SSI).

PHILOSOPHY	KEY CRASH TYPE			
	HEAD-ON	RUNOFF ROAD	INTERSECTIONS	VULNERABLE ROAD USERS
Recommended safety management treatments	<ul style="list-style-type: none"> • ATP markings • Improved delineation (signs and markings) • Active signs • Separated off-road facilities • Safe and appropriate speeds 	<ul style="list-style-type: none"> • Wider shoulders • Improve delineation • Active signs • Safe and appropriate speeds 	<ul style="list-style-type: none"> • Skid resistance • Improved sight visibility through various treatment 	<ul style="list-style-type: none"> • Improved sight visibility • Reduce pinch points • Maintain consistent shoulder width • Maintain surface quality

Figure 8-3: Excerpt of Safety Management Treatments from Waka Kotahi's SSI Toolkit¹⁰

8.2.1 Delineation Improvements

Sufficient delineation is a key part of any road safety improvements. Various measures contribute to the delineation of a section of road during the day or at night. This corridor, as is the case with most rural New Zealand roads, does not have street or intersection lighting and therefore night-time delineation is especially important.

The methodology for identifying delineation improvements and the recommended improvements across each sub-subsection of the corridor are captured in further detail within **Appendix C**.

Edgelines and Centrelines

The most basic form of delineation is the provision of edgelines and centrelines to guide vehicles to remain in the safest position on the road. Where sections lack edgeline markings, this was mainly due to narrow seal widths or broken shoulders. This means that in many instances edgeline treatments are recommended along with seal or shoulder widening.

Centreline markings are present along the majority of the corridor. The main section lacking centreline treatments is halfway between Taihape and Napier on Taihape-Napier Road 2. This is due to the extremely narrow seal width, requiring drivers to take care when passing oncoming vehicles. It is therefore recommended that this section of the corridor be widened to sufficiently accommodate centreline and edgeline treatments, and the swept path of oncoming heavy vehicles. For the rest of the network centreline treatment are recommended where short sections of gaps exist.

Edge Marker Posts (EMP's)

Edge marker posts play a significant role in night-time delineation. White edge marker posts are fitted with two red strips and a reflective white strip for the left-hand side of the road and have a solid red band and a yellow reflector on the back to indicate the right-hand side of the road. The spacing of these posts is subject to the design speed of the road and typically decrease around corners compared to straight sections of road.

Edge marker posts are present along the majority of the corridor with most deficiencies related to maintenance i.e. damaged, dirty or missing posts. Therefore, edge marker posts in the implementation plan are only recommended along 20%-50% of each section.

¹⁰ <https://www.nzta.govt.nz/assets/resources/standard-safety-intervention-toolkit/standard-safety-intervention-toolkit.pdf>

Raised Reflective Pavement Markers (RRPM's)

Raised Reflective Pavement Markers or “Cats eyes” are an excellent supporting measure for lane line delineation, especially where centrelines fade between maintenance cycles. The main benefit of these markers is realised at night or in wet conditions when lane lines become obscured but can also be beneficial in sunstrike due to the contrast in colour and texture. The installation of RRPM's greatly assist in encouraging better lane discipline.

Given the winter conditions experienced in areas along the route with higher elevation and the annual maintenance associated with these conditions, there are certain sections on the corridor where RRPM's are not desirable as it is not cost-effective to replace these seasonally should they be damaged.

Audio Tactile Profiles (ATP)

Rumble strips help prevent drivers from running off the road or straying across the centreline as they can be felt and heard as car wheels cross over them. They help to reduce crashes caused by driver inattention or fatigue because the noise and feel of the strips can provide a ‘wake-up’ before a crash happens.

As stated in the Waka Kotahi Audio Tactile Profiled Roadmarkings Guideline, ATP has proven to reduce all crash types by 27% on average. When considering only “head-on” and sideswipe crashes, centreline rumble strips were found to reduce crashes by 21% to 37%.

ATP is a highly beneficial treatment to support cyclists where there is a dedicated cycle lane or wide shoulder for cyclists on the end of the traffic lane as it serves as warning to drivers, especially around corners, not to drift into the cycle lane. However, the narrow nature of the lanes on this route between Taihape and Napier means that there is limited space for cyclists. In many instances, the cyclable shoulder is reduced when ATP's are implemented on the edge lines. Therefore, given that this is a tourist cycle route, ATP's are only proposed as a centreline treatment.

The noise often created by this treatment means ATP's should carefully be considered or not installed within 500m of a residential or school building. MOTSAM also states that ATP must not be used in the vicinity of intersections and major accesses as motorcyclists and cyclists are likely to have to cross them. Centreline ATP has therefore only been recommended across 50% of the length of the corridor due to the presence of residential land-uses and intersections on this road.

Similar to the RRPM's, areas which might require regular snow ploughing in winter months should be avoided as this damages or completely removes the ATP which is not cost-effective.

Delineation Benefits Summary

The Waka Kotahi “High Risk Rural Roads Guide” provides details of the safety benefits that could be derived through investment in delineation improvements. The estimated crash benefits from each of the proposed delineation improvements are summarised within Table 8-1.

Table 8-1: Delineation Benefits Summary

TREATMENT	SAFETY BENEFITS - SUMMARY
Centreline	<ul style="list-style-type: none"> 30% reduction in all crashes 25-40% reduction in casualty crashes
Edgeline	<ul style="list-style-type: none"> 30% reduction in crashes on curves and straights 25% reduction in loss of control crashes 35% reduction of total accidents
Edge Marker Posts	<ul style="list-style-type: none"> 67% reduction in loss of control crashes at night 18% reduction in total crashes at night 30% crash effectiveness
Raised Reflective Pavement Markers (RRPM's)	<ul style="list-style-type: none"> 15-20% reduction in lost control and head-on crashes at night and during wet road conditions 18% reduction in total crashes 5% reduction in crashes 5.7% reduction in total crashes and a 6.2 % reduction in daytime crashes
Audio-Tactile Profiled (ATP) Markings	<ul style="list-style-type: none"> 21-37% reductions in head-on and sideswipe crashes ranging from 21% to 37% of reported crashes. On two-lane rural roads: <ul style="list-style-type: none"> 12% reduction in fatal and injury crashes 44% reduction in fatal and injury head-on and sideswipe (opposite direction) crashes 25% reduction in head-on injury crashes

8.2.2 Seal Widening

A safe road corridor should have sufficient width to cater for all expected road users. One of the most noticeable limitations on this corridor is the narrow lane widths and lack of sealed shoulders. Given the status of much of the route as an inter-regional collector road with high levels of freight demand and use by touring cyclists, some widening should be carried out on the route to provide a sealed shoulder where viable.

The majority of the road seal within the Rangitikei District is 6.0m or less in width, significantly below the desired minimum width of 7.0m¹¹. Although road widths largely exceed 7.0m along most sections within the Hastings District, there are isolated areas where the desired standards are not currently being met.

Achieving the desired minimum seal widths would contribute towards improving safety for all road users, reducing the risk of head-on and run-off road type crashes, providing additional space for cyclists and improving safety for heavy vehicle traffic by providing additional separation between oncoming vehicles.

The "High Risk Rural Roads Guide" provides indicates the following incremental crash savings could be achieved through road widening:

- Increasing seal widths from 2.7-3.0m (13%)
- Increasing seal widths from 3.0-3.3m (19%)
- Increasing seal widths from 3.3-3.6m (5%)

The road widening improvements outlined within **Appendix D** provide a clear indication of sections of road where minor or major widening is required to achieve minimum standards and ensure the road operates at a safe and acceptable level for all users.

¹¹ NZTA's SH Control Manual SM012 - Part 14 Consolidated Projects Section details design standards for State Highways and cross section standards

The challenging topography and geography of the route means that in many instances there are steep drops present on the side of the road which restricts options for road widening without additional engineering measures, such as retaining walls. Where shoulder or road widening has been proposed through the CMP, this will need to be confirmed by site inspections and topographical surveys.

8.2.3 Intersection Improvements

The CMP reviewed the suitability of existing provisions at intersections along the corridor. This includes signs, markings and street lighting to identify to all drivers that they are approaching an intersection where Give Way or Priority Control rules apply and raise awareness of the potential for conflict / presence of other road users.

Elements considered included:

- **For the main road:** Advance intersection signs, Street Nameblade, Continuity markings, Flag Light.
- **For the side road:** Sealing up to the main road, priority control sign, limit line, centre-line.

The need for turning bays have also been considered for intersections where turning demands are high or delays for turning vehicles are apparent, or sections of the corridor with high heavy vehicle turning demands (based on Austroads Design Guidelines). Given existing and forecast low traffic volumes along the route, fundamental changes in intersection form (i.e. roundabouts or signals) have not been considered.

A full programme of intersection upgrades along the route is outlined within **Appendix E**.

Typical crash saving benefits of intersection treatments include:

Table 8-2: Intersection Improvements – Indicative Benefits

Treatment Type	Benefit / Savings
Street Lighting At Rural Intersections	<ul style="list-style-type: none"> • 40% reduction in injury crashes for improving lighting (all intersection forms).
Formalising Intersections (Priority Control)	<ul style="list-style-type: none"> • 15-35% of all crashes (25%)
Sealing Side Road At Intersection	<ul style="list-style-type: none"> • Positive improvement to safety, including improved environment for cycling (less detritus on road)
Auxiliary Turn Lanes	<ul style="list-style-type: none"> • 25-40% reduction in intersection crashes • 30% reduction of casualty crashes with construction of right turn (rural) and/or left turn auxiliary lane • 33% reduction in overall injury crashes

8.2.4 Curve Improvements

The Taihape-Napier Road alignment comprises a rural environment with a mix of both isolated and groups of challenging roadside curves. The majority of crashes recorded on the route that resulted in death or serious injuries over the last five years are the result of loss of control crashes on winding sections of the route. Whilst general midblock delineation measures along the route (Section 8.2.1) would contribute towards reducing loss of control crashes, the CMP has also considered specific treatments that could be considered at challenging curves.

Treatments identified through the CMP process at curves along the route include:

- Chevron signage
- Advisory signage
- Centre line RRPMS
- Barriers

- Shoulder/seal widening.

Easing the existing curves would provide a highly effective response to loss of control issues and would provide long lasting benefits, although it is expensive and subject to budget availability. In many locations, the ability for enhancing route alignment is constrained by its current surroundings, given the road alignment is bounded by significant sloping geometry (such as sections of the Gentle Annie ascent).

A programme of curve enhancement treatments that could be implemented to support safety at each across the full corridor is outlined within **Appendix F**.

SAFETY ACTION SUMMARY

- Develop a staged programme of countermeasure improvements a curves (i.e. warning signage or surface treatments) in response to the high level of loss of control crashes experienced along the corridor. Key short-term focus areas include Spooners Hill Road (Section 1) which has been identified as part of the Waka Kotahi's Top 10% DSI savings network.
- Develop a road widening programme to provide a consistent road environment that achieves the minimum desired road widths (7.0m). This programme could be delivered in co-ordination with wider works programmes, such as maintenance improvements.
- Implement minor works programme of intersection improvements through "low cost, low risk" funding classes within the short-term.
- Implement a staged programme of delineation improvements that support wider safety activities (such as road widening or curve improvements) to ensure consistency in roadside environment along the full extent of the corridor.

8.3 Amenity Strategy

Taihape - Napier Road has been identified as a key route for tourism and regional visitation, given the range of outdoor pursuits, its regional connectivity to the Central Plateau and the routes role as a recognised NZ Cycle Trail. The strategic responses identified to support amenity include the development of passing opportunities (where warranted) and supporting access by enhancing rest areas and developing additional points of interest along the corridor.

8.3.1 Policy and Planning

This national tourism strategy (Tourism 2025) produced by Tourism Industry Aotearoa in 2015 provides a strategic framework and shared vision for aligning growth of the tourism industry within New Zealand. The Strategy outlines two key areas of emphasis, including seasonality and dispersal - in particular the need to create new tourism opportunities outside of popular regions.

Tourism within the Rangitikei region is disadvantaged due to challenging driving conditions, lack of amenities and poor access to key attractions. As a regionally recognised tourist route, there are significant opportunities to grow and support visitor access demands on Taihape-Napier Road in co-ordination with a range of strategic partners. Opportunities that could be considered further by Council's to support tourism growth on Taihape-Napier Road include:

- Branding or theming of the route to raise its regional and national profile as a tourist destination, like the "Country Road"¹² concept developed within the Manawatu District;

¹² <https://www.manawatumz.co.nz/the-country-road/>

- Support and develop quality sustainable visitor experiences on the route with key strategic partners, that attract users to the region whilst recognising the need to maintain natural or cultural values of the environment;
- Identify, encourage and support communities in realizing potential economic opportunities that could be achieved through increased visitor activity within the region;
- Provide high quality, consistent and informative heritage communication and interpretation of the routes history and key points of interest, to build tourist expectations and deliver high quality visitor experiences. This could be disseminated through a range of mediums, including website coverage and journey apps. and
- Developing, funding and implementing infrastructure (such as signage and amenities) to support tourism growth (discussed below).

8.3.2 *Passing Opportunities*

This existing road environment on Taihape-Napier Road is constrained by the regions topography resulting in steep and winding alignment. This alignment limits certain vehicles to lower speeds than posted or capable by other drivers and vehicles, in particular for freight or tourists in campervans.

There is limited informal overtaking or formalised passing opportunities available on large sections of Taihape-Napier Road, meaning slower vehicles impact on the reliability and efficiency of these journeys for other customers. This is expected to be compounded by potential future growth in both inter- and intra-regional freight as well as the growth in drivers that are not familiar with the road network, such as domestic and international visitors which can also result in a more precautionary approach and lower travel speeds.

As outlined within Section 5.2.1, passing opportunities are likely to be most applicable through the Hastings District where traffic volumes and slow vehicle numbers are expected to be highest. Traffic volumes are not anticipated to be high enough to warrant full “passing lanes”; however, slow vehicle bays may be an attractive option, particularly in areas with challenging geometry and speed differentials between users.

Hastings District have identified and programmed the delivery of several new passing opportunities on the eastern extent of the route, including:

- Lauchlan at HDC to advise

It is recommended that both Council's develop a monitoring programme to review traffic growth rates, crash history and network performance (such as travel time variability) to assist in identifying and confirming the need for (and preferred locations of) future passing opportunities along the corridor where warranted.

8.3.3 *Tourism Related Infrastructure*

The CMP has identified a number of enhancements to the road form that would enhance safety and accessibility for all corridor users, including regional visitors; however, the CMP strategy also recognises a number of tourism related infrastructure improvements that could be considered along the route to enhance route amenity and increase the attractiveness of travelling along the route, as a destination itself. These include:

- Developing suitable rest areas and amenities; and
- Developing a signage strategy that promotes the route as a tourist destination, raises awareness of key points of interest and enhances safety by reducing confusion and indecision for drivers.

There are several rest areas located at key points of interest along the route; however, most are poorly signposted and are very basic in terms of amenity provisions. The CMP has assessed existing and potential rest areas along the route, and identifies opportunities to enhance these facilities in co-

ordination with other stakeholders or partners to support access and journey experience along the corridor. A full list of the sites consider through the CMP are detailed within Table 8-3.

Table 8-3: RDC Identified Tourism Locations / Points of Interest

SITE	ROAD	LOCATION (RP)	COMMENT
Springvale Bridge – Point of Interest	Napier Taihape Road 1	0.120	Existing facility with off-road parking area located adjacent to the historic Springvale Bridge
Scenic Lookout (potential)	Napier Taihape Road 1	15.000-23.000	Potential new point of interest area with views of Central Plateau / Mt Ruapehu. Location to be confirmed through future investigation.
Rest Area / Pull Over Site	Napier Taihape Road 2	18.900	Existing scenic lookout into Ngamahanga section of the ranges. Could be upgraded to provide a rest area, central to the journey.
Taurarau River Crossing – Scenic Lookout	Napier Taihape Road 2	21.400	Informal rest area / point of interest for travellers
Comet Road	Napier Taihape Road 2	28.900	Connection to DoC walking tracks servicing Comet Hut.
Ngaruroro River Crossing – Scenic Lookout	Napier Taihape Road 2	35.150	Informal rest area / point of interest for travellers
Kuripapango Campsite	Taihape Road	55.120	Provides the main access from Taihape Road into the Kurpapango campsite facility run by DoC.
Cameron Carpark	Taihape Road	54.900	Provides the main access from Taihape Road into the Cameron walking tracks, owned and maintained by DoC.
Kuripapango Road	Taihape Road	52.300	Side road provides access to forestry and local walking tracks owned/operated by DoC through the forest parks.
Lawrence Road	Taihape Road	44.171	Side road provides access to forestry and local walking tracks owned/operated by DoC through the forest parks.

In lieu of regional district based directives on tourism provisions, best practice guidelines in the strategic provision of rest areas and visitor facilities developed by Waka Kotahi have been reviewed and used as a basis for assessing provisions on Taihape-Napier Road¹³. The treatment types considered for each rest area/viewing point is outlined within Table 8-4.

Table 8-4: Treatment Type – Tourist Facilities Considered

TREATMENT	GUIDANCE DOCUMENT	TREATMENTS IDENTIFIED
Signage	Guidance on signage provisions are outlined within Waka Kotahi Traffic Control Devises Manual (TCDM) Part 2	<ul style="list-style-type: none"> - Advance Sign – 300-500m before feature (both directions) - Positional Sign – Pair located at site
Amenities	Guidance on supporting amenity provisions are outlined within SM012 State Highway Control Manual – Part 17.	Consider the following, as appropriate to facility type: <ul style="list-style-type: none"> - Internal vehicle circulation - Public information boards - Rubbish bins - Bench seats - Toilets

The general recommendations outlined within these guidelines include:

- Rest areas should be 1hr travel time or approximately 50km apart. On this basis, the existing scenic lookout facility within the Ngamahanga section of the ranges (Taihape-Napier Road 2, RP18.900) provides an ideal location for such as facility (56min/60km from Taihape and 1hr 7min / 73km from SH50, Hastings).

