

# Opotiki to Gisborne via East Cape

CORRIDOR MANAGEMENT PLAN

35

2018-2028



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# Executive summary

The Opotiki to Gisborne corridor, State Highway 35 is the only road that circuits the East Cape of the North Island from Opotiki in the Eastern BoP to Gisborne on the east coast.

SH35 was originally a Maori designation road, fully constructed in 1929. It serves the majority of the regional rural population as it is the only transport route linking local communities throughout the East Cape. The corridor follows the Eastern BoP coast from Opotiki to Waihau Bay, before heading slightly inland crossing the regional boundary into the Gisborne Region.

The corridor is approximately 335 km long (2.9% of the state highway network). The total value of assets along the corridor is \$403M (1.7% of the total national asset value).

The corridor is fairly consistent in nature, being a two-lane opposing road, narrow for large sections, with frequent bends and steep undulating topography and geometry. Opotiki to Waihau Bay is characterised by its coastal setting on the west side and native forests to the east, single-lane bridges and small rural communities. The remaining alignment of the corridor south of Hicks Bay through to the east of Gisborne is inland through farmland, forestry and local communities. The corridor follows alongside the Waiapu River to Ruatoria, gradually rises towards its highest point of 271m near Tokomaru Bay, dropping steeply in to the coastal town, before rising back to a similar height and descending again towards Gisborne. SH35 is the key connection for East Cape community services including healthcare, education, and food and fuel access as well as for exporting local products.

Customers using this corridor are generally locals, driving between home and employment, accessing local services and distributing goods. There is a good understanding of the road conditions and its limits. The corridor is occasionally subject to closure due to storms and flooding, resulting in disruption to business sustainability and extensive detours for all other users.

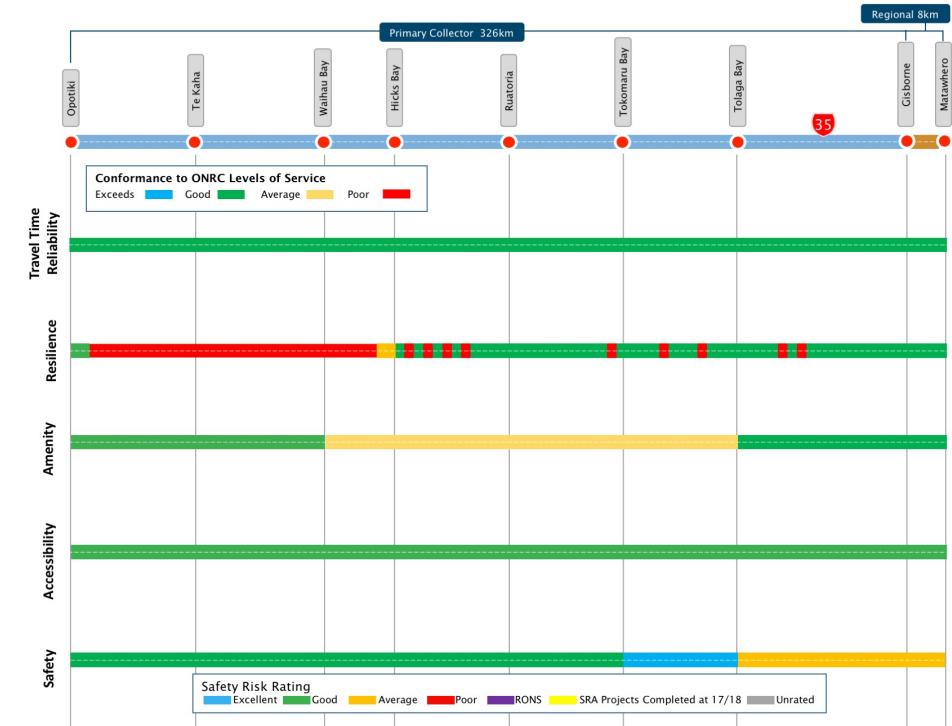
SH35 is the only road around the majority of the East Cape, which is also the freight route and access for local communities and commercial enterprise. Population stagnation and possible decline in the Eastern Bay of Plenty (BoP) and Gisborne Region is a current concern. Investment opportunities are available to reverse the decline, however increasing local, national and international based traffic using the corridor increases pressures on the local road network.

