


Strategic Transport Assessment

December 2017

Traffic Design Group

Technical Report 1



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Executive Summary

Continued strengthening and growth of Taranaki has steadily added pressures and exposed shortcomings within the northern arterial connections serving New Plymouth and the wider Taranaki region. These pressures and the associated limitations are especially evident along the length of State Highway 3 (SH3) north from New Plymouth and particularly through its length between Urenui and Pio Pio. This includes the existing portions of the Awakino Gorge section between Awakino and Mahoenui, and the Mt Messenger section between Uruti and Ahititi that is the focus of this report.

The Mt Messenger Bypass (the Project) will establish a new 6 km length of SH3 between Uruti and Ahititi, leading north from New Plymouth. The Project will enhance the safety, resilience and journey time reliability of travel on SH3.

Overall, SH3 to and from the north serves the key strategic purpose of connecting the Taranaki region through to the Waikato and on to key economic and transportation hubs at Hamilton, Tauranga and Auckland. These connections are vital to Taranaki's forward prospects and ongoing economic performance.

The route has considerable strategic value. As Taranaki's only arterial connection directly to and from the north, it is of particular importance to the economic well-being and wider future of Taranaki. The route connects Taranaki's oil and gas, agricultural, forestry and engineering products and expertise through to the main economic and transport hubs at Hamilton, Tauranga and Auckland.

With continuing traffic growth and growing reliance on the route, there is an increasingly evident need to attend to the inadequacies and vulnerabilities of the Mt Messenger portion of the route in carrying freight and serving Taranaki's current and future needs.

The practical limitations and vulnerability of the route have long been recognised with closures brought by rockfalls, landslips, vehicle breakdowns and crashes. In its present form and reflecting the nature of the terrain, the existing road has steep grades, a winding alignment, restricted forward visibility, and limited overtaking opportunities. There are significant lengths with no or only limited shoulders that allow little room for error, breakdowns or passing. The narrow tunnels at Mt Messenger and Awakino physically constrain maximum load sizes.

As the only direct arterial highway connection to and from the north, enhancing the safety, resilience and journey time reliability of travel on SH3 will benefit the whole of Taranaki, and in particular the growing proportion of heavy traffic carrying freight to and from key economic and transportation hubs. This will match the form of the road to its modern-day function and ensure that it can accommodate future growth. Such improvement is recognised as a key regional and inter-regional priority in the Regional Land Transport Plan (RLTP) 2015/16 – 2020/21 and supports its strategic vision for the future.

1 Introduction

1.1 Purpose and Scope of this Report

This report forms part of a suite of technical reports prepared for the NZ Transport Agency's Mt Messenger Bypass project (the Project). Its purpose is to inform the Assessment of Effects on the Environment Report (AEE) and to support the resource consent applications and Notice of Requirement to alter the existing State Highway designation, which are required to enable the Project to proceed.

This report presents a Strategic Transport Assessment of SH3 in the wider transportation network of the Taranaki region and the Project Alignment as shown on the Project Drawings in Volume 2: Drawing Set.

The SH3 portion of the Taranaki regional network serves as the principal route joining Taranaki to the major economic hubs of Hamilton, Tauranga and Auckland and is a key element in both providing for and serving Taranaki's forward growth and ongoing economic performance. Where most of the 240km length of SH3 between New Plymouth and Hamilton traverses open country with average travel speeds between 75 and 85 km/h, the local portions of the route through the Awakino Gorge and over Mt Messenger are to a markedly different standard being characterised by a torturous alignment, narrow widths, steep grades, limited overtaking and restricted visibility.

This report examines the location and role of the planned SH3 Mt Messenger Project and the strategic purpose the improvements will serve across the wider transportation network of the Taranaki region. In so doing, it first presents an overview of what is required from the wider transportation network serving Taranaki in terms of its role and performance, and including the pressure points and deficiencies that are evident in the connections to and from the north that have led to the Project.

This extends to include the functional role that SH3 provides within Taranaki, especially in its connections to and from the north, the travel patterns it carries as a vital component of the region's transportation network, and its particular value to the movement of freight.

The report then reviews the functional role the route serves within the forward vision and purpose of the adopted RLTP and the contribution that SH3 makes in furthering the core transportation goals and objectives of the region, together with an evaluation of the wider contribution it makes to economic growth and development.

The particular topographical form of Taranaki and its reliance on the two state highway routes entering/leaving the region (SH3 north and south, and SH43 east), is noted as meaning that the performance and reliability of the state highways is a key element in both shaping and providing for Taranaki's future.

This report then assesses how the Project enhances the resilience and reliability of SH3 and contributes to improved heavy vehicle access and freight connections between Taranaki and the principal transportation hubs at Hamilton, Tauranga and Auckland.

1.2 Project Description

The Project involves the construction and ongoing operation of a new section of SH3, generally between Uruti and Ahititi to the north of New Plymouth. This new section of SH3 will bypass the existing steep, narrow and winding section of highway at Mt Messenger. The Project comprises a new section of two lane highway, approximately 6 km in length, located to the east of the existing SH3 alignment.

A full description of the Project, including its design, construction and operation is provided in the Assessment of Effects on the Environment Report, contained in Volume 1: AEE, and is shown on the Drawings in Volume 2: Drawing Set.

1.3 Project Objectives

The Project objectives are to:

- a Enhance the safety of travel on SH3;
- b Enhance resilience and journey time reliability of the state highway network;
- c Contribute to enhanced local and regional economic growth and productivity for people and freight by improving connectivity and reducing journey times between the Taranaki and Waikato Regions; and
- d Manage the immediate and long term cultural, social, land use and other environmental impacts of the Project by so far as practicable avoiding, remedying or mitigating any such effects through route and alignment selection, highway design and conditions.

Each of these objectives is directed at capturing the economic and transport-related benefits that the NZ Transport Agency is seeking to achieve in its delivery of the Project.

2 Strategic Location

2.1 Strategic Road Network

Figure 2.1 shows the wider strategic road network serving Taranaki as defined by the Regional Land Transport Plan 2015/16 – 2020/21 (RLTP). The location of the Project is marked on Figure 2.1, being between Uruti and Ahititi. The Mt Messenger summit is some 56km north of New Plymouth and 42km north of Waitara.

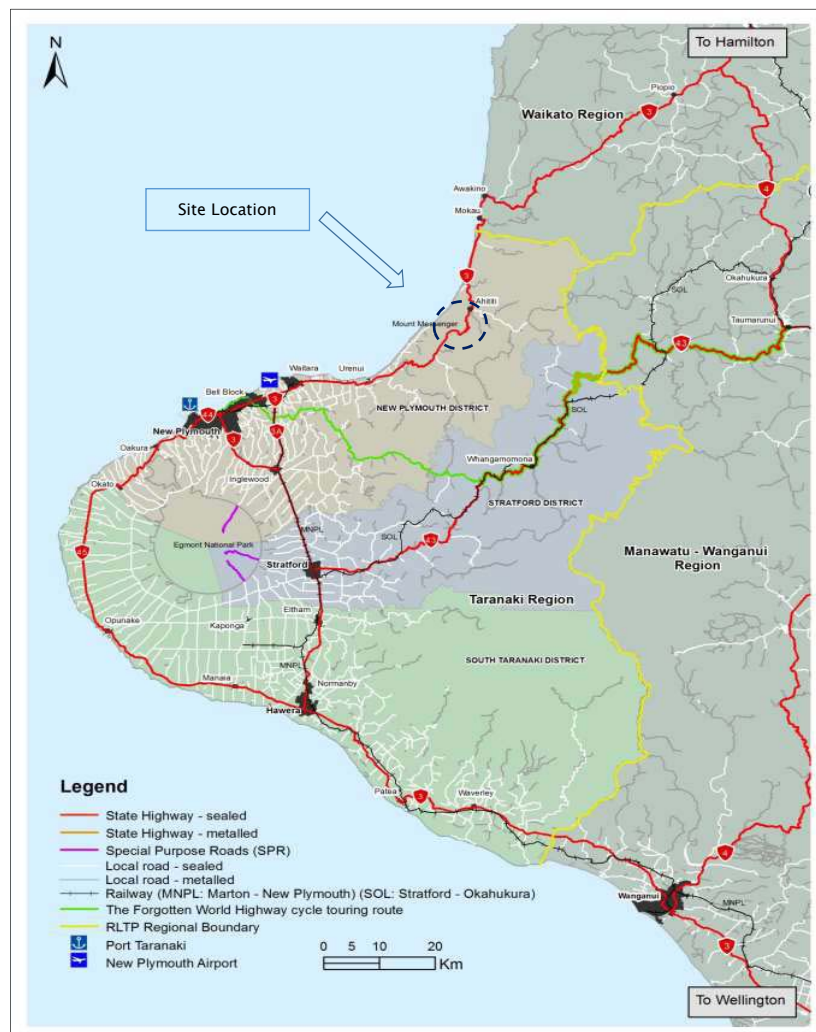


Figure 2.1 –Regional Land Transport Network¹

As shown, SH3 north from New Plymouth and Waitara serves as the principal transport route joining the Taranaki region through to the Waikato and on to Hamilton, Tauranga and Auckland.