¹³ SM012 State Highway Control Manual – Part 17: Consolidated Stopping on Highway Sections

- All rest areas and viewing points should be accompanied with appropriate advanced signposting to provide drivers with adequate time to decide to use a particular area / facility. They should be at least 300-500m prior to the site. This should be reinforced with additional positional signage at the entrance to clearly identify where the site is.
- The type and number of amenities (e.g. tables/seats) within sites should be based on peak vehicle use and upon there being an average of 2 persons per stopped vehicle. There should be at least one rubbish bin for each recognised rest area.
- The number of parking spaces should be determined by existing rest area usage patterns, traffic volume and professional judgement.

The principles outlined above have been used in identifying and developing recommendations for visitor sites and rest areas along the Taihape-Napier Road route.

Table 8-5: Recommended Tourism Enhancements

SITE	LOCATION		SIGNAGE		DESTINATION FEATURES				
	ROAD	RP	ADVANCE SIGNAGE	POSITION SIGNS	SEATING / BENCHES	INFORMATION BOARDS	PARKING AREA	RUBBISH BINS	TOILETS
Springvale Bridge – Point of Interest	Napier Taihape Road 1	0.120	✓	✓	✓			✓	
Scenic Lookout (potential)	Napier Taihape Road 1	15.000-23.000	✓	✓			✓		
Rest Area / Pull Over Site	Napier Taihape Road 2	18.900	✓	✓	✓	✓		✓	✓
Taurarau River Crossing – Scenic Lookout	Napier Taihape Road 2	21.400	✓	✓			✓		
Comet Road	Napier Taihape Road 2	28.900	✓	✓					
Ngaruroro River Crossing – Scenic Lookout	Napier Taihape Road 2	35.150	✓	✓			✓		
Kuripapango Campsite	Taihape Road	55.120	✓	✓					
Cameron Carpark	Taihape Road	54.900	✓	✓	✓				
Kuripapango Road	Taihape Road	52.300	✓	✓					
Lawrence Road	Taihape Road	44.171	✓	✓					

A full list of proposed tourist enhancements is outlined in further detail within **Appendix G**.

AMENITY ACTION SUMMARY

- Develop a strategy for promoting the route as a regional tourist destination to maximise local economic benefits for local communities, in co-ordination with other key stakeholders such as MBIE and DoC.
- Implement passing opportunities identified for delivery within the Hastings District forward works programme within the short-term.
- Monitor future traffic volumes and network performance to identify the need for providing formal passing opportunities within the Rangitikei District.
- Develop a physical works programme of tourism signage and infrastructure improvements that improve accessibility and amenity for visitors travelling on the route, focusing on enhanced rest areas and improved access to key points of interest.
- Implementing suitable amenities together with wayfinding solutions present potential synergies that will help provide more impactful messages to visitors by raising awareness and accessibility of attractions on the Taihape - Napier Road journey.

8.4 Accessibility Strategy

The route aligns with CLoS expectations relating to accessibility by providing connections from local access roads onto regionally significant routes and arterial roads; however, there are opportunities to further enhance access opportunities that will support regional economic growth, including:

- Enabling and improving the efficiency movement of goods and services; and
- Supporting access for tourists and visitors travelling on the NZ Cycle Trail.

8.4.1 50MAX Capability

Works have been undertaken in recent years to strengthen existing bridging structures on the route located within the Hastings District; however, the ability for inter-regional freight trips generated within, or passing through, the Rangitikei District is restricted by the capacity of the existing bridges.

The capability of the route could be improved to enable more efficient movement of goods along the corridor by enabling access to 50Max vehicles. This would align with Customer Outcome Performance Measures for the ONRC which seeks to increase the proportion of the network available to 50Max vehicles.

Upgrading all structures on the route to be 50MAX capable would allow larger loads to be transported on fewer trucks, resulting in more productive and efficient movement of goods through the region. Improving the capability and coverage of HPMV access across the local road network would provide a complete trip from trip origin to destination, providing both equitable access and financial savings to local industries.

Investing in low bound HPMV bridge strengthening (50MAX) could provide the following benefits to industry within the region¹⁴:

- Operator efficiency gains equating to an 8-12% reduction in operating costs compared with typical 44T freight vehicle operations;
- Increased payload of freight task (+10-13%) allowing more product to be moved on fewer trucks; and
- Reduced cost for in processing HPMV permits and assessment of applications.

¹⁴ <https://www.nzta.govt.nz/assets/Vehicles/docs/lower-bound-hpmv-business-case.pdf>

A total of 5 bridges have been identified along the route that may require additional strengthening to make the route 50Max capable (see Table 8-6). Three bridges are located within the Rangitikei District whilst a further two bridges are recommended for strengthening within the Hastings District, based on Waka Kotahi 50Max bridge restriction maps. It is recommended that structural assessments are undertaken in the short-term, with a view to implementing improvements in the medium-to-long term.

Table 8-6: 50Max Bridge Improvement Locations

BRIDGE NAME	LOCATION	50MAX	TWO LANING
Moawhango	Te Moehau Rd (RP 8.3)	✓	✓
Springvale	Taihape-Napier Rd 2 (RP: 0.0)	✓	✓
Taruarau River Crossing	Taihape Napier Road 2 (RP 21.800)		✓
Kuripapango	Taihape-Napier Rd 2 (RP: 35.6)	✓	✓
Pukehomoamo	Taihape Road (RP. 8.800)	✓	
Kawera	Taihape Road (RP. 7.300)	✓	

Whilst the CMP recommends strengthening of existing route is recognised that there are wider considerations beyond the corridors capability that will influence the potential uptake of 50Max. It is recommended that further engagement is undertaken with key stakeholders (such as local industry and transport operators) to establish the end-user’s appetite and level of support for upgrading the capability of the network to support access for 50Max access.

Several structures along the route within the Rangitikei District also comprise single lane bridges, including the bridges outlined within Table 8-6. Removing single lane bridges would provide some capacity and travel time benefits, as well as a potential reduction in crash exposure.

Given the existing low volume of traffic and the low crash history recorded at these bridges, it is unlikely that these would warrant the costs of fully upgrading facilities to provide for two-way traffic flows in the short-term; as such, these bridges should be considered for replacement/widening once they reach the end of their design life.

A full list of proposed bridge improvements is provided within **Appendix H**.

8.4.2 Cycling Improvements

With the growth of cycle tourism across New Zealand and growing regional cycle events, the number of cyclists using the study route can be reasonably expected to grow over the next 30 years. These vulnerable road users are currently not well provided for on the majority of the study route.

The Gentle Annie cycle route is graded “Advanced” (Grade 4) due to a number of steep gradients. The NZCT Design Guide has been developed by the Ministry of Business, Innovation and Employment (MBIE) as a guide for planning and designing NZCT related cycling infrastructure¹⁵. Figure 8-4 extracted from the guide shows the recommended facility type for cyclists based on traffic speed and volume characteristics for Grade 4 on-road trails.

¹⁵ <https://www.mbie.govt.nz/assets/new-zealand-cycle-trail-design-guide.pdf>

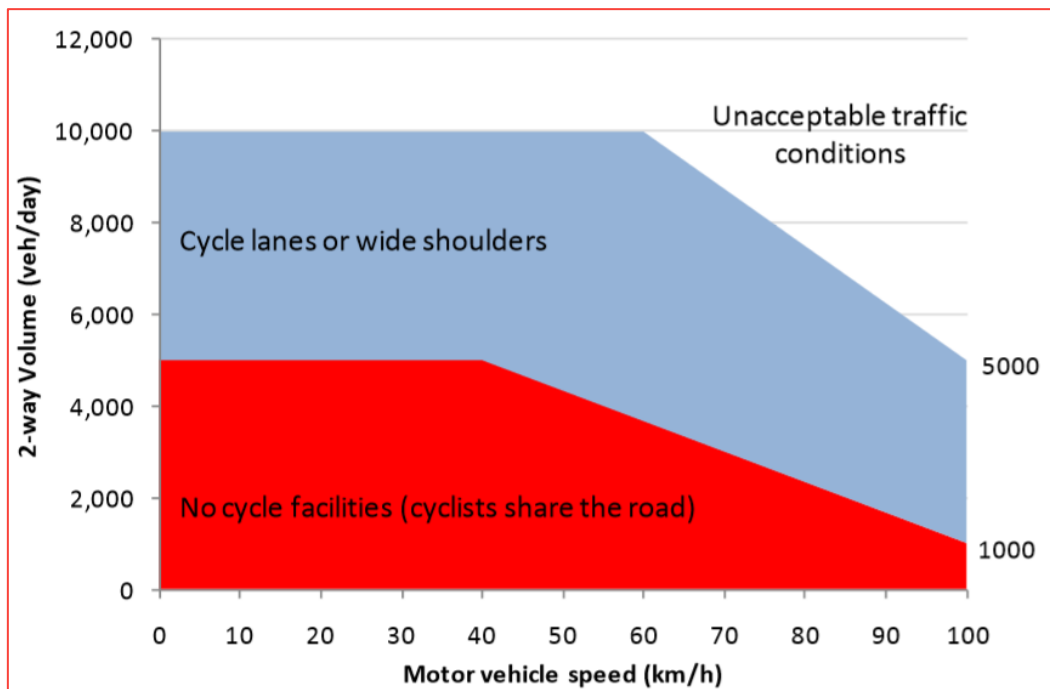


Figure 8-4: Treatment Type for Grade 3 and 4 NZ Cycle Trail Routes

Based on forecast volumes and existing posted speed limits, the guidance doesn't identify special provision for cycling along the majority of the route other than NZCT signage and branding. Where traffic volumes exceed 1,000 vpd or gradients are enough to create high speed differentials between vehicles and vulnerable road users, wider shoulders or cycle lanes could be considered to improve conditions for cyclists.

It is recommended the CMP considers targeted safety improvements for cyclists to minimise conflicts with heavy vehicle traffic, where visibility is constrained or sections where speed differentials between users are higher (i.e. on steep gradients). This could be achieved through a number of strategic responses already identified through the CMP to support and enhance the route as a cyclist destination, including:

- Improved tourist destinations and rest stops;
- Reduction in posted speed limits;
- Wider shoulders (road widening);
- Improved delineation;
- Reduced or managed pinch points; or
- Visibility enhancements especially at curves and crossing points.

A key short-term initiative to raise awareness of the presence of cyclists and promote safe driving behaviours when overtaking cyclists through educational signage along Taihape-Napier Road. Examples of such signage are shown in Figure 8-5. This is particularly important for routes such as Taihape-Napier Road which provide access to a range of visitors who are likely to be unfamiliar with the road and its surrounding environment.



Figure 8-5: Examples of Cycle Safety Signage

In implementing such a strategy, it is recommended that Council's considering the following:

- Ensure that signage is regularly maintained to ensure it remains legible and relevant for users;
- Signs are placed in the best position to inform drivers, and should be logically and clearly structured;
- Ensure a balance is achieved in providing sufficient information to inform drivers of hazards whilst recognising over provision results in visual clutter that detracts from the aesthetics of the surrounding environment; and
- Signs accommodate only important information and presented in graphic form wherever possible, as this is a universal language.

ACCESSIBILITY ACTION SUMMARY

- Investigate requirements for strengthening existing bridge structures to support 50Max loads in the short-term, with a view to implementing bridge strengthening upgrades in the medium to long-term.
- Upgrade existing single lane bridge structures to provide two general traffic lanes once bridges are due for replacement at the end of their design life. This is not expected to occur within the lifetime of the CMP, however, it has been included for foresight and future planning purposes.
- Develop a programme of signage improvements along Taihape - Napier Road to raise its profile as a recognised NZ cycle trail route as well as raise awareness of the presence of cyclists to other road users.
- Identify cyclist needs when implementing wider physical works improvements to enhance the existing roadside environment for cyclists, with a particular focus on sections of the corridor that provide greatest risk for users.

9 Implementation Plan

The implementation plan is an important component of the CMP, providing an overview of the packages of work identified through the CMP along the Taihape-Napier Road corridor.

The implementation plan seeks to provide a summary of the relative priority of each project, considering the relative “urgency” of the activities in responding to identified ONRC issues, as well as considering alignment to objectives of the Government Policy Statement (GPS) for Land Transport and likely economic returns. The prioritisation of projects also recognises opportunities for co-ordinating improvements with other currently committed projects (i.e. maintenance) as they arise.

This section of the report provides an outline of the following:

- Rationale for prioritising activities identified through the strategy;
- The strategic alignment of activities (i.e. how do they align with the requirements of the GPS); and
- Estimated costs of the programme and the likely benefit-cost ratios (BCR) for activities.

The proposed activity implementation plan resulting from the process is included within **Appendix J**.

9.1 Prioritisation and Programming Rationale

Each of the activities identified within the implementation plan has been prioritised to identify projects that could be delivered in the short (2021-2024), medium (2024-2030) and long-term (2031+).

The majority of improvements identified within the corridor respond to safety concerns, given a number of sections of the route exhibit “high” personal crash risks. The prioritisation rationale seeks target investment on sub-sections of the corridor which exhibit the highest personal crash risk, with a key focus given to curve and safety improvements that respond to the loss of control crashes and head-on collisions.

Wider improvements that support the amenity or accessibility of the route have been programmed in the medium-to-long term, recognising the need for further engagement with stakeholders or investigation works prior to implementation.

The implementation plan also recognises that the programme of physical works requires significant investment over the next 30 years to achieve the desired outcomes; therefore, the implementation plan has sought to spread the costs evenly over the lifespan of the CMP.

Further details on the rationale for programming activities is outlined within **Error! Reference source not found.**

Table 9-1: Recommended Activity Programming Rationale

IDENTIFIED ACTIVITY	PROGRAMME STRATEGY COMMENTARY
Speed Management	<p>The delivery of the speed management programme for the corridor has been identified as a short-term priority. This reflects the crash saving benefits that could potentially be achieved through reducing the posted speed limit in terms of reducing the frequency and severity of crashes along the corridor.</p> <p>This activity includes undertaking appropriate speed limit assessments and consultation, as well as implementation of supporting infrastructure within the 2021-2024 period.</p>
Delineation Improvements	<p>Delineation improvements are largely identified for medium-term delivery, largely programmed to be implemented at a sub-section level to complement wider curve improvement or road widening activities.</p> <p>Short-term priorities for improved delineation include sections of Spooners Hill Road within the Rangitikei District and several subsections of Taihape Road within the Hastings District.</p>

IDENTIFIED ACTIVITY	PROGRAMME STRATEGY COMMENTARY
Road Widening	The majority of seal widening activities along Taihape-Napier Road are likely to have a low benefit-cost ratio, therefore have been programmed in the long-term, and included for future visibility. Opportunities to align this activity with wider capital or maintenance improvements may allow projects to be accelerated. As such, the seal widening programme will be refined in accordance with wider investment opportunities.
Intersection Enhancements	The activity programme comprises a range of targeted local improvements at key intersections along the route, the majority of which are relatively low cost and low complexity projects that are simple to implement. Intersection enhancement projects have been programmed within the short-term and can be delivered through “Low Cost, Low Risk” activity class.
Curve Improvements	Activities associated with curve improvements that seek to enhance safety have been prioritised in the short and medium term, as these respond to key cause of most severe crashes along the corridor. The programme recognises curve improvements on Spooners Hill Road and Te Moehau Road as immediate priorities for the investment, with the remainder of the programme prioritising improvements on sub-sections of the road with a “high” personal crash risk within the “medium” term. The remainder of curve enhancements are programmed in the “long term”.
Passing Opportunities	Passing opportunities within the Hastings District are prioritised within the short-term, recognising that these projects are already committed to be developed under existing strategies and plans.
Bridge Improvements	Activities associated with enabling access for 50Max vehicles have been identified as a medium-term project within the CMP implementation plan. This recognises the need to undertake additional investigation to establish structural engineering requirements for implementing the improvements, as well as undertaking additional consultation with local businesses and communities to establish potential uptake across the region within the short-term.
Tourism Improvements	Tourism improvements have been programmed within the “long-term”, reflecting the need to undertake a strategy and wider consultation with key delivery partners such as DoC and MBIE; however, the programme could be accelerated to the medium-term subject to the recommendations of the strategy and / or the availability of external funding support.

It is not intended that the implementation plan operates as a ‘fixed and final’ plan but rather an organic plan that can be adapted to respond to network changes or where new opportunities to implement improvements are realised (i.e. where new maintenance work/ programmes are identified). This may increase or decrease the urgency or priority of projects, whilst providing opportunities to reduce the cost of delivering projects and minimise community inconvenience (i.e. disruption from associated road works).

9.2 Strategic Alignment Assessment

The Waka Kotahi Investment Assessment Framework (IAF) has been used as a basis for identifying project strategic alignment (in terms of high, medium and low alignment) for each of the activities to the objectives of the GPS. The majority of proposed improvements identified through the CMP would be undertaken through the “regional, local road, and state highway improvements” activity class. The strategic alignment of projects to the rating system has been undertaken as shown on Table 9-2.

Table 9-2: Strategic Alignment Process

GPS PRIORITIES	ACTIVITIES	STRATEGIC ALIGNMENT RATING PRINCIPLES
Safety	Delineation Curve Enhancements Road Widening	<p>Very High Alignment</p> <ul style="list-style-type: none"> - implements a speed management approach focusing on treating the top 10 percent of the network that will result in the greatest reduction in deaths and serious injuries <p>High Alignment</p> <ul style="list-style-type: none"> - addresses safety issues presenting a high crash risk, affecting communities subject to high safety risk, and/or in Safer Journeys area of high concern <p>Medium Alignment</p> <ul style="list-style-type: none"> - addresses safety issues presenting a medium crash risk, affecting communities subject to medium safety risk, and/or in Safer Journeys area of medium concern <p>Low Alignment</p> <ul style="list-style-type: none"> - address safety gaps with reference to the ONRC
Access to Opportunities	Tourism Improvements Bridge Upgrades	<p>High Alignment</p> <ul style="list-style-type: none"> - addresses significant resilience gap or impediment to access on nationally important social and economic connections - makes best use of key corridors that prioritise national freight and tourism - provides significant operational efficiencies to reduce the costs of meeting appropriate levels of service without impacting benefits adversely <p>Medium Alignment</p> <ul style="list-style-type: none"> - addresses significant resilience gap or impediment to access on regionally important social and economic connections - makes best use of key corridors that prioritise regional freight and tourism - provides operational efficiencies to reduce the costs of meeting appropriate levels of service without impacting benefits adversely <p>Low Alignment</p> <ul style="list-style-type: none"> - address identified resilience gap or impediments to accessing social and economic opportunities

9.3 Indicative Benefit Cost Ratios

Benefit cost ratios have not been developed for each of the identified packages; however, likely BCR ranges have been developed for each of the packages based on the following:

- < (less than) 1
- 1 to 3
- 3 +.

