

Central Group West

CORRIDOR MANAGEMENT PLAN

30 41 43 45

2018-2028



Table of contents

Executive summary	1
Introduction	1
Purpose	1
The corridor at a glance	2
Corridor overview	2
The regional economy	2
Understanding our customers	3
Key customers	3
How we deliver services along the corridor	5
Transport partners	5
Network Outcomes Contracts approach	6
Drivers for change	7
Understanding customer levels of service on the corridor	8
Current levels of service performance	8
Improving the customer experience	10
Access	11
Resilience	15
Reliability and efficiency	17
Safety	19
People, places and environment	21
Understanding the infrastructure assets	23
Corridor asset base	23
Asset condition and performance	24
Asset condition and performance pressures	29
Asset condition and performance future considerations	29
Investing in the corridor	30
Summary investment	30
Investing in access and resilience	32
Investing in reliability and efficiency	34
Investing in safety	35
Investing in people, places and environment	37
Investment pressures	39
Investment future considerations	39
Appendix A – Information sources	40

Table of figures

Figure 1 - Performance of the corridor against ONRC outcomes	1
Figure 2 - Corridor management plan framework	1
Figure 3 - Corridor overview	2
Figure 4 - Key customers, journeys, and destinations	3
Figure 5 - Map of associated local authorities	5
Figure 6 - NOC process	6
Figure 7 - Current ONRC levels of service performance	8
Figure 8 - Significant corridor planned improvements	10
Figure 9 - Corridor characteristics	11
Figure 10 - Horizontal alignment	12
Figure 11 - Corridor capacity	13
Figure 12 - Resilience	15
Figure 13 - Reliability and efficiency	17
Figure 14 - Safety	19
Figure 15 - People, places and environment	21
Figure 16 - Corridor asset base	23
Figure 17 - Summary asset condition and performance	23
Figure 18 - Asset condition	24
Figure 19 - Asset condition 2	25
Figure 20 - Asset condition 3	26
Figure 21 - Asset condition 4	27
Figure 22 - Asset condition 5	28
Figure 23 - Corridor investment	30
Figure 24 - Access and resilience investment	32
Figure 25 - Access and resilience investment 2	33
Figure 26 - Reliability and efficiency investment	34
Figure 27 - Safety investment	35
Figure 28 - People, places and environment investment	37

Executive summary

The Central Group West corridor comprises SH30 (from Te Kuiti to Atiamuri), SH41 between Manunui and Kuratau, SH43 between Stratford and Taumaranui (the Forgotten World Highway), and SH45 around the Taranaki coast between New Plymouth and Hawera. The North Island Main Trunk and Marton - New Plymouth rail lines provide alternatives to road travel for freight.

The corridor provides resilience to, and secondary routes for, the main north-south SH1 and SH3 corridors through the Waikato, Taranaki, and Whanganui-Manawatu Regions. The corridor is characterised by its remote rural nature, except for the urban section through New Plymouth.

The corridor is approximately 397 km long (3.5% of the state highway network). The total value of assets along the corridor is \$465M (2.0% of the total national asset value).

The corridor is a significant enabler of the economy in the area, particularly of forestry and tourism. Traversing remote rural areas of the western part of the central north island, the corridor provides the necessary link to markets for primary industry, opens up wilderness areas to tourism, and connects remote rural communities to main centres. A feature is the Forgotten World Highway, the section of corridor that winds through the almost untouched rural hinterland of Taranaki to the central volcanic plateau.

The Waikato has considerable economic diversity with a strong focus on dairy, sheep farming, forestry, horticulture, mining and mineral assets (coal and iron sands). The Taranaki region specialises in dairy farming 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.

Safety and resilience are the two biggest concerns on this corridor. The rate of deaths and serious injuries occurring on the corridor is high given the low traffic volume. This corridor is also vulnerable to closure from crashes and environmental factors which can have a negative impact on the regional and national economy.

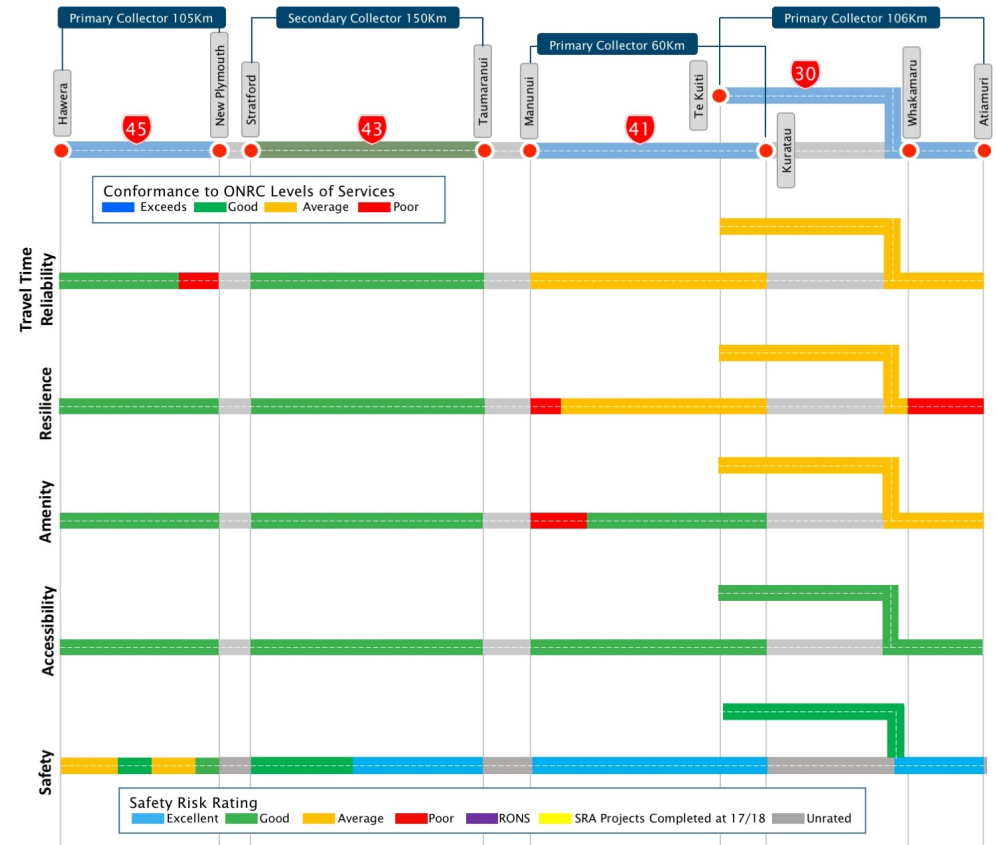
Whilst other corridors provide the primary linkages between Taranaki, the Waikato, and Whanganui-Manawatu, this corridor provides important secondary linkages adding resilience.

Frequent rock falls and slips combined with snow events in winter mean customer movements are frequently restricted on the corridor.

The corridor has also proven vulnerable due areas of pumice subgrade, and on-going land subsidence. This results in an on-going and increasing maintenance concern.

Investment in the corridor is directed towards keeping the route open to support the remote rural communities along its length, and ensuring safe journeys.

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 Central Group West 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 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.

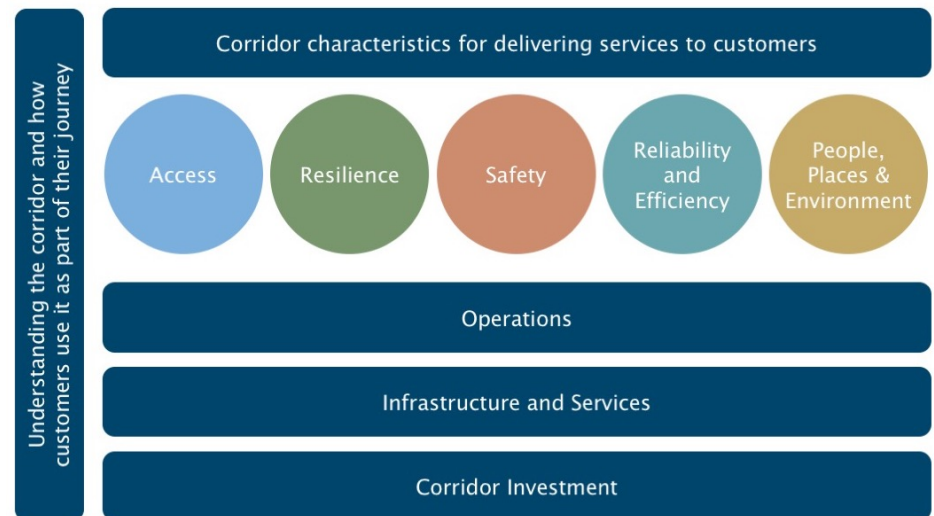
Planning is currently undertaken at the regional level, but typically significant journeys traverse more than one region. By considering the significant customer journeys and destinations, the corridor management plan is a vehicle to engage in regional and inter-regional conversations by focusing on 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 Central Group West corridor provides resilience to, and secondary routes for, the main north-south SH1 and SH3 corridors through the Waikato, Taranaki, and Whanganui-Manawatu Regions. It also provides connection to the Tongariro National Park.

The corridor comprises SH30 (from Te Kuiti to Atiamuri), SH41 between Manunui and Kuratau, SH43 between Stratford and Taumaranui (the Forgotten World Highway), and SH45 around the Taranaki coast between New Plymouth and Hawera. The North Island Main Trunk and Marton - New Plymouth rail lines provide alternatives to road travel for freight. The Stratford - Okahukura Line has been leased to a private operator since June 2012.

The corridor is a significant enabler of the economy in the area, particularly of forestry and tourism.

The regional economy

The Manawatu-Wanganui Region is a predominantly rural region with a few main centres of population with around 5% of New Zealand's population (222,672 people in 2013), generating 4% of national GDP and 4.9% of national employment. Agriculture, forestry and fishing are important industries to the region, making a significant contribution to the regional economy. The Tongariro and Whanganui National Parks are significant attractors of international tourists to the region.

The Waikato Region is home to almost 10% of New Zealand's population. The region has considerable economic diversity generating 9% of New Zealand's GDP, with a strong focus on dairy, sheep farming, forestry, horticulture, mining and mineral assets (coal and iron sands).

The Taranaki region is home to 115,000 residents (2.5% of New Zealand's population) generating a proportionally higher 4% of New Zealand's GDP. The region specialises in dairy farming 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 and transportation facilities to support this economy.

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 customers value from the transport network needs to be understood in the context of who they are.

Daily commuter

The corridor provides a commuter route during weekday peaks into New Plymouth (SH45). The length of SH45 through the urban area of New Plymouth provides for active modes.

Insights into daily commuter users:

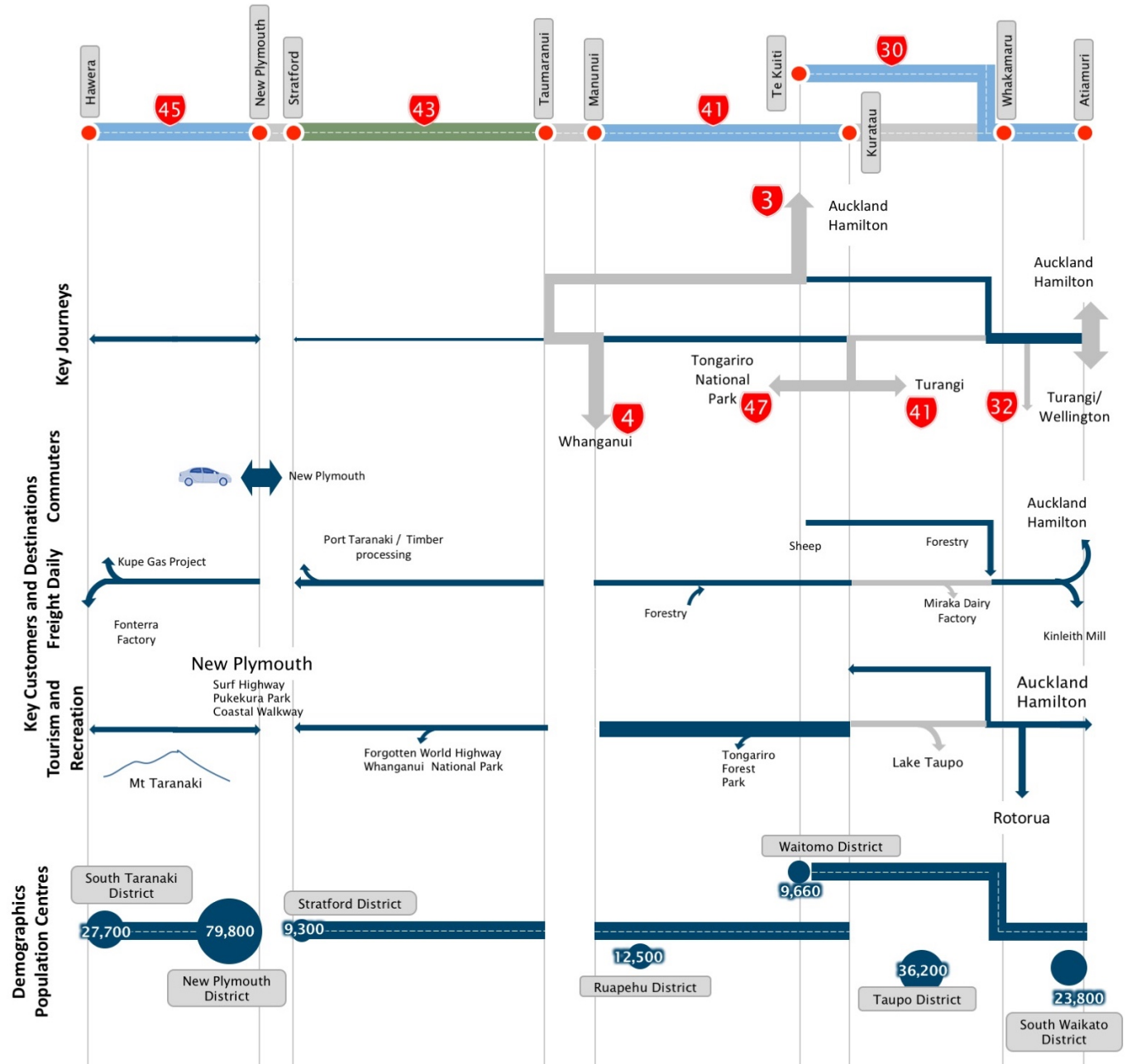
Road use: The predominant mode is private vehicle. Active modes (cycling and walking) are provided within New Plymouth (SH45).

Road knowledge: Commuters are familiar with the route and the viable alternatives to avoid congestion when required. Journey times for daily commuters on the corridor are relatively predictable considering time and day of week.

Pain points: The urban areas of New Plymouth face access and efficiency issues arising from urban (residential and commercial) growth, as well as intersections and accesses along the corridor.

Daily commuters expect: A predictable journey time, 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

The corridor provides access to several key attractions in the Tongariro Whanganui Taranaki area, including the Tongariro National Park and Whanganui National Park.

Key tourist attractions in the Tongariro National Park include the Tongariro Alpine Crossing which forms part of the Tongariro Northern Circuit, one of New Zealand's nine Great Walks. Ruapehu offers two of New Zealand Cycleways Great Rides and many other scenic trails drawing local and international tourists.

SH43, also known as the Forgotten World Highway, is a scenic drive from the volcanic ring plain through virgin rainforest and regenerating bush and heritage sites to the Taranaki plain.

