

*State Highway 43
Investigation
Taranaki Regional Council*





State Highway 43 Investigation

Taranaki Regional Council

Quality Assurance Information

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Executive Summary

The project is a high-level research and stakeholder engagement process to enable commencement of a NZ Transport Agency (NZTA) business case preparation exercise. It aims to assess the economic and tourism importance of State Highway 43 (SH43) and the consequences of its current state of maintenance and resilience, along with the strategic importance of the highway as the secondary lifeline in the event of State Highway 3 north of New Plymouth being closed. The stakeholders contacted as part of this project are listed in the Appendix.

SH43 Description

SH43 connects Stratford with Taumarunui over a distance of approximately 149km. The road is relatively narrow with many sharp turns and changes in grade as it passes over a number of saddles and through the Tangarakau Gorge. 12km of the route through the Tangarakau Gorge is unsealed. SH43 is referred to as the Forgotten World Highway, a name which harks to the existence of abandoned settlements along its length and its relative isolation. It provides access to several walking tracks and other attractions including the village of Whangamomona.

Traffic Demands and ONRC Classification

Traffic volumes increase towards the Stratford and Taumarunui ends of the route and are lowest in the central section. The average traffic volume over the eight counting stations on the route was 450 vehicles/day (with 20% HCVs) in 2015. Between 2012 and 2015 the total number of vehicles counted at the eight counting stations increased by 12.8%.

The NZTA's One Network Road Classification (ONRC) classifies SH43 as a Secondary Collector. While the ONRC classification is strongly influenced by traffic volumes and truck (HCV) volumes, it does allow other criteria to be used to move up a category from Secondary Collector to Primary Collector. The importance of SH43 to regional tourism is one such factor.

SH43 as a Detour Route

Although SH43 can and does act as part of an alternative route between New Plymouth and Te Kuiti in the event of closure of SH3 between SH3A and Ahititi, the NZTA does not consider the SH43 to be a nominated detour route due to its alignment, physical characteristics and isolation. As this situation is unlikely to change, the potential role of SH43 as a nominated detour route in the event of a major closure of SH3 cannot realistically be used to support its improvement or upgraded maintenance.

Resilience

Farms, radiata pine forest harvesting, honey producers and tourist operators rely on SH43 for access. While preventing road closures due to storm events is not realistically feasible, a greater focus on improving the resilience of those sections of SH43 which are of most significance to the local economy would be appropriate.

SH43 as Part of a Cycle Touring Route

Between west of Whangamomona and Taumarunui, SH43 is part of the cycle touring route from New Plymouth to Taumarunui. The National Cycling Team Senior Project Manager did not identify any specific issues relating to SH43. Its relatively low traffic speeds, low traffic volume, interesting features, attractions such as Whangamomona and peaceful environment make it an attractive route for experienced cyclists.

Road Maintenance Issues and Expenditure

The standard of maintenance of SH43 and the speed at which repairs are undertaken and slips are cleared has been raised as a significant issue by Venture Taranaki, the AA, and local companies involved in tourism on the highway. Data provided by the NZTA has identified that major slips have occurred over the last two years particularly in the Tangarakau Gorge and can take several days to clear completely. The NZTA's average annual maintenance expenditure was \$1,206,000 between 2010/2011 and 2012/2013, but reduced to \$505,000 between 2013/2014 and 2015/2016. This reduction presumably reflects the NZTA's change in maintenance funding allocation in line with the ONRC.

Traffic Demand Influences and Projections

The combination of increasing international tourism, Tourism New Zealand's aim to encourage more international tourists into areas such as Taranaki, the regional and local focus on increasing visitor numbers, and the associated further promotion of The Forgotten World Highway, can be expected to significantly increase the number of visitors who would consider using SH43. The recently announced Government funding of the Taranaki Crossing one-day walk over the next 2-3 years will add to the attractiveness of the area for visitors. SH43 is a direct link between the very popular Tongariro Crossing and the Taranaki Crossing.

Economic Value of SH43

In addition to its current and potential future value as a tourist route, SH43 has an important and increasing freight movement function. It provides access to several beef, lamb and dairy farms. Manuka honey production is increasing and can also be expected to generate additional traffic volumes.

Freight use of SH43 between Junction Road and Stratford is expected to increase significantly as the radiata pine forests planted in the 1990s are harvested. The main harvest period is expected to commence within the next 2-3 years and last for approximately 10 years. The large majority of logging trucks are expected to use SH43 west of the intersection with Junction Road, which is 42km from Stratford. This report estimates the potential increase in logging trucks as 14 trucks/day/direction from south of Junction Road increasing to 39 trucks/day/direction east of Beaconsfield Road.

At an average of 29 trucks per day with an estimated average value of \$4,000 per load, the estimated log freight value of trucks using SH43 south of Junction Road is \$29 million/year over the 10-year period 2021 to 2030. It is essential that the future maintenance of SH43 between Junction Road and Stratford support the anticipated increase in logging traffic due to its potential value to the economy.

Crash Reduction Benefits and Actions

The estimated Present Value of potential crash cost savings along SH43 is just over \$7 million. These savings result primarily from measures to reduce the number and severity of out of control crashes. They include relatively low cost measures such as the introduction of signage warning of sharp curves ahead (particularly a sharp curve at the end of a long straight). The introduction of a speed restriction such as 80km/h for the whole of SH43 should be investigated.

Benefits and Costs of sealing the remaining 12km unsealed section through the Tangarakau Gorge

Central, regional and local government are seeking to increase tourism in Taranaki. The Forgotten World Highway is one of the major attractions. Sealing the final 12km section through the Tangarakau Gorge is essential if the route is to achieve its potential. It is a key component of regional strategies aimed at increasing tourism in Taranaki. Venture Taranaki, Forgotten World Adventures - a major tourist operator using SH43, the Stratford Business Association, Stratford District Council, Ruapehu District Council, and the Taranaki Regional Council all seek the sealing of the remaining unsealed section to remove what they see as a significant impediment to growth in tourism in the region.

Sealing would remove a significant deterrent to international tourists driving on SH43 by eliminating the impediment a lack of rental vehicle insurance cover on unsealed roads creates. Negative social media feedback on SH43/The Forgotten World Highway due to the unsealed section can also discourage visitors from driving the route.

International visitors are typically unfamiliar with driving on unsealed roads, increasing the risk of loss-of-control crashes in an isolated area which does not have cell-phone coverage. The AA regards the unsealed section of the Tangarakau Gorge as being much more dangerous for drivers than the sealed section.

Sealing the unsealed section of SH43 would complete a 215km direct sealed link between SH1 at Turangi and SH3 at Stratford.

Anecdotal evidence is that the periodic re-metalling of the unsealed section initially results in flat tyres due presumably to use of an aggregate with sharp edges. This can be very distressing for visitors as it occurs in an isolated area with low traffic volumes. Social media reports on the resulting experience are likely to further discourage use by tourists.

Recent major investments in visitor offerings within the region (totalling around \$100 million) include Pukeiti international garden, Len Lye Centre, New Plymouth Coastal Walkway and the Novotel New Plymouth Hobson hotel.

The recent Government decision to fund the upgrading over the next 2-3 years and the improved maintenance of the Taranaki Crossing (formerly Pouakai Crossing) will encourage visitors to use both the very popular Tongariro Crossing day walk and the Taranaki Crossing day walk. SH43 links these two walks and itself provides access to interesting locations and activities along its length. The potential will not, however, be realised without completing the sealing of the route.

The estimated cost of sealing the unsealed section of SH43 is \$7.59 million (Abley estimate) to \$8.01 million (NZTA estimate). This includes additional improvement works to ensure the road is safe once sealed. The estimated Benefit/Cost Ratio (BCR) of sealing the unsealed section of SH43 is 0.64. This figure does not, however, take into account the increase in visitor traffic using SH43 likely to result.

Recommendations

It is recommended that:

- 1) The NZ Transport Agency be asked to upgrade the ONRC classification of SH43 from Secondary Collector to Primary Collector using this report and other sources to provide the rationale for the upgrading.
- 2) The NZ Transport Agency be asked to provide additional funding for the maintenance of SH43 in light of its increasing importance both as a key tourist route, and as a freight route supporting farming, manuka honey production and the logging of the radiata pine forests planted in the 1990s.
- 3) The NZTA investigate and implement measures for reducing the crash risk on SH43 including improved signage, road markings and a general speed restriction for the route.
- 4) The Taranaki Regional Council and District Councils supported by the NZTA approach the Government with a request for funding the estimated \$8.01 million cost of sealing the remaining 12km unsealed section of SH43 as a contribution towards increasing the attraction of the region as a destination for tourists, and to maximise the potential benefits of the upgrading of the Taranaki Crossing day walk and other substantial investments in visitor offerings. As the tourism benefits would not be achieved until the sealing is completed, the sealing should be undertaken over a single construction season.

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1. Introduction

1.1 Project objectives

The project is a high-level research and stakeholder engagement process to enable commencement of a NZ Transport Agency (NZTA) business case preparation exercise. It aims to assess the economic and tourism importance of State Highway 43 (SH43), the consequences of its current state of maintenance and resilience, along with the strategic importance of the highway as the secondary lifeline in the event of State Highway 3 north of New Plymouth being closed.

The project objectives include the following:

- 1) Tell the story of the importance of SH43 to the Taranaki region and other stakeholders.
- 2) Assess the resilience of the highway, particularly as a secondary lifeline for the Taranaki region (generally when SH3 is unavailable)
- 3) Identify likely economic benefits (including tourism and forestry harvesting) of improving the condition and resilience of the highway.
- 4) Assess how the current state of the road compares to the levels of service required under the One Network Roding Classification (ONRC).
- 5) Undertake a cost benefit analysis for completing the sealing of the highway.

1.2 Project scope

The Project scope includes:

- a review of available information relating to SH43, including that held by the Stratford District Council (SDC) and the NZTA
- obtain views of adjoining territorial and regional authorities, and other stakeholders
- identify tourism opportunities and economic benefits from improving the condition of the highway
- assessing the sealing cost for the 12km metalled section
- assessing resilience of the highway particularly as the secondary lifeline for the Taranaki region, and
- assess SH43 against the ONRC criteria.