In this position, and as Taranaki’s only arterial route connecting directly to and from the north, it is recognised as being of particular strategic importance to the economic well-

¹ RLTP, Section 2.6, p12

being and wider future of Taranaki. The route serves to connect Taranaki's oil and gas, agricultural, forestry and engineering products and expertise through to the main economic and transport hubs at Hamilton, Tauranga and Auckland.

2.2 Operational Characteristics

As regards the existing Mt Messenger portion of the SH3 route, its principal operational characteristics can be identified as:

- Present volumes using this length of SH3 across Mt Messenger and through the Awakino Gorge amount to some 2300 vehicles per day;
- Of this total, up to 20% of all the traffic is heavy commercial vehicles carrying the products and services that are key to Taranaki's wider economy and outputs. These include a proportion of High Productivity Motor Vehicles (HPMV's);
- In its present form and reflecting the nature of the terrain, the existing highway at Mt Messenger has steep grades, a torturous alignment, restricted forward visibility, and limited overtaking opportunities;
- There are significant lengths with no or only limited shoulders that allow little room for error, breakdowns or passing;
- The narrow tunnel (and similarly at Awakino) physically limits the maximum size of loads able to be carried and makes two-way use difficult. While included as part of the country's series of overdimension routes² (and the High Productivity Freight Network), restrictions are recorded at the Mt Messenger tunnel and the Awakino tunnel;
- The route is especially vulnerable to interruption and closure by slips and rockfalls; and
- With only very limited alternatives, the route has poor resilience, needing to be closed or severely restricted during events including breakdowns, land slips or crashes.

Fundamentally, this section of SH3 is of an inadequate standard in relation to its importance and function.

The alternative of the SH43 connection via Whangamomona and on to reach SH4 at Taumarunui is severely limited and ill-suited to commercial loads. HPMV are not permitted on SH43.

² NZ Transport Agency Overdimension Vehicle Route Maps, July 2007

3 Travel Patterns

3.1 Existing Travel Demands

The current 2016 weekday travel demands being carried on the principal corridors through Taranaki, measured in vehicles per day are shown in Figure 3.1.



Figure 3.1 – 2016 Daily Travel Demands³

As is shown, the wider regional traffic volumes being carried on SH3 to the east of New Plymouth total some 7200 vpd at Waitara, and 2300 vpd at Mt Messenger and Awakino travelling to and from the north.

³ NZTA State Highway Traffic Count Data 2016

3.2 Daily Patterns

The daily and hourly volumes using SH3 at Mt Messenger through the seven days of a typical week as measured in May 2017 are shown in Figure 3.2.

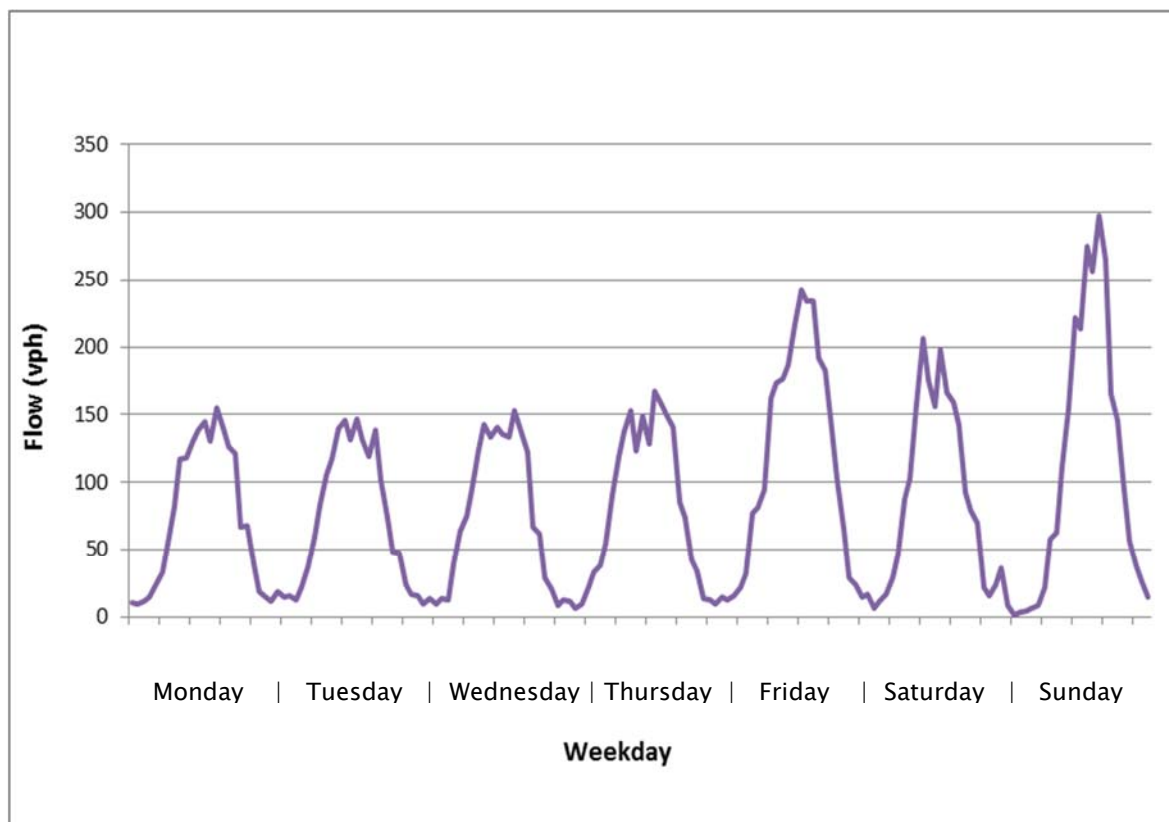


Figure 3.2 –Daily and Hourly Volumes SH3, May 2017⁴

As is shown, weekday daytime volumes at Mt Messenger are generally in the range 130 to 150 vph. The busiest weekday hour of 242 vph was recorded at 3.00pm on the Friday. Weekend flows range from 230 to 270 vph through the middle periods of the day and up to a peak of 297 vph at 3.00pm on the Sunday afternoon.

Such patterns amounting to a vehicle every 20 to 30 seconds are typical of a modestly loaded main regional connector. The particular pressures at Mt Messenger arise from the combination of a sharply curving alignment, limited forward visibility and steep grades.

3.3 Ongoing Growth

The long-term pattern of ongoing traffic growth as recorded at the permanent traffic counting station at Tongaporutu through the course of the past 40 years is shown in Figure 3.3.

⁴ NZTA Traffic State Highway Traffic Count Data, May 2017

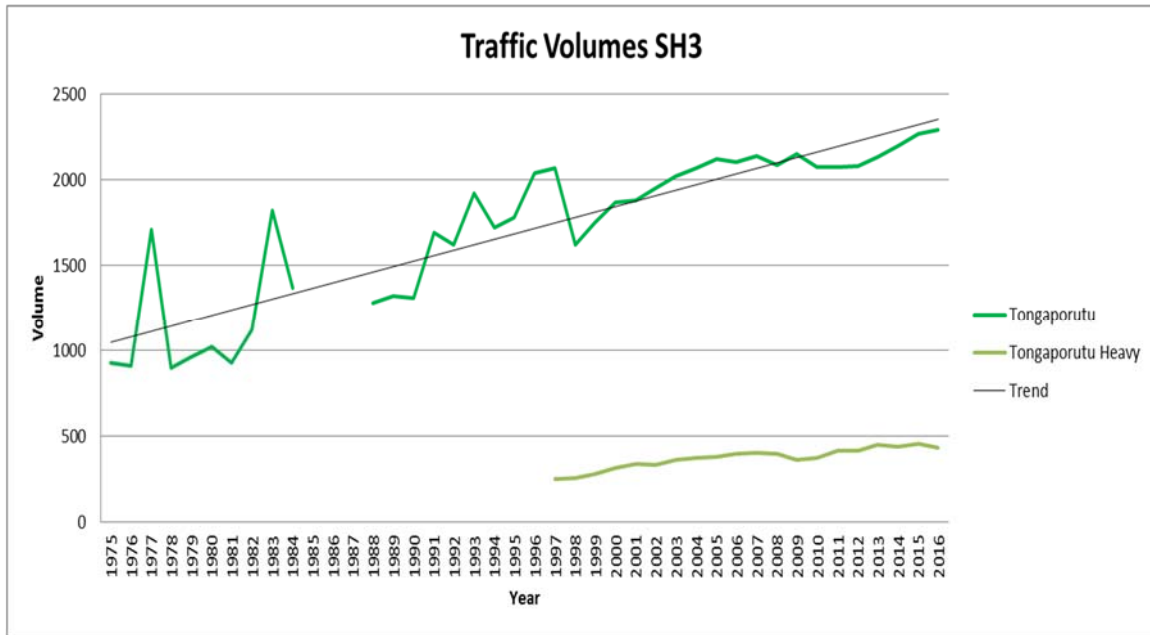


Figure 3.3 – 40-year pattern of Traffic Growth 1975 – 2015 SH3 at Tongaporutu⁵

The data shows the annual average daily volume of traffic using the Mt Messenger portion of SH3 having increased over the past 40 years at a long term and ongoing rate of some 3% per annum.

