

Northland Primary Collectors

CORRIDOR MANAGEMENT PLAN

12 14 15

2018-2028

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Executive summary

The Northland Primary Collectors corridor is comprised of SH12, SH14 and SH15 to the west of Whangarei, in an area of Northland known as the mid north. SH12 connects the Hokianga and west coast communities such as Omapere. Dargaville and Maungaturoto to SH1 at Brynderwyn to the south, and Ohaeawai to the north. It forms part of the Twin Coast Discovery Highway, coined in 1999, and nominated as New Zealand’s first official tourist route. SH14 provides the most direct connection between Dargaville and Whangarei, providing the most efficient access between the two largest tertiary hospital facilities in Northland. SH15, known as the *Inland Freight Route*, was declared State Highway in 2106 connecting forestry areas in the north to Northport in the south.

The corridor is approximately 271 km long (2.4% of the state highway network). The total value of assets along the corridor is \$348M (1.5% of the total national asset value).

The corridor is a critical transport link for communities on the west coast of the Northland region. The corridor plays a vital role in enabling the economy of the Northland region, including tourism, agricultural, horticulture and logging industries. It provides critical links to Whangarei, Auckland, and the rest of New Zealand. SH15 is primarily a logging route linking far north forestry areas with Northport at Marsden Point for export.

Customers are generally tourists, locals and freight. Non-visitors and freight customers along this corridor tend to be well-informed, have an expectation of continuous service, but accept that the quality of service may vary according to overall demand. Visitors can underestimate travel times and be unprepared for windy roads and one lane bridges.

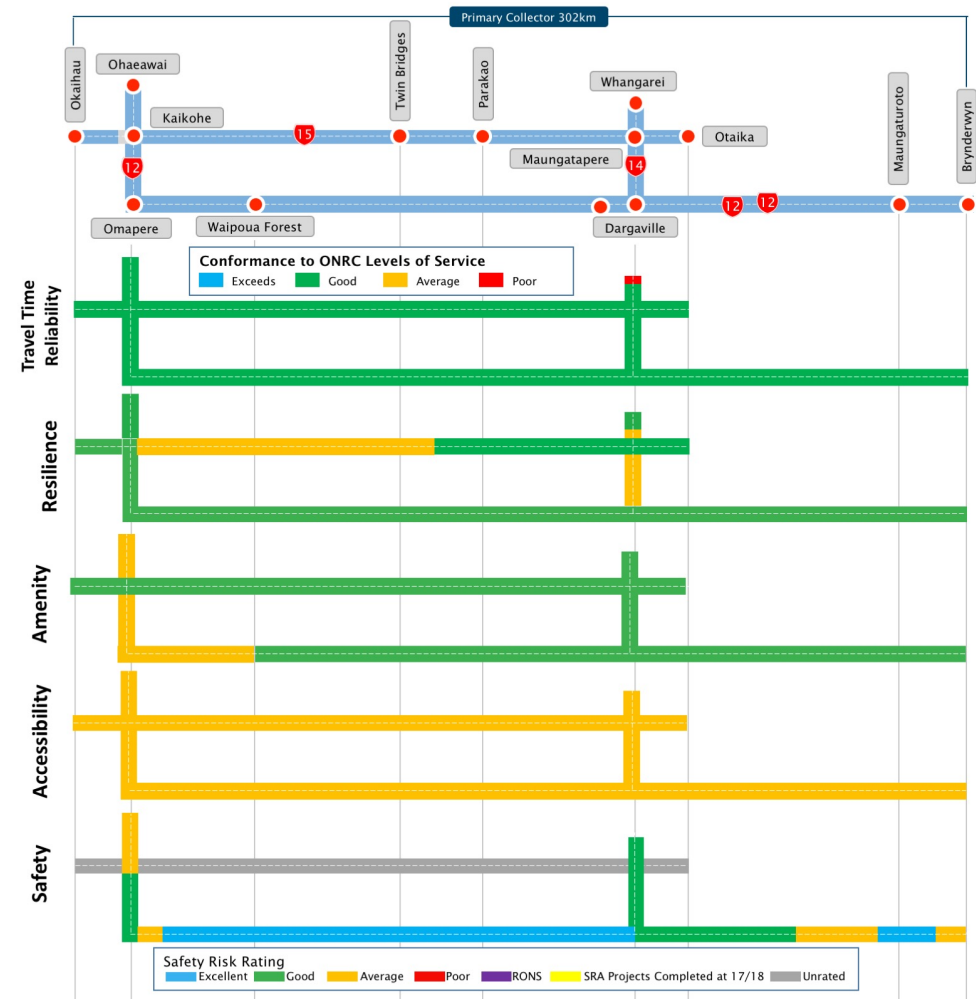
Tourism is increasing with the Twin Coast Discovery Route being successfully marketed. Tourism contributed an estimated \$128 million to regional GDP in 2013 and the corridor plays a key role in supporting tourism growth as part of the Twin Coast discovery route. There are plans to develop and promote the route as part of a round-trip that incorporates the various visitor offerings and products on both coasts and up to Cape Rēinga.

Safety improvements are the key focus areas on SH15 to support ongoing economic growth and development in the region. There is increasing conflict between tourism and heavy traffic on SH12, and SH15 will require investment to bring it up to state highway standard.

Expected growth in activity at Northport and potential for economic development at Ngawha will rely on a resilient, safe, and efficient state highway network, with SH15 providing the most efficient connection between the far north and Northport, and markets further south.

As activity increases on the corridor, customer safety and travel reliability will continue to become more important. Up-to-date real-time information about the accessibility of the corridor will become more critical as customers choose when and what route to undertake for their journey.

Figure 1 - Performance of the corridor against ONRC outcomes



Tourist facilities along SH12 are important to ensure safe stopping places in areas of interest with appropriate facilities. The strategic placement of these facilities can also address fatigue issues for drivers, particularly those unfamiliar with the corridor.

Several improvements including replacement of one lane bridges at Matakoke and through the Waipoua Forest will improve safety and efficiency of the corridor.

Introduction

Purpose

What is the corridor management plan?

This Corridor Management Plan describes the customer service delivery story for the Northland Primary Collectors 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 view, 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.

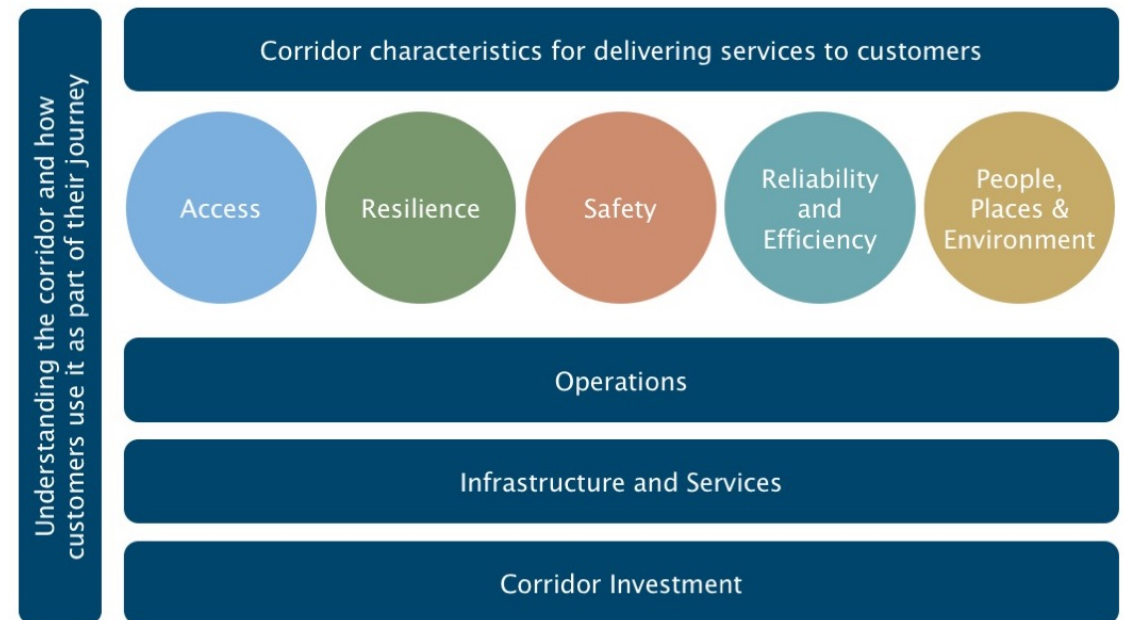
Planning is currently undertaken at the regional level, but typically significant journeys traverse more than one region. By considering the significant customer journeys and destinations, the corridor management plan is a vehicle to engage in regional and inter-regional conversations by focusing on 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 Northland Primary Collectors corridor is comprised of SH12, SH14 and SH15 to the west of Whangarei, in an area of Northland known as the mid north.

SH12 connects the Hokianga and west coast communities such as Omapere, Dargaville and Maungaturoto to SH1 at Brynderwyn to the south, and Ohaeawai to the north. It forms part of the Twin Coast Discovery Highway, coined in 1999, and nominated as New Zealand's first official tourist route. This 800km circular route starts and ends in Auckland, leading visitors around Northland and linking tourist destinations, freight destinations, and communities on both the east and west coast of Northland.

SH14 provides the most direct connection between Dargaville and Whangarei, providing the most efficient access between the two largest tertiary hospital facilities in Northland. SH15, known as the *Inland Freight Route*, was declared State Highway in 2106 connecting forestry areas in the north to Northport in the south.

The southern part of the corridor is a critical transport link for communities on the west coast of Northland. Noting the connections with SH1, the corridor plays a vital role in enabling the economy of Northland, including tourism, agricultural, horticulture and logging industries. It provides critical links to Whangarei, Auckland, and the rest of New Zealand.

The regional economy

Northland is a regional economy that has been underperforming relative to other New Zealand regions, and relative to its resource base. At the 2013 census it had a population of just over 150,000 people and is one of the most economically deprived areas of the country. While 20% of New Zealand's population is in the lowest quartile of the deprivation index, the equivalent measure for Northland is 39%.

The regional economy was impacted by the Global Financial Crisis through a significant drop in international tourism, and is vulnerable to significant climatic events - both severe storms and drought conditions. The Far North and Kaipara districts have similar economic structures, with a strong focus on primary production. Whangarei is the region's main urban and servicing centre with a higher concentration of manufacturing and service industries.

Northland's economy accounts for 2.5% of New Zealand's Gross Domestic Product (GDP). Nominal GDP in the region increased by 2.6% per annum on average over the past five years, compared to the national average of 4.1%. The unemployment rate in Northland is three percentage points above the national rate and nominal GDP per capita is 32% below the national average. These economic indicators are closely affected by the quality of the transport network, as the availability of safe and reliable transport drives the success of the economy. With almost all goods and services moved by road, the transport network (and the state highway network in particular) is a critical component of the region's economy. This importance is reflected in a number of the regional economic action plans with transport identified as a key enabler for improved economic performance in the area.

Figure 3 – Corridor overview



Understanding our customers

Key customers

The key customers who use the corridor are primarily local, tourists or heavy vehicle operators, with limited modal diversity on the corridor. 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. Whangarei is the largest city in Northland, and when coupled with the Port at Northport (Marsden Point), they generate the majority of economic activity. These locations therefore draw and generate a significant amount of traffic on this corridor, shown in Figure 4.

Daily commuter

Travelling by car is almost exclusively the mode of choice for commuters who travel along the SH14 section of the corridor to work in Whangarei, although a bus network is available within the city. Some may walk or cycle to local work places, and school buses operate along parts of the corridor, however these modes are limited.

Insights into daily commuter users:

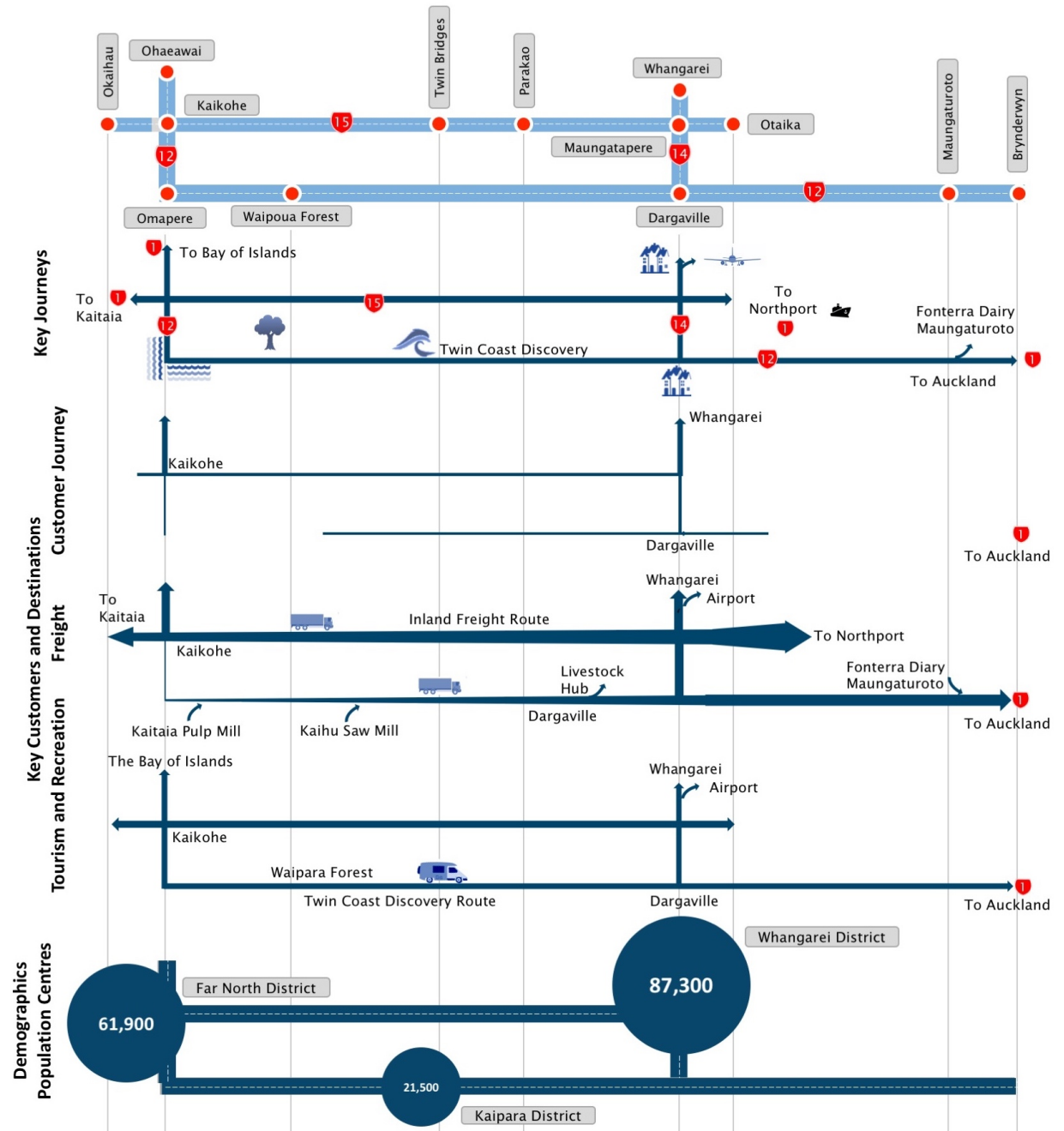
Road use: Commuters are using private vehicles and rely on the state highway when accessing employment.

Road knowledge: Commuters are familiar with the main routes into cities and towns. There are limited alternative routes however journey times are relatively predictable.

Pain points: The main commuter pain point is on approach to Whangarei via SH14. The intersection of SH1 and SH14 experiences congestion in the AM/PM Peak periods, which can impact SH14 at Whangarei Hospital.

Daily commuters expect: Predictable journeys at peak times, accurate and up to date information about traffic (peak and off peak), weather, road conditions and hazards. Commuters also experience increased interaction with heavy vehicles and high volumes of tourists during peak holiday periods, and as such would expect clear signage and information about any changes to the network.

Figure 4 - Key customers, journeys, and destinations



Tourist and recreational users

Tourism is the third largest sector of the Northland economy with 1.7 million guest nights in 2014. Northland has many significant tourism and natural attractions on this corridor including features along the Kauri Coast, and Cape Reinga.

SH12 forms part of the Twin Coast Discovery Highway connecting Auckland with Kaitaia via Dargaville. This is a key tourist route for visitors arriving into Auckland Airport and the port. There is a high tourism and recreational peak demand during the holiday peak periods, including motorcyclists on recreational trips. The off-road Twin Coast Cycle Trail between Opuia and Kohukohu is becoming increasingly popular during summer months.

Insights into tourist and recreational users are as follows:

Road use: There are a high number of recreational users on the route during weekend and public holidays as well as summer school holiday periods. Similarly, international visitors have a regular presence on the corridor, particularly along SH12 through the Waipoua Forest and in the Hokianga at Omapere.

Road knowledge: International and domestic visitors arriving by car will have travelled on New Zealand roads before entering the corridor, however perhaps not experienced narrow winding roads and single lane bridges. Many international visitors tend to be focused on the landscape and their destination and can be distracted. Travel times can be underestimated, with limited or no knowledge of where the road narrows or becomes winding, particularly through the Waipoua Forest and along SH15 where sight lines are constrained. Domestic recreational users are more familiar with the roads and anticipated travel times.

Pain points: Weekend and holiday traffic can be particularly busy around key tourist centres such as Opononi/ Omapere, Dargaville and Kaikohe and is most noticeable during summer months. Traffic often builds up through Waipoua forest during summer months, with increasing parking demand at Tane Mahuta and safety risks near local stopping places. Regular flooding and slips cause minor maintenance-related delays, particularly along SH12 near the coast.