Insights into tourist and recreational users are as follows:

Road use: Travel is made by mixed mode including passenger vehicle, campervan, and bus. Journeys start from all over the North Island.

Road knowledge: Many international visitors unfamiliar with rural driving have limited experience of New Zealand roads and conditions and tend to be focused on the landscape and adventure (roads are a means to an end). Travel times can be underestimated. There is limited or no knowledge of places on the journey where the road environment changes and the road narrows, becomes rolling and/or winding. Domestic recreational users are more familiar with the road and anticipated journey times.

Pain points: Narrow, rolling, and windy sections of road, high speed priority intersections and general lack of passing lanes can cause issues for tourists unfamiliar with the corridor, exacerbating problems around efficiency and safety.

Tourist and recreational users expect: Ease of getting around the country, including the use of alternative travel modes, reliability of routes and predictable destination arrival, scenic route with good directional signage, good road surface and plenty of places to pull over safely for refreshments and toilet breaks and take photographs.

Freight operator

Freight movements include general freight supplying the local districts, along with forestry to the Kinleith Mill, Karioi Forest Pulp Mill, Tangiwai Saw Mill and the Port of Tauranga. Timber is cut from forests to the west and south of Lake Taupo and taken East.

Milk is transported from farms in Taranaki to the Fonterra factory in Hawera and from south Waikato farms to the Miraka Dairy factory in Mokai.

Insights into freight operators are as follows:

Road use: Logs and general freight is moved by large standard and HPMV trucks along the corridor which provides the most direct and efficient route for the freight journey. Milk is transported in truck and trailer tankers. General freight is moved in a range of heavy vehicles from B-trains through to fixed unit trucks.

Road knowledge: Knowledge of the corridor is extremely high among most truck drivers, verging on technical. This includes road alignment and cross-section, appropriate route choice, and journey time expectations and the best places to stop for refreshments and conveniences.

Pain points: The corridor includes rolling and winding sections slowing truck speeds. Alternative heavy transport routes are available for most of the corridor but do have an adverse effect on delivery times and therefore on business.

Freight operators expect: Infrastructure that supports commercial activity. This includes alternative routes that cater for freight trucks safety and consistently with consistent width and visibility convenient places for stop for drivers to have a rest, access services and facilities; and passing lanes for vehicles that want to go faster. They also expect information about road conditions allowing considered decision-making and confidence to keep their business operating efficiently.

How we deliver services along the corridor

Transport partners

The land transport system comprises more than State Highways. To provide customers with a reliable and safe journey usually requires the use of two or more transport infrastructure provider's networks. As such we work with other network providers to provide a one network approach. We work closely with the Local Authorities and regional councils along the corridor shown in Figure 5.

Collaboration along the corridor

The Joint Transport Study Working Group, later named the Accessing Central NZ Governance Group consists of Palmerston North City Council, Manawatu District Council, the New Zealand Transport Agency and Horizons Regional Council (who represent the Manawatu-Whanganui Region). The purpose of the group is to develop a 30-year strategy for the development and management of a strategic transport network within for the Manawatu area.

Figure 5 - Map of associated local authorities



Network Outcomes Contracts approach

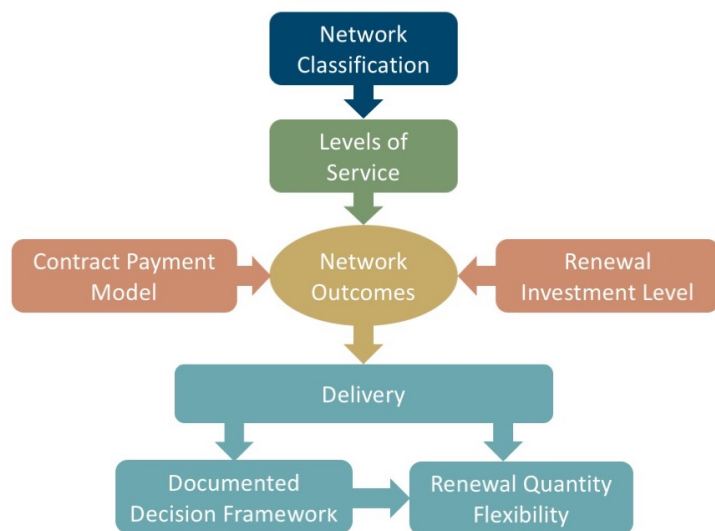
The Network Outcome Contracts (NOC) are aimed at improving the effectiveness of service delivery for maintenance and operations of the state highway network. Elements of previous procurement methodologies (PSMC, Hybrid and Traditional models) have been integrated into the NOC contract model that delivers 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 represents 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 contract 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, and maintenance and repairs of bridges and other structures.

The contract process for the NOC is shown below:

Figure 6 - NOC process



Collaborative delivery of services

The Central Group West corridor crosses over four NOC contract areas as discussed below. The Central Waikato NOC includes SH4 between Manunui and National Park, SH32, SH41, SH47, and SH48. The West Waikato South NOC includes the north end of SH4 and the west end of SH30 that are within the Waikato Region. The Taranaki NOC includes SH4 between the Waikato Region and Manunui, SH43, and SH45. The Manawatu Whanganui NOC includes the southern part of SH4 and SH54.

Central Waikato Network Outcomes Contract

The Central Waikato NOC is undertaken by Downer NZ Limited commencing on November 2014 for a seven-year period, with the option based on performance for a further two years. This contract is 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 additional years based on performance.
- **Traffic Monitoring Sites** – Professional Services contract covering the wider Waikato and Bay of Plenty Regions, awarded to Beca in October 2016 with a contract term of two years with the option based on performance for a further three years.

West Waikato South Network Outcomes Contract

The West Waikato South NOC is undertaken by Broadspectrum. The NOC contract is for a six-year period with an expected expiry of January 2020. It is 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 additional years based on performance.
- **Traffic Monitoring Sites** – Professional Services contract covering the wider Waikato and Bay of Plenty Regions, awarded to Beca in October 2016 with a contract term of two years with the option based on performance for a further three years.

Taranaki Network Outcomes Contract (TNOC 14)

The Taranaki NOC is undertaken by Downer NZ Limited. 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 of over 527km. This contract is supported by the following specialist maintenance contracts:

- **Regional Bridge and Structures** – Professional Services contract covering the Taranaki and Manawatu-Whanganui Regions, awarded to Opus International Consultants in November 2014 with a contract term through to 30 June 2017, plus two additional years based on performance.

Drivers for change

The Central Group West corridor caters for variable levels and types of customers and this demand is expected to increase commensurate to variable growth. Some sections will remain static or experience declining demand. The drivers for change associated with the corridor are briefly described below.

Regional growth and development

The Manawatu-Whanganui region (Horizons Region) is the second largest North Island region by land area with a diverse range of natural resources and economic activity. The region specialises in industries which tend to have lower pay rates and levels of employment. The population in 2016 was estimated at 236,900 but is currently understood to be in decline.

Growth studies such as the Manawatu-Whanganui Economic Action Plan (August 2016) identified several advantages the region can build on, centring on the Region's highly productive agricultural industries, particularly high-country beef and lamb, and expansion of fresh vegetable production for export. These drivers for growth are common to the northern area of the corridor, the Ruapehu and Otorohonga Districts, as well as the Taranaki Region.

Agriculture has experienced strong growth, with the intensification of land use seen as desirable by many farmers. Intensification is supported by the District Plans and will leverage land usage with an increase in vehicle movements and an increase in maintenance expenditure. There is a desire to diversify into other types of agriculture including poultry and Manuka honey production. This is likely to result in traffic growth in general and a change in the number and type of vehicle movements.

Forestry is a strong driver of economic growth at the northern extent of the corridor but traffic is not expected to change significantly. However exotic forests have been increasingly developed in both Taranaki and Whanganui. A modest tonnage of logs is exported out of Port Taranaki which will increase over the next 10 to 20 years.

The corridor has several significant tourist destinations. New Plymouth is an event destination with the WOMAD and Festival of Lights events attracting tourists from adjacent regions with some traffic impacts on the SH45 section of the corridor.

Within the Manawatu-Whanganui Economic Action Plan (Aug 2016) several emerging opportunities have been identified, including:

- Efficient and well-serviced aggregated transport hubs. The region needs to have the capacity to efficiently collect, package and redistribute product.
- Scalability of operations. The region needs the capacity to expedite road infrastructure investment decision-making when the contributions to the economy justify this. This includes the potential to take advantage of the interest in 'rail tourism' to convey an increased number of tourists to the Tongariro Whanganui area. This may reduce road trips to the region.

Key journeys

Auckland to Wellington

Due to the challenging terrain, transport linkages between the upper and lower North Island are limited and result in journey times that are comparatively long. While there are critical transport links between the upper and lower North Island areas (particularly for freight), traffic volumes reduce over the Volcanic Plateau.

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.

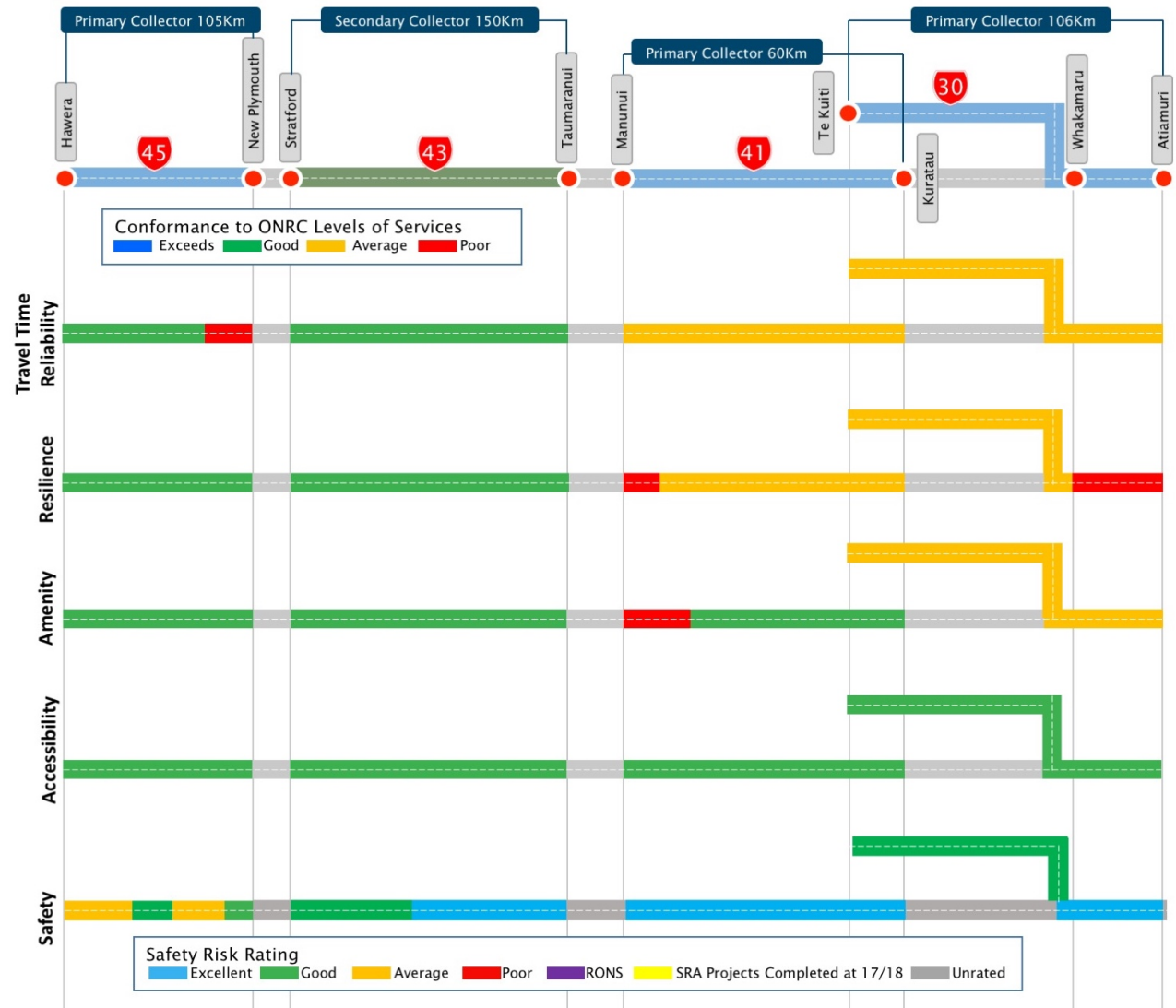
Overall, customers will be provided with the right level of road transport infrastructure where it is needed, determined by a robust, impartial, nationally consistent tool – the ONRC.

Road classification

SH30, SH41, and SH44 are classified as Primary Collector. SH43 is classified as a Secondary Collector.

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 Central Group West corridor is performing against the ONRC Levels of Service, as they relate to each of the three current classifications.

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

Commuter congestion leads to unreliable travel times on SH45 into New Plymouth. Ice and snow can lead to unreliable travel times on the corridor on the Primary Collector network on the central plateau.

Resilience

Most the corridor can either provide alternative routes and/or has a low risk of unplanned closures. SH30 between Whakamaru and Atiamuri is prone to slips and rock falls.

Amenity

Most the corridor is delivering the expected ride quality. SH41 to the east of Manunui is slowly slipping away causing an undulating ride. Large and rigid rock fall is causing significant deterioration in the pavement surface along SH30 between Whakamaru and Atiamuri.

Most of the corridor has low traffic volumes. Few sections of the corridor provide good customer facilities with SH45 having adequate facilities. Whilst the selling point of the Forgotten World Highway (SH43) is that it has few facilities and is remote, it may benefit from emergency telephone installations.

Accessibility

The corridor generally provides an appropriate level of access along the corridor. Accesses and intersections are infrequently dispersed along the rural sections of the corridor.

Safety

While collective risk along the corridor is low or medium-low, the personal risk is high, particularly between Manunui and Kuratau. There are large portions of the corridor with a high personal risk. The corridor is either 2 or 3-star rated, and from Hawera to Taumaranui is rated 2-star. This 2 or 3-star KiwiRAP rating denotes some major deficiencies in road features.

There are large sections of the corridor where targeted low cost high coverage improvements will be beneficial. Tourism is creating increasing pressure on the corridors capacity and performance. Additional safety measures for all modes of transport and minor safety improvements should be considered for the corridor.

Key pressures on the corridor include out of context curves, lack of barrier protection, and a high number of visiting drivers.