3.4 Heavy Truck Movements

Figure 3.3 also shows the included number of heavy truck movements using this Mt Messenger portion of the SH3 route through the years from 1997.

As shown, the route is currently carrying an average 460 heavy truck movements a day. The majority of these movements are long-distance journeys carrying commercial loads and freight to and from Taranaki to destinations across the Waikato, and in Hamilton, Tauranga and Auckland.

As the counts indicate, these truck volumes have approximately doubled over the last 20 years, reflecting that a principal pressure on serving this ongoing growth stems from the increasing numbers of heavy trucks.

These patterns reflect the key importance of this SH3 route in connecting the wider areas of Taranaki and its rural and industrial production through to the Waikato and the key economic and transport hubs of Hamilton, Tauranga and Auckland.

⁵ NZTA State Highway Traffic Count Data, 1975 – 2017

4 Regional Land Transport

The Land Transport Management Act 2003 (LTMA), has required that the earlier Regional Land Transport Strategy and Regional Land Transport Programme be consolidated into the new Regional Land Transport Plan. This is required to contribute to the purpose of the LTMA (which seeks ‘an effective, efficient, and safe land transport system in the public interest’⁶) and is also required to be consistent with the Government Policy Statement on Land Transport (GPS)⁷.

The vision sought by the RLTP is the provision of

“A safe, effective and efficient land transport network, integrated across the whole of the transport system, which enables Taranaki to thrive and to lead a sustainably prosperous New Zealand.”⁸

In this respect, and while the RLTP considers Taranaki to be generally well connected and serviced from an infrastructural perspective relative to its size and population, it goes on to identify particular roading and transport infrastructure issues that require attention. It particularly notes those that must be addressed if Taranaki is to meet its current and anticipated growth and development needs, and continue to significantly contribute to national growth and productivity.

4.1 Forward Challenges

The RLTP summarises the forward challenges for land transport in Taranaki as:

- 1 Ensuring a regionally and nationally integrated transport network;
- 2 Facilitating growth and economic development;
- 3 Reducing the safety risk on Taranaki’s transport network;
- 4 Maintaining and improving accessibility and travel options throughout the region;
- 5 Ensuring network resilience and responsiveness in the context of internal and external pressures;
- 6 Reducing negative environmental and community impacts arising from transport; and
- 7 Addressing these issues in an environment of constrained funding and affordability yet rising costs.

These challenges are identified as taking into account the national issues and priorities set out in GPS 2015/16–2024/25, and the New Zealand Energy Efficiency and Conservation Strategy 2001.

Under the heading of providing for forward growth and positive economic development, the RLTP notes reliance on the transport network needing to be able to move people and goods to, from and within the region safely, reliably and efficiently and without unnecessary

⁶ LTMA, s3.

⁷ LTMA, s14.

⁸ RLTP, Section 4.1, p29

restrictions or delays at all times – both now and in the future. The levels of service required to maintain the network, combined with the topographical nature of Taranaki and the fact that there are only two state highway routes entering/leaving the region (SH3 north and south and SH43 east), are noted as meaning that investment in maintenance and renewals of state highways is of major interest.⁹

The goal of ensuring an integrated network and taking a one-network approach includes managing and developing the transport network in a way that provides for all modes of transport in an integrated manner.

Facilitating growth is particularly described as including a focus on ensuring inter-regional reliability and route security through an effective and an efficient strategic road and rail corridor, particularly between inter-regional ports. This extends to improving the efficiency and effectiveness for all modes and enabling more freight on fewer trucks through the current national HPMV and 50MAX programmes. Such goals require higher standards and better roads.

4.2 Regional Growth

Since 2001, the New Plymouth District has seen a significant increase in population, reflecting the wider regional changes to the economic landscape. Its current population of approximately 75,000 is expected to grow to approximately 83,000 during the next 10 years.

In looking forward, the Venture Taranaki Trust (VTT) economic development agency has identified the range of growth industries contributing to Taranaki’s ongoing growth. The major entries for 2015 and 2016 include:¹⁰

Industry	Annual Growth
Forestry and Logging	+29.9%
Meat and Meat Product Manufacturing	+6.1%
Dairy Product Manufacturing	+5.5%

These industries are seen as vital to Taranaki’s future. All have a key role in underpinning Taranaki’s forward economic strength and well-being, and all have an associated reliance on SH3 providing an assured, dependable, efficient and appropriately resilient road transport service in delivering their goods and products across the North Island and through to the major hubs at Hamilton, Tauranga and Auckland.

The ability to deliver that assurance is underpinned by enhancing the safety, resilience and journey time reliability of travel on the Mt Messenger length of SH3.

⁹ RLTP, Section 4.3, p29

¹⁰ Venture Taranaki, Infometrics Taranaki Region Economic Profile, Growth Industries 2015 – 2016
<https://ecoprofile.infometrics.co.nz/taranaki%20region/Gdp/GrowthIndustries>

4.3 Economic Growth

The RLTP further points to Taranaki's reliance on its natural and physical resources for its social and economic wellbeing. Farming and other land-based activities continue to play a prominent role with economic growth in Taranaki having been consistently above the national growth rate, and this is projected to continue.¹¹

As key elements within these ongoing trends and forward prospects, agriculture and forestry are identified as significant contributors to the region's economy together with their associated transport demands involving increasing numbers of heavy vehicles servicing these industries.

Within both the dairying industry and sheep/beef industry, amalgamation trends have resulted in a concentration of the processing facilities that has in turn significantly altered the pattern of rail and heavy traffic road use involved in these industries together with associated dependence on the availability and performance of the region's land transport network.

Each of these elements has an associated reliance on the availability and performance of the SH3 connections enabling dependable and efficient connections to and from the major economic hubs in the Waikato, and at Hamilton, Tauranga and Auckland.

4.4 Regional Network

Within Taranaki itself, the need for and reliance on a land transport system that is robust, responsive to changing needs, and resilient to external influences relies principally on the availability and performance of the regional state highway network, shown in Figure 1 included earlier.

In this respect, the overall national strategic direction for land transport is to drive improved performance from the land transport system by focusing on economic growth and productivity, road safety, and value for money.

For the present however, the limitations needing to be addressed within the Mt Messenger length of SH3 stem from the inadequacies of the road alignment itself, including its sharp curves, poor forward visibility and steep grades combined with its vulnerability and lack of resilience to the continuing series of incidents that characterise this portion of the inter-regional route.

4.5 Inter-regional Links

Being positioned at the western edge of the North Island, Taranaki has a significant reliance on the availability and performance of its associated inter-regional transportation links with Waikato leading through to Hamilton, Tauranga and Auckland to the north, and similarly through to the Manawatu-Whanganui region to the east and south-east.

The RLTP has recognised that:

¹¹ Taranaki Industry Projections 2013–2036, November 2014

The region’s transport opportunities, problems and risks do not stop at regional or district boundaries. Co-operation with adjoining local authorities is imperative in ensuring that a consistent and co-ordinated approach is taken to the management of any land transport networks that cross regional boundaries. In Taranaki this means developing a co-ordinated approach with the Horizons Regional Council and Waikato Regional Council, as well as other regions along the western seaboard for coastal matters.¹²

Figure 4.1 shows the location of Taranaki’s strategic cross-boundary transport links and particularly including SH3 leading to the north through Mahoenui and Pio Pio in the Waikato and on to the key economic hubs of Hamilton, Tauranga and Auckland.