The typical BCR ranges applied to treatments are outlined within **Appendix K**.

The majority of the benefits expected to be generated will likely arise from crash savings. To capture the benefits of the treatments a crash by crash analysis and the application of crash modification factors is required. However due to the low overall injury crash numbers it is unlikely the treatments will meet the Waka Kotahi Economic Evaluation Manual minimum requirements to undertake this type of analysis. Based on this it is anticipated that most of the interventions will return a BCR of less than 1.

Further discussion could be had with Waka Kotahi to determine whether crash by crash analysis could be undertaken without meeting the minimum injury crash requirements.

9.4 Priority Rating

The priority order rating is currently used by Waka Kotahi as a system for prioritising projects for funding, based on the projects alignment with the objectives of the 2018-2021 National Land Transport Programme (NLTP) and the intended outcomes of the GPS. Depending on the amount of funding available for an activity class, activities with sufficiently high priority are included in the NLTP. Activities are then assessed for funding approval at the time they are ready to progress, and an appropriate business case has been developed and assessed.

The two assessment factors of results alignment and cost benefit appraisal are brought together to form an assessment profile that determines a proposal's priority. Table 9-3 summarises the priority order for improvement programme proposals based on the scores achieved. Projects that are to receive funding from the Transport Agency are expected to largely achieve a medium or above rating from the IAF assessment (i.e. a minimum priority order rating of 6).

Table 9-3: Priority Order Rating – Waka Kotahi IAF

RESULTS ALIGNMENT	COST BENEFIT APPRAISAL	PRIORITY ORDER
Very high	L/M/H/VH	1
L/M/H	Very high (BCR 10+); PV_EoL	2
High	High (BCR 5-9.9)	3
High	Medium (BCR 3-4.9)	4
Medium	High (BCR 5-9.9)	4
High	Low (BCR 1-2.9)	5
Medium	Medium (BCR 3-4.9)	5
Medium	Low (BCR 1-2.9)	6
Low	High (BCR 5-9.9)	7
Low	Medium (BCR 3-4.9)	8
Low	Low (BCR 1-2.9)	Exclude

Based on the strategic alignment and likely benefit cost ratio, a priority order rating has been allocated against each project within the implementation plan. It should be noted that IAF prioritisation of safety activities excludes works undertaken for reasons of “urgent public safety”, because these types of activities are funded using different prioritisation to enable urgent safety works (e.g. the imminent collapse of a bridge).

Projects that are unlikely to achieve a BCR of 1 have a “very low” alignment and are unlikely to be awarded a priority rating. As such, these projects would likely require Council to fully fund improvements, or they could be delivered as part of wider maintenance programmes.

9.5 Implementation Costs

Cost estimates for delivering the programme have been provided for all identified packages of improvements based on rough order cost estimates outlined within **Appendix K**. It should be recognised that the rough order costs are indicative, and will need to be refined further as individual or groups of projects are developed. All rough order costs are inclusive of relevant contingency (20%) given the strategic nature of the CMP.

The estimated cost for delivering the full suite of transport improvements is **\$36.2M**. A full list of costs associated with each relevant activity class is outlined within Table 9-4. Most costs are associated with road widening and safety improvements at curves, particularly within the Rangitikei District.

Table 9-4: Forecast Programme Costs by Activity Class (By Council)

ACTIVITY CLASS	RANGITIKEI DISTRICT COUNCIL	HASTINGS DISTRICT COUNCIL
WC 222: Traffic Services Renewals	\$755,987	\$171,744
General Delineation Improvements	\$755,987	\$171,744
WC 324: Road Improvements	\$27,832,085	\$7,048,063
Midblock Road Widening	\$13,083,168	\$1,849,680
Curve Improvements	\$12,948,917	\$3,998,383
50Max Bridge Strengthening	\$1,800,000	\$1,200,000
WC 341: Low cost, low risk roading improvements	\$165,047	74,478
Intersection Improvements	\$25,248	\$60,078
Tourism Improvements	\$103,800	\$14,400
School Safety - Speed Devices	\$36,000	-
WC432: Safety promotion, education and advertising	\$80,000	\$80,000
Speed Management Improvements	\$60,000	\$60,000
Cyclist Warning Signage	\$20,000	\$20,000
Total Cost	\$28,833,120	\$7,374,315

Based on the relative priority afforded to programmes within the implementation plan, the indicative costs for staging the identified programme across the short, medium and long-term (by territorial authority) is outlined within Table 9-5.

Table 9-5: Forecast Programme Costs (by Council)

FUNDING PERIOD	RANGITIKEI DISTRICT COUNCIL	HASTINGS DISTRICT COUNCIL	TOTAL
Short-Term (2021-24)	\$3,097,000	\$861,136	\$3,958,388
Medium-Term (2025-31)	\$8,217,000	\$1,940,279	\$10,157,460
Long-Term (2032-51)	\$17,519,000	\$4,572,899	\$22,091,586
Total Costs	\$28,833,120	\$7,374,315	\$36,207,434

9.6 Funding

Most projects identified through the CMP are expected to be funded through respective Council's capital budget programmes through the National Land Transport Programme (NLTP), with funding contributions from Waka Kotahi via the Funding Assistance Rating for qualifying activities.

It is recognised that the full programme of work requires significant investment over the lifetime of the CMP; however, there are several additional funding opportunities that could be considered for supporting infrastructure development on the corridor, including (but not limited to):

- Provincial Growth Funding
- Tourism Infrastructure Funding

These are discussed further below.

Provincial Growth Funding (PGF)

Through the PGF, the Government seeks to ensure that people living all over New Zealand can reach their full potential by helping build a regional economy that is sustainable, inclusive and productive. The majority of road transport investment covered by the National Land Transport

Programme and Regional Land Transport Plans; however, if a project can generate additional benefits for regional development, the Provincial Growth Fund can also be involved.

PGF funding is available to organisations to:

- Provide a source of funding for local authorities that face significant difficulty in meeting local share requirements;
- Bring projects forward where they may not be prioritised under the NLTP but are strategically important to a region; and
- Provide a source of funding for projects that cannot secure funding through the National Land Transport Fund, but which otherwise meet the government's criteria and objectives for the PGF.

Economic Development Funding

The Ministry of Business, Innovation and Employment (MBIE) oversees a number of funding streams that support investment in quality infrastructure and tourism assets helps creates positive economic, social and environmental benefits for New Zealand and its visitors.

The Tourism Infrastructure Fund (TIF) provides up to \$25 million annually to develop tourism-related infrastructure that supports regions facing pressure from tourism growth. The TIF supports local communities facing pressure from tourism growth and in need of assistance, including areas with high visitor numbers but small ratepayer bases.

The fund aims to protect and enhance New Zealand's reputation both domestically and internationally by supporting robust infrastructure that contributes to quality experiences for visitors. Enhancements that seek to support access and journey experiences for both domestic and international visitors (such as rest areas and supporting infrastructure) may qualify for funding.

MBIE also oversees funding streams that support the development and maintenance of the Ngā Haerenga, the New Zealand Cycle Trail. As a recognised Heartland Ride (Gentle Annie), improvements on Taihape-Napier Road that seek to enhance safety and accessibility for cyclists travelling on the trail may attract funding.

10 Conclusions

10.1 Corridor Performance Summary

A detailed analysis of the corridors performance against the Customer Levels of Service (CLOS) expectations of the route as a “collector” road. The assessment reviewed the relative performance of the corridor against the desired CLOS objectives of mobility, safety, amenity and accessibility, to identify key deficiencies and challenges that could be addressed through the CMP process.

The key conclusions of this assessment are:

- Traffic volumes have grown by approximately 2% over the past 20 years, largely as a result of local economic growth and inter-regional trip growth associated with visitor and tourism growth. Heavy vehicle traffic demands on Taihape-Napier Road equate to 18-24% of traffic along the route.
- Based on historical traffic growth rates, future traffic volumes are expected to remain less than 500 vehicles per day (vpd) along the majority of the corridor, with the exception of populated sections at either end of the route where traffic volumes are expected to exceed 1,000 vpd. These volumes indicate that the route is unlikely to change its route function as a collector road over the lifetime of the CMP.
- Over the last 10 years, 88 crashes have been recorded on the route. 23 of these crashes have resulted in a death or serious injury (DSI), leading to 5 deaths and 20 serious injuries. Several sections of the corridor have a “Medium-High” to “High” personal crash risk and a low collective risk, reflecting a high number of DSI crashes for the relatively low traffic volumes at present;
- The corridor comprises two-lane sealed carriageway which over a large proportion is winding, narrow and rural in nature. The alignment includes multiple challenging curves with poor sight lines, which coupled with narrow seal widths (<6.0m) create significant safety issues for road users, most prominently on sections within the Rangitikei District.
- The challenging road alignment has resulted in a history of loss of control crashes, with a high proportion involving single vehicles losing control at curves or corners.
- Taihape-Napier Road is particularly vulnerable to closure from natural hazard events due to weather events (rain, snow and ice) and slips/drop-outs, and the lack of alternative parallel routes means closures can sever local business and communities from key services and markets.
- Limited cell phone coverage reduces the ability to respond efficiently and effectively to vehicle crashes and natural hazard events that disrupt access. The route also forms an alternative detour route to State Highway 5 in the event of a regional route closure.
- Most the route operates with a 100km/hr posted speed limit; however, the challenging corridor environment makes the posted speeds difficult to achieve along its full length. The posted speed limit is also identified as being above the “safe and appropriate” speed based on Waka Kotahi guidelines.
- Freight demands are expected to remain a large proportion of traffic volumes over the horizon of the CMP. In recent years, many of the bridge structures through the Hastings District have been upgraded to support 50Max vehicle loads, however, several bridges require strengthening on the route to fully secure the benefits of improved access for commercial operates located along the whole route.
- The route is identified as a national cycle route and a number of recreational and competitive cyclists use the route each year. The route is also a recognised tourist route, connecting key tourist destinations and branded tourism state highways within the Central Plateau and the Hawkes Bay.

- The future focus on tourism and visitor growth within the regions is expected to grow access demands along the corridor over the next 30 years, and improving accessibility and amenity on the route would encourage further domestic and international visitor demand and provide new opportunities for local economic growth.

10.2 Corridor Strategy Summary

The CMP has identified a range of measures that respond to key deficiencies in the existing routes performance, including a combination of both policy/planning initiatives and physical works.

The recommended policy and planning initiatives identified through the CMP include:

- Both Councils should undertake regular monitoring of traffic volumes and crash data to support the future decision-making and prioritisation of future work programmes over the next 30 years;
- Identify opportunities to implement resilience enhancements in co-ordination wider physical works programmes along the corridor to reduce route susceptibility to unplanned road closure events;
- Engagement with national communication providers (i.e. Vodafone, Spark, 2degrees) with a view to improving cell phone coverage through the route in the long term;
- Investigate opportunities to enhance / promote the journey as a tourism themed route (like the Country Road within the Manawatu District) in co-ordination with relevant stakeholders such as MBIE and DoC; and
- Undertake a review of the existing speed limits along the full extent of the route, to ensure posted speeds align with the Waka Kotahi Speed Management Guide (2016).

In addition to the planning policies, a programme of physical works has been identified along the corridor that would support the route in achieving its desired performance standards. The bulk of the proposed programme consists of safety improvements that seek to improve roadside conditions through roadside delineation, curve enhancements and road widening to achieve the minimum desired road standards.

The principles behind the prioritisation process is outlined in detail within Section 9.1 of the report. The identified infrastructure responses and indicative timeframes for implementation are summarised within Figure 10-1 overleaf.

10.3 CMP Review

It is recommended that the CMP remains a 'live' document to ensure that it is updated and reviewed on a regular basis to make certain that recommendations within the report remain current and reflect any emerging issues or proposed network changes.

It is expected that the CMP will need to be reviewed and updated every three years to confirm the relevance of assumptions outlined within the report, as well as identify improvements that could be included within Council's Long-Term Plan. This will also allow the CMP to remain updated with progress-to-date on actions identified within the implementation plan and highlight the next stages / priorities identified within the CMP.

10.4 Future Works Programming

The implementation plan identifies opportunities to implement corridor improvements in co-ordination with other projects, including maintenance work. As part of future Forward Works Programming, it is recommended that Councils consider opportunities for integrating recommendations outlined within the CMP into these projects to minimise delivery costs and community disruption.



Figure 10-1: CMP Implementation Plan

10.5 Traffic Monitoring Framework

It is recommended that RDC and HDC develops a monitoring programme on the corridor to establish annual growth trends and safety performance of the route. This will allow Councils to monitor traffic growth rates and confirm the relevance of assumptions outlined within the CMP, as well as allowing Councils to assess the effectiveness of improvements once delivered.

10.6 Oversight and Management

The development of initiatives identified through the CMP requires close collaboration between RDC and HDC, as well as other key stakeholders with a vested interest in the corridor including (but not limited to) Waka Kotahi, Ministry of Business, Innovation and Employment (MBIE), Department of Conservation, and local communities.

Developing a working group with representatives from key stakeholder organisations to oversee the development, co-ordination and implementation of broader initiatives is recommended and should be established early in the process.

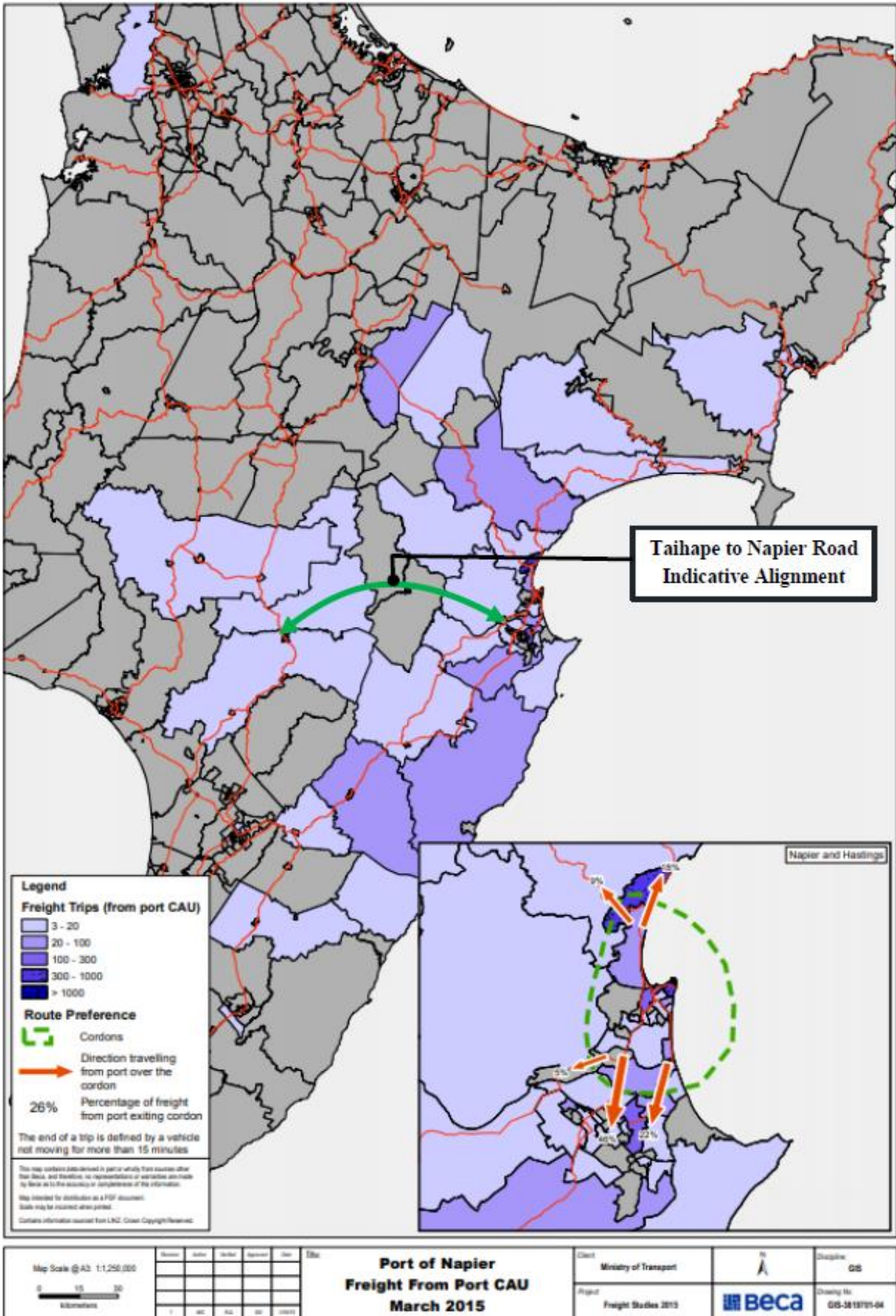
This governance structure approach would:

