Hamilton to New Plymouth

CORRIDOR MANAGEMENT PLAN

3 21 37 44

2018-2028

NZ TRANSPORT AGENCY
WAKA KOTAHI

New Zealand Government

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Executive summary

The Hamilton to New Plymouth Corridor comprises SH3 from its intersection with SH1 in Hamilton, to its junction with SH44 and SH45 at the entrance of New Plymouth CBD; and SH44 where it intersects with SH3 to the Port of Taranaki. SH21 between Tamahere and Rukuhia, and, SH37 between Hangatiki and Waitomo are also included within this corridor. The corridor is the only inter-regional route that directly connects Taranaki to the north, the "Golden Triangle" (i.e. Auckland, Tauranga and Hamilton), providing an important link for the Port of Taranaki to the Upper North Island. SH37 provides access to the nationally significant tourist destination of Waitomo, and SH21 is a key link between SH3 and the Waikato Expressway providing access to Hamilton Airport.

The corridor is approximately 263 km long (2.3% of the state highway network). The total value of assets along the corridor is $430M (1.9% of the total national asset value).

The corridor connects the urban areas of Hamilton and New Plymouth with rural landscapes north of Mahoenui and steep-sided river valleys and passes with indigenous forest, natural characteristics, and DOC conservation areas. Susceptible to slips, rock falls and flooding south of Mahoenui, this narrow, winding, steep stretch of SH 3 also features the Awakino and the Mt Messenger tunnels. The topographical constraints of the corridor combined with a lack of passing opportunities has an impact on the efficiency of the route, customer safety and route access and resilience.

Customers along this corridor are a combination of daily commuters, local traffic, tourists, inter regional traffic and freight. Customers tend to be a combination of well-informed, experienced drivers and first-time visitors with limited knowledge of New Zealand roads. The corridor features challenging topography for most of the length of SH3

The Waikato region has considerable economic diversity generating 9% of New Zealand's Gross Domestic Product (GDP), with a strong economic focus on dairy, sheep and beef, forestry, horticulture, mining and mineral assets (coal and iron sand). The Taranaki region specialises in manufacturing (food processing and equipment), agriculture and natural resources, capitalising on the oil and gas industry as a major source of economic growth. Taranaki has an extensive supply chain to support this industry, with many specialist chemical, manufacturing, heavy engineering and transportation facilities. Population growth at either ends of the corridor, increased freight and tourist demand will continue creating additional demand on the corridor.

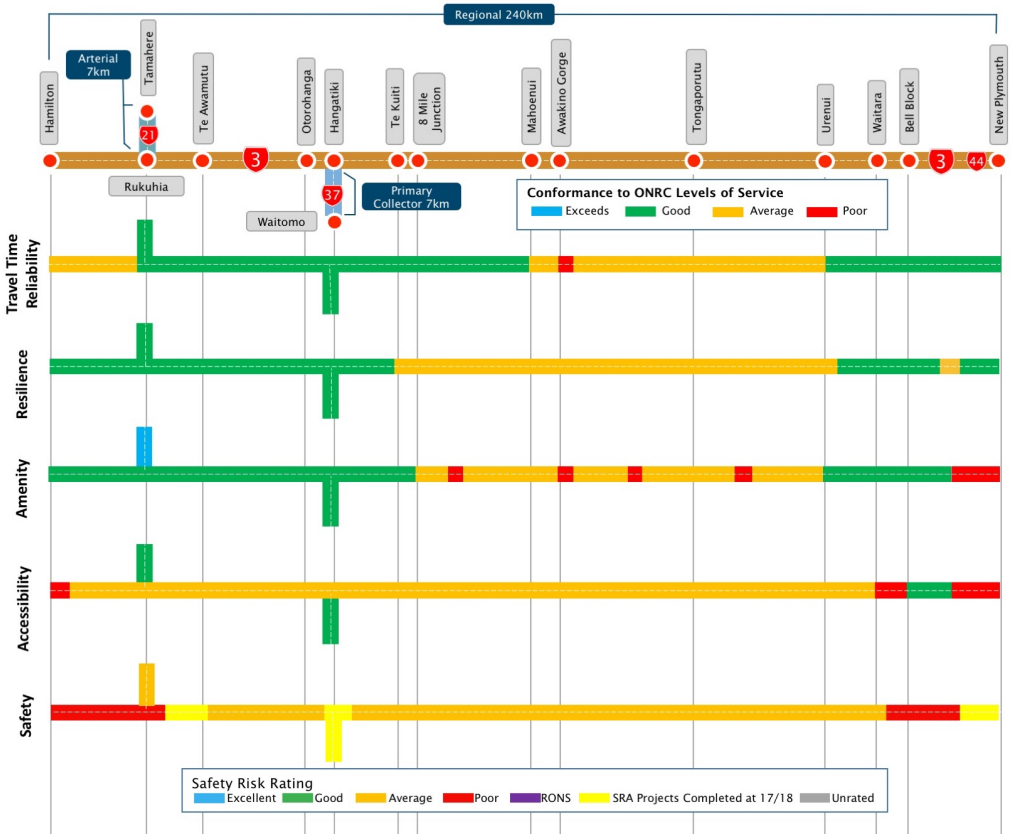
SH3 is strategically important for road freight transport, providing the primary link between Taranaki and south-west Waikato to the upper North Island. SH21 was built with the strategic function of airport and port access.

The Hamilton to New Plymouth corridor supports a growing tourism industry and caters for inter and intra-regional freight in the absence of convenient alternative routes.

A number of improvements are already planned or underway to relieve some of the pressure on the corridor. Although the corridor caters for low traffic volumes outside the urban centres at either end, further investment will be required to ensure the corridor functions to the appropriate levels of service.

Predicted growth along the corridor will have an impact on how the corridor is managed and where investment is prioritised.

Figure 1 - Performance of the corridor against ONRC outcomes



Introduction

Purpose

What is the Corridor Management Plan?

This Corridor Management Plan describes the customer service delivery story for the Hamilton to New Plymouth corridor, as measured against the One Road Network Classification performance framework. It is intended to describe the investment story, i.e. why invest in this corridor, in a context everyone can understand whether the activities are delivered through investment in the State Highways maintenance, operations, renewals and improvements programmes.

The corridor management plan considers a combination of:

- The **pressures** on the system that are resulting in increased demand or a reduction in levels of service
- The **current state** of the system and how it is performing
- The **response** the Agency is investing in to deliver the customer levels of service along the corridor.

It is important to note that this is a first-generation Corridor Management Plan, therefore, we expect it to be improved as we learn from this approach. It sets a firm foundation to improve from in the next 2-3 years, utilising a common framework and consistent data sets across the 30 corridors.

Why is it needed?

The corridor plan provides a link between the 30-year, long term planning outlook, the 10-year medium term investment programme and the 3-year land transport programmes for the next funding round.

Traditionally, the approach to investing in maintenance and renewals is to consider each asset activity in isolation, i.e. pavement, structures, drainage, and in isolation of capital expenditure. The Corridor Management Plan approach considers all assets within the corridor and takes a holistic view of the customer levels of service they provide throughout the corridor.

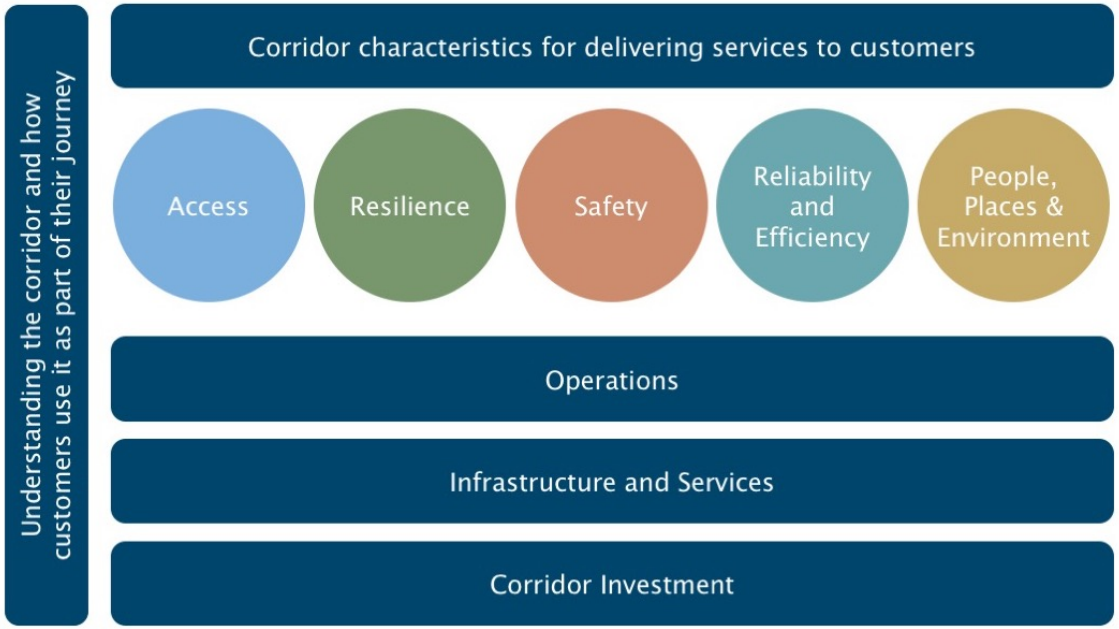
Planning is currently undertaken at the regional level, but typically significant journeys traverse more than one region. By considering the significant customer journeys and destinations, the corridor management plan is a vehicle to engage in regional and inter-regional conversations by focusing on the issues that are important and may extend beyond the state highways network.

How will we use it?

The Corridor Management Plan will provide the customer story and case for investment in maintenance, renewal and improvement on the corridor, based on targeting maintenance to achieve the appropriate customer levels of service within the context of providing value for money. The information presented in the corridor management plan helps to inform the business case for investment in State Highways for the subsequent triennial period.

In conjunction with the long-term view, the corridor management plan will provide for engagement with key stakeholders and partners to shape the future of the corridor. It responds to the needs of the users of the corridor to shape the future service levels.

Figure 2 - Corridor Management Plan framework



The corridor at a glance

Corridor overview

The Hamilton to New Plymouth Corridor comprises SH3 from its intersection with SH1 in Hamilton, to its junction with SH44 and SH45 at the entrance of New Plymouth CBD; and SH44 where it intersects with SH3 to the Port of Taranaki. SH21 and SH37 are also included within this corridor as shown in Figure 2. SH37 provides access to the nationally significant tourist destination of Waitomo, and SH21 is a key link between SH3 and the Waikato Expressway providing access to Hamilton Airport. As the SH3/SH44 route makes up the main link between Hamilton and New Plymouth, this route will be referred to as 'the corridor'. The other segments (SH21 and SH37) will be specifically referenced where applicable.

The corridor is the only inter-regional route that directly connects Taranaki to the north, the "Golden Triangle" (i.e. Auckland, Tauranga and Hamilton), providing an important link for the Port of Taranaki to the Upper North Island. From Otorohanga, SH1/39 is the preferred alternative route between New Plymouth and Auckland, bypassing Hamilton for freight and vehicles.

The corridor connects the urban areas of Hamilton and New Plymouth with rural landscapes north of Mahoenui and steep-sided river valleys and passes with indigenous forest, natural characteristics, and DOC conservation areas. Susceptible to slips, rock falls and flooding south of Mahoenui, this narrow, winding, steep stretch of SH 3 also features the Awakino and the Mt Messenger tunnels. The topographical constraints of the corridor combined with a lack of passing opportunities has an impact on the efficiency of the route, customer safety and route access and resilience.

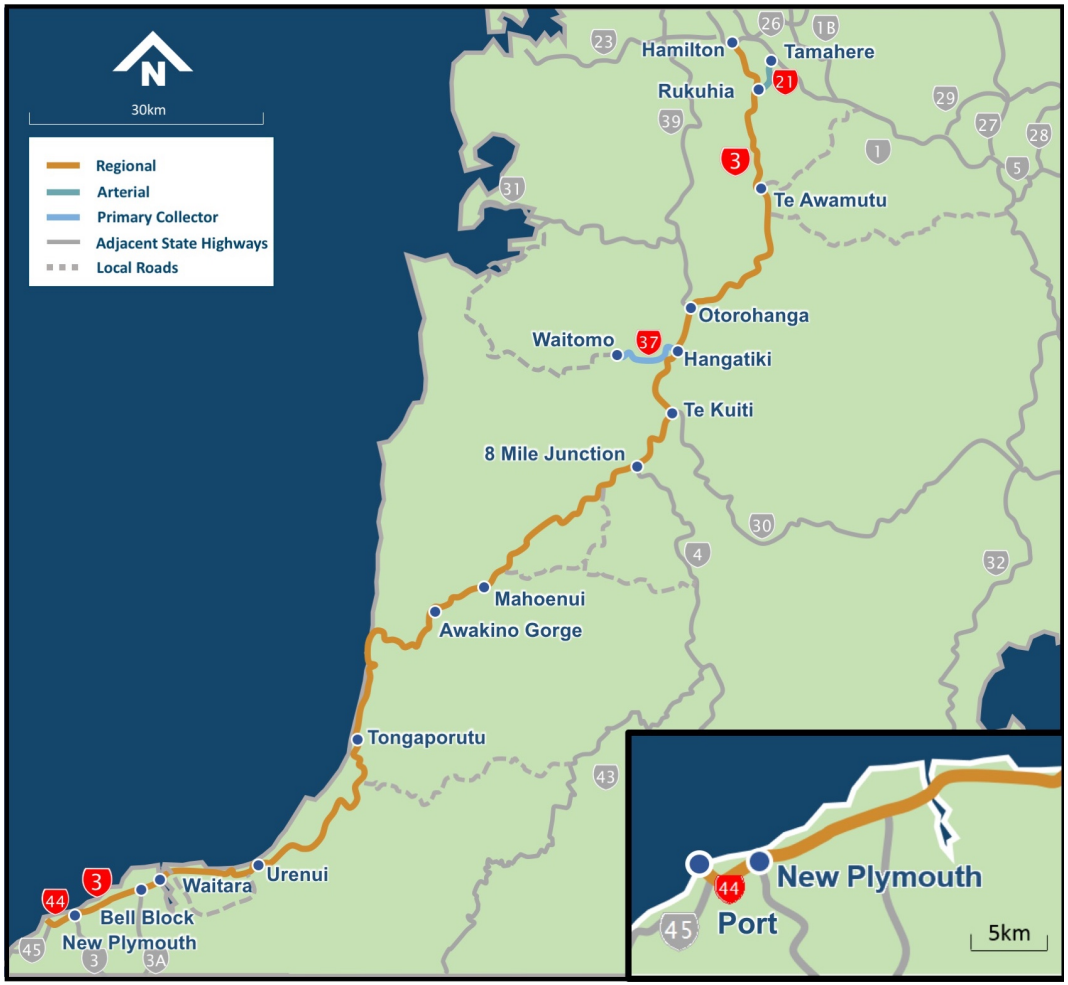
Along the corridor, traffic volumes (including heavy vehicles) vary significantly, with higher volumes to the south of Hamilton, through to Te Kuiti, and to the north-east of New Plymouth, as far as Waitara. The central section of the corridor features relatively low traffic volumes for a regional road with traffic diverting east on the SH30 route and south towards National Park and Wanganui using the SH4 route at the 8 Mile Junction. Although the corridor caters for relatively lower levels of traffic volumes, it is the only direct connection between New Plymouth and the northern regions.

The regional economy

The Waikato region is home to almost 10% of New Zealand's population and is predicted to reach almost 470,000 by 2031. The region has considerable economic diversity generating 9% of New Zealand's Gross Domestic Product (GDP), with a strong economic focus on dairy, sheep and beef, forestry, horticulture, mining and mineral assets (coal and iron sand). It is also home to New Zealand's fourth largest tertiary education provider, the University of Waikato.

The Taranaki region is home to 110,000 residents (2.6% of New Zealand's population) generating NZ's highest per capita GDP at 3.6% of the nation's total. The region specialises in manufacturing (food processing and equipment), agriculture and natural resources, capitalising on the oil and gas industry as a major source of economic growth. Taranaki has an extensive supply chain to support this industry, with many specialist chemical, manufacturing, heavy engineering and transportation facilities. The Port of Taranaki is the third largest export port by volume in NZ, including oil and gas, forestry and agriculture as well as the prosperity of the wider community.

Figure 3 – Corridor overview



Understanding our customers

Key customers

The key customers utilising the corridor are diverse, and utilise a range of transport modes. Different customers have different needs, expectations, and personal circumstances for using the transport system. Therefore, what customer's value from the transport network needs to be understood in the context of who they are.

Daily commuter

The section of corridor between Hamilton and Te Awamutu and between Waitara and New Plymouth provides a daily commuter route during weekday peaks, as well as providing for journeys via active modes and public transport. With increasing urban growth in these areas, use of this corridor as a commuter route will continue to increase.

Insights into daily commuter users:

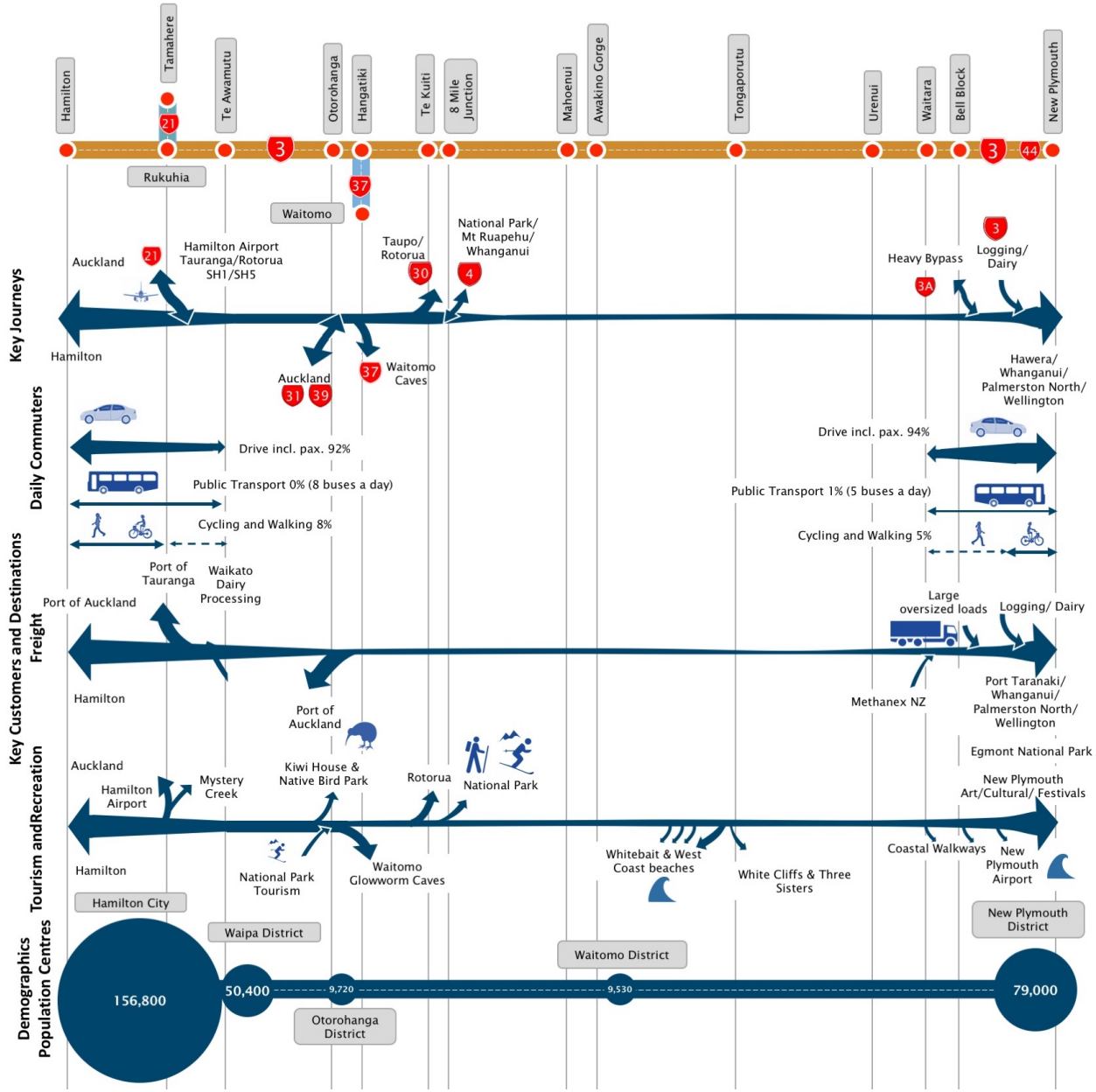
Road use: Private vehicle is the predominant mode of commuting between Hamilton and Te Awamutu and between Waitara and New Plymouth, with limited public transport opportunities via bus services.

Road knowledge: Regular commuters are familiar with the route and the viable alternatives to avoid congestion when required.