The project feeds into but does not constitute the beginning of a Business Case Approach. That would be initiated and undertaken by the NZTA.

The project is to be completed by 31 July 2017.

2. State Highway 43 Description

State Highway 43 (SH43) connects Stratford with Taumarunui over a distance of approximately 149km. The road is relatively narrow with many sharp turns and changes in grade as it passes over a number of saddles and through the Tangarakau Gorge. 12km of the route through the Tangarakau Gorge is unsealed. SH43 is referred to as the Forgotten World Highway, a name which harks to the existence of abandoned settlements along its length and its relative isolation.

Figure 2.1 SH43 Location



Visitor internet reviews typically refer both to the views and quality of the scenery plus the attractions along SH43 including the Whangamomona Hotel, Mt Damper Falls, walks, lookout points and historic places. SH43 passes through what a local tourist operator describes as a “stunning and remote part of the country”, and offers a “beautiful drive through country that many people don’t get to see, e.g. the Tangarakau Gorge”.

SH43 provides access to the Forgotten World including several walking tracks and other attractions including the village of Whangamomona. The Whangamomona Republic Day held every second January attracts thousands of visitors.

Many visitors and regular users of SH43 however, also mention the poor condition of parts of the route with slips, washouts, rockfalls etc. to be contended with. The Forgotten World Highway brochure points out that 12km of the highway is unsealed, and there are no petrol stations along its length.

Generally, SH43 is seen as a road that should be taken only by drivers experienced in driving on gravel roads.

Figure 2.2 SH43 -
The Forgotten
World Highway



Figure 2.3
*Unsealed Section
of SH43 through
the Tangarakau
Gorge*



2.1 Traffic volumes

Table 2.1 SH43 Traffic Volumes 2011 to 2015 gives the traffic volumes on SH43 between 2011 and 2015. The data was extracted from the NZTA publication, State Highway Traffic Volumes 1975 to 2015, dated 2015.

Table 2.1 SH43 Traffic Volumes 2011 to 2015

Location	Year					%HCV
	2011	2012	2013	2014	2015	
East of Stratford	1295	1255	1303	1279	1349	24%
Toko	624	685	671	652	664	18%
Te Wera	160	179	207	189	194	26%
Whangamomona	137	130	163	156	168	14%
Sth River Road	121	130	141	132	160	18%
Tokirima	164	148	173	176	205	16%
Te Maire	274	251	288	295	352	19%
Mania Road	417	413	447	467	507	16%
Total	3192	3191	3393	3346	3599	

As may be expected the traffic volumes increase towards the Stratford and Taumarunui ends of the route and are their lowest over the central section.

The average traffic volume over the eight counting stations was 450 vehicles/day in 2015. The average number of HCVs was 91 (20%).

Between 2012 and 2015 the total number of vehicles counted at the eight counting stations on SH43 increased by 12.8%.

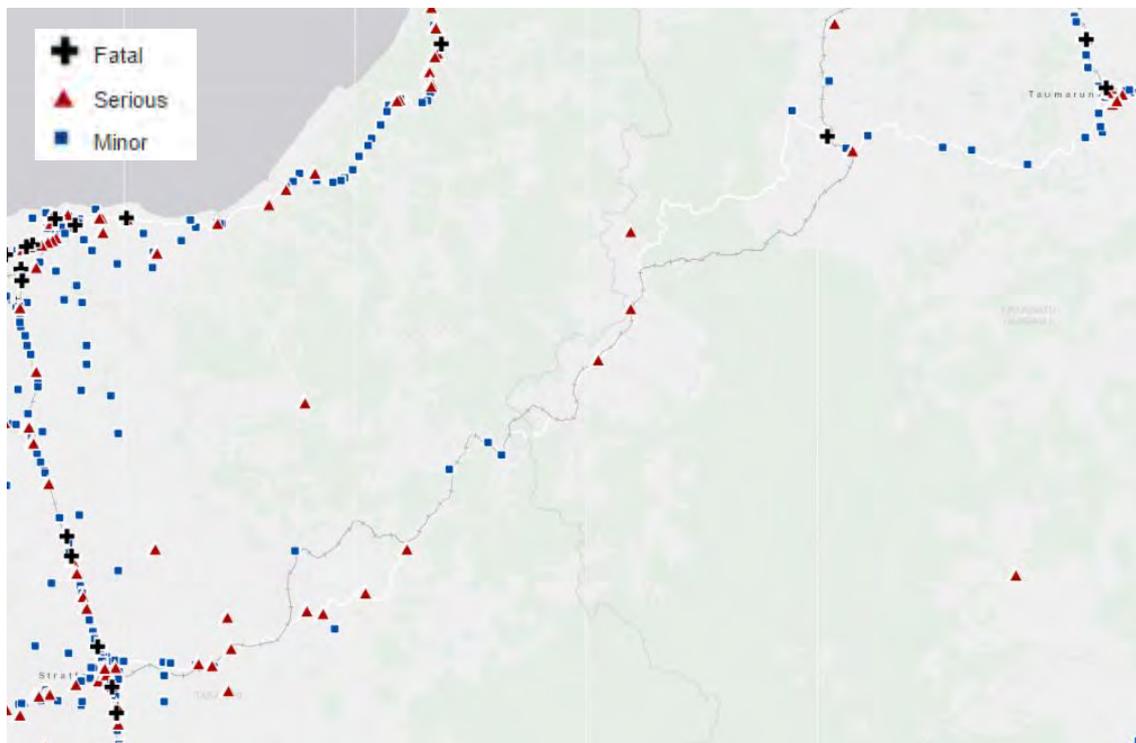
2.2 Road Safety

Over the 10 years to 2012 there were 29 serious or fatal crashes on SH43 resulting in 7 deaths and 28 serious injuries. The main type of crash was loss of control, with the top three causes relating to poor handling, driving too fast and road factors. Crashes were spread out over SH43 with no clustering evident. Motorcycles were 43% of the vehicles involved. Crashes peaked on weekend afternoons during the summer, a time when visitor numbers are likely to be at their highest.

Based on the March 2016 figures prepared by the Ministry of Transport, the average social cost of a fatality is \$4,095,000 and the average social cost of a serious injury is \$760,000. It follows that the total social cost of the fatalities and serious injuries over the 10 years to 2012 was \$49,945,000 (\$2016) or \$5 million a year. This figure does not include (reported) minor injuries or damage only crashes.

The KiwiRap Taranaki Regional Results 2012 give SH43 a low collective risk rating (average annual fatal and serious crashes per km) and a high personal risk rating (average annual fatal and serious crashes per 100 million vehicle-km) for the period 2007-2011.

Figure 2.4 Injury Crashes 2011-2015 (Speed Management Framework)



2.3 Towns and villages linked by SH43

Stratford

Stratford is a rural service town, serving the agricultural economy of its wider hinterland. It has a population of 5,650. The district is predominantly dairying, while the rolling to steep eastern hill country supports dry stock farming and forestry. The tourism industry is of growing significance to the Stratford District.

Stratford is centrally located for Fonterra factories and Anzo and Silver Fern Farm meat works in nearby Eltham and Hawera. The oil and gas industry is also a major employer.

Visitor attractions includes Mount Taranaki; the Forgotten World Highway; cycling, walking or horse riding; self-drive carts along the old railway line with Forgotten World Adventures; Fernbrooke Farm Amusement Park; and the Pioneer Village.

In July 2014 Stratford District Council entered into a partnership with the New Plymouth District Council and South Taranaki District Council to contract its regional tourism service to Venture Taranaki. Venture Taranaki has developed a Regional Visitor Strategy 2010-2019 and a Regional Economic Development Strategy 2010-2035.

Stratford's Economic Development Strategy 2012-2015, Strategy 4 – Tourism and Events includes “Develop linkages between Stratford/Mt Taranaki and Forgotten World Highway as key access points” and “Promote Stratford as gateway through Forgotten World Highway”. Marketing Stratford outside the region is through Venture Taranaki.

Taumarunui

Taumarunui has a population of approximately 4,500 (2013 census). The economy is traditionally based on forestry and farming, but Taumarunui is becoming increasingly important as a tourism centre.

The Growing Ruapehu Economic Development Strategy 2015-2025 includes as one of its six key themes “Council needs to encourage and work proactively with the tourism industry”. The Council is seeking to increase the number of visitors to the district and to improve growth in the value/income of the visitor industry sector. It seeks to capitalise on the success of the new cycle and walking trails and develop new cycling and walking opportunities.

Visit Ruapehu is the region’s Regional Tourism Organisation whose responsibility is to market the destination of Ruapehu as New Zealand’s first choice, outdoor destination. It is mostly funded by the Ruapehu District Council (RDC), but is governed by an independent Board of Trustees. It is located in Ohakune. Visit Ruapehu in conjunction with the RDC has recently undertaken research into why people come to Ruapehu and why they do not. The key outcome was that better information on the area and what it has to offer tourists is required. In response, they are upgrading the information available on-line through “i-SITE” visitor facilities.

Whangamomona

Whangamomona is 65 km from Stratford along SH43 and has a population of around 40 people. The Whangamomona Hotel is the main visitor attraction. Every second January the village holds its successful Republic Day, attracting several thousand visitors.

2.4 Venture Taranaki Regional Visitor Strategy 2010-2019

The Regional Visitor Strategy’s strategic aim is to build and leverage Taranaki’s visitor economy as a significant contributor to regional growth. Connected Taranaki is one of the strategic themes and its goal is to connect Taranaki locally and nationally by strengthening and improving the infrastructure necessary for the visitor industry to grow and thrive.

The strategy states that “*The Forgotten World Highway has over the years become more popular with visitors seeking a scenic heritage journey, with the production of collateral, and increased media coverage and general awareness. The challenge for the Forgotten World Highway is to grow its visitor infrastructure to add value to those travelling along it, and gain return investment from the visitor traffic.*”

The Developed Taranaki chapter includes the following section on the Forgotten World Highway:

“Established in 1990 the Stratford to Taumarunui Heritage Trail promotes the rich history along the route linking Taranaki and the Central North Island. Branded the ‘Forgotten World Highway’ it threads through 155km of pristine scenic sub-tropical rain forests.