Figure 4.1 –Inter-regional corridor links¹³

The performance of each of these inter-regional links is recognised as important to the continuing development of the entire Taranaki region. In this respect, the objectives determined for the Project are particularly appropriate as they deliver better safety and

¹² RLTP, Section 2.8, p17

¹³ RLTP, Section 2.8, p17

performance outcomes, enhanced resilience and reliability together with a positive contribution to local and regional growth, while managing associated cultural, social, land use and environmental impacts.

4.6 Regional Programme

Within the wider goals, the RLTP itself has prioritised the ‘regional significance’ of projects with reference to the following:

Policy for determination of ‘significant activities’ within the Plan requiring prioritisation:

For the purpose of Section 16(3)(d) of the Act, a significant activity is any of the following activities put forward by an approved organisation:

- Roading improvement projects on state highway and/or local road networks that have significant network, economic, safety and/or land use implications.
- Significant improvement activities to services, infrastructure and/or administration of public transport.
- Significant improvement activities that would encourage or facilitate the use of alternative land transport modes such as walking or cycling.
- Significant activities, including studies, which relate to inter-regional connections and/or require cooperation with other regions.
- Significant activities relating to road safety.
- Activities which make a significant contribution to the objectives of the Plan.
- Any other activity that the Regional Transport Committee considers to be significant.¹⁴

Under these headings, the SH3 Mt Messenger Project is appropriately ranked as a ‘regionally significant’ activity in terms of the improvement it brings to the regional state highway network.¹⁵

4.7 RLTP Key Projects

Within the RLTP programme, prioritisation of intended road improvement projects is undertaken by rating across strategic fit, effectiveness, and the benefit cost appraisal.

Within this process, two regionally significant projects are particularly identified, being the SH3 Normanby Overbridge Realignment and the upgrading intended within the SH3 Mt Messenger to Awakino Gorge Corridor.

Both are prioritised and funded under the NZ Transport Agency’s Accelerated Regional Roading Package (ARRP), and both are ranked within the RLTP as having inter-regional significance.¹⁶

Construction of the Normanby Overbridge project began in March 2015 and is now complete. Tenders have been invited for the Awakino Gorge portion of the SH3

¹⁴ RLTP, Chapter 5, p40

¹⁵ RLTP, Section 5.1, p44

¹⁶ RLTP, Section 5.6, p50

improvements. For the Mt Messenger Bypass project, the Alliance has been appointed by the NZ Transport Agency to complete investigations, designs and associated consent applications, and to commence construction once all required approvals are in place.

4.8 State Highway 3 North

The RLTP ranks the priority inter-regional issue for the Taranaki region as being improving the future route efficiency, safety and reliability of SH3 travelling north over Mt Messenger, through the Awakino Gorge to Te Kuiti, Hamilton and beyond.

In discussing the wider importance of the regional network and its external connections, the RLTP says:

State Highway 3 North:

The priority inter-regional issue for the Taranaki region is the future route efficiency, safety and reliability of State Highway 3 travelling north over Mt Messenger, through the Awakino Gorge to Te Kuiti, Hamilton and beyond. Although located largely outside the Taranaki region, this section of the state highway network has a history of road closures due to its surrounding topography and limited access points. This route is also strategically important to the Taranaki region as the principal arterial transport route between the Taranaki and Waikato regions, and is vital to Taranaki's industry and commerce for access to northern markets and export outlets, for tourism linkages, and also for access to health, cultural and other services. An economic assessment of the strategic value of State Highway 3 between Taranaki and the Waikato region (undertaken by Venture Taranaki in 2012) confirmed the importance of this route and found that there is a case for greater priority to be placed on network improvement works on this section of the state highway network.¹⁷

The route also provides a valuable alternative when both SH1 and SH4 are closed because of inclement weather, as has occurred recently.

The upgrading to be undertaken within this current Project is the next step in both securing and ensuring the future dependability and performance of SH3 in serving Taranaki's needs.

4.9 Regional Outcomes

The RLTP addresses and particularly identifies each of the key transport issues for the Taranaki region, and sets out the region's land transport objectives, policies and measures through the coming decade.

Within this assessment, it ranks the Mt Messenger Project as contributing positively to each of the following regional policies:¹⁸

¹⁷ RLTP, Section 2.8, p18

¹⁸ RLTP, Section 5.3, Table 3, p44

2.Facilitating growth and regional development	
G1	Removal of constraints to growth in freight, tourism and people movement, particularly on inter-regional corridors.
G2	Focus on effective and efficient strategic road and rail corridors, particularly between inter-regional ports.
G3	Ensure those roads in the region serving tourism and the productive sector are fit for purpose.
3.Reducing the safety risk on Taranaki's transport network	
S1	Promote infrastructure improvements on strategic corridors.
S3	Support the aims of Roadsafe Taranaki.
S4	Support the aims of Safer Journeys.
4.Maintaining and improving accessibility and travel options throughout the region	
A1	Protect and enhance the accessibility of the land transport system to all people in the region to enable community participation and ensure appropriate access to services.
5.Ensuring network resilience and responsiveness in the context of internal and external pressures	
R1	Improve the resilience of transport infrastructure.
R2	Protect routes with lifeline functions.
7. Addressing these issues amongst constrained funding and affordability, and rising costs.	
F1	Maximise efficiency and optimisation of existing capacity across the transport system.

In this regard, the transportation improvements brought by the Project will make a significant contribution to the ongoing social, investment and economic development of the wider community. All are directed at supporting and advancing Taranaki's forward strategic vision for the future.

5 Freight Demands

The Ministry of Transport study of freight demands published in 2014 includes a comprehensive assessment of the total national inter-regional freight demands being transported by road throughout the length of New Zealand. More recently, the NZ Transport Agency's published Research Report 608 has a focus on the economic impacts of connectivity, and includes details of the national pattern of inter-regional freight haulage by road, repeated here as Figure 5.1.

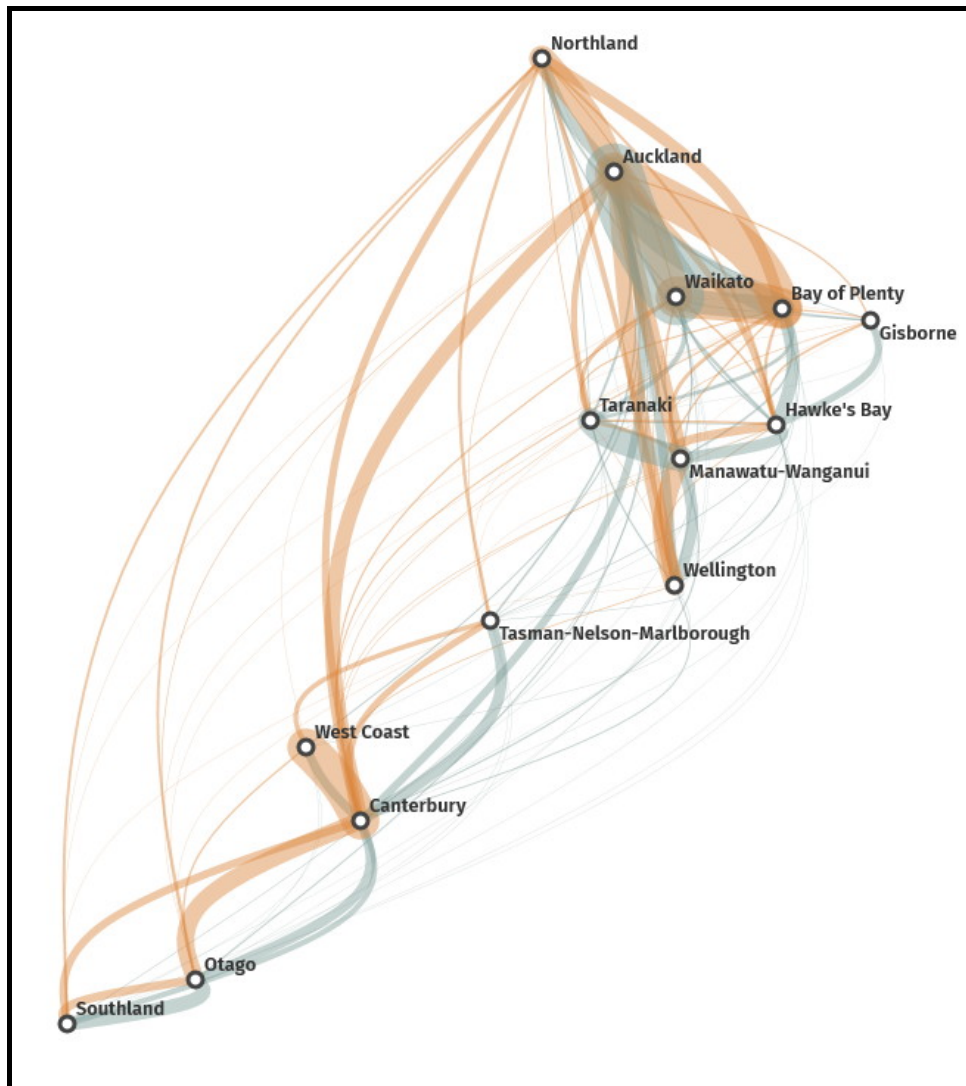


Figure 5.1 – National Freight Haulage by Road¹⁹

As is shown, SH1 has an obvious importance as the mainline freight route on the long-haul route running almost the full length of both the North and South Islands. There is a similar emphasis on the SH2 and SH29 route between Auckland and Tauranga serving the Bay of Plenty.