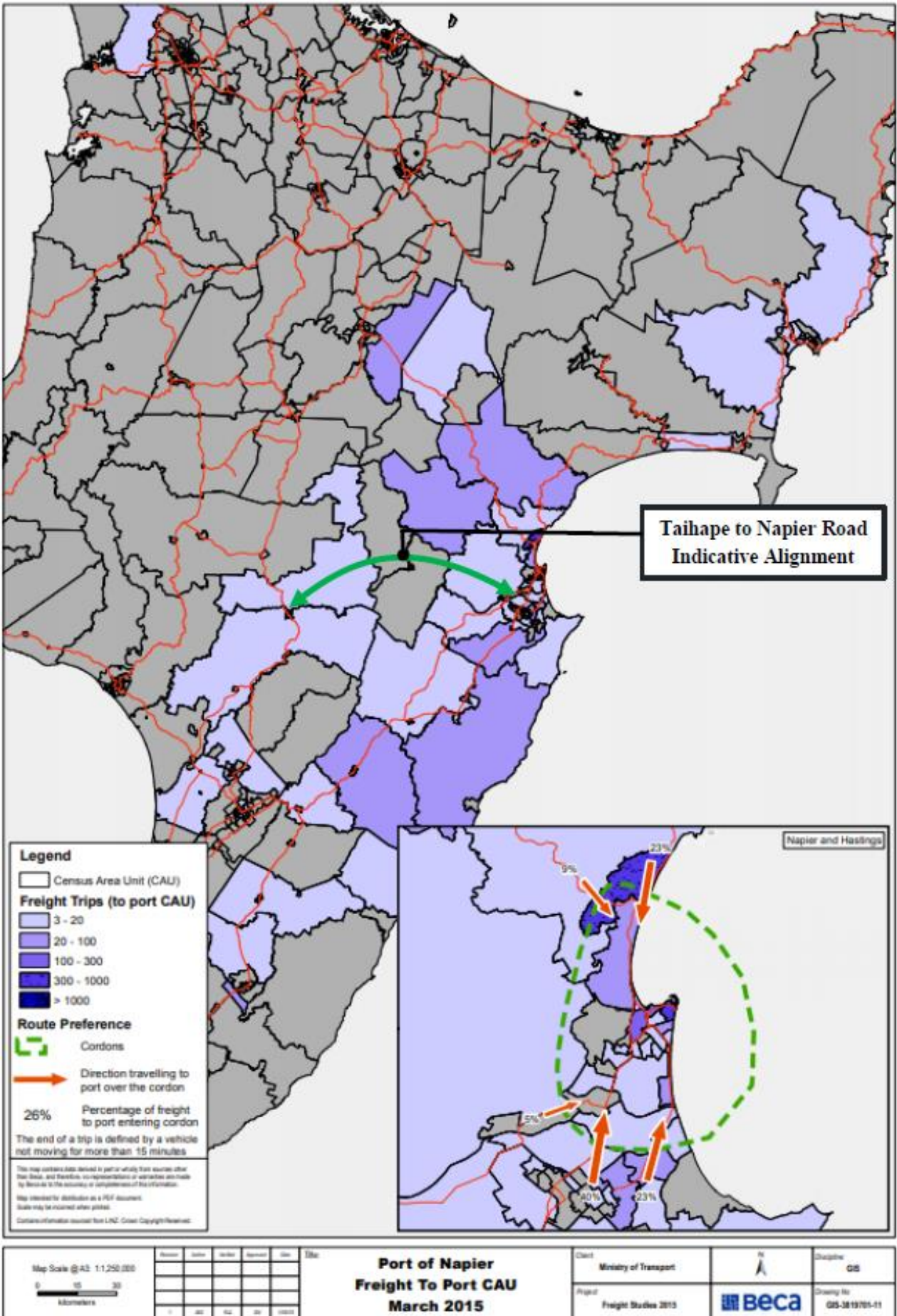
- Ensure regular communication between organisations with a key interest in the operation of the corridor;
- Establish an understanding and support of initiatives through collaboration and involvement in key decisions related to enhancing access and safety along the corridor;
- Enable a co-ordinated approach to delivering initiatives / improvements in co-ordination with communities, ensuring they are delivered with due consideration given to key user needs;
- Provide access to broader range of external funding opportunities to deliver future initiatives (i.e. PGF funding); and
- Enable efficient and effective monitoring of improvements / solutions identified within the CMP.

Appendix A: Napier Port Catchment

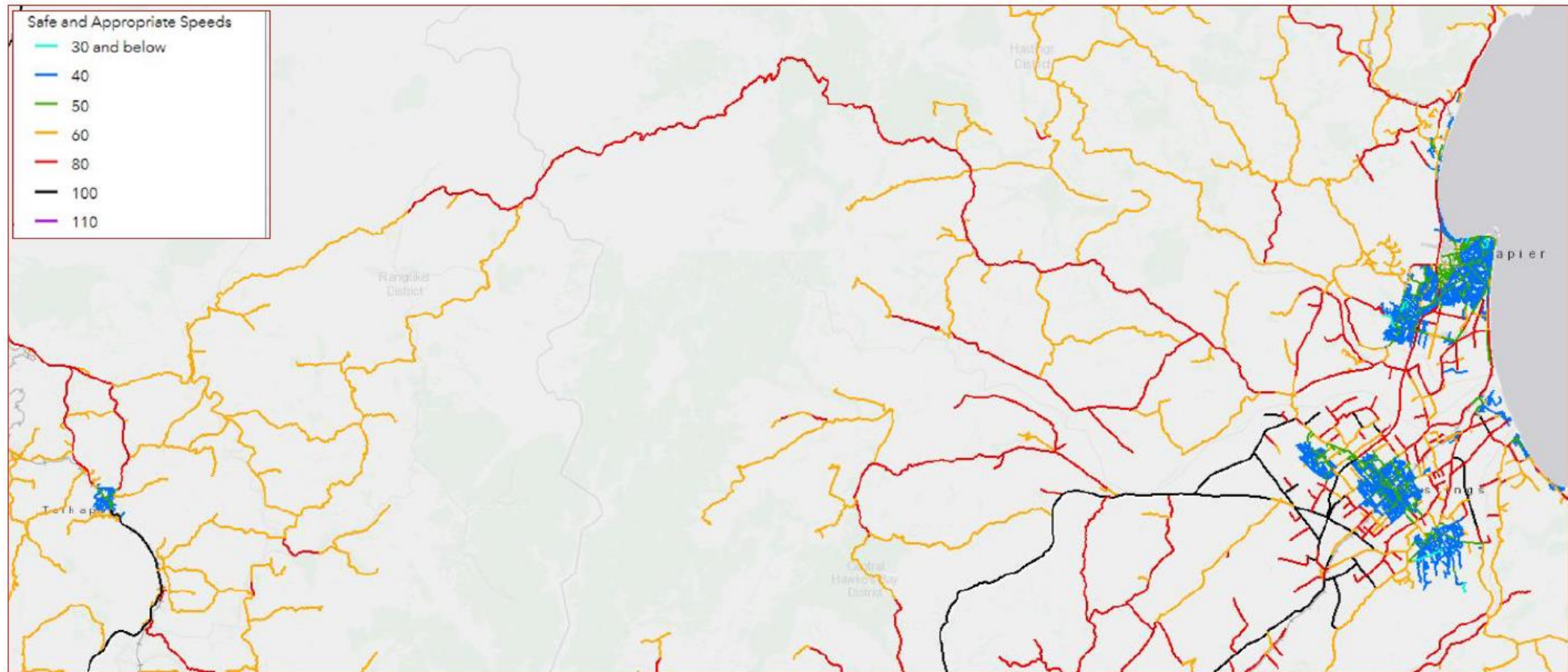
Source: Ministry of Transport Freight Study (2015)

Link: <https://www.transport.govt.nz/assets/Uploads/Research/Documents/867abceef8/Beca-Freight-Studies-Small.pdf>

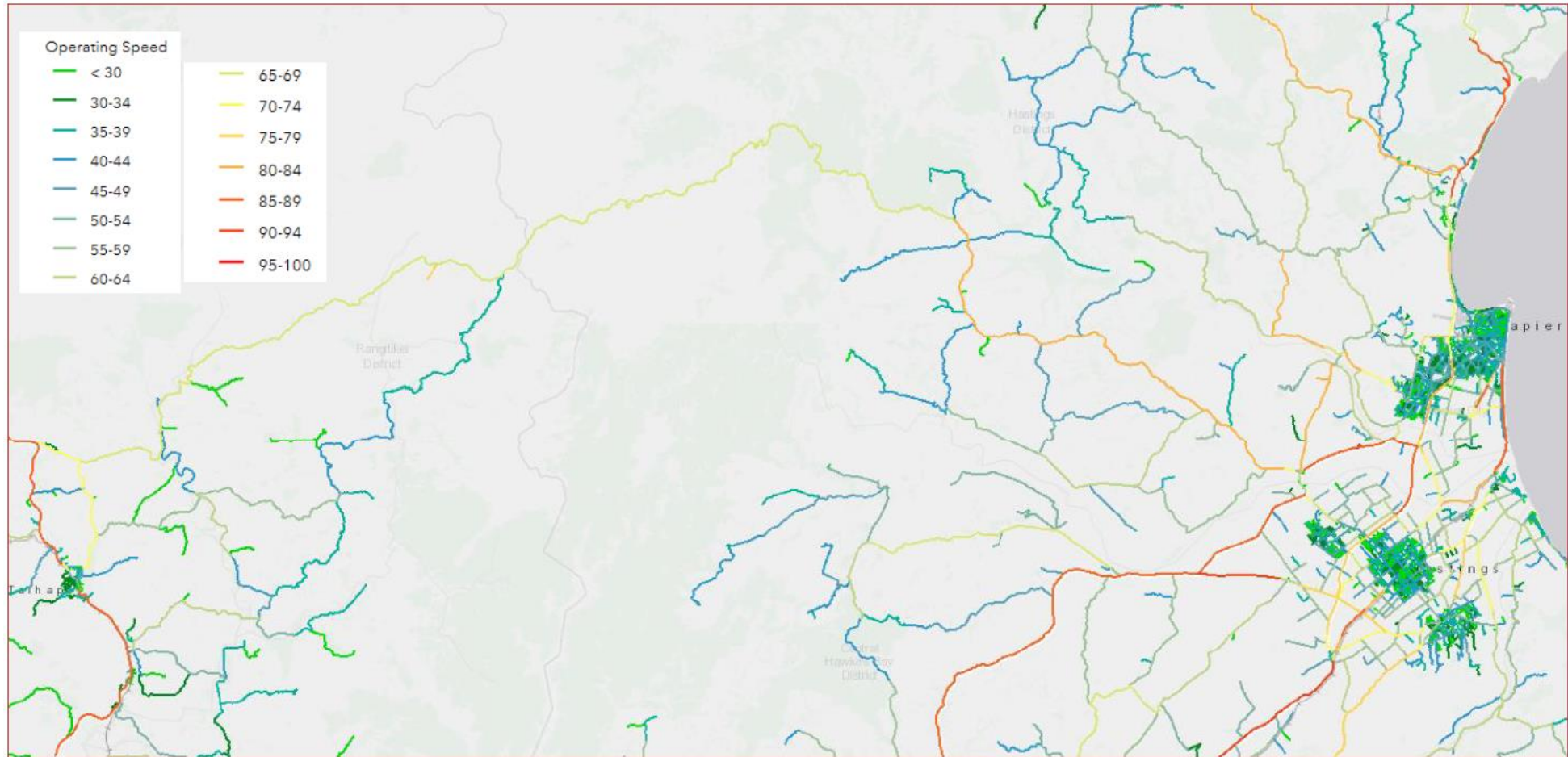




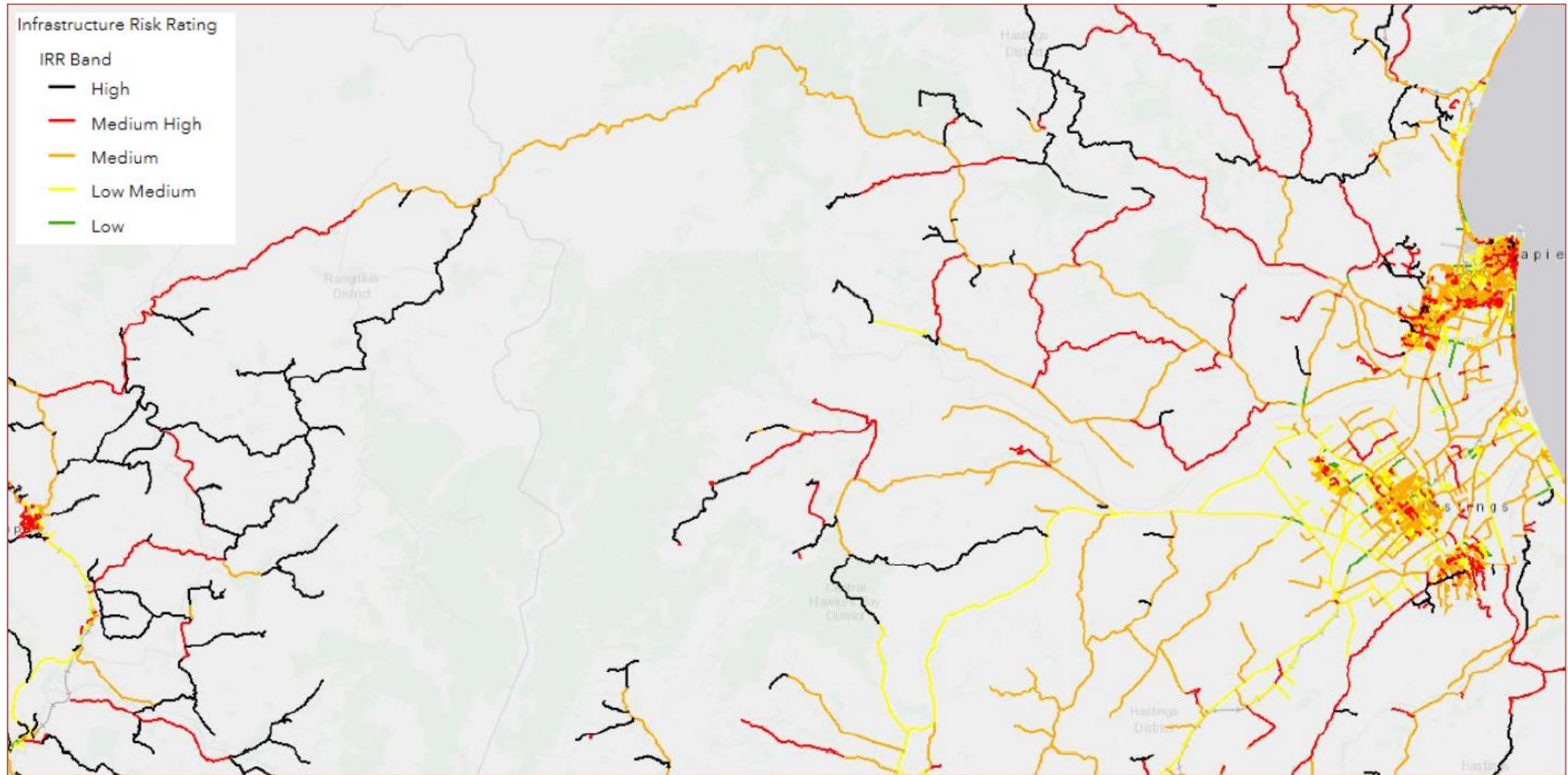
Appendix B: Mega Maps Extracts



Waka Kotahi Mega Maps - Safe and Appropriate Posted Speed Limit



Waka Kotahi Mega Maps – Mean Operating Speeds



Waka Kotahi Mega Maps – Infrastructure Risk Rating

Appendix C: Delineation Improvements

Methodology

As part of a site drive over of the route from Taihape - Napier in March 2020, the Road Safety and Transportation Engineers from WSP, with valuable input from Alan Geerkins from RDC, noted areas in need of improvement.

Further to this, video footage was collected through a Go-Pro camera.

As part of a desktop study, the video footage was reviewed to identify areas in need of delineation improvements.

In order for the team to put a quantitative value to the proposed delineation improvements at a strategic level, existing provisions were reviewed from the video footage and approximate length of treatments were established based the following categories:

- 20% coverage would typically be where the specific delineation improvement is either missing completely over short and scatted sections or where the specific delineation improvement requires some form of rejuvenation.
- The 50% and 100% categories are as per the description, where the section requires intervention over half the length or the full length of the section respectively.

It is important to note that the recommendations made are part of a high-level investigation to estimate expected costs. Each improvement should be investigated in more detail to ensure site specific requirements are met.