Pain points: Both ends of the corridor face access issues arising from urban (residential and industrial) growth, as well as high frequency of intersections and driveways along the route. Lack of an alternative route into New Plymouth over the Waiwhakaiho River poses a resilience risk.

Daily commuters expect: Ease of access on and off the corridor, up to date information about traffic, road conditions and activities which may impact their commute.

Figure 4 - Key customers, journeys, and destinations



Tourist and recreational users

This corridor forms part of a key tourist route connecting Hamilton and the Upper North Island with New Plymouth and wider Taranaki region, with the journey itself promoted as part of the experience. Waitomo Caves and related natural attractions such as the Otorohanga Kiwi House accessed via SH37 are a major draw for tourists. Seasonal recreational users access part of the corridor (Otorohanga through to 8 Mile Junction) as the direct route connecting Auckland through to National Park/Mt Ruapehu.

Taranaki is home to the Egmont National Park including Mount Taranaki, featuring over 300 kilometres of walking tracks, cycling trails and a visually stunning coastline with a legendary surf break. The city of New Plymouth itself is renowned for its arts and culture, particularly the Len Lye Centre, hosting a number of nationally and internationally recognised events and festivals annually. Venture Taranaki is actively promoting tourism within the Taranaki region, which has been recognised as the second-best region in the world to visit in 2016 (Lonely Planet). This will likely have a significant impact on the numbers of tourists expected to visit the region in the future, and further raise the importance of this corridor to provide a safe, secure and enjoyable journey experience. Insights into Tourist and Recreational Users are as follows:

Road use: Recreational users along the corridor utilise a range of travel modes including passenger vehicles, campervans, and buses. The corridor is used seasonally by skiers/hikers travelling to National Park and Mt Taranaki, and holiday makers visiting attractions in the region. New Plymouth caters for tourists with many weekend festivals particularly in summer adding to the seasonal traffic flow.

Road knowledge: Many international visitors and first-time visitors are not experienced in travelling on New Zealand roads and conditions. There is limited or no knowledge of places on the journey where the road narrows or becomes winding. Domestic recreational visitors familiar with the journey are more aware of the conditions and anticipated travel times.

Pain points: Narrow, windy and steep topography and a lack of passing lanes between Piopio and Urenui cause issues for those unfamiliar with the corridor, exacerbating problems around efficiency and safety.

Tourist and recreational users expect: Reliability of routes and predictable destination arrival. Good directional signage. Smooth road surface and appropriate places to pull over safely for refreshments, toilet breaks and scenic points for photo opportunities.

"Better passing opportunities and signage aimed at unfamiliar drivers"

Freight operator

"My time is valuable, if there is a delay I want to know about it so I can change my plans"

SH3 is strategically important for road freight transport, providing the primary link between Taranaki and south-west Waikato to the upper North Island. SH21 was built with the strategic function of airport and port access. There are major ports located at each end of the corridor, the Port of Taranaki, the inland port in Hamilton, Ports of Auckland and Tauranga. KiwiRail ceased operation of the direct rail link north in 2010, limiting transport options from the Taranaki region, and increasing the reliance on the corridor for freight haulage.

Freight movements along the corridor are predominately made up of LPG, dairy, logging and general goods servicing the local communities. All the LPG supplied to the "Golden Triangle" (i.e. Auckland, Tauranga and Hamilton), and high-value/short shelf life dairy product from Taranaki bound for Litchfield, travels along the corridor. South-bound freight provides support to the oil and gas industry, in particular, the Kapuni and Maui CNG pipelines.

Insights into freight operators are as follows:

Road use: Roughly an even split of freight is destined for Port of Auckland and Port of Tauranga, with the predominant northbound freight movement being dairy (destined for Waikato dairy factories via Te Awamutu), food products and gas (LPG) which bypasses Hamilton using SH1/39. SH44 to the Port of Taranaki carries increasing logging freight, with occasional closures to transport extremely oversize loads from local engineering fabricators.

Road knowledge: Knowledge of road conditions is high among familiar users with the confidence of managing difficult conditions. Despite this, there are regular truck rollovers in the windier sections of the corridor, such as the Awakino Gorge.

Pain points: Resilience of the corridor is an issue as there are no convenient alternative routes to detour around an incident for much of the corridor, which has adverse effects on delivery times and subsequent business efficiency. The one-way tunnels at Awakino and Mt Messenger prevent HPMV from using the route.

Freight operators expect: The ability to comfortably undertake the freight journey between New Plymouth and Hamilton/Auckland. Alternative routes that cater for freight safely with consistent width and visibility, convenient places for trucks to stop and drivers to rest, and passing opportunities to improve travel time reliability. Information about road conditions that provides as much planning time as possible and enables considered decision making and confidence that the advice is enabling business.

How we deliver services along the corridor

Transport partners

The land transport system comprises more than State Highways. Providing customers with a reliable and safe journey usually requires the use of two or more transport infrastructure provider's networks. As such, the NZ Transport Agency will work with other network providers to provide a one network approach.

Collaboration along the corridor

The NZ Transport Agency is a partner in the Future Proof Strategy (2009, updated in 2014), along with Hamilton City, Waikato District, Waipa District Council and Tangata Whenua providing a growth strategy to manage urban development by providing a safe, effective and efficient land transport network. The Waikato Regional Council provide and facilitate an increase in provision for alternative modes, with decisions often being influenced by walking and cycling lobby groups.

The NZ Transport Agency is a key partner in the SH3 Working Party, alongside Taranaki Regional Council, Waikato Regional Council, New Plymouth District Council, Waitomo District Council and other industry partners. Established in 2002, with a primary purpose to liaise, monitor, coordinate, advocate and collate information to address problems felt along the length of this corridor. The Regional Transport Committee (RTC) use the Working Party as a monitoring mechanism for delivery of the respective component of their RLTP's.

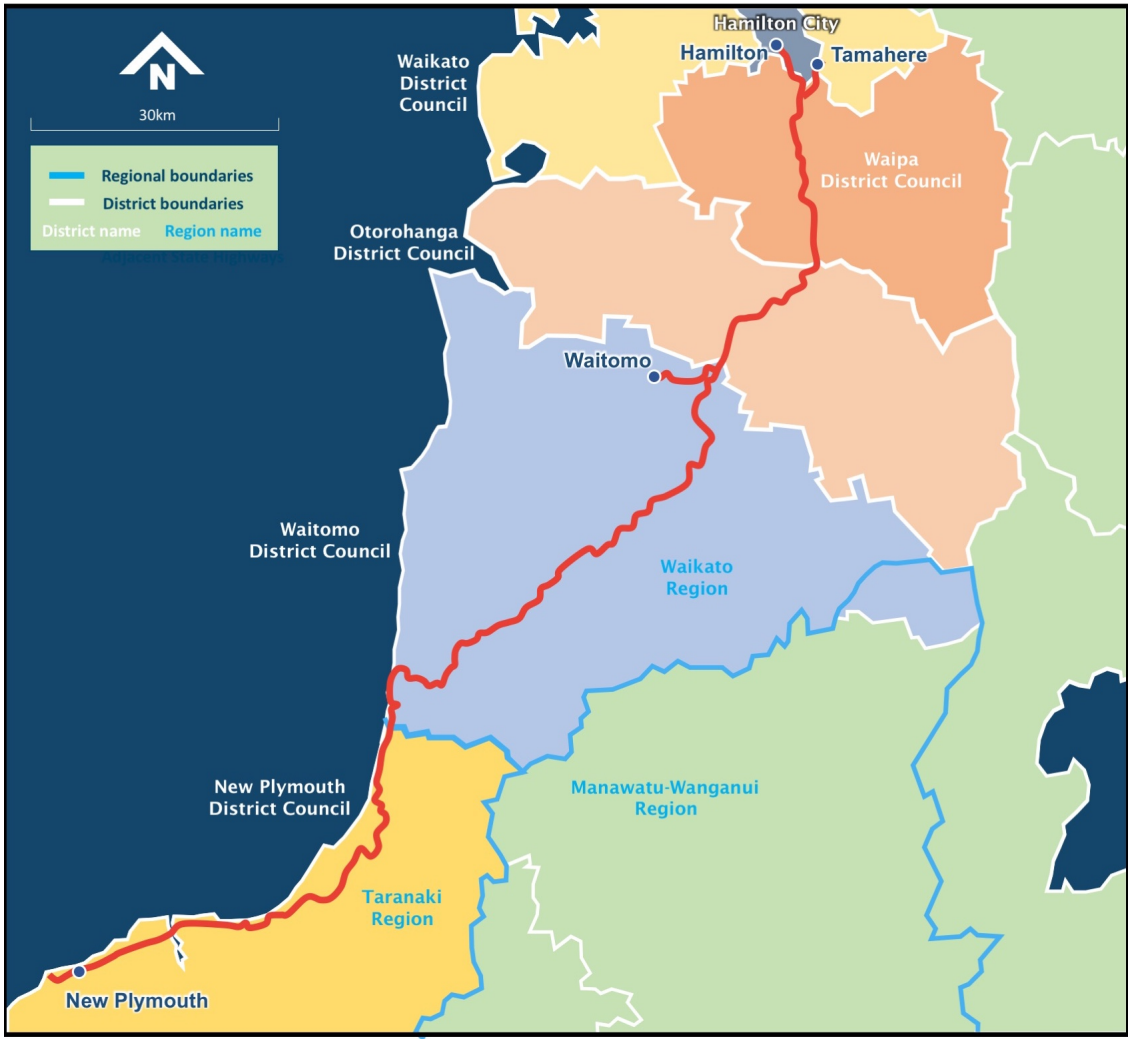
Safe roads alliance

The Safe Roads Alliance commenced in July 2015 to deliver a programme of road and roadside safety improvements to the SH Network over six years. A programme alliance of Beca, BBO and Northern Civil partnered with the NZ Transport Agency, currently covers approximately fifty-five projects nationally, seven of which are located on this corridor.

Traffic Operation Centres (TOC)

Traffic Operation Centre's are the 'conduit' services in place nationwide to communicate activities/event on the transport network to the users of the SH network and wider stakeholders (e.g. emergency services and NOC suppliers providing emergency response), and monitor and report SH incident response in the online TREIS system. ATOC (Auckland) covers the northern section of the corridor north of the Waikato/Taranaki Regional boundary with WTOC (Wellington) operating on the lower corridor.

Figure 5 - Map of associated Local Authorities



Network Outcomes Contracts approach

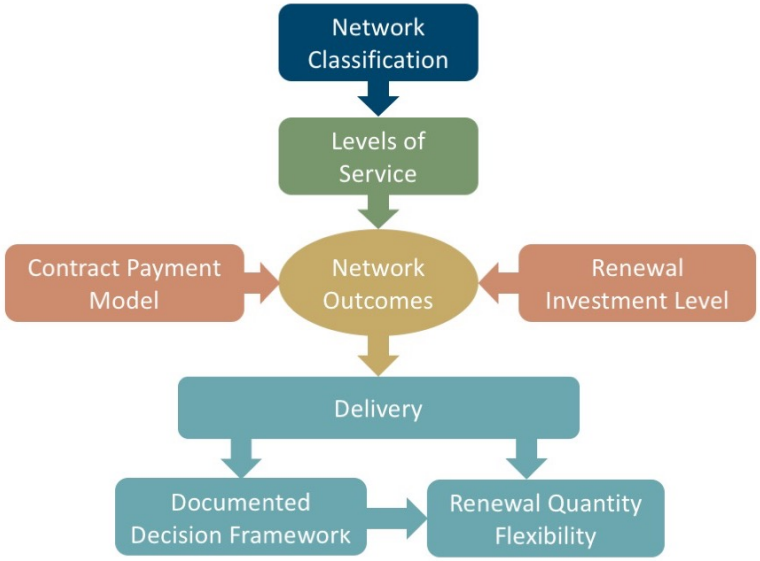
Network Outcome Contracts (NOC) are aimed at improving the effectiveness of service delivery for maintenance and operations of the state highway network. Elements of previous procurement methodologies (PSMC, Hybrid and Traditional models) have been integrated into the NOC contract model which delivers services through a primary supplier incorporating both professional services and physical works for all key maintenance activities.

To support this a central Governance and Management Group is in place to represent the interests of the Maintenance and Operations teams in the delivery of the NOCs. This group resolves issues, looks at opportunities for improvement, recommends changes to the national contact documentation, and ensures a consistent application, understanding and implementation of the NOC delivery model.

The core scope of work typically includes, but is not limited to maintenance, operations and renewals. The core scope of work typically excludes; transport planning, ITS maintenance and management, capital works, emergency works reinstatement, Traffic Operation Centre activities, bridge and other structures management and repairs.

The contract process for the NOCs is shown below:

Figure 6 - NOC process



Collaborative delivery of services

The Hamilton to New Plymouth corridor crosses over three NOC contract areas; West Waikato North, West Waikato South, and Taranaki. The West Waikato North contract covers SH3 through Hamilton to the SH21 intersection, including SH21. Taranaki extends north on the SH3 route from New Plymouth through to just south of Mokau with the remainder of the corridor within the West Waikato South contract area.

Taranaki Network Outcomes Contract (TNOC14)

The Taranaki NOC contract is undertaken by Downer NZ Limited, with support from Opus International Consultants, Whitaker Civil Engineering, and Cape Mowing. The contract commenced on 1 July 2014 for a term of five years, plus additional one year based on performance. The contract covers road maintenance over 527km of which 85km are on this corridor including SH44. The contract also includes the maintenance and management of proprietary ITS assets.

This contract is supported by the following specialist maintenance contracts:

- **Regional bridge and structures:** Professional Services contract covering the Taranaki region, awarded to Opus International Consultants in November 2014 with a contract term through to 30 June 2017, plus two additional years based on performance.
- **Memorandum of understanding:** With local councils for urban maintenance (e.g. street cleaning, streetlights).
- **Traffic counting** Currently there are separate traffic monitoring contracts for the Manawatu/Whanganui/Taranaki and Gisborne/Hawke's Bay regions that expire in mid-2017. A new contract combining these regions with Wellington will be tendered in 2017 and include traffic counting, installing new count sites, repairs, maintenance and upgrades of assets and carrying out special counts or speed surveys.

West Waikato North Network Outcomes Contract

This contract is undertaken by Fulton Hogan and covers the road maintenance north of the SH21 intersection, and includes SH21. This contract was converted from PSMC007 to NOC in July 2015 for a term of two years plus three based on performance, due to finish in June 2020.

West Waikato South Network Outcomes Contract

This contract undertaken by Broad-spectrum (formerly Transfield Services) and covers the road maintenance south of the SH21 intersection through to just south of Mokau including SH37. This contract was converted from PSMC006 to NOC in December 2014 for a term of two years plus three based on performance, due to finish in June 2020.

Both West Waikato contracts are supported by the following specialist maintenance contracts:

- **Regional bridge and structures:** Professional Services contract covering the wider Waikato and Bay of Plenty regions, awarded to Beca in October 2015 with a contract term of three years, plus two based on performance.
- **Traffic monitoring sites:** Professional Services contract covering the wider Waikato and Bay of Plenty regions, awarded to Beca in November 2016 with a contract term of two years with the option based on performance for a further three years.

Drivers for change

The Hamilton to New Plymouth corridor caters for variable levels and types of customers and although the corridor caters for relatively low traffic volumes, demand is expected to grow into the future. The drivers for change in the future associated with the corridor, are briefly described below.

Population growth

Over the coming years, the population along the northern end of the corridor is expected to continue its upward trend as Auckland continues to expand and more people move into the regional centres. The majority of this growth is expected to occur in Hamilton City, Waikato District (SH21) and Waipa District with an expected doubling of population in these districts over the next 50 years. The Future Proof Strategy recognises Peacocke, Hamilton Airport, Tamahere and Rukuhia as major growth corridors.

Traffic volumes near Bell Block are expected to double over the next 10 years as a consequence of the expansion of Bell Block residential area. Active promotion of Taranaki as the preferred place to live, work and visit could also lead to a higher demand for the corridor towards New Plymouth.

As such, journey times at the northern and southern-most ends of the route are expected to fall below acceptable levels between around 2030 and 2040 (WRTM), as a result of increased urban growth in the absence of any appropriate intervention. This could potentially impact upon the ability of SH3 to fulfil its functions. Outside the main urban centres, SH3 is not expected to suffer any significant capacity constraints in the foreseeable future.

Freight demand

This corridor will continue to provide the main access of passage for goods transportation, between New Plymouth and the Upper North Island.

Research work commissioned by Venture Taranaki suggests that the Taranaki Regional economy is expected to show strong growth in the period up to 2026. Particular growth potential is highlighted in the oil and gas sector, engineering and manufacturing industries and the transport and storage industries. This growth would be expected to contribute towards some additional goods vehicle movements on SH3 to the north of New Plymouth. In addition, logging traffic between south Waikato and the Port of Taranaki has experienced notable growth in recent years. The limited scope for modal shift of freight transport from SH3 to alternative modes will continue to put pressure for access demands on the corridor.

Future focus

Influencing travel demand: The corridor at both ends is subject to reliability issues especially during peak times due to a mix of development, tourist traffic, freight as well as daily commuters. This may require land use decisions to support an efficient transport network and further investment in public transport to facilitate daily commuter journeys. Maximising opportunities from existing and new technologies (e.g. intelligent transport systems to provide real-time information) to increase vehicle occupancy and throughput, and encourage more efficient travel should also be key in managing travel demand moving forward.

Making better use of existing infrastructure: Ensuring best returns on infrastructure investment means better prioritisation of existing networks to get the most from the existing infrastructure and continue to improve efficiencies in maintaining, operating and renewing infrastructure. The completion of the Waikato Expressway will provide opportunities at the Hamilton end of the corridor.

New infrastructure and services: Committed infrastructure including safety improvements between Hamilton and Te Kuiti, Southern links project, Waitara to Bell Block corridor improvements and the Awakino and Mt Messenger tunnel bypasses seek to alleviate many of the pressures impacting the corridor's performance.

Vulnerability to natural events: Impacts of climate change, the risk of flooding, slips and rockfall on SH3 particularly between Te Kuiti and Urenui makes it vulnerable to natural events especially given the importance of the route connecting the Taranaki to the Upper North Island. The need to manage this vulnerability is likely to heighten as traffic volumes along the corridor increase and the intensity of weather events increases.

Although the most vulnerable sections of the corridor carry low levels of traffic, a key focus moving forward is to ensure that the state highway network meets the aspired levels of service for the corridor and supports future growth.

Understanding customer levels of service on the corridor

Current levels of service performance

The One Network Road Classification (ONRC) is a framework that categorises roads throughout the country depending on what purpose they serve. Importantly it will also help New Zealand to plan, invest in, maintain, and operate the road network in a more strategic, consistent and affordable way throughout the country.

Over time all roads in a particular category should offer an increasingly consistent and fit for purpose customer Level of Service (CLoS) for road users. With the knowledge of current CLoS experienced by customers, we can better target investment to meet future intended service levels.

Overall, customers will be provided with the right level of road transport infrastructure where it is needed, determined by a robust, impartial, nationally consistent tool (ONRC).