Tourist and recreational users expect: Predictable and safe journeys, with clear distance and travel time information for key tourism routes and destinations, accurate and up to date information about traffic, weather, road conditions and hazards. Quality rest areas and locations to park near known vistas or tourist spots are also highly sought after by tourists and other road users.

“Safety and travel time reliability are valued more highly than travel time savings” Customer
Insights Investigations

Freight operator

The state highway network is a critical component of the economic performance of Northland. Almost all goods and services are transported by road-based freight. The main industries are forestry and dairy, particularly within the rural areas of the corridor. Many of these products require transportation to key transport hubs within Northland, or processing sites across the rest of the Upper North Island and beyond. A proportion of international and domestic freight is processed at Northport which lies to the east of the corridor.

Insights into freight operators are as follows:

Road use: SH12 is a key link for freight journeys from industry hubs in the region to Whangarei and Northport. SH14 also provides a direct link into local freight destinations in Whangarei. Additionally, the Inland Freight Route (SH15) provides access and resilience for freight journeys through the Northland region and is the preferred route for logging trucks access Northport. Some journeys are undertaken at night when traffic flows are lower, due to the time critical nature of the produce (agricultural/arboriculture). Forestry products can at times be time critical when required to meet agreed shipping times. If these are missed there can be large financial losses.

Road knowledge: Knowledge of the road is extremely high, with freight operators confident in understanding the corridor and managing difficult conditions. With the declaration of SH15, increased options are available for freight operators looking to traverse the region.

Pain points: The State Highway network is susceptible to unplanned closures resulting from weather events or crashes. Alternative heavy transport routes are limited along the corridor, and tend to be longer, affecting delivery times, and therefore business operations. The network of State Highways on the southern part of the corridor provides some resilience should unplanned incidences occur. There are no alternative routes in the event of incidence occurring on the northern peninsula of SH1 from Awanui to Cape Reinga.

There are occasional frustrations associated with conflict between heavy vehicles and tourist customers near tourism destinations, particularly along SH12 near the Waipoua Forest.

Freight operators expect: Freight operators expect the route to be available, with reliable travel times. They also value accurate and up to date information about traffic, weather, road conditions, and hazards. Quality rest areas and adequate parking for large vehicles in town centres or other locations near facilities are also valued.

“We want to know the road is open and the travel time predictable”...

Northland freight user group

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 councils along the corridor shown in Figure 5. It should be noted that the Northland Regional Council spans the entire corridor.

Collaboration along the corridor

The Transport Agency is collaborating with the associated local authorities and Northland Inc. to revitalise the Twin Coast Discovery Scenic Route, of which a significant portion of the Whangarei to Kaitiāia corridor is a part of.

Northern transport alliance

The three Northland District Councils - Kaipara, Whangarei and Far North, as well as the Northland Regional Council and the Transport Agency, formed the Northland Transportation Alliance (NTA) on 1 July 2016.

The aim of the alliance is to empower a One Network approach and make State Highways, regional, and local roads more resilient, more connected and safer for the communities of Northland as they get to work, school and play.

Traffic Operation Centres (TOC)

Traffic Operation Centres are the 'conduit' services in place nationwide to communicate activities/events 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 entire corridor.

Figure 5 - Map of associated local authorities



Network Outcomes Contracts approach

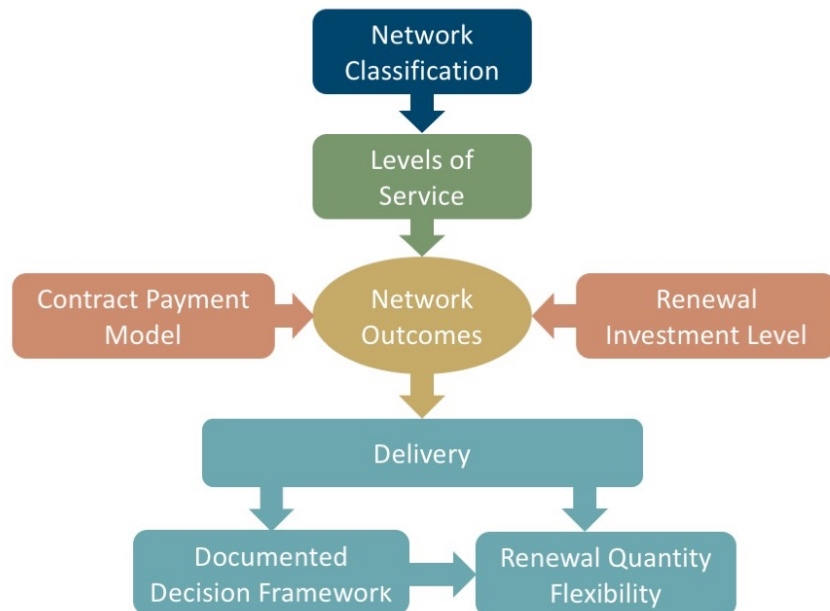
Network Outcome Contracts (NOC) are aimed at improving the effectiveness of service delivery for maintenance and operations of the state highway network. Elements of previous procurement methodologies (PSMC, Hybrid and Traditional models) have been integrated into the NOC contract model which delivers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

The contract process for the Network Outcomes Contracts is shown below:

Figure 6 - NOC process



Collaborative delivery of services

This corridor is within the Northland NOC contract area, which extends from Warkworth to Cape Reinga.

Northland Network Outcomes Contract

The Northland NOC contract is undertaken by Fulton Hogan. The contract was awarded in July 2015 for a 7-year period, with the option for a further 2 years based on performance.

This contract is supported by the following specialist maintenance contracts:

- **Traffic signal maintenance Northland** – Curry Electrical through the Whangarei District Council contract was awarded in 2015 and has a 3+1+1 contract term.
- **Traffic monitoring sites** – Agfirst was awarded this contract in July 2016 with a 3+2+2 contract term.
- **Regional bridge and structures**: Opus was awarded this contract in 2015 for a 3+1+1 term.
- **Electrical supply** – Genesis and Meridian are the two suppliers of electricity for the NZ Transport Agency along the route.

Drivers for change

The Northland Primary Collectors corridor caters for variable levels and types of customers and this demand is expected to grow into the future. The drivers for change associated with the corridor are briefly described below.

Whangarei urban area development

Whangarei District Council (WDC) is currently undertaking a review of the city-wide transport strategy that will identify the transport needs for the next 30 years, together with the priorities for implementation. WDC is undertaking this review through a business case approach and the NZ Transport Agency is involved in the development of this strategy. Population growth is occurring outside of the city centre and the strategy is exploring ways of meeting the needs of this growth.

With 300% forecast growth at NorthPort over the next 25 years, increasing pressure will be placed on the corridor to service this growth. Improvements to the corridor, particularly SH15 will be required to meet this demand safely and efficiently.

Ngawha development

Economic activity in Ngawha, just east of Kaikohe on SH12, is expected to result in increased traffic volumes in the corridor. Top Energy plan to expand the existing power station, which in turn will enable the development of a potential new saw mill. In addition, the inmate capacity of the Ngawha Prison is being increased, with a corresponding increase in staff and visitors accessing the facility.

Key journeys

Twin coast discovery highway

The Twin Coast Discovery Highway is a circular route that starts and ends in Auckland, leading visitors around Northland. This route offers a variety of tourist attractions as well as coastal and forest views, and is therefore a popular choice for international and domestic tourists in New Zealand. With increasing promotion of this route tourism activity is expected to continue to grow on this corridor. A corridor study underway in 2017 will investigate how this section of the corridor can be made safer and more reliable as well as provide better accessibility for tourists, local communities and freight.

Trips typically originate in Auckland or Whangarei and are either coach tours or self-driving tours. There are also a significant number of trips associated with the cruise ships that arrive in the Bay of Islands and Auckland, with visitors on these cruise ships completing coach-led day tours through Northland. As the cruise ship industry increases, it is expected there will be more coach-led day trips within Northland.

Northport/Whangarei to the Far North via Kaikohe

Northport is located just south of Whangarei at Marsden Point, and generates high volumes of freight movements throughout Northland. The Far North is a tourism and freight generator for the dairy and forestry industries, and includes local towns such as Kaitiaki and Kaikohe. As a result, there is considerable movement of goods, services, and people between Northport/Whangarei and the Far North. SH12 and SH15 provide alternative routes to SH10 and SH1 for north-south journeys within Northland. Heavy vehicle journeys on these routes are a significant proportion of overall traffic and rely on the availability of the routes now and into the future. With significant growth expected at Northport, there will be a corresponding growth in the flow of goods and services within the Northland Region.

Northland regional growth programme

The Tai Tokerau Northland Economic Action Plan (NEAP) is an all of government economic development plan released in February 2016 to guide a series of projects and initiatives aimed at stimulating and transforming the Northland region's economy. The NEAP collates these projects into four common work streams, being:

1. **Enablers:** bringing Northland's transport, digital infrastructure, skills and capabilities, and water resources to a standard that creates an enabling environment for economic development in Northland
2. **Land & Water:** To identify and develop opportunities for more productive use of land and water resources across a range of primary industry sectors
3. **Visitor Industry:** to reduce the impact of seasonality, improve product dispersal across the region and enhance tourism promotion
4. **Specialised Manufacturing & Services:** to support the development of new innovation and specialised manufacturing and service sectors.

The need to improve logistics and transport infrastructure is a key work area within the Enablers stream. The latest NZ social deprivation index shows that Northland is one of the most socially deprived areas in New Zealand and this impacts on the transport environment as well, with an older fleet and poor driver choices such as a higher proportion of alcohol related accidents and driver licensing challenges (large number of unlicensed drivers).

Improved transport will not only support increased economic prosperity of Northland, but also enhance the socio-economic characteristics of the region.

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.

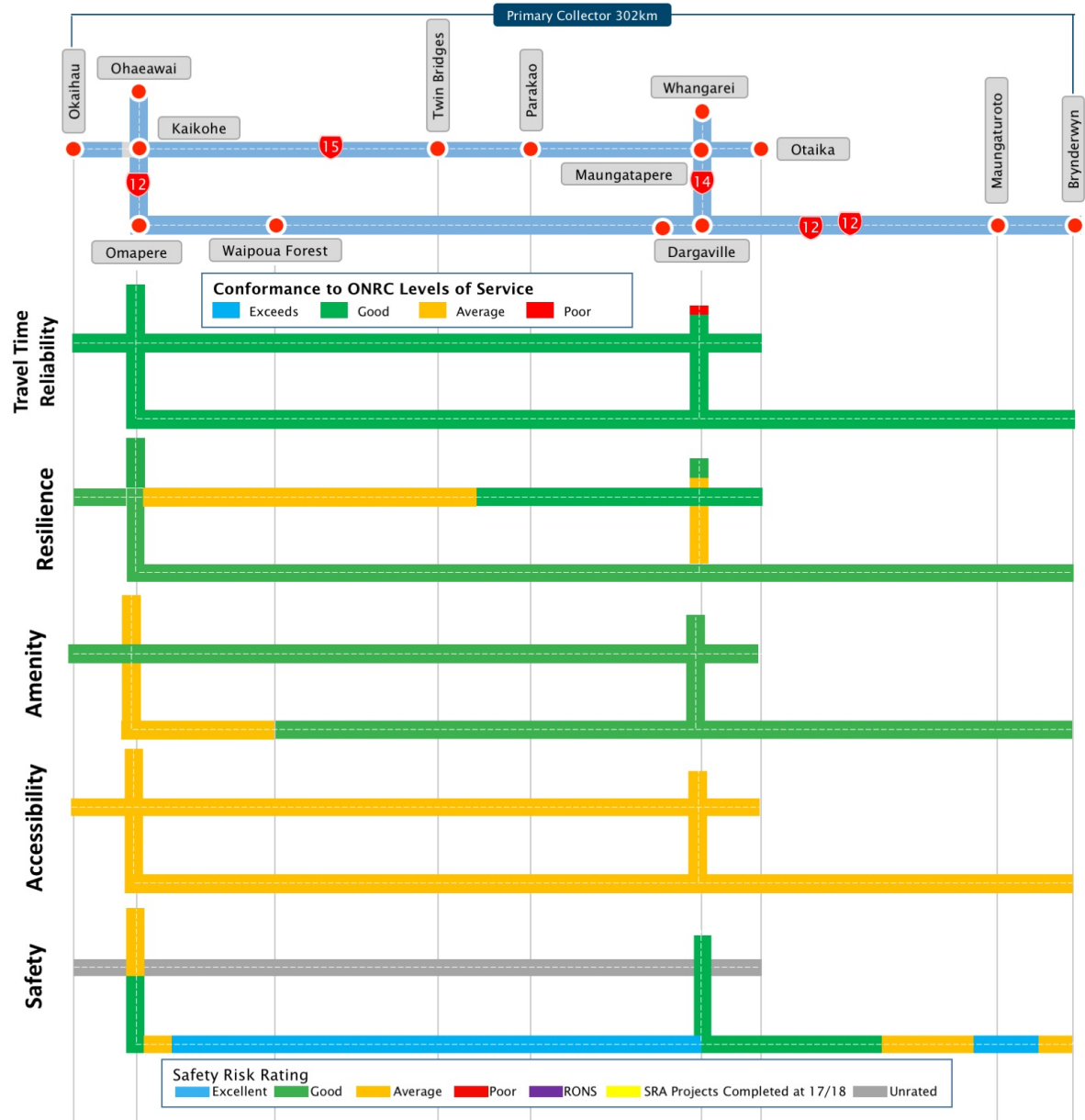
Road classification

The corridor is a collection of state highways classified as Primary Collectors, serving as the key route for regionally and locally significant destinations. The corridor also forms part of the scenic Twin Coast Discovery Highway, and provides alternative connections to this route.

Levels of service performance has been determined by workshop participants in the development of this corridor plan. It is not based upon consolidated evidence from the ONRC technical measures. This section of the plan provides additional context to explain the current levels of service along the corridor based on the road classification.

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 Northland Primary Collector corridor is performing against the ONRC Levels of Service, as they relate to the primary collector classification.

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

Travel time reliability is generally acceptable across the corridor. Some localised congestion is experienced during the peak holiday period particularly around settlements such as Kaikohe, Opononi, and Omapere. Congestion is also experienced on approach to Whangarei on SH14, causing reduced reliability during weekday peak times.

Resilience

Sections of SH15 north of Twin Rivers have a high resilience risk, with long detours and occasionally no alternative routes during closures. Most closures are due to frequent flooding which can also increase the risk of under slips affecting sections of the corridor. Resilience is also reduced due to limited alternative routes suitable for heavy vehicles on sections of the corridor.

The corridor is ranked low in priority as part of the State Highway Network Resilience National Programme Business Case. However, the Tai Tokerau Northland Economic Action Plan and Northland economic indicators point to the need for increased investment in road infrastructure to support economic growth. This need for increased investment is also

supported by growth forecasts for Northport which will increase heavy vehicle volumes on the corridor, particularly SH15.

Amenity

In general, the corridor provides a moderate level of ride quality, where the roughness of the road is generally in line with what would be expected of a Primary Collector route. The exception is SH12 between Kaikohe and Waipoua Forest.

The roadside environment, public amenities and aesthetics, particularly on SH12 are considered adequate for the low volumes using the route. SH14, and SH15 between SH14 and Loop Road carry a higher volume of heavy vehicles to Whangarei and Northport which might influence the priority for roughness improvements.

Accessibility

Accessibility to the network is consistent with that of a Primary Collector with access generally permitted to properties with some restrictions. Intersections with other state highways are considered adequate, except for the intersection of SH1 and SH12 at Ohaeawai where the priority of each State Highway and directional signage is unclear.

The corridor is currently not available for HPMV access, with a 50MAX vehicle restriction in place throughout the corridor. This excludes SH15, which was not classified at the time this plan was prepared.

Safety

Most the corridor has a KiwiRAP rating of between 2 and 3 stars. Sections of SH12 through the Waipoua Forest and Hokianga have been rated 2 stars and are under-performing when compared to the 3-star rating desired for Primary Collector routes.

The corridor is characteristic of unforgiving road conditions. This includes poor sightlines and geometric constraints. The 2 and 3-star KiwiRAP ratings denote major deficiencies in the road features.

There are also socio-economic factors affecting safety outcomes in the area where education and behaviour change interventions are required.

Improving the customer experience

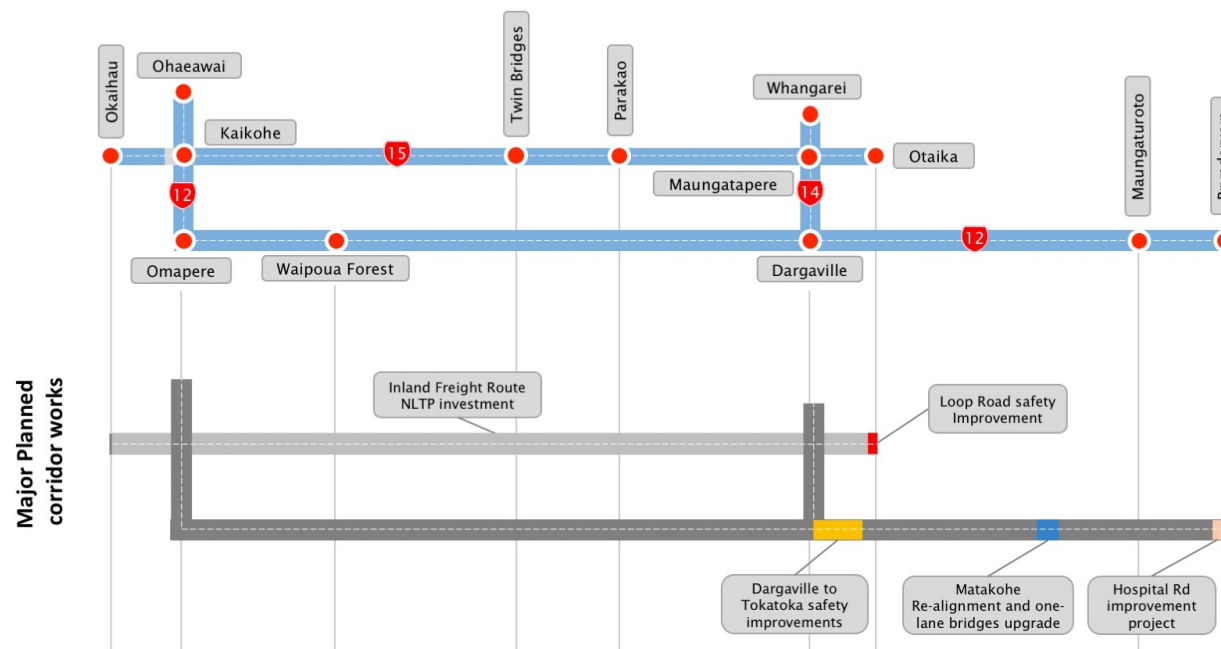
In responding to Customer Levels of Service it is important to acknowledge that some improvements to the corridor are planned or underway. Figure 8 shows the planned improvements in the corridor.