Taihape-Napier Road CMP

Treatments	Speed Management	
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Segment	Description	Sub-Section	Start		End		AADT	Length	Delineation					Cost
			Road Name	RP	Road Name	RP			Edgemarker Posts	Edgelines	Centreline	RRPMs	Centreline ATP	
									\$ 1.20	\$ 7.20	\$ 2.40	\$ 0.78	\$ 4.80	
Section 1	Taihape to Moawhango	Sub Section A	Spooners Hill Rd	11.900	Spooners Hill Rd	9.100	590	2.800	0.2		0.5	1	0.5	\$ 12,936.00
		Sub Section B	Spooners Hill Rd	9.100	Spooners Hill Rd	3.340	280	5.760	0.2	1		1	0.5	\$ 61,171.20
		Sub Section C	Te Moehau Rd	0.000	Te Moehau Rd	3.700	344	3.700	0.5	1		1	0.5	\$ 40,626.00
		Sub Section D	Te Moehau Rd	3.700	Taihape-Napier Rd 1	0.310	270	5.085	1	1		1	0.5	\$ 58,884.30
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	Taihape-Napier Rd 1	0.310	Taihape-Napier Rd 1	7.210	270	6.900	0.5	0.5		1	0.5	\$ 50,922.00
		Sub Section B	Taihape-Napier Rd 1	7.210	Taihape-Napier Rd 1	23.190	200	15.980	0.5	1		1	0.5	\$ 175,460.40
Section 3	Springvale Suspension Bridge to Ngamatea Rest	Sub Section A	Taihape-Napier Rd 1	23.190	Taihape-Napier Rd 2	7.765	185	7.819	0.5	1		1	0.5	\$ 85,852.62
		Sub Section B	Taihape-Napier Rd 2	7.765	Taihape-Napier Rd 2	15.735	173	7.970	0.5	1		1	0.5	\$ 87,510.60
Section 4	Ngamatea Rest Stop to Ngaruroro River	Sub Section A	Taihape-Napier Rd 2	15.735	Taihape-Napier Rd 2	29.610	70	13.875	0.5	0.5		1	0.5	\$ 102,397.50
		Sub Section B	Taihape-Napier Rd 2	29.610	Taihape-Napier Rd 2	35.606	63	5.996	0.5	1	1	1	0.5	\$ 80,226.48
Section 5	Hastings District	Sub Section A	Taihape Road	56.348	Taihape Road	51.300	154	5.048					0.5	\$ 12,115.20
		Sub Section B	Taihape Road	51.300	Taihape Road	41.585	181	9.715			0.2		0.5	\$ 27,979.20
		Sub Section C	Taihape Road	41.585	Taihape Road	36.785	181	4.800					0.5	\$ 11,520.00
Section 6	Hastings District	Sub Section A	Taihape Road	36.785	Taihape Road	27.800	250	8.985	0.5				0.5	\$ 26,955.00
		Sub Section B	Taihape Road	27.800	Taihape Road	19.920	500	7.880	0.5	0.2	0.2		0.5	\$ 38,769.60
		Sub Section C	Taihape Road	19.920	Taihape Road	8.770	900	11.150	0.5				0.5	\$ 33,450.00
		Sub Section D	Taihape Road	8.770	Taihape Road	1.775	2000	6.995	0.5				0.5	\$ 20,985.00
		Sub Section E	Taihape Road	1.775	Taihape Road	0.005	2500	1.770						\$ -

Appendix D: Seal Widening Improvements

Taihape-Napier Road CMP

Treatments	Road Widening
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Section	Description	Sub Section	Road Name	Treatments								Total Cost
				Start	End	Length	Road Width	Desired Minimum	Widening	Curve Widening Proposed	Total Widening (Midblock)	
Section 1	Taihape to Moawhango	Sub Section A	Spooners Hill Road	11.90	9.10	2.80	6.9	7.0	0.1	1.700	110.0	\$ 26,400.00
		Sub Section B	Spooners Hill Road	9.10	5.50	3.60	6.4	7.0	0.6	0.000	2160.0	\$ 518,400.00
				5.50	3.33	2.17	6.6	7.0	0.4	0.000	868.0	\$ 208,320.00
		Sub Section C	Te Moehau Road	0.00	3.70	3.70	5.7	7.0	1.3	0.326	4386.2	\$ 1,052,688.00
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	Taihape-Napier Road 1	3.70	8.48	4.78	5.7	7.0	1.3	1.600	4134.0	\$ 992,160.00
				0.00	0.31	0.31	5.7	7.0	1.3	0.000	403.0	\$ 96,720.00
		Sub Section B	Taihape-Napier Road 1	0.31	1.62	1.31	5.9	7.0	1.1	0.140	1287.0	\$ 308,880.00
				1.62	5.15	3.53	5.6	7.0	1.4	0.510	4228.0	\$ 1,014,720.00
5.15	7.21	2.06	6.0	7.0	1.0	0.560	1500.0	\$ 360,000.00				
Section 3	Springvale Suspension Bridge to Ngamatea Plateau Rest Stop	Sub Section A	Taihape-Napier Road 1	7.21	23.19	15.98	6.0	7.0	1.0	4.790	11190.0	\$ 2,685,600.00
				0.00	4.50	4.50	6.0	7.0	1.0	0.920	3580.0	\$ 859,200.00
		Sub Section B	Taihape-Napier Road 2	4.50	7.77	3.27	5.8	7.0	1.2	0.560	3246.0	\$ 779,040.00
				7.77	9.77	2.01	5.8	7.0	1.2	0.620	1662.0	\$ 398,880.00
9.77	15.74	5.97	6.3	7.0	0.7	1.140	3377.5	\$ 810,600.00				
Section 4	Ngamatea Rest Stop to Ngaruroro River	Sub Section A	Taihape-Napier Road 2	15.74	21.60	5.87	6.3	7.0	0.7	2.540	2327.5	\$ 558,600.00
		Sub Section B	Taihape-Napier Road 2	21.60	29.61	8.01	5.9	7.0	1.1	2.240	6347.0	\$ 1,523,280.00
Section 5	Ngaruroro River to Waiwhare	Sub Section A	Taihape Road	29.61	35.60	5.99	5.9	7.0	1.1	2.620	3707.0	\$ 889,680.00
				54.12	51.50	2.62	8.2	7.0	N/A	N/A	-	\$ -
		Sub Section B	Taihape Road	51.50	51.30	0.20	8.5	7.0	N/A	N/A	-	\$ -
				51.30	48.06	3.24	8.5	7.0	N/A	N/A	-	\$ -
48.06	41.59	6.48	7.4	7.0	N/A	N/A	-	\$ -				
Sub Section C	Taihape Road	41.59	36.79	4.80	7.4	7.0	N/A	N/A	-	\$ -		
Section 6	Waiwhare to Fernhill	Sub Section A	Taihape Road	36.79	36.28	0.50	7.4	7.0	N/A	N/A	-	\$ -
				36.28	32.56	3.72	7.0	7.0	N/A	N/A	-	\$ -
				32.56	30.60	1.96	6.7	7.0	0.3	0.000	588.0	\$ 141,120
				30.60	29.26	1.34	6.6	7.0	0.4	0.000	536.0	\$ 128,640
		Sub Section B	Taihape Road	29.26	27.98	1.28	6.4	7.0	0.6	0.300	588.0	\$ 141,120
				27.98	27.80	0.18	6.3	7.0	0.7	0.000	126.0	\$ 30,240
				27.80	26.85	0.95	6.3	7.0	0.7	0.250	490.0	\$ 117,600
				26.85	24.52	2.33	6.8	7.0	0.2	0.130	440.0	\$ 105,600
		Sub Section C	Taihape Road	24.52	22.75	1.77	7.2	7.0	N/A	N/A	-	\$ -
				22.75	19.92	2.83	6.9	7.0	0.1	0.380	245.0	\$ 58,800
				19.92	19.67	0.25	6.9	7.0	0.1	0.000	25.0	\$ 6,000
				19.67	12.75	6.92	6.6	7.0	0.4	1.165	2302.0	\$ 552,480
		Sub Section D	Taihape Road	12.75	8.70	4.05	6.4	7.0	0.6	0.105	2367.0	\$ 568,080
				8.70	5.90	2.80	7.3	7.0	N/A	N/A	-	\$ -
5.90	2.37			3.53	7.2	7.0	N/A	N/A	-	\$ -		
2.37	1.78			0.60	7.3	7.0	N/A	N/A	-	\$ -		
Sub Section E	Taihape Road	1.775	0.88	0.90	7.3	7.0	N/A	N/A	-	\$ -		
		0.88	0.00	0.88	10.1	7.0	N/A	N/A	-	\$ -		

Appendix E: Intersection Improvements

Taihape-Napier Road CMP

Treatments	Intersection Improvements
TLA	Rangitikei District Council

Key  Denotes Existing Facilities
 Denotes Proposed Facilities

Section	District	Sub Section	Main Road	Side Road	RP	Main Road		Local Road		Road Classification (ONRC)	Recommended Main Road Treatment								Recommended Local Road Treatment					Cost	Notes	
						ADT	Est Peak (10% of ADT)	ADT	Est Peak (10% of ADT)		Destination Signs	Advance Signs	Street Name	Continuity Marking	Flag Light	Painted Median	Left-Turn Bay	Right-Turn Bay	Seal Throat	Priority Control	Limit Line	Centreline	Traffic Islands			
											\$ 840	\$ 840	\$ 600	\$ 8	\$ 36,000	\$ 18	\$ 36,000	\$ 72,000	\$ 3,600	\$ 1,200	\$ 300	\$ 2	\$ 6,000			
Section 1	Taihape to Moawhango	Sub Section A	Spooners Hill Road	Pungatawa Road	9.053	590	59	228	22.8	Secondary Collector														\$ -		
		Sub Section B	Spooners Hill Road	Addis Road	6.431	318	31.8	10	1	Low Volume														\$ 3,600.00	Located on a curve with two entranceways. Rises above road level. Local Road is unsealed.	
				Paengaroa Road	5.433	318	31.8	49	4.9	Low Volume															\$ 4,440.00	Located on a curve with two entranceways. Local road is unsealed.
				Te Moehau Road	3.339	223	22.3	344	34.4	Primary Collector															\$ 2,520.00	Te Moehau Road has the highest ADT, however, it is priority controlled (considered the minor road). If funding allows, consider realigning to have northern section of Spooners Hill Road (to SH1) as priority controlled.
		Sub Section C	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sub Section D	Te Moehau Road	Moawhango Valley Road	8.452	344	34.4	37	3.7	Low Volume															\$ 4,440.00	Local Road is unsealed, located on a curve with two entranceways.		
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	Taihape-Napier Road 1	Wherewhere Road	0.310	289	28.9	43	4.3	Low Volume														\$ 3,048.00	School located nearby - may be advisable (although low volume road).	
				Burridges Road	1.620	289	28.9	20	2	Low Volume															\$ 3,600.00	Local Road is unsealed.
				Makokomiko Road West	5.149	256	25.6	10	1	Low Volume																\$ -
		Sub Section C	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	Sub Section A	Taihape-Napier Road 2	Kelly Road	4.510	199	19.9	5	0.5	Low Volume														\$ 3,600.00	Local Road is unsealed. Appears to be more of a private accessway than a local road.	
		Sub Section B	Taihape-Napier Road 2	Mangaohane Road	9.771	199	19.9	15	1.5	Low Volume															\$ -	Local Road is unsealed beyond the throat.
Section 4	Ngamatea Rest Stop to Ngaruroro River	Sub Section A	Taihape-Napier Road 2	Comet Road	28.922		0		0															\$ -	Road is unsealed. DoC road to walking track (Shutes Hut)? No traffic volumes available on MobileRoad.	
		Sub Section B	N/A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Taihape-Napier Road CMP

Treatments	Intersection Improvements
TLA	Hastings District Council

Key
 Denotes Existing Facilities
 Denotes Proposed Facilities

Section	District	Sub Section	Main Road	Side Road	RP	Main Road		Local Road		Road Classification (ONRC)	Recommended Main Road Treatment								Recommended Local Road Treatment					Cost	Notes			
						ADT	Est Peak (10% of ADT)	ADT	Est Peak (10% of ADT)		Destination Signs	Advance Signs	Street Name	Continuity Marking	Flag Light	Painted Median	Left-Turn Bay	Right-Turn Bay	Seal Throat	Priority Control	Limit Line	Centreline	Traffic Islands					
						\$	\$	\$	\$		\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$			\$		
Section 5	Ngaruroro River to Waiwhare	Sub Section A	Taihape Road	Robson Lodge Road	56.165	154	15.4		0															\$ -	Road only leads to Robson's Lodge (DoC owned?). Can probably be neglected.			
				Kuri Campsite Road	55.122	154	15.4		0																\$ -	DoC road to Kuripapango campsite.		
				Un-named Forestry Road	54.255	154	15.4																			\$ -		
				Un-named Forestry Road	54.020	154	15.4																				\$ 3,600.00	
				Un-named Forestry Road	53.485	154	15.4																				\$ -	
				Un-named Forestry Road	53.017	154	15.4																				\$ 3,600.00	
				Lumsden Road	52.939	154	15.4																				\$ 3,600.00	
				Kuripapango Road	52.431	154	15.4																				\$ 5,040.00	DoC access road.
		Sub Section B	Taihape Road	Mavis Road	51.846	154	15.4		0																	\$ -		
				Un-named Forestry Road	51.530	154	15.4		0																	\$ -		
				Un-named Forestry Road	50.821	181	18.1		0																		\$ -	
				Castle Rock Road	50.490	181	18.1		0																		\$ 5,292.00	Leads to DoC carparks (walking trails?).
				Un-named Forestry Road	49.658	181	18.1		0																		\$ -	
				Un-named Forestry Road	49.226	181	18.1		0																		\$ -	
				Burns Road	48.760	181	18.1		0																		\$ 3,600.00	
				Century Road	48.543	181	18.1		0																		\$ 3,600.00	
				Un-named Forestry Road	48.052	181	18.1		0																		\$ -	
				Un-named Forestry Road	47.777	181	18.1		0																		\$ -	
				Ritch Road	46.990	181	18.1		0																		\$ 3,600.00	
				Un-named Forestry Road	46.568	181	18.1		0																		\$ -	
				Un-named Forestry Road	45.064	181	18.1		0																		\$ -	
				Lawrence Road	44.186	181	18.1		0																		\$ 3,600.00	DoC / historical site access road. Wide shoulder on the same side of Lawrence Road.
				Un-named Forestry Road	43.486	181	18.1		0																		\$ -	
				Un-named Forestry Road	43.235	181	18.1		0																		\$ -	
		Lizard Road	42.606	181	18.1		0																		\$ 3,600.00			
Un-named Forestry Road	41.751	181	18.1		0																		\$ -					
Sub Section C	Taihape Road	Army Road	41.167	181	18.1		0																	\$ -	Wide shoulder on the same side as Army Road.			
		Waiwhare Road	39.156	181	18.1		0																	\$ 3,600.00				
		Willowford Road	36.269	238	23.8	55	5.5	Access Road																\$ -	Local road is unsealed beyond the throat.			
Sub Section A	Taihape Road	River Road (Kaweka)	34.560	287	28.7	93	9.3	Access Road																\$ 840.00				
		Glenross Road	34.560	287	28.7	107	10.7	Access Road																\$ 840.00				
		Waikonini Road	32.550	357	35.7		0																	\$ -	Appears the local road is more of an accessway to a property, not a public road. Unsealed beyond the throat.			
		Koromiko Road	30.587	455	45.5	37	3.7	Low Volume																\$ -	Local Road is unsealed beyond the throat.			
		Lee Road	29.269	455	45.5	14	1.4	Low Volume																\$ -				
		Otamauri Road	28.000	405	40.5	120	12	Access Road																\$ 840.00	Local Road intersects on a curve with two accessways.			
		Kikowhero Road	26.841	455	45.5	7	0.7	Low Volume																\$ 3,726.00	Local Road is unsealed.			
Sub Section B	Taihape Road	Lechlade Road	24.528	566	56.6	12	1.2	Low Volume															\$ -	Local Road is unsealed beyond the throat.				
		Crownthorpe Settlement Road	22.757	566	56.6	49	4.9	Low Volume															\$ -					
Sub Section C	Taihape Road	Flag Range Road	19.656	603	60.3	43	4.3	Low Volume															\$ -	Local road has two entrances.				
Sub Section D	Taihape Road	Matapiro Road	8.700	1673	167.3	785	78.5	Secondary Collector																\$ 8,160.00	Painted median at the intersection along the Local Road (instead of a traffic island). Recommend obtaining traffic counts at this location to determine if turning bays are required (both right and left turning bays along Taihape Road).			
		Shanley Road	7.360	1673	167.3	163	16.3	Access Road																\$ 1,500.00				
		Kawera Road	6.438	1673	167.3	162	16.2	Access Road																\$ -				
		Ohiti Road	2.379	2203	220.3	400	40	Secondary Collector																\$ -				
		Sub Section E	Taihape Road	Swamp Road	0.028	2847	284.7	1201	120.1	Primary Collector																\$ 900.00	Very close to SH50. Recommend obtaining traffic counts at this location to determine if a right-turning bay is required (expect most of the traffic along Swamp Road will be coming from SH50 south, therefore using the slip lane provided).	
				SH50 turn-off	0.028	2847	284.7		0																\$ 540.00	Slip lane from SH50 south (one-way).		