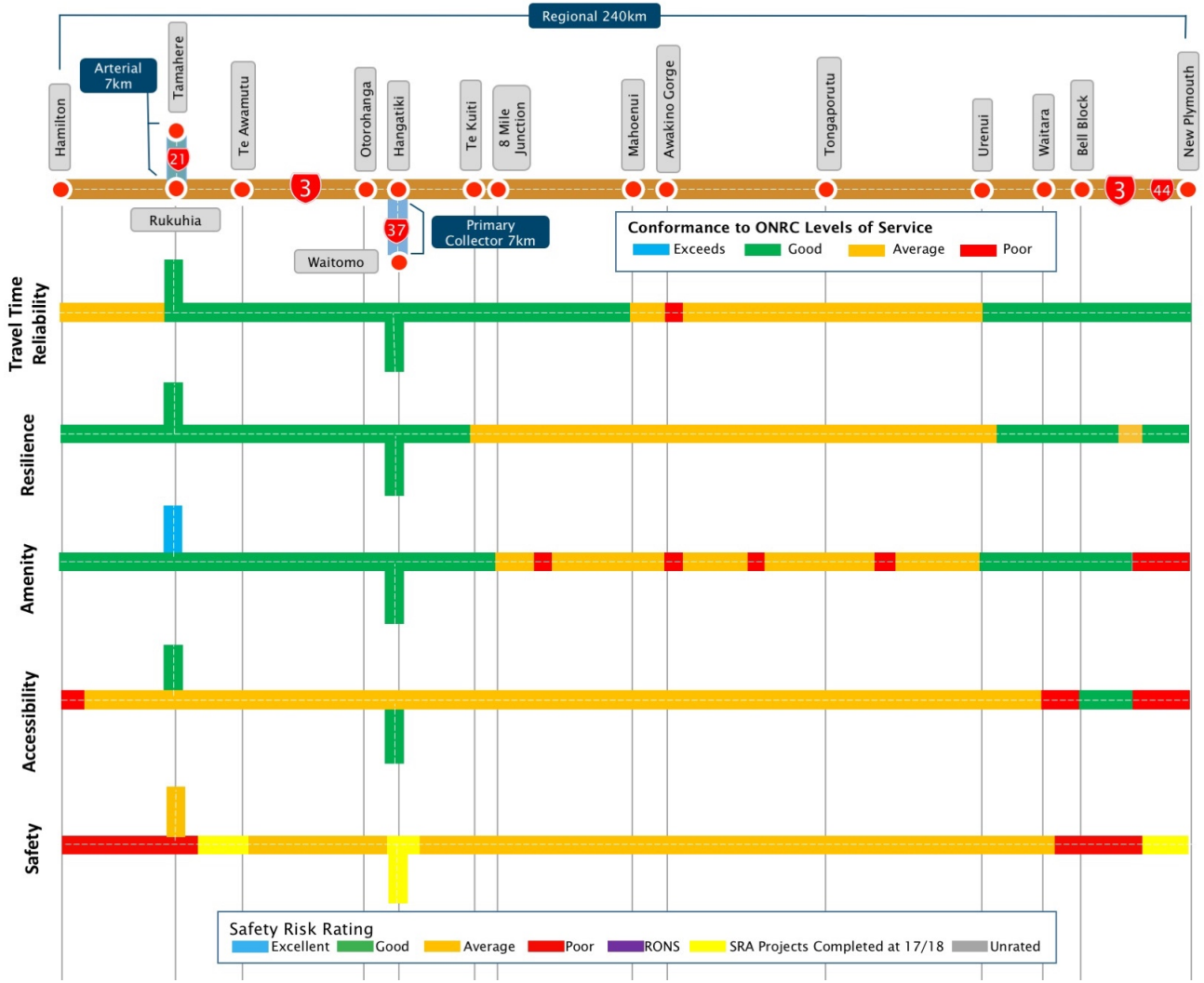
Road classification

The 240km corridor comprising of SH3 and SH44 between Hamilton and New Plymouth is classified as Regional and is the primary transport route between these locations along the west of the North Island. The 7km stretch of SH21 from Rukuhia to Tamahere is classified as Arterial and the 7km stretch of SH37 from Hangatiki to Waitomo as a Primary Collector.

With completion of the extensive improvement packages along SH3, aligning along with the Waikato Expressway in 2020, the use and function of SH21 is expected to increase and its classification may need revision.

Overleaf provides additional context to explain the current Levels of Service along the corridor based on the road classification.

Figure 7 – Current ONRC levels of service performance



Summary of current performance

Figure 7 shows how the Hamilton to New Plymouth corridor is currently performing against the ONRC Levels of Service expected for the relevant classification of each section.

Levels of service performance has been determined by workshop participants in the development of this corridor plan and is therefore not solely based upon consolidated evidence from the ONRC technical measures.

A simple four-point assessment has been utilised as follows:

Exceeds	The level of service provided by the section of corridor for the activity under consideration exceeds what is required for a highway of that classification
Good	The section of corridor generally meets the LOS requirements for the activity and ONRC
Average	The section of corridor meets some but not all of the LOS requirements for the activity and ONRC classification
Poor	The section of corridor generally fails the LOS requirements for the activity and ONRC classification, or there is a significant gap in the LOS for some aspects of the activity.

Travel time reliability

Limited passing opportunities and tight/steep alignments through the Awakino Gorge and Mt Messenger section lead to reduced reliability. The corridor faces commuter congestion closer to Hamilton and New Plymouth especially at peak times.

Travel time reliability will be improved through the planned safety and resilience corridor improvements.

Resilience

The 120km section of SH3 between 8 Mile Junction and Urenui encompasses no alternative state highway connections, or local road connections of a comparable standard. Challenging topography contributes to a high frequency of crashes and environmental incidents (slips, rock falls, trees and flooding) resulting in unplanned closures. Due to the physical constraints, the ability to turn trucks around is limited and alternative routes add approximately 3 hours to the journey when this route is closed.

A compounding factor is the remote nature of this section both in terms of distance from the urban hubs, and the limited cell phone coverage. The Awakino Gorge to Mt Messenger Corridor improvement project is expected to improve resilience of this section (see Improvement Investment section for more details).

Amenity

At a network level, the corridor is delivering the expected ride quality within the urban/rural context. Some specific locations (e.g. bridge approaches) and areas with geographical constraints are delivering poor ride quality, specifically Mt Messenger and sections of Awakino Gorge. SH21 was built with the strategic function of airport and port access, and despite low classification, delivers the highest LoS within the corridor, across all ONRC measures. This future proofing will minimise the impact to both customer and investment, of potential function changes to SH21 with the opening of the Waikato Expressway.

Accessibility

Both ends of the corridor, with exception of recent upgrades (City to Vickers improvement project), are currently performing below expectation with frequent direct driveway access and unsafe intersections. The Hamilton to Ohaupo and Waitara to Bell Block improvement packages including flush medians for safe turning, side barriers limiting access ways and intersection upgrades will improve delivery to expected levels of service in these areas. Accessibility to the Port of Taranaki is impacted by conflict between residential and industrial users along SH44.

Safety

Safety is a significant concern over parts of the corridor where roadside hazards are severe and unforgiving, thus creating a high potential of death or serious injury. The narrow and winding corridors provide little opportunity for passing. This combined with the lack of mobile coverage within the Awakino Gorge and Mt Messenger area can lead to delays in communicating incidents and accessing emergency services.

The corridor fails to meet KiwiRAP targets (a rural measure only) over much of the northern section through to Te Awamutu, and much of the southern section from Waitara to New Plymouth. Multiple committed safety improvement packages are at varying stages and will help mitigate the risk in these areas. The comparatively higher collective risk ratings and crash rates towards either end of the route, immediately to the south of Hamilton and immediately to the north of New Plymouth, reflect the higher volumes of traffic on the approaches to the urban areas.

Improving safety is the key investment driver on this corridor with all investment packages addressing safety improvements in part at least.

Improving the customer experience

Significant improvements to the corridor are planned or underway, identified through the Future Proof Strategy, Hamilton to New Plymouth Strategic Case, the Safer Roads and Roadsides National PBC and the Accelerated Regional Roading Package. The transformation of this corridor is expected to be complete by 2020, to coincide with the completion of the Waikato Expressway.

There are eight separate investment packages committed or underway along the length of the corridor, as well as one long-term initiative at designation/investigation stage.

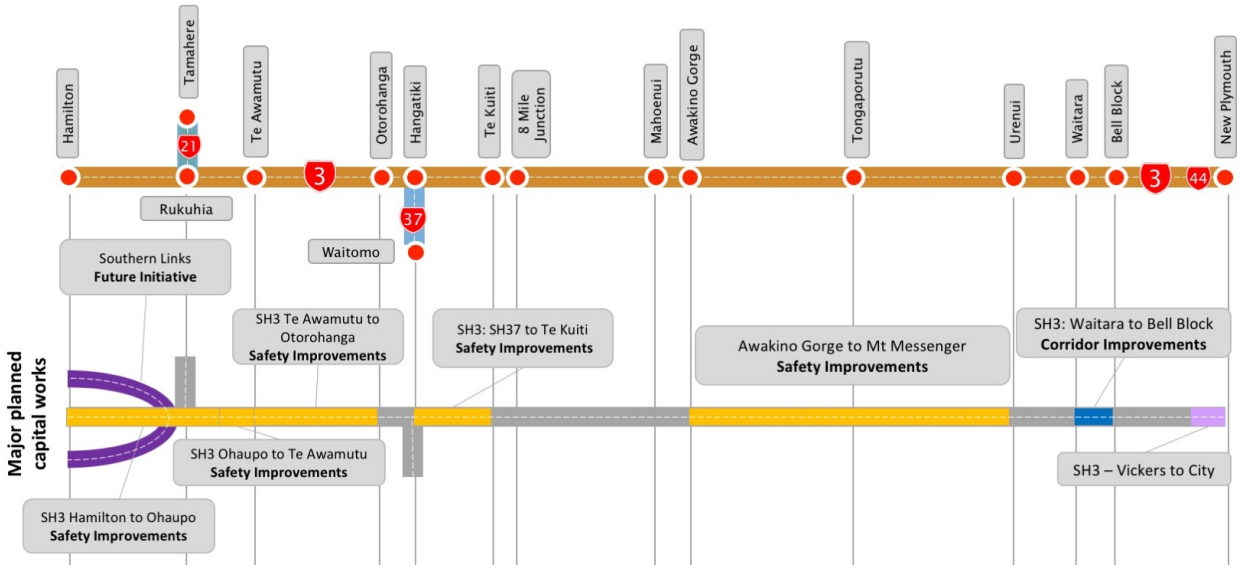
- Southern Links is a long-term initiative, in place to ensure that future state highway routes are well integrated with the local arterial road network, and to allow for planned growth in Hamilton City. The improvements would see better linkage and access across and in and out of Hamilton City. When constructed, the Southern Links project will reduce congestion, improve safety on SH1 and SH3 in the Hillcrest and Melville suburbs of Hamilton and improve freight flows for industry. Maintenance impact on the existing corridor as a result of this future project is unlikely to be felt within the next decade.
- Part of a $600 million nationwide road safety programme, improvements are planned to address safety concerns between Hamilton and Te Kuiti (4 separate packages as shown in Figure 7). Between 2005 and 2014 there were four deaths and 18 serious injuries in this section of SH3. The project aims to reduce deaths and serious injuries on this stretch of the highway by 11 or more by 2026.
- The Waitara to Bell Block package, a partnership between the NZ Transport Agency and NPDC, consists of a mixture of activities and measures that will improve the performance and safety of both the state highway and local road transport networks.
- The Awakino Gorge to Mt Messenger Corridor Programme is made up of three projects: SH3 safety and resilience improvements; and bypass projects for both Mt Messenger and Awakino Tunnel. The programme of works aims to reduce deaths and serious injuries, decrease the number and duration of road closures and improve journey experience along the highway. Anticipated construction times are as below:

    1. Safety and resilience improvements – 2017/18 with a duration of 12 months
    2. Awakino Tunnel bypass – 2018/19 with a duration of 24 months
    3. Mt Messenger bypass – 2018/19 with a duration of 24 months.

Assuming all planned improvements make it through the business case stage, completion is expected by 2020 (with exception of Southern Links), in line with Waikato Expressway. Traffic and freight volumes corridor-wide are expected to increase, particularly on SH21, connecting SH3 with the Waikato Expressway and beyond to Auckland and Tauranga. The corresponding increase in maintenance investment is expected to be partially offset by cost reduction through some of the improvement areas, particularly Mt Messenger.

When completed, the planned improvements on the corridor will result in significant improvements to corridor performance as measured against the ONRC outcomes. Planned improvements are discussed in greater detail later in this document

Figure 8 – Significant corridor planned improvements



Access

Carriageway configuration

The section between SH21 south of Hamilton Airport and Te Awamutu was recently converted from 4 lanes to 2+1 configuration for safety reasons, along with recent 4 lane divided capacity upgrades from Bell Block to New Plymouth.

A significant proportion of the carriageway has limited passing opportunities, with the longest stretch between Mahoenui and Urenui resulting in a poor LoS associated with resilience, safety and efficiency.

Speed limits

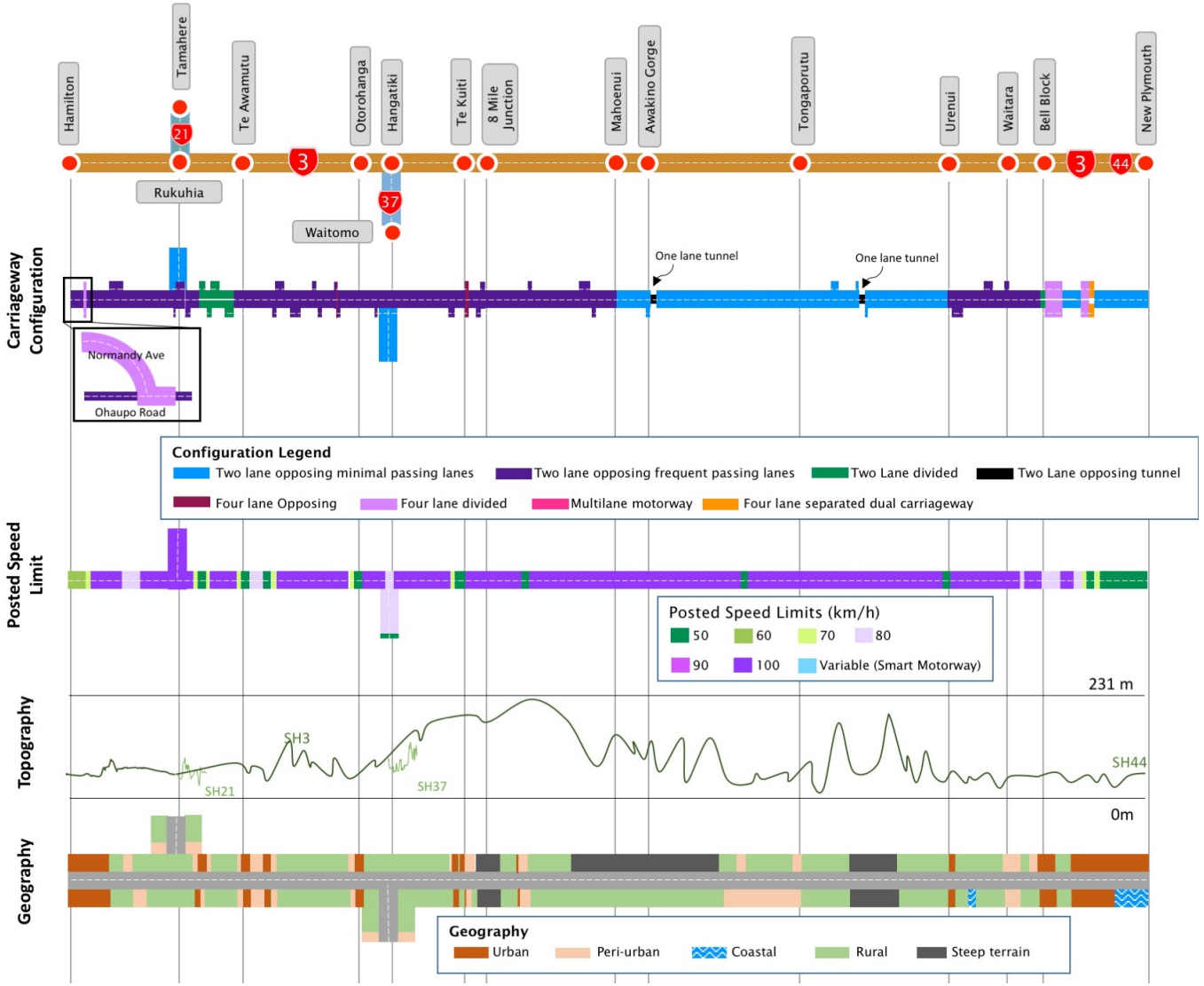
Safer speed 80km/h zones are in place through peri-urban sections and were recently introduced over the full length of SH37 (Waitomo Caves Road).

Consultation to align posted speed limits on the corridor with NZ Speed Management Guideline is anticipated, particularly through the gorge and mountainous sections of the corridor where safe, appropriate, and achievable speeds are lower than the posted 100km/hr.

Topography/geography

The corridor transitions from a high density urban environment to open rural landscapes, from flat to rolling agricultural land, leading to the steep-sided narrow Awakino Gorge clad with indigenous forest, onto coastal terraces bisected by large rivers, and the mountainous terrain of Mt Messenger ending with peri-urban and urban areas towards New Plymouth.

Figure 9 - Corridor characteristics

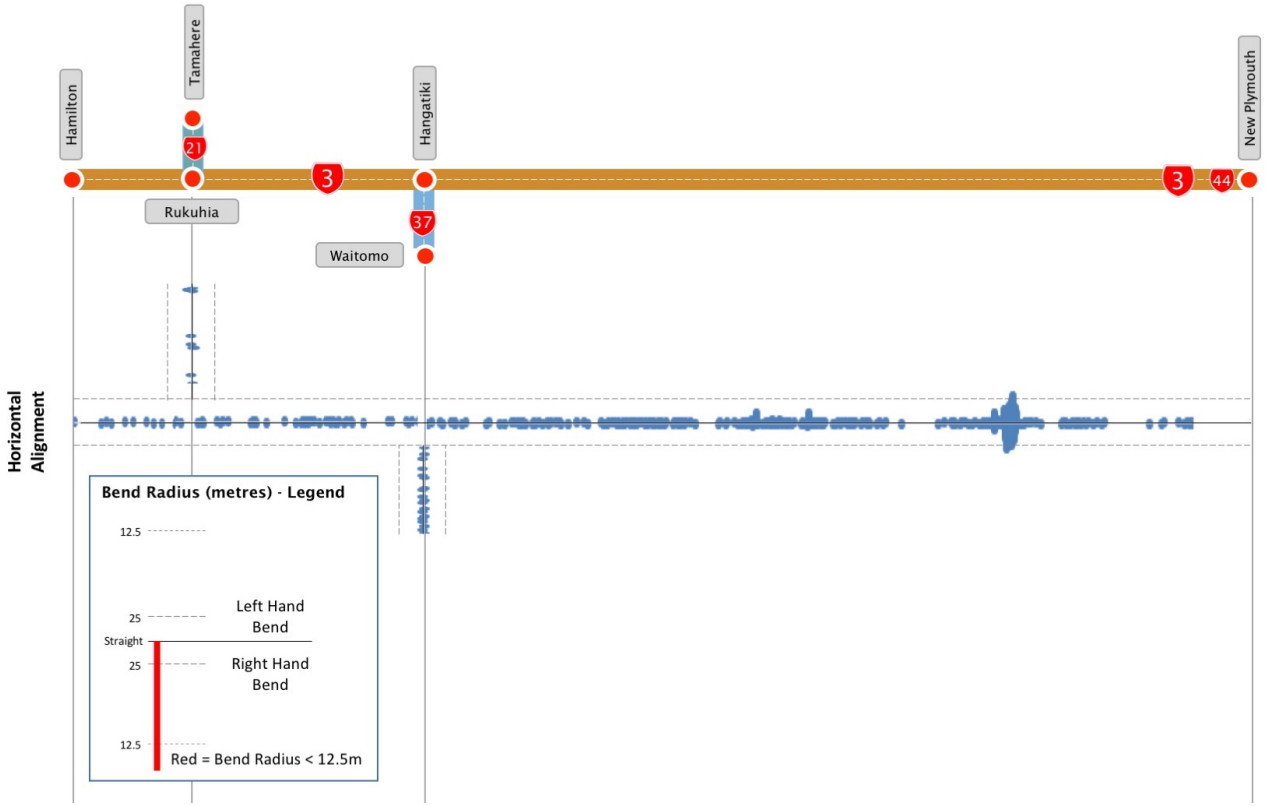


Horizontal alignment

The infographic shows the location and extent of the out of context curves along the corridor. The height of the bar is an indication of the severity of the curve calculated as $\frac{1}{radius^2}$, meaning the taller the bar, the smaller the radius of the curve. Note: Unlike other infographics, the horizontal alignment infographics are drawn in proportion to the length along the corridor. As such they are not shown in context with the intermediate points which have been excluded.

Mt Messenger contains a number of tight curves with a radius under 25m, otherwise there is a relatively even distribution of larger radius out of context curves along SH3 and SH37.

Figure 10 – Horizontal alignment



Volumes

Higher volumes south of Hamilton and to the north-west of New Plymouth are characterised by expanding urban development, which due to their proximity to the respective centres of Hamilton and New Plymouth, generate a notable element of short distance commuter traffic. There are few communities between Te Kuiti and Urenui and little industry along the topographically challenging section of this route, resulting in much lower traffic volumes.