When completed, the current and planned improvements on the corridor will result in removal of one way bridges on SH12 at Matakohe. Investment in the Inland Freight Route (SH15) involves the continued improvement and maintenance of SH15 to appropriate State Highway standards, including the Loop Road improvements.

Safety improvements at key interchanges and towns have also been identified as potential future projects to create a safer network for all users. A current planned improvement is SH12 Dargaville Pedestrian Improvements to install kerb build-outs and pram crossings in four locations, widen footpaths, etc.

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

Figure 8 – Significant corridor planned improvements



SH15, from Mangakahia Road to Maungatapere is now part of a broader Northland network of state highways

Access

Carriageway configuration

The carriageway is reasonably consistent throughout the corridor and generally consists of two lanes with minimal passing lanes. One lane bridges can also be found on sections of the corridor as shown in Figure 9, particularly on SH15.

Speed limits

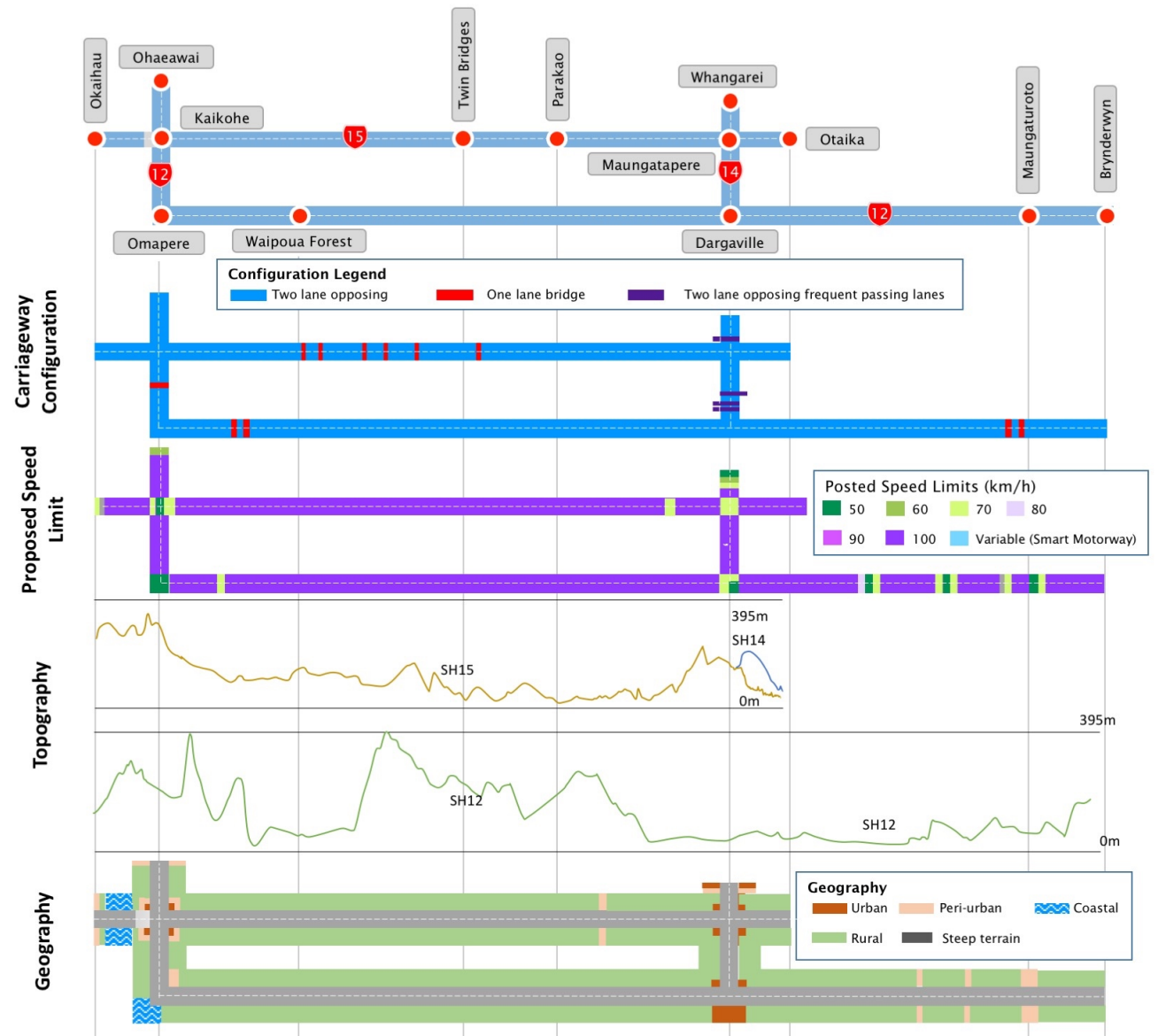
The corridor generally has posted speed limits of 100 km/h lowering gradually to 50km/h on approaches to settlements such as Kaikohe, Maungatapere, Dargaville, Matakohe, Maungaturoto and into Whangarei. At some of the smaller settlements, where traffic volumes are relatively low, the speed limit is only reduced to 70 km/h.

Topography/geography

The corridor section north of Awanui is relatively flat as it approaches the top of the North Island at Cape Reinga. Other parts of the corridor are undulating and occasionally steep particularly through the Waipoua Forest area, where SH12 becomes very rugged as it navigates the west coast. SH15 is located over higher ground at Kaikohe at the northern part of the corridor and gradually descends towards its junction with SH14 at Maungatapere, and then onto SH1 at Otaika.

The corridor is generally rural in nature with rural towns spread along the corridor. Larger urban settlements include Kaikohe, Dargaville and Whangarei.

Figure 9 - Corridor characteristics

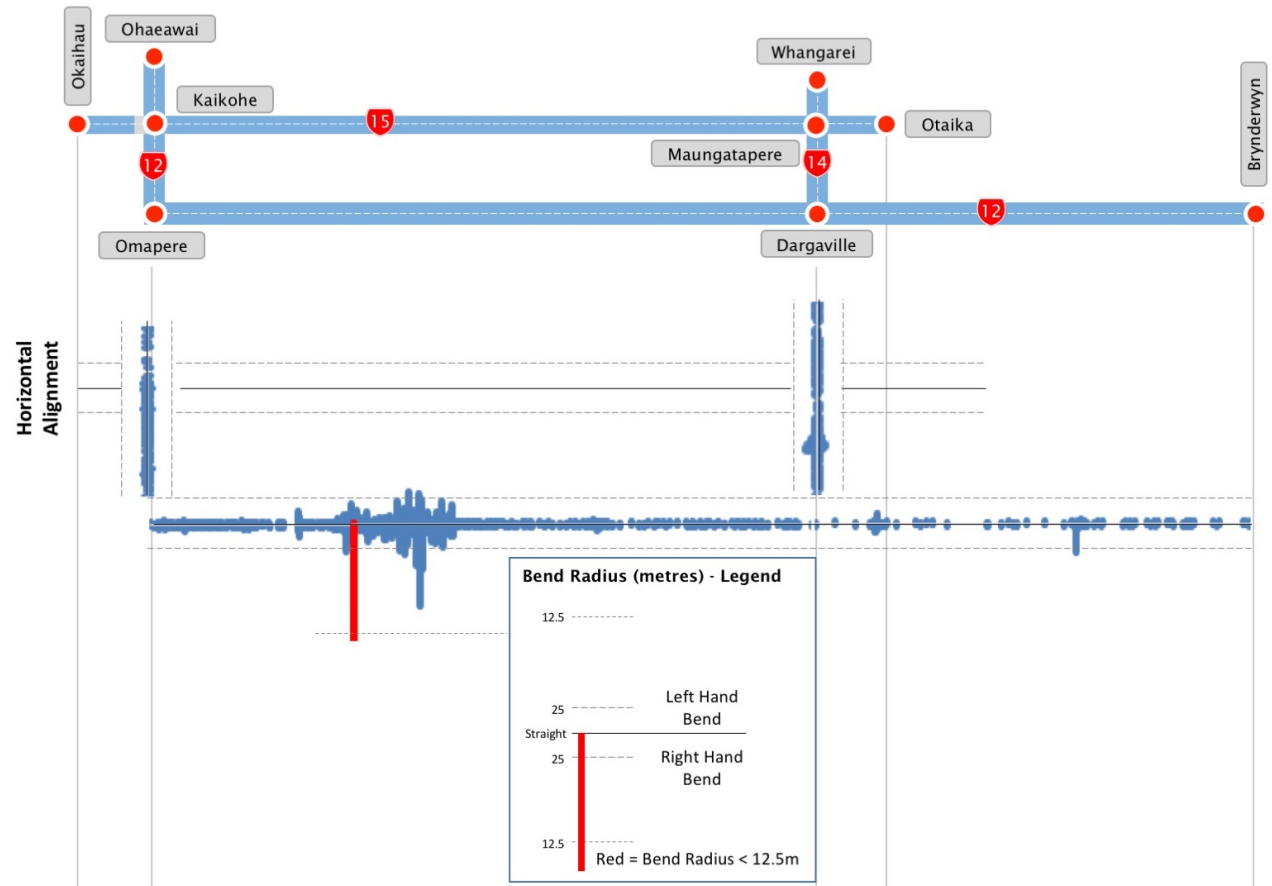


Horizontal alignment

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 section of corridor through Waipoua forest contains a number of tight curves with a radius under 25m, including one severe bend with a radius below 12.5m.

Figure 10 - Horizontal Alignment



Volumes

Traffic volumes are low across most the corridor. There are increases in traffic on SH14 on approaches to Whangarei, and small increases through Kaikohe and Dargaville associated with local traffic.

Roads with the highest percentage of heavy vehicles are SH15 near Otaika, at 20-25%, SH14 north of Dargaville at 14%, SH15 near Twin Bridges at 15%, and SH12 approaching Dargaville from the west at 16%. This indicates the region is highly dependent on a reliable state highway network that is suitable for road freight operations.

With the declaration of SH15 and promotion of this as the Inland Freight Route, it is likely that heavy vehicle numbers will increase substantially on this part of the corridor.

HPMV routes

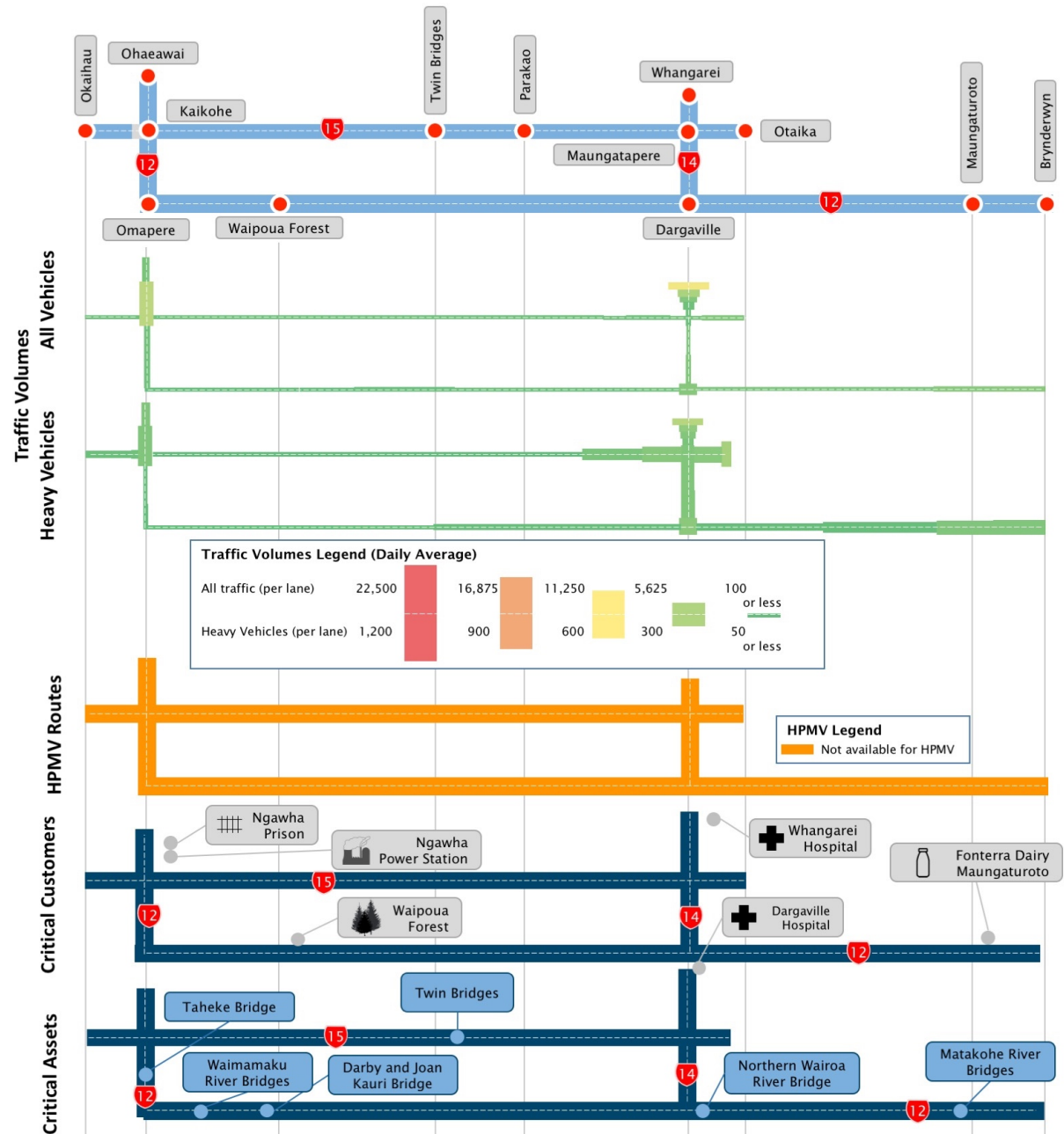
The corridor is currently not available for HPMV access, with a 50MAX vehicle restriction in place throughout the corridor. This excludes SH15, which has not yet been classified.

Critical customers and assets

There are a number of critical customers adjacent or close to the corridor who rely on the corridor being available at all times and are vulnerable to having short term interruptions. These customers include hospitals in Dargaville and Whangarei and the Kauri Fonterra milk processing plant. While the Kauri Fonterra plant isn't on this corridor, raw milk is collected along the corridor.

Critical assets present potential vulnerabilities to resilience and accessibility of the corridor if these assets fail. There are several infrastructure assets considered critical, including bridges, and retaining walls along rugged sections of SH12. The resilience and accessibility of the corridor will be improved with the planned replacement of six one lane bridges within the corridor.

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:

- **Unplanned closures:** Flooding and slips continue to make the corridor susceptible to large weather events which can limit access to the western communities of Northland. This is particularly evident on SH12 on the coastal and riverine sections where flooding and under slips degrade the road condition and can cause substantial delays.
- **Seasonal traffic congestion:** Delays can occur during holiday periods, particularly in summer. This is of concern around rural towns, near Tane Mahuta, and where there are single lane bridges.
- **Frequency and quality of maintenance:** Geological conditions and flood risk along the corridor generate an increasing maintenance burden resulting in more road closures along most sections of the corridor. There are also constraints on the availability of appropriate materials for maintenance. The long distances and travel times for acquiring high quality and high performing materials, which are typically located in Auckland, place restrictions on the intervention options. This is most noticeable in the isolated and higher-risk areas of Northland, such as SH12 along the west coast and through the Waipoua Forest. Due to these limitations, more readily available sub-standard materials are often used reducing the longevity of maintenance treatments.
- **Increase in traffic on SH15:** The declaration of SH15 and promotion as the Inland Freight Route will see higher vehicle numbers on this section of the corridor, with a corresponding increase in access, safety, and resilience risks. There are one lane bridges impeding access, along with intersections and accesses that are unlikely to meet state highway standards.
- **HPMV restrictions on SH15:** These restrictions will need to be clarified for all heavy vehicles, to ensure safe use of this section of the corridor before further upgrades are implemented.
- **Development at Ngawha;** Along with expansion of the existing power station and an increase in inmate capacity at the prison, a new saw mill may be developed which would increase heavy vehicles on the corridor.

Future considerations

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

- **Higher quality maintenance treatments:** Maintaining and developing a quality asset with greater resilience, longer life and lower maintenance improves the accessibility of the corridor by keeping it open for longer.
- **Improvements to SH15:** With increases in traffic using SH15, there is a significant task to upgrade the corridor to a standard fitting its classification, which is likely to include improvements to intersections and single lane bridges, and a review of accesses.
- **Maintain strong stakeholder relationships:** By maintaining strong relationships with key stakeholders such as councils and the freight industry will provide early indications of potential development, such as that around Ngawha, enabling a collaborative and proactive response.