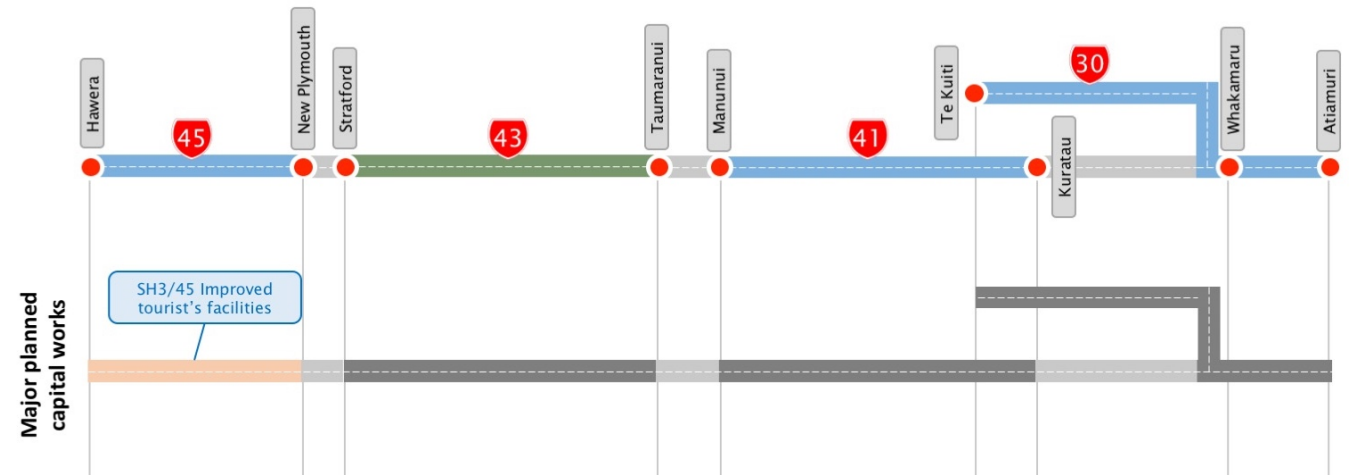
Improving the customer experience

There is a limited amount of work beyond minor improvement work planned or occurring on this corridor.

Improved tourist facilities are planned for SH45.

Planned improvements are discussed in greater detail later in this document.

Figure 8 – Significant corridor planned improvements



SH30 RP84 – Whakamaru Dam signalled bridge access

Access

Carriageway configuration

The corridor is mostly two opposing lanes with minimal passing lanes and narrow shoulders. There are four lanes on two parallel streets divided by a block through the centre of New Plymouth supporting urban commuter traffic. There are also many single lanes bridges throughout the corridor, and a tunnel on SH43.

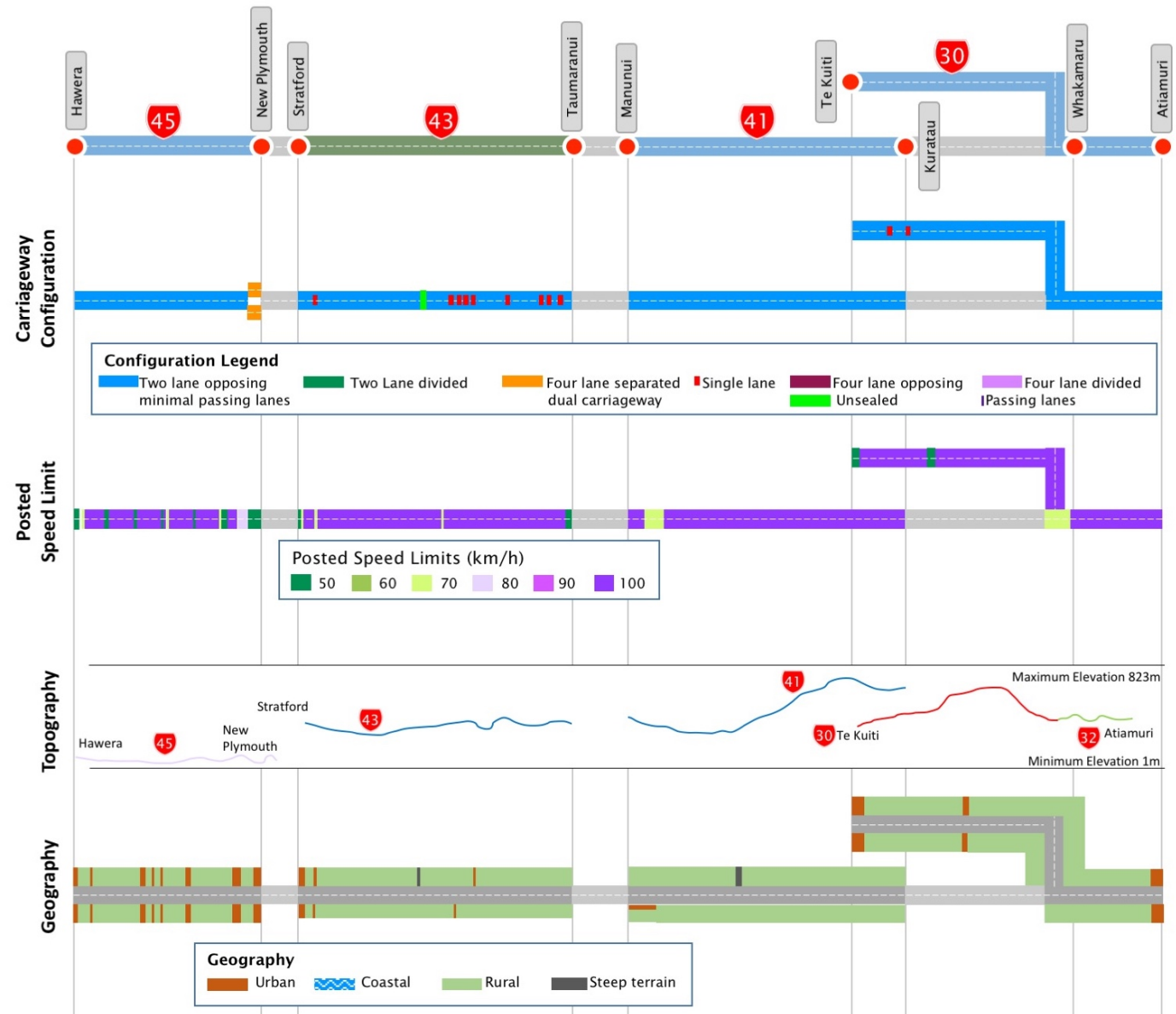
Speed limits

The corridor is mostly posted at 100 km/h except in the urban areas of New Plymouth and rural settlements where the posted speed ranges from 50 to 80 km/h.

Topography/geography

The topography of the corridor is variable, depending upon the section of the corridor. The corridor passes through a range of open rural landscapes, planted forests, and smaller communities, with some urban environments on the fringes.

Figure 9 - Corridor characteristics

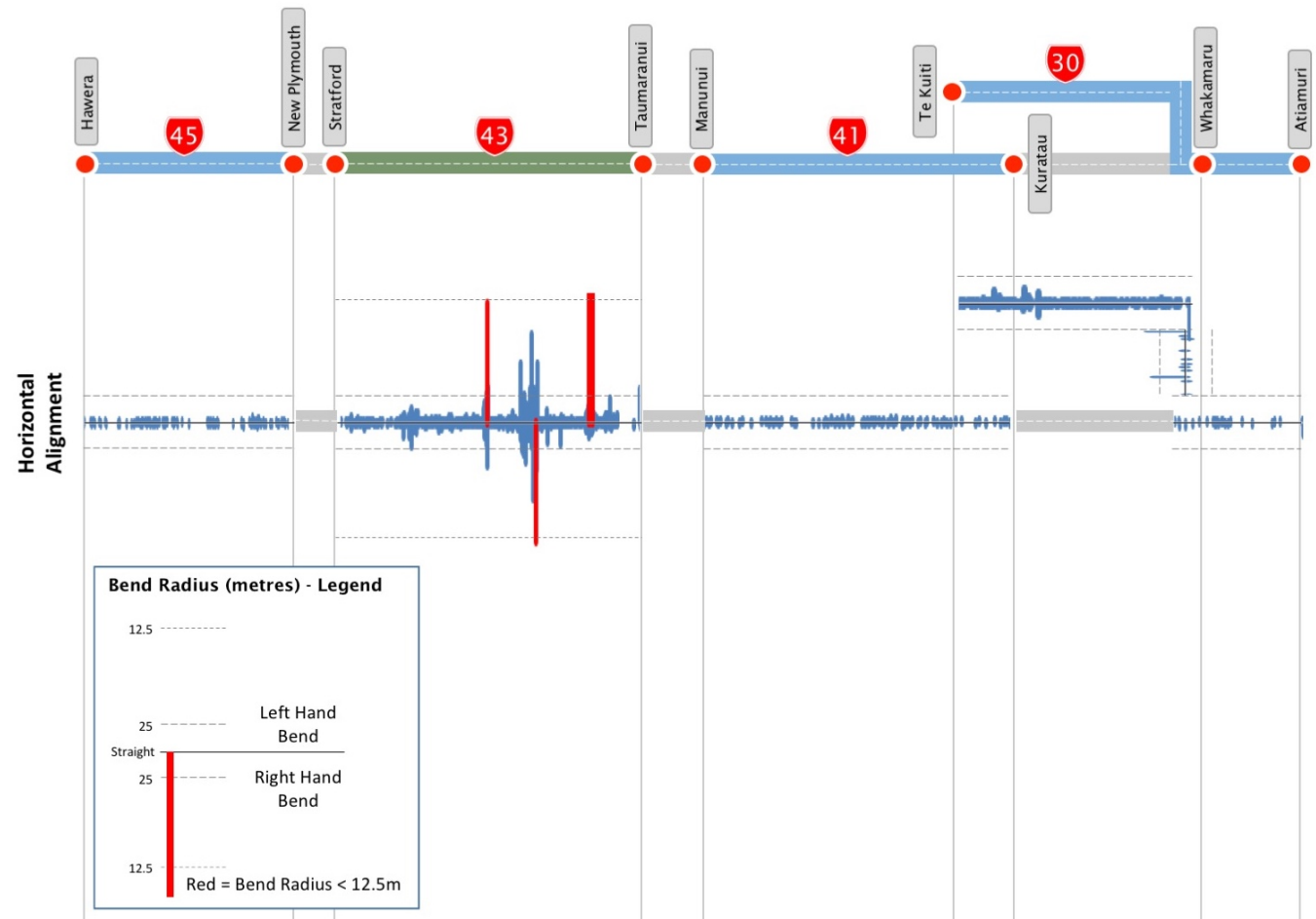


Horizontal alignment

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.

The Forgotten World highway SH43 contains a number of tight curves with a radius under 25m, including several severe bends with a radius below 12.5m. SH30 also has some tight bends with a radius under 25m. On the remainder of the corridor, out of context curves occur frequently.

Figure 10 - Horizontal alignment



Volumes

Traffic volumes outside the urban areas along the corridor are mostly between 500 and 3,000 vehicles per day with heavy vehicles ranging from 100 to 200 vehicles per day. Traffic volumes within New Plymouth (SH45) urban area up to 15,000 vehicles per day per direction and 2,000 heavy vehicles per day westbound, 300 eastbound.

HPMV routes

The alternative route around Lake Taupo (SH30, SH32, and SH41) is fully HPMV capable. The full HPMV capable route extends down SH30 to the Kopaki Bridge (22km from Te Kuiti) and down SH41.

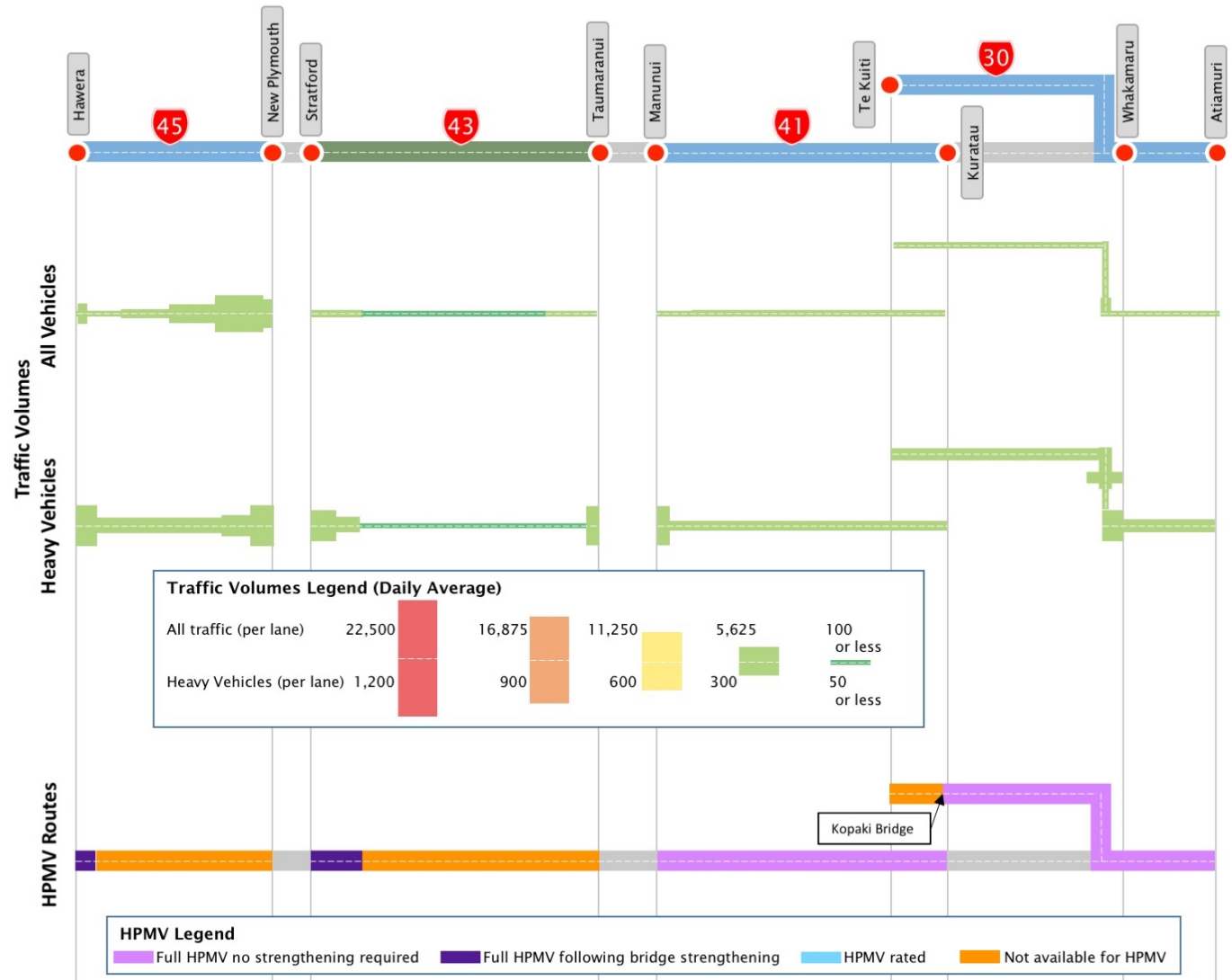
Short sections of the corridor will be fully HPMV capable following bridge strengthening on the corridor into Stratford (SH43) from Te Wera and Hawera (SH45) from the Kupe Gas Project.

Critical customers and assets

There are several critical customers adjacent or close to the corridor and rely on the corridor to be open 24/7 and are vulnerable to interruptions. Examples include connection to Port Taranaki, local hospitals, and access for Transpower to the Bunnythorpe line which is a strategic North Island electricity connection.

There are also critical assets along the route which need an enhanced maintenance focus to ensure they do not fail or significantly interrupt services along the network. The Whakamaru Dam and road bridges over the rail network are assets that if failed, would have significant impacts on this corridor and the wider state highway network.

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:

- **Constraints to HPMV access:** Physical constraints on HPMV limit the efficient movement of freight. Several bridges do not allow full HPMV capability such as the Kopaki Bridge (SH30).
- **Changes in land use:** Farm conversion to lifestyle residential areas, forestry to dairy and intensification of rural areas are leading to the increased pressure on accesses onto the corridor.
- **Limited passing opportunities:** This leads to reduced travel time reliability and inappropriate driver behaviour. Whilst the corridor has relatively low volumes the targeted of passing should focus on the sections likely to carry higher freight volumes. These could focus on sites where costs are economic at reasonable extended frequencies.
- **Tourism:** Increasing tourist activity and awareness of recreational areas is creating increasing demand for parking and access to recreational sites.