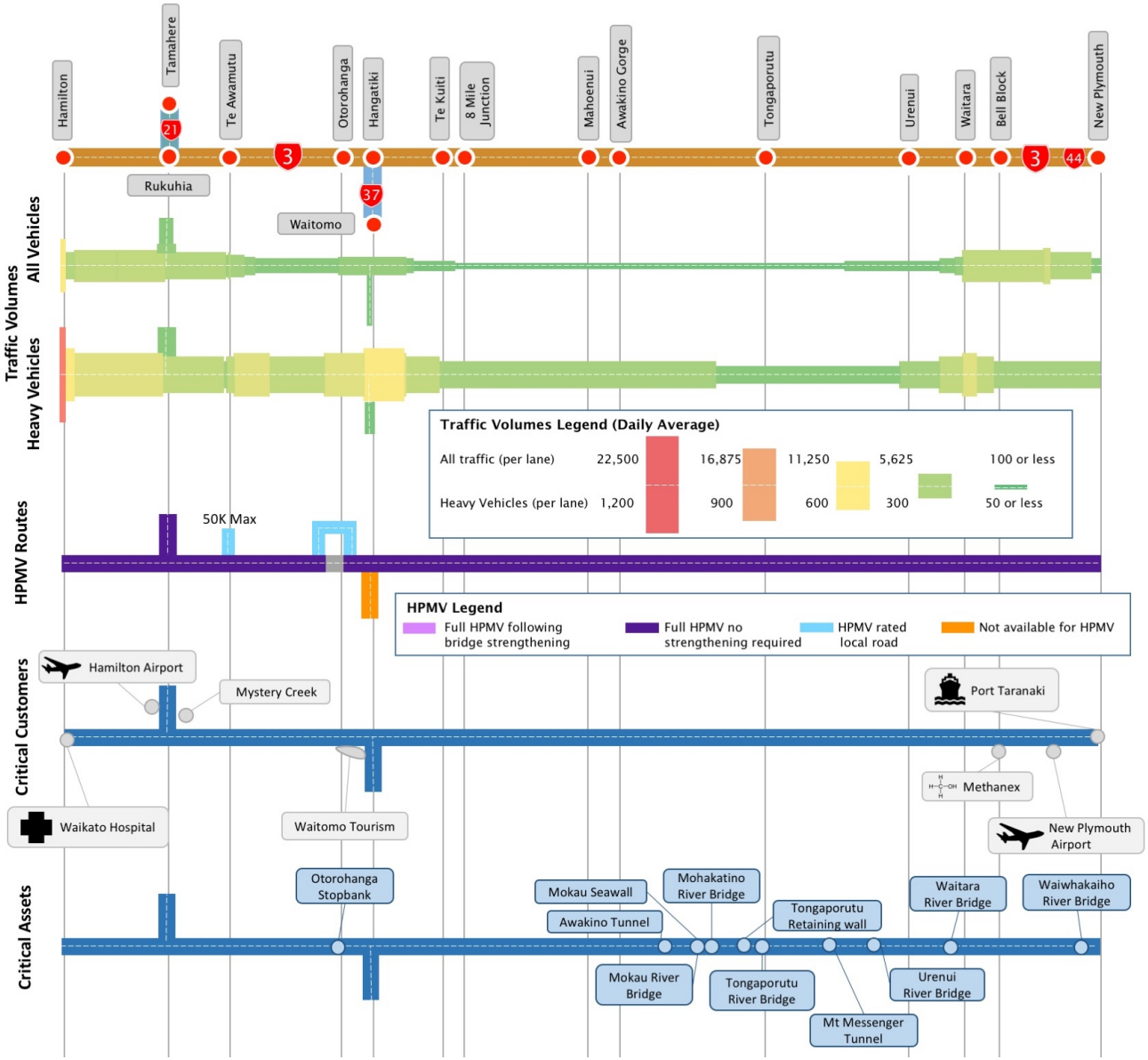
HPMV routes

The type of heavy vehicles travelling the route are predominantly long-haul carriers, often B-trains, the longer quad axle semi-trailers, and there are some 50Max/HPMV trucks using the route since upgrades to facilitate were completed in 2014. There is a large proportion of tankers carrying dangerous goods from the petro-chemical industries in New Plymouth using the corridor, in addition to the adjacent Kapuni and Maui gas pipelines.

Critical customers and assets

There are a number of critical customers adjacent or close to the corridor which rely on the corridor to be open 24/7 and are vulnerable to interruptions. As the corridor is the primary freight route between New Plymouth, Hamilton and further north; disruptions can have a major impact on productivity. The corridor supports access to nationally-critical infrastructure, such as the Maui pipeline north. This requires maintenance and is subject to failures such as that which occurred in 2011. South of Mahoenui, alternative routes are limited and therefore the integrity of the bridges, the Awakino and Mt Messenger tunnels, seawalls and retaining walls along this section of the corridor are critical in ensuring an uninterrupted journey.

Figure 11 - Corridor capacity



Pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for Access are the following:

- **Increased access demands of urban growth:** Future growth to the south of Hamilton (Peacocke, the Airport and surrounds, the proposed Ruakura Freight Hub and the inland port development) and at Bell Block, north east of New Plymouth is expected to increase access demands for the corridor. This increase in demand is reducing the ability of the route to facilitate efficient, reliable and safe journeys at both ends of the corridor.
- **Challenging topography:** The section between Awakino Gorge and Mt Messenger is narrow, steep and winding. The topography, road reserve area and substantial river systems in this section constrain alternative route opportunities. Higher costs to the freight industry for vehicles using this corridor (estimated at 2 times average), and corresponding negative impact to business and economy, is largely attributed to these topographic constraints.
- **Choke points:** Carriageway lane and shoulder configurations on SH3 (although HPMV suitable) can be highly variable for the size of the trucks travelling the route. The one lane tunnel at Awakino, the tunnel at Mt Messenger along with the steep and/or winding narrow sections of the corridor create choke points and impact journey times and travel speed as well as preventing moderately oversized loads from using the route. The single alternate HPMV route (SH4 via Wanganui) increases direct journey time by three hours. Both the planned Awakino Tunnel bypass and the Mount Messenger bypass will assist in alleviating some of this pressure (see page 10).
- **Access to stopping places:** The small settlements of Mokau (white-bait coast north of Tongaporutu) and Piopio (between Te Kuiti and Mahoenui) are popular stop-overs for tourists and truck drivers, but have inadequate stopping places to cater for the volumes. Existing stopping places in these locations are often inaccessible and unsafe due to vehicle overflow and mix of vulnerable users, recreational vehicles and heavy trucks.

Future considerations

The future considerations and responses to corridor pressures, intervention triggers and appropriate levels of investment related to Access include:

- **Modes:** As the urban population grows and development expands, the role of public transport, walking and cycling in facilitating travel within the urban centres and to satellite towns in the regions will become an increasingly important travel mode. As such, expansion of the public transport network, as well as providing active modes, should be considered to manage demand.
- **SH3:** Although both the Hamilton section of the Waikato Expressway and Southern Links will provide new strategic road connections to the north of SH21, the existing route of SH3 is expected to remain a heavily trafficked route, for local traffic accessing Hamilton. Some traffic volumes on the remaining two-lane sections would exceed levels considered appropriate with efficient operation and should be managed accordingly.
- **LoS:** Future proofing the route to maintain appropriate LoS for both commuters and those undertaking long haul trips should be a consideration for investment along this corridor (i.e. the trade-off between limiting or increasing access and maintaining safety and efficiency of the corridor).
- **Assets:** New assets may require specialist maintenance, such as the Awakino and Mt Messenger bypasses. Older assets such as the existing Awakino and Mt Messenger tunnels may be made redundant depending on regional and local access. Investigations into future maintenance of older assets may need to be considered, especially if utilised for active modes or alternative access.

Resilience

As a vital inter-regional transport route, this corridor is vulnerable to closures from crashes and environmental factors which can have significant negative impacts to the regional economy. There are critical parts of the corridor with a significant resilience risk profile including coastal portions of the highway between Awakino and Tongaporutu, the steep, windy, and slip prone alignments through Awakino Gorge and Mt Messenger, and the narrow tunnels and numerous bridges over the rivers crossed by the highway.

Vulnerabilities

Slips and rock falls present a major issue for a proportion of the corridor between Hangatiki and Urenui given the steep terrain. The corridor is also susceptible to flooding especially in the coastal and low-lying sections through the Awakino Gorge and between Awakino and Tongaporutu.

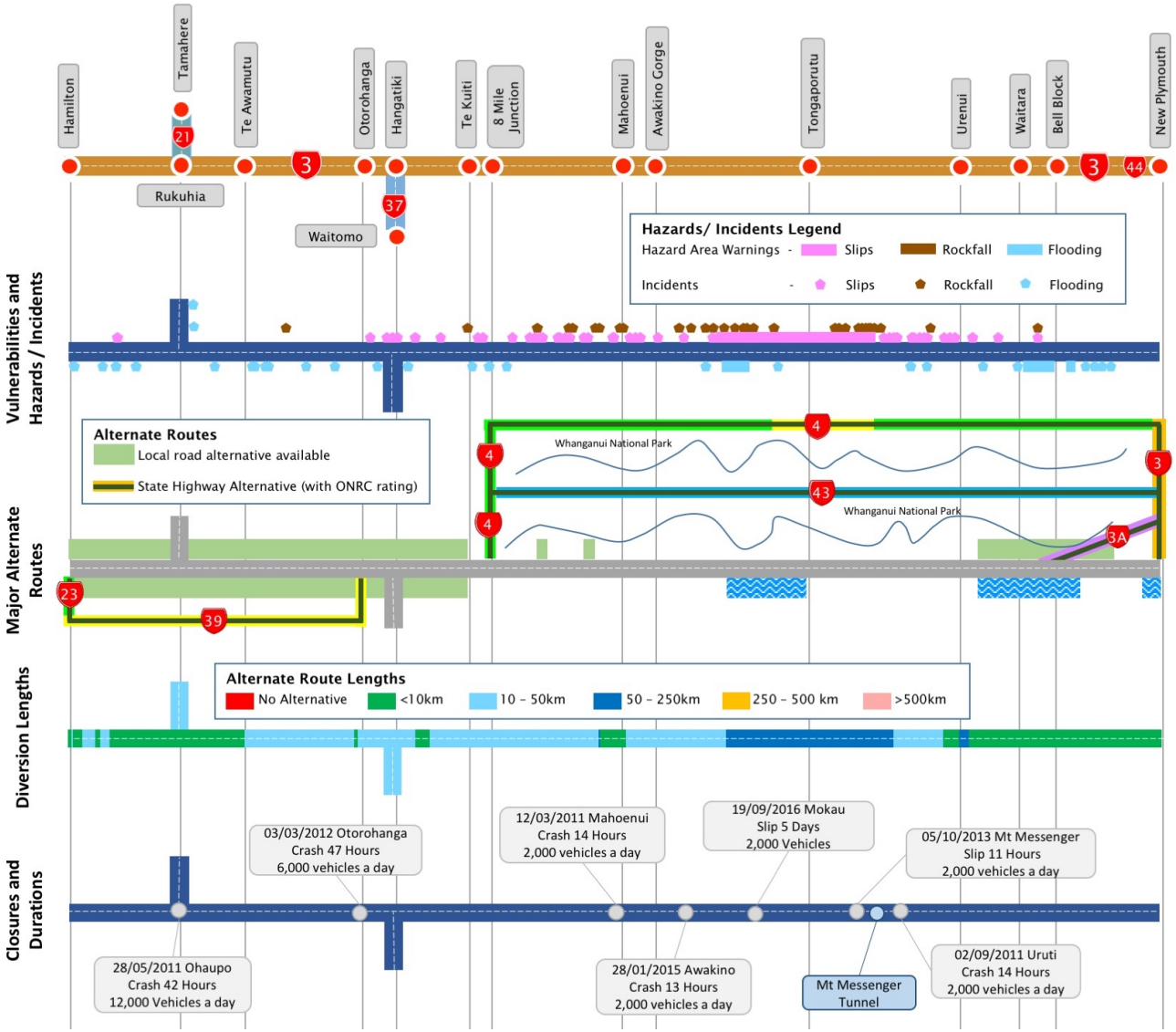
Alternative routes and diversion lengths

Due to lack of suitable alternative routes over a large portion of the corridor (8 Mile Junction through Urenui), road closures can impact significantly on the ability of customers to complete their journeys. SH4/SH43/SH3 via Stratford is the shortest alternative route, extending the journey time by 1hr 20 mins, however unsuitable for heavy vehicles (SH43 is partially unsealed with poor alignment). SH4/SH3 via Whanganui is 242km longer in distance and extends the journey time by three hours. The latter is the only viable option for heavy vehicles.

Closures and duration

Over the past five years, there have been seven major unplanned road closures over 10 hours in duration, the most recent and longest road closure being five days as a result of a slip at Mokau. The most common causes of road closure are maintenance activities, crashes and incidents resulting from environmental factors (e.g. flooding, slips, river scour and trees on the highway). Partial closures (often for slips etc.), also slow traffic and reduce travel time reliability.

Figure 12 – Resilience



Pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for Resilience are the following:

- **Lack of suitable alternative routes:** As the only direct state highway route between Hamilton and New Plymouth, closures of SH3 have potential to impact significantly on the ability of state highway traffic to complete its journey, due to the long detours that this necessitates. In particular, between Te-Kuiti and Urenui where there are no alternative state highway connections, or local road connections of a comparable standard and due to the physical constraints on SH3, the ability to turn around trucks is limited.
- **Road closures:** Vehicle crashes and natural events result in road closures. Steep terrains and exposed coastal section of the corridor between Mahoenui and Tongaporutu is particularly vulnerable to slips, rock falls, flooding, coastal erosion and windblown trees are an ongoing maintenance issue. Projections of increased severity of storm events and rainfall to NZ West Coast will impact future maintenance and risk assessment around slips and rock fall along the corridor.
- **Response times to incidents:** The remote nature of the corridor and lack of cell phone coverage can impact response times to emergency events. This also results in difficulty in accessing and clearing incidents, and delays in re-opening the route in terms of response times for maintenance crews, heavy equipment and/or emergency services. Sections of SH3 most prone to closure incidents, such as Awakino Gorge and Mount Messenger, are amongst the most distant from the main urban centres on the route.
- **Nationally critical infrastructure:** SH3 supports access to nationally-critical infrastructure, such as the Maui pipeline, for pipeline restoration efforts and maintenance. If an unplanned incident occurs, there is no alternative route to access the Maui pipeline - posing a nationally significant risk.
- **Critical customers:** The seasonal transport of high-value (up to $1.2M per truckload), short shelf life dairy product between Hawera and Litchfield, is reliant on SH3 to be open, with delays resulting not only in loss of product but also factory down-time losses.

Future considerations

The future considerations and responses to corridor pressures, intervention triggers and appropriate levels of investment related to Resilience are as follows:

- **Vulnerable areas:** Further investment to support identification, active monitoring and proactive management of vulnerable areas and mitigating slope instability issues on a priority basis by actively monitoring prone areas and investing in preventive maintenance options should be considered.
- **Improved response times and emergency management**: In future providing better communication and facilities along the corridor this will enable improved response and emergency management. Continued support of the Mobile Black Spot fund (MBIE initiative) application for mobile coverage upgrade between Awakino Gorge and Mt Messenger. Improve life-lines by investigating feasibility of helicopter pads in new or existing stopping areas to transport critical patients to Waikato Hospital where travel delays are impacting the road journey.
- **Real time information:** Given the challenging terrain, real time information is critical in diverting/planning journeys. VMS boards are currently located at 8 Mile Junction and at the SH3/3A intersection with no means of communicating to the customer between these points. Bluetooth connectivity (BlipTrack) through the corridor is in the planning phase. Further investigation and investment in ITS system should be considered in order to aid the customer decision making process.
- **Second crossing:** Supporting NPDC with further investigations into a second crossing of the Waiwhakaiho River on the local network, to mitigate the risk of unplanned bridge closure to the corridor and the economy.

Reliability and efficiency

Efficiency

Efficiency on the corridor is reduced due to the nature of the geography with tight and often steep alignment through the Awakino Gorge and over Mt Messenger. The geography and reduced speed limit on SH37 impact on efficiency along this route. Demand from local commuters at either end of the corridor also results in lower levels of service during AM/PM peaks.

Variability

High commuter sections approaching both urban centre have high variability due largely to the AM/PM peak flows.

Source data is limited.

Commercial vehicle average speed

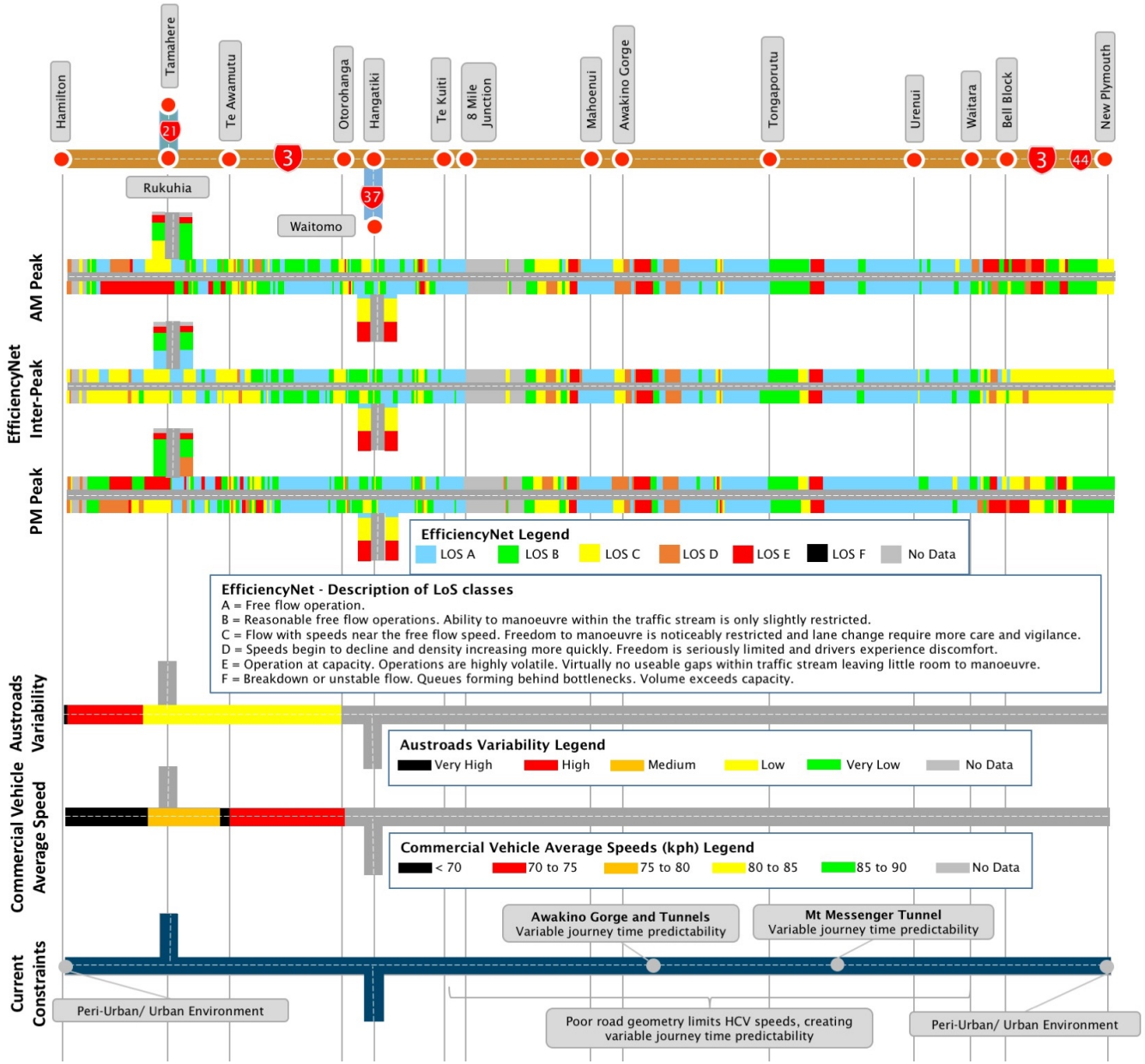
Average speeds for commercial vehicles is relatively low for the SH3 section of the corridor for which data exists. The corridor between Hamilton towards Rukuhia achieving speeds less than 70km/hr and then from Te Awamutu to Otorohanga only achieving 70-75km/hr. It is expected these speeds would be below 70km/hr between Tongaporutu through to southern base of Mt messenger.

Source data is limited.

Current constraints

The urban and peri-urban environments with high frequency of intersections and access ways at both ends of the corridor and the topography, limited passing lanes and narrow tunnels through the middle section are the significant constraints effecting journey reliability and efficiency.

Figure 13 - Reliability and efficiency



Pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for **Reliability and efficiency** are as follows:

- **Inconvenience during construction of improvement projects:** Significant improvement projects under construction over the next 2-3 years (refer to pg. 10) will place more pressure on the customer journey. Customers are expected to be impacted while construction is underway, resulting in travel time delays and impacting travel time reliability and efficiency.
- **Intersection efficiency and highway capacity issues:** A high frequency of intersections and access ways both at the northern and the southern urban fringes of the corridor are leading to intersection efficiency and highway capacity issues. These are being addressed through committed improvement packages (Hamilton to Ohaupo, Ohaupo to Te Awamutu and Waitara to Bell Block).
- **High demand for daily commuter traffic:** Either ends of the corridor are characterised by higher levels of urban development, which due to their proximity to the respective centres of Hamilton and New Plymouth, generate a notable element of short distance commuter traffic. This has the potential to adversely impact journey time efficiency and reliability, and compromise the corridor's ability to meet its functions.
- **Heavy vehicle growth to the Port of Taranaki:** Growth in traffic driven by logging in southern Taranaki will put further pressure on SH44. Freight efficiency on this short route is impacted by signalised intersections and tight cornering through the CBD, narrow widths and un-signalised pedestrian crossings nearing the port.