In 2006 Venture Taranaki took over the management of the Forgotten World Highway brochure to attract more visitors to explore the route and to travel to Taranaki from the central plateau. Since 2006 the focus of the brochure has moved from the route’s businesses to its history and activities, complemented by places to stay, eat and refresh.”

In 2008, the Ruapehu District committed to part funding the brochure and providing information on the Taumarunui end of the highway, and distribution was increased around key access points in the region. In 2009, the brochure was replicated on a regional website, giving the ability to search by criteria.

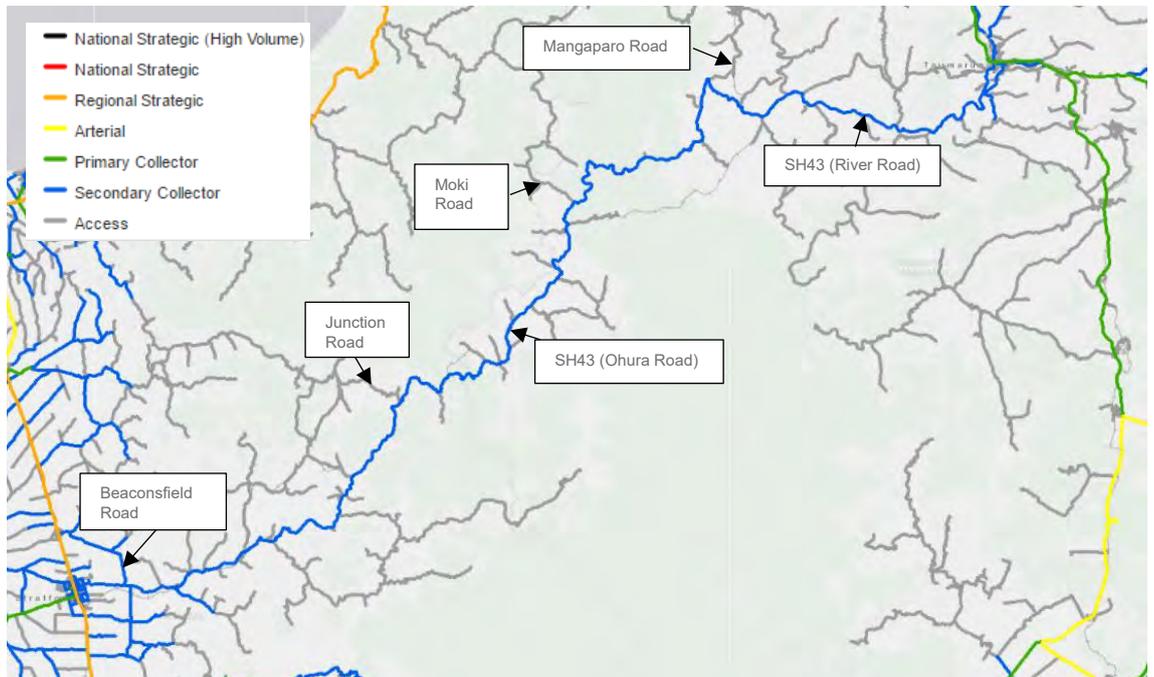
3. One Network Road Classification

The One Network Road Classification (ONRC) facilitates what is described as a customer-focused, business case approach to budget bids for the National Land Transport programme. Using the ONRC, local authorities and the NZTA can compare the state of roads across the country, and direct investment where it is needed most.

3.1 SH43 ONRC Road Category

The 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. SH43 is classed as a Secondary Collector in the ONRC. It is the only state highway in the North Island with this classification.

Figure 3.1 ONRC (Speed Management Framework)



The level of investment in maintaining SH43 is a factor of its classification as a Secondary Collector and the volume and type of traffic using the road. Re-classifying SH43 as a Primary Collector would enable an increase in expenditure on maintaining the route.

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

Primary and Secondary Collectors must meet at least one of the movement criteria (AADT or HCV). 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.

The ONRC criteria in **Table 3.1** apply to rural Collector and Access roads (airport passenger numbers are excluded).

Table 3.1 ONRC Criteria for Collector and Access Roads

Category	Movements		Active Modes	Link and Place		
	AADT (vehs/day)	HCV (daily)		Linking Places	Freight – Inland Port(s)	Tourism
Primary Collector	>1,000	>150	Part of an identified cycling or walking network	>2,000 population	<1 million tonnes per annum	Regionally or locally significant tourist destinations or significant scenic routes
Secondary Collector	>200	>25		>250 population		
Access	<200	<25		<250 population		

The ONRC road categories are strongly influenced by traffic demands. At an average daily traffic volume of 450vpd and 91 HCVs for the 8 counting station along its length, SH43 does 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. It does, however, link places with populations of over 2,000 people.

A 65% increase in HCV traffic would achieve one of the movement criteria for a Primary Collector, and a 120% 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”*.

This report sets out regional and national factors which could potentially justify an increase in the ONRC classification of SH43 from Secondary Collector to Primary Collector.

3.2 ONRC Level of Service Assessment

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 are:

- 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 performance measures are a key tool for RCAs (Road Controlling Authorities) when building their business cases for national funding. RCAs don’t have to use every performance measure for every road, as long as they demonstrate they are addressing all Customer Levels of Service.”

The ONRC and its performance measures will enable the NZRC to benchmark the performance of each RCA’s network. 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. However, to provide some context as to probable fit within the identified road classification of Secondary Collector, the following sets out a subjective assessment based on stakeholder feedback and data reviewed as a part of this project.

Safety

The ONRC Safety measures include the number of fatal and serious injuries each year, collective risk and personal risk. They also include the number of fatal and serious crashes attributable to driver loss of control, and the number occurring at night. The number of hazardous faults which require evasive action by motorists (including ponding water and pot holes) is also measured.

For SH43, the Personal Risk is high. However, the Collective Risk is low due to the low traffic volume using the road.

The high Personal Risk rating is strongly influenced by the nature of the terrain which results in several changes in gradient, sharp curves with poor sight distance, and steep terrain along the edge of parts of the route. The isolation of much of SH43 and lack of cell phone coverage in places can increase the consequences of a serious crash by delaying rescue. In addition, slips can create unexpected obstacles in the road and reduce the available carriageway widths.

Upgrading the road sufficiently to remove these risks is not economically realistic. Road safety can, however, be improved through signage warning of changes in alignment such as a low safe speed bends at the end of straight sections of road and advising of lower speed sections of road.

Anecdotal evidence is that hazardous faults such as detritus and potholes can take some time to remove/repair. These faults can require drivers to take evasive action adding to safety risks. It is stated that the unsealed section can be slippery in the wet. Punctures caused by newly laid aggregate in the unsealed section are another hazard that should be addressed.

Overall, while there is some evidence that sight distances and signing should be improved, there is insufficient evidence to conclude that the overall level of safety is inappropriate for a low volume Secondary Collector.

Safety issues are discussed further in Section 9 of this report.

Resilience

Resilience is measured by the number of unplanned road closures and the total number of vehicles affected by closures annually. It is also measured by the number of unplanned road closures and the number of vehicles affected by closures where there was no viable detour.

The NZTA data in **Table 6.3** identifies recorded road closures from 2015. Six instances of road closures occurred during 2016, most of which were due to slips. One slip took 4 days to clear.

The Tangarakau Gorge seems to be particularly vulnerable. Assuming 160 vehicles/day through the Gorge, closing the road for 4 days would affect 640 vehicle trips. While this number may be regarded as relatively low, there is no local alternative route.

The cost of repairing some slips can be relatively high. The damage illustrated in **Figure 6.1** SH43 Storm Damage, June 2015, for example, would have required construction of a substantial retaining wall to enable the road to be fully reinstated.

Farms, radiata pine forest harvesting, honey producers and tourist operators rely on SH43 for access. While preventing road closures due to storm events is not realistically feasible, a focus on improving the resilience of those sections of SH43 which are of most significance to the local economy would be appropriate. In this regard, the projected increase in forestry harvesting (refer Section 9.2) and increased activity by tourism operators are particularly relevant.

Amenity, Accessibility and Travel Reliability

Amenity is measured by road roughness, and “aesthetic faults” that detract from the customer experience such as litter, graffiti etc.

An Accessibility measure is the length of network not accessible to Class 1 Heavy Vehicles and 50MAX vehicles.

With the exception of the unsealed section, the roughness of the road surface does not appear to be an issue, although there are concerns over the speed at which potholes are repaired and detritus is cleared. The need for improved signage to areas of interest along the route has been raised by Stakeholders. Aesthetic faults generally have not been raised as issues.

Travel time reliability has not been identified as a significant issue.

Overall, although improvements can certainly be made, SH43 appears to be generally fit for purpose under these criteria.

Cost Efficiency

Cost efficiency measures include the total quantity and cost of pavement rehabilitation as renewal work (by classification), sealed road chipseal resurfacing, asphaltic sealed road resurfacing, metalling as renewal work, and routine maintenance over the previous year.

The ONRC process should eventually enable Secondary Collector rural roads to be compared (taking the differences in geography into account). However, at present there is insufficient data to allow this to be undertaken.

3.3 Summary

The criteria for determining the category of a road under the One Network Road Classification in Table 3.1 are strongly influenced by traffic demand. Based on these criteria SH43 is classified as a Secondary Collector. The ONRC, however, accepts that other criteria may be used to justify a change in status for roads classed in the Collector and Access road categories. This report sets out a number of factors which can be used to support a case for SH43 being upgraded to a Primary Collector. Upgrading the ONRC status of SH43 would assist in justifying an increased level of funding from the National Land Transport Fund.

While there are a number of issues that justify action to improve safety and resilience, the available information is insufficient to enable a definitive statement to be made on whether or not SH43 is fit for purpose.

Similarly, only a national comparison of Secondary Collector roads can identify if SH43 has a significantly lower Customer Level of Service than can realistically be expected for a road in this category.

4. SH43 as an alternative route to SH3

SH43 could potentially provide the alternative route to Taumarunui and Te Kuiti on closure of SH3 between SH3A and Ahititi. On closure of SH3 north of Ahititi traffic, the Okau Road Waitaanga Road – Ohura Road route would form a more likely alternative route.