Freight using this corridor is generally bound for the Port of Tauranga for international distribution as well as collecting supplies for the region, and transferring timber to Eastland Port in Gisborne. Inter-regional freight distributes local produce to key servicing locations,

The East Cape is heavily reliant on the resilience of the corridor, with local fruit producers in particular susceptible to closures. Local growers include kiwifruit and stone fruits, which are perishable and have a short shelf life. The long-term sustainability of local business relies on their produce reliably getting to market. There has been recent promotion of value-adding

crops in the region to bring further investment and greater opportunities for local employment. Tourism and local recreation is an additional opportunity and risk for the corridor, being an extra source of revenue, along with an increase of traffic, potential delay for freight and locals, and greater infrastructure requirements.

**Figure 1 - Performance of the corridor against ONRC outcomes**



Corridor resilience is the primary concern for State Highway 35, with the corridor being the only route for East Cape communities and business. A road closure in the event of flooding, slips, rockfalls and wind/waves can limit the economic sustainability of the region. Management of weather events and general incidents is paramount, but this corridor has areas of low resilience and high vulnerability to service disruption.

The East Cape has a variety of potential futures. The corridor may require limited investment to realise its full potential. The corridor has a section that is full HPMV capable between Tolaga Bay and Gisborne. Expanding the capability may open opportunities for business expansion and investment.

# Introduction

## Purpose

### What is the corridor management plan?

This Corridor Management Plan describes the customer service delivery story for the Opotiki to Gisborne 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 CMP provides a link between the long-term planning outlook, the 10-year medium term investment programme and the three-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 CMP approach considers all assets within the corridor and takes a holistic view of the customer levels of service they provide throughout the corridor.

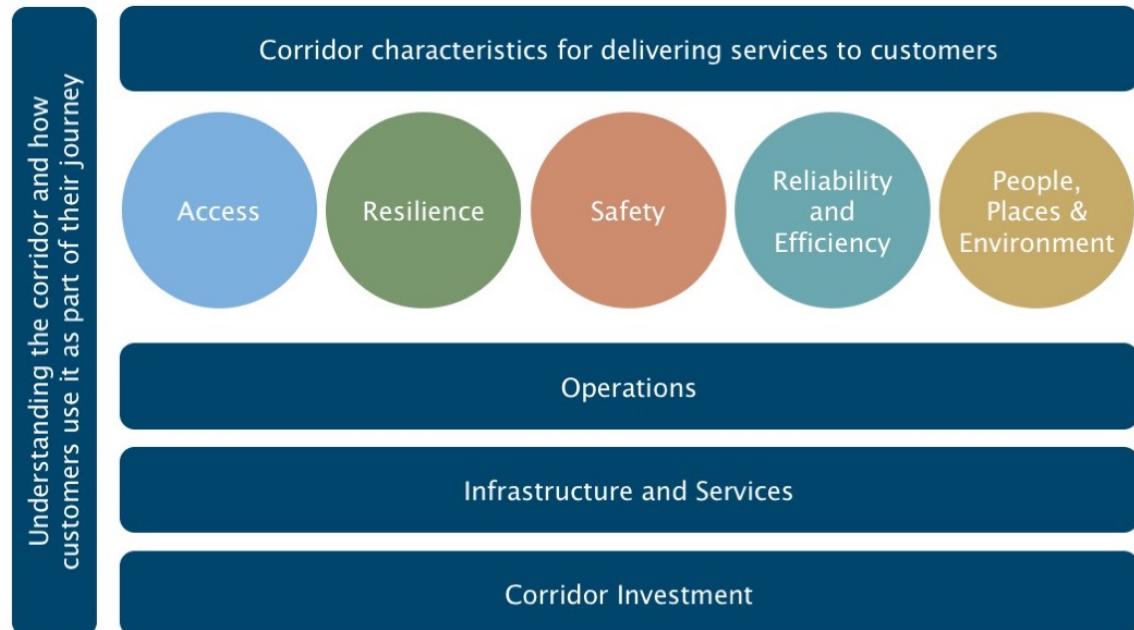
Planning is currently undertaken at the regional level, but typically significant journeys traverse more than one region. By considering the significant customer journeys and destinations, the CMP is a vehicle to engage in regional and inter-regional conversations by focusing on the issues that are important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

## How will we use it?

The CMP 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 CMP helps to inform the business case for investment in state highways for the subsequent triennial period.