Future considerations

The future considerations and responses to corridor pressures, intervention triggers and appropriate levels of investment related to **Reliability and efficiency** are as follows:

- **Safety and Major Capital improvement:** The corridor has significant Safety and Major Capital improvement packages planned, which are expected to mitigate safety and time travel reliability issues.
  - These improvements will result in growth of assets on the corridor (e.g. new alignments, shared pathways, streetlights, safety barriers, signs, markings, planting, etc.). The design and construction quality of these assets will impact on type, frequency and cost of future maintenance. Provision for adequate maintenance and renewal investment should be considered.
  - Robust communication plans including public consultation and notifications, advanced warnings, and enhanced ITS will need to be put in place to inform the customers of up-coming projects, and minimise the impact on journey.
  - Communication and assignment of maintenance responsibility between parties working on the road (NOC maintenance contractors, safety and capital improvement teams) will be important in ensuring: continued delivery of maintenance; optimised investment; and that disruption to customers is minimised.
- **Future traffic impacts:** Additional work should be undertaken to understand the significance of the traffic impact of growth between Hamilton and Kihikihi (including the interim impact as far south as Hamilton Airport, prior to the delivery of Southern Links) and between Bell Block and Waitara.
- **Customer journey:** Better management of the journey experience through speed management, enforcement and driver information. Real time information will enable the customer to make more informed decisions around travel along the corridor, particularly planned delays.

Safety

Collective risk

The section of SH3 corridor from Hamilton to Te Awamutu and Waitara to New Plymouth generally has a high or medium-high collective risk rating. A medium risk rating is seen between Hangatiki and the Awakino Gorge as well as around Tongaporutu. SH21 generally has a low risk rating, however, changes to a medium-high risk rating on approach to Tamahere. SH37 has a medium-low risk rating.

Personal risk

There is a high personal risk rating on the SH3 corridor from 8 Mile Junction to Awakino Gorge and around Tongaporutu, as well as SH37 to Waitomo. The corridor also has a medium risk rating between Hamilton to Tamahere and Waitara to New Plymouth.

Star rating

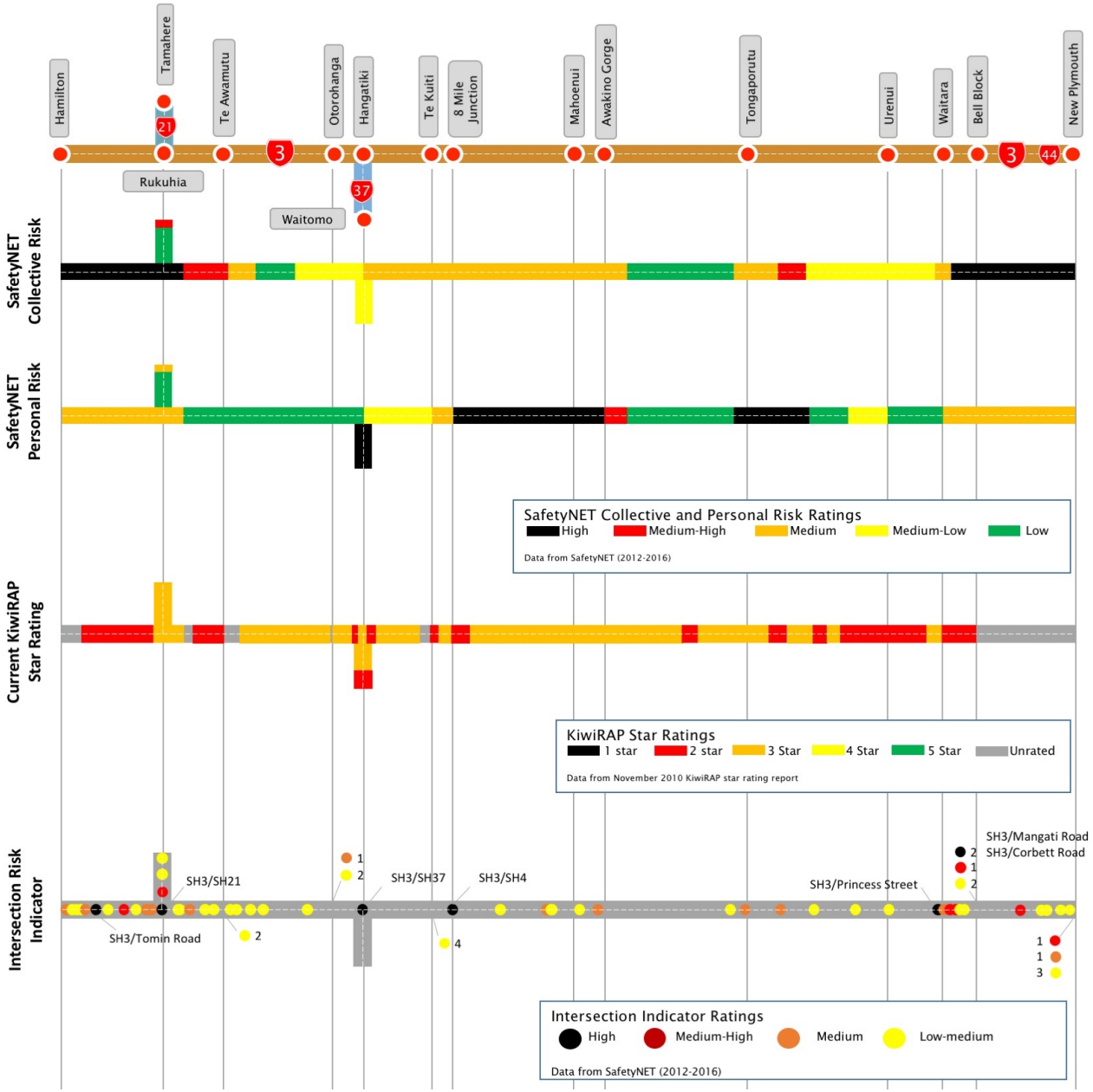
The corridor is predominantly 3-star rated except for the section between Hamilton and Rukuhia and around Urenui and Waitara where is it 2-star.

No star rating has been undertaken for the urban areas.

Intersection risk indicator

There are a total of seven high risk intersections along the corridor: SH3 intersections with Tomin Road in Hamilton, SH21, SH37, SH4, and Princess Street in Waitara, Mangati Road and Corbett Road in Bell Block has also been categorised as high risk.

Figure 14 – Safety



Pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for Safety are as follows:

- **Crash risk:**
  - High numbers of deaths and serious injuries at the northern and southern ends of the corridor, attributed to increasing traffic volumes and conflict at intersections and accessways result in a poor safety record (Hamilton to Ohaupo, Ohaupo to Te Awamutu, Te Awamutu to Otorohanga, SH37 to Te Kuiti and Waitara to Bell Block). Improvement packages addressing each of these areas are detailed in Investment Improvements section.
  - Narrow lanes, lack of shoulder, poor geometric alignment and challenging topography from Awakino Gorge to Urenui contributes to a high number of crashes, deaths and serious injuries, and road closures.
- **Lack of passing opportunities:** The section of the corridor from Mahoenui to Waitara features lower traffic volumes and minimal passing which can create conflicts between heavy vehicles and local passenger vehicles. There is an extended stretch (approximately 50km) with no passing lanes between Awakino Gorge and Urenui and only limited safe passing opportunities over the length, leading to driver frustration and increased risk taking, increasing the risk of crashes. The Uruti Valley, south of Mount Messenger is regularly cloaked in fog limiting visibility, travel speeds and adding to factors resulting in risky driving conditions.
- **Limited width carriageway, range of land use, roadside activity** and multiple pedestrian crossings condensed along the short length of SH44 results in conflict between Port Taranaki destined heavy vehicles and the urban residential environment.
- **Vulnerable users:** Demand for walking and cycling journeys within the urban areas of Hamilton and New Plymouth and tour cycling along the corridor is likely to increase, creating potential conflict between traffic and these vulnerable users.

Future considerations

The future considerations and responses to corridor pressures, intervention triggers and appropriate levels of investment related to Safety are as follows:

- **Safety of cyclists:** The proposed Waitara to Bell Block improvement package will offer improved safety and social benefits for vulnerable road users from the provision of improved walking and cycling facilities. Consideration should also be made for the safety of cyclists accessing the length of the corridor
- **Future improvements:** Safety risk remains along the sections without any current planned improvements (Otorohanga to SH37, Te Kuiti to Awakino Gorge and Urenui to Waitara). These sections deliver an average to poor level of service, in terms of safety, and should be considered for future improvements.
- **Life-lines:** Improve life-lines by investigating feasibility of helicopter pads in new or existing stopping areas to transport critical patients to Waikato Hospital where travel delays are impacting journey.
- **Amenity and safety:** Improvements to enhance amenity and safety along SH44 should be considered.

improving road safety on State Highway 3 between Ohaupo and Te Awamutu

People, places and environment

Natural environment

The corridor is characterised by predominantly rural landscapes north of Mahoenui with urban areas at either ends of the corridor. The section south of Mahoenui features steep-sided river valleys and passes with indigenous forest, natural characteristics and DoC conservation areas providing exceptional views, but is also susceptible to slips and rock falls. The SH spans four large catchments with the largest being the North Taranaki and Mokau River catchments along with the Upper Waipa and Waikato River catchments. There are numerous minor stream crossings on the corridor.

In the southern section of the corridor, streams and major rivers can flood low lying areas, and in some areas coastal erosion is a risk.

Noise, vibration and air quality

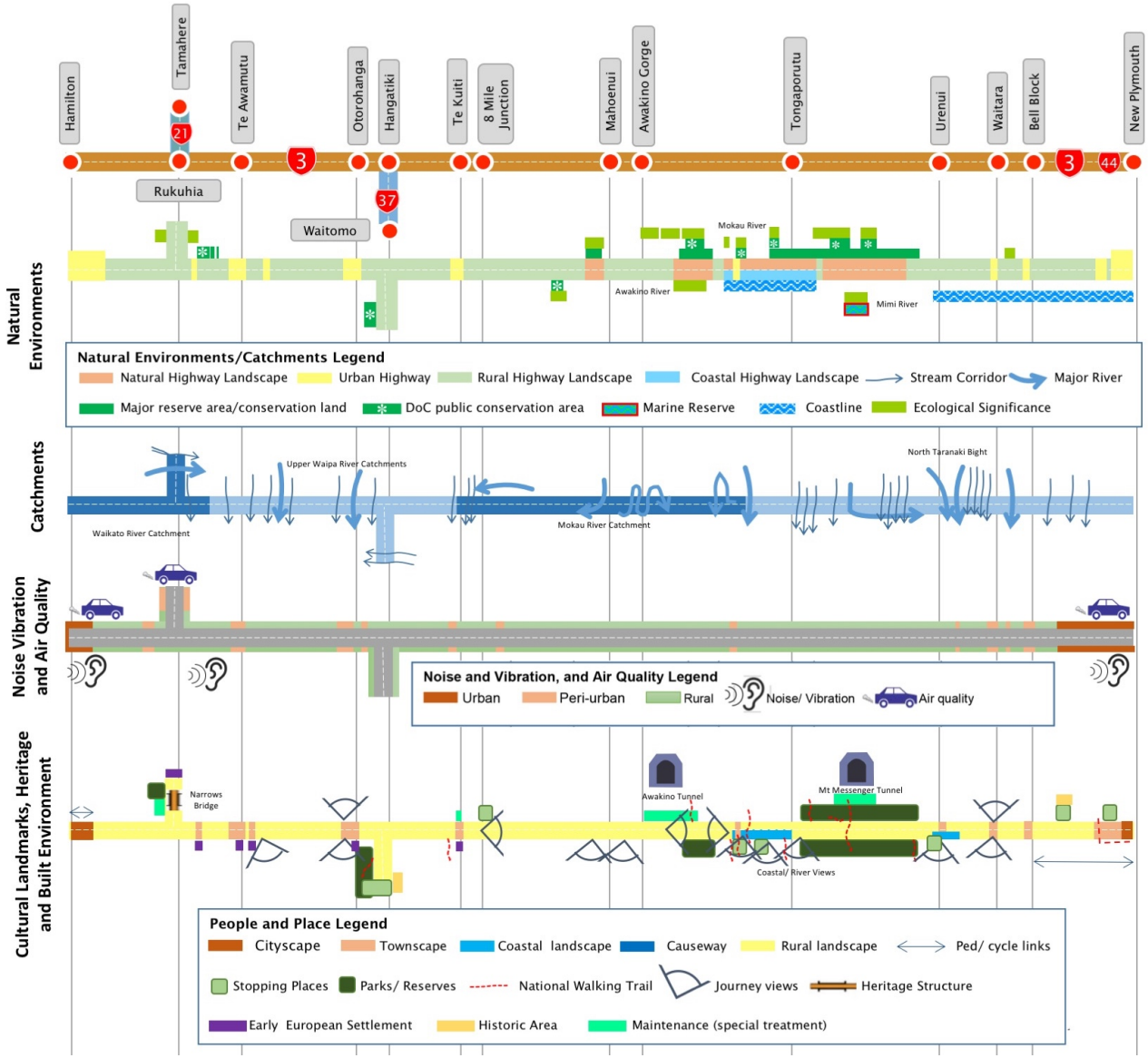
Consistent vehicle traffic creates noise, vibration and air pollution impacting adjacent residential development in Hamilton, Ohaupo, New Plymouth and Tamahere (SH21). For the majority of larger settlements along SH3, bypasses avoid town centres, reducing noise and vibration issues felt within residential areas. Ohaupo is an exception, and these issues will continue to be felt as the development of growth in this area continues.

Cultural landmarks, heritage and built environment

The visual character of the corridor provides vibrancy and attractiveness to journeys, with a range of urban, peri-urban developments and small remote service towns. Particularly within the Waikato, many of these date to early European settlement with significant historic built structures and monuments scattered along the SH.

This area was greatly contested because of fertile soils and economic opportunities for supply close to Auckland during the Wars of the Waikato and Taranaki. The area has a rich cultural significance with historic sites along or nearby the SH such as the boundary for the Kingitanga.

Figure 15 – People, places and environment



Pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for **People, places and environment** are as follows:

Natural Environment

- **Climate change:** Climate change through higher temperatures and intensive rainfall will accelerate erosion and degrade slopes within and alongside the corridor, particularly the Awakino Gorge and Mt Messenger sections. The effect of this will also include flooding frequency and intensity and erosion along coastal sections of the highway from Awakino to Tongaporutu and Urenui to New Plymouth. The management of these risks are likely to require greater engineered intervention and controls.
- **Vegetation management:** requirements (particularly near sensitive ecological and protected conservation lands) along the corridor are likely to increase. As the corridor develops and expands, expectations (e.g. visual quality, control of pest plants) will lead to areas of managed vegetation being increased as well as operational costs.

Noise, Vibration and Air Quality

- **Development:** As development continues in the north (Ohaupo, Te Awamutu and Kihikihi) and south (Bell Block and Waitara), the need to manage noise and vibration issues will increase.
- **Congestion:** Increased congestion in urban areas is creating air pollution with more vehicles moving slower, and burning fuel less efficiently. This is likely to exacerbate with development for both Hamilton and New Plymouth urban communities, and smaller population centres along the corridor to a lesser extent.

Cultural landmarks, heritage and built environment

- Service towns function as part of the highway and provide rest areas, with local trade benefiting from the connection with highway customers. Increasing corridor demand will increase pressure on these communities in their ability to continue as a functional part of the customer journey without impacting local liveability.
- The corridor is rich in cultural significance (e.g. archaeological and built heritage) and the management of this will need to be understood (e.g. safe access/any inherent responsibilities of the NZ Transport Agency), particularly as the corridor develops. Increasingly, higher standards of heritage assessment and management will be sought.
- View shaft and associated vegetation management, along with provision of adequate amenity facilities to stopping places (including rest areas) along the corridor are becoming an increasingly important part of the journey experience and development of the corridor.

Future considerations

The future considerations and responses to corridor pressures, intervention triggers and appropriate levels of investment related to **People, places and environment** are as follows:

- **Stopping places:** Consider a review and rationalisation of stopping places (including rest areas and look outs) with places of interest, heritage sites, local business areas and main streets, and future electric vehicle charging infrastructure. Utilising these places to tell local stories and enhance the attractiveness and amenity of journeys.
- **Relationships:** Effective relationships between iwi and associated councils to work together and maximise access to cultural and heritage places (built forms, monuments, marae and pa site) to support economic and social growth. Lonely Planet gave recognition to Taranaki as the second-best region in the world to visit, creating potential for an increased interest in cultural and heritage values and places of the region. This may require safety and journey management programmes to ensure the corridor continues to meet its transport responsibilities.
- **Environmental standards:** Tighter environmental standards for stormwater, erosion and sediment control may be required for maintenance and upgrades in the vicinity of coastal areas and waterways (e.g. exposed West Coast/multitude of rivers south of Awakino). Activities in these areas may be restricted to certain times of the year impacting maintenance programmes.
- **Maintenance technology:** Consider improved maintenance technology, as townships continue to develop and vehicle numbers increase more people will be exposed to human health issues, e.g. by improving seal joins may decrease the level of vibration and noise complaints.
- **Weigh stations/stock effluent sites**: Consider suitability of the location of weigh pits/stock effluent sites after improvements (e.g. effluent site north- side of Mt Messenger that may be bypassed, weigh pit at SH3/3A may impede intersection improvement).
- **Rationalise resource consents:** Consider opportunities to consolidate/rationalise resource consents, particularly for regular maintenance activities.
- **Mapping of sensitive ecological areas:** Managing biosecurity and biodiversity issues along the corridor through smart technologies and monitoring. Updating the GIS based record of the multiple archaeological sites adjacent to the highways would enable maintenance works to avoid significant sites and improve planning, design and investment.

Understanding the infrastructure assets

The following sections contain information about the condition and performance of the state highway assets within the corridor. This information is necessarily complex and therefore challenging to communicate simply. Every effort has been made to explain the base data inputs and what the information is describing in as simple terms as possible, however full comprehension does require some technical knowledge of the terms used.

Corridor asset base

The state highway system is a significant national asset, made up of 11,412 km of roads and associated assets. This corridor contributes approximately 263 km of road network which reflects 2.3% nationally. The total value of the assets along the corridor is $430M (excluding ITS, and, heritage and green assets).

The corridor assets have been divided into eight groups as shown in Figure 16 which directly support the access, reliability and efficiency, safety, resilience, and, people, places and environment outcomes on the network.

Asset condition and performance summary

The infographic shows the summary score the entire corridor achieves for each of the eight measures used in this document to assess the condition and performance of the assets. These measures are assessed in more detail along the corridor in the following sections of the document.

Figure 16 – Corridor asset base

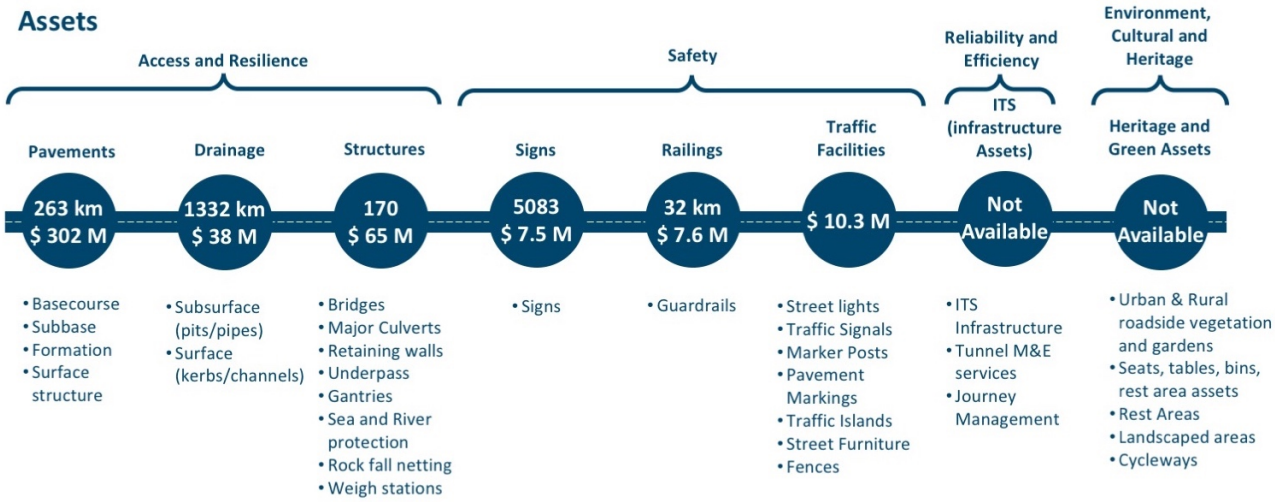


Figure 17 – Asset condition and performance summary

Asset condition and performance

Surface skid resistance

The infographic shows the proportion of the Route Section, as a percentage, that falls within the two levels of either threshold limit or investigation level. The change in Surface Skid Resistance infographic shows the change in the levels from the 2014 survey to the 2016 survey, as either an improvement or degradation.