Figure 4.1 New Plymouth to Te Kuiti via SH3 or SH43

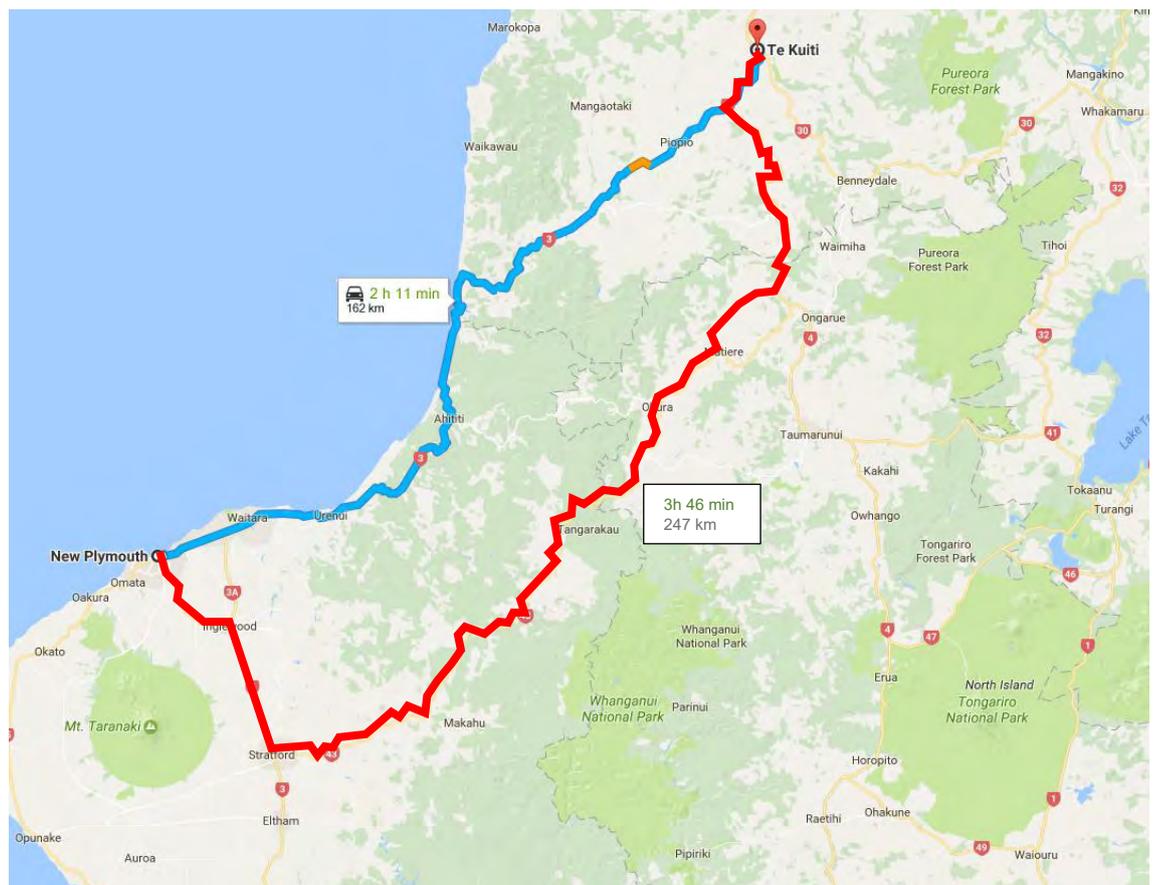


Table 4.1 Travel Distances and Travel Times (Source: Google Maps & AA) compares the travel distances and times between New Plymouth and Taumarunui and New Plymouth and Te Kuiti using either SH43 or SH3.

Table 4.1 Travel Distances and Travel Times (Source: Google Maps & AA)

Route	Travel Distance	Travel Time
Stratford to Taumarunui via SH43	149.1 km	2hrs 33 mins
New Plymouth to Taumarunui via Stratford & SH43	189.1 km	3 hrs 6 mins
New Plymouth to Taumarunui via SH3, Okau and SH4	161.5 km	2 hrs 44 mins
New Plymouth to Te Kuiti via Stratford, SH43, Ohura Rd, SH4 & SH3	247 km	3hrs 46 mins
New Plymouth to Te Kuiti via SH3	162 km	2 hrs 11 mins

It follows that using SH43 instead of SH3 would add approximately 22 minutes to travel time between New Plymouth and Taumarunui, and would add approximately 1 hour and 35 minutes to travel time between New Plymouth and Te Kuiti.

These differences indicate that major maintenance activity along SH3 between New Plymouth and Ahititi would not be expected to create sufficient delay to justify considering using SH43. However, in the event of a complete road closure due to, say, a major slip, SH43 could potentially act as the alternative route.

A major closure of SH3 between Motunui and Ahititi could potentially result in through traffic travelling to Te Kuiti diverting to SH43. The amount of such through traffic can be estimated from the three count sites on SH3 between Ahititi and the junction with SH4 (about 11km north of Piopio). Over this 88km distance the three traffic count station 2015 AADT traffic volumes are very consistent at 2,413 vehicles (21% HCV), 2,269 vehicles (20% HCV) and 2,364 vehicles (23% HCV). Based on these counts it is estimated that the relevant 2-way through traffic volume on SH3 is approximately 2,000 vehicles/day with 20% (400) trucks per day. This is the estimated amount of traffic which could divert to SH43.

According to the NZTA Highway Manager – Palmerston North, SH43 can act as an alternative to SH3 when it is closed, although this has generally been for relatively short periods. However, there are no records showing formal diversions from other State Highways onto SH43, i.e. using SH43 as a nominated detour route. *“Due to its alignment, physical characteristics and isolation it is not recommended as a detour route for traffic when events impact other highways in the central/western North Island.”* The recommended route for road closures is via SH4.

4.1 Conclusion

SH43 could potentially act as an alternative route in event of a major closure of SH3, and in doing so could need to accommodate up to an additional approximately 2,000vpd (with 20% HCVs).

However, the NZTA does not consider SH43 to be a suitable alternative route due to its alignment, physical characteristics and isolation. In the event of closure of SH3, SH4 is the recommended detour route.

This situation is unlikely to change without a major upgrade of SH43, which is not economically feasible. Consequently, while SH43 can and does provide an alternative route to SH3, the potential role of SH43 as an alternative route in the event of a major closure of SH3 cannot realistically be used to support the improvement or upgraded maintenance of SH43.

5. *The SH43 Cycle Touring Route*

The cycle touring route from New Plymouth to Taumarunui follows SH43 from west of Whangamomona to Taumarunui. The section on SH43 has been assessed against the New Zealand Cycle Trail design guide and meets the criteria for Grade 3. A Grade 3 cycle trail is described in the guide as “On-road route suitable for cyclists at least 12 years with some on-road cycling experience and reasonable level of fitness. Moderate exertion levels expected. Some steep climbs.”

The guide states that no special cycling provisions are needed on rural roads if motor vehicle operating speeds are low and traffic volumes are below 1,000 vehicles/day.

The section of SH43 used by the cycleway has low traffic volumes and the operating speed of road users is around 50-60km/h on much of the route

The following information was provided by Jonathan Kennett, Senior Project Manager, National Cycling Team, NZTA.

The unsealed (gravel/metalled) section is not seen as a problem for cycle tourists.

The reasons why cyclists are attracted to the route are:

- It is a scenic route with interesting features such as a narrow ‘Hobbit’ tunnel, native forest, rivers, and cliffs.
- Because it is a narrow twisty road there are new things to look at around every corner.
- Whangamomona is an interesting small town.
- There is very little traffic, so it is a peaceful place to ride and people don’t have to spend much of the time worrying about passing traffic.
- It connects two major transport hubs – Taumarunui and New Plymouth
- There is no safe alternative for those wanting to cycle from the centre of the North Island to New Plymouth.

Although the National Cycling Team has not identified any issues, there are several references on the internet to cyclists suffering from punctures on the unsealed section. This is discussed further below.

6. SH43 Maintenance

6.1 Road user comments and recommendations

The comments summarised in this section are based primarily on responses to requests sent to various organisations and individuals as part of this project.

The general opinion expressed in comments received by Stratford District Council on its recent consultation relating to the Forgotten World Highway and in consultation undertaken for this project is that overall the road alignment should be left largely as it is. This reflects the desire to retain the attractive features of the route and its “Forgotten (World) Highway” image and feel.

There is, however, a strong perception that road safety and the standard of maintenance must be significantly improved. **Table 6.1** provides valuable local views and suggestions on SH43 maintenance, plus suggestions for improving cycling safety.

Table 6.1 Local Views and Suggestions on SH43 Maintenance

Source	Comments
Venture Taranaki	<p>Slips tend to be present for months reducing the road down to one lane and making driving hazardous over the narrow saddles.</p> <p>Ancillary infrastructure is another area that could be greatly improved. This includes signage, stopping points and required infrastructure such as toilets. The highway experience needs to be comfortable, safe and informative in order to ensure its usability and attractiveness.</p> <p>If possible some additional passing areas would be useful – even if it is only some passing bays for a slow vehicle to pull over in.</p>
Automobile Association	<p>Some significant yet comparatively minor cost repairs have taken up to two years to complete. Lack of attention to repairs increases the risk of road damage extending. It impacts on the safety and convenience of road users. The AA has voiced these concerns to the NZTA.</p> <p>We also consider that greater attention to drainage will reduce the risk of future flood damage¹.</p> <p>The AA also states it has noticed that in recent years pavement faults have been marked for repairs that have never been undertaken (the AA has advised the NZTA of these concerns). The AA is concerned that maintenance is not being undertaken and is leading to a gradual deterioration in pavement condition.</p> <p>Road safety would be improved with less delay in fixing flood damage to the highway – e.g. slips and drop-outs. Drop-outs in particular constitute a very real safety hazard to tourist drivers (often in quite large mobile homes) who are unfamiliar with the route, and an increasing number of drivers of logging trucks travelling the route. The problem is particularly concerning on wet nights when visibility is limited.</p> <p><i>“We recognise that the type of country traversed by the route will always limit the extent of really major structural improvements, however sealing the remaining section, and prompt repairs and maintenance are basic issues for the NZTA to address.”</i></p>

¹ The NZTA has recently been on a drive over with the Mayor of Stratford District. As a result of the drive over, the NZTA currently (June 2017) has crews working on the road clearing all drainage channels and culverts.