SH12 through the Waipoua Forest slip

Resilience

The corridor plays a key role in connecting the western communities of Northland to Whangarei, and south to Auckland and the rest of the Upper North Island.

Limited alternative routes are available via the state highway network. Shorter alternatives are available via more local roads, but these may be through narrow and winding terrain, and not suitable for heavy vehicles.

Vulnerabilities

The route is susceptible to flooding for a significant proportion of its length particularly along the coastline sections of SH12, SH14, and SH15. It is not uncommon for unplanned events to close the road for several days, particularly as the resulting failures can be large in scale and constrained by local terrain.

Sections of the corridor are also susceptible to slips and rock falls. Whilst these risks are intermittent, incidents tend to occur through the northern sections of SH12 and SH14. In particular, SH12 at Kaihu (north of Dargaville) continues to be a vulnerable section of road, at risk of under slip from river scour.

Alternative routes and diversion lengths

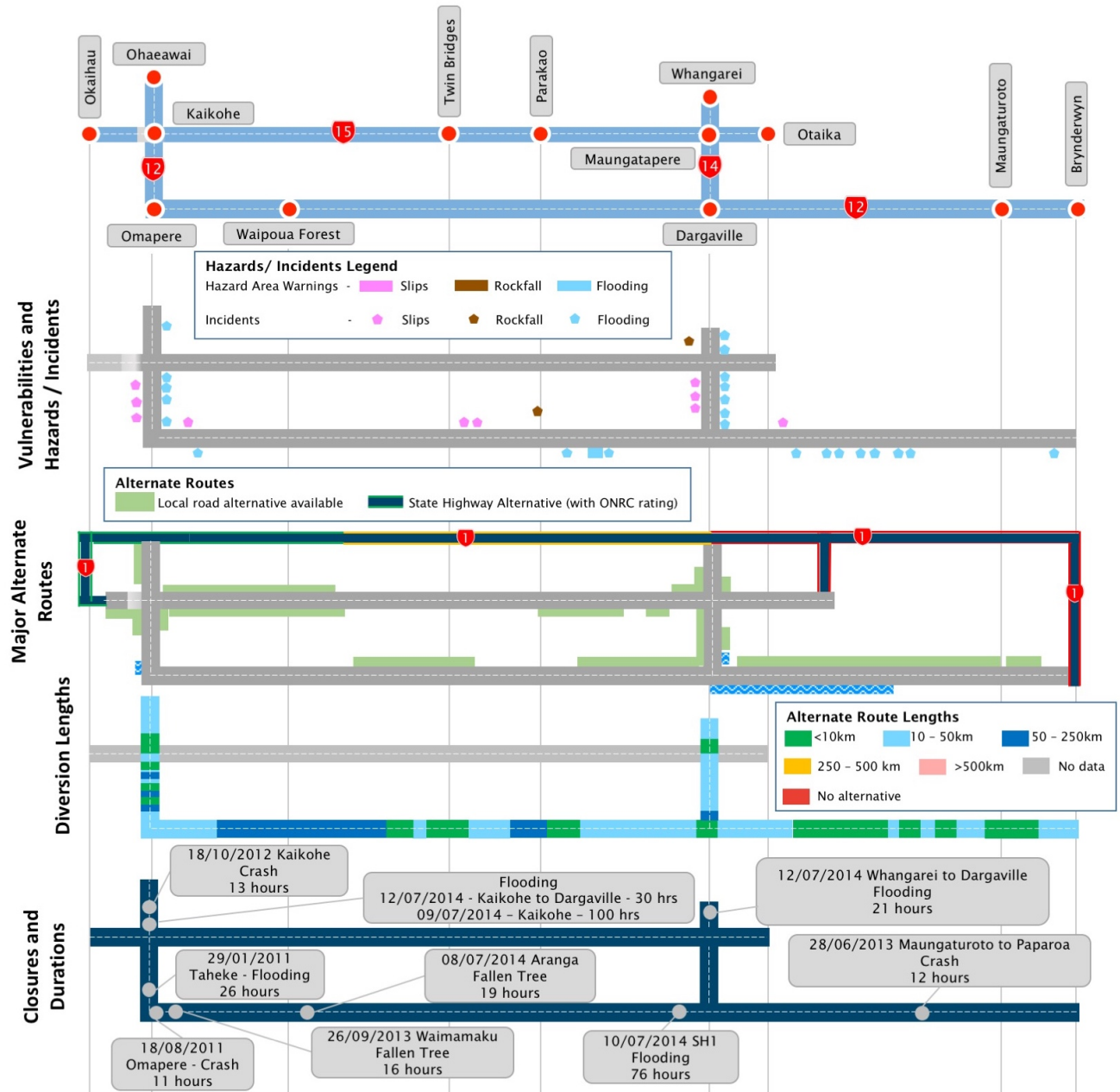
The majority of the corridor is served by alternative routes along smaller collector roads, with detours of under 50km. A number of these routes are via local roads and may not be suitable for all heavy vehicles which are generally required to make much longer detours during closures.

The stretch of SH12 between Omapere and Dargaville has a diversion length greater than 50km in sections, which is the longest diversion route across the corridor.

Closures and duration

The most significant unplanned road closures (greater than 10 hours) along the corridor in the last 5 years are shown in Figure 12 Closures on the corridor range from a few hours to over 4 days with most being from flooding.

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:

- **Flooding, slips, and scour:** Instability along sections of the corridor continues to make it susceptible to large weather events which can further isolate communities. This is particularly evident on coastal sections of SH12 where flooding and under slips can cause road closures and substantial delays in areas where there are limited alternatives. There are also two locations on SH15 where the land is quite flat, and where the river levels rise during heavy rain events, resulting in flooding the state highway network. The heavy rain events tend to occur on an annual basis, and flooding occurs near Twin Bridges where the capacity of a nearby wetland/swamp is inadequate to cope with high water volumes.
- **Lack of or long alternative routes:** These are long, not intuitive, and are often reliant on the customer's own local knowledge. Most shorter local diversion routes are unsuitable for heavy vehicles. For time-critical and perishable goods (such as raw milk) delays can have significant impacts on business. Long delays can isolate communities. It is however acknowledged that there is no one section of the corridor that experiences significant delays more than another section.
- **Mobile phone coverage black spots:** Sections of the corridor, have no mobile phone coverage which impacts the ability for emergency services and maintenance response to unplanned incidents.

Future considerations

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

- **Improved monitoring:** Real time, or early warnings relating to weather events could improve response times, or enable proactive management to reduce impacts and increase the ability of the corridor to recover from closures or delays, such as those caused by slips and flooding. Such initiatives may include improved monitoring, communications and reporting techniques, and improved mobile phone coverage across the corridor.
- **Improved customer communication:** A network of linked ITS signs (or other technology) would allow information to be provided to customers in advance of decision making points. This would help to keep users informed, allowing them to make appropriate decisions, and thereby increase the safety for users and the resilience of the network.
- **More reliable infrastructure:** A resilient asset is one that is more likely to remain in operation when slips or floods occur, which importantly reduces the impact on customers during these events. This could involve measures such road widening to reduce the impact of flooding or slips when they occur, or the realignment of roads away from waterways causing vulnerability. For example, the areas around Kaikohe and Taheke (west of Kaikohe) are particularly vulnerable to flooded roads or slips, and raising the level of the road, improving drainage infrastructure, or widening the road could greatly improve the resilience of the asset, and therefore maintain accessibility for road users.

Reliability and efficiency

Efficiency

In general, the capacity of the corridor is adequate for the volume of traffic. Significantly reduced levels of service are experienced on the north-western sections of SH12 through the Waipoua Forest where geometry, sightlines, and road widths are limited. This is worsened during holiday periods as traffic volumes and parking demand at tourist destinations such as Tane Mahuta increase.

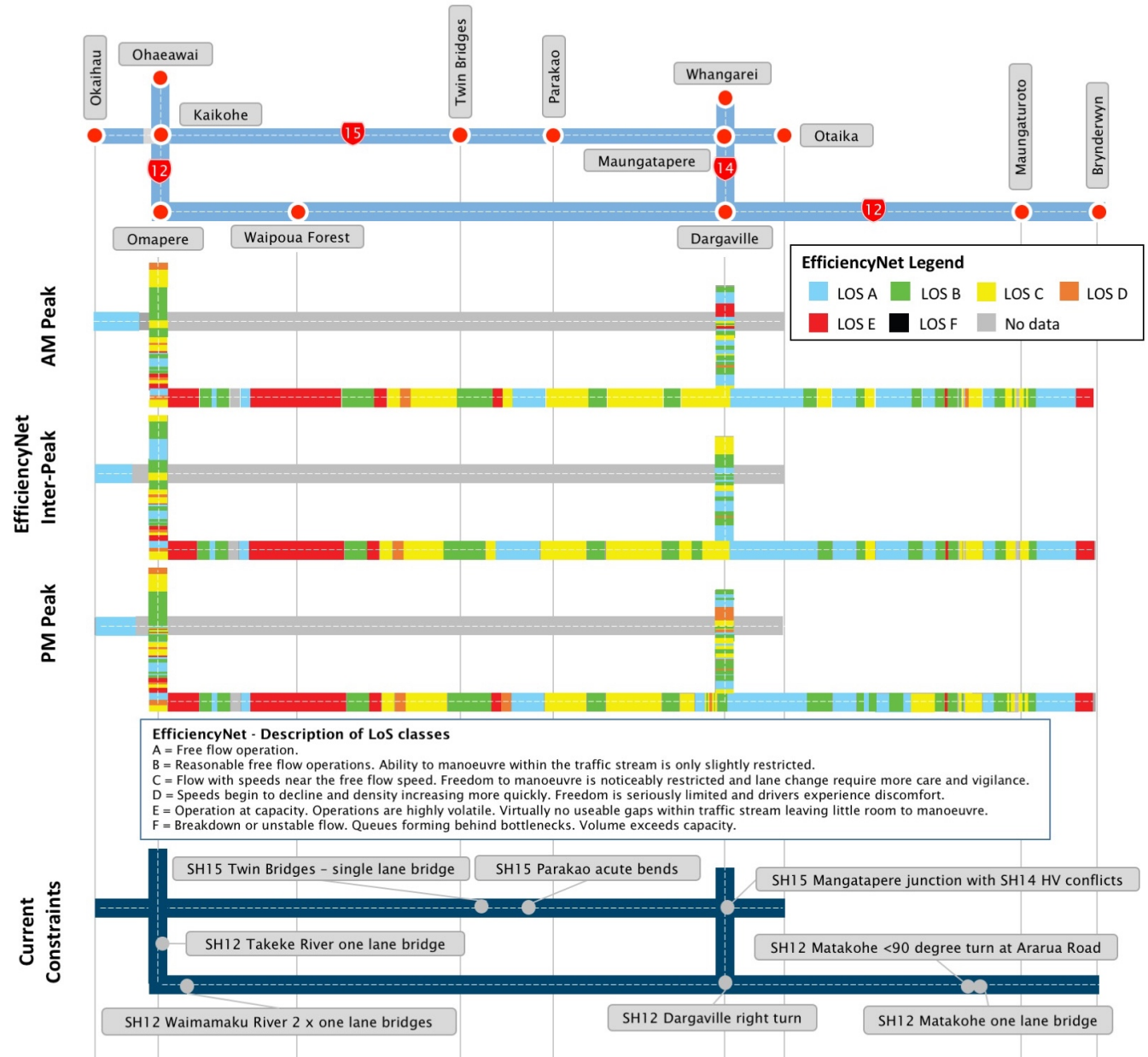
SH14 experiences lower levels of service between Maungatapere and Whangarei, possibly due to the intersection of SH14 and SH15, and peak period congestion on SH14 within the Whangarei urban area.

No data is available for SH15; however, it was observed that traffic flow through this section of the corridor was continuous, and likely to be at an acceptable level of service.

Current constraints

The major current constraints on the corridor affecting journey reliability and efficiency are shown in Figure 13. Many structures, sections of sub-standard road geometry, and intersection layouts have been identified as constraints.

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:

- **Low speed environments:** Parts of the state highway pass through rural towns with lower speed limits than the remainder of the corridor. This results in less reliable journey times for through traffic, particularly in combination with conflict between through and local traffic, which can compromise the efficiency of the corridor.
- **Seasonal traffic variations:** Demand on the corridor is seasonal with increased numbers of tourists visiting the area during the summer. This causes localised congestion and constraints throughout the corridor. This could be exacerbated through the Waipoua Forest as tourism traffic increases. Locals and heavy vehicle drivers need to be responsive to the presence of tourists during the summer season, however can be caught off guard.
- **Limited passing opportunities:** A lack of passing opportunities and the resulting platooning affect can cause slow speeds for customers caught behind a line of slower vehicles, particularly when a heavy vehicle is using the route.
- **Single lane bridges and substandard alignments:** With the declaration of SH15, an increase in traffic numbers (particularly heavy vehicles) is anticipated. The route is not to state highway standard in terms of carriageway width, etc. There are also several single lane bridges across the corridor that impede the flow of traffic.

Future considerations

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

- **Intersection improvements:** As the transport demand on the corridor increases and the opportunities introduced by the declaration of SH15 are realised, several key intersections will require upgrading to provide for safe and efficient movements. This includes intersections such as the SH12/SH14 intersection in Dargaville and SH14/SH15 at Maungatapere west of Whangarei.
- **Increase passing opportunities:** Additional passing lanes could be considered at locations where steep gradients are known to cause slow speeds, particularly for towing and heavy vehicles, or where high levels of turning traffic create delays. Passing lanes would be beneficial along SH12 through Waipoua Forest, however environmental constraints and adjacent conservation land make this challenging.
- **Improved customer communications:** Appropriate ITS systems allow information to be provided to customers well in advance of decision making points. This would help to keep users informed, allowing road users to make appropriate decisions and thereby increase the efficiency as well as the resilience of the corridor.

Safety

Collective risk

SH15 has a low collective risk along the entire corridor. The collective risk for both SH12 and SH14 is generally low or medium-low with the exception around Twin Bridges and Maungaturoto and Brynderwyn where it is at medium risk levels.

Personal risk

Personal risk for SH15 is also low for the corridor. SH12 between Kaikohe and Dargaville predominantly has a high personal risk rating for the whole route with the exception of a small section between Twin Bridges and Parakao which is rated medium and low between Omapere and Kaikohe.

From Dargaville to Brynderwyn the risk varies between low and high risk with the high-risk areas located on the approach to Maungaturoto, and between Maungaturoto and Brynderwyn. The SH14 corridor has a low rating from Whangarei to Tangiteroria and a medium rating from Tangiteroria to Dargaville.

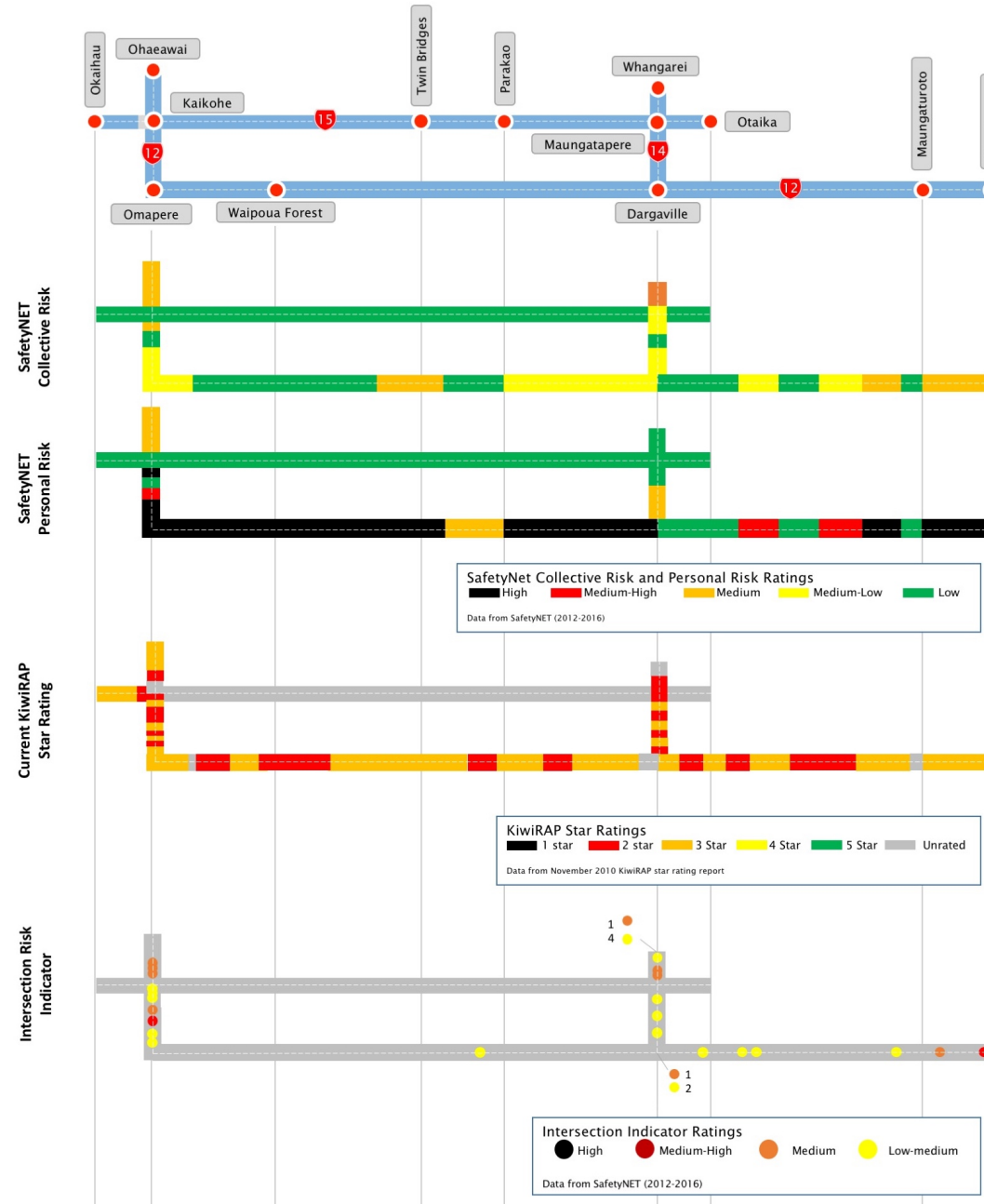
Star rating

Overall, the SH12 corridor achieves a 3-star rating interspersed with 2-star rated segments. SH14 varies between 2-star and 3-star ratings throughout the corridor and there is no data available on SH15 between Kaikohe and Otaika.