The information is derived from inspection data that records a value every 10m in each direction. Each 10m length is rated as to whether it is within one of the bands: below threshold limit; within investigation limits; or above Investigation limits. The proportion is then the number of 10m lengths in that section as a percentage of all 10m lengths in that section.

Surface skid resistance results have improved markedly across this corridor. Some sections, SH3 RS0 to RS5; RS103 to RS158; and SH44 RS0, show an improvement from below the threshold level but continuing to remain below the investigation level. Higher amounts of surface skid resistance below the threshold level are noted in the areas of Mt Messenger (RS176) and Awakino Gorge (RS133).

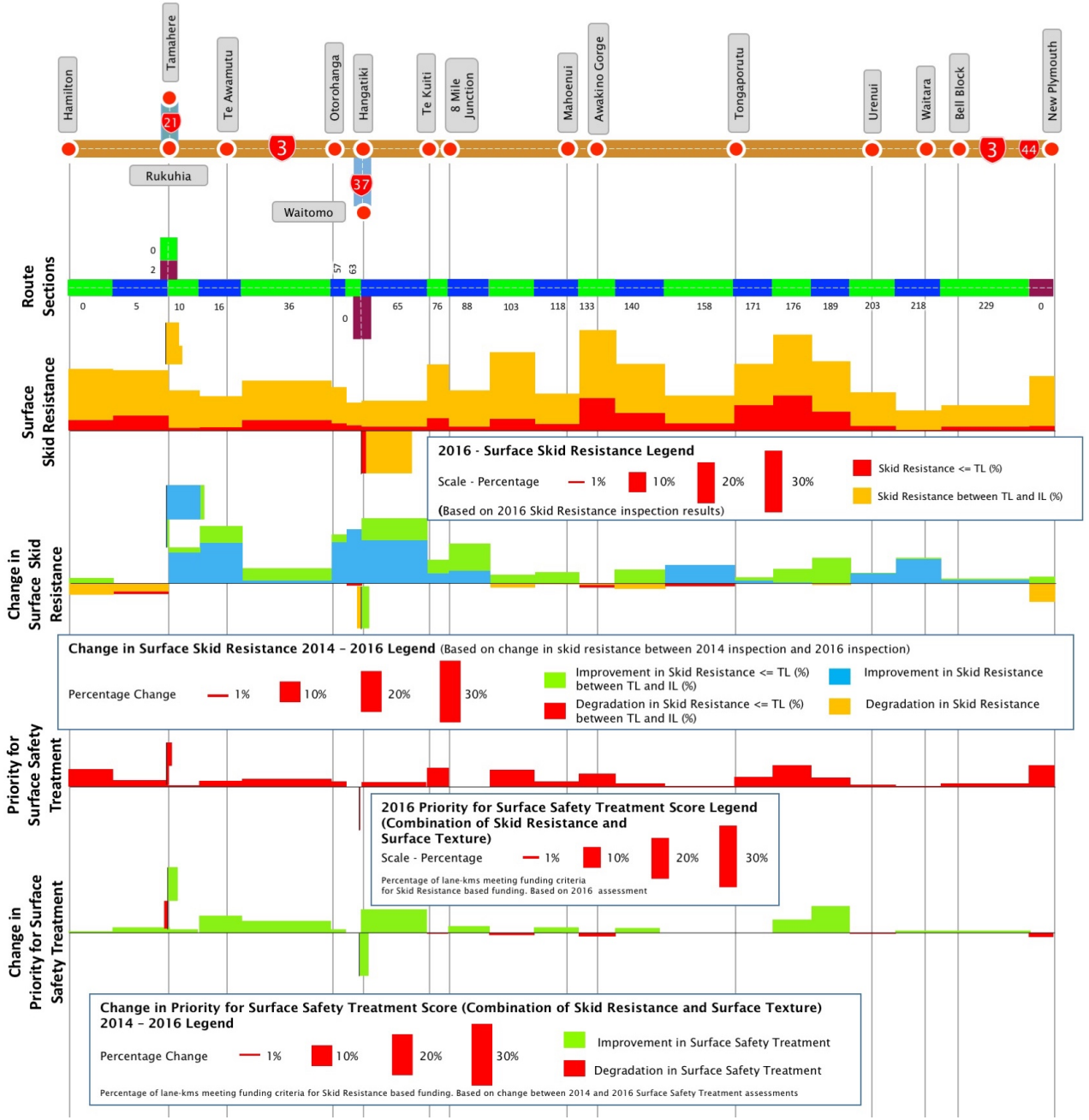
Priority for surface safety treatment

The infographics show the proportion of the Route Section that has a Priority for Surface Safety Treatment (Skid Assessment Length) that would qualify for funding, i.e. a score >140. The second infographic shows the change in these levels from the 2014 survey to the 2016 survey, as either an improvement or degradation.

Taken from inspection data that is normally recorded every 100m in each direction. Each 100m assessment length is rated and if it achieves a score over 140 it qualifies for funding. The proportion is then the length of route section that qualifies for funding as a percentage of the total length of that section.

There was 18 lane km of this 504 lane km corridor that qualified for surface skid resistance funding. The change in the priority for surface safety treatment score indicates that there have been improvements to surface skid resistance and this is consistent with a recent emphasis on water cutting surfaces. Pockets of continued degradation remain on SH3 between Te Kuiti and Mahoenui, RS76, RS103 and RS133 (Awakino Gorge) as well as on SH44 leading into New Plymouth.

Figure 18 – Asset condition



Surface defects

The infographics show the proportion of the Route Section that has a Surface Defects (100m Priority) score that would signal the need for further investigation, i.e. a score >20. The second infographic shows the change in these levels from the 2014 survey to the 2016 survey, as either an improvement or degradation, as well as the three-year trend.

The Surface Defects score is made up of a number of measures which all contribute to the overall score including: roughness, rutting, shoving, flushing, and design life. Any 100m section achieving a score over a total of 20 rates as flagged for inspection. The proportion is then the length of corridor that is flagged for inspection as a percentage of the total length of that section.

Overall, 20% of the corridor achieves a score above which inspection is required. This is most prevalent in the urban section of New Plymouth (SH44) and the southern end of Awakino Gorge.

Surface age

The infographic shows the weighted average age of road surface, and the proportions of surface age that fall within the three age bands.

The base data is all the seal lengths and their age from RAMM. Then a weighted average is then calculated. Overall, all sections add up to 100%. The proportion is the length of corridor in a particular age band as a percentage of the total length of that section.

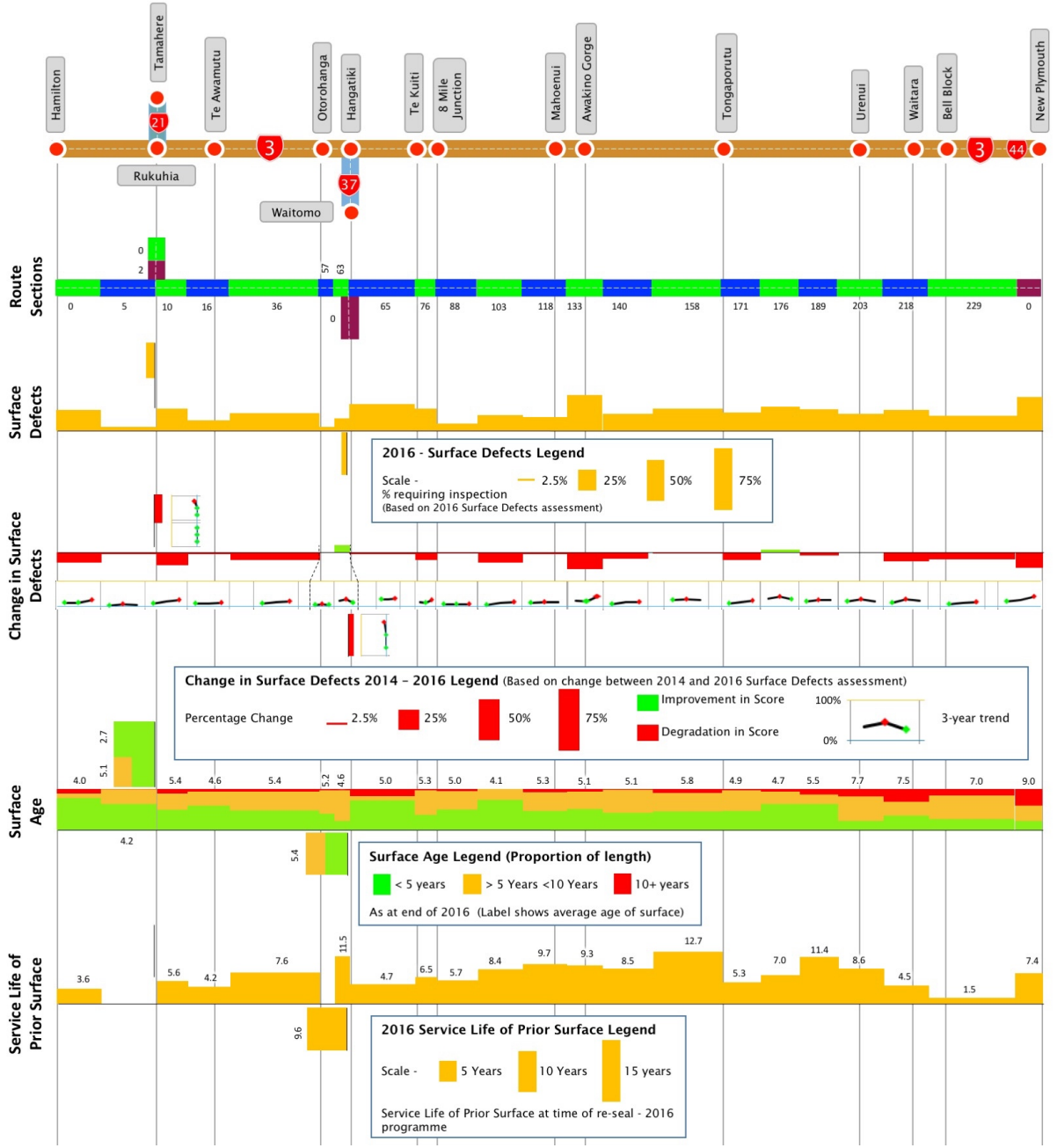
The sections of corridor with the oldest age profile are between Urenui and the Port of Taranaki.

Service life of prior surface

The infographic shows the weighted average age achieved for the sections of road surface that were resurfaced in the last financial year (2015-16). The infographic only shows sections where re-surfacing work was undertaken in the 2015/16 season. The value is derived from the weighted average age of the sections of seal that were overlaid by a new first coat seal. This is a standard ONRC measure.

Generally, a service life of around 8 years or greater was achieved for most sections that were resealed in the last year.

Figure 19 – Asset condition 2



Resurfacing

The infographics show the proportion of Route Sections planned for resurfacing in the 2016/17 and 2017/18 approved annual plans, confirmed through the RAPT tour, as an indication of the response to the surface condition described previously, and current surface condition.

The major resurfacing works are planned for the sections 3/5 north of Rukuhia, and 3/158 north of Tongaporutu.

Proportion of travel on smooth roads

The infographic shows whether the route section passes the ONRC standard for Proportion of Travel on Smooth Roads (Smooth Travel Exposure). 97% is the ONRC target for proportion of travel on smooth roads. The infographic simply shows whether the route section achieves this level or not.

Sections of corridor falling below acceptable proportions of travel on smooth roads include: SH3/0 urban Hamilton, SH3/10 Rukuhia, SH3/76 between Te Kuiti and 8-mile junction, SH3/133 Awakino Gorge, SH3/176 Mt Messenger, and, SH3/229 and SH44/0 between Brixton and Port of Taranaki.

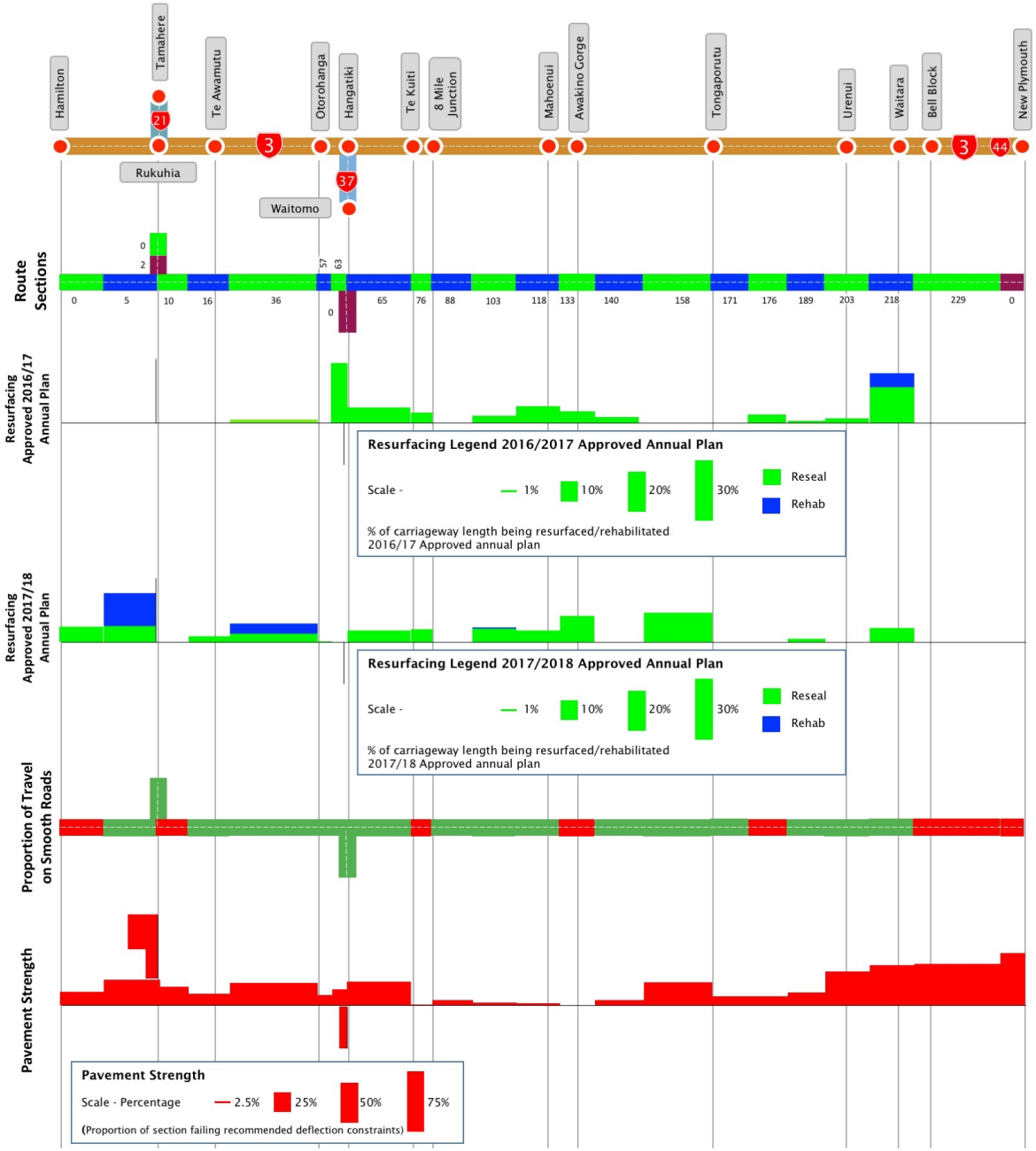
Pavement strength

Recommended deflection constraints for thin asphaltic surfaces is used as a measure of pavement strength. The infographic shows the proportion of the Route Section that fails to achieve the recommended deflection constraint for the classification of road, based on lane-km.

The sections of corridor with the highest proportion of pavement failing to meet the deflection constraints occur at SH3/218, SH2/229 and SH44/0 between Motunui and the Port of Taranaki.

There is high deflection due to the volcanic soil in Taranaki, but this is not necessarily a problem. However, this may influence and limit the range of suitable surface treatments and value for money of investment decisions as well as fundability.

Figure 20 – Asset condition 3



Asset condition and performance pressures

The pressures on the corridor that are resulting in increased demand or a reduction in levels of service for **Asset Condition and Performance** are as follows:

- **Truck Rollovers:** Truck rollovers are common and cause a resilience and reliability issue as well as being a significant safety concern. This is due to the pavement shape and out of context curves along the corridor. The issue is particularly prevalent on Mt Messenger.
- **Mt Messenger**: Mt Messenger is a known problem area and surfacing is being held back awaiting confirmation of a future alternative route. Surface skid resistance performance is under pressure. It is difficult to apply an enduring surface on the Mt Messenger alignment. It has steep, tortuous grade for heavy vehicles on current alignment. With trucks getting more powerful, this is applying more stress to the pavement.
- **Flushing (loss of surface texture):** There are flushing issues south of Awakino Gorge, and in the urban area of New Plymouth.
- **Drainage issues**: – the area has very high rainfalls. (SH43) –can get better performance from pavement if get better drainage and better response to events can improve. Some localised undersize culverts. NOC notes a move to implement moisture detection surveys to support prioritisation of drainage improvement and or works.
- **Underperformance of asphalt products:** There are legacy issues from underperformance of AC caused by suppliers.
- **Rutting:** The extent of rutting is increasing and becoming a concern.

Asset condition and performance future considerations

The future considerations relating to corridor pressures, intervention triggers and appropriate levels of investment related to **Asset Condition and Performance** are as follows:

- **Planned new roads:** Maintenance and rehabilitation works will need to be coordinated around the planned alignment changes.
- **Shape Correction:** Will need to consider fixing shape during rehab/reseal work where practical.
- **Resilience:** Need to ensure a response at the right time to ensure resilience is maintained.
- **Aging Pavements:** There are a lot of "older" pavements with a risk that if intervention timing is wrong then there will be a need to rehabilitate. The forward works programme could be stretched because of timing of works to actual need, rather than intervening too early, the downside being that when intervention is required it will involve a costly rehabilitation.

Investing in the corridor

The **Customer Levels of Service** shapes our response to our investment in maintenance, renewals and improvements. The NZ Transport Agency must consider the impact we have on our customers, the environment, communities, iwi, and the NZ economy in everything we do.

Decisions must be evidence based, informed and transparent with investment targeted to the right treatment, in the right place, at the right time while considering a range of competing priorities for investment. This requires significant analysis of various alternatives and options and expertise in applying appropriate judgement in collaboration with our service delivery partners.

Right treatment, right place, right time

A range of factors have been considered to determine the best point at which to intervene with maintenance and/or renewal treatments and improvements along the corridor.

Intervention works will be programmed to ensure:

- The right treatment,
- At the right place, and,
- At the right time.