Tourist Operator	<p>Road should be maintained at a level appropriate to a State Highway. There have been some road subsidence/slips which have taken out one lane and not been fixed for several years.</p> <p>Not much else needs to change other than sealing Tangarakau Gorge section.</p>
Stratford Visitor Accommodation Provider	<p>Wants to see SH43 improved to a level where it is safe to drive on.</p> <p>In recent years are getting a large number of complaints from leisure travellers regarding the road itself, and how the NZTA have completely neglected it after the last big flood. Having areas of the highway where there is only half the road still left is creating a negative experience for these travellers who then go and tell others.</p> <p>Don't want to see route upgraded to a 4-lane highway, just want to see it maintained to a level that is safe to drive on (but see a few passing lanes or slow vehicle bays as desirable).</p> <p>Fix issues on the saddles where the road is crumbling away.</p> <p>Strengthen road on the left-hand side heading towards Stratford. This side receives the most damage because logging trucks are travelling on this side with full loads (and coming back on the other side with empty loads).</p>
National Cycling Team Project Manager	<p>Suggested improvements for cyclists:</p> <ul style="list-style-type: none"> • Appropriate speed limit (i.e. the safe operating speed). • Pass Safely cyclist signs (1.5m lateral clearance to a cyclist). • Signs encouraging drivers to drive safely • Signs encouraging cyclists to ride safely

6.2 Road maintenance expenditure

Table 6.2 lists the annual maintenance costs for SH43 from 2010/2011 to the almost completed 2016/2017 year (data is current to 30 April 2017) provided by the NZTA.

Table 6.2 Annual Maintenance Expenditure

Year	Expenditure (\$)
2010/11	810,672
2011/12	893,448
2012/13	1,914,293
2013/14	542,204
2014/15	465,965
2015/16	513,597
2016/17 (to 30 April)	496,556
Average	805,248

The average annual maintenance expenditure for SH43 from the year 2010/11 to 2016/17 was \$805,248. The average annual maintenance expenditure for SH43 from the year 2013/14 to 2016/17 was \$504,581. These figures and Table 6.2 indicate that there has been a significant and sustained reduction in maintenance expenditure from the 2013/2014 year.

6.3 SH43 Closures

The following information on closures of SH43 was provided by the NZTA.

Table 6.3 SH43
Closures

Date	Duration	Description
5 May 2017	3 days (road not closed for full duration)	Tangarakau Gorge: Moki Road through to River Road and Ohura Road closed due to slips. No detour available.
18 Sep 2016	10 hrs 20 mins	Tangarakau Gorge near intersection with Tahora Road on gravel road section. Slip blocking both lanes.
18 Sep 2016	4 days (road not closed for full duration)	Tangarakau Gorge. Big slip blocking whole road 6km from Moki Road.
17 Sep 2016	3 hrs 22 mins	Location not given. Slip.
11 July 2016	2 hrs 18 mins	Near Ruapehu end of SH43. Slip covering both lanes.
27 June 2016	3 hrs 12 mins	SH43/Mohakau Intersection. Tree blocking both lanes and has taken down power lines.
26 June 2016	6 hrs 16 mins	SH43 at Whitianga Road. Fallen tree across both lanes.
20 June 2015	7 hrs 1 min	SH43/SH4 intersection. Flooding closing Taranaki side of SH43

This information confirms that SH43 can be closed for a significant length of time due to slips and indicates that the most vulnerable section is through the Tangarakau Gorge.

Figure 6.1 SH43
Storm Damage,
June 2015



7. Other Actions Likely to Increase Traffic Demand

This section outlines other actions and initiatives either underway or proposed which can be expected to increase the attractiveness of SH43 to visitors and hence to increase demand for use of the highway, but are not directly related to the maintenance or completion of sealing of SH43.

7.1 Taranaki Crossing

In May 2017, the government stated that it is funding a \$3.4 million upgrade of the Taranaki Crossing. The upgrade is expected to take 2-3 years and is to help pay for more bridges, carparking, toilets, signage, interpretive panels and on-going maintenance. The Taranaki Crossing (formerly Pouakai Crossing) is one of a number of day walks throughout New Zealand the government is seeking to promote. It starts at North Egmont and finishes at the Egmont National Park boundary at Mangorei Road over a distance of 18.4km.

According to Venture Taranaki, the Taranaki (Pouakai Crossing) is already seen as a sister walk to the very popular Tongariro Crossing which now attracts 150,000 people a year. A certain percentage of these walkers could be expected to travel through the Forgotten World Highway which is the natural travel route from central North Island.

The Automobile Association's response to questions asked as part of this project points out that the national desire to spread growing tourism numbers would be helped by improvements to links between tourist attractions. *"The Pouakai Crossing is now being promoted as a high quality alpine walking experience just as Tongariro Crossing is well established as one. Therefore, we expect that SH43 will be used by tourists wishing to walk both crossings with the unique visitor experience of the Forgotten World Highway on the way."*

7.2 Recent Major Investments

Recent major investments in other visitor offerings within the region (totalling around \$100 million) include the Pukeiti international garden, the Len Lye Centre, the New Plymouth Coastal Walkway and the Novotel New Plymouth Hobson hotel.

7.3 Additional actions identified by Venture Taranaki

Forgotten World Adventures has been responsible for driving much of the tourism in the area, and they are still increasing in popularity according to Venture Taranaki. Among other things they operate the popular rail- car based business using the former Stratford to Ohura railway line (which has generated 20,000 visitors in the last 5 years). They are looking to offer other experiences for their customers.

Operators are considering upgrading camp sites or looking at developing camp sites and promoting back country experience such as walks and fishing.

Stratford District Council is exploring development of the Whanga Road route (off SH43) from Whangamomona to Aotuhia as a cycling route. Aotuhia is home to the "Bridge to Somewhere".

Stratford tourism operators including Amity Court have been active in developing product and are seeking to consolidate Stratford in the tourism space.

Ruapehu, at the other end of SH43, are also undertaking destination planning.

7.4 Make Way for Taranaki Strategy

The Make Way for Taranaki project launched on 16 May 2017 is a whole of region collaborative project between New Plymouth District Council, South Taranaki District Council, Stratford District Council, Taranaki Regional Council, Venture Taranaki, local business leaders, iwi and central government (MBIE). The objective is to prepare an economic strategy and action plan for the next 10 years.

The final Action Plan is due for release in October 2017. It is expected to include actions that will boost economic activity and tourism in the region including the Forgotten World Highway.

At the time of writing this report, advice on the likely content of the Action Plan is not available.

7.5 Other Enhancement Suggestions

In addition to the above, various other interested parties / stakeholders provided the following suggestions to enhance the corridor.

Table 7.1
Proposed Actions to Increase Use of SH43

Source	Suggestion
Automobile Association	Named/themed routes with tourism products/attractions along the route will attract more tourists and therefore will increase highway/traffic.
Venture Taranaki	The Forgotten World Highway is in the wide list of areas for improved cell phone coverage under the Mobile Black Spot Fund. While not directly related to roading improvements, improving cell phone coverage is an important safety matter.
Tourist Operator	Greater marketing of route/Forgotten World Highway Hold Whangamomona Republic Day annually instead of bi-annually
Stratford Visitor Accommodation Provider	Provide cell phone coverage. SH43 ranked in Top10 of worst and most dangerous roads in NZ but no cell phone coverage to alert the authorities of an accident. Has heard of people having to walk 10-20km to find a house with a landline. Improve the rest stops and heritage sites. The seating and signage is old and uninviting. More attractions along the route (walking tracks etc).
National Cycling Team Project Management	Improved services and accommodation along the route (e.g. water, food, accommodation and picnic areas).

8. The Unsealed Section of SH43

An 11.8km section of SH43 through the Tangarakau Gorge is still unsealed.

8.1 Issues

Issues raised regarding the unsealed section of SH43 include the following:

- Tourists are unused to driving on gravel/metaled roads. This could presumably discourage some tourists from using SH43 and could increase the crash risk for those that do drive it.
- Rental vehicle cover typically does not cover unsealed roads, and this deters some visitors from travelling along SH43.

Venture Taranaki considers that the unsealed section deters many people from driving on SH43. In their response to questions asked as part of this project's consultation they state that "*International travellers need to be considered as New Zealand roads are often completely unique in comparison to what they have driven in terms of narrowness and windiness. If there is any additional concern regarding health and safety issues – as in driving on gravel – it is a major drawback*". These concerns also apply to the growing motor home fraternity.

The AA considers that the unsealed section through the Tangarakau Gorge is far more dangerous than the sealed eastern section of the Gorge. According to the AA "Any reluctance of tourists to drive on unsealed surfaces is a major restriction to increasing traffic volumes on SH43. Furthermore, Taranaki is quite possibly the only region in NZ without a direct sealed link to SH1, and SH43 is one of the very few highways still with an unsealed section. Sealing this 12km section would complete a 215km direct seal link between SH1 at Turangi and SH3 at Stratford." The AA also points out that the sealing of this last length of SH43 has a history of promised inclusions in work programmes.

According to a local tourist operator who uses SH43 on a daily basis in the main summer season the unsealed section has a significant limiting effect for those who would consider driving on SH43, and it is "often in poor condition (particularly Spring)". A Stratford visitor accommodation provider ranks the sealing of this section as the third highest in his list of six improvements which would encourage greater use of SH43.

The Road Transport Association wants to see the sealed section improved as part of improving the whole of SH43.

The addition of new aggregate or road metal to the unsealed section seems to result in a number of punctures for cars and bicycles. The following anecdote has recently been received from a regular user of SH43.

"I drove through to Stratford on SH43/Forgotten World Highway on Fri 19 May (2017). New metal had recently been laid on the 12km unsealed section. On the return journey I came across a couple of Germans who had crashed their car into the bank. The car was a write off. They were travelling in convoy with another vehicle which was using its space saver spare tyre as they had got a flat tyre on the unsealed section just prior to the crash that occurred. They didn't have space in the car for everyone and their gear so I picked up the two Germans. I was driving a Toyota Prado with good tyres, I got a flat tyre (that nearly broke the poor German woman who was starting to think the place was cursed). We got through to Taumarunui that evening. My other work colleague who was also driving a Toyota Prado got two flat tyres in the Tangarakau Gorge and had to leave the vehicle behind and get a ride with a local farmer back into town.