Intersection risk indicators

There are no high-risk intersections along this corridor. SH12 between Ohaeawai and Omapere has several intersections, ranging from low-medium to medium-high risk. SH14 also has intersections with risks varying from low-medium to medium risk ratings.

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:

- **Tourism traffic:** Influxes of tourist traffic, coupled with long driving distances and varying levels of driver experience leads to increased safety risks and incidents during summer months.
- **Roadside hazards:** Unforgiving roadsides are creating potential safety issues on sections of the corridor. This is being caused by a combination of topography and geometric constraints.
- **Poor sightlines:** Particularly through the forested areas of SH12, and along SH15 poor sight lines are increasing the safety risk.
- **Inappropriate speeds:** There are frequent truck rollovers on SH15 due to truck drivers exceeding safe speeds based on the quality and alignment of the corridor.

Future considerations

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

- **Further investigations to close knowledge gaps:** There is currently limited understanding of the reasons for poor KiwiRAP ratings on some sections of the corridor, and there is no data for SH15. Undertaking further investigations to develop a better understanding will enable an informed response to improving ratings.
- **Improve knowledge of SH15:** Investigations to increase the understanding of the likely hazards is required and may lead to a programme of upgrades to the route.
- **Reduction of roadside hazards:** Reduction on existing routes including the removal of deep drainage ditches alongside several State Highway locations within the corridor, would improve corridor safety and resilience.
- **Appropriately located stopping areas and facilities:** Appropriately located stopping areas with facilities for drivers would reduce the incidence of fatigue on this part of the network.

People, places and environment

Natural environment

There are diverse natural environments throughout the corridor, as shown in Figure 15, with some visually outstanding landscapes. From the Brynderwyns, SH12 travels through rolling rural landscapes and alongside the Wairoa River to Dargaville before heading up through the Waipoua Kauri Forest and emerging at Omapere to expansive views of sandhills on the northern side of the Hokianga harbour.

Areas of conservation land along SH12 through the Waipoua Forest have a high environmental value and require specific vegetation management plans, there are also more infrequent areas of conservation land along SH14 and SH15.

Outside of specific conservation areas, flora and fauna are not unique and are generally reflective of the wider Northland area.

Noise, vibration and air quality

Noise, vibration and air quality issues are generally not found to be an issue on this corridor. Increasing air quality pollutants can be found on SH14 within the urban area of Whangarei, however these remain below acceptable thresholds.

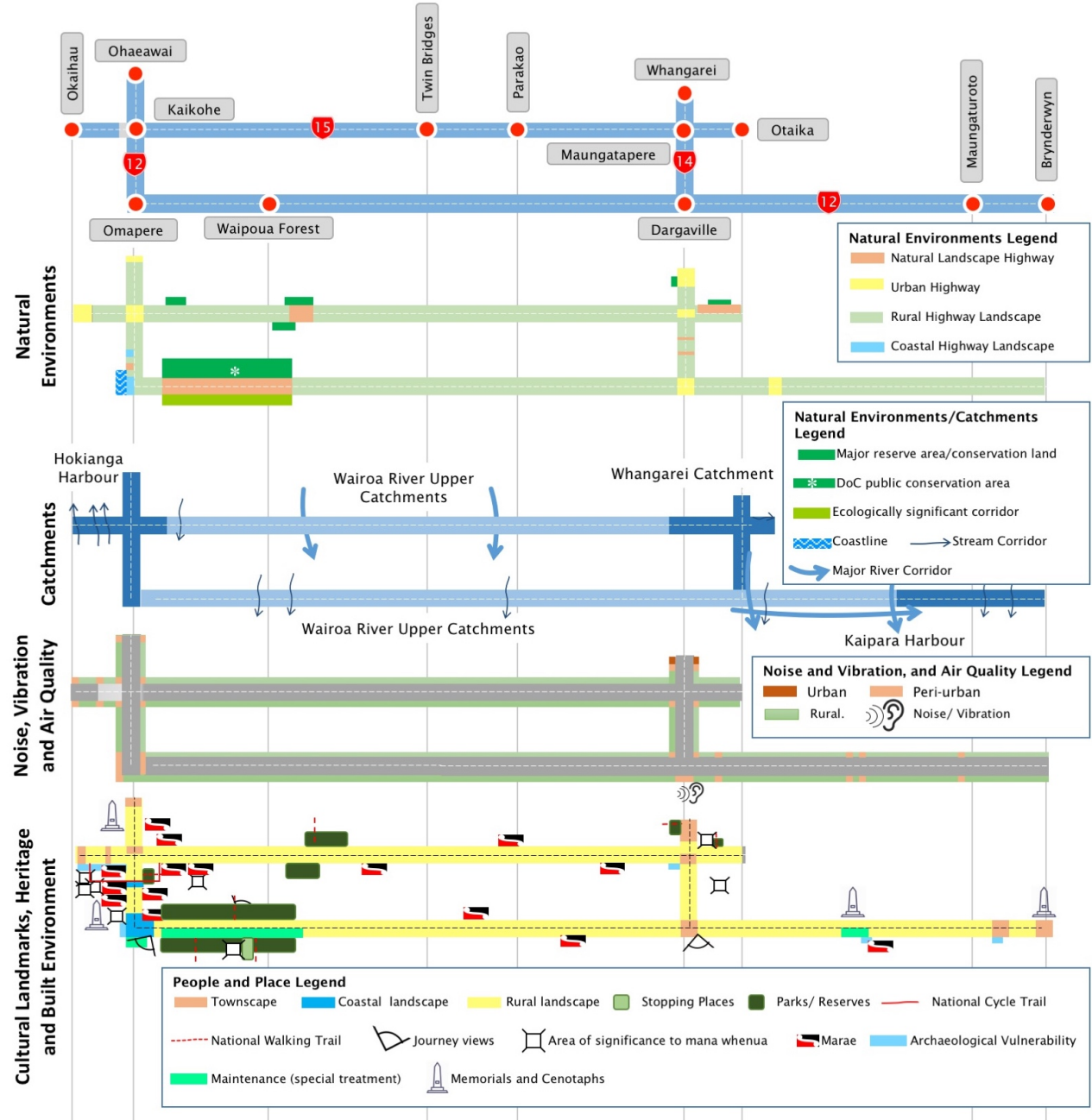
Cultural landmarks, heritage and built environment

The visual character, locations of Maori significance, as well as tourism attractions provide attractive journeys for customers along the corridor.

There are marae and culturally significant sites along the corridor, with many within the Hokianga area.

Many coastal settlements also provide recreational facilities such as boat ramps and other community facilities.

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:

- **Surface water flooding:** Flooding of the highway from increased rainfall intensity and the hilly character of the landscapes is an increasingly common issue. This results in considerable localised flooding and disruption to customers, damaging the environment, and associated infrastructure.
- **Stopping in inappropriate places:** The vistas, particularly along coastal routes, are exceptional. This can encourage tourists to stop in inappropriate and unsafe locations along the State Highway or miss them altogether. The incidence of tourists seeking new experiences and using unmonitored or private routes to see the Kauri located on the west coast and SH12 is increasing. Since the discovery of the wreck of the SS Ventor in 2014, there has been an increase in Chinese visitors to the coast around Hokianga Heads. The SS Ventor, carrying the remains of 499 Chinese miners, sank in 1902.
- **Increased pressure on conservation areas:** Conservation areas adjacent to the State Highway are under increasing risk of unreasonable damage as vehicle traffic increases and visitors seek to access and explore the natural environment, particularly those who are unaware of local environmental management controls.
- **Kauri die-back:** Management of the Kauri die-back problem will generate higher maintenance requirements for work undertaken in the Waipoua forest to comply with the environmental plan.
- **Increased tourist activity:** Increased activity around cultural and heritage landmarks, such as the Waipoua Forest, Trounson Park, or Hokianga Harbour could increase damage, maintenance costs, and loss of value. Some specific landmarks and places may require management plans and additional consideration for protection.
- **Relationships with Iwi/Mana whenua:** Acknowledgement of iwi/mana whenua relationships is increasing along the corridor with their input to the management of heritage assets and landscapes actively occurring. 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. In addition, it is anticipated that cultural-related tourism may increase.

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 and management of cultural sites.** Such sites play an increasingly significant role in the economy of Northland. Partnerships with other agencies such as iwi, and the development of strategies for the management of sites can further enhance these.
- **Appropriately located stopping points:** With increasing tourism activity and new areas if activity (e.g. SS Ventor), appropriately located stopping points with amenities incorporating educational information for visitors about safe, low-risk, and low-impact ways of visiting or viewing Northland's natural landscapes could be considered. The objectives of the Twin Coast Discovery PBC will seek to address some of the issues associated with this.
- **Waipoua Forest designation as National Park:** The forest is expected to achieve National Park status in the future, which would cause additional pressure for the adjacent roads to meet stricter standards, with regards to maintenance and tourism activity.



Tokatoka Bluff rest area maintenance needs

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 11,412km of roads and associated assets. This corridor contributes approximately 271km of road network which reflects 2.4% nationally. The total value of the assets along the corridor is \$348M (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 – Corridor asset base



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.

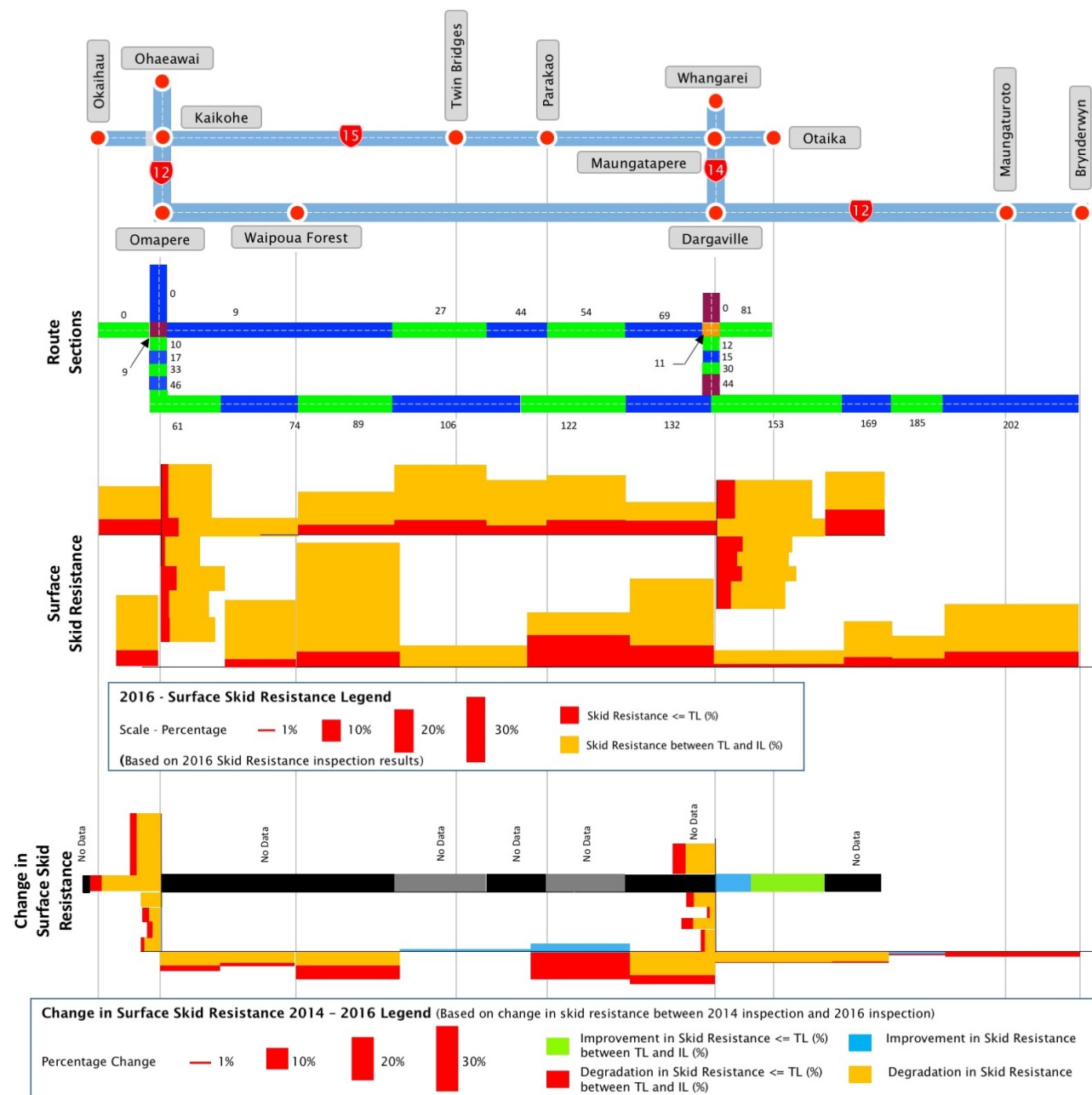
The information is derived from inspection data that records a value every 10m in each direction. Each 10m length is rated as to whether it is within one of the bands: below threshold limit; within investigation limits; or above Investigation limits. The proportion is then the number of 10m lengths in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

Waipoua Forest, SH15, does not have an historic surface skid resistance record as data collection commenced with the 2015/16 monitoring cycle. That data shows similar proportions within the investigatory levels to those found on the remainder of the corridor.

Along this corridor, the portions of surface skid resistance below the threshold limit and within the investigatory range are consistently high. Sections with highest percentages below TL are along SH12 at RS89, RS122 and RS132. Section SH12 RS106 is notable for having no surface skid resistance below the threshold limit.

On SH15 this is the first time this section of corridor has been assessed since being taken over as a State Highway and assessed to State Highway standards. For this reason, there are no previous assessments on which to base the change in surface skid resistance infographic for this part of the corridor.

Figure 18 – Asset condition



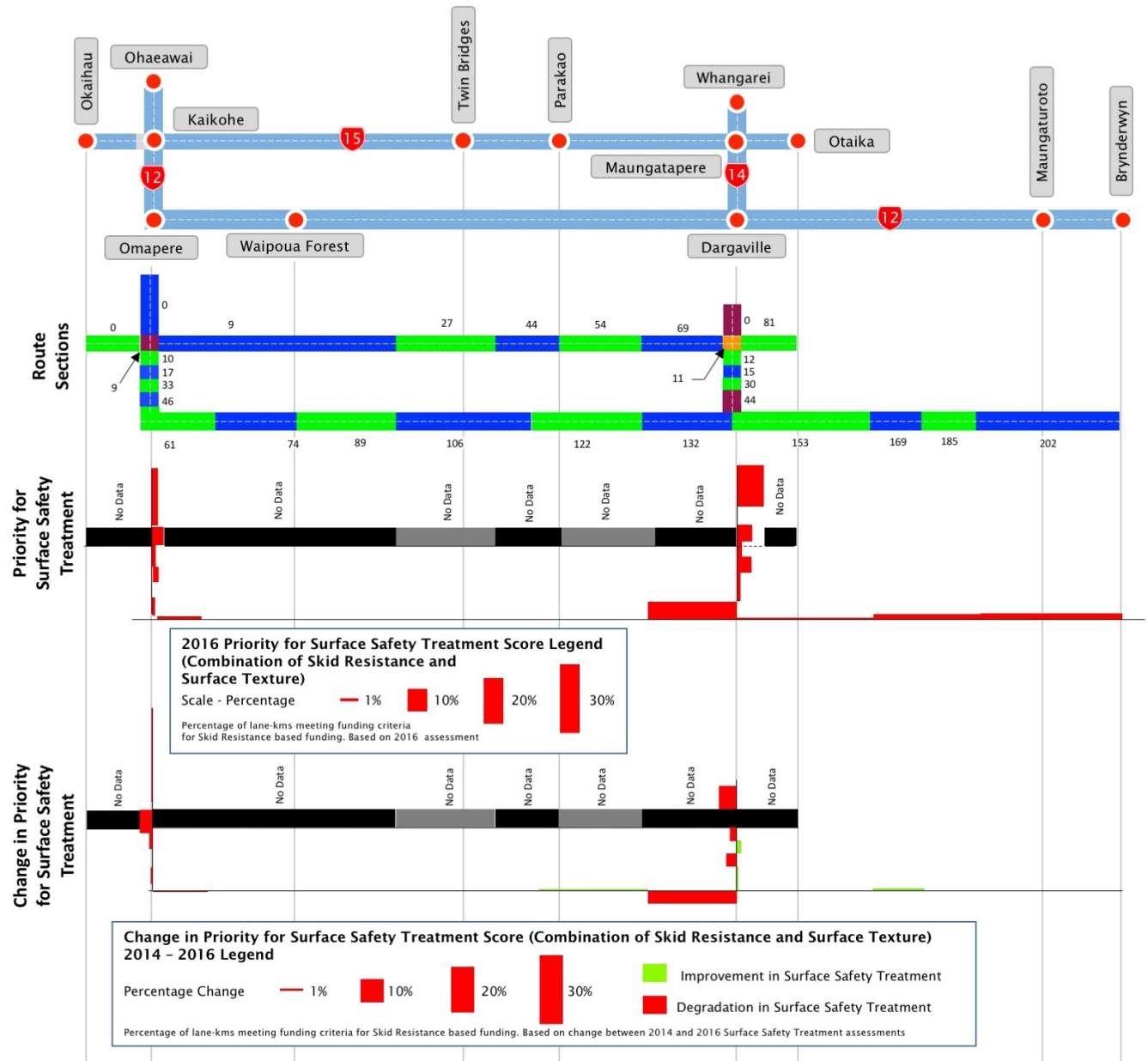
Priority for Surface Safety Treatment

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.