Interventions will:

- Be based on minimising whole of life, whole of system costs and be underpinned by facts derived from enhanced asset information and modelling
- Define the most appropriate approach to asset maintenance, inspection and renewal, supported by reliability, availability, maintainability and safety specifications
- Use a risk-based approach to determine intervention requirements to specified levels of reliability
- Use resilience requirements to a specified range of weather conditions, considering climate change
- Define how sustainable development requirements are to be addressed

Summary investment

The proposed investment in the corridor is as follows:

Table 1- Summary corridor investment ($000)

Outcome	Expenditure Category	2018-2021	2021-2024	2024-2028
Access and Resilience	Maintenance and Operations	$13,719	$14,460	$21,721
	Renewals	$26,556	$28,659	$44,164
	Improvements	$40,876	$12,315	$34,900
Reliability and Efficiency	Maintenance and Operations	$5,880	$6,172	$9,265
	Renewals	$353	$393	$624
	Improvements	$106,080	$6,800	$5,000
Safety	Maintenance and Operations	$12,820	$13,714	$20,869
	Renewals	$3,552	$3,735	$5,651
	Improvements	$35,786	$0	$23,300
People, places and Environment	Maintenance and Operations	$3,340	$3,488	$5,238
	Renewals	$111	$114	$171
	Improvements	$0	$0	$0
	Total	**$249,073**	**$89,850**	**$170,904**

Figure 21 – Corridor investment

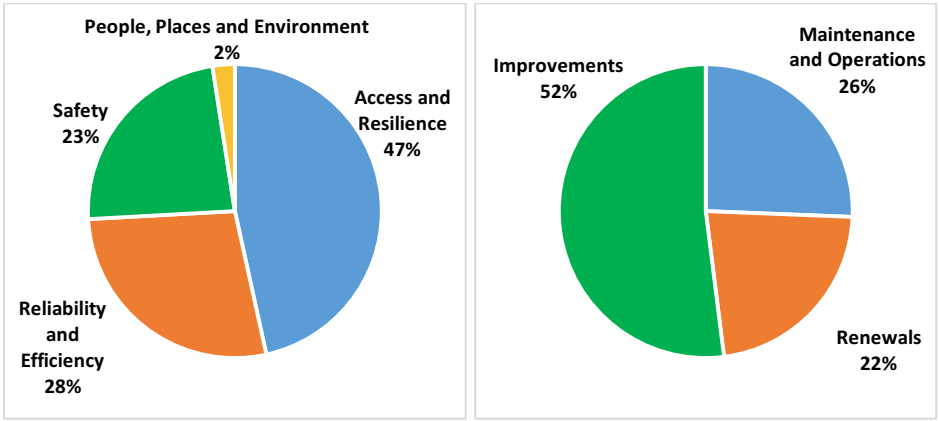


Table 2 - Summary investment by work category ($000)

Outcome	Work Category		2018-2021	2021-2024	2024-2028
Access and Resilience	111	Sealed Pavement Maintenance	$3,305	$3,575	$5,381
	112	Unsealed Roads	$20	$22	$33
	113	Drainage Maintenance	$1,532	$1,658	$2,481
	114	Structures Maintenance	$2,688	$2,802	$4,208
	121	Environmental Maintenance	$1,412	$1,557	$2,338
	122	Traffic Services Maintenance	$38	$93	$140
	124	Cycle Path Maintenance	$20	$20	$30
	151	Network & Asset Management	$3,774	$3,801	$5,709
	161	Property	$928	$934	$1,402
	211	Unsealed Road Metalling	$234	$136	$118
	212	Sealed Road Resurfacing (excl. surface skid resistance)	$10,699	$12,574	$22,020
	213	Drainage Renewals	$858	$952	$1,427
	214	Pavement Rehabilitation	$11,295	$11,503	$15,352
	215	Structures Component Replacements	$3,365	$3,380	$5,076
	222	Traffic Services Renewals	$106	$114	$172
	321 - 341	Improvements	$40,876	$12,315	$34,900
Reliability and Efficiency	121	Environmental Maintenance	$1,485	$1,572	$2,361
	123	Operational Traffic Management	$2,918	$3,131	$4,712
	151	Network & Asset Management	$1,307	$1,299	$1,937
	161	Property	$170	$169	$254
	222	Traffic Services Renewals	$353	$393	$624
	321 - 341	Improvements	$106,080	$6,800	$5,000
Safety	111	Sealed Pavement Maintenance	$3,497	$3,743	$5,633
	112	Unsealed Roads	$0	$0	$0
	113	Drainage Maintenance	$256	$305	$463
	114	Structures Maintenance	$421	$546	$965
	121	Environmental Maintenance	$360	$426	$640
	122	Traffic Services Maintenance	$5,187	$5,520	$8,368
	124	Cycle Path Maintenance	$6	$9	$13
	151	Network & Asset Management	$2,696	$2,757	$4,173
	161	Property	$397	$409	$614
	212	Surface Skid Resistance	$2,495	$2,701	$4,057
	214	Pavement Rehabilitation	$50	$59	$89
	215	Structures Component Replacements	$455	$381	$572
	222	Traffic Services Renewals	$553	$593	$932
	321 - 341	Improvements	$35,786	$0	$23,300
People, places and Environment	111	Sealed Pavement Maintenance	$186	$200	$300
	121	Environmental Maintenance	$2,652	$2,784	$4,181
	151	Network & Asset Management	$403	$404	$607
	161	Property	$99	$99	$149
	221	Environmental Renewals	$111	$114	$171
	321 - 341	Improvements	$0	$0	$0
		Total	**$249,073**	**$89,850**	**$170,904**

To be confirmed through the RLTP

Investing in access and resilience

Operations and maintenance

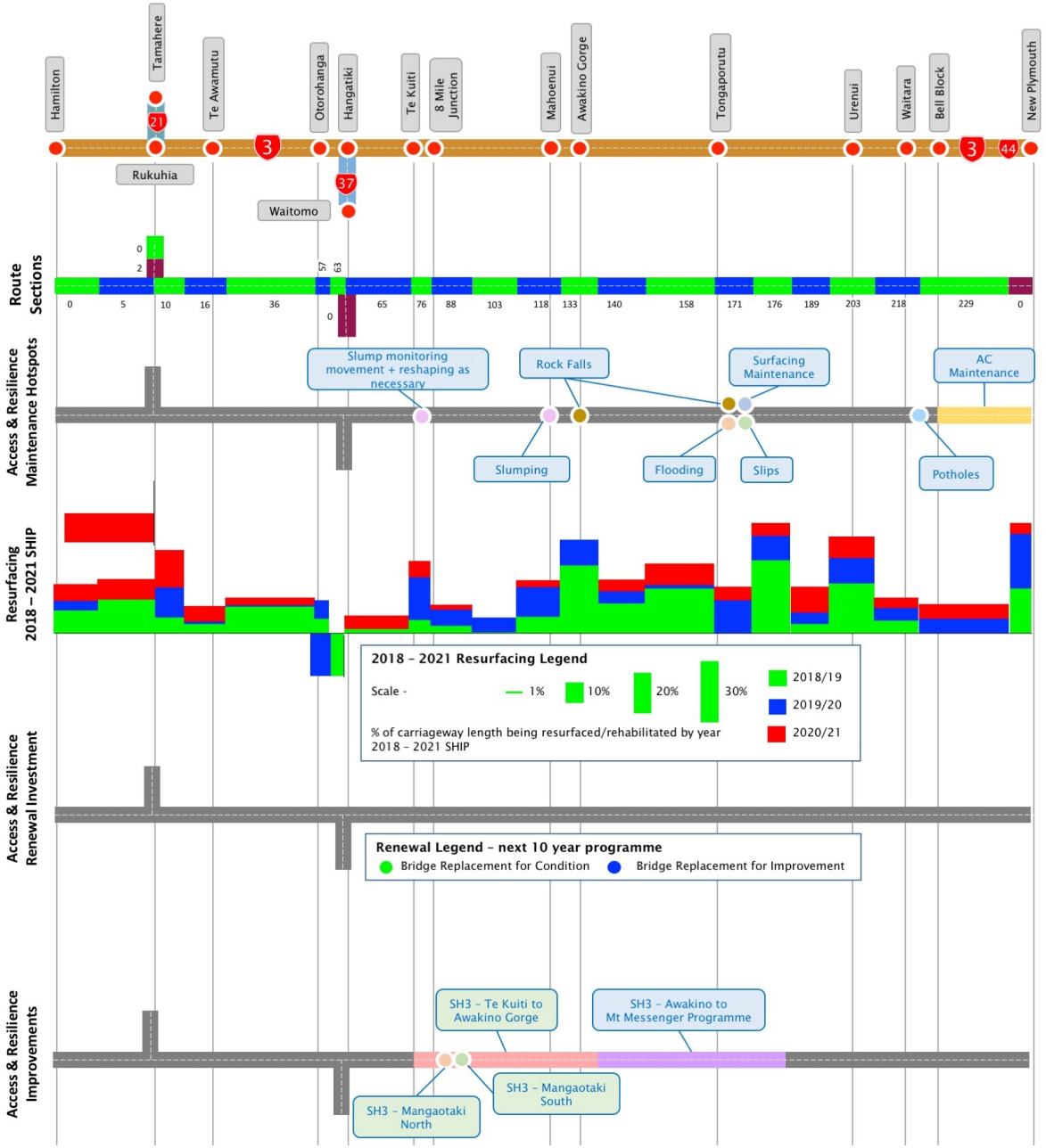
The main areas of investment to provide and preserve access and resilience are drainage maintenance, sealed road surfacing and structural component replacements and vegetation control. A key focus is to realign the base preservation quantities toward increased preventative maintenance and to slow pavement deterioration specially through improved drainage.

Maintenance hot spots

The following maintenance 'hotspots' require additional monitoring or cause an increased maintenance burden along the corridor:

- **Mt Messenger:** Rockfalls, slips and flooding, surfacing challenges due to steep grades, and out of context curves
- **Awakino gorge:** Rockfall is an issue through the gorge where steep bluffs are present.
- **Mahoenui:** Slumping which is being actively monitored, and beginning to plan response.
- **Te Kuiti hill:** Asphalt slumping, where the current approach is to refill with more AC.
- **Aging AC:** Particularly in and through urban New Plymouth, SH3/229 and SH44. About half of asphalt concrete through New Plymouth is due for renewal over next three years.
- **Potholes:** Identified by the NOC contractor, there are. groupings of potholes in known areas such as SH3/3a intersection (RS229). There may be a relationship to areas where surface texture has been reinstated via water cutting treatment.
- **Flooding**: at the bottom of Mt Messenger hill, Urenui & Tongaporutu

Figure 22 – Access and resilience investment



Renewals

Resurfacing

The infographic shows the proportion of route section by carriageway length planned for resurfacing within the period 2018/19 to 2020/21, the three-year span of the SHIP. This is also broken down in to the individual years to indicate the timing of expenditure over the three-year period.

Significant investment in resurfacing is planned for sections: 3/10 and 21/2 near Hamilton Airport, 3/176 Mt Messenger, 3/203 around Urenui, and 44/0 through urban New Plymouth.

Improvements

Planned

The following projects are planned and underway. Details of the project progress can be found on the Transport Agency website at: https://www.nzta.govt.nz/projects/

SH3 Awakino Mt Messenger Programme

Description: Improvements are underway on State Highway 3 (SH3) from Awakino Gorge to Mt Messenger to improve safety, resilience and route availability. This 58km section of SH3 is Taranaki's main route north, it runs through rough terrain and is winding and narrow.

State Highway 3 (SH3) from Awakino Gorge to Mt Messenger to improve safety, resilience and route availability.

Draft Regional Programme considered for SHIP

The following table shows the list of projects being considered through the Draft Regional Programme for SHIP, and cover the next 10 years.

Table 3- Draft regional programme considered for SHIP

Project	Funding Status	Description
SH3 West Waikato South Town Centre Accessibility Enhanced		Placeholder activity subject to strategic case
SH3 Te Kuiti to Awakino Gorge Safety & Resilience Improvements		Bypass of the single lane Awakino Tunnel on State Highway 3 in south-west Waikato between Hamilton and New Plymouth, as part of the Accelerated Regional Roading Package.
SH3 (Mangaotaki South Features 3&4) Resilience		Investigation, Design and Construction of bank stabilising solution
SH3 (Mangaotaki North Features 4&5) Resilience		Design and Construction of suitable bank stabilisation option
SH3 (Mangaotaki South Lower Slopes) Resilience		Investigation, Design and Construction of suitable bank stabilisation options
SH3 (Mangaotaki South Zone 2 - Rockfall site) Resilience		Investigation, Design and Construction of suitable protective solution
SH3 (Stockman's Saddle South) Resilience		Design and Construction of back to back steel H pile retaining walls, tied together
SH3 (McLaughlin's Approach Slumping/Cracking) Resilience		Further Investigation needed
SH3 (Awakino Gorge Debris Slide South) Resilience		Rock armouring and retaining. Armouring where soil slopes extend to river level. Retaining may be more applicable where rock outcrops above existing river level.

Investing in reliability and efficiency

Operations and maintenance

The main areas of investment to provide and preserve reliability and efficiency are environmental maintenance through keeping potential obstructions clear of the highway, wayfinding signage, and operational traffic management.

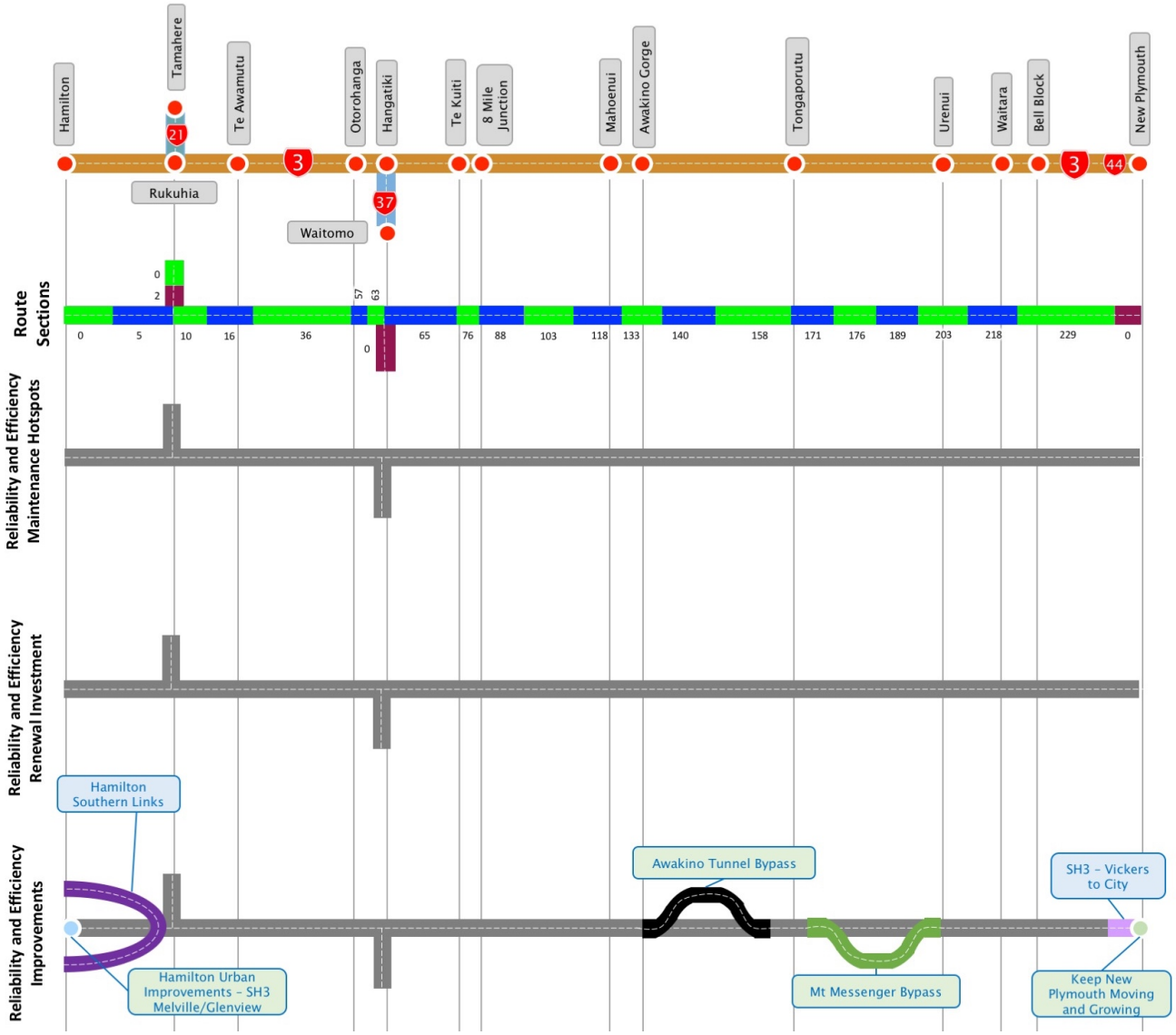
Maintenance Hotspots

The following maintenance 'hotspots' require additional monitoring or cause an increased maintenance burden along the corridor:

- **Incident response:** Ensuring prompt response to incidents and restoration of service that effect reliability of journeys is important. All alternative routes between Hamilton and New Plymouth are very long.
- **Defective culverts:** Identifying defective culverts that may cause an issue is a priority within this corridor.

Improving capacity between Vickers Road to Hobson Street on State Highway 3, New Plymouth.

Figure 23 – Reliability and efficiency investment



Renewals

There are no reliability and efficiency related renewals planned for the corridor.

Improvements

Planned

The following projects are planned and underway. Details of the project progress can be found on the Transport Agency website at: https://www.nzta.govt.nz/projects/

SH3 Vickers to City

Description: Improving capacity between Vickers Road to Hobson Street on State Highway 3, New Plymouth. The upgrade will relieve existing traffic congestion on this busy stretch of road, improve safety, reduce travel times, improve the reliability of travel times, support future economic growth and support ongoing land development at Bell Block and Waiwhakaiho.

SH3 – Hamilton Southern Links

Description: The Southern Links project aims to develop an effective transport network of state highway and urban arterial routes to support Hamilton's planned growth. The route has been designated but the project is still in early stages of development and no decision has been made about construction timeframes

The NZ Transport Agency and Hamilton City Council (HCC) are working together to ensure that the future state highway routes will be well integrated with local roads, and the planned residential and industrial developments.

Draft Regional Programme considered for SHIP

The following table shows the list of projects being considered through the Draft Regional Programme for SHIP, and cover the next 10 years.

Table 4- Draft regional programme considered for SHIP

Project	Funding Status	Description
SH3 Awakino Gorge to Mt Messenger Corridor		Bypass of the existing winding road alignment at Mt Messenger on State Highway 3 between Hamilton and New Plymouth.
SH3 Mt Messenger Bypass		Bypass of the existing winding road alignment at Mt Messenger on State Highway 3 between Hamilton and New Plymouth.
Keep New Plymouth Moving and Growing		This programme business case (including a Network Operating Plan) sets out national, regional and metropolitan considerations affecting the operation of State Highway's and their interaction with adjacent local roads and land uses at and in the New Plymouth, particularly access around the port.
Hamilton Urban Improvements – SH3 Melville/Glenview		Improvements to SH and local roads in southern part of Hamilton city to improve levels of service for different modes/users at different times of day in line with the Hamilton Network Improvement Plan.

Investing in safety

Operations and maintenance

Safer Journeys Goal 2016 to 2020 is to reduce the likelihood of crashes occurring and to minimise the consequences. The main areas of investment into ensuring safer journeys include: specialist pavement treatments, road marking including audio-tactile markings (ATP), signage, edge markers, safety barriers, speed limits, roadside vegetation control, and, street lighting.

Maintenance Hotspots

The following maintenance 'hotspots' require additional monitoring or cause an increased maintenance burden along the corridor:

- **Te Kuiti to Mokau Bluffs:** Rockfall monitoring and protection. The plan is to consider the opportunity for automatic monitoring of risk.
- **Mt Messenger to Awakino:** The current alignment in this section has led to low speed crashes.
- **Urban New Plymouth** along SH44 has a surface skid resistance issue.
- **Waitara to Mt Messenger,** there are some alignment quirks within this section, including switchbacks, that require higher levels of maintenance to maintain safe levels of surface skid resistance.
- **SH44:** Concerns along this section are mainly related to pedestrian safety.

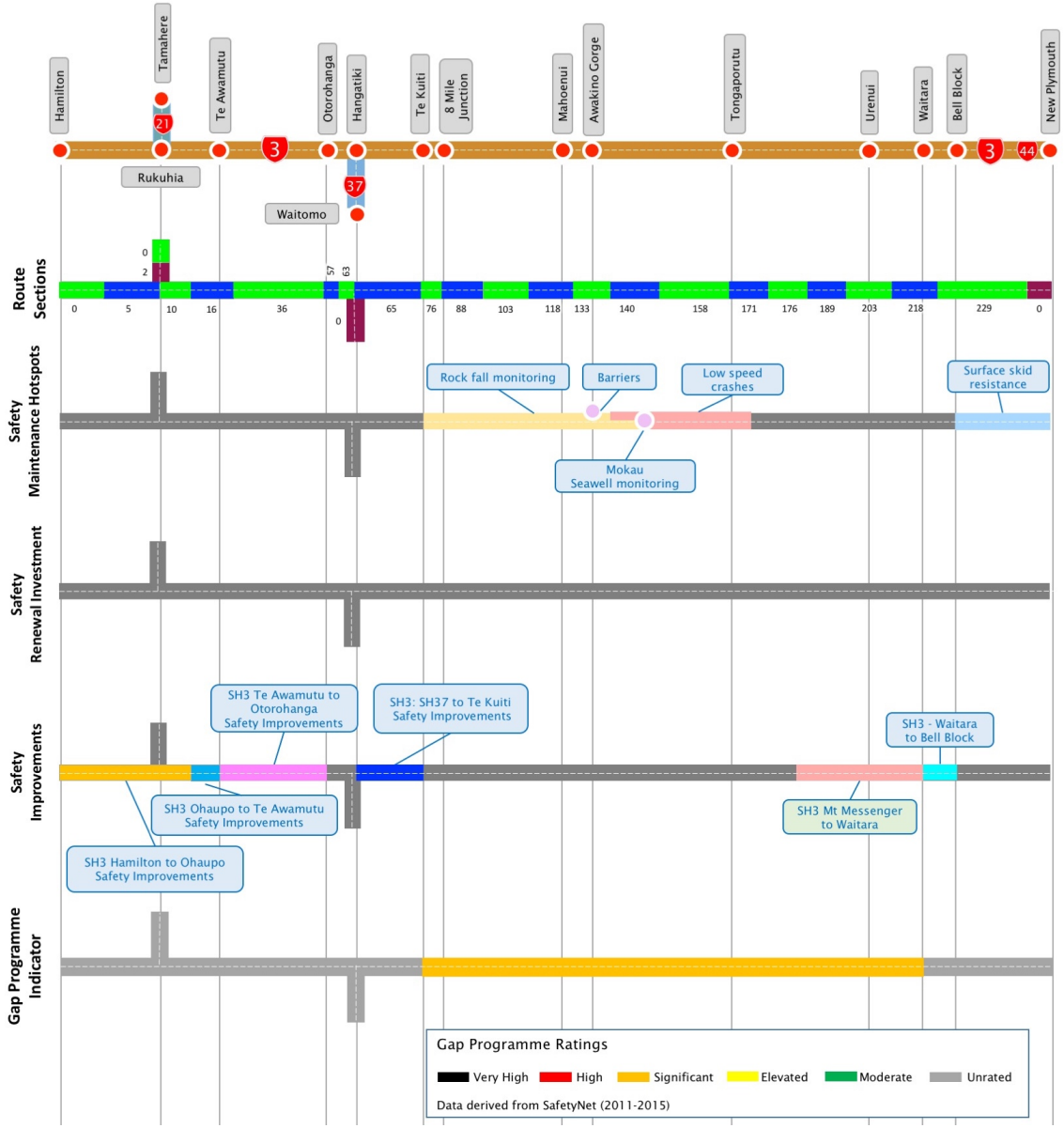
Gap programme indicator

The potential for reducing fatal and serious injuries across the corridor has been assessed under the Gap programme. The Gap programme looks at the collective risk rating, likely level of intervention and the potential reduction in death and serious injury that may be achieved to determine a possible treatment approach. For instance, a road segment rated 'Very High' could potentially achieve a 50-70% reduction in fatal and serious injuries with the application of high cost improvements. Alternatively, if the risk level is "Elevated' a 10-20% reduction may be realised through targeted low cost, high coverage treatment improvements.