Appendix F: Curve Improvements

Taihape-Napier Road CMP

Treatments Curve Treatments

Section	Description	Sub-Section	Start Point		End Point		Length	Curves			Treatment Type						Total Cost		
			Road	RP	Road	RP		Isolated / Series	Start RP	End RP	Notes	Singage - Chevrons	Signage - Advisory	Centreline RRPms	Line Marking	Barrier		Widening	Retaining Walls
Section 1	Taihape to Moawhango	Sub Section A	Spooners Hill Rd	11.900	Spooners Hill Rd	9.100	2.800	Series	11.775	10.990	Multiple tight curves located within close proximity within a known crash risk area.							\$ 1,593,942.30	
								Series	10.895	9.475	Multiple tight curves located within close proximity within a known crash risk area.								\$ 1,165,883.70
		Sub Section B	Spooners Hill Rd	9.100	Spooners Hill Rd	3.340	5.760	N/A											
		Sub Section C	Te Moehau Rd	0.000	Te Moehau Rd	3.700	3.700	Isolated	0.330	0.530	Single isolated curve, mostly of concern due to sight distance.								\$ 97,956.00
								Isolated	2.924	3.050	Single isolated curve, adjacent to forestry block and bank dropping away from outside of curve. Could be linked to Sub Section D improvements								\$ 94,886.28
		Sub Section D	Te Moehau Rd	3.700	Taihape-Napier Rd 1	0.310	5.010	Series	3.710	6.160	Multiple curves of concern with gentle sections in-between with varying levels of existing signage.								\$ 712,413.00
								Isolated	7.050	7.050	Single isolated curve, isolated improvement.							\$ 40,262.40	
Isolated	7.820							7.820	Single isolated curve with existing roadside hazards (power poles)							\$ 75,678.00			
Isolated	8.220							8.220	Single challenging curve on approach to bridge structure							\$ 35,454.60			
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	Taihape-Napier Rd 1	0.310	Taihape-Napier Rd 1	7.210	6.900	Isolated	1.540	1.680	Single isolated curve through Burridges Road intersection							\$ 69,109.20	
								Isolated	2.420	2.730	Single isolated sharp curve							\$ 149,641.80	
								Isolated	3.460	3.580	Single isolated tight curve with multiple roadside hazards (banks/drops)							\$ 58,293.60	
								Series	4.160	7.020	Multiple moderate to tight curves							\$ 473,541.00	
								Series	8.100	8.560	Multiple curves with poor visibility or roadside hazards							\$ 184,230.60	
		Sub Section B	Taihape-Napier Rd 1	7.210	Taihape-Napier Rd 1	23.190	15.980	Series	9.340	11.850	Multiple tight curves located within close proximity							\$ 394,808.40	
								Series	12.210	14.790	Multiple gentle to moderate curves located in close proximity							\$ 400,224.00	
								Series	15.390	18.850	Multiple gentle to moderate curves located in close proximity							\$ 411,748.80	
								Series	19.500	21.940	Multiple tight curves located within close proximity							\$ 871,099.20	
								Series	22.040	23.160	Multiple gentle curves located within close proximity							\$ 98,665.20	
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	Sub Section A	Taihape-Napier Rd 1	23.190	Taihape-Napier Rd 2	7.765	7.789	Isolated	0.840	0.960	Single isolated curve located on slight incline.							\$ 59,493.60	
								Series	2.990	4.060	Multiple curves located within close proximity.							\$ 388,224.00	
								Isolated	5.450	5.580	Single isolated curve located on slight decline.							\$ 64,301.40	
		Sub Section B	Taihape-Napier Rd 2	7.765	Taihape-Napier Rd 2	15.735	7.970	Series	6.360	6.750	Two sharp curves with roadside hazards (banks)							\$ 141,226.20	
								Series	7.560	10.530	Multiple curves located within close proximity.							\$ 454,325.40	
								Series	11.200	11.780	Two curves located within close proximity.							\$ 118,987.20	
								Series	13.600	14.770	Multiple curves with limited sight distance (hill / embankment)							\$ 252,452.40	
Isolated	15.680	15.830	Isolated curve with roadside hazard							\$ 73,917.00									
Section 4	Ngamatea Rest Stop to Ngaruroro River	Sub Section A	Taihape-Napier Rd 2	15.735	Taihape-Napier Rd 2	29.610	13.875	Series	16.320	17.730	Multiple winding curves with identified roadside hazards (banks / drops)							\$ 563,817.60	
								Series	17.800	19.150	Multiple winding curves with identified roadside hazards (banks / drops)							\$ 473,262.60	
								Series	19.220	23.100	Multiple winding curves							\$ 957,930.00	
								Series	23.500	24.760	Several curves with identified roadside hazards (banks/drops)							\$ 163,238.40	
								Series	25.450	29.370	Multiple winding curves with identified roadside hazards (banks / drops)							\$ 501,859.80	
								Series	30.770	35.580	Multiple winding curves best treated as a single project.							\$ 1,808,043.60	
Section 5	Ngaruroro River to Waiwhare	Sub Section A	Taihape Road	56.348	Taihape Road	51.300	5.048	Series	56.370	56.010							\$ 84,841.80		
								Series	55.355	52.385							\$ 574,565.70		
		Sub Section B	Taihape Road	51.300	Taihape Road	41.585	9.715	Series	51.190	47.950							\$ 728,273.40		
								Series	47.540	44.810							\$ 544,454.10		
								Series	44.250	41.920							\$ 266,825.10		
		Sub Section C	Taihape Road	41.585	Taihape Road	36.785	4.800	Series	41.490	38.200							\$ 524,716.50		
								Isolated	36.745	36.670							\$ 37,858.50		
Section 5	Ngaruroro River to Waiwhare	Sub Section A	Taihape Road	36.785	Taihape Road	27.800	8.985	Series	28.470	27.960							\$ 150,234.00		
								Series	27.720	25.920							\$ 183,296.40		
		Sub Section B	Taihape Road	27.800	Taihape Road	19.920	7.880	Series	24.040	23.520							\$ 51,117.00		
								Series	22.280	22.105							\$ 60,697.50		
								Series	20.850	20.300							\$ 124,398.90		
		Sub Section C	Taihape Road	19.920	Taihape Road	8.770	11.150	Series	18.765	17.340							\$ 199,523.70		
								Series	16.755	15.745							\$ 253,601.70		
								Isolated	15.070	14.970							\$ 48,078.00		
								Isolated	14.190	14.120							\$ 33,654.60		
		Sub Section D	Taihape Road	8.770	Taihape Road	1.775	6.995	Series	7.020	6.445							\$ 45,705.30		
Isolated	4.895							4.820							\$ 36,058.50				
Sub Section E	Taihape Road	1.775	Taihape Road	0.005	1.770	N/A													

Appendix G: Tourism Enhancements

Taihape-Napier Road CMP

Treatments Tourism Enhancements

Section	Description	Sub Section	Location	Facility Type	Location			Signage		Destination Features				Total Cost	Comments	
					Road Name	Start RP	End RP	Advance Signage	Position Signs	Seating / Benches	Information Boards	Parking Area	Rubbish Bins			
								\$ 1,200.00	\$ 1,200.00	\$ 2,400.00	\$ 4,200.00	\$ 180.00	\$ 600.00			
Section 1	Taihape to Moawhango	Sub Section A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	
		Sub Section B	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
		Sub Section C	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
		Sub Section D	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	
		Sub Section B	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	Sub Section A	Springvale Bridge - Tourist Destination	Point of Interest	Taihape-Napier Road 1	0.12	0.12	1	2	2			1	\$ 9,000.00	Well developed tourist attraction. Existing site has pull over/parking areas and information boards. Lack of signage/advanced warning of site on-road.	
		Sub Section B	New Scenic Look-out (Section 3B)	New Viewing Point	Taihape-Napier Road 1	15.000	23.000	1	2			120		\$ 25,200.00	Potential tourism pull over area to be located on Section 3, with views of Mt Ruhapehu / Central Plateau. Would require identification of suitable site, and development of associated amenities/facilities.	
Section 4	Ngamatea Rest Stop to Ngaruroro River	Sub Section A	Scenic Lookout - Rest Area	Existing Viewing Point - Potential Rest Area	Taihape-Napier Road 2	18.900	18.900	1	2	6	1		1	\$ 22,800.00	Established look out point. Carparking facilities located on both sides of the road. Existing facilities have lack of advanced/positional signage. Site is ideally located as a mid-point rest area for travellers. Potential to enhance with wider amenities. Assumes allowance for six cars at a time.	
			Taurarau River Crossing	Viewing Point	Taihape-Napier Road 2	21.400	21.400	1	2				100		\$ 21,600.00	Viewpoint of River Crossing - some informal parking area provided. Could be upgraded to provide stopping point/viewing of river area.
			Comet Road	Connection to DoC site	Taihape-Napier Road 2	28.900	28.900	1	2						\$ 3,600.00	Pedestrian connection to viewing area. Limited space for parking. Provides access tracks to Comet Hut and Shutes Hut.
		Sub Section B	Ngaruroro River Crossing	Viewing Point	Taihape-Napier Road 2	35.150	35.150	1	2				100		\$ 21,600.00	Viewpoint of River Crossing - some informal parking area provided. Could be upgraded to provide stopping point/viewing of river area.
Section 5	Ngaruroro River to Waiwhare	Sub Section A	Kuripapango Campsite	Connection to DoC site	Taihape Road	55.120	55.120	1	1					\$ 2,400.00	Provides the main access from Taihape Road into the Kurpapango campsite facility run by DoC. Additional signage provides improved advanced warning of site entrance, improving safety and access to the facility.	
			Cameron Carpark	Point of Interest	Taihape Road	54.900	54.900	1	1	2					\$ 7,200.00	Provides the main access from Taihape Road into the Cameron walking tracks, owned and maintained by DoC. Additional signage provides improved advanced warning of site entrance, improving safety and access to the facility. Facility could also be enhanced through provision of suitable picnic and bench areas.
			Kuripapango Road	Connection to DoC site	Taihape Road	52.300	52.300	1	1						\$ 2,400.00	Side road provides access to forestry and local walking tracks owned/operated by DoC through the forest parks. Improved signage provides improved safety and awareness of side road.
		Sub Section B	Lawrence Road	Connection to DoC site	Taihape Road	44.171	44.171	1	1						\$ 2,400.00	Side road provides access to forestry and local walking tracks owned/operated by DoC through the forest parks. Improved signage provides improved safety and awareness of side road.
		Sub Section C	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
Section 6	Waiwhare to Fernhill	Sub Section A	N/A	-	-	-	-	-	-	-	-	-	-	-	-	
		Sub Section B	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
		Sub Section C	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
		Sub Section D	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-
		Sub Section E	N/A	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix H: Bridge Improvements

Taihape-Napier Road CMP

Treatments Bridge Improvements

Section	Sub-Section	Sub-Section	Road Name	Bridge Name	Start RP	End RP	Treatments		Total Cost	Notes
							50Max Bridge Strengthening \$ 600,000.00	Single Lane Bridge Removal 0		
Section 1	Taihape to Moawhango	Sub Section A	Spooners Hill Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section B	Spooners Hill Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section C	Te Moehau Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section D	Te Moehau Road	Moawhango	8.300	8.300			\$ 600,000.00	Bridge located on south approach to Moawhango currently has bridging restrictions. Positioned at the boundary between Section 1 and Section 2. Existing bridge requires strengthening to support HPMV loads. Single lane bridge could be upgraded to support two way traffic flow (long-term).
Section 2	Moawhango to Springvale Suspension Bridge	Sub Section A	Taihape Napier Road 1	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section B	Taihape Napier Road 1	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	Sub Section A	Taihape Napier Road 2	Springvale	0	0			\$ 600,000.00	Springvale bridge located across the Otamatea Stream at the boundary between Section 2 and Section 3. Existing bridge requires strengthening to support HPMV loads. Single lane bridge could be upgraded to support two way traffic flow (long-term).
		Sub Section B	Taihape Napier Road 2	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
Section 4	Ngamatea Rest Stop to Ngaruro River	Sub Section A	Taihape Napier Road 2	Taruarau River Crossing	21.800	21.800			\$ -	Existing bridge comprises of single lane bridge. Could be upgraded in long term to support two-way traffic flow (long-term).
		Sub Section B	Taihape Napier Road 2	Kurapapanga	35.600	35.600			\$ 600,000.00	Positioned at the boundary between Section 4 and Section 5, denoting the geographic boundary between the Hastings and Napier Districts. Existing bridge requires strengthening to support HPMV loads. Single lane bridge could be upgraded to support two way traffic flow (long-term).
Section 5	Ngaruro River to Waiwhare	Sub Section A	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section B	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section C	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
Section 6	Waiwhare to Fernhill	Sub Section A	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section B	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A
		Sub Section C	Taihape Road	Pukehamoamo	8.800	8.800			\$ 600,000.00	Existing bridge structure identified as not 50Max capable within Waka Kotahi network maps. Strengthen to provide access for HPMV vehicle access to key destinations such as Napier Port.
		Sub Section D	Taihape Road	Kawera	7.300	7.300			\$ 600,000.00	Existing bridge structure identified as not 50Max capable within Waka Kotahi network maps. Strengthen to provide access for HPMV vehicle access to key destinations such as Napier Port.
		Sub Section E	Taihape Road	N/A	N/A	N/A	N/A	N/A	\$ -	N/A

Appendix I: Speed Management Improvements

Taihape-Napier Road CMP

Treatments	Speed Management
TLA	Rangitikei District Council

Estimated cost for speed limit assessment, consultation and implementation:

\$	60,000.00	RDC
\$	60,000.00	HDC

Section	Description	Main Road	Sub Section	Response	Start Road	Start RP	End Road	End RP	Length	Cost	Notes
Section 1-4	Cycle Safety Signage Strategy	Full Corridor	Full Corridor	Safe Speed / Cyclist Awareness	Spooners Hill Road	11.900	Taihape-Napier Road 2	35.600	FC	\$ 20,000.00	Implementation of safety signage for cyclists, encouraging safe speeds and awareness of the route as a NZCT.
Section 1	Taihape to Moawhango	Spooners Hill Road	Sub Section A	Speed Limit Review	Spooners Hill Road	11.900	Te Moehau Road	9.100	2.800	-	Undertake review of suitability of posted speed limits on road corridor - advisory 60km/hr on Spooners Hill Road based on Megamaps indicative assessment. Note: Spooners Hill Road identified as part of the top 10% DSI Network Saving Sections
		Spooners Hill Road	Sub Section B	Speed Limit Review	Spooners Hill Road	9.100	Te Moehau Road	3.340	5.760	-	
		Te Moehau Road	Sub Section C	Speed Limit Review	Te Moehau Road	0.000	Te Moehau Road	3.700	3.700	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 60km/hr on Te Moehau Road based on Megamaps indicative assessment.
		Te Moehau Road	Sub Section D	Speed Limit Review	Te Moehau Road	3.700	Taihape-Napier Road 1	8.470	4.770	-	
Section 2	Moawhango to Springvale Suspension Bridge	Taihape-Napier Road 1	Sub Section A	Moawhango School Rural School Zone	Taihape-Napier Road 1	0.085	Taihape-Napier Road 1	0.240	0.155	\$ 36,000.00	Existing rural school located adjacent to high speed road corridor. Proposed installation of electronic / active school warning signs to support awareness of school location during pick up / drop off periods.
		Taihape-Napier Road 1	Sub Section A	Speed Limit Review	Taihape-Napier Road 1	0.000	Taihape-Napier Road 1	7.210	7.210	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 60km/hr based on Megamaps indicative assessment.
		Taihape-Napier Road 1	Sub Section B	Speed Limit Review	Taihape-Napier Road 1	7.210	Taihape-Napier Road 1	23.200	15.990	-	
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	Taihape-Napier Road 2	Sub Section A	Speed Limit Review	Taihape-Napier Road 2	0.000	Taihape-Napier Road 2	7.765	7.765	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 80km/hr based on Megamaps indicative assessment.
		Taihape-Napier Road 2	Sub Section B	Speed Limit Review	Taihape-Napier Road 2	7.765	Taihape-Napier Road 2	15.735	7.970	-	
Section 4	Ngamatea Rest Stop to Ngaruroro River	Taihape-Napier Road 2	Sub Section A	Speed Limit Review	Taihape-Napier Road 2	15.735	Taihape-Napier Road 2	29.610	13.875	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 60km/hr based on Megamaps indicative assessment.
		Taihape-Napier Road 2	Sub Section B	Speed Limit Review	Taihape-Napier Road 2	29.610	Taihape-Napier Road 2	35.600	5.990	-	

Taihape-Napier Road CMP

Treatments	Speed Management
TLA	Hastings District Council

Estimated cost for speed limit assessment, consultation and implementation:

\$	60,000.00	RDC
\$	60,000.00	HDC

Sections 5-6	Cycle Safety Signage Strategy	Full Corridor	Full Corridor	Safe Speed / Cyclist Awareness	Taihape Road	56.348	Taihape Road	0.000	FC	\$ 20,000.00	Implementation of safety signage for cyclists, encouraging safe speeds and awareness of the route as a NZCT.
Section 5	Ngaruroro River to Waiwhare	Taihape Road	Sub Section A	Speed Limit Review	Taihape Road	56.348	Taihape Road	51.300	5.048	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 80km/hr based on Megamaps indicative assessment.
		Taihape Road	Sub Section B	Speed Limit Review	Taihape Road	51.300	Taihape Road	41.585	9.715	-	
		Taihape Road	Sub Section C	Speed Limit Review	Taihape Road	41.585	Taihape Road	36.785	4.800	-	
Section 6	Waiwhare to Fernhill	Taihape Road	Sub Section A	Speed Limit Review	Taihape Road	36.785	Taihape Road	27.800	8.985	-	Undertake review of suitability of posted speed limits on road corridor - advisory of 80km/hr based on Megamaps indicative assessment.
		Taihape Road	Sub Section B	Speed Limit Review	Taihape Road	27.800	Taihape Road	19.920	7.880	-	
		Taihape Road	Sub Section C	Speed Limit Review	Taihape Road	19.920	Taihape Road	8.770	11.150	-	
		Taihape Road	Sub Section D	Speed Limit Review	Taihape Road	8.770	Taihape Road	1.775	6.995	-	
		Taihape Road	Sub Section E	Speed Limit Review	Taihape Road	1.775	Taihape Road	0.005	1.770	-	

Appendix J: Detailed Implementation Plan

Taihape-Napier Road CMP
 Priority Plan

Section Summary			Sub Section Reference		Start		End		Option Detail				Improvements														Rough Order Costs														
Section	Extent	Sub Section	Road Name (Start)	RP Start	Road Name (End)	RP End	Length	Treatment Type	Description	RP Start	RP End	General Delineation		Intersections						Curves				SM	Bridge	Tourism			Line Item	Sub-Total for Section											
												Edgemarkers	RRPMs	Main Road	Side Road			Seal	Centreline	Sigage - Chevrons	Line Marking	Barrier	Widening	Retaining Wall	Speed Limit Review	50Max Strengthening	Bridge Widening	Advance Signage			Position Signs	Seating / Benches	Information Boards	Parking Area	Rubbish Bins						
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	A	Taihape - Napier Road 1	23.19	Taihape-Napier Rd 2	7.765	7.819	General Delineation	Full Route	23.190	7.765																														
								Road Widening	Per Section	0.000	4.500																														
								Intersections	Kelly Road	4.510	4.510																														
								Curve Improvements	Isolated curve	0.840	0.960																														
									Multiple curves (grouped)	2.990	4.060																														
									Isolated curve	5.450	5.580																														
			Multiple curves (grouped)	6.360	6.750																																				
			Bridge Improvements	Springvale	0.000	0.000																																			
			Tourism Improvements	Springvale Bridge - Tourist Destination	0.000	0.000																																			
				B	Taihape-Napier Rd 2	7.765	Taihape-Napier Rd 2	15.735	7.97	General Delineation	Full Route	7.765	15.735																												
										Road Widening	Per Section	7.765	9.770																												
									Per Section	9.770	15.735																														
								Intersections	Mangaohane Road	9.771	9.771																														
								Curve Improvements	Multiple curves (grouped)	7.560	10.530																														
									Multiple curves (grouped)	11.200	11.780																														
									Multiple curves (grouped)	13.600	14.770																														
									Isolated curve	15.680	15.830																														
								Bridge Improvements	N/A	N/A	N/A																														
								Tourism Improvements	New Scenic Look-out (Section 3B)	15.000	23.000																														
Section 4	Ngamatea Rest Stop to Ngaruroro River	A	Taihape-Napier Rd 2	15.735	Taihape-Napier Rd 2	29.61	13.875	General Delineation	Full Route	15.735	29.610																														
								Road Widening	Per Section	15.735	21.600																														
								Intersections	N/A	-	-																														
								Curve Improvements	Multiple curves (grouped)	16.320	17.730																														
									Multiple curves (grouped)	17.800	19.150																														
									Multiple curves (grouped)	19.220	23.100																														
			Multiple curves (grouped)	23.500	24.760																																				
			Multiple curves (grouped)	25.450	29.370																																				
			Bridge Improvements	Taruarau River Crossing	21.800	21.800																																			
			Tourism Improvements	Scenic Lookout - Rest Area	18.900	18.900																																			
				Taurarau River Crossing	21.400	21.400																																			
				Comet Road	28.900	28.900																																			
		B	Taihape-Napier Rd 2	29.61	Taihape-Napier Rd 2	35.606	5.996	General Delineation	Full Route	29.610	35.606																														
								Road Widening	Per Section	29.610	35.600																														
								Intersections	N/A	N/A	N/A																														
								Curve Improvements	Multiple curves (grouped)	30.770	35.580																														
								Bridge Improvements	Kurapapanga	35.600	35.600																														
								Tourism Improvements	Ngaruroro River Crossing	35.150	35.150																														