Surface skid resistance funding is justified for 14km, just over 2.61%, of this corridor. Sections with the highest proportion of priority for surface safety treatment score qualifying for funding are: 12/132 north of Dargaville, and 14/0 in Whangarei.

Figure 19 – Asset condition 2



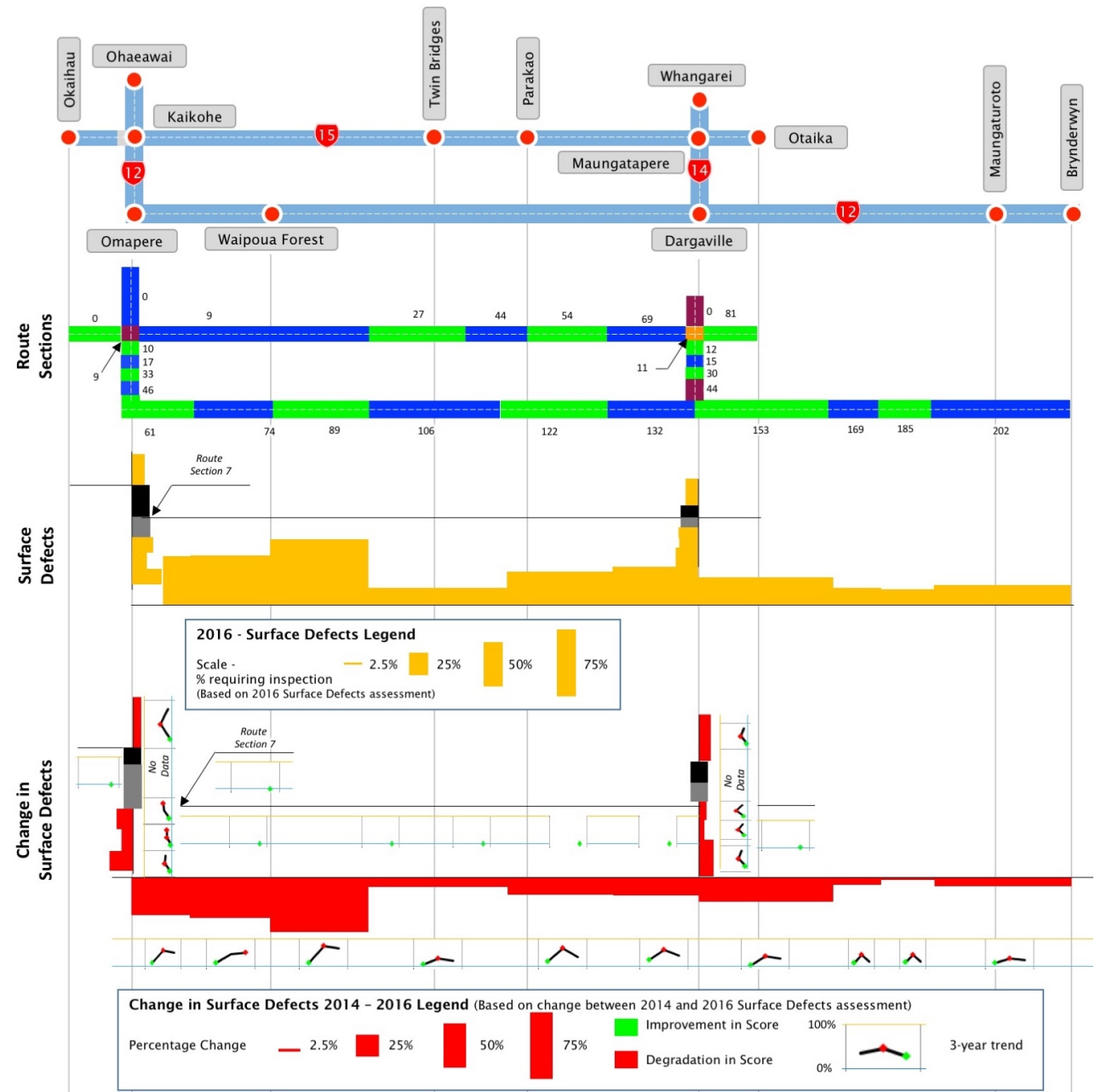
Surface Defects

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, 23% of the corridor achieves a score above which inspection is required. Sections with significant lengths of surface requiring inspection include: 12/61, 12/75 and 12/89 from Opononi to south of Waipoua Forest. These sections also show a significant level of degradation in score over the last three years.

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.

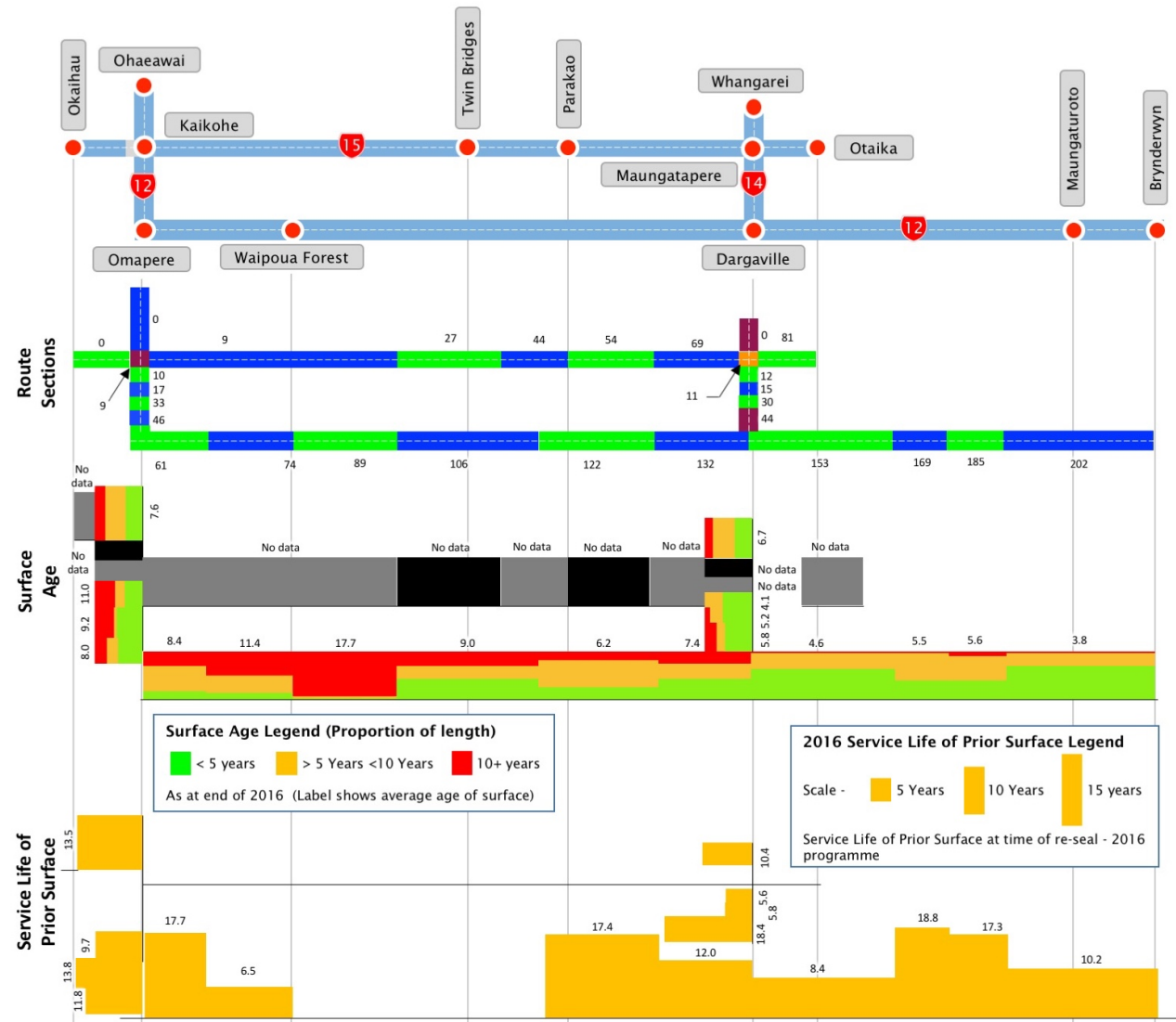
The sections of corridor with the oldest age profile are 12/46 East of Opononi, 12/74 through Waimamaku, and 12/89 through Waipoua Forest.

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.

Overall the re-surfaced sections achieved an average service life of 11.1 years, with several sections achieving a service life in excess of 15 years.

Figure 21 - Asset condition 4

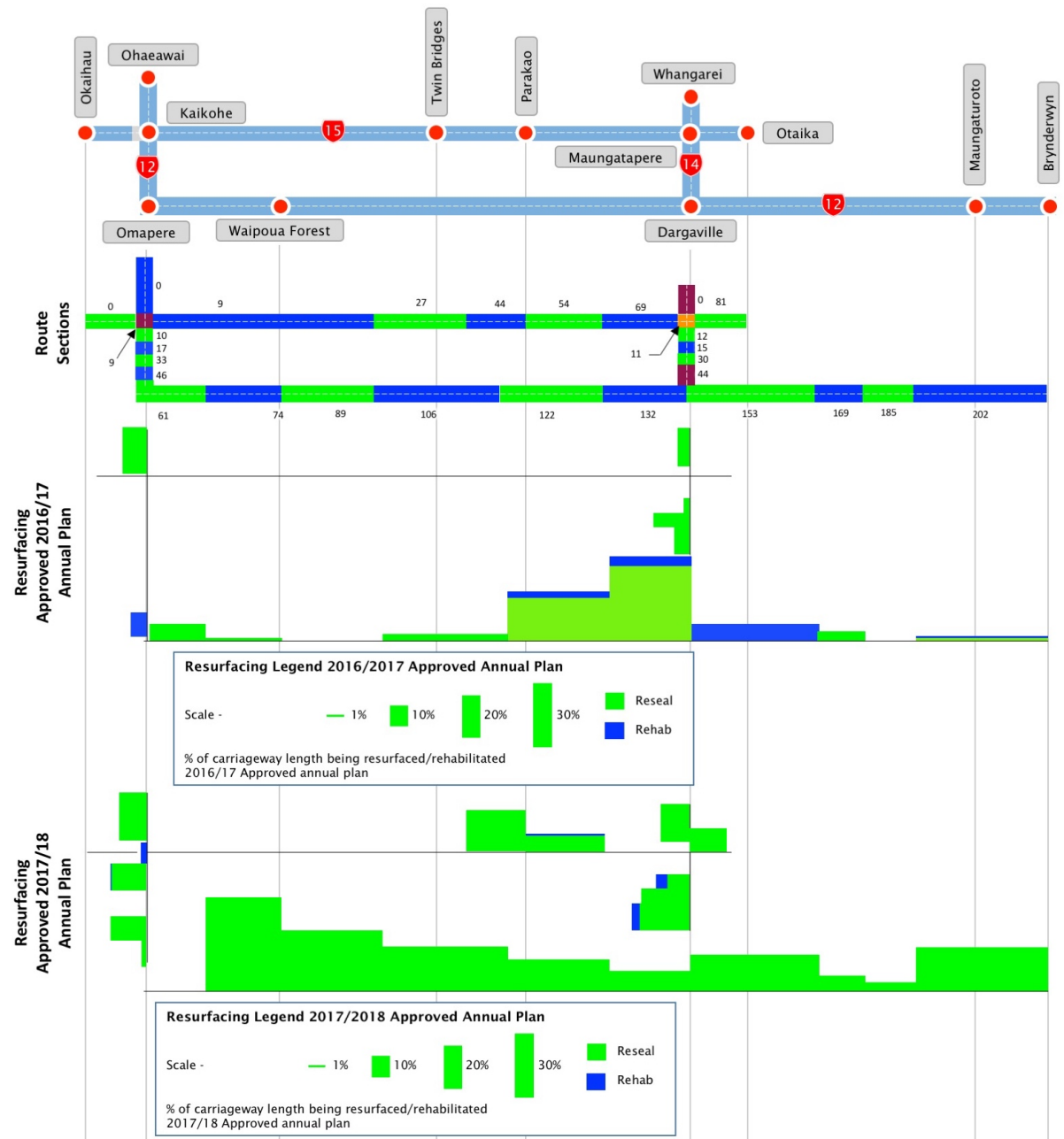


Resurfacing

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 sections 12/74, 12/89 and 12/106 between Waimamaku and Kaihu, and 15/44 through Pakotai.

Figure 22 – Asset condition 5



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.

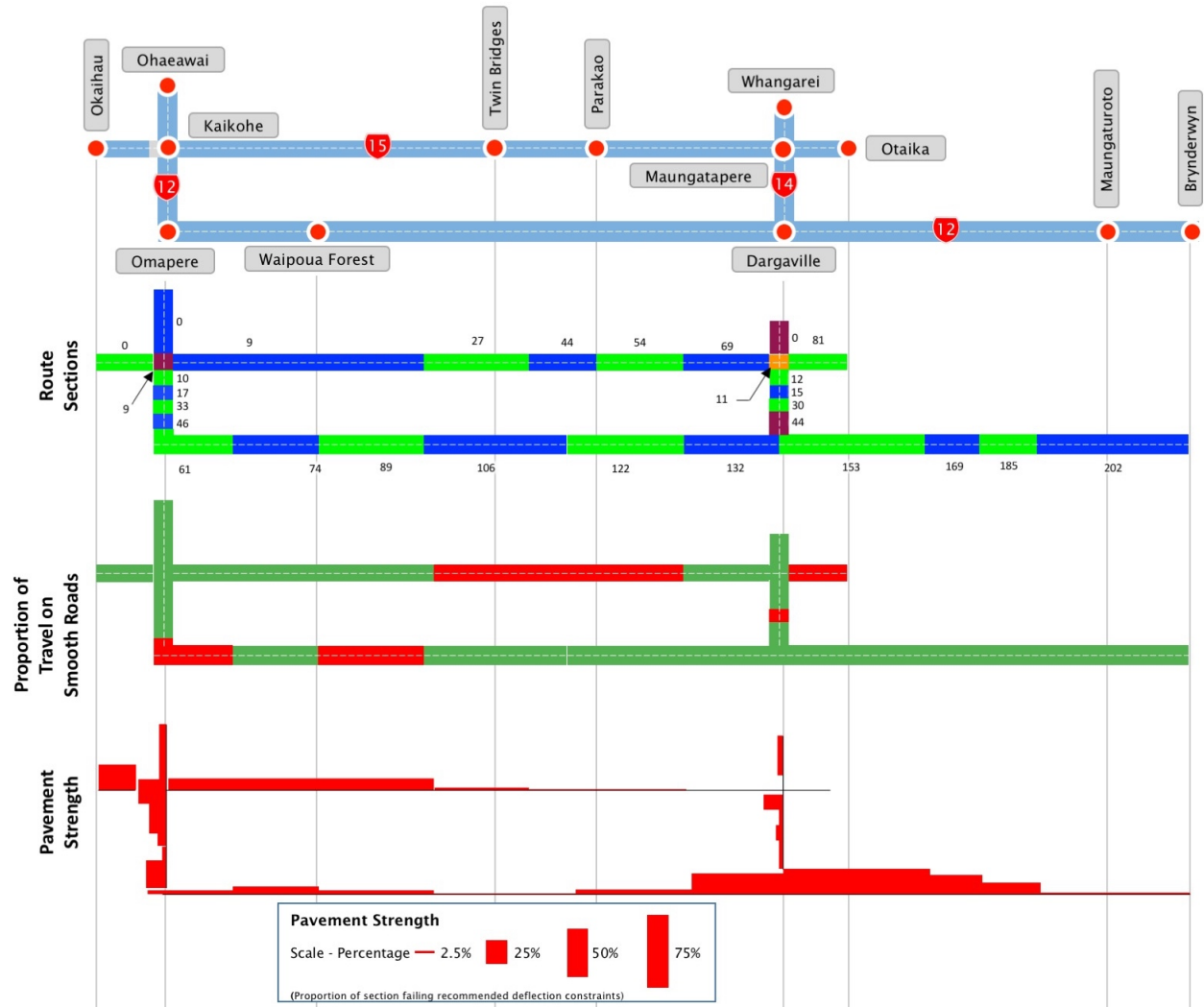
Sections of corridor that fail to provide the minimum level of travel on smooth roads include: significant lengths of SH15 from RS27 to RS54, and, RS81 from Maungatapere to Otaika, SH12/61 and SH12/89, as well as SH14/30.

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 on SH12 around Dargaville, between Okaihau and Kaikohe on SH15, and, through Kaikohe.