¹⁹ NZ Transport Agency Research Report 608, the Economic Impacts of Connectivity, 2017, p134

Each of these routes in turn relies on their associated regional connections to and from the east and west coasts.

For Taranaki, the SH3 connection to and from the north is clearly important to Taranaki's prosperity, both in serving present demands and in providing for future growth. These particular freight haulage demand patterns to and from Taranaki are illustrated in Figure 5.2.

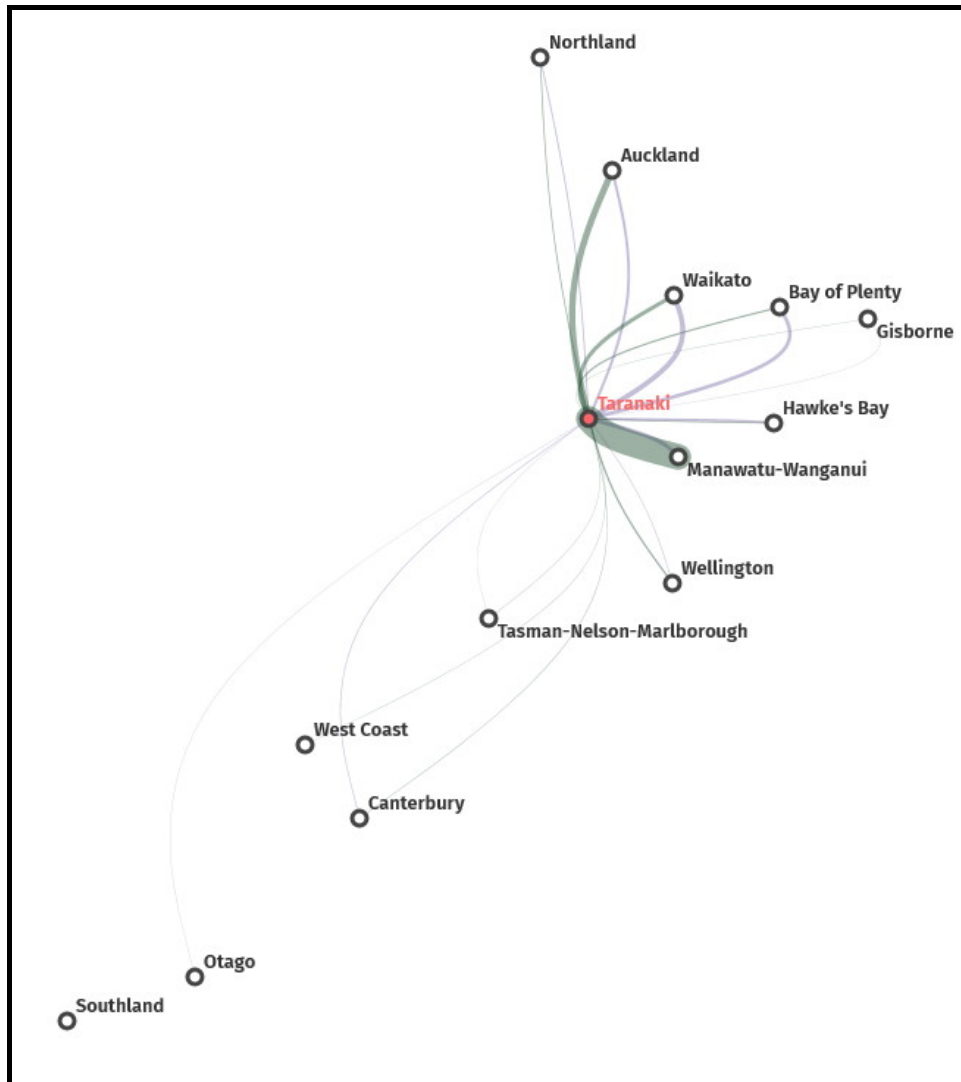


Figure 5.2 – Freight Demands by Road to/from Taranaki²⁰

While the routine movement of freight between Taranaki and the immediately adjoining Manawatu and Whanganui regions is an obvious focus of local truck movements, the next heaviest volume of inter-regional haulage in and out of Taranaki is being handled via SH3 and Mt Messenger to and from the north.

The present heavy vehicle volumes using SH3 at Mt Messenger average a reported total of some 460 trucks/day. At an average 12.1 tonnes per truck, this amounts to an annual total

²⁰ Sourced directly from the NZ Transport Agency based on analysis carried out for Research Report 608

of some 2,000,000 tonnes being carried to and from the north for the year 2016. Such movements underpin and are key to the wider patterns of growth and industry that together shape Taranaki's prosperity and forward outlook.

It is important to the wider community that this is able to be done safely and efficiently.

6 Strategic and Functional Importance

6.1 Availability and Performance

As noted, SH3 serves as Taranaki's strategic cross-boundary transport link leading to the north through Mahoenui and Pio Pio in the Waikato and on to the key economic hubs of Hamilton, Tauranga and Auckland. Its availability and performance is important to the growth and economic strength of all of the Taranaki region.

The existing Mt Messenger portion of SH3, with its steep grades, narrow width and difficult winding alignment impose limitations and costs in terms of both its safety and its performance. Similar shortcomings are evident at the Awakino Gorge. In addition, there are localised areas with safety shortcomings which have been identified along SH3 between Awakino and Mt Messenger. Collectively, these concerns are being addressed through three separate packages of work as part of the overall programme of works for the SH3 corridor.

Further beyond these two sections, SH3 has a more adequate alignment and is able to operate normally and at an acceptable level of service. This is in contrast to the inadequacies at and between Mt Messenger and the Awakino Gorge where the long-standing deficiencies are in contrast to the strategic and functional importance of the route to the wider economic strengths of the Taranaki region.

The principal problems needing to be overcome at Mt Messenger include:

- The existing narrow lanes, absent shoulder and poor geometric alignment resulting in a difficult and unforgiving driving environment where vehicle breakdowns and crashes result in significant delays;
- With the difficult alignment and narrow widths amongst steep mountainous terrain, the occurrence of rock falls and landslips similarly cause noticeable delays;
- The route also has two narrow tunnels, at Mt Messenger and Awakino that physically limit the maximum size of loads able to be carried and making two-way use of the tunnels difficult; and
- There are significant lengths with no or only limited shoulders that allow few opportunities for passing with resultant frustration and delays and a poor driving experience.

Being the only direct arterial highway connection to and from the north, improving the performance, dependability and resilience of the Mt Messenger and Awakino Gorge lengths of SH3 benefits the wider areas of Taranaki, and particularly to the growing proportions of heavy traffic movements carrying freight to and from the key economic and transportation hubs at Hamilton, Tauranga and Auckland.

Accordingly, the principal matters to be delivered within this Project at Mt Messenger centre on enhanced safety, an increased level of dependability and resilience, and an improved journey experience for all users.

6.2 Community Expectations

An objective appraisal of the community expectations as to the availability of SH3 at Mt Messenger is assisted by application of the findings and recommendations of the NZ Transport Agency Research Report 614.²¹

With reference to the Resilience Decision-Making Support Tool repeated on the next page, assessment can be made of the contribution that SH3 at Mt Messenger makes by way of:

- The provision of a principal highway connection to major population centres;
- Access to and from significant economic hubs at Hamilton, Tauranga and Auckland;
- The level of service provided to users;
- The standard of service provided to heavy vehicles;
- The safety provided to all users; and
- Being able to reduce a reliance on the use of lesser alternative routes.

Each of these matters is considered in terms of its economic, social, cultural and environmental contributions. The rating given under each of these headings is then determined by considering the consequences of the Mt Messenger portion of the route being closed for varying periods ranging from an hour through to four hours, one day, five days, a month and longer than six months with the consequences under each being ranked against a five point scale of very low, low, medium, high or very high. The resulting recovery time objective as determined under each of the headings is then in turn compared against each of the community expectations.