When that road gets new metal multiple flat tyres is common place.

I imagine that the German tourists will not be recommending that route to their friends. Multiple flat tyres are common place when the road gets fresh metal, so much so that we carry two spare tyres until the road gets bedded in again."

8.2 Benefits of Completing the Sealing of SH43

The primary benefits of sealing the remaining unsealed section of SH43 are:

- Central, regional and local government are seeking to increase tourism in Taranaki. The Forgotten World Highway is one of the major attractions. Sealing the final 12km section through the Tangarakau Gorge is essential if the route is to achieve its potential. It is a key component of regional strategies aimed at increasing tourism in Taranaki. Venture Taranaki, Forgotten World Adventures - a major tourist operator using SH43, the Stratford Business Association, Stratford District Council, Ruapehu District Council, and the Taranaki Regional Council all seek the sealing of the remaining unsealed section to remove what they see as a significant impediment to growth in tourism in the region.
- Sealing would remove a significant deterrent to driving on SH43 by international tourists by eliminating a lack of rental vehicle insurance cover on unsealed roads. Negative social media feedback on SH43/The Forgotten World Highway due to the unsealed section can also discourage visitors from driving the route.
- The recent Government decision to fund the upgrading over the next 2-3 years and the improved maintenance of the Taranaki Crossing (formerly Pouakai Crossing) will encourage visitors to use both the very popular Tongariro Crossing day walk and the Taranaki Crossing day walk. SH43 links these two walks and itself provides access to interesting locations and activities along its length. The potential will not, however, be realised without completing the sealing of the route.
- International visitors are typically unused to driving on unsealed roads, increasing the risk of loss of control crashes in an isolated area which does not have cell-phone coverage. The AA regards the unsealed section of the Tangarakau Gorge as being much more dangerous for drivers than the sealed section
- Sealing the unsealed section of SH43 would complete a 215km direct sealed link between SH1 at Turangi and SH3 at Stratford.
- Anecdotal evidence is that the periodic re-metalling of the unsealed section initially results in flat tyres due presumably to use of an aggregate with sharp edges. This can be very distressing for visitors as it occurs in an isolated area with low traffic volumes.

8.3 Cost of Completing the Sealing of SH43

Information provided by the NZTA Highway Manager-Palmerston North, is that the estimated cost to seal the unsealed section of SH43 is \$8.01 million. This estimate allows for some additional improvement works to ensure this section of SH43 is safe once sealed, particularly for tourist traffic.

The Highway Manager's advice includes the following comments – *"To date there has not been a project put forward for a seal extension project in this location due to the difficulty of achieving benefits for investment under the Transport Agency's investment criteria. This has also had an impact on seal extensions on local authority roads."*

Abley has made an independent estimate of the cost of sealing SH43 which is attached as Appendix B. The estimated cost is \$7.59 million.

The NZTA has provided information on the annual maintenance costs of the unsealed section over the years 2010/11 to 2016/17. The costs are separated into pavement and non-pavements costs.

Table 8.1
Unsealed Section
Maintenance Costs

Year	Unsealed Pavement Maintenance (\$)	Other Maintenance Costs (\$)	Emergency Work (\$)	Total Maintenance Costs (\$)
2010/11	55,000.00	1,008.01	43,594.00	99,602.01
2011/12	55,000.00	1,044.09	32,733.09	88,777.18
2012/13	27,500.00	7,425.40	8,797.70	43,723.10
2013/14	0	14,862.37	13,298.42	28,160.79
2014/15	49,679.16	515.10	4,200.00	54,394.26
2015/16	49,432.00	216.00	1,700.00	51,348.00
2016/17	36,179.00	166.80	51,507.00	87,852.80
Total	272,790.16	25,237.77	155,830.21	453,858.14
Annual Average	38,970.02	3,605.40	22,261.46	64,836.88

The average annual unsealed pavement maintenance costs over the last 7 years are \$38,970. The annual average expenditure on other maintenance is \$3,605. The expenditure on emergency work varies considerably from a low of \$1,700 to a high of \$51,507 with an average of \$22,261.

The non-pavement maintenance and emergency work costs are unlikely to be significantly affected by the sealing of the unsealed section.

The average annual total maintenance cost of the 12km unsealed section over the last 7 years is \$5,403/km. Table 6.2 gives a total maintenance expenditure for the whole of SH43 (149km) over the same period as \$805,248, which is equivalent to an average of \$5,404/km/year. As the non-pavement costs for the 12km unsealed section are unlikely to be lower than the remainder of SH43 (and may well be higher), it can be assumed for current purposes that the sealing of the unsealed section will not reduce maintenance costs.

8.4 Seal Funding Options

The NZTA's investment criteria do not currently support the investment of an estimated \$8 million to seal the 12km unsealed section. Despite the potential for significant increases in SH43 visitor traffic volumes (but not necessarily HCV volumes through the Gorge), this situation appears unlikely to change unless the investment criteria change or additional capital funding is made available for the project outside the National Land Transport Fund.

One option may be a change in the NZTA's funding allocation through the next Government Policy Statement on Land Transport Funding in favour of sealing the remaining sections of unsealed State Highways.

Another option may be for the Government to make a specific allocation to funding the sealing of SH43 as part of its promotion of regional tourism in Taranaki and the impacts on wider economic growth.

8.5 Sealing Cost Benefit Analysis

The following calculations use the Economic Evaluation Manual simplified procedure for a seal extension.

Sealing Benefits

1) Reduction in roughness plus road user comfort

Assuming 6.5 IRI before sealing and 2.5 IRI when sealed, the roughness cost reduction is 15.8c/km. Applying the 2016 factor of 0.98 this gives a current value of 15.48 c/km (July 2016).

The road user comfort benefit is 10c/km.

The combined roughness and comfort benefit is 25.48c/km or \$3.06 for 12km.

Assuming 200vpd for 350days/year, the combined benefits are \$214,700

2) Travel Time Savings

Current travel speed through the unsealed section is 40km/h (from TomTom navigation software). Current travel time over 12km is 18 minutes.

Estimated travel speed after sealing is 50km/h. New travel time over 12km length is 14.4minutes.

Travel time saving = 3.6 minutes. Daily travel time saving = $200 \times 3.6 = 720$ mins = 12 hours.

Value of travel time for rural non-strategic routes = \$22.72/hour (2002) = \$32.94/hour (2016)

Annual value of travel time saved = $12 \times 32.94 \times 350 = \$138,348$

3) Crash cost savings

There is very limited data which can be used to estimate the value of crash cost savings from sealing the unsealed section. For current purposes, it is assumed that sealing will not result in a significant change in the death or serious injury crash risk. Although it can be expected to reduce the number of damage-only crashes, there is insufficient information to place a value on this.

4) Combined benefits = $\$214,700 + \$138,348 = \$353,048$ /year. Assuming that the sealing takes place in year 1, the present value of the above benefits over 40 years at a 6% discount factor = $\$14.6163 \times 353,048 = \$5,160,255$

Capital and Maintenance Costs

The NZTA has advised that the actual length of the unsealed section is 11.8km. This should be increased to 12.2km as the bridge approaches will need work if the road is sealed.

The estimated cost is \$7.59 million.

For current purposes, it can be assumed that the sealing of the unsealed section of SH43 will not have a significant effect on annual maintenance costs.

Net present value of capital and maintenance costs = \$7.59 million (assuming construction in a single construction season)

Benefit Cost Ratio

BCR = $5.16 / 7.59 = 0.68$.

Impact of Increased Visitor Numbers

The above calculations do not take into account the potential other economic benefits of the sealing of the unsealed length produced by the resulting increase in visitors to the region.

For example, a tourism benefit to the economy of \$166,250/year would have a net present value of \$2.43 million over 40 years, and would increase the sealing BCR to 1.0. A tourism benefit to the economy of \$685,540/year would increase the sealing BCR to 2.0.

While it is not currently feasible to estimate the likely increase in visitor numbers resulting from sealing the unsealed section of SH43, determining the added value to the economy of each additional visitor trip would enable BCRs to be calculated based on a range of traffic increases.

9. *Crash Costs and Crash Reduction*

The following high-level analysis is based on the 2011- 2015 crash data. There are a total of 25 fatal or serious injury crashes over the 5-year period.

23 out of 25 crashes are broadly attributable to loss-of-control factors. It follows that interventions that are known to assist in reducing the severity or frequency of such crashes are likely to be effective.

There is little to no spatial clustering of crashes. The crashes appear to be randomly spaced and are mostly located on curved sections (but not necessarily out of context curves).

Appendix C applies the SP3 simplified procedures for estimating the value of the crash cost savings in the NZTA's Economic Evaluation Manual.

The total social cost of the fatal and serious crashes on SH43 over the 5-year period is \$2,917,441 a year.

The estimated crash cost saving assuming the implementation of measures to reduce loss-of-control crashes is \$484,744 a year. The Present Value of the crash cost savings over 40 years is \$7,039,400.

While the analysis is of necessity high-level, it clearly demonstrates the potential benefits of investing in measures for reducing out of control crashes on SH43. These measures can include relatively low cost actions such as introducing signage at appropriate locations advising of low speed bends ahead, and of sections of road with limited sight distance requiring particular caution.

It may also be appropriate to implement a general speed restriction of, say, 80km/h for SH43.

10. Economic Importance of SH43

This section identifies the existing and potential importance of SH43 to the tourism sector. The potential increase in logging trucks using SH43 as forests planted in the 1990s are harvested is estimated, and an estimate is made of the value of the harvested logs to the New Zealand economy. The role of SH43 as an alternative to SH3 is discussed.

10.1 Taranaki Tourism

Future increases in visitor numbers will lead to increased traffic on SH43. While it is not possible to quantify the increase, there is clearly the potential for a substantial increase over the short to medium term.

Venture Taranaki does not have specific research on the influence of the Forgotten World Highway on decisions to visit the area. They do point out, however, that touring routes are becoming increasingly popular. Tourism New Zealand research indicates that visitors are more inclined to travel a highway that is named and themed, as long as there is sufficient product along the route.