Figure 23 – Asset condition 6



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:

- **Surface skid resistance:** Surface skid resistance and priority for surface safety treatment is a real issue on this corridor.
- **Poor pavement base:** Much of the route is based on the original alignment of road and so has a pavement base where there has had no formal investigation of geotechnical aspects of the pavement. This may cause future issues with the underlying base having not been fully prepared.
- **Poor aggregate:** Surface aggregate is of poor quality and susceptible to moisture. When the aggregate gets wet it degrades rapidly.
- **Cultural sensitivity:** There is cultural sensitivity around where the road is formed, meaning when maintenance is undertaken iwi consultation is critical.
- **SH15:** This is a recently vested and declared State Highway. At present the highway continues to provide a challenging environment for operations and maintenance. As the level of deterioration is beginning to be understood issues such as waterproofness of pavement and a disproportionate amount of shoving and pavement failures is becoming more apparent. Drainage maintenance has been minimal historically and the extend of the backlog is still emerging.
- **SH15:** Currently consideration is being given to the need to upgrade the bridges to 50max and HPMV on this part of the corridor.
- **Dargaville south SH12:** A poor standard of road widening is causing edge slump and collapse.

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:

- **Alternative pavement treatments:** Volume of growth may generate the need for alternative methods of pavement rehabilitation.
- **Maintenance within the Waipoua forest:** Within the maintenance activity controls associated with the Waipoua Forest, there are requirements around addressing the Kauri die back disease. This also links to the ongoing ecological management plan which influences road maintenance activity through SH12.
- **SH15:** The original design is causing issues with the pavement that may require complete reconstruction in the future. Options will be considered for rehabilitating these pavements to ensure a long service life.

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	\$3,117	\$3,476	\$5,391
	Renewals	\$5,420	\$4,708	\$7,434
	Improvements	\$46,500	\$30,450	\$11,000
Reliability and Efficiency	Maintenance and Operations	\$1,662	\$1,726	\$2,599
	Renewals	\$127	\$145	\$203
	Improvements	\$0	\$0	\$0
Safety	Maintenance and Operations	\$2,727	\$3,040	\$4,743
	Renewals	\$3,274	\$3,653	\$5,565
	Improvements	\$1,772	\$1,867	\$0
People, places and Environment	Maintenance and Operations	\$728	\$688	\$1,048
	Renewals	\$99	\$191	\$255
	Improvements	\$0	\$0	\$0
Total		\$65,424	\$49,944	\$38,238

Figure 24 - Corridor investment

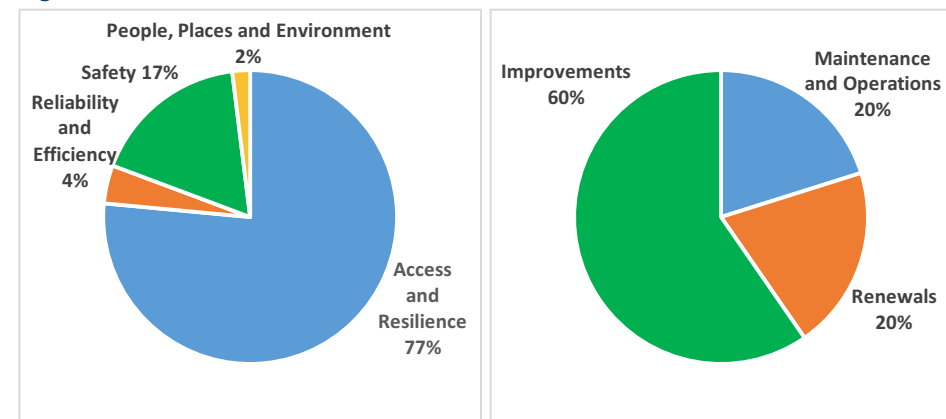


Table 2- Summary investment by work category (\$000)

Outcome	Work Category	2018-2021	2021-2024	2024-2027	
Access and Resilience	111	Sealed Pavement Maintenance	\$787	\$1,030	\$1,685
	112	Unsealed Roads	\$0	\$0	\$0
	113	Drainage Maintenance	\$135	\$191	\$296
	114	Structures Maintenance	\$435	\$475	\$734
	121	Environmental Maintenance	\$485	\$526	\$789
	122	Traffic Services Maintenance	\$19	\$24	\$37
	124	Cycle Path Maintenance	\$0	\$0	\$0
	151	Network & Asset Management	\$1,024	\$1,005	\$1,509
	161	Property	\$232	\$226	\$339
	211	Unsealed Road Metalling	\$0	\$0	\$0
	212	Sealed Road Resurfacing (excl. surface skid resistance)	\$3,009	\$2,010	\$3,804
	213	Drainage Renewals	\$310	\$183	\$237
	214	Pavement Rehabilitation	\$1,491	\$1,857	\$2,422
	215	Structures Component Replacements	\$546	\$611	\$904
	222	Traffic Services Renewals	\$63	\$47	\$67
	321 - 341	Improvements	\$46,500	\$30,450	\$11,000
Reliability and Efficiency	121	Environmental Maintenance	\$424	\$456	\$684
	123	Operational Traffic Management	\$812	\$859	\$1,298
	151	Network & Asset Management	\$383	\$370	\$555
	161	Property	\$42	\$41	\$62
	222	Traffic Services Renewals	\$127	\$145	\$203
	321 - 341	Improvements	\$0	\$0	\$0
Safety	111	Sealed Pavement Maintenance	\$887	\$1,176	\$1,902
	112	Unsealed Roads	\$0	\$0	\$0

Outcome	Work Category	2018-2021	2021-2024	2024-2027		
	113	Drainage Maintenance	\$152	\$92	\$140	
	114	Structures Maintenance	\$100	\$113	\$172	
	121	Environmental Maintenance	\$44	\$57	\$85	
	122	Traffic Services Maintenance	\$902	\$943	\$1,416	
	124	Cycle Path Maintenance	\$0	\$0	\$0	
	151	Network & Asset Management	\$542	\$561	\$879	
	161	Property	\$99	\$99	\$148	
	212	Surface Skid Resistance	\$2,870	\$3,046	\$4,575	
	214	Pavement Rehabilitation	\$7	\$14	\$22	
	215	Structures Component Replacements	\$86	\$311	\$470	
	222	Traffic Services Renewals	\$311	\$281	\$498	
	321 - 341	Improvements	\$1,772	\$1,867	\$0	
	People, places and Environment	111	Sealed Pavement Maintenance	\$162	\$111	\$182
		121	Environmental Maintenance	\$440	\$455	\$683
151		Network & Asset Management	\$101	\$98	\$147	
161		Property	\$25	\$24	\$36	
221		Environmental Renewals	\$99	\$191	\$255	
321 - 341		Improvements	\$0	\$0	\$0	
	Total	\$65,424	\$49,944	\$38,238		

To be confirmed through the RLTP

Investing in access and resilience

Operations and maintenance

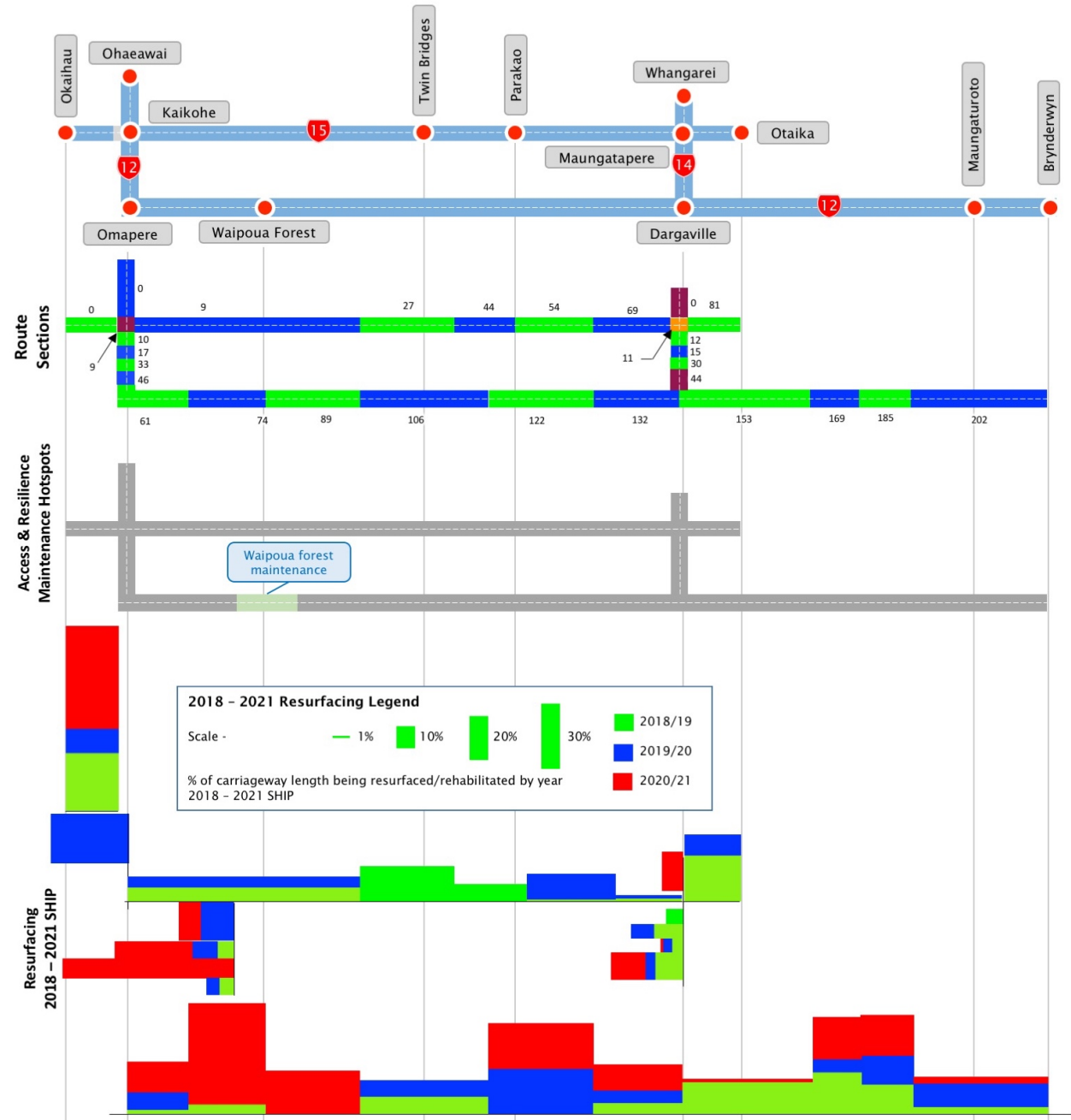
The main areas of investment to provide and preserve access and resilience are drainage maintenance, sealed road surfacing and structural component replacements and vegetation control. A key focus is to realign the base preservation quantities toward increased preventative maintenance and to slow pavement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

Maintenance hot spots

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

- **Waipoua forest:** This is a challenging route through the forest presenting the need for special maintenance requirements.

Figure 25 – Access and resilience investment



Renewals

Resurfacing

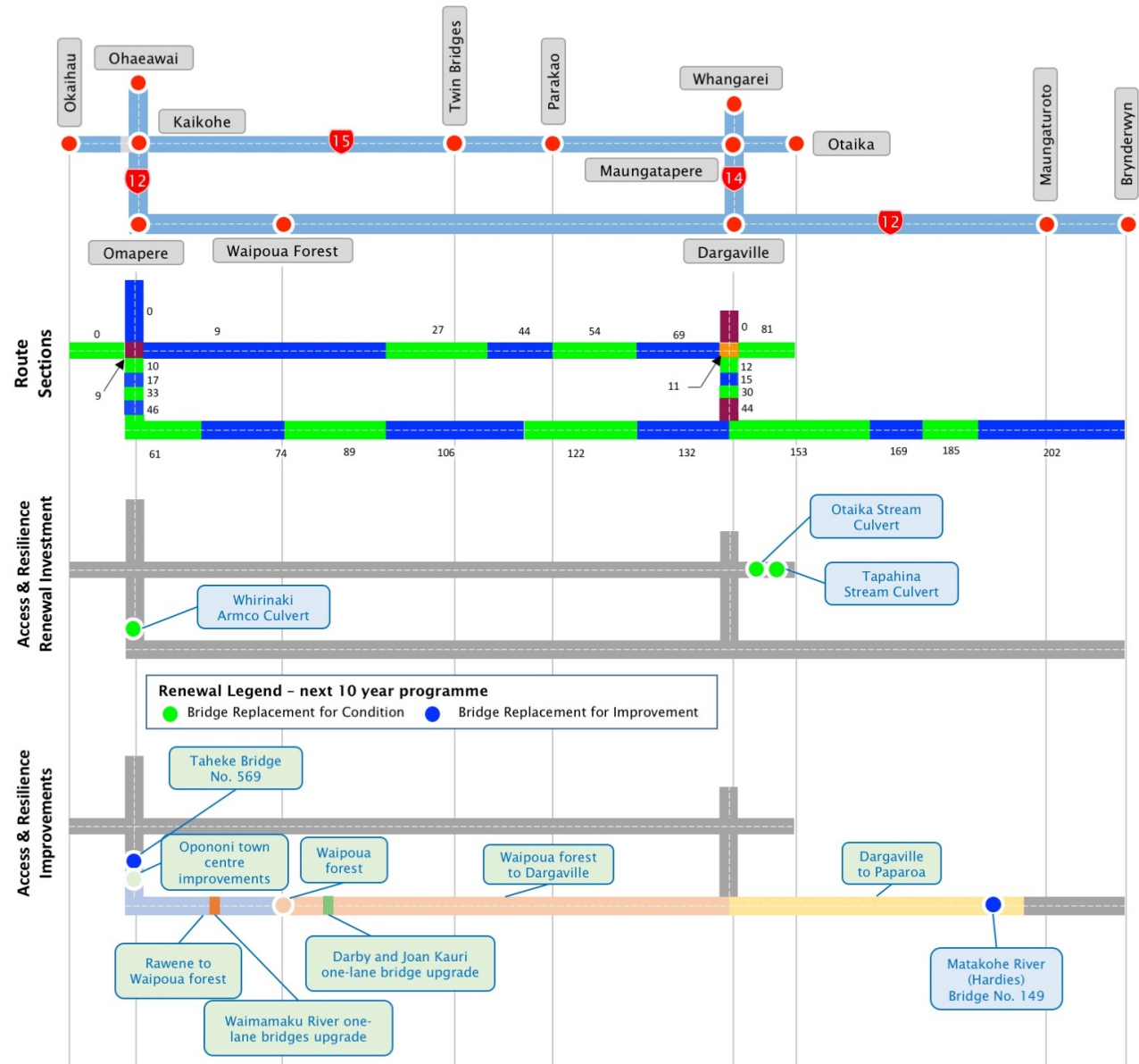
The infographic on the previous page shows the proportion of route section by carriageway length planned for resurfacing within the period 2018/19 to 2020/21, the three-year span of the SHIP. This is also broken down in to the individual years to indicate the timing of expenditure over the three-year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

Significant investment in resurfacing is planned for sections: 12/33 and 12/46 between Waima and Koutu, 12/74 south of Waimamaku, 12/122 south of Kaihu, 12/169 and 12/185 between Ruawai and Paparaoa, and, 15/0 between Okaihau and Kaikohe,

Structure Renewal

The renewal investment infographic shows the planned bridge replacements along the corridor. Three culverts are planned for replacement due to asset condition, at a total estimated cost of \$1.8M.

Figure 26 - Access and resilience investment 2



Improvements

Structure Improvement

Three bridges are scheduled to be replaced for improvement reasons, at an estimated cost of \$16M.

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/>

SH12 – Matakohe Bridges

Description: The Matakohe Bridges are located on SH12 on the Twin Coast Discovery Route, near the popular Kauri Museum. This stretch of highway is the main route to Dargaville and provides access for visitors and businesses.



Matakohe Bridges

Draft Regional Land Transport Programme considered for the SHIP

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

Table 3- Draft regional programme considered for SHIP

Project	Funding Status	Description
SH12 – Darby and Joan Kauri bridge		Part of the Northland Bridges upgrade
SH12 – Waimamaku river bridge		Part of the Northland Bridges upgrade
SH12 – Taheke bridge		Greater resilience
SH12 - Opononi town centre improvements		Greater resilience
SH12 - Waipoua forest to Dargaville		Greater resilience
SH12 – Dargaville to Paparoa		Greater resilience
SH12 - Waipoua Forest		Greater resilience
SH12 – Rawene to Waipoua Forest		Greater resilience

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

The following are the **Reliability and Efficiency** maintenance 'hotspots' that may require additional monitoring or cause an increased maintenance burden along the corridor:

- Increase in recreational traffic:** There may be changes to access and points of interest based around the twin coast discovery route. If successful, the planned changes may cause an increase in recreational traffic on the corridor, and a change in the character of users of the corridor, such as campervans, may have an impact on travel time reliability.