Future considerations

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

- **Integrated landuse and transport planning:** As land use intensifies (including recreational activity) and more accesses are requested or become more heavily trafficked, planning and foresight is needed so the appropriate site and form of access is provided for immediate and potential future use. Working with local authorities to consider land use development and impacts on the transport network will help maintain ONRC levels of service along the corridor.
- **Recreational access strategy:** Working with partners and other agencies such as mana whenua, local councils and DoC to develop strategies around access to recreational areas will enable consideration of appropriate intersection form and location, sight distance, queueing areas in these locations.



SH43 Pohukura Saddle Underslip

Resilience

This corridor is vulnerable to closure from crashes and environmental factors which can have a negative impact on the regional and national economy. Flooding has occurred on SH43 and SH45. Alternative routes exist in most parts of the corridor but are reasonably longer.

Vulnerabilities

The corridor experiences a moderate to high level of slips, rock falls and flooding. Known areas of concern are:

- rock falls between Whakamaru and Atiamuri (SH30)
- flooding on SH43 and SH45

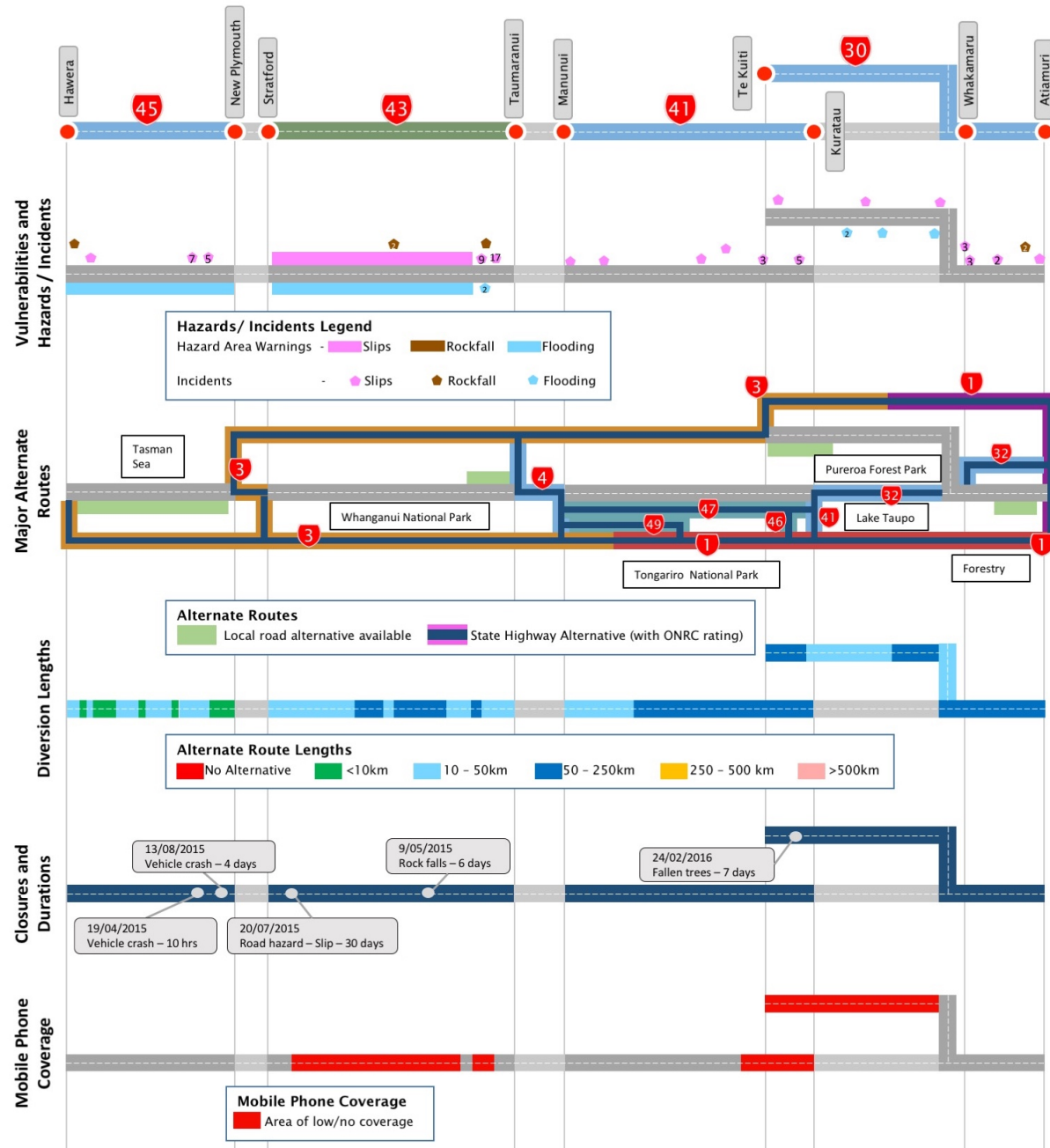
Alternative routes and diversion lengths

Alternative routes exist for a large proportion of the corridor both via state highways (SH1 and SH3) and local roads. The multiple park reserves, hill ranges and forests surrounding the corridor obstruct potential for some detour routes. Many of the alternative routes for the corridor are more than 50km in length.

Closures and duration

The major unplanned road closures and duration of interruption along the corridor in the last 5 years are shown in Figure 12. Slips, rock falls, and fallen trees are the main cause of lengthy closures on the corridor.

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 as follows:

- **Slips and flooding:** Annual severe weather events result in partial and full road closures which have a negative effect on journey time and an adverse economic impact. The narrow width of the corridor makes it difficult to manage these events and the subsequent clean up around live traffic. Large and rigid rock fall is causing significant deterioration in the pavement surface along SH30 between Whakamaru and Atiamuri. Harvesting of forests and conversion to pasture land also means water is no longer being held within forest lands and resulting in increased flooding on the corridor. This is exacerbated by under capacity culverts, shallow swales and silting of the stormwater system.
- **Volcanic activity:** The proximity of the corridor to the volcanically active mountains within Tongariro National Park create a risk of volcanic ash.
- **Geology:** Land subsidence has created an undulating ride between Manunui and the Waituhi Saddle (SH41). The land is continuing to move resulting in an on-going and increasing maintenance concern.
- **Suitability of roading materials:** The pumice subgrade that the northern parts of the corridor (SH30) are built on, along with a high-water table in some areas results in increased pavement rutting issues. This leaves the pavement vulnerable to the periodic loadings from heavy forestry vehicle movements.
- **Poor communication:** There are significant mobile phone black spots along the corridor. A lack of advanced and real-time warning of full and partial road closure events means journeys are less adaptable to changing road conditions.

Future considerations

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

- **Communications:** ITS system investment is important as real-time information is critical in planning and diverting journeys. ITS can convey important information around the location of snow and ice issues, slips, rock falls, flooding, and crashes and convey available routes that customers can still use. Consideration should also be given to supplementing this information with real-time journey times. This will require working with telecommunications companies to improve mobile phone coverage throughout the corridor.
- **Further investigations into resilience:** A resilience study would provide a better understanding of the risks and issues within this corridor and enable the development of a more informed strategy to manage and mitigate risks.
- **Monitoring high risk areas:** Mitigating slope on a priority basis by actively monitoring prone areas and investigating preventive maintenance options. Climate change with projections of increased severity of storm events and rainfall will impact future maintenance and risk assessment around slips and rock fall along the corridor.



SH43 Whangamomana Saddle East underslip

Reliability and efficiency

Efficiency

Most the corridor performs well against the EfficiencyNet Level of Service. High volumes in New Plymouth result in periods of poor LoS. The winding and rolling geography and resulting poor alignment on SH43, between just beyond Puketutu and Kopaki (SH30), and the Waituhi Saddle (SH41) results in poor Levels of Service.

Variability

There is no variability data for this corridor.

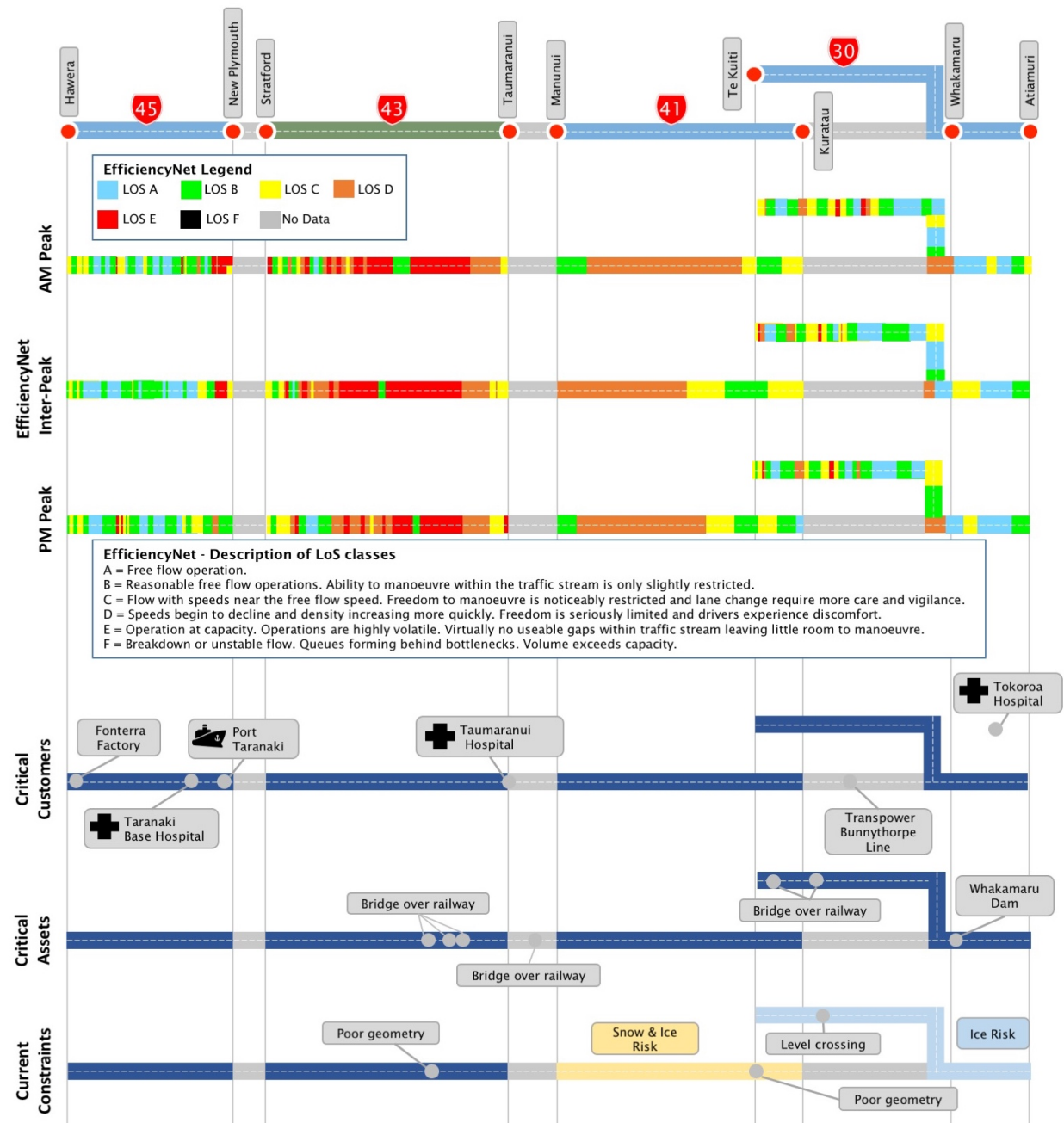
Commercial vehicle average speed

There is no commercial vehicle speed data for this corridor.

Current constraints

The major current constraints on the network affecting journey reliability and efficiency are shown in Figure 13. These largely due to ice and snow on SH41. Other constraints include sections of winding/ rolling road alignment through SH43 and railway crossings.

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 following:

- **Climatic conditions:** The alpine climate around the corridor results in snow events and ice forming on the pavement in winter. Ice is of concern on SH30 and SH41. These issues result in uncertain route options, unreliable travel times and safety risks. The rural inland nature of the corridor leads to mist forming over the road during evening driving at times during the year. This can limit forward visibility, making driving hazardous and lead to unreliable travel times.
- **Topography:** The winding and rolling geography and resulting poor alignment on the Waituhi Saddle (SH41) Forgotten World Highway (SH43) and between/ just beyond Puketutu and Kopaki (SH30) results in unreliable travel times and overall poor journey experience.
- **Management of recreational events:** Cycling and running events around Lake Taupo and their traffic management has an impact on travel time reliability of other road users during these events.

Future considerations

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

- **Monitoring:** Investment in electronic weather stations and warning devices will provide real time information critical for planning and diverting journeys. This would require upgrading the existing manual signs and coordination with mobile network suppliers to ensure adequate coverage.
- **Active journey management:** 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 through application of the Speed Management Guide.



SH30 RPO resealing with 50km temporary speed limit

Safety

Collective risk

Collective risk along the corridor is either low or medium-low. SH43 between Stratford and Taumaranui is rated low collective risk. There are three sections along the corridor that are unrated for collective risk.

Personal risk

Personal risk along the corridor varies significantly. Between Stratford and Taumaranui on SH43, there are four high risk sections. SH41, between Manunui and Kuratau is rated medium-high and high risk. There are three sections of SH30 are rated high risk.

There are three sections along the corridor that are unrated for personal risk.