In 2016, 84% of Taranaki's commercial guest nights were from domestic visitors, and 16% were from international visitors. For the year ending December 2016, the percentage change in guest nights from the previous year was 7.6% for domestic visitors and 26.5% for international visitors. The comparative figures for New Zealand as a whole were 2.4% and 11.8% respectively^[2].

Venture Taranaki has identified the following influences or initiatives which have the potential to increase visitor numbers:

- International tourism has seen a huge increase and is still increasing rapidly. This increase is largely through Asian markets, but is also across the board. Both the general markets and Asian markets are moving to travelling on a free independent traveller basis, which is positive regarding the attractiveness and potential of drive routes.
- Tourism New Zealand have announced one of their strategic goals over the next 4-year period is to concentrate on regional dispersal. Effectively this means they will be trying to push out international visitation to smaller areas such as Taranaki.
- Taranaki is currently undertaking a destination strategy refresh. 'Journeys and Connections' are specified as one of the key actions in this strategy.
- Motor home ownership and membership of the NZ Motor Home and Caravan Association has increased hugely especially in the pre-retiree 50+ market. This has implications for SH43.
- Cycleways are increasingly popular. There is a steady stream of cyclists using the route.

The Stratford Business Association regards SH43 as one of Stratford's key attractions. Stratford is the gateway to Mount Taranaki and the Forgotten World. It is off the beaten track and has an agriculture industry background. In that sense, it offers tourists an experience of the real NZ. SH43 is the connection to that story.

The Government's recent provision of funds to upgrade the one-day Taranaki Crossing walk over the next 2-3 years could result in the crossing becoming a major attraction for visitors to the area. Visitors using both the Tongariro Crossing and Taranaki Crossing may decide to use The Forgotten World Highway when travelling between the two walks.

^[2] Taranaki Visitor Statistics: December 2016, Venture Taranaki.

10.2 Freight

SH43 provides access to a significant number of beef and lamb farms and a few dairy farms plus manuka honey producers.

The logging of the radiata pine forests planted in the 1990s is starting to come on stream and is likely to peak in 4 to 5 years. Following closure of the rail line, all logs must be transported by road. The vast majority of logs travel by road to New Plymouth. The bulk are exported from Port Taranaki, though significant volumes are processed within the region (particularly by Taranaki Pine).

Stratford District Council has undertaken some investigation into the harvesting of forestry blocks as the forest planted in the 1990s mature and the resulting number of forestry truck movements generated by the forestry catchment areas of roads intersecting with SH43. The number of truck movements from each catchment area is based on 17 loaded trucks movements per harvested hectare of radiata pine, which assumes 500 tonnes logs per hectare and 29 tonnes logs per truck.

For purposes of this project, the information provided by Stratford District Council was used to estimate the total number of truck movements along SH43 resulting from the harvesting of the maturing forests. Based on information provided by the Ministry for Primary Industries, the large majority of the logging is likely to take place over the 10-year period from 2021 to 2030. For current purposes, it is assumed that logging volumes will remain constant over that period, i.e. that 10% of the trees are harvested each year. It is further assumed that trucks operate 5 days a week over 50 weeks a year.

The resulting daily logging truck volumes on SH43 follow. Trucks are loaded in the Stratford direction and return unloaded.

Table 10.1
Estimated logging truck volumes 2021 to 2030

Location	Estimated Number of Logging Trucks
Just north of Junction Road	3 trucks/day/direction
Just south of Junction Road	14 trucks/day/direction
Just north of Brewer Road	26 trucks/day/direction
Just west of Douglas Road	37 trucks/day/direction
Just east of Beaconsfield Road (near Stratford)	39 trucks/day/direction
Average truck volume south of Junction Road	29 trucks/day/direction

The intersection between SH43 and Junction Road is approximately 42km from the start of SH43 at its intersection with SH3 (Broadway, Stratford). The SH43/Beaconsfield Road intersection is approximately 4.7km from SH3 along SH43. Junction Road and Beaconsfield Road are shown on **Figure 3.1** ONRC (Speed Management Framework).

The Ministry for Primary Industries website gives March quarter 2017 export radiata pine prices free on board³ per tonne of \$185-\$214 for pruned logs, \$150-\$180 for unpruned A grade logs, and \$142-\$174 for unpruned K grade logs. Assuming an average log price of \$140 per tonne which allows for some domestic supply, and 29 tonnes per truck, an average logging truck load has a value of \$4,060. Assuming an average of 29 trucks/day and a value of \$4,000 per load, gives a total log freight value of \$116,000 per weekday using SH43 between Junction Road and Beaconsfield Road over the period 2021 to 2030. This is equivalent to \$29 million/year.

³ Free on board (fob) means that the seller pays for the transportation of the goods to the port of shipment, plus loading costs.

11. Conclusion

The strong push for increasing tourism in the Taranaki region from both Councils and Venture Taranaki and Central Government has the potential to create a large increase in demand for SH43/The Forgotten World Highway over the next few years and beyond. The extent to which that demand is realised depends on a number of factors not least of which are the improved maintenance of SH43 and the sealing of the remaining unsealed section through the Tangarakau Gorge.

SH43 traffic volumes

The average traffic volume over the eight counting stations on the route was 450 vehicles/day (with 20% HCVs) in 2015. Between 2012 and 2015 the total number of vehicles counted at the eight counting stations increased by 12.8%.

ONRC classification

The NZTA's One Network Road Classification (ONRC) classifies SH43 as a Secondary Collector. While the ONRC classification is strongly influenced by traffic volumes and truck (HCV) volumes, it does allow other criteria to be used to move up a category from Secondary Collector to Primary Collector. The importance of SH43 to regional tourism could be one such factor.

SH43 as an alternative route to SH3

Although SH43 can act as an alternative route in the event of closure of SH3 between SH3A and Ahititi, the NZTA does not consider the SH43 to be a nominated detour route due to its alignment, physical characteristics and isolation. As this situation is unlikely to change, the potential role of SH43 as a nominated detour route in the event of a major closure of SH3 cannot realistically be used to support its improvement and upgraded maintenance.

Resilience

Six instances of road closures occurred during 2016, most of which were due to slips. One slip took 4 days to clear.

Farms, radiata pine forest harvesting, honey producers and tourist operators rely on SH43 for access. While preventing road closures due to storm events is not realistically feasible, a focus on improving the resilience of those sections of SH43 which are of most significance to the local economy would be appropriate.

SH43 as part of a national cycle touring route

SH43 is part of the cycle touring route from New Plymouth to Taumarunui between west of Whangamomona and Taumarunui. No specific issues or concerns for touring cyclists were identified.

SH43 maintenance

Data provided by the NZTA has identified that major slips have occurred over the last two years particularly in the Tangarakau Gorge and can take several days to clear completely.

The average annual maintenance expenditure was \$1,206,000 between 2010/2011 and 2012/2013, but reduced to \$505,000 between 2013/2014 and 2015/2016. This reduction may reflect the NZTA's change in maintenance funding allocation in line with the ONRC, and/or the change in maintenance contract to the Network Outcomes Contract model which came into effect in Taranaki from 1 July 2014.

Future traffic demands

The combination of increasing tourism, Tourism New Zealand's aim to encourage more international tourists into areas such as Taranaki, the regional and local focus on increasing visitor numbers, and, associated with these, promotion of The Forgotten World Highway can be expected to significantly increase the number of visitors who would consider using SH43. The recently announced Government funding of the Taranaki Crossing one day walk will add to the attractiveness of the area for visitors.

Economic value of SH43

SH43 has an important and increasing freight movement function. It provides access to several beef and lamb farms and dairy farms. Manuka honey production is increasing and can also be expected to generate additional traffic volumes.

Freight use of SH43 between Junction Road and Stratford is expected to increase significantly as the radiata pine forests planted in the 1990s are harvested. The main harvest period is expected to commence within the next 2-3 years and last for approximately 10 years. This report estimates the potential increase in logging trucks as 14 trucks/day/direction south of Junction Road increasing to 39 trucks/day/direction east of Beaconsfield Road. At an average of 29 trucks per day south of Junction Road with an estimated average value of \$4,000 per load, the log freight value of SH43 south of Junction Road is estimated to be \$29 million/year over the 10-year period 2021 to 2030. It is essential that the future maintenance of SH43 between Junction Road and Beaconsfield Road support the anticipated increase in logging traffic due to its potential value to the economy.

Crash reduction benefits and measures

The total cost of fatal and serious crashes on SH43 between 2011 and 2015 is \$2.9 million a year. The Present Value of the potential crash savings is estimated to be just over \$7 million. These savings would result primarily from measures to reduce the number and severity of out control crashes. Such measures include relatively low cost actions such as the introduction of signage warning of sharp curves ahead (particularly a sharp curve at the end of a long straight) and warning of locations with poor forward visibility. The introduction of a speed restriction such as 80km/h for the whole of SH43 should be investigated.

Benefits of sealing the remaining 12km unsealed section through the Tangarakau Gorge

The Forgotten World Highway is one of the major tourist attractions in Taranaki. Sealing the final 12km section through the Tangarakau Gorge is essential if the route is to achieve its potential.

The estimated Benefit:Cost Ratio or BCR of sealing the unsealed section of SH43 is 0.64. This figure does not, however, take into account the increase in visitor traffic using SH43 likely to result. Factors which contribute to the sealing increasing visitor traffic using SH43 are:

- Sealing would remove a significant deterrent to driving on SH43 by international tourists by eliminating a lack of rental vehicle insurance cover on unsealed roads.
- Many international visitors are unused to driving on unsealed roads, increasing the risk of loss of control crashes in an isolated area which does not have cell-phone coverage. The AA has major concerns over the safety of the unsealed section of the Tangarakau Gorge.
- Sealing the unsealed section of SH43 would complete a 215km direct sealed link between SH1 at Turangi and SH3 at Stratford.
- Anecdotal evidence is that the periodic re-metalling of the unsealed section initially results in flat tyres due presumably to use of an aggregate with sharp edges. This can be very distressing for visitors as it

occurs in an isolated area with low traffic volumes. Such experiences reported on social media discourage tourists from using SH43.