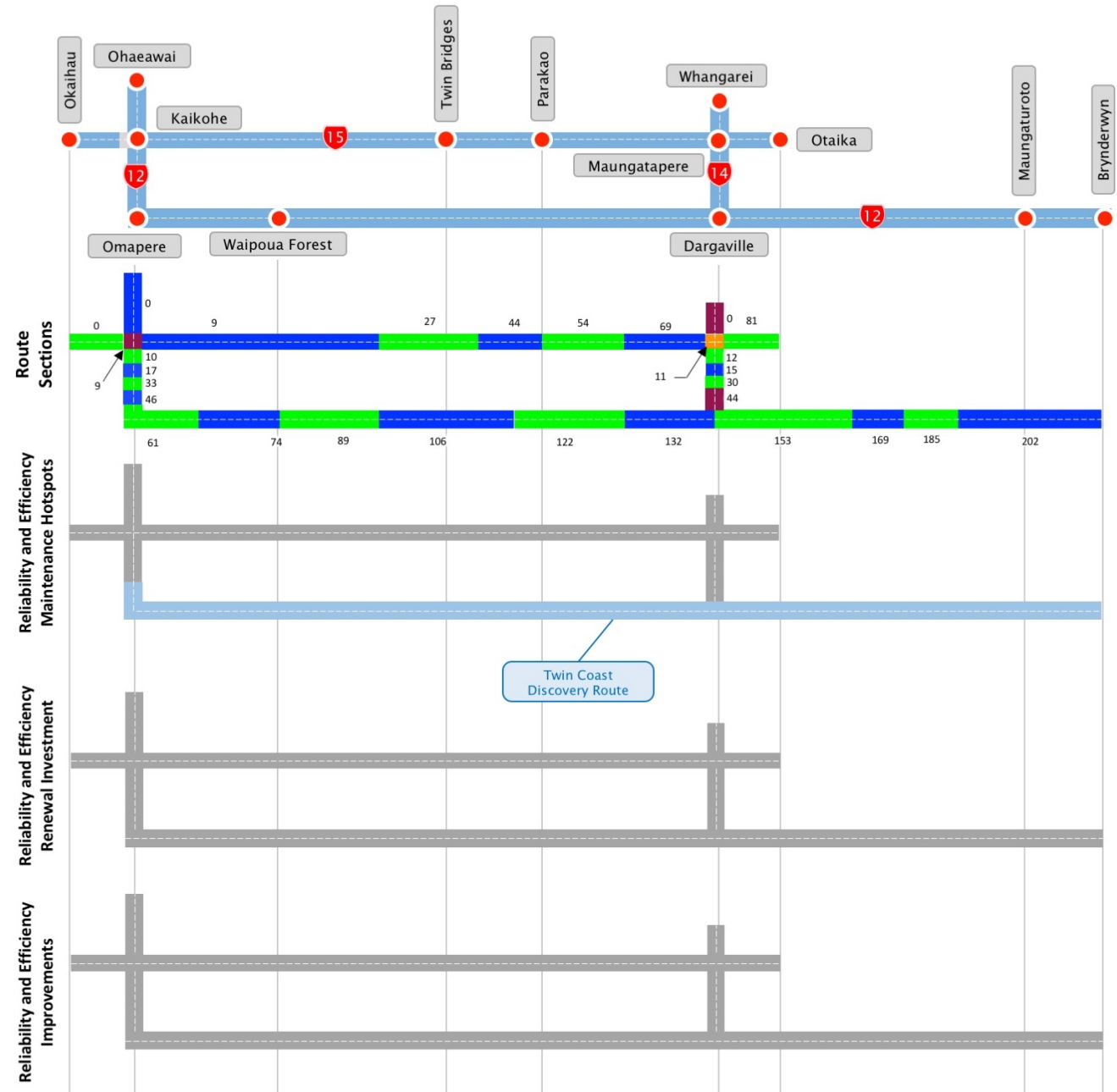
Renewals

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

Improvements

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

Figure 27 – 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 are the **Safety** maintenance 'hotspots' that may require additional monitoring or cause an increased maintenance burden along the corridor:

- **Emphasis for safety:** The emphasis for safety will remain on SH12 south of Dargaville and on SH14.

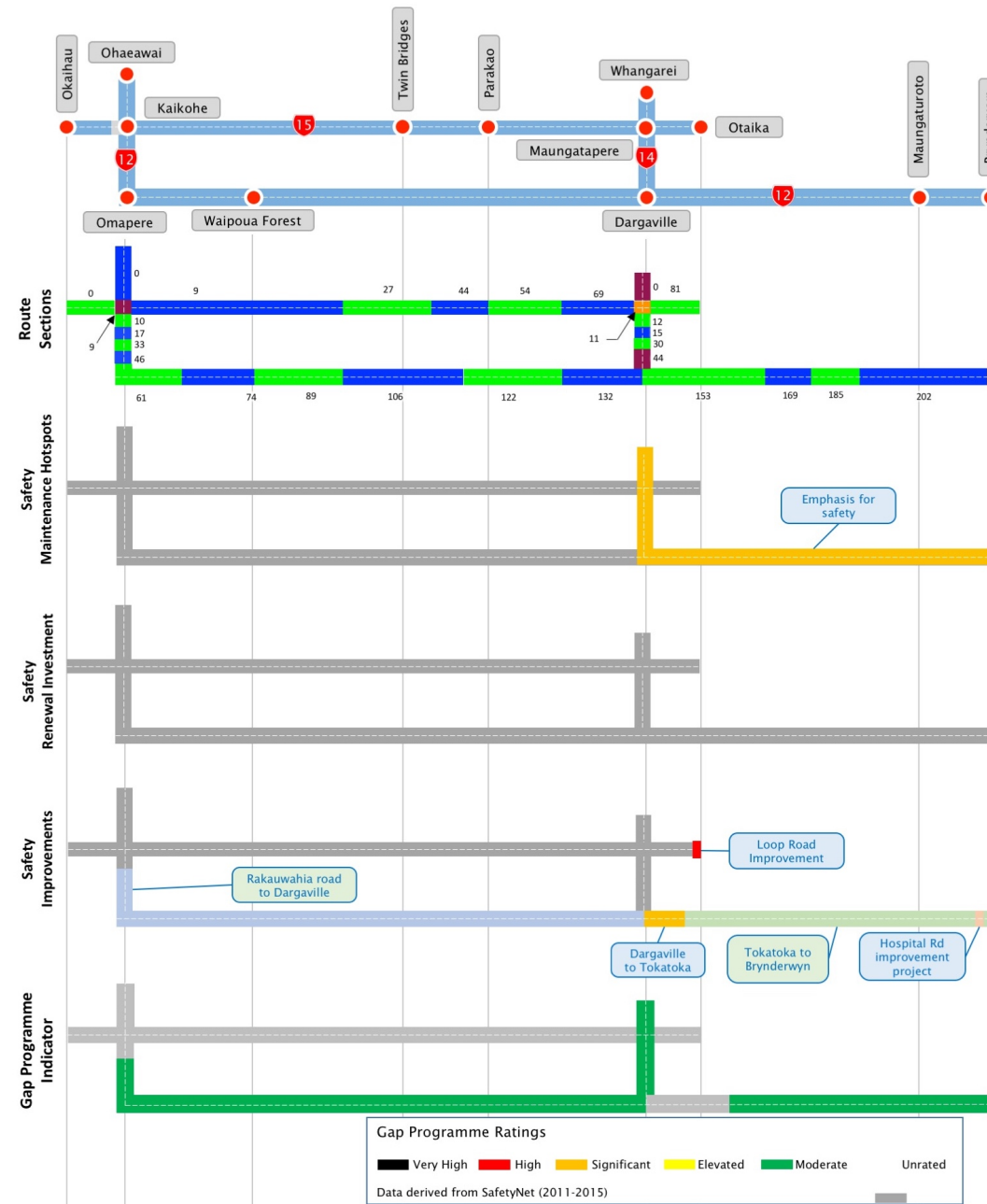
Gap programme indicators

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 is a moderate potential to reduce fatal and serious injuries on SH12, except for a small, unrated, segment south of Dargaville, and SH14 between Dargaville and Whangarei through the introduction of 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 28 – 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/>

SH1N/15 – Loop Road Improvements

Description: Loop Road is the southern portion of an ‘inland freight route’, which crosses SH1 south of Whangarei. The intersection with the state highway is a critical connection for the Northland forestry sector on the journey to and from Northport at Marsden Point, where logs are sent for export.

SH12 – Dargaville to Tokatoka

Description: Reducing occurrences of run-off-road crashed by applying rumble strips to edge and centrelines along the entire route over three seasons.

SH14 – Hospital Rd Improvement Project

Description: Installation of traffic signals at the intersection of SH14 and Hospital Rd, cycle lanes extensions and providing a painted median along the state highway from the Hospital to connect into the existing painted median near Silverstream Road.



Intersection of SH14 and Hospital Rd

Draft Regional Land Transport Programme considered for the 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
SH12 – Rakauwahia Road to Dargaville		Improved road safety
SH12 – Tokatoka to Brynderwyn		Improved road safety



Planned Improvements to the SH1 and Loop Road intersection

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 hot spots

The following are the **People, Places and Environment** maintenance 'hotspots' that may require additional monitoring or cause an increased maintenance burden along the corridor:

- **Waipoua forest:** Practices will adjust as the situation within the Waipoua forest and the emerging special requirements within this area are understood. This is also noted in the maintenance section.

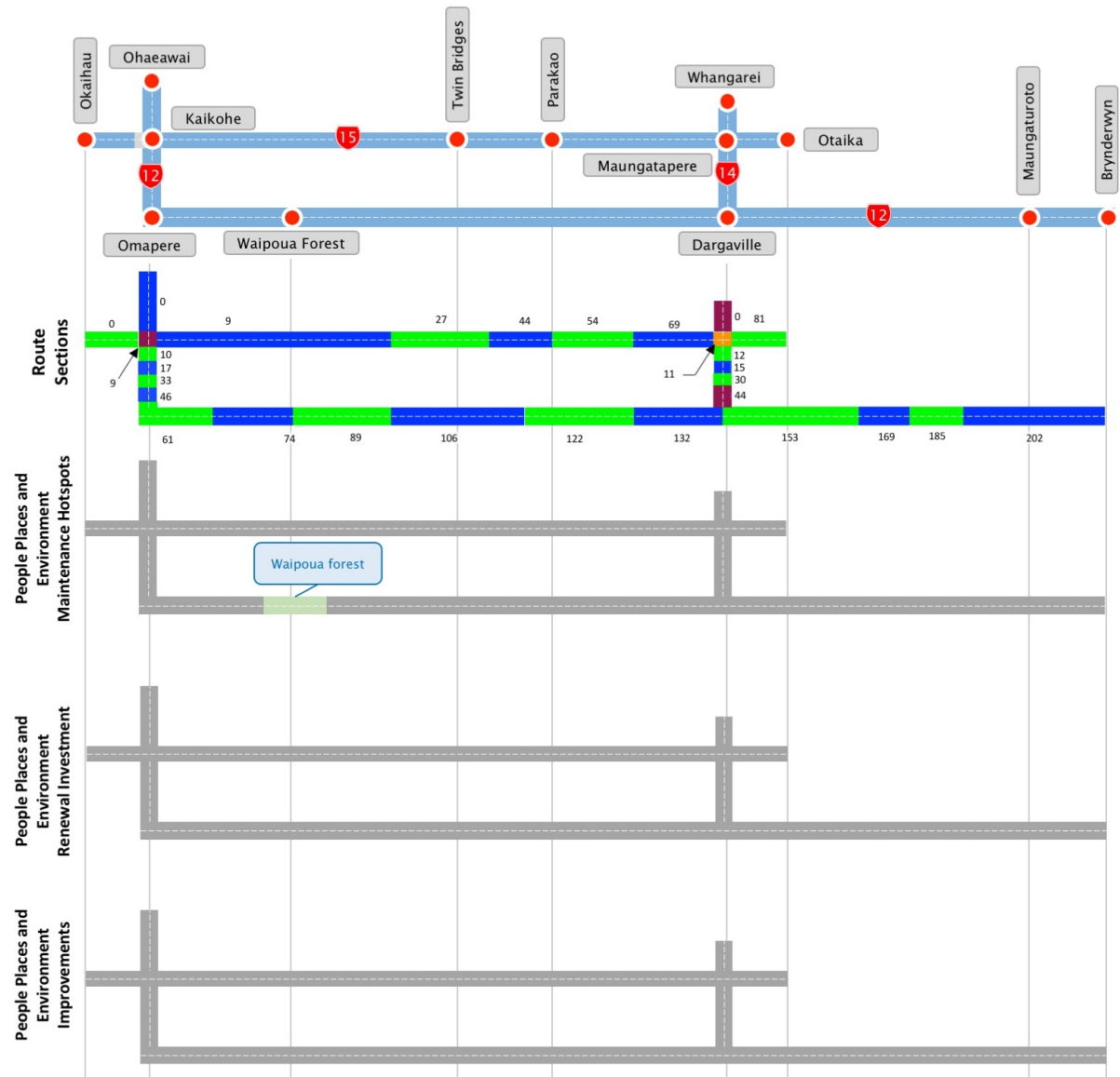
Renewals

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 29 – 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.

- **Effective response coverage:** The size of the corridor necessitates the contractor operating from several depots, located at: Kaitaia, Whangarei, and Waipoua Forest (Environmental).
- **SH15:** The declaration of SH15 and promotion as the Inland Freight Route will see higher vehicle numbers on this section of the corridor, with a corresponding increase in access, safety, and resilience risks. There are one lane bridges impeding access, along with intersections and accesses that are unlikely to meet state highway standards. SH15 is now also acting as a resilience route for SH1N providing another alternative route when SH1N is not available. HPMV restrictions will need to be clarified for all heavy vehicles, to ensure safe use of this section of the corridor before further upgrades are implemented.
- **Frequency and quality of maintenance:** Geological conditions and flood risk along the corridor generate an increasing maintenance burden resulting in more road closures along most sections of the corridor. There are also constraints on the availability of appropriate materials for maintenance. The long distances and travel times for acquiring high quality and high performing materials, which are typically located in Auckland, place restrictions on the intervention options.
- **SH12 south of Dargaville** still remains a resilience route for SH1N at the southern end of the corridor.

Reliability and efficiency

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

- **Visiting drivers:** Challenges exist with foreign drivers and crashes, particularly on the more challenging sections of the corridor.
- **Seasonal traffic variations:** Demand on the corridor is seasonal with increased numbers of tourists visiting the area during the warmer spring and summer months. This causes localised congestion and constraints throughout the corridor, particularly at either end of long holiday weekends.
- **Limited passing opportunities:** A lack of passing opportunities and the resulting platooning affect can cause slow speeds for customers caught behind a line of slower vehicles, particularly when a heavy vehicle is using the route.

Safety

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

- **Challenging Route:** The corridor is a challenging safety environment due to the nature of the route, deep ditches, sharp corners, high drop-offs.
- **Tourism traffic:** Influxes of tourist traffic, coupled with long driving distances and varying levels of driver experience leads to increased safety risks and incidents during summer months.
- **Inappropriate speeds:** There are frequent truck rollovers on SH15 due to truck drivers exceeding safe speeds based on the quality and alignment of the corridor.
- **Socio-economic effects:** This corridor serves a lower socio-economic area, and this means high levels of driving with no driver's license, no Warrant of fitness, and inadequately maintained vehicles. This leads to higher accident rates and a continued high investment in safety.

People, places and environment

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

- **Increased pressure on conservation areas:** Conservation areas adjacent to the State Highway are under increasing risk of unreasonable damage as vehicle traffic increases and visitors seek to access and explore the natural environment, particularly those who are unaware of local environmental management controls.
- **Kauri die back disease:** Within the maintenance activity controls associated with the Waipoua Forest, there are requirements around addressing the Kauri die back disease. This also links to the ongoing ecological management plan which influences road maintenance activity through SH12.

Investment future considerations

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

- **SH15:** There is a significant task to upgrade the corridor to a standard fitting its classification, which is likely to include improvements to intersections and single lane bridges, and a review of accesses. Investigations to increase the understanding of the likely hazards is required and may lead to a programme of upgrades to the route. The original design is causing issues with the pavement that may require complete reconstruction. There will be a need to look at all options for rehabilitating these pavements to ensure a long service life.
- **Alternative pavement materials:** The degradation of pavement surfaces places a burden on surface skid resistance management. Investigation into alternative pavement materials which provide an improved balance between cost and benefit may be warranted.
- **Increased investment in areas of environmental value:** Corridor maintenance and development potential through areas of high environmental value, including potential Conservation areas requires consideration. This may result in extensive engagement, costly environmental management, mitigation measures, and tighter controls.
- **Improved monitoring:** Real time, or early warnings relating to weather events could improve response times, or enable proactive management to reduce impacts and increase the ability of the corridor to recover from closures or delays, such as those caused by slips and flooding.
- **Improved customer communication:** A network of linked ITS signs (or other technology) would allow information to be provided to customers in advance of decision making points. This would help to keep users informed, allowing road users to make appropriate decisions and thereby increase the efficiency as well as the resilience of the corridor.
- **Relationships with Iwi/Mana whenua:** Acknowledgement of iwi/mana whenua relationships is increasing along the corridor with their input to the management of heritage assets and landscapes actively occurring. 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.
- **Waipoua Forest designation as National Park:** The forest is expected to achieve National Park status in the future, which would cause additional pressure for the adjacent roads to meet stricter standards, with regards to maintenance and tourism activity.
- **Kauri die-back** – Management of the Kauri die-back problem may generate a higher level of maintenance requirement within the Waipoua forest.
- **Appropriately located stopping points:** With increasing tourism activity and new areas of activity (e.g. SS Ventor), appropriately located stopping points with amenities incorporating educational information for visitors about safe, low-risk, and low-impact ways of visiting or viewing Northland's natural landscapes could be considered. The objectives of the Twin Coast Discovery PBC will seek to address some of the issues associated with this.

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
Access	ONRC classification	The Road Efficiency Group https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/	2013

Section	Infographic	Information Source	Date
	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
Closures		NZTA 2011-2015_Treis_incidents_by_region.xlsx	2015
Reliability and efficiency	Efficiency	NZTA – MapHub EfficiencyNet	2016

Section	Infographic	Information Source	Date
	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

Section	Infographic	Information Source	Date
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			
Investing in access and resilience	Maintenance Hot Spots	Network Manager and Regional Staff	2017
	Resurfacing 2018 - 2021	Resurface data derived from forward works programme	
	Renewal Investment	National Bridge Replacement Programme National bridge replacement programme 2017 LCMP data.xlsx	

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	
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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