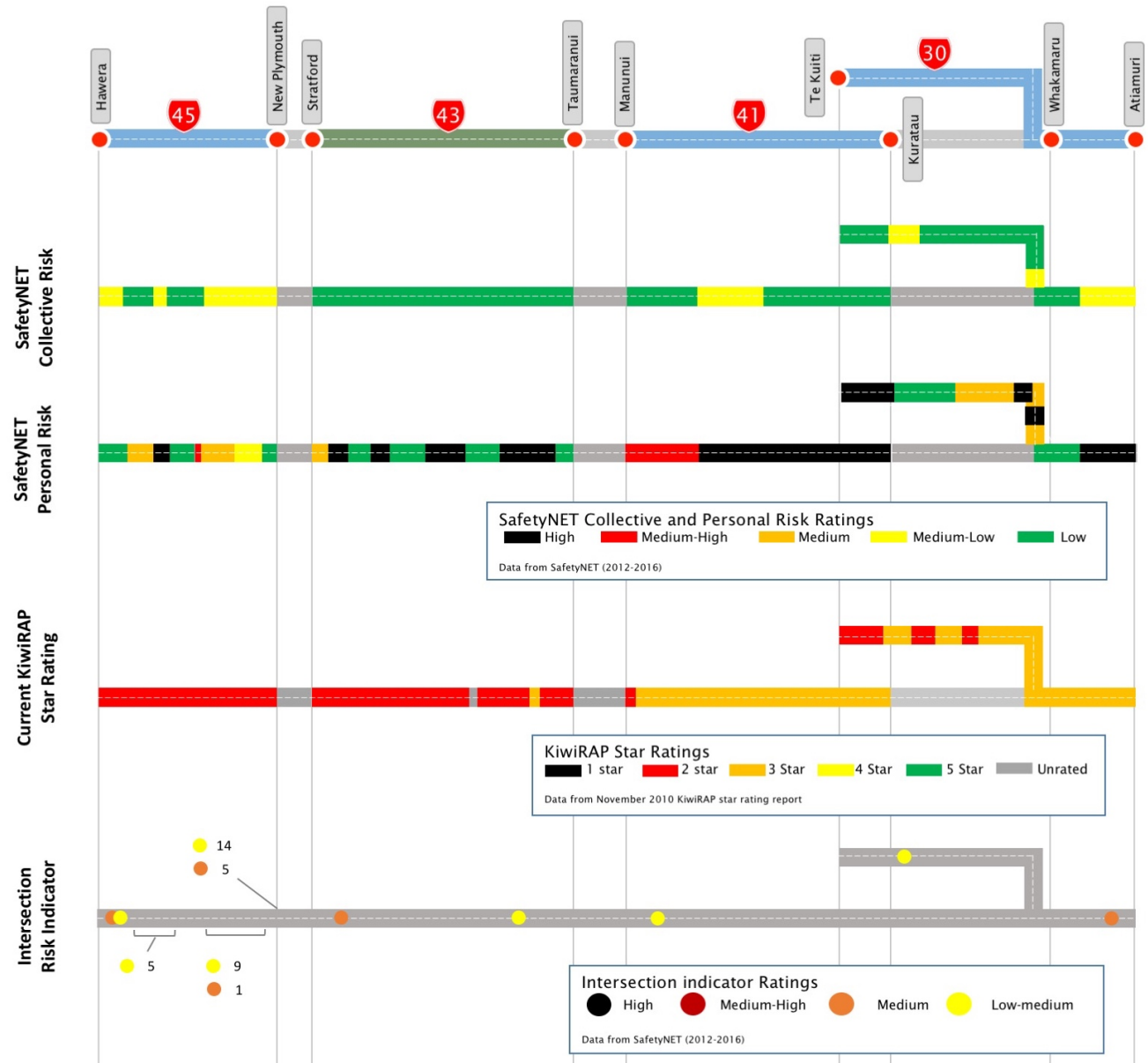
Star rating

The corridor is rated 2-3 star. From Hawera to Taumaranui is 2-star except for a small 3-star segment. The majority of SH41 between Manunui and Kuratau has a 3-star rating. From Te Kuiti and Atiamuri it varies between 2-star at the Te Kuiti end through to 3-star at Atiamuri.

Intersection risk indicators

There are no high-risk intersections along the corridor. There is a total of nine medium-risk intersections along the corridor. Five of these are in the urban area of New Plymouth. Additionally, there are 14 low-medium risk intersections in New Plymouth.

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:

- **Disproportional DSI rates:** The significant rate of death and serious injuries considering the low traffic volumes can be attributed to inconsistent and narrow road alignments, limited separation between opposing traffic, and hazardous roadside environments on a number of highway sections.
- **Out of context environments:** The general topography of SH41 between Kuratau and Turangi, and SH43 is out of context from the wider corridor environment. This creates a particularly hazardous environment and points to the standard 100 km/h open road speed being inappropriate for this part of the corridor.
- **Lack of barrier protection:** Several bridges have limited or no barrier protection that can safely redirect errant vehicles. There are also gullies and stream crossings on SH45 result in a 2-star KiwiRAP rating throughout, placing pressure to install more barriers.
- **At grade rail level crossings:** There are at grade level crossings across active rail lines at Te Kuiti (SH30) and near Mangapehi (SH30). The Mangapehi crossing is being addressed by the Safer Roads and Roadside Programme.

Future consideration

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

- **Widening and protection:** Safety improvements creating recovery space outside of traffic lanes, and protection from or removal of roadside hazards, including hazardous bridge arrangements and level crossings.
- **Speed management:** Consideration of the safe and appropriate speed for each part of the corridor given its level of risk to road users and level of importance in accordance with the Speed Management Guide framework.
- **Minor safety improvements:** Continued implementation of low cost solutions such as; delineation improvements (i.e. line markings, edge marker posts, RRPMs, ATP, curve signs), sight distance improvements, and side barrier installation.



SH43 Inside the Moki tunnel

People, places and environment

Natural environment

The corridor is characterised by predominantly rural landscapes and park reserves, with some urban areas on the fringes of the corridor. The corridor touches Mt Taranaki National Park, and Whanganui National Park. It follows and crosses rivers in many locations, including the Waikato River, Lake Whakamaru, and Whanganui River and numerous other rivers and minor streams.

Noise, vibration and air quality

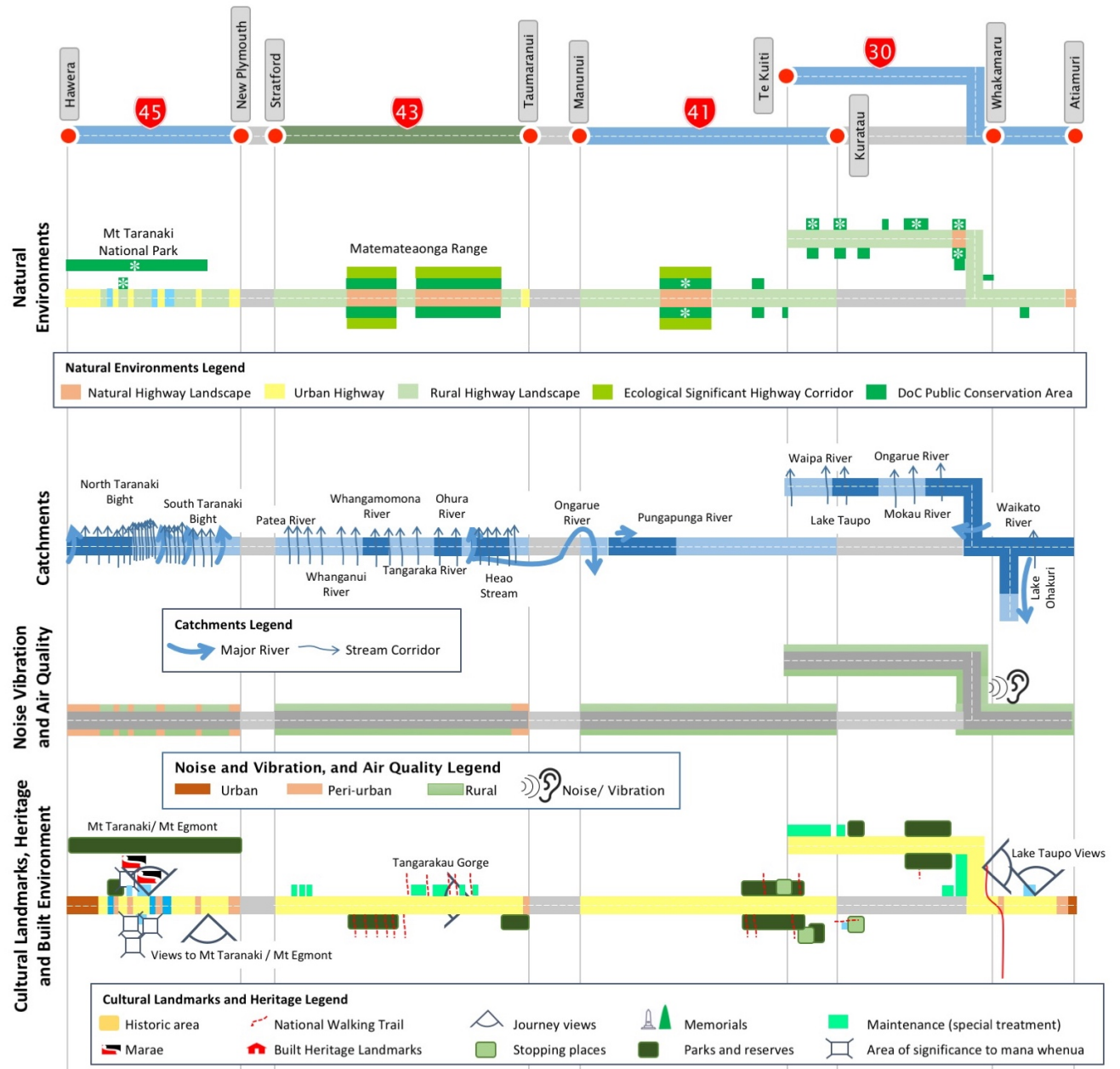
Vibration has been an issue in Whakamaru due to a more rigid pavement on the highway causing vibration issues for residents when heavy vehicles pass through the residential area.

Cultural landmarks, heritage and built environment

The visual character of the corridor provides vibrancy and attractiveness to journeys, with a range of reserves, rural areas, and rural settlements.

The mountains surrounding the corridor are of significant importance to iwi and all New Zealand. They are considered sacred ground by iwi. Tongariro was the first national park in the country. These draw significant visitors and tourists each year placing pressure on the corridor for access and facilities associated with walking trails, ski fields and vistas.

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:

- **Weather:** Increasing frequency and severity of weather events is accelerating flood frequency and intensity, and erosion and slope degradation within and alongside the corridor, particularly SH30 between Whakamaru and Atiamuri. The management of these risks are likely to require greater engineering control.
- **Vegetation management:** Particularly near sensitive ecological and protected conservation lands. As the corridor develops and expands, community expectations (e.g. visual quality, control of pest plants) will lead to areas of managed vegetation being increased as well as operational costs which will require management plans with ongoing obligations.
- **Increasing environmental standards:** The sensitive ecological and protected conservation lands near the corridor will result in more intensive resource consent requirements when corridor activities need to change, including consideration of water quality issues.
- **Stormwater management:** Harvesting of forests and conversion to pasture land means water is no longer being held within forest lands and resulting in increased flooding on the corridor. This is exacerbated by under capacity culverts, shallow swales and silting of the stormwater system.
- **Noise, Vibration and Air Quality:** Heavy vehicle movements through residential areas of the corridor will continue to result in noise and vibration impacts. Receptors close to the state highway are more likely to be potentially impacted. Balancing community expectation around noise and vibration with sensible maintenance solutions in established areas will remain an ongoing maintenance consideration.
- **Management of cultural landmarks and heritage buildings:** The range of cultural heritage places and landmarks are subject to incremental damage through both corridor management activities and environmental changes. Some of these places and landmarks may require management plans with ongoing obligations. Additional investigations and management of impacts on these features may also be required.
- **Improved relationships:** Acknowledgement of iwi/ mana whenua relationships is increasing along with their input to the management of heritage assets and landscapes. The number of features and locations along the corridor of importance to iwi is expected to increase and these will need to be considered in corridor management and development activities. This includes the placement of Pou or land symbol posts around the national parks.

Future considerations

The future considerations relating to corridor pressures, intervention triggers and appropriate levels of investment related to **People, Places and Environment** are as follows:

- **Relationships:** Effective relationships between iwi and associated councils to work together and maximise access to cultural and heritage places to support economic and social growth. This may require safety and journey management programmes to ensure the corridor continues to meet its transport responsibilities.
- **Noise management measures in urban areas:** Consideration of surface type, or heavy vehicle bypasses through or around some centre could address existing concerns in some areas.
- **Review of stopping areas and development of a stopping area strategy:** Suitable stopping places are needed in places to provide, among other things, safe areas where tourists can pull off the road to view the mountains and other notable sights and avoid them parking in dangerous areas. Consideration could be given to maintaining less stopping areas but to a higher, more effective standard.
- **Rationalise resource consents:** Consider opportunities to consolidate/rationalise resource consents, particularly for regular maintenance activities.



SH43 Nevins Hill culvert

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 397 km of road network which reflects 3.5% nationally. The total value of the assets along the corridor is \$466M.

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 – Summary asset condition and performance



Figure 18 – Asset condition

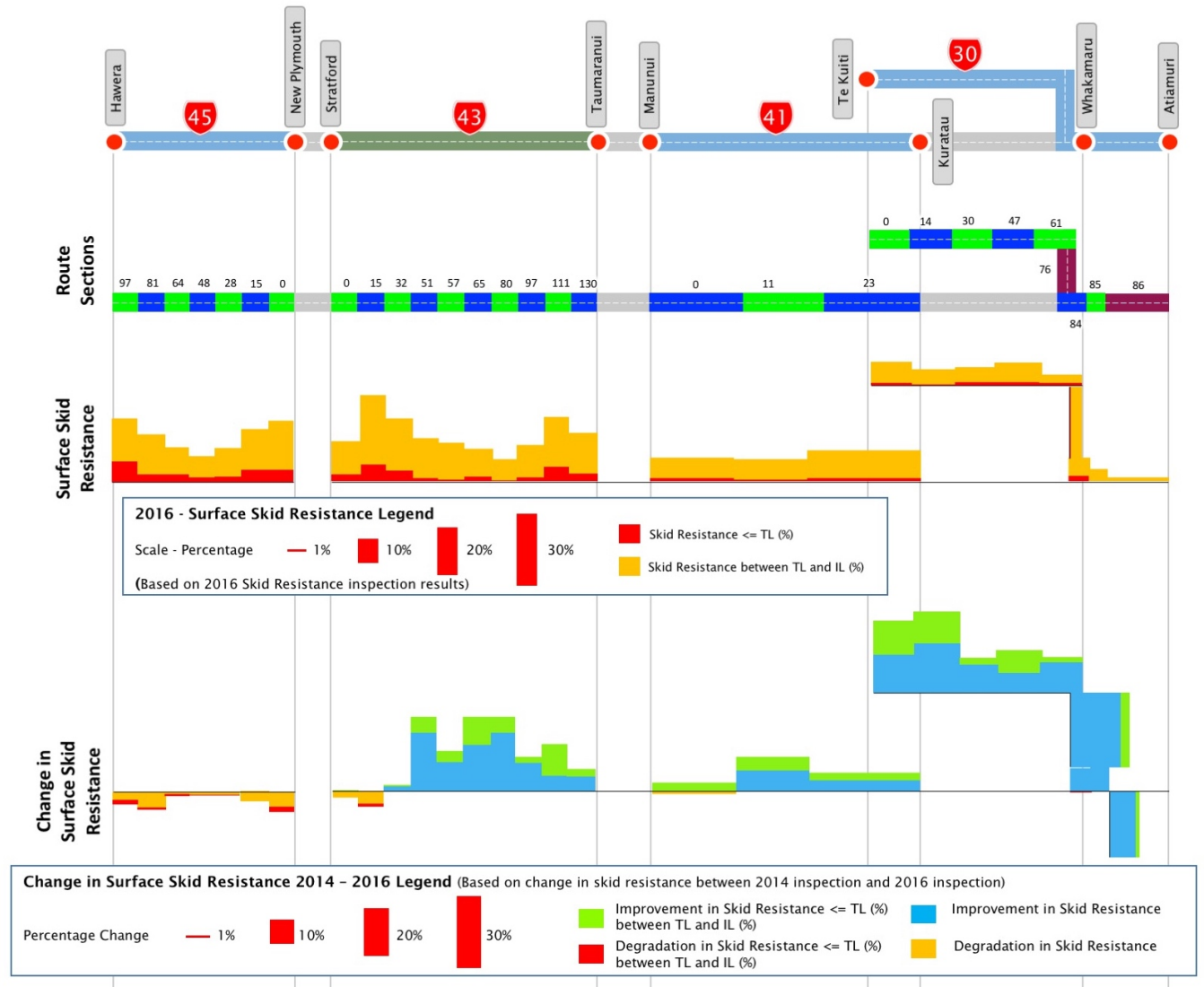
Asset condition and performance

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 below the threshold level appeared across the extent of this corridor/cluster. Surface skid resistance has been improved markedly across much of the cluster with the exception being SH45, where a degradation in surface skid resistance continues through RSO to 97.