The recent Government decision to fund the upgrading over the next 2-3 years and the improved maintenance of the Taranaki Crossing (formerly Pouakai Crossing) will encourage visitors to use both the very popular Tongariro Crossing day walk and the Taranaki Crossing day walk. SH43 links these two walks and itself provides access to interesting locations and activities along its length.

Increased visitor traffic provides economic benefits to the region and wider economy. The case for sealing the unsealed section would be enhanced by research into the added value of each additional visitor trip.

11.1 Recommendations

It is recommended that:

- 1) The NZ Transport Agency be asked to upgrade the ONRC classification of SH43 from Secondary Collector to Primary Collector using this report and other sources to provide the rationale for the upgrading.
- 2) The NZ Transport Agency be asked to provide additional funding for the maintenance of SH43 in light of its increasing importance as a key tourist route and as a freight route.
- 3) The NZTA investigate and implement measures for reducing the crash risk on SH43 including improved signage and a general speed restriction for the route.
- 4) The Taranaki Regional Council and District Councils supported the NZTA approach the Government with a request for funding the estimated \$8.01 million cost of sealing the remaining 12km unsealed section of SH43 as a contribution towards increasing the attraction of the region as a destination for tourists, and to maximise the potential benefits of the upgrading of the Taranaki Crossing day walk. As the tourism benefits would not be achieved until the sealing is completed, the sealing should be undertaken over a single construction season.

Appendix A
Contact List

L



A1 Contact List

The following people or companies were contacted as part of this project.

Person or Company	Organisation
Fiona Ritson	Taranaki Regional Council, Policy Analyst – Transport Portfolio
Gray Severinsen	Taranaki Regional Council, Manager Policy and Strategy
Kevin Cash	Taranaki Regional Council, Hill Country Land Management Officer
Steve Bowden	Stratford District Council, Roading Asset Manager
Warren Furner	Ruapehu District Council, Land Transport/Economic Development Manager
Phillip Hindrup	Horizons Regional Council, Transport Manager
Liam Hodgetts	New Plymouth District Council, Group Manager Strategy
Anne Probert	Venture Taranaki, GM - Economy and Sectors
Vicki Fairley	Venture Taranaki
John Haylock	Venture Taranaki, GM – Innovations and Strategic Projects
Stuart Trundle	Venture Taranaki
Fiona Croot	AA, Taranaki District Manager
Jason Kowaleswski	GM, Amity Motor Hotel, Stratford
Paul Chaplow	GM, Forgotten World Adventures Ltd
Ross l'Anson	NZTA, State Highway Manager, Central
Parekawhia McLean	NZTA, Regional Director Waikato and Bay of Plenty
Jonathan Kennett	NZTA, National Cycling Team Senior Project Manager
Tom Cloke	Road Transport Association, Western Central RTA Area Executive
John Hutchings	Partner, HenleyHutchins
Robbie O'Keefe	NZ Police (Senior Sargeant), Taranaki Road Policing Manager
Aitken Transport	
Uhlenbergs Transport	
FBT	
GJ Sole Ltd	

*Appendix B
Sealing Cost Estimate*



B1 Sealing Cost Estimate

Project Estimate - Form A			
Project Name: Taranaki Seal Extension			
High Level Indicative Estimate			
Item	Description	Base Estimate	Funding Risk Contingency
A	Nett Project Property Cost	\$ -	\$ 150,000.00
	Project Development Phase		\$ -
	- Consultancy Fees		\$ -
	- NZTA Managed Costs		\$ -
B	Total Project Development	\$ 120,000.00	\$ 36,000.00
	Pre-implementation Phase		\$ -
	- Consultancy Fees		\$ -
	- NZTA Managed Costs		\$ -
C	Total Pre-implementation	\$ 615,000.00	\$ 184,500.00
	Implementation Phase		
	Implementation Fees		
	- Consultancy Fees		\$ -
	- NZTA Managed Costs		\$ -
	- Consent Monitoring Fees		\$ -
	SubTotal Base Implementation Fees	\$ 275,000.00	\$ 82,500.00
	Physical Works		
1	Environmental Compliance	\$ 10,000.00	\$ 3,000.00
2	Earthworks	\$ 1,835,725.00	\$ 550,717.50
3	Ground Improvements	\$ 175,000.00	\$ 52,500.00
4	Drainage	\$ 150,000.00	\$ 45,000.00
5	Pavement and Surfacing	\$ 1,302,000.00	\$ 390,600.00
6	Bridges	\$ -	\$ -
7	Retaining Walls	\$ 1,000,000.00	\$ 300,000.00
8	Traffic Services	\$ 30,000.00	\$ 9,000.00
9	Service Relocations	\$ 50,000.00	\$ 15,000.00
10	Landscaping	\$ 50,000.00	\$ 15,000.00
11	Traffic Management and Temporary Works	\$ 50,000.00	\$ 15,000.00
12	Preliminary and General	\$ 100,000.00	\$ 30,000.00
13	Extraordinary Construction Costs	\$ -	\$ -
	SubTotal Base Physical Works	\$ 4,752,725.00	\$ 1,425,817.50
D	Total for Implementation Phase	\$ 5,027,725.00	\$ 1,508,317.50
E	Project Base Estimate (A+B+C+D)	5,762,725	
F	Contingency (Assessed/Analysed) (A+B+C+D)		1,828,818
G	Project Expected Estimate (E+F)		7,591,543
	Nett Project Property Cost Expected Estimate		100,000
	Project Development Phase Expected Estimate		156,000
	Pre-implementation Phase Expected Estimate		799,500
	Implementation Phase Expected Estimate		6,536,043
H	Funding Risk Contingency (Assessed/Analysed) (A+B+C+D)		3,031,363
I	95th percentile Project Estimate (G+H)		10,622,905
	Nett Project Property Cost 95th percentile Estimate		250,000
	Project Development Phase 95th percentile Estimate		216,000
	Pre-implementation Phase 95th percentile Estimate		1,107,000
	Implementation Phase 95th percentile Estimate		9,049,905
Date of Estimate		Cost Index (Qtr/Year)	3/2017
Estimate prepared by		Signed	Colin MacArthur
Estimate internal peer review by		Signed	
Estimate external peer review by		Signed	
Estimate accepted by NZTA		Signed	

*Appendix C
Crash Cost Savings
Estimate*



C1 Crash Cost Savings Estimate

SP3 General road improvements

Spreadsheet 6 (17-Jun-2017)

Worksheet 6 - Crash cost savings

These simplified procedures are suitable only for **crash-by-crash analysis** (method A in appendix A6). There must be 5 years or more crash data for the site and the number and types of crashes must meet the specifications set out in appendix A6.1 and A6.2. If not, either the crash rate analysis or weighted crash procedure described in appendix A6.2 should be used. The annual crash cost savings determined from such an evaluation are multiplied by the appropriate discount factor and entered in worksheet 1 as total E. Evidence to support alternative analysis must be attached.

Movement category	All movements	Vehicle involvement	All vehicles
1 Do-minimum mean speed	0	Road category	Rural strategic
Posted speed limit	100	Traffic growth rate	1.00%
2 Option mean speed	0		

Do-minimum	Severity			
	Fatal	Serious	Minor	Non-injury
3 Number of years of typical crash rate records	5			
4 Number of reported crashes over period	1	10	14	0
5 Fatal/serious severity ratio (tables A6.19(a) to (c))	0.21	0.79	1.0	1.0
6 Number of reported crashes adjusted by severity (4) × (5)	2.31	8.69	14	0
7 Crashes per year = (6)/(3)	0.46	1.74	2.80	0.00
8 Adjustment factor for crash trend (table A6.1(a))	0.98			
9 Adjusted crashes per year = (7) × (8)	0.453	1.703	2.744	0.000
10 Under-reporting factors (tables A6.20(a) to (b))	1	2.3	7.5	
11 Total estimated crashes per year = (9) × (10)	0.453	3.917	20.580	0.000
12 Crash cost, 100km/h limit (tables A6.21(e) to (h))	3,800,000	405,000	24,000	2,400
13 Crash cost, 50km/h limit (tables A6.21(a) to (d))	3,350,000	360,000	21,000	2,100
14 Mean speed adjustment = ((1) - 50)/50	-1			
15 Cost per crash = (13) + (14) × [(12) - (13)]	2,900,000	315,000	18,000	1,800
16 Crash cost per year = (11) × (15)	1,313,004	1,233,997	370,440	-
17 Total cost of crashes per year (sum of columns in row (16) fatal + serious + minor + non-injury)	\$2,917,441			
Option				
18 Percentage crash reduction	20	15	10	
19 Percentage of crashes 'remaining' [100 - (18)]	80	85	90	100
20 Predicted crashes per year (11) × (19)	0.362	3.330	18.522	0.000
21 Crash cost, 100km/h limit (tables A6.21(e) to (h))	3,800,000	405,000	24,000	2,400
22 Crash cost, 50km/h limit (tables A6.21(a) to (d))	3,350,000	360,000	21,000	2,100
23 Mean speed adjustment = ((2) - 50)/50	-1			
24 Cost per crash = (22) + (23) × [(21) - (22)]	2,900,000	315,000	18,000	1,800
25 Crash cost per year = (20) × (24)	1,050,403	1,048,898	333,396	-
26 Total cost of crashes per year (sum of columns in row (25) fatal + serious + minor + non-injury)	\$2,432,697			
27 Annual crash cost savings = (17) - (26)	\$484,744			
28 PV crash cost savings = (27) × DF	\$7,039,400			
Transfer PV of crash cost savings, E for the preferred option to E on worksheet 1				

Factors for converting from reported injury crashes to total injury crashes

Table A6.20(a)

		Fatal	Serious	Minor
50, 60 and 70 km/h speed limit	Pedestrian	1	1.5	4.5
	Other			2.75
80 and 100 km/h speed limit (excluding motorways)	Pedestrian	1	1.9	7.5
	Other			4.5
100 km/h speed limit remote rural area	Pedestrian	1	2.3	13
	Other			7.5
Motorway	All	1	1.9	1.9
All	All	1	1.7	3.6

Factor for converting from reported non-injury crashes to total non-injury crashes

Table A6.20(b)

Speed limit area	50, 60 or 70 km/h	80 or 100 km/h	Motorway
All movements	7	18.5	7

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