Taihape-Napier Road CMP
 Priority Plan

Section Summary								Option Detail										Improvements														Rough Order Costs																					
Section	Extent	Sub Section Reference		Start RP Start	End RP End	Length	Treatment Type	Description	RP Start	RP End	General Delineation				Intersections						Curves			SM		Bridges		Tourism			Line Item	Sub-Total for Section																					
		Sub Section	Road Name (Start)								Road Name (End)	RP Start	Road Name (End)	RP End	Length	Edge Marker Posts	Edgelines	Centreline	RRPMs	Centreline ATP	Seal Widening	Destination Signs	Advance Signs	Street Name	Continuity Marking	Flag Light	Painted Median	Left-Turn Bay	Right-Turn Bay	Seal Throat			Priority Control	Limit Line	Centreline	Traffic Islands	Signage - Chevrons	Signage - Advisory	Centreline RPPMs	Line Marking	Barrier	Widening	Retaining Wall	Speed Limit Review	Active School Signs	50Max Strengthening	Bridge Widening	Advance Signage	Position Signs	Seating / Benches	Information Boards	Parking Area	Rubbish Bins
Section 6	Waiwhare to Fernhill	A	Taihape Road	36.785	Taihape Road	27.800	8.985	General Delineation	Full Route	36.785	27.800																																\$	26,955.00	\$	620,829.00							
								Road Widening	Per Section	32.560	30.600																																							141,120.00			
									Per Section	30.600	29.260																																										128,640.00
									Per Section	29.260	27.980																																										141,120.00
									Per Section	27.980	27.800																																										30,240.00
		Intersections	Willowford Road	36.269	36.269																																						840.00										
			River Road (Kaweka)	34.560	34.560																																						840.00										
			Glenross Road	34.560	34.560																																						-										
			Waikonini Road	32.550	32.550																																						-										
			Koromiko Road	30.587	30.587																																						-										
			Lee Road	29.269	29.269																																						-										
			Otamauri Road	28.000	28.000																																						840.00										
			Curve Improvements	Multiple curves (grouped)	28.470	27.960																																				150,234.00											
			Bridge Improvements	N/A	N/A	N/A																																				-											
			Tourism Improvements	N/A	N/A	N/A																																					-										
		B	Taihape Road	27.800	Taihape Road	19.920	7.880	General Delineation	Full Route	27.800	19.920																																	38,769.60									
								Road Widening	Per Section	27.800	26.850																																				117,600.00						
									Per Section	26.850	24.520																																					105,600.00					
									Per Section	22.750	19.920																																						58,800.00				
									Per Section	26.841	26.841																																						3,726.00				
			Intersections	Kikowhero Road	26.841	26.841																																				-											
				Lechlade Road	24.528	24.528																																				-											
				Crownthorpe Settlement Road	22.757	22.757																																			-												
			Curve Improvements	Multiple curves (grouped)	27.720	25.920																																				183,296.40											
				Multiple curves (grouped)	24.040	23.520																																				51,117.00											
				Multiple curves (grouped)	22.280	22.105																																				60,697.50											
				Multiple curves (grouped)	20.850	20.300																																				124,398.90											
			Bridge Improvements	N/A	N/A	N/A																																			-												
			Tourism Improvements	N/A	N/A	N/A																																				-											
		C	Taihape Road	19.920	Taihape Road	8.770	11.150	General Delineation	Full Route	19.920	8.770																															33,450.00											
								Road Widening	Per Section	19.920	19.670																																				6,000.00						
									Per Section	19.670	12.750																																				552,480.00						
									Per Section	12.750	8.700																																					568,080.00					
									Per Section	19.656	19.656																																					-					
			Intersections	Flag Range Road	19.656	19.656																																				-											
			Curve Improvements	Multiple curves (grouped)	18.765	17.340																																			199,523.70												
				Multiple curves (grouped)	16.755	15.745																																			253,601.70												
				Isolated curve	15.070	14.970																																			48,078.00												
				Isolated curve	14.190	14.120																																			33,654.60												
				Isolated curve	12.625	12.520																																			50,481.90												
			Bridge Improvements	Pukehamoama	8.800	8.800																																			600,000.00												
			Tourism Improvements	N/A	N/A	N/A																																			-												
		D	Taihape Road	8.770	Taihape Road	1.775	6.995	General Delineation	Full Route	8.770	1.775																														20,985.00												
								Road Widening	N/A	-	-																																			-							
								Intersections	Matapiro Road	8.700	8.700																																			8,160.00							
									Shanley Road	7.360	7.360																																				1,500.00						
									Kawera Road	6.438	6.438																																				-						
			Ohiti Road	2.379	2.379																																				-												
			Curve Improvements	Multiple curves (grouped)	7.020	6.445																																		45,705.30													
				Isolated curve	4.895	4.820																																		36,058.50													
			Bridge Improvements	Kawera	7.300	7.300																																		600,000.00													
			Tourism Improvements	N/A	N/A	N/A																																			-												
		E	Taihape Road	1.775	Taihape Road	0.005	1.770	General Delineation	Full Route	1.775	0.005																														-												
								Road Widening	N/A	-	-																																										

Project Prioritisation and Funding Plan by Section

Taihape-Napier Road CMP
 Priority Plan

Section Summary		Sub Section Reference		Start	End	Length	Option Detail		Prioritisation											Funding Year														
Section	Extent	Sub Section	Road Name (Start)	RP Start	Road Name (End)		RP End	Treatment Type	Description	RP Start	RP End	DSIS	ADT	Personal Crash Risk	PCR Rating	Collective Crash Risk	CCR Rating	Maintenance	Priority Level	Likely BCR	Strategic Alignment	NZTA Priority Order	Funding Category	Year 1	Year 2	Year 3	Year 4-10	Year 10+						
Sections 1-4	Full Corridor	All	Spooners Hill Rd	11.9	Taihape-Napier Rd 2	35.606	75.885	Speed Management	Full Route	-	-	-	-	-	-	-	-	-	-	VH	N/A	WC432: Safety promotion, education and advertising	\$ 40,000.00	\$ 20,000.00										
			Spooners Hill Rd	11.9	Taihape-Napier Rd 2	35.606	75.885	Cyclist Warning Signage	Full Route	-	-	-	-	-	-	-	-	-	-	-	H	N/A	WC432: Safety promotion, education and advertising		\$ 20,000.00									
Section 1	Taihape to Moawhango	A	Spooners Hill Rd	11.9	Spooners Hill Rd	9.1	2.8	General Delineation	Full Route	11.900	9.100	1	590	33.2	H	0.071	M	1				< 1	VH	N/A	WC 222: Traffic Services Renewals	\$ 12,936.00								
								Road Widening	Per Section	11.900	9.100											1 to 3	H	N/A	WC 324: Road Improvements	\$ 26,400.00								
								Intersections	Pungatara Road	9.053	9.053											< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements									
								Curve Improvements	Multiple curves (grouped)	11.775	10.990											< 1	H	N/A	WC 324: Road Improvements	\$ 1,593,942.30								
								Speed Management	Multiple curves (grouped)	10.895	9.475											< 1	H	N/A	WC 324: Road Improvements		\$ 1,165,883.70							
								Bridge Improvements	Full Route	11.900	9.100											< 1	H	N/A										
								Tourism Improvements	N/A	N/A	N/A											< 1	H	N/A										
								Tourism Improvements	N/A	N/A	N/A																							
		B	Spooners Hill Rd	9.1	Spooners Hill Rd	3.34	5.76	0	280	0	L	0.000	L	3								< 1	L	N/A	WC 222: Traffic Services Renewals			\$ 61,171.20						
																						Road Widening	Per Section	9.100	5.500	< 1	L	N/A	WC 324: Road Improvements				\$ 518,400.00	
																						Intersections	Per Section	5.500	3.330	< 1	L	N/A	WC 324: Road Improvements				\$ 208,320.00	
																						Intersections	Addis Road	6.431	6.431	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 3,600.00				
																						Intersections	Paengaroa Road	5.433	5.433	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 4,440.00				
																						Intersections	Te Moehau Road	3.339	3.339	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 2,520.00				
																						Curve Improvements	N/A	N/A	N/A									
																						Tourism Improvements	N/A	N/A	N/A									
C	Te Moehau Rd	0	Te Moehau Rd	3.7	3.7	1	344	43.1	H	0.054	LM	1								< 1	H	N/A	WC 222: Traffic Services Renewals			\$ 40,626.00								
																				Road Widening	Per Section	0.000	3.700	< 1	H	N/A	WC 324: Road Improvements				\$ 1,052,688.00			
																				Intersections	N/A	N/A	N/A											
																				Curve Improvements	Isolated curve	0.330	0.530	< 1	H	N/A	WC 324: Road Improvements		\$ 97,956.00					
																				Curve Improvements	Isolated curve	2.924	3.050	< 1	H	N/A	WC 324: Road Improvements		\$ 94,886.28					
																				Bridge Improvements	N/A	N/A	N/A											
																				Tourism Improvements	N/A	N/A	N/A											
																				Tourism Improvements	N/A	N/A	N/A											
Section 2	Moawhango to Springvale Suspension Bridge	A	Taihape-Napier Rd 1	0.31	Taihape-Napier Rd 1	7.21	6.9	0	270	0	L	0.000	L	3							< 1	L	N/A	WC 222: Traffic Services Renewals			\$ 50,922.00							
																					Road Widening	Per Section	0.310	1.620	< 1	L	N/A	WC 324: Road Improvements				\$ 308,880.00		
																					Road Widening	Per Section	1.620	5.150	< 1	L	N/A	WC 324: Road Improvements				\$ 1,014,720.00		
																					Road Widening	Per Section	5.150	7.210	< 1	L	N/A	WC 324: Road Improvements				\$ 360,000.00		
																					Intersections	Wherewhere Road	0.310	0.310	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 3,048.00					
																					Intersections	Burridges Road	1.620	1.620	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 3,600.00					
																					Intersections	Makomiko Road West	5.149	5.149	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -					
																					Curve Improvements	Isolated curve	1.540	1.680	< 1	L	N/A	WC 324: Road Improvements				\$ 69,109.20		
		Curve Improvements	Isolated curve	2.420	2.730	< 1	L	N/A	WC 324: Road Improvements				\$ 149,641.80																					
		Curve Improvements	Isolated curve	3.460	3.580	< 1	L	N/A	WC 324: Road Improvements				\$ 58,293.60																					
		Curve Improvements	Multiple curves (grouped)	4.160	7.020	< 1	L	N/A	WC 324: Road Improvements				\$ 473,541.00																					
		Speed Management	Moawhango School Rural School Zone	0.085	0.240	< 1	N/A	N/A	WC 341: Low cost, low risk roading improvements				\$ 36,000.00																					
		Bridge Improvements	N/A	N/A	N/A																													
		Tourism Improvements	N/A	N/A	N/A																													
		Tourism Improvements	N/A	N/A	N/A																													
		B	Taihape-Napier Rd 1	7.21	Taihape-Napier Rd 1	23.19	15.98	2	200	34.3	H	0.025	L	1								< 1	H	N/A	WC 222: Traffic Services Renewals			\$ 175,460.40						
Road Widening	Per Section																					7.210	23.190	< 1	H	N/A	WC 324: Road Improvements				\$ 2,685,600.00			
Intersections	N/A																					N/A	N/A											
Curve Improvements	Multiple curves (grouped)																					8.100	8.560	< 1	H	N/A	WC 324: Road Improvements				\$ 184,230.60			
Curve Improvements	Multiple curves (grouped)																					9.340	11.850	< 1	H	N/A	WC 324: Road Improvements				\$ 394,808.40			
Curve Improvements	Multiple curves (grouped)																					12.210	14.790	< 1	H	N/A	WC 324: Road Improvements				\$ 400,224.00			
Curve Improvements	Multiple curves (grouped)																					15.390	18.850	< 1	H	N/A	WC 324: Road Improvements				\$ 411,748.80			
Curve Improvements	Multiple curves (grouped)																					19.500	21.940	< 1	H	N/A	WC 324: Road Improvements				\$ 871,099.20			
Curve Improvements	Multiple curves (grouped)	22.040	23.160	< 1	H	N/A	WC 324: Road Improvements				\$ 98,665.20																							
Bridge Improvements	N/A	N/A	N/A																															
Tourism Improvements	N/A	N/A	N/A																															

Taihape-Napier Road CMP
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Section Summary								Option Detail		Prioritisation										Funding Year											
Section	Extent	Sub Section	Road Name (Start)	RP Start	Road Name (End)	RP End	Length	Treatment Type	Description	RP Start	RP End	Dist	ADT	Personal Crash Risk	PCR Rating	Collective Crash Risk	CCR Rating	Maintenance	Priority Level	Lively BCR	Strategic Alignment	NZTA Priority Order	Funding Category	Year 1	Year 2	Year 3	Year 4-10	Year 10+			
Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	A	Taihape - Napier Road 1	23.19	Taihape-Napier Rd 2	7.765	7.819	General Delineation	Full Route	23.190	7.765	1	185	37.9	H	0.026	L	1	<1	H	N/A	WC 222: Traffic Services Renewals							\$ 85,852.62		
								Road Widening	Per Section	0.000	4.500								<1	H	N/A	WC 324: Road Improvements							\$ 859,200.00		
								Road Widening	Per Section	4.500	7.765								<1	H	N/A	WC 324: Road Improvements							\$ 779,040.00		
								Intersections	Kelly Road	4.510	4.510								<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 3,600.00								
								Curve Improvements	Isolated curve	0.840	0.960								<1	H	N/A	WC 324: Road Improvements							\$ 59,493.60		
								Curve Improvements	Multiple curves (grouped)	2.990	4.060								<1	H	N/A	WC 324: Road Improvements							\$ 388,224.00		
								Curve Improvements	Isolated curve	5.450	5.580								<1	H	N/A	WC 324: Road Improvements							\$ 64,301.40		
								Curve Improvements	Multiple curves (grouped)	6.360	6.750								<1	H	N/A	WC 324: Road Improvements							\$ 141,226.20		
	Bridge Improvements	Springvale	0.000	0.000	1 to 3	M	6	WC 324: Road Improvements							\$ 600,000.00																
	Tourism Improvements	Springvale Bridge - Tourist Destination	0.000	0.000	<1	N/A	N/A	WC 321: New Traffic Management Facilities							\$ 9,000.00																
	Section 3	Springvale Suspension Bridge to Ngamatea Rest Stop	B	Taihape-Napier Rd 2	7.765	Taihape-Napier Rd 2	15.735	7.97	General Delineation	Full Route	7.765	15.735	0	173	0	L	0.000	L	3	<1	L	N/A	WC 222: Traffic Services Renewals						\$ 87,510.60		
									Road Widening	Per Section	7.765	9.770								<1	L	N/A	WC 324: Road Improvements							\$ 398,880.00	
									Road Widening	Per Section	9.770	15.735								<1	L	N/A	WC 324: Road Improvements							\$ 810,600.00	
									Intersections	Mangaohane Road	9.771	9.771								<1	L	N/A	WC 341: Low cost, low risk roading improvements							\$ -	
									Curve Improvements	Multiple curves (grouped)	7.560	10.530								<1	L	N/A	WC 324: Road Improvements							\$ 454,325.40	
									Curve Improvements	Multiple curves (grouped)	11.200	11.780								<1	L	N/A	WC 324: Road Improvements							\$ 118,987.20	
Curve Improvements									Multiple curves (grouped)	13.600	14.770	<1								L	N/A	WC 324: Road Improvements							\$ 252,452.40		
Curve Improvements									Isolated curve	15.680	15.830	<1								L	N/A	WC 324: Road Improvements							\$ 73,917.00		
Bridge Improvements	N/A	N/A	N/A	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements							\$ 25,200.00																	
Tourism Improvements	New Scenic Look-out (Section 3B)	15.000	23.000																												
Section 4	Ngamatea Rest Stop to Ngaruroro River	A	Taihape-Napier Rd 2	15.735	Taihape-Napier Rd 2	29.61	13.875	General Delineation	Full Route	15.735	29.610	2	70	113	H	0.029	L	1	<1	H	N/A	WC 222: Traffic Services Renewals						\$ 102,397.50			
								Road Widening	Per Section	15.735	21.600								<1	H	N/A	WC 324: Road Improvements							\$ 558,600.00		
								Road Widening	Per Section	21.600	29.610								<1	H	N/A	WC 324: Road Improvements							\$ 1,523,280.00		
								Intersections	N/A	-	-								<1	H	N/A	WC 341: Low cost, low risk roading improvements							\$ -		
								Curve Improvements	Multiple curves (grouped)	16.320	17.730								<1	H	N/A	WC 324: Road Improvements							\$ 563,817.60		
								Curve Improvements	Multiple curves (grouped)	17.800	19.150								<1	H	N/A	WC 324: Road Improvements							\$ 473,262.60		
								Curve Improvements	Multiple curves (grouped)	19.220	23.100								<1	H	N/A	WC 324: Road Improvements							\$ 957,930.00		
								Curve Improvements	Multiple curves (grouped)	23.500	24.760								<1	H	N/A	WC 324: Road Improvements							\$ 163,238.40		
	Curve Improvements	Multiple curves (grouped)	25.450	29.370	<1	H	N/A	WC 324: Road Improvements							\$ 501,859.80																
	Bridge Improvements	Taurarau River Crossing	21.800	21.800	3+	N/A	N/A	WC 324: Road Improvements							\$ -																
	Tourism Improvements	Scenic Lookout - Rest Area	18.900	18.900	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements							\$ 22,800.00																
	Tourism Improvements	Taurarau River Crossing	21.400	21.400	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements							\$ 21,600.00																
	Tourism Improvements	Comet Road	28.900	28.900	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements							\$ 3,600.00																
	Section 4	Ngamatea Rest Stop to Ngaruroro River	B	Taihape-Napier Rd 2	29.61	Taihape-Napier Rd 2	35.606	5.996	General Delineation	Full Route	29.610	35.606	0	63	0	L	0.000	L	3	<1	L	N/A	WC 222: Traffic Services Renewals						\$ 80,226.48		
									Road Widening	Per Section	29.610	35.600								<1	L	N/A	WC 324: Road Improvements							\$ 889,680.00	
									Intersections	N/A	N/A	N/A																			
Curve Improvements									Multiple curves (grouped)	30.770	35.580	<1								L	N/A	WC 324: Road Improvements							\$ 1,808,043.60		
Bridge Improvements									Kurapapanga	35.600	35.600	1 to 3								M	6	WC 324: Road Improvements							\$ 600,000.00		
Tourism Improvements									Ngaruroro River Crossing	35.150	35.150	<1								N/A	N/A	WC 341: Low cost, low risk roading improvements							\$ 21,600.00		