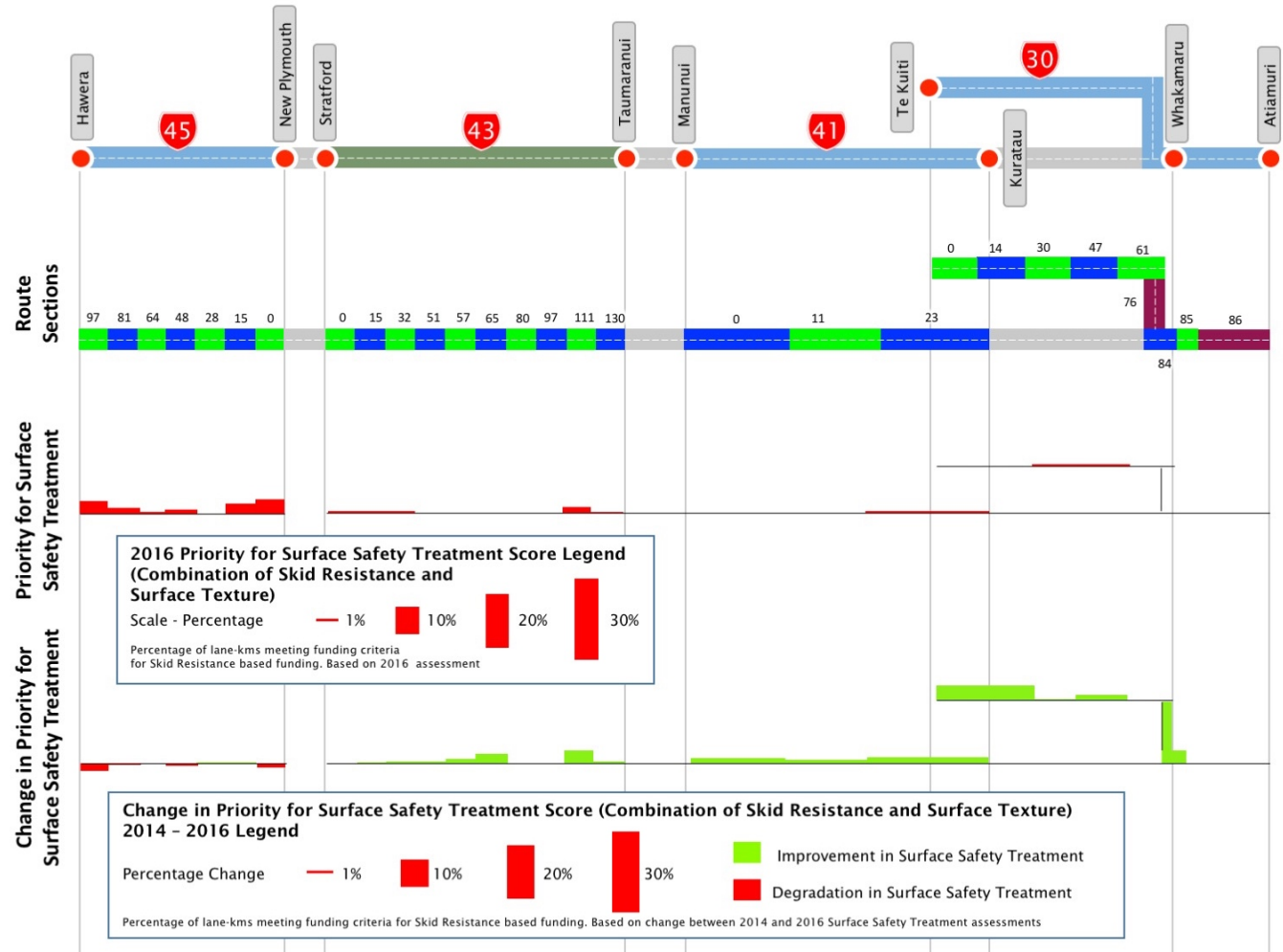
Priority for surface safety treatment

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.

Just 0.95 percent of the corridor has a surface safety treatment score that meets the funding qualification, being along primarily along SH45 between RS0 and RS97. Overall there has been a marked improvement in priority for surface safety treatment across the bulk of the corridor.

Figure 19 - Asset condition 2



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, 40.8% of the corridor achieves a score above which inspection is required, making it the worst performing corridor on the state highway network. Sections with significant lengths of surface requiring inspection include: Significant parts of SH43. SH43 has also shown the greatest increase in length achieving a poor surface defects score.

Figure 20 – Asset condition 3



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.

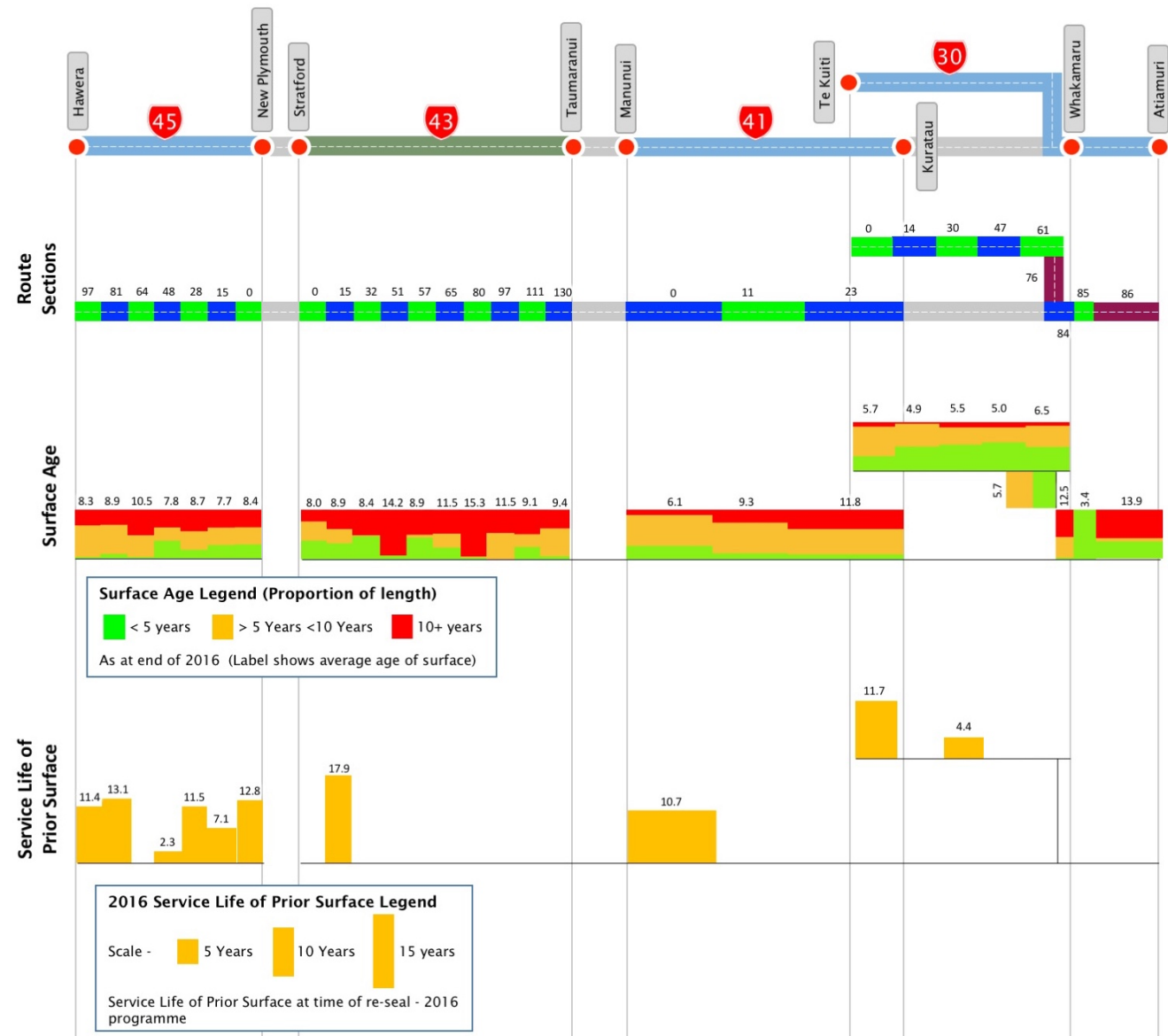
The sections of corridor with the oldest age profile are 45/64 south of Opunaki, 43/51 east of Te Wera, 43/65 and 43/80 between Whangamomona and Heao, and, 30/86 West of Atiamuri, all of which have an average surface age in excess of 10 years.

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, an average service life in excess of 10 years or greater was achieved for most sections that were resealed in the last year.

Figure 21 – Asset condition 4



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 section 30/47 through Pureora Forest Park.

Proportion of travel on smooth roads

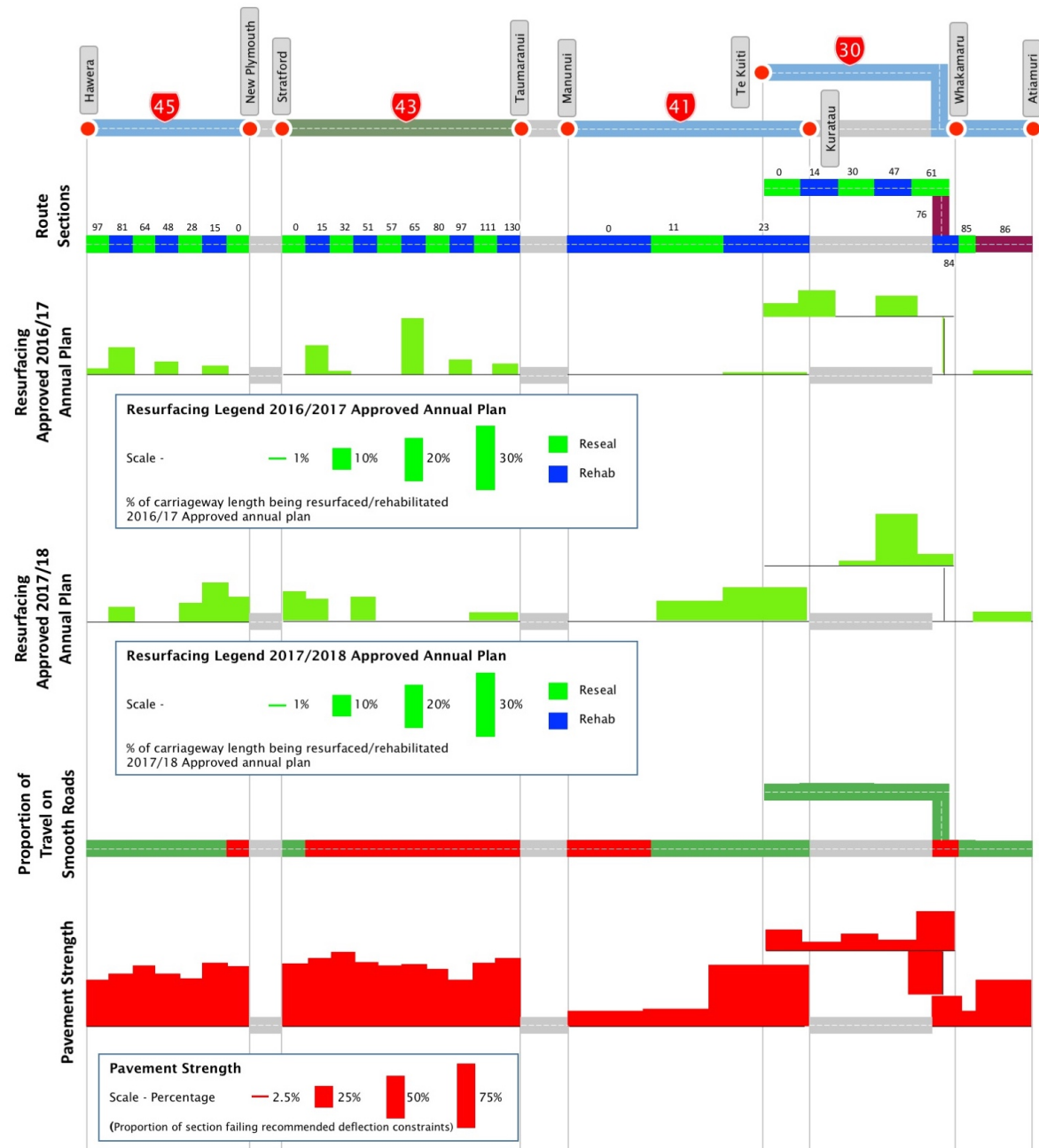
The infographic shows whether the route section passes the ONRC standard for Proportion of Travel on Smooth Roads (Smooth Travel Exposure). 97% is the ONRC target for proportion of travel on smooth roads. The infographic simply shows whether the route section achieves this level or not.

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 include all of SH43 and SH45, and SH41/23 west of Kuratau.

Figure 22 – Asset condition 5



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:

- **SH30:** Low traffic volumes on this highway means it does not demand a lot of maintenance. There is a very vocal community in Bennydale regarding speed through the township.
- **SH41:** Also a low volume section of the corridor. There is a vibration issue near Whakamaru Dam, SH30/84.
- **SH43:** Maintenance of the many rail crossings along the length of this highway have become problematic since KiwiRail no longer use the branch line, and the private operator using part of the rail line also has no interest, although the crossings are still required to be maintained to industry standards. Roughness at crossings is causing issues for road users.

Surface assets are being stretched to their limits, and achieving long lives, but this has resulted in a lot of texture loss and flushing. Approach has been to run to failure. The highway supports only light traffic volumes on light duty/fragile pavement. The unsealed section has had minimal maintenance, although there are plans to reinstate.

Around Whangamomona, there are high expectations for customer levels of service above the classification of the highway.

Access and resilience is important at the Taumaranui end as SH43 is the only access to Taumaranui Hospital.

- **SH45:** On RS0 there AC issues in the New Plymouth urban area with much of this section a divided carriageway, and supporting traffic volumes higher than what the classification would suggest. Outside New Plymouth, the mostly coastal nature of this highway means it is prone to high winds, and localised flooding. Bridge painting is more frequent due to the coastal environment.

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:

- **Due to the low volumes** of vehicles on this corridor, no exceptional increases in the maintenance requirement is expected on this corridor.
- **Dairy conversion** from forestry on parts of the corridor may have a minor future impact on maintenance.