From Te Kuiti to Waitara, there is significant potential for reducing fatal and serious injuries through targeted low – medium cost improvements.

The unrated segments are either areas where potential crash savings are low or are being addressed under other existing programmes.

Figure 24 – Safety investment



Renewals

There are no safety related renewals planned for the corridor.

Improvements

Planned

The following projects are planned and underway. Details of the project progress can be found on the Transport Agency website at: https://www.nzta.govt.nz/projects/

SH3 – Hamilton to Ohaupo

Description: Potential treatments for consideration would include improved delineation, intersection improvements and rumble strips along edge lines. Treatments to be confirmed following completion of the investigation phase.

SH3 – Ohaupo to Te Awamutu

Description: This project will improve road safety on State Highway 3 between Ohaupo and Te Awamutu. When these changes have been implemented, we estimate there will be 11 fewer deaths and serious injuries on this stretch of the highway over the next decade.

SH3 –Te Awamutu to Otorohanga

Description: Potential treatments for consideration would include side barrier at high risk locations, rumble strips along edge lines and improved signage. Treatments to be confirmed following completion of the investigation phase

SH3 – SH37 to Te Kuiti

Description: This project aims to make the 9km section of State Highway 3, from the State Highway 37 intersection at Hangatiki through to the township of Te Kuiti, safer for all road users. This section of the highway is classified as a medium to high-risk crash zone.

SH3– Waitara to Bell Block

Description: The NZ Transport Agency is investigating State Highway 3 between Waitara and Bell Block to find ways to help improve road safety, reduce crashes and ease congestion. It is made up of two projects: SH3 Waitara to SH3A (managed by Safe Roads) and SH3A to Bell Block (managed by the Transport Agency).

Draft Regional Programme considered for SHIP

The following table shows the list of projects being considered through the Draft Regional Programme for SHIP, and cover the next 10 years.

Table 5- Draft regional programme considered for SHIP

Project	Funding Status	Description
SH3 Mt Messenger to Waitara Safety Improvements		Safer Corridors improvements which may include: Wide Centre lines, edge barriers.
Weigh Right Regional Construction		Improve weigh pits to improve overweight detection and to meet new vehicle and safety standards.
Minor Improvements 18/21		Activities will be targeted to low cost safety, optimisation and resilience activities which contribute to the Transport Agency's goals of either reduce the level of deaths and serious injuries, improve urban network capacity in our major centres or to reduce the resilience risk on our key routes through preventative maintenance activities.
Speed Management Implementation		Transport planning activity to enable development of Regional Speed Management Plan in conjunction with partner Road Controlling Authorities.
Accelerated LED Renewals for SH Street Lighting		To replace all street lights with more cost-effective LEDs to save costs on power and maintenance.

The SH3 Normanby Bridge Realignment project has improved safety and route efficiency with a straighter and wider alignment, shortening the route length by half a kilometre.

Investing in people, places and environment

Operations and maintenance

The main areas of investment into people, places and environment are: pavement rehabilitation to ensure a high proportion of travel on smooth roads, control of litter, provision of rest areas and stopping points, landscaped areas maintenance, and, environmental compliance.

Maintenance Hotspots

The following maintenance 'hotspots' require additional monitoring or cause an increased maintenance burden along the corridor:

- **Awakino gorge:** Vegetation encroachment is a continuing issue within the gorge.
- **Mt Messenger:** Vegetation encroachments and dangerous trees also create concerns within the Mt Messenger section of corridor.
- **New Plymouth:** Cycle path maintenance is being undertaken on the revocated section of motorway in Fitzroy.
- **Freedom campers** are starting to be of concern along this corridor.

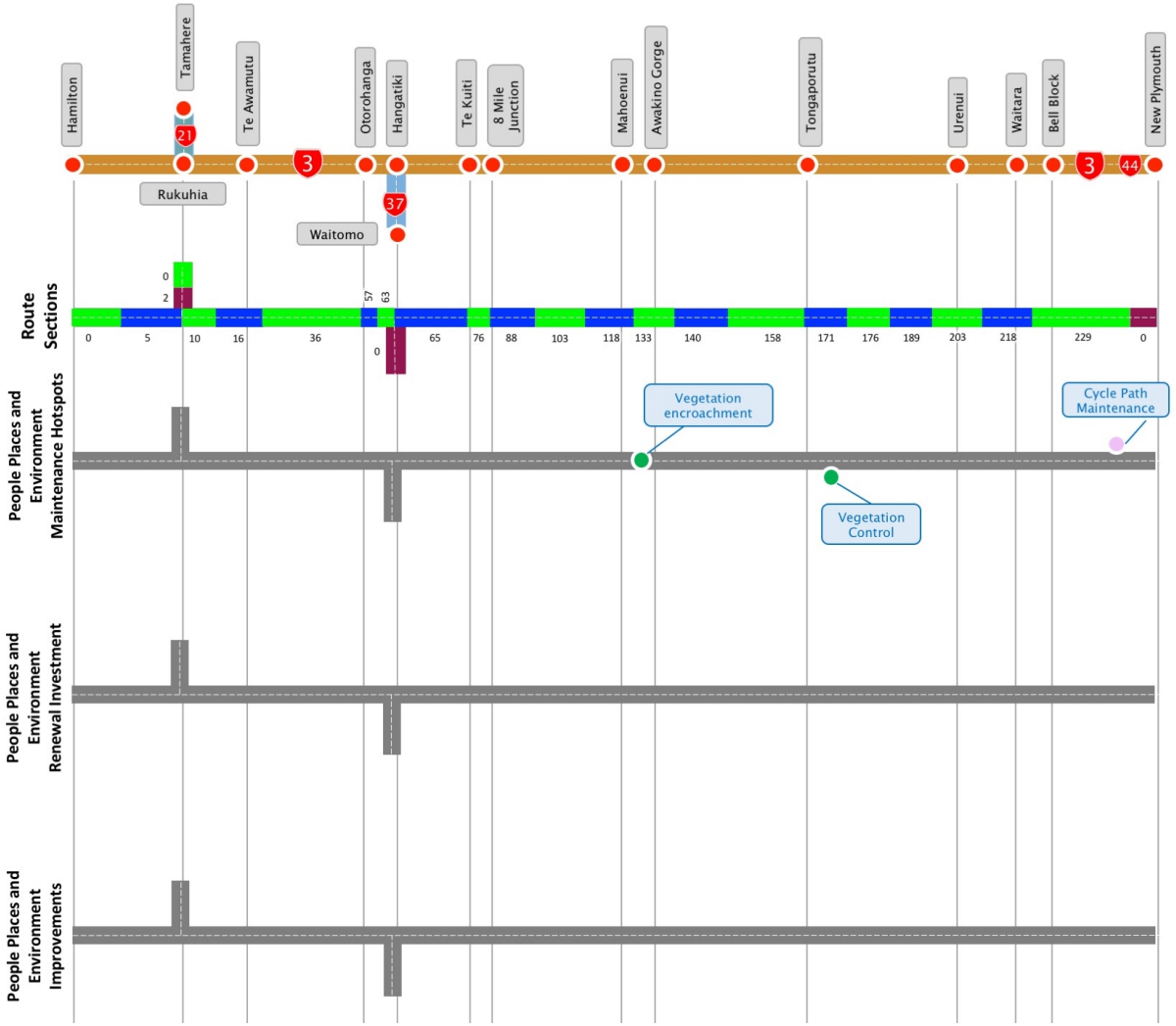
Renewals

There are no people, places and environment related renewals planned for the corridor.

Improvements

There are no people, places and environment related improvements planned for the corridor.

Figure 25 – People, places and environment investment



Investment pressures

Access and resilience

The following concerns excerpt pressure on the investment in **Access and resilience** on the corridor.

- **Contribution to growth:** There is pressure on the Transport Agency to contribute towards investment to facilitate growth for Local Authorities with a low rating base.
- **Stable demand:** Traffic volumes are unlikely to increase on this corridor to levels that would trigger significant capex investment. The approach will be to monitor, learn, then treat risk. Where risk grows localised treatments will be put in place to mitigate.
- **Resilience** is important on this corridor as alternative routes, especially for heavy vehicles are significant in length.
- **Maintenance activities:** The steep/tight alignments on the southern Mt Messenger ascent experience surface stripping as an ongoing maintenance concern and the steep/windy remote length between Awakino and Tongaporutu put pressure on the scheduling and management of maintenance activities.
- **Access for maintenance, renewal and emergency response:** Access through the central section of SH3 requires a high level of coordination due to the remote nature and location of the NOC contract boundary. Economic and time efficiencies could be gained through re-designation of contract boundaries to allow single supplier access from both ends.

Reliability and efficiency

The following concerns excerpt pressure on the investment in **Reliability and efficiency** on the corridor.

- **Economic criticality:** This corridor is a critical freight route for the Taranaki Region providing the link to and from Tauranga and Auckland Ports. The corridor is generally in good condition and supporting reliable journey times along its length.
- **Hydraulic performance:** There is a need to investigate the hydraulic performance of the network within the corridor, and by increasing capacity, most likely increase durability and performance in increased intensity storms.

Safety

The following concerns excerpt pressure on the investment in **Safety** on the corridor:

- **Review of flush median trial:** The section of multilane highway around Ohaupo has been reconfigured using wide painted flush central medians. There will be a need to review the success of this change in configuration once it has been in pace for a reasonable period.
- **A crash reduction study** is underway for the Waitara to Mt Messenger section of corridor.
- **Crash risk:**
  - High numbers of deaths and serious injuries at the northern and southern ends of the corridor, attributed to increasing traffic volumes and conflict at intersections and accessways result in a poor safety record
  - Narrow lanes, lack of shoulder, poor geometric alignment and challenging topography from Awakino Gorge to Urenui contributes to a high number of crashes, deaths and serious injuries, and road closures.

People, places and environment

The following concerns excerpt pressure on the investment in People, places and environment on the corridor.

- **Fish passage consideration** is an issue on this corridor. Taranaki Regional Council is seeking new and retrofitting of existing fish passages and culverts, and seeking to include provisions/conditions in new resource consents as a generic rather than specific requirement.
- **Vegetation Management:** View shaft and associated vegetation management, along with provision of adequate amenity facilities to stopping places (including rest areas) along the corridor are becoming an increasingly important part of the journey experience and development of the corridor.

Investment future considerations

Consideration of investment in the corridor in future should take account of the following:

- **Historical over-investment:** The former Performance Specified Maintenance Contract has historically caused an over investment on the corridor. There is a need to consider how to gradually adjust the balance.
- **Increased access demands of urban growth:** Future growth to the south of Hamilton (Peacocke, the Airport and surrounds, the proposed Ruakura Freight Hub and the inland port development) and at Bell Block, north east of New Plymouth is expected to increase access demands for the corridor.
- **Real time information:** Given the challenging terrain, real time information is critical in diverting/planning journeys. Further investigation and investment in ITS system should be considered in order to aid the customer decision making process.
- **Crash risk:** Narrow lanes, lack of shoulder, poor geometric alignment and challenging topography from Awakino Gorge to Urenui contributes to a high number of crashes, deaths and serious injuries, and road closures.
- **Future improvements:** Safety risk remains along the sections without any current planned improvements (Otorohanga to SH37, Te Kuiti to Awakino Gorge and Urenui to Waitara). These sections deliver an average to poor level of service, in terms of safety, and should be considered for future improvements.
- **New Assets:** New assets may require specialist maintenance, such as the Awakino and Mt Messenger bypasses. Older assets such as the existing Awakino and Mt Messenger tunnels may be made redundant depending on regional and local access. Investigations into future maintenance of older assets may need to be considered, especially if utilised for active modes or alternative access.
- **Maintenance of new assets:** New assets as a result of safety initiatives should be prioritised accordingly. The wider impact of initiatives such as side barrier protection on maintenance extends to considerations of activities behind the barrier; mowing, drainage, tree work and other service providers accessing assets, such as utilities providers.
- **Non-asset solutions:** Continued implementation of low cost and non-asset solutions such as; wide centrelines and flush medians, currently used as interim safety solutions in the northern and southern parts of corridor where road widths permit; and maintenance of delineation to high standard (markings, edge marker post, raised pavement markers, chevrons, etc.) to help drivers judge the alignment of the road and mitigate risk of run-off-road crashes.
- **Vulnerable users:** Demand for walking and cycling journeys within the urban areas of Hamilton and New Plymouth and tour cycling along the corridor is likely to increase, creating potential conflict between traffic and these vulnerable users.
- **Stopping places:** Consider a review and rationalisation of stopping places (including rest areas and look outs) with places of interest, heritage sites, local business areas and main streets, and future electric vehicle charging infrastructure. Utilising these places to tell local stories and enhance the attractiveness and amenity of journeys.
- **Environmental standards:** Tighter environmental standards for stormwater, erosion and sediment control may be required for maintenance and upgrades in the vicinity of coastal areas and waterways (e.g. exposed West Coast/multitude of rivers south of Awakino).
- **Freight access:** Future maintenance and improvements on SH44 or alternatives routes could be considered in the future to improve the access of freight vehicles to the Port Taranaki balanced with community outcomes and economic efficiencies for the Port.
- **Sustainability of network:** In the Taranaki sub-region, the Network statement notes that the funding request is probably below that required to operate the network optimally.

Appendix A – Information sources

Section	Infographic	Information Source	Date
Introduction	Corridor Overview Map	The Road Efficiency Group https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/	2013
Understanding our Customers			
Key Customers	Key journeys	Network Manager and Regional Staff	2016
	Daily commuters	Network Manager and Regional Staff	2016
	Freight	Network Manager and Regional Staff	2016
	Tourism and recreation	Network Manager and Regional Staff	2016
	Demographics and population centres	MBIE Regional Economic Activity Report Web Tool http://www.mbie.govt.nz/info-services/business/business-growth-agenda/regions	2015
Understanding Customer Levels of Service on the Corridor			
Customer Levels of Service	Corridor classifications	The Road Efficiency Group ONRC -right-road-right-value-right-time-combined-poster.pdf https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/	2015
Current Levels of Service Performance	Current ONRC Levels of Service Performance	Network Manager and Regional Staff	2016
Improving the Customer Experience	Significant planned improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ NZTA Safe Roads web page: https://www.nzta.govt.nz/safety/our-vision-vision-of-a-safe-road-system/safe-roads/ Submitted Regional SHIP programmes	2017

Section	Infographic	Information Source	Date
Access	ONRC classification	The Road Efficiency Group https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/	2013
	Carriageway configuration	Network Manager and Regional Staff Corridor drive-over Highway information Sheets	2016
	Posted speed limit	NZTA – MapHub Speed Limits on NZ Road Network	2016
	Topography	Elevations derived from Google Earth™	2016
	Geography	Network Manager and Regional Staff Corridor drive-over	2016
	Traffic volumes – heavy vehicles	RAMM Carriageway Table – December Traffic Estimates	2015
	Traffic volumes – all vehicles	RAMM Carriageway Table – December Traffic Estimates	2015
	HPMV routes	NZTA – MapHub High Productivity Freight Network	2016
	Critical Customers	Network Manager and Regional Staff	2016
	Critical Assets	Network Manager and Regional Staff	2016
Resilience	Vulnerabilities	NZTA – MapHub Hazard Incidents and Area Warnings	2016
	Major Alternate Routes	Network Manager and Regional Staff Desktop analysis Corridor drive-over	2016
	Diversion Lengths	NZTA StateHighways.pptx Diversion Routes	Unknown

Section	Infographic	Information Source	Date
	Closures	NZTA 2011-2015_Treis_incidents_by_region.xlsx	2015
Reliability and efficiency	Efficiency	NZTA – MapHub EfficiencyNet	2016
	Variability	NZTA / Beca Dwg No. GIS-3391515-500-4 Network Performance - Attachments.pdf March 2012 eRUC Commercial Vehicle Data – State Highway Austroads Variability Assessment	2012
	Commercial Vehicle Average Speed	NZTA / Beca Dwg No. GIS-3391515-500-5 Network Performance - Attachments.pdf March 2012 eRUC Commercial Vehicle Data – State Highway Average Speeds	2012
	Current Constraints	Network Manager and Regional Staff Corridor drive-over	2016
Safety	KiwiRAP Collective Risk	https://nzta.abley.com/SafetyNET_2017 SafetyNET	2016
	KiwiRAP Personal Risk	https://nzta.abley.com/SafetyNET_2017/ SafetyNET	2016
	KiwiRAP Star Rating	http://www.kiwirap.org.nz From 2010 KiwiRAP star rating report.	2010
	Intersection Risk Indicator	https://nzta.abley.com/SafetyNET_2017/ SafetyNET	2016
	Gap Programme Rating	https://nzta.abley.com/SafetyNET_2017/ SafetyNET	2015
Environment Culture and Heritage	Natural Environment	NZTA - Environment and Urban Design Team	2016
	People and Place: Journeys	NZTA - Environment and Urban Design Team	2016
	People and Place: Landmarks and Heritage Places	NZTA - Environment and Urban Design Team	2016
	Noise and Vibration	NZTA - Environment and Urban Design Team	2016
	Drainage Catchments	NZTA - Environment and Urban Design Team	2016
Understanding the Infrastructure Assets			
Overview	Corridor Asset Base	NZTA_ 2017 Values by Corridor.xlsx complied by Opus International Consultants from RAMM and other asset information sources	
	Asset Condition and Performance	Summarised from the data sets described below	
Asset condition and performance	Surface Skid Resistance	SCRIM data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Safety Treatment	SAL data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Defects	100m Priority data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Age	Surface Age data derived from RAMM by NZTA Data Quality and Access team	2016
	Service life of Prior Surface	Surface Age data derived from RAMM by NZTA Data Quality and Access team	2016
	Resurfacing	Resurface data derived from forward works programme	2016
	Proportion of Travel on Smooth Roads	STE data derived from RAMM by NZTA Data Quality and Access team	2016
	Pavement Strength	Deflection data derived from RAMM by NZTA Data Quality and Access team	2016
Investing in the Corridor			
Summary Investment	Summary Corridor Investment	2028-21 SHIP programme funding requests 2017/18 Annual Plans	2017
	Summary investment by work category	2028-21 SHIP programme funding requests 2017/18 Annual Plans	2017
Investing in access and resilience			
	Maintenance Hot Spots	Network Manager and Regional Staff	2017

Section	Infographic	Information Source	Date
Investing in access and resilience	Resurfacing 2018 - 2021	Resurface data derived from forward works programme	
	Renewal Investment	National Bridge Replacement Programme National bridge replacement programme 2017 LCMP data.xlsx	
	Improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ Submitted Regional SHIP programmes	
Investing in reliability and efficiency	Maintenance Hot Spots	Network Manager and Regional Staff	2017
	Renewal Investment		
	Improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ Submitted Regional SHIP programmes	
Investing in safety	Maintenance Hot Spots	Network Manager and Regional Staff	2017
	Renewal Investment		
	Improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ NZTA Safe Roads web page: https://www.nzta.govt.nz/safety/our-vision-vision-of-a-safe-road-system/safe-roads/ Submitted Regional SHIP programmes	
Investing in people places and environment	Maintenance Hot Spots	Network Manager and Regional Staff	2017
	Renewal Investment		
	Improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ Submitted Regional SHIP programmes	

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