Taihape-Napier Road CMP
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Section Summary		Sub Section Reference		Start	End	Length	Option Detail			Prioritisation										Funding Category	Funding Year																				
Section	Extent	Sub Section	Road Name (Start)	RP Start	Road Name (End)		RP End	Treatment Type	Description	RP Start	RP End	Dist	ADT	Personal Crash Risk	PCR Rating	Collective Crash Risk	CCR Rating	Maintenance	Priority Level		Lively BCR	Strategic Alignment	NZTA Priority Order	Year 1	Year 2	Year 3	Year 4-10	Year 10+													
Sections 5-6	Full Corridor	All	Taihape Road	56.348	Taihape Road		0.005	47.578	Speed Management	Full Route	-	-	-	-	-	-	-	-	-		-	-	H	N/A	WC432: Safety promotion, education and advertising	\$ 40,000.00	\$ 20,000.00														
			Taihape Road	56.348	Taihape Road	0.005	47.578	Cyclist Warning Signage	Full Route	-	-	-	-	-	-	-	-	-	-	-	H	N/A	WC432: Safety promotion, education and advertising		\$ 20,000.00																
Section 5	Ngaruroro River to Waiwhare	A	Taihape Road	56.348	Taihape Road	51.300	5.048	General Delineation	Full Route	56.348	51.300											<1	L	N/A	WC 222: Traffic Services Renewals					\$ 12,115.20											
								Road Widening	N/A	-	-																														
								Intersections	Robson Lodge Road	45.064	45.064																														
									Kuri Campsite Road	44.186	44.186																														
									Un-named Forestry Road	43.486	43.486																														
									Un-named Forestry Road	43.235	43.235																														
									Un-named Forestry Road	42.606	42.606																														
									Un-named Forestry Road	41.751	41.751																														
									Lumsden Road	41.167	41.167																														
								Kuripapango Road	39.156	39.156																															
		Curve Improvements	Multiple curves (grouped)	56.370	56.010																													\$ 84,841.80							
			Multiple curves (grouped)	55.355	52.385																													\$ 574,565.70							
		Bridge Improvements	N/A	N/A	N/A																																				
		Tourism Improvements	Kuripapango Campsite	55.120	55.120																													\$ 2,400.00							
			Cameron Carpark	54.900	54.900																													\$ 7,200.00							
			Kuripapango Road	52.300	52.300																													\$ 2,400.00							
		B	Taihape Road	51.300	Taihape Road	41.585	9.715	General Delineation	Full Route	51.300	41.585																							\$ 27,979.20							
								Road Widening	N/A	-	-																														
								Intersections	Mavis Road	51.846	51.846																														
									Un-named Forestry Road	51.530	51.530																														
									Un-named Forestry Road	50.821	50.821																														
									Castle Rock Road	50.490	50.490																														
									Un-named Forestry Road	49.658	49.658																														
									Un-named Forestry Road	49.226	49.226																														
									Burns Road	48.760	48.760																														
									Century Road	48.543	48.543																														
Un-named Forestry Road	48.052								48.052																																
Un-named Forestry Road	47.777								47.777																																
Ritch Road	46.990								46.990																																
Un-named Forestry Road	46.568								46.568																																
Un-named Forestry Road	45.064								45.064																																
Lawrence Road	44.186								44.186																																
Un-named Forestry Road	43.486								43.486																																
Un-named Forestry Road	43.235								43.235																																
Lizard Road	42.606								42.606																																
Un-named Forestry Road	41.751								41.751																																
Curve Improvements	Multiple curves (grouped)							51.190	47.950																													\$ 728,273.40			
	Multiple curves (grouped)							47.540	44.810																													\$ 544,454.10			
	Multiple curves (grouped)							44.250	41.920																													\$ 266,825.10			
Bridge Improvements	N/A							N/A	N/A																																
Tourism Improvements	Lawrence Road							44.171	44.171																													\$ 2,400.00			
	Full Route							41.585	36.785																													\$ 11,520.00			
C	Taihape Road	41.585	Taihape Road	36.785	4.800	General Delineation	Full Route	41.585	36.785																																
						Road Widening	N/A	-	-																																
						Intersections	Army Road	41.167	41.167																																
							Waiwhare Road	39.156	39.156																																
						Curve Improvements	Multiple curves (grouped)	41.490	38.200																														\$ 524,716.50		
							Isolated curve	36.745	36.670																														\$ 37,858.50		
						Bridge Improvements	N/A	N/A	N/A																																
Tourism Improvements	N/A	N/A	N/A																																						

Taihape-Napier Road CMP
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Section Summary		Sub Section Reference		Start	End	Length	Option Detail		Prioritisation										Funding Category	Funding Year							
Section	Extent	Sub Section	Road Name (Start)	RP Start	Road Name (End)		RP End	Treatment Type	Description	RP Start	RP End	Dist	ADT	Personal Crash Risk	PCR Rating	Collective Crash Risk	CCR Rating	Maintenance		Priority Level	Lively BCR	Strategic Alignment	NZTA Priority Order	Year 1	Year 2	Year 3	Year 4-10
Section 6	Waiwhare to Fernhill	A	Taihape Road	36.785	Taihape Road	27.800	8.985	General Delineation	Full Route	36.785	27.800	1	250	24.4	H	0.022	L	1	<1	H	N/A	WC 222: Traffic Services Renewals					\$ 26,955.00
								Road Widening	Per Section	32.560	30.600								<1	H	N/A	WC 324: Road Improvements					\$ 141,120.00
								Per Section	30.600	29.260	<1								H	N/A	WC 324: Road Improvements					\$ 128,640.00	
								Per Section	29.260	27.980	<1								H	N/A	WC 324: Road Improvements					\$ 141,120.00	
								Per Section	27.980	27.800	<1								H	N/A	WC 324: Road Improvements					\$ 30,240.00	
								Intersections	Willowford Road	36.269	36.269								<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -				
								River Road (Kaweka)	34.560	34.560	<1								N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 840.00					
								Glenross Road	34.560	34.560	<1								N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 840.00					
								Waikonini Road	32.550	32.550	<1								N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -					
								Koromiko Road	30.587	30.587	<1								N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -					
Lee Road	29.269	29.269	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -																				
Otamauri Road	28.000	28.000	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 840.00																				
Curve Improvements	Multiple curves (grouped)	28.470	27.960	<1	H	N/A	WC 324: Road Improvements						\$ 150,234.00														
Bridge Improvements	N/A	N/A	N/A																								
Tourism Improvements	N/A	N/A	N/A																								
B	Taihape Road	27.800	Taihape Road	19.920	7.880	1	500	13.9	H	0.025	L	1	<1	H	N/A	WC 222: Traffic Services Renewals										\$ 38,769.60	
													Road Widening	Per Section	27.800	26.850	<1	H	N/A	WC 324: Road Improvements					\$ 117,600.00		
													Per Section	26.850	24.520	<1	H	N/A	WC 324: Road Improvements					\$ 105,600.00			
													Per Section	22.750	19.920	<1	H	N/A	WC 324: Road Improvements					\$ 58,800.00			
													Intersections	Kikowhero Road	26.841	26.841	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 3,726.00						
													Lechlade Road	24.528	24.528	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -							
													Crownthorpe Settlement Road	22.757	22.757	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -							
													Curve Improvements	Multiple curves (grouped)	27.720	25.920	<1	H	N/A	WC 324: Road Improvements					\$ 183,296.40		
													Multiple curves (grouped)	24.040	23.520	<1	H	N/A	WC 324: Road Improvements					\$ 51,117.00			
													Multiple curves (grouped)	22.280	22.105	<1	H	N/A	WC 324: Road Improvements					\$ 60,697.50			
Multiple curves (grouped)	20.850	20.300	<1	H	N/A	WC 324: Road Improvements					\$ 124,398.90																
Bridge Improvements	N/A	N/A	N/A																								
Tourism Improvements	N/A	N/A	N/A																								
C	Taihape Road	19.920	Taihape Road	8.770	11.150	0	900	0	L	0.000	L	1	<1	L	N/A	WC 222: Traffic Services Renewals										\$ 33,450.00	
													Road Widening	Per Section	19.920	19.670	<1	L	N/A	WC 324: Road Improvements					\$ 6,000.00		
													Per Section	19.670	12.750	<1	L	N/A	WC 324: Road Improvements					\$ 552,480.00			
													Per Section	12.750	8.700	<1	L	N/A	WC 324: Road Improvements					\$ 568,080.00			
													Intersections	Flag Range Road	19.656	19.656	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -						
													Curve Improvements	Multiple curves (grouped)	18.765	17.340	<1	L	N/A	WC 324: Road Improvements					\$ 199,523.70		
													Multiple curves (grouped)	16.755	15.745	<1	L	N/A	WC 324: Road Improvements					\$ 253,601.70			
													Isolated curve	15.070	14.970	<1	L	N/A	WC 324: Road Improvements					\$ 48,078.00			
													Isolated curve	14.190	14.120	<1	L	N/A	WC 324: Road Improvements					\$ 33,654.60			
													Isolated curve	12.625	12.520	<1	L	N/A	WC 324: Road Improvements					\$ 50,481.90			
Bridge Improvements	Pukehomoamo	8.800	8.800	1 to 3	M	6	WC 324: Road Improvements					\$ 600,000.00															
Tourism Improvements	N/A	N/A	N/A																								
D	Taihape Road	8.770	Taihape Road	1.775	6.995	7	2000	27.4	H	0.200	H	1	<1	H	N/A	WC 222: Traffic Services Renewals			\$ 20,985.00								
													Road Widening	N/A	-	-											
													Intersections	Matapiro Road	8.700	8.700	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 8,160.00						
													Shanley Road	7.360	7.360	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 1,500.00							
													Kawera Road	6.438	6.438	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -							
													Ohiti Road	2.379	2.379	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ -							
													Curve Improvements	Multiple curves (grouped)	7.020	6.445	<1	H	N/A	WC 324: Road Improvements					\$ 45,705.30		
													Isolated curve	4.895	4.820	<1	H	N/A	WC 324: Road Improvements					\$ 36,058.50			
													Bridge Improvements	Kawera	7.300	7.300	1 to 3	M	6	WC 324: Road Improvements					\$ 600,000.00		
													Tourism Improvements	N/A	N/A	N/A											
E	Taihape Road	1.775	Taihape Road	0.005	1.770	1	2500	12.4	H	0.113	MH	1	<1	H	N/A	WC 222: Traffic Services Renewals											
													Road Widening	N/A	-	-											
													Intersections	Swamp Road	0.028	0.028	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 900.00						
													SH50 turn-off	0.028	0.028	<1	N/A	N/A	WC 341: Low cost, low risk roading improvements	\$ 540.00							
													Curve Improvements	N/A	N/A	N/A											
													Bridge Improvements	N/A	N/A	N/A											
Tourism Improvements	N/A	N/A	N/A																								

Appendix K: Indicative Cost Rates

Taihape-Napier Road CMP

Unit Rates

Item	Description	Unit Rate	Cost (\$)	Contingency (+20%)	Commentary / Assumptions	Likely BCR Range	BCR Commentary
Delineation	Edgemarker Posts	Linear Meter	\$ 1.00	\$ 1.20	1 each side every 50m. Exc. Higher density on curves	<1	
	Egelines	Linear Meter	\$ 3.00	\$ 3.60	100mm wide reflectorised white	<1	
	Centreline	Linear Meter	\$ 2.00	\$ 2.40	3m line, 7m gap	<1	
	RRPM	Linear Meter	\$ 0.65	\$ 0.78	1 every 20m @ \$13ea, centreline only	<1	
	Centreline ATP	Linear Meter	\$ 4.00	\$ 4.80		<1	
Seal Widening	Seal Widening	M2	\$ 200.00	\$ 240.00	Assumes 1m width of new pavement construction @ a rough order rate of \$200m2, includes P&Gs, traffic management etc	<1	Extensive works to widen seal along the full length of the corridor unlikely to achieve a positive BCR.
Intersection Improvements - Main Road	Destination Signs	Per Unit	\$ 700.00	\$ 840.00		N/A	Assumed minor intersection works could be undertaken as part of general maintenance works.
	Advance Signs	Per Unit	\$ 700.00	\$ 840.00	Assumes intersection advance warning + supplementary plate	N/A	
	Street Name	Per Unit	\$ 500.00	\$ 600.00	If pole already present rate could be cheaper	N/A	
	Continuity Marking	Linear Meter	\$ 7.00	\$ 8.40		N/A	
	Flag Light	Per Unit	\$ 30,000.00	\$ 36,000.00	Very high as power source is uncertain. If a nearby source is available rate could be closer to \$10-15k	N/A	
	Painted Median	M2	\$ 15.00	\$ 18.00	Gone with m2 rate as it depends on the width, otherwise should be Linear Meter	N/A	
	Left-Turn Bay	Per Unit	\$ 30,000.00	\$ 36,000.00	Assume 150m2 of new pavement construction @ a rough order rate of \$200m2, includes P&Gs, traffic management etc	<1	
Right-Turn Bay	Per Unit	\$ 60,000.00	\$ 72,000.00	Assume 300m2 of new pavement construction @ a rough order rate of \$200m2, includes P&Gs, traffic management etc	<1		
Intersection Improvements - Side Road	Seal Throat	Per Unit	\$ 3,000.00	\$ 3,600.00	Assumes sealing back 10m by 6m width. Allows for 100mm basecourse top up and compaction prior to sealing	N/A	Assumed minor intersection works could be undertaken as part of general maintenance works.
	Priority Controls	Per Unit	\$ 1,000.00	\$ 1,200.00	Give way sign + painted triangle excludes limit line	N/A	
	Limit Line	Per Unit	\$ 250.00	\$ 300.00	assumes there will be multiple sites that can be painted in one run/ day	N/A	
	Centreline	Linear Meter	\$ 2.00	\$ 2.40	3m line, 7m gap	N/A	
	Traffic Islands	Per Unit	\$ 5,000.00	\$ 6,000.00	Location makes establishment costly	N/A	
Curve Enhancements	Signage - Chevrons	Per Unit	\$ 1,500.00	\$ 1,800.00	Assumes 3 chevrons per curve	<1	
	Signage - Advisory	Per Unit	\$ 500.00	\$ 600.00		<1	
	Centreline RRPMs	Linear Meter	\$ 0.65	\$ 0.78	1 every 20m @ \$13ea,	<1	
	Line Marking	Linear Meter	\$ 3.00	\$ 3.60	Assumes 1 edgeline	<1	
	Barrier	Linear Meter	\$ 215.00	\$ 258.00	Assumes steel post and rail @ 100m + 2x terminal ends	<1	
	Widening	M2	\$ 200.00	\$ 240.00	Assumes 1m width of new pavement construction @ a rough order rate of \$200m2, includes P&Gs, traffic management etc	<1	
	Retaining Walls	Linear Meter	\$ 1,250.00	\$ 1,500.00		<1	
Speed Limit	Speed Limit Review	Per Unit	\$ 50,000.00	\$ 60,000.00	40k for investigation and consultation, 10k for new signage	N/A	
	Active School Signs	Per Unit	\$ 30,000.00	\$ 36,000.00		N/A	
Bridge Enhancements	50Max Strengthening	Per Unit	\$ 500,000.00	\$ 600,000.00	Nominal sum based on average bridge 50max upgrade costs from Tairawhiti ITPP. Will be dependant on length and structure type	1 to 3	BCR based on experience in other bridge strengthening schemes on low traffic volume roads in Gisborne.
	Bridge Widening	Per Unit	\$ -	\$ -	Widening of existing bridges in the short to medium term is not expected to be economically viable due to expected high costs and low traffic volumes/ benefits. No cost allowed for replacing existing bridges as this won't occur until they reach end of design life. This is not expected to occur within the next 30 years	3+	BCR based on assumption that bridge is replaced at the end of its design life.
Tourism Enhancements	Advance Signage	Per Unit	\$ 1,000.00	\$ 1,200.00		<1	
	Position Signs	Per Unit	\$ 1,000.00	\$ 1,200.00		<1	
	Seating / Benches	Per Unit	\$ 2,000.00	\$ 2,400.00		N/A	Tourism enhancements largely amenity based improvements. Some wider economic benefits (not accounted for) could be derived from making the project more attractive to tourists/visitors.
	Information Boards	Per Unit	\$ 3,500.00	\$ 4,200.00		N/A	
	Parking Area	M2	\$ 150.00	\$ 180.00	Assumed shallower pavement than road widening	N/A	
	Rubbish Bins	Per Unit	\$ 500.00	\$ 600.00		N/A	

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