SH30 Whakamaru has low maintenance demands due to low traffic volumes

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	\$3,910	\$4,122	\$6,203
	Renewals	\$7,046	\$7,783	\$9,509
	Improvements	\$0	\$28,600	\$0
Reliability and Efficiency	Maintenance and Operations	\$1,925	\$2,034	\$3,040
	Renewals	\$178	\$162	\$286
	Improvements	\$14,600	\$4,500	\$0
Safety	Maintenance and Operations	\$4,001	\$4,269	\$6,456
	Renewals	\$2,503	\$2,641	\$3,965
	Improvements	\$0	\$5,110	\$0
People, places and Environment	Maintenance and Operations	\$706	\$728	\$1,093
	Renewals	\$30	\$23	\$34
	Improvements	\$300	\$2,000	\$0
Total		\$35,198	\$61,971	\$30,587

Figure 23 - Corridor investment

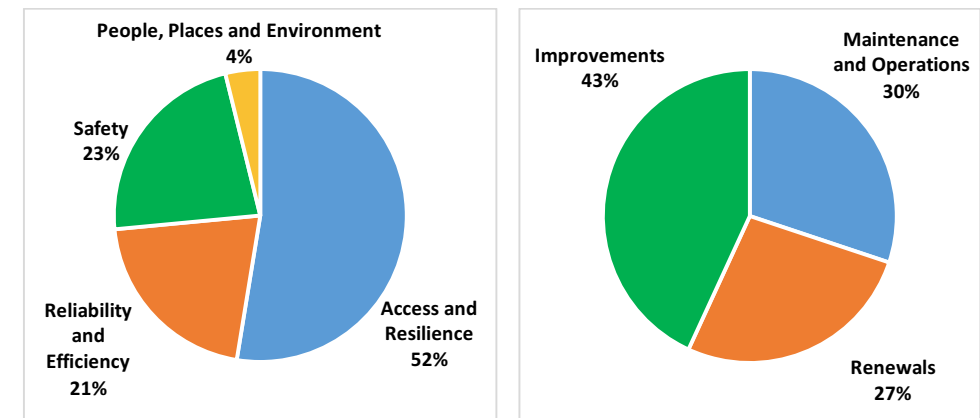


Table 2 - Summary investment by work category (\$000)

Outcome	Work Category	2018-2021	2021-2024	2024-2028
Access and Resilience	111 Sealed Pavement Maintenance	\$905	\$1,005	\$1,524
	112 Unsealed Roads	\$16	\$17	\$26
	113 Drainage Maintenance	\$363	\$383	\$576
	114 Structures Maintenance	\$723	\$767	\$1,152
	121 Environmental Maintenance	\$488	\$530	\$794
	122 Traffic Services Maintenance	\$24	\$40	\$60
	124 Cycle Path Maintenance	\$11	\$10	\$15
	151 Network & Asset Management	\$1,108	\$1,099	\$1,650
	161 Property	\$273	\$270	\$405
	211 Unsealed Road Metalling	\$208	\$117	\$96
	212 Sealed Road Resurfacing (excl. surface skid resistance)	\$3,464	\$4,125	\$5,382
	213 Drainage Renewals	\$230	\$205	\$308
	214 Pavement Rehabilitation	\$2,212	\$2,428	\$2,359
	215 Structures Component Replacements	\$891	\$885	\$1,330
222 Traffic Services Renewals	\$41	\$23	\$35	
321 - 341 Improvements	\$0	\$28,600	\$0	
Reliability and Efficiency	121 Environmental Maintenance	\$345	\$365	\$549
	123 Operational Traffic Management	\$1,160	\$1,249	\$1,872
	151 Network & Asset Management	\$370	\$371	\$545
	161 Property	\$50	\$49	\$74
	222 Traffic Services Renewals	\$178	\$162	\$286
	321 - 341 Improvements	\$14,600	\$4,500	\$0
Safety	111 Sealed Pavement Maintenance	\$985	\$1,075	\$1,629

Outcome	Work Category	2018-2021	2021-2024	2024-2028	
	112 Unsealed Roads	\$0	\$0	\$0	
	113 Drainage Maintenance	\$65	\$95	\$144	
	114 Structures Maintenance	\$113	\$107	\$163	
	121 Environmental Maintenance	\$255	\$282	\$424	
	122 Traffic Services Maintenance	\$1,571	\$1,667	\$2,530	
	124 Cycle Path Maintenance	\$0	\$0	\$0	
	151 Network & Asset Management	\$897	\$925	\$1,389	
	161 Property	\$117	\$118	\$178	
	212 Surface Skid Resistance	\$2,227	\$2,370	\$3,560	
	214 Pavement Rehabilitation	\$27	\$17	\$26	
	215 Structures Component Replacements	\$95	\$101	\$152	
	222 Traffic Services Renewals	\$153	\$153	\$228	
	321 - 341 Improvements	\$0	\$5,110	\$0	
	People, places and Environment	111 Sealed Pavement Maintenance	\$93	\$99	\$149
		121 Environmental Maintenance	\$465	\$483	\$725
		151 Network & Asset Management	\$118	\$117	\$175
		161 Property	\$29	\$29	\$43
221 Environmental Renewals		\$30	\$23	\$34	
321 - 341 Improvements		\$300	\$2,000	\$0	
	Total	\$35,198	\$61,971	\$30,587	

To be confirmed through the RLTP process

Investing in access and resilience

Operations and maintenance

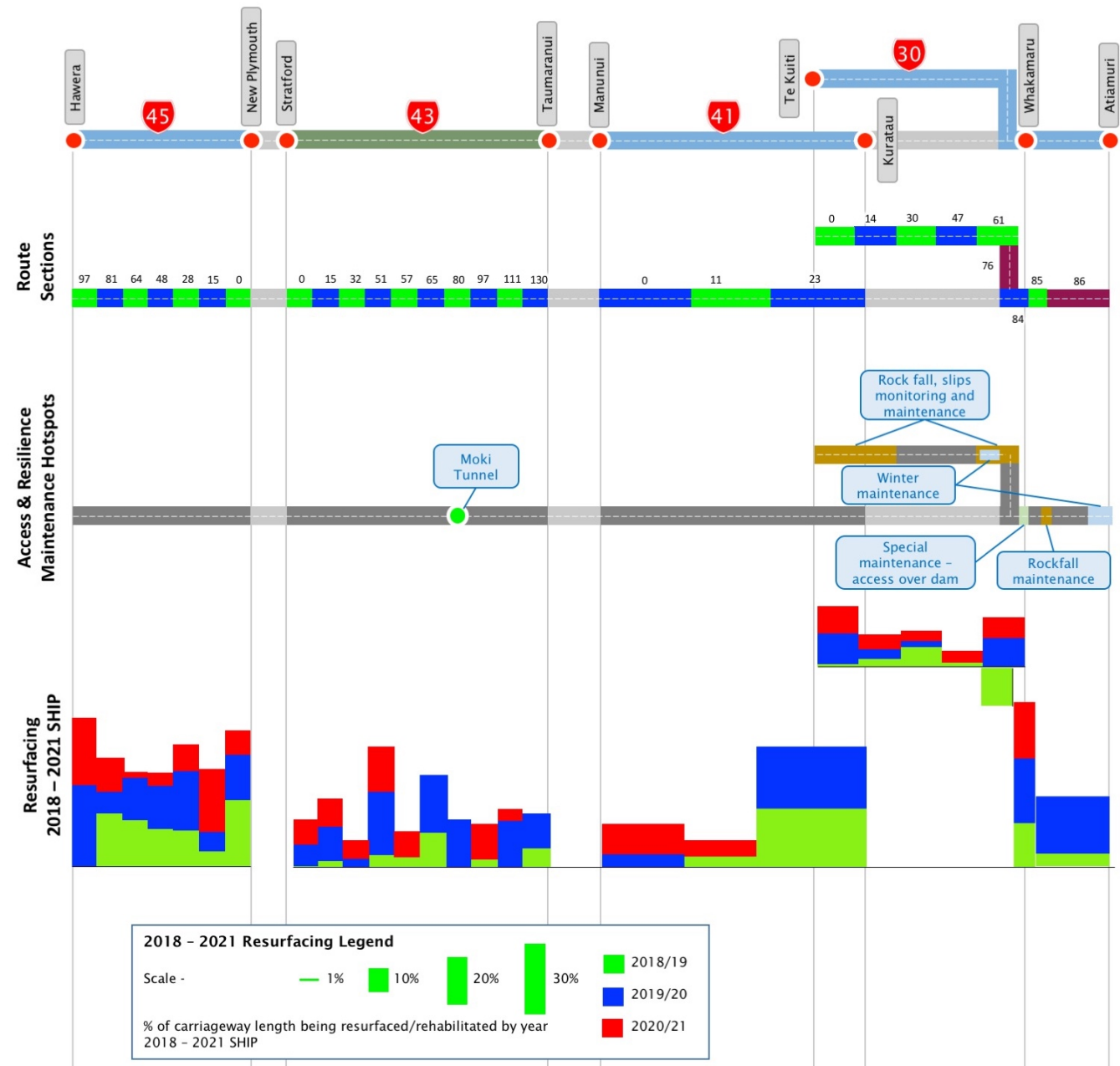
The main areas of investment to provide and preserve access and resilience are drainage maintenance, sealed road surfacing and structural component replacements and vegetation control. A key focus is to realign the base preservation quantities toward increased preventative maintenance and to slow pavement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

Maintenance hot spots

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

- **Winter Maintenance:** During colder months, minor ice issues are experienced on section SH30/61 southwest of Mangakino.
- **Slips:** Steep embankments and poor geometry cause a need for slip maintenance in the same section SH30/61.
- **Rockfall monitoring:** At the start of section SH30/86:1.0 – 3.0, near Whakamaru Dam, rockfall monitoring is undertaken.
- **Special maintenance area:** The highway crosses Whakamaru Dam resulting in a special maintenance area on section SH30/84
- **Moki Tunnel:** The tunnel is narrow and vulnerable, SH43 RP80.

Figure 24 – 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 the entire length of SH45 between New Plymouth and Hawera, and, 41/23 west of Kurataua.

Structure renewal

The renewal investment infographic shows the planned bridge replacements along the corridor. Two bridges are planned for replacement due to asset condition, at a total estimated cost of \$6.5M.

Improvements

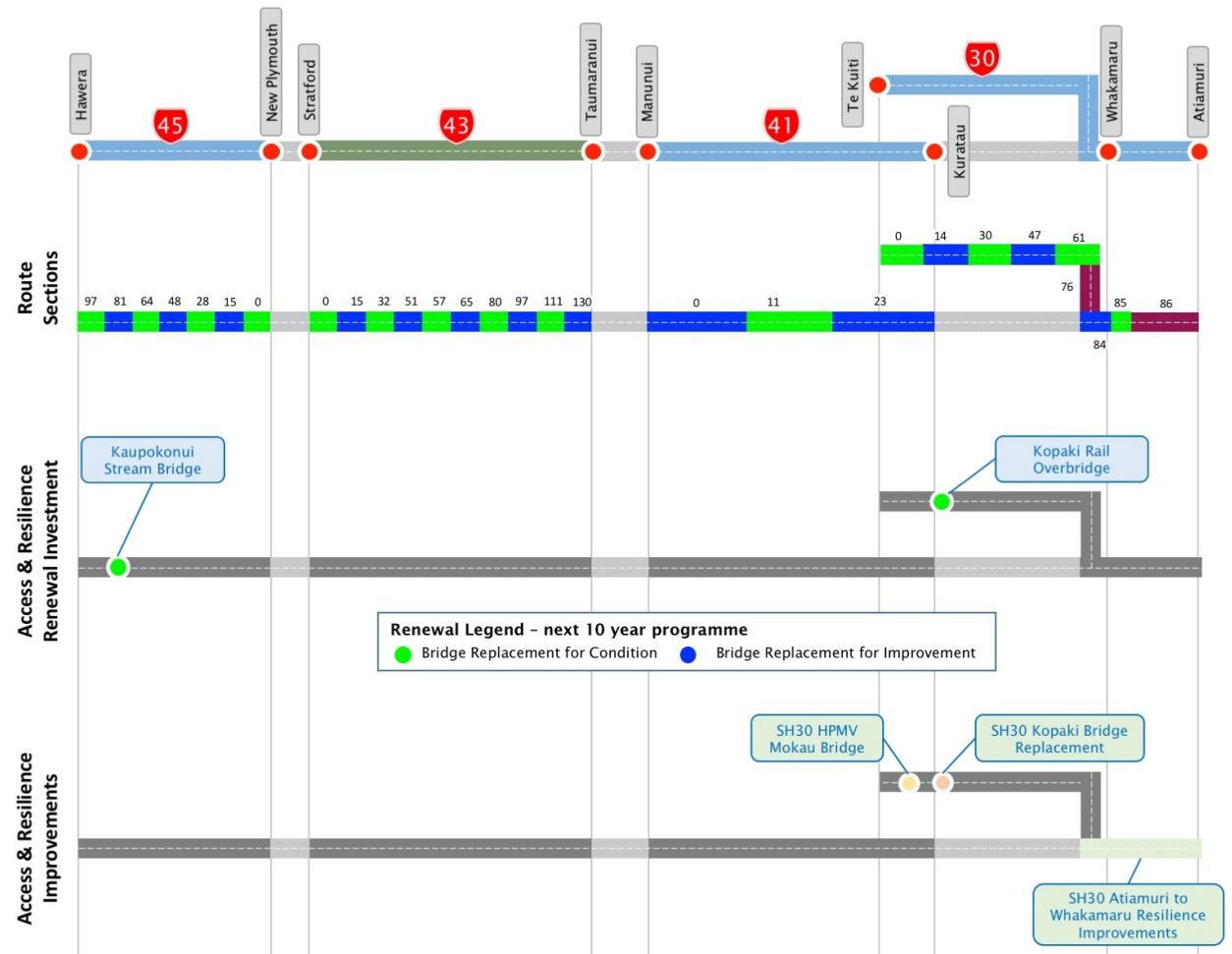
Draft Regional Programme considered for SHIP

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
SH30 Atiamuri to Whakamaru Resilience Improvements		Resilience improvements on SH30 between Atiamuri and Whakamaru as identified in the Central Group West CMP. MapHub shows part of route catastrophic but majority high max. disruption state.
SH30 Kopaki Bridge Replacement		Kopaki bridge is at the end of its life and needs to be replaced - national bridges team have agreed this. At time of replacement, take opportunity to ensure bridge can take HPMVs.
HPMV SH30 Mokau Bridge		Improvements to enable HPMV to use SH4 (as often alternative route for SH1).

Figure 25 – Access and resilience investment 2



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 hot spots

No reliability and efficiency related maintenance hotspots have been identified.