The appraisal shows that considered under these various headings, and while some in the community may tolerate a temporary closure of SH3 at Mt Messenger requiring use of the alternative routes for one or perhaps two days, for commercial users and heavy trucks, the prime expectation is that the road should be able to be cleared so that normal service is able to be resumed within four hours.

The outcomes from the Project deliver against each of these community expectations.

²¹ NZ Transport Agency Research Report 614, Establishing the value of resilience, 2017

Consequence Criteria (Click to view)

vl very low	l low	m medium	h high	vh very high
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Service / Function	#	Consequence of service disruption over time								RTO # of days	MBCO (if different than BAU)	MAO # of days	Figure
		1 hr	4 hr	1 day	2 days	5 days	1 mth	>6 mths	Comments				
Principal highway connection to major population centres	1	Economic	vl	l	m	h	vh	vh	vh	Short closures are tolerated. Longer outages bring social & cultural impacts. Considered the region can cope with a few days of alternate route incurs added wear & fuel costs.	2.00	30.0	Principal highway connection to major population centres
		Social	vl	l	m	h	vh	vh	vh				
		Cultural	vl	vl	l	m	h	vh	vh				
		Environmental	vl	l	l	m	m	h	h				
Access to and from significant economic hubs at Hamilton, Tauranga and Auckland	2	Economic	vl	l	m	h	vh	vh	vh	Reliance on connections to & from north. Longer closures incur social impacts. It is longer closures incur loss of cultural linkages. It is the length of closed and alternate routes.	2.00	5.0	Access to and from significant economic hubs at Hamilton, Tauranga and Auckland
		Social	vl	l	m	h	vh	vh	vh				
		Cultural	vl	vl	l	l	m	h	h				
		Environmental	vl	l	m	m	h	vh	vh				
Level of service available to users	3	Economic	l	m	m	h	vh	vh	vh	SH3 significant to Taranaki economics. Existing poor quality impedes Waikato links. Existing poor quality limits cultural exchange. The steep grades & low LOS has environmental costs.	2.00	30.0	Level of service available to users
		Social	vl	l	m	h	vh	vh	vh				
		Cultural	vl	l	l	l	m	h	vh				
		Environmental	l	m	h	h	vh	vh	vh				
Standard of service to heavy vehicles	4	Economic	l	m	h	vh	vh	vh	vh	Linkage important to Taranaki economy. HCV use of alternate route brings social costs. Truck diversion little direct effect on cultural issues. HCV's on alternate route has environmental costs.	0.16	2.0	Standard of service to heavy vehicles
		Social	l	m	m	m	h	vh	vh				
		Cultural	l	m	m	m	m	h	h				
		Environmental	l	m	h	vh	vh	vh	vh				
Safety	5	Economic	l	m	h	vh	vh	vh	vh	Extra length & worse geometrics of alternate route exposes users to additional safety risks with together with associated community impacts.	1.00	2.0	Safety
		Social	l	m	h	vh	vh	vh	vh				
		Cultural	l	l	l	m	m	h	h				
		Environmental	l	m	h	h	vh	vh	vh				
Reliance on poor alternative routes	6	Economic	l	m	h	vh	vh	vh	vh	The additional economic, social, cultural and environmental impacts brought by use of the alternate route are directly proportional to the time the diversion remains in place.	1.00	2.0	Reliance on poor alternative routes
		Social	l	m	h	vh	vh	vh	vh				
		Cultural	l	m	h	h	vh	vh	vh				
		Environmental	l	m	h	vh	vh	vh	vh				

7 Operational Performance

7.1 Availability and Performance

The improved availability and performance of the SH3 northern connection joining Taranaki through to the Waikato and on to Hamilton, Tauranga and Auckland is a key outcome in this upgrading Project.

The upgrading is directed at ensuring the connectivity of SH3, improving its reliability, and securing its resilience. Within these headings:

- Connectivity has to do with ensuring the overall provision and expected routine availability and performance of the route including a reliance on its typical travel times;
- Reliability has to do with variability in the levels of performance provided to users in terms of the route being able to meet and fulfil travellers' expectations as to the levels of service and dependable travel times. These characteristics of a route include acknowledgement of the numbers of heavy vehicles and the effects of steep grades, and the availability or otherwise of passing lanes; and
- Resilience has to do with the dependability of the route and the frequency of occurrences when use of the road is restricted or closed because of crashes, or because of weather related events such as flooding, or because of physical occurrences such as slips or rockfalls, including due to earthquakes.

Each of these matters is assessed in the next sections of this report.

7.2 Customer Service

In 2013, the NZ Transport Agency adopted a national set of policies and procedures directed at establishing a recognisably consistent standard of dependability and performance across all of New Zealand's national road network.

The adoption of these One Network Road Classification (ONRC) standards centred around ensuring consistent levels of customer service across all elements of the network signalled a major shift in the road management and investment decision making priorities at both national and regional levels. The changes were directed at placing the customer as the central focus of every investment decision.

The adopted classification is shown in Figure 7.1.

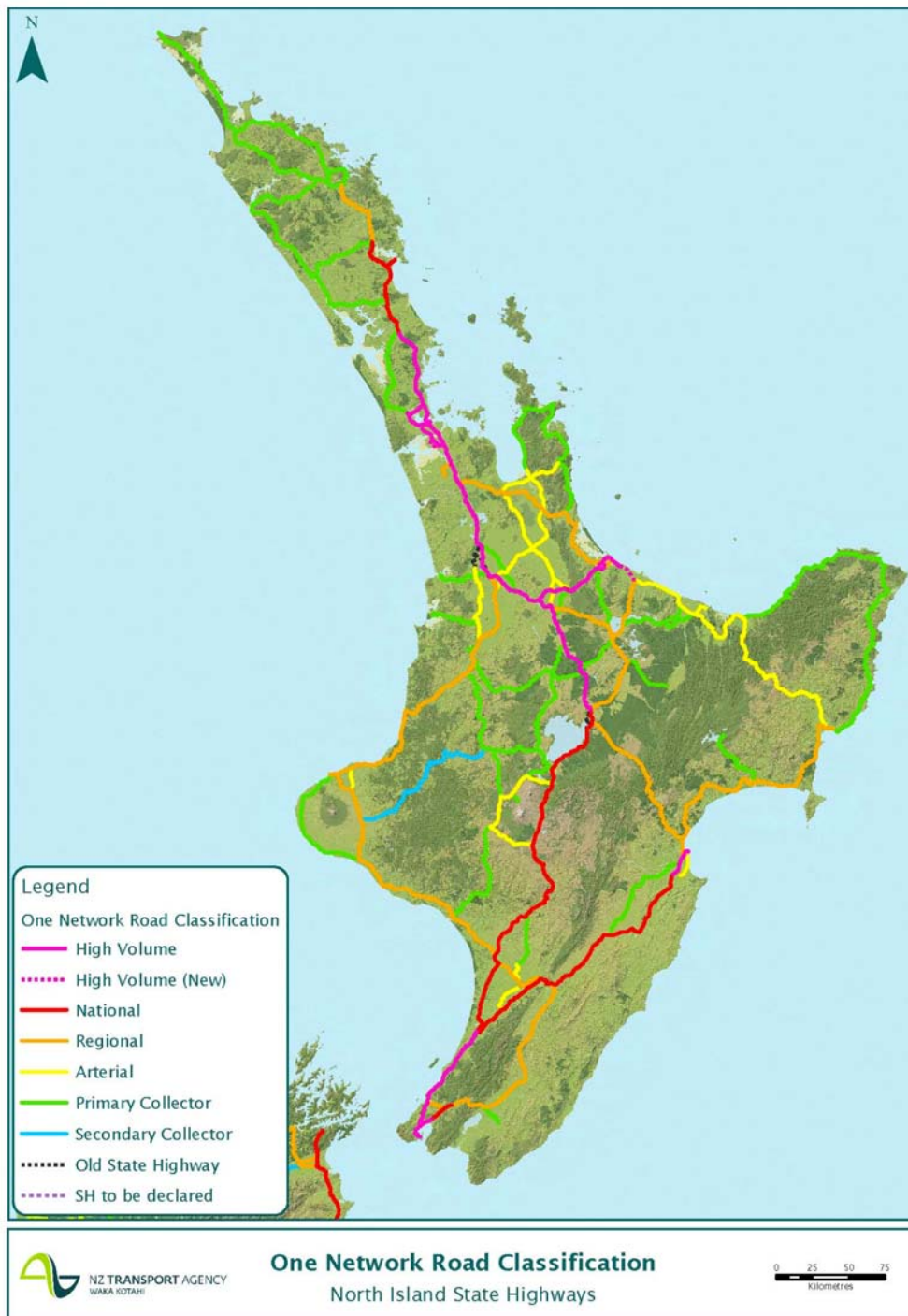


Figure 7.1 – North Island One Network Road Classification²²

The ONRC divides New Zealand’s roads into six categories based on how busy they are, whether they connect to important destinations, or are the only route available. The categories comprise:

²² NZTA, ONRC Classification of State Highways – North Island
<https://www.nzta.govt.nz/assets/Road-Efficiency-Group-2/docs/onrc-north-island-map.pdf>

National

These are the roads that make the largest contribution to the social and economic wellbeing of New Zealand by connecting major population centres, major ports or international airports and have high volumes of heavy commercial vehicles or general traffic.