Renewals

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

Improvements

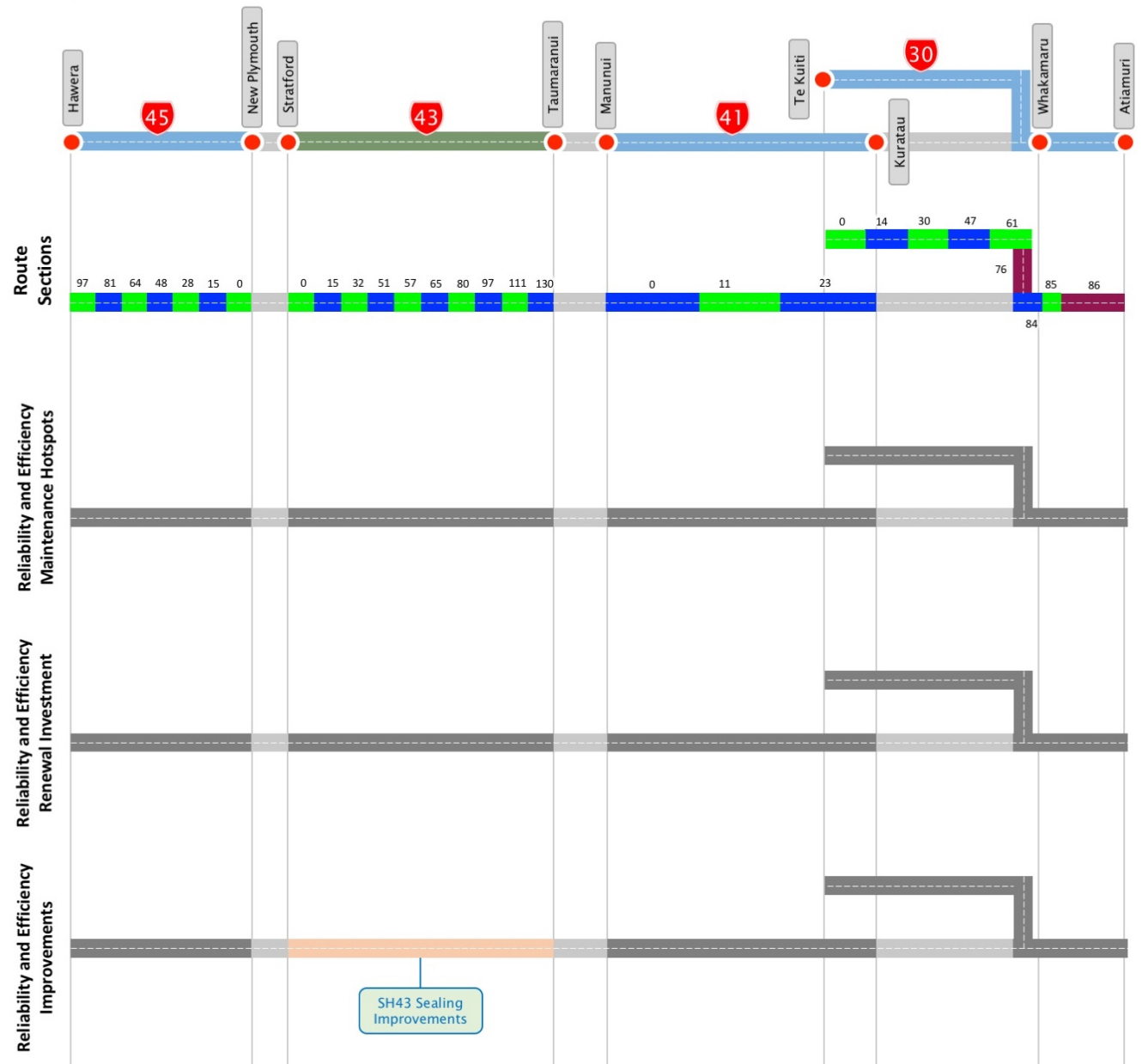
Draft Regional Programme considered for SHIP

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
SH43 Sealing Improvements		Sealing improvements along SH43, including sealing the 12km unsealed section through the Tangarakau Gorge.

Figure 26 – Reliability and efficiency investment



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 hot spots

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

- **Tangarakau Gorge:** The SH43 narrow 12km unsealed section north of Moki Road can be slippery and has a high personal safety risk.

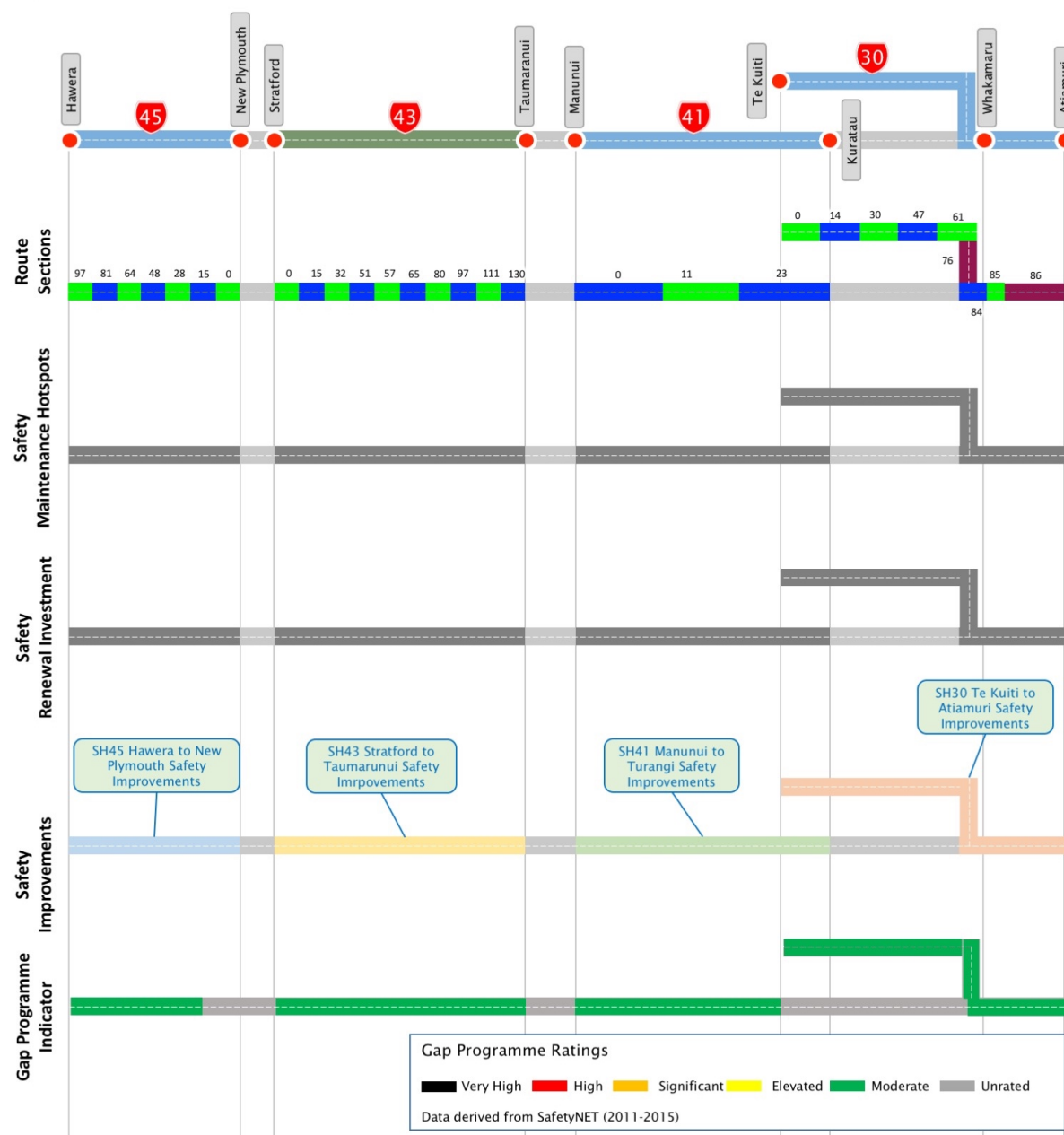
Gap programme indicators

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.

There are four sections along the corridor with a moderate potential for reducing fatal and serious injuries which would benefit from targeted low cost, high coverage, improvements.

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

Figure 27 – Safety investment



Renewals

There are no safety related renewals planned for the corridor.



Forgotten World Highway (SH43)

Improvements

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
SH30 Te Kuiti to Atiamuri Safety Improvements		Safety improvements on SH30 from Te Kuiti to Atiamuri as identified in the NSRRP Review.
SH41 Manunui to Turangi Safety Improvements		Safety improvements on SH41 from Manunui to Turangi as identified in the NSRRP Review.
SH45 Hawera to New Plymouth Safety Improvements		Safety Maintenance improvements which may include: ATP, seal widening on curves, some barrier at high risk locations.
SH43 Stratford to Taumarunui Safety Improvements		Safety Maintenance improvements which may include: seal widening, some barrier at high risk locations, enhanced delineation.

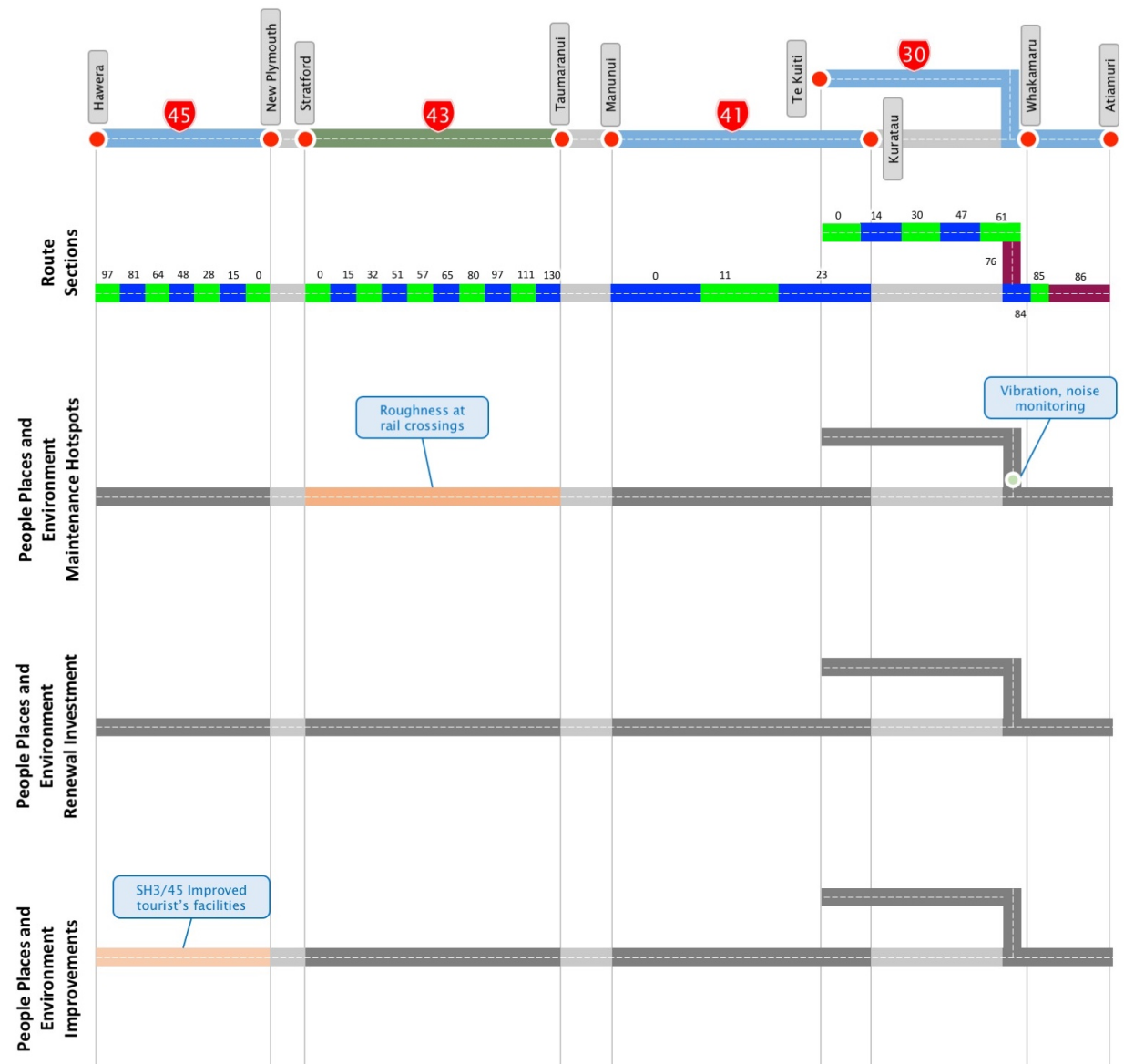
Investing in people, places and environment

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 hot spots

- **Vibration and Noise:** Due to the unique geology of the area leading to a higher than normal level of complaints, vibration and noise monitoring is undertaken at Whakamaru SH30/76
- **Rail Crossings:** There are issues with maintenance of rail crossings along SH43 causing roughness. While no longer an operational line for KiwiRail, the crossings are still required to be maintained to the required standard.

Figure 28 – People, places and environment investment



Renewals

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



SH43 Awahou stream culvert

Improvements

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 6- Draft regional programme considered for SHIP

Project	Funding Status	Description
SH3/45 Improved tourist's facilities		"Potential REDS activity to facilitate regional tourism around the coast, and Mt Taranaki Improved tourist facilities e.g. stopping facilities, signage and marking, view points, visitor centres/information management, variable messaging signs There is an opportunity to support economic growth in regional New Zealand through the provision of better access to tourist destinations. "

Investment pressures

Access and resilience

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

- **New Plymouth urban area:** There are AC issues in the New Plymouth urban area, SH45/0, with much of this section a divided carriageway, and supporting traffic volumes higher than what the classification would suggest.
- **Changes in land use:** Farm conversion to lifestyle residential areas, forestry to dairy and intensification of rural areas are leading to the increased pressure to access the corridor.
- **Tourism:** Increasing tourist activity and awareness of recreational areas is creating increasing demand for parking and access to recreational sites.
- **Geology:** Land subsidence has created an undulating ride between Manunui and the Waituhi Saddle (SH41). The land is continuing to move resulting in an on-going and increasing maintenance concern.
- **Suitability of roading materials:** The pumice subgrade that the northern parts of the corridor (SH30) are built on, along with a high-water table in some areas results in increased pavement rutting issues. This leaves the pavement vulnerable to the periodic loadings from heavy forestry vehicle movements.

Reliability and efficiency

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

- **Topography:** The winding and rolling geography and resulting poor alignment on the Waituhi Saddle (SH41) Forgotten World Highway (SH43) and between/ just beyond Puketutu and Kopaki (SH30) results in unreliable travel times and overall poor journey experience.

Safety

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

- **Speed through small townships** is a concern for local residents, with Bennydale being particularly vocal in lobbying for a change in speed limit.
- **Lack of barrier protection:** Several bridges have limited or no barrier protection that can safely redirect errant vehicles. There are also gullies and stream crossings on SH45 result in a 2-star KiwiRAP rating throughout, placing pressure to install more barriers.

People, places and environment

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

- **Weather:** Increasing frequency and severity of weather events is accelerating flood frequency and intensity, and erosion and slope degradation within and alongside the corridor, particularly SH30 between Whakamaru and Atiamuri. The management of these risks are likely to require greater engineering control.
- **Stormwater management:** Harvesting of forests and conversion to pasture land means water is no longer being held within forest lands and resulting in increased flooding on the corridor. This is exacerbated by under capacity culverts, shallow swales and silting of the stormwater system.

Investment future considerations

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

- **Integrated landuse and transport planning:** As land use intensifies (including recreational activity) and more accesses are requested or become more heavily trafficked, planning and foresight is needed so the appropriate site and form of access is provided for immediate and potential future use.
- **Monitoring high risk areas:** Mitigating slope on a priority basis by actively monitoring prone areas and investigating preventive maintenance options. Climate change with projections of increased severity of storm events and rainfall will impact future maintenance and risk assessment around slips and rock fall along the corridor.
- **Speed management:** Consideration of the safe and appropriate speed for each part of the corridor given its level of risk to road users and level of importance in accordance with the Speed Management Guide framework.
- **Provision for cyclists:** Consideration must be made for the safety of cyclists by providing an appropriate and consistent shoulder width, particularly in areas frequently used by cyclists and tourist cyclists accessing the corridor.
- **Improved relationships:** Acknowledgement of iwi/ mana whenua relationships is increasing along with their input to the management of heritage assets and landscapes. Effective relationships between iwi and associated councils to work together and maximise access to cultural and heritage places to support economic and social growth.
- **Due to the low volumes** of vehicles on this corridor, no exceptional increases in the maintenance requirement is expected on this corridor.

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
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

Section	Infographic	Information Source	Date
	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 compiled 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		

Section	Infographic	Information Source	Date
	Improvements	Network Manager and Regional Staff NZTA Projects web page: https://www.nzta.govt.nz/projects/ Submitted Regional SHIP programmes	



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