Regional

These roads make a major contribution to the social and economic wellbeing of a region and connect to regionally significant places, industries, ports or airports. They are also major connectors between regions and in urban areas may have substantial passenger transport movements.

Arterial

These roads make a significant contribution to social and economic wellbeing, link regionally significant places, industries, ports or airports and may be the only route available to some places within the region (i.e. they may perform a significant lifeline function). In urban areas they may have significant passenger transport movements and numbers of cyclists and pedestrians using the road.

Primary Collector

These are locally important roads that provide a primary distributor/collector function, linking significant local economic areas or areas of population. They may be the only route available to some places within the region and in urban areas they may have moderate passenger transport movements and numbers of cyclists and pedestrians using the road.

Secondary Collector

These are roads that provide a secondary distributor/collector function, linking local areas of population and economic sites and may be the only route available to some places within this local area.

Access

These are all other roads. Low volume roads within this category fall into the low volume subset.²³

Within these classifications, the regional road category would usually be expected to carry volumes exceeding the 'usage' levels under one or more of those listed under the headings of Typical Daily Traffic, Heavy Commercial Vehicles or Buses, or Urban Peak, while also meeting at least one of the accompanying 'Economic and Social' criteria.

Under 'usage' and by serving its primary 'Movement of People and Goods' purpose, the Mt Messenger length of SH3 is recognised within the 'Regional' category of the national network in being an arterial road linking centres of more than 30,000 population (New Plymouth 74,000, Hamilton 142,000), and carrying more than 400 heavy commercial vehicles per day (460 HCV/day). Under the accompanying 'Economic and Social' heading, the route also exceeds the associated connectivity criterion of 'linking remote regions'.

²³ NZTA, One Network Road Classification, Functional Classification, March 2013

In terms of its operational performance, this recognition is then in turn able to be used in then determining the standard of reliability that the SH3 route at Mt Messenger is expected to meet in its service to businesses and the wider community.

7.3 Reliability

Journey reliability is important for all road users, and particularly for those businesses that need to have confidence in the network so that their choice of transport maximises their productivity.

In this respect, the reliability of the highway performance provided to users can impact on business confidence and underpin economic growth within a region. On the other hand, experiencing an inconsistent level of network reliability reduces the choices for locating a business, and reduces inter-regional competitiveness.²⁴

In determining the expected levels of performance for each of the elements of the national highway network, the NZ Transport Agency has developed a national assessment tool centred on setting the levels of dependability and reliability to be expected for a route.

For SH3 at Mt Messenger, being classed as a Regional Arterial where there is no suitable alternate route, the performance expected of the highway in terms of the level of dependability and reliability to be provided for users is as shown in the following table:

Table 7.1 – Regional Arterial with no suitable alternate route²⁵

Outage	Frequency		Assessment
2 – 4 hrs	0.5 pa	once in 2 years	Acceptable
5 – 12 hrs	0.05 pa	once in 20 years	Acceptable
13 hrs – 2 days	0.025 pa	once in 40 years	Acceptable
3 – 5 days	0.025 pa	once in 40 years	Acceptable
6 – 14 days	0.1 pa	once in 10 years	Not Acceptable
15 – 49 days	0.02 pa	once in 50 years	Not Acceptable
50 – 120 days	0.2 pa	once in 20 years	Not Acceptable
more than 120 days	0.02 pa	once in 50 years	Not Acceptable

As shown in this table, the reliability expectations for SH3 at Mt Messenger are such that a two to four-hour closure would be acceptable no more than once in every two years, a five

²⁴ NZTA, Delivering State Highway Resilience, 2014, p10

²⁵ NZTA, Customer Levels of Service Assessment, June 2017

to twelve hour closure no more than once in 20 years, and a 13 hour to five day closure no more than once in forty years.

In examining the present performance of SH3 at Mt Messenger, the detailed maintenance contractor records²⁶ show that, during the period 2011 to 2017, the highway has been closed seven times as a result of events occurring on SH3 within this local length where the improvements are to be undertaken at Mt Messenger. The details are summarised as follows:

Table 7.2 – Details of road closures

#	Date	Time	Location	Event	Duration of Closure
1	25 Oct 2011	12.30	300 m south of summit	Car v car crash	2:03 hrs
2	5 Sept 2012	19.00	400 m north of tunnel	Car v car crash	4:50hrs
3	15 Oct 2013	08.43	450 m north of tunnel	Slip	8:46 hrs
4	20 Jun 2015	17:13	750 m north of tunnel	Slip	16:53 hrs
5	27 Oct 2015	09.01	500 m south of summit	Tanker rolled	5:13 hrs
6	8 Jan 2016	14.29	4.5 km south of summit	M/bike v truck crash	2:35–4:00 hrs
7	10 Apr 2017	14:47	300 m north of summit	Crash	0:34 hrs ²⁷

Of these events, four were because of crashes, two because of slips that occurred following heavy rainfall, and one when a tanker rolled on a sharp curve. All reflect the current issues with safety, reliability and resilience of the existing Mt Messenger section of SH3, brought about by the problems outlined in Section 7.1.

When considered against each of the assessment criteria, records for the full reported years 2011 to 2016, show the rated route outages have been as follows:

²⁶ Records made available by Opus from TREIS (Traffic and Road Event Information System).

²⁷ Note this 34-minute closure is shorter than the 2–4 hour category used in the assessment table that follows and has been excluded accordingly.

Table 7.3 – SH3 at Mt Messenger

Outage	Expected Performance	2011–2016 Performance		Assessment
2 – 4 hours	0.5 pa	0.400 pa	two in 5 years	Acceptable
5 – 12 hours	0.05 pa	0.600 pa	three in 5 years	Not acceptable
13 hrs – 2 days	0.025 pa	0.200 pa	once in 5 years	Not acceptable
3 – 5 days	0.025 pa	0.000 pa	none in 5 years	Acceptable

It is noted that the four events listed as having taken more than four hours to clear particularly reflect the practical difficulties brought by the remoteness of this location.

The inconvenience and widespread disruption brought by the two-day closure resulting from the most recent August 2017 slip further to the north also serves as a reminder of Taranaki’s reliance on this portion of SH3.

As the data shows, the closure rates being experienced in the 5 – 12 hours and 13 hrs – 2 day categories of performance within this Mt Messenger length of SH3 have been up to twelve times greater than should be delivered by way of the dependability performance expected for a national route classed as a Regional Arterial. This poor level of reliability experienced over recent years is unacceptable for SH3.

The new 6km section of two lane highway will bypass the existing steep, narrow and winding section of SH3 at Mt Messenger in a way that will mitigate these events and minimise highway closures. Based on the analysis presented, the Project will significantly improve reliability on this section of SH3.

7.4 Trucking Operations

The wider state highway network provides the main routes for the movement of freight by road. As a consequence, establishing efficient and dependable travel times is important in supporting the performance of the freight sector and to help reduce the costs of transport. A key component of this is freight time reliability in which respect a higher level of dependability enables the best and most effective use to be made of the assets used.

In this regard, it is noted that while there may be a range of travel times for particular lengths of highway, this may not always be associated with journey time unreliability but as an overall measure can reflect the wider operating characteristics of particular vehicles and loads, and the specific nature of the route itself. For lengths involving steep gradients as currently occurs at Mt Messenger, laden vehicles typically travel much slower than those travelling empty. While this produces a greater level of travel time variability, the provision of flatter grades and better passing opportunities enables the differences for particular vehicles to be much lower with a corresponding gain in reliability.²⁸

²⁸ NZTA Wider Impacts for Strategic Priority Corridors, 2012, p41

Another particular benefit of the Project stems from its contribution towards bringing trucking depots in Auckland into the horizon of the 5½ hour maximum driving time that commercial drivers are required to observe between breaks. As a further operating requirement, commercial drivers are also not permitted to drive more than a total of 13 hours a day.

Currently, the driving time between New Plymouth and the Wiri depots in Auckland is more than this 5½ hour limit, which requires that drivers stop and take a break during their trip. For the majority of such trips, this requirement means that the round trip is beyond the limit of the driving task able to be served by a single driver.

While the gains brought with the SH3 upgrading at Mt Messenger will not by themselves bring the Auckland trucking destinations within the bounds of a single driving task, combined with the other continuing programme of highway improvements being made elsewhere along the route, they are a step further towards that goal. A 10% improvement in the overall average travel speed of heavy vehicles along the route will enable that goal to be accomplished.

8 Resilience

8.1 Regional Gains

Resilience is all important in delivering a highway service that is able to be relied upon in terms of its service to the regional community.

Across the national state highway network, resilience is the ability to proactively resist, absorb, recover from, or adapt to, disruption within a timeframe which is tolerable across the full range of social, economic, and environmental perspectives.²⁹

In this context, the benefits from improved resilience in relation to strategic transport benefits include:

- Enabling better disaster response and recovery and minimising disruption through better event preparedness, and fuller achievement of infrastructure standards;
- Better support for economic growth through improved public and business confidence in route availability, and improved availability of key routes; and
- Reduced risk of harm to road users as seen by the decreased number of incidents, and a reduced risk of harm.

The improved resilience brought by the Mt Messenger Bypass is directed at contributing across all of these matters.

8.2 Reducing Consequences

Improved resilience also brings the benefit of reducing the consequences of adverse events.

Such improved highway resilience assists critical services in providing disaster response and recovery support. The NZ Transport Agency carries a statutory duty as a lifeline provider to maintain its network to function at the fullest possible extent during and after an emergency. This duty implicitly requires a pro-active approach aimed at improving the resilience of the network so that critical services are available to support response and recovery.

Better reliability of highways assists business and economic growth and reduces the consequences of adverse events whether from crashes or mishaps, or from flooding, slips, rock falls and the like. Journey reliability is important for road users, particularly businesses that need to have confidence in the network so that their choice of transport maximises their productivity.

8.3 Minimising Disruption

In terms of minimising disruption, enabling better resilience is concerned with minimising the occurrence and effects of any event, natural or man-made, which interfere with the travel needs of users. Making improvements that give greater resilience is directed at making the network robust enough to withstand events; ensuring that alternative routes are

²⁹ NZTA, Research Report 614 Establishing the value of resilience, April 2017, p7

available to be used, being prepared to deal with events, and minimising the extent and nature of associated delays so that the highway network is returned to normal as soon as possible.

Applied to the Mt Messenger length of SH3, the Project provides for and improves the ability of the route to resist, absorb or recover from adverse events that would otherwise disrupt, limit or prevent its routine use by traffic. In this regard, the prime purpose of the route is to provide service to the wider regional communities in a manner acknowledging that its interruption reduces and interferes with the level of service that it otherwise exists to provide.

8.4 Redundancy

Redundancy refers to the ability of the location and associated wider network to be able to provide a 'functionally similar outcome at an equivalent or appropriately acceptable standard during lost or degraded levels of service on the principal route'.³⁰

In the event of a temporary closure of this length of SH3 at Mt Messenger necessitated by a crash, a slip or an adverse weather event, the only practicable remaining 'functionally similar' choice for travel from the north necessitates instead travelling from Hamilton through Taumarunui and then via the 'Forgotten World Highway' to Stratford and on to New Plymouth. Such a route would add some 1 hour and 20 minutes travel time to the journey. For trucks, this would add some three hours to the journey in each direction (noting that HPMV vehicles are not permitted on SH43).

A second but longer choice is to travel from Hamilton via SH4 to Whanganui and then up SH3 through Hawera and on to New Plymouth. Such a diversion would add some 250km and 3 hours and 10 minutes to the trip. For trucks, the added journey time would be around an extra 3¾ hours in each direction.

Because of the significant added time and distances involved, neither of these choices is regarded as enabling a practicable or appropriate level of temporary redundancy for SH3 at Mt Messenger.

The Project represents a response to this limited redundancy available to the Mt Messenger section of the SH3 route, which goes directly to enhancing the resilience of SH3 and the communities it serves.

8.5 Robustness

Robustness in this context refers to the ability of the state highway provisions in this location to withstand or accommodate disruption and continue to provide an acceptable level of service to users and the wider community.

In terms of the particular 'robustness' of Taranaki's state highway connections to and from the north including the principal economic hubs of Hamilton, Tauranga and Auckland, the support able to be provided within other highway options is clearly limited. Enabling

³⁰ NZTA, Delivering State Highway Resilience, 2014.

robustness expects that specific choices are available that are capable of ensuring that provisions are in place that anticipate and cope with closures

In the case of this section of SH3 at Mt Messenger, there is currently a particular reliance on the Police being able to be advised and on their subsequent actions in assessing what is needed and summoning assistance from other emergency services and maintenance crews as required.

These associated agencies then in turn deal with any injuries that may have occurred, recover the vehicles together with any loads involved, and clear the road so as to enable normal service to be restored. At Mt Messenger, the various radio and mobile phone blind spots that characterise this portion of the highway make such tasks more difficult. The extent and effectiveness of the response is then often reliant on the individual circumstances of the particular event, access to and the availability of equipment, and the versatility and resourcefulness of the people involved.

In almost all cases, the nature of the existing route is such that a full closure of the road is needed until the recovery and clearance is complete. In this regard, the existing narrow width, lack of forward visibility and torturous alignment means that the expectation of 'continuation of an acceptable level of service during the closure' is not possible. Following drivers are required to wait until the crash is cleared, any casualties dealt with, and the road freed enabling traffic movement to resume.

A particular benefit from the Mt Messenger Project centres on the increased performance and strengthened robustness that the work will bring to this length of SH3 with lessened risk and an extended ability to withstand disruption. Together these combine to provide enhanced resilience and more assured continuity of service to all users.

As a whole, the Project will result in enhanced resilience of SH3 at Mt Messenger brought about through improved levels of service, fewer incidents, better reliability available to businesses and the wider community, and an associated corresponding reduction in the risk of harm to all road users.³¹

³¹ NZTA, Delivering State Highway Resilience, 2014, p10

9 Regional Gains

The prime outcomes from this Project are recognised as important to New Plymouth and the wider Taranaki economy, not only in terms of better serving existing needs but also in providing for and supporting forward growth and investment. As set out in the RLTP³², the Project is directed at:

- Facilitating growth and regional development;
- Reducing the safety risk on Taranaki's transport network;
- Maintaining and improving accessibility and travel options throughout the region;
- Ensuring network resilience and responsiveness in the context of internal and external pressures; and
- Addressing these issues amongst constrained funding and affordability, and rising costs.

Strategically, the Project as a whole is ranked as making a significant contribution to the ongoing social, investment and economic development of the wider community.

In this respect, and as set out in the objectives adopted for the Project, the improvements to be made to SH3 at Mt Messenger are directed at:

- Enhancing the safety of travel on SH3;
- Enhancing resilience and journey time reliability of the state highway network;
- Contributing to enhanced local and regional economic growth and productivity for people and freight by improving connectivity and reducing journey times between the Taranaki and Waikato Regions; and
- Managing the immediate and long term cultural, social, land use and other environmental impacts of the Project by so far as practicable avoiding, remedying or mitigating any such effects through route and alignment selection, highway design and conditions.

All represent positive outcomes to the advantage of users and the wider region. All are directed at supporting and advancing Taranaki's forward strategic vision for the future.

³² See Section 5.9 and RLTP Section 5.3, Table 3, p44

10 Conclusion

The Mt Messenger Bypass represents delivery of a long-awaited project that will remove a long-standing impediment and greatly improve the quality of access to and from New Plymouth and the wider Taranaki region.

This improvement is of particular benefit in terms of the gains it will bring for this section of SH3 in serving as the principal route joining Taranaki to the major economic hubs of Hamilton, Tauranga and Auckland.

In this respect, the Project enables a key objective in both providing for and supporting the transportation needs of Taranaki's forward growth and ongoing economic performance.

Where most of the 240km length of SH3 between New Plymouth and Hamilton traverses open country with average travel speeds between 75 and 85 km/h, the local portions of the route at Mt Messenger are to a markedly different standard being characterised by a torturous alignment, narrow widths, steep grades, very limited overtaking and restricted forward visibility. Because there are only very limited alternatives, this portion of the route has proved especially vulnerable to slips and closures. Travel speeds are low and the crash rate is poor.

In undertaking this Project, the work is directed at better safety, enhanced resilience, dependable journey times, support for local and regional economic growth and productivity, while managing the immediate and long term cultural, social, land use and other environmental impacts of the Project.

The Mt Messenger Bypass will significantly strengthen this key strategic link and enable a better and more dependable standard of access to the benefit and advantage of the Taranaki region as a whole.