In conjunction with the long-term view, the CMP 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 Opotiki to Gisborne corridor, State Highway 35 (SH35) is the only road that circuits the East Cape of the North Island from Opotiki in the Eastern BoP to Gisborne on the east coast.

SH35 was originally a Maori designation road, fully constructed in 1929. It serves the majority of the regional rural population as it is the only transport route linking local communities throughout the East Cape. The corridor follows the Eastern BoP coast from Opotiki to Waihau Bay, before heading slightly inland crossing the regional boundary into the Gisborne Region. The corridor is fairly consistent in nature, being a two-lane opposing road, narrow for large sections, with frequent bends and steep undulating topography and geometry. Opotiki to Waihau Bay is characterised by its coastal setting on the west side and native forests to the east, single-lane bridges and small rural communities. The remaining alignment of the corridor south of Hicks Bay through to the east of Gisborne is inland through farmland, forestry and local communities. The corridor follows alongside the Waiapu River to Ruatoria, gradually rises towards its highest point of 271m near Tokomaru Bay, dropping steeply in to the coastal town, before rising back to a similar height and descending again towards Gisborne. SH35 is the key connection for East Cape community services including healthcare, education, and food and fuel access as well as for exporting local products.

## The regional economy

SH35 is within the more remote eastern end of the BoP Region and the Gisborne Region. The BoP Region has approximately 270,000 residents (6% of New Zealand's population), of which 50,000 live in the Eastern BoP (Kawerau, Whakatane and Opotiki Districts). The region accounts for approximately 6% of national employment and 5% of NZ GDP. The Gisborne Region has approximately 44,000 residents (1% of New Zealand's population), and accounts for 1.0% of national employment and almost 1% of NZ GDP.

The BoP Region has a high representation of employment in health care and social assistance, retail trade, education and training, and manufacturing, accounting for around 45% of the paid employees in the region. The Eastern BoP has a high representation of employment in agriculture, forestry and fishing, manufacturing, education and training, accounting for almost 40% of the paid employees in this part of the region. The unemployment rate in the BoP Region is around 9.0%, compared with 7% for all of New Zealand.

Agriculture, forestry and fishing, and tourism are the primary export earners for the region. Tourism, forestry and timber processing, agriculture, Edgecumbe dairy processing plants, Kawerau timber processing and Opotiki fruit packing as well as health services, are other important areas for industry in both the BoP and Gisborne Regions' economy.

Agriculture, forestry and fishing underpin the Gisborne Region's economy, accounting for around 22% of the paid employees. The region has a high representation of employment in health care and other social assistance, with education and training, manufacturing and retail trade making up 40% of employment. Unemployment in the region is in the order of 9%.

The Gisborne Region in particular has a generally aging and declining population. The areas along SH35 are highly reliant on labour-based primary industries for employment and are highly vulnerable to international market price reductions for timber and other primary industry products.

Figure 3 – Corridor overview



# Understanding our customers

## Key customers

The key customers utilising the corridor are mainly residents and freight operators. Customers value a reliable and resilient network capable of enduring the weather and other environmental pressures so local produce can reach markets for sale and residents can access schools, shops and services. Any delay for product delivery can have detrimental cost and profitability implications for business in the area, at times preventing business from operating efficiently and sustainably, particularly regarding perishable goods. Locals are also reliant on the corridor to complete day-to-day activities as no alternative is available.

## Daily users

### Insights into daily users:

**Road use:** Many daily users of the corridor are not commuters, but residents of the communities along the corridor making localised trips or trips to/from the East Cape to Opotiki or Gisborne. These residents travel by private vehicle, due to the limited transport choices available. There are no other options available for residents using the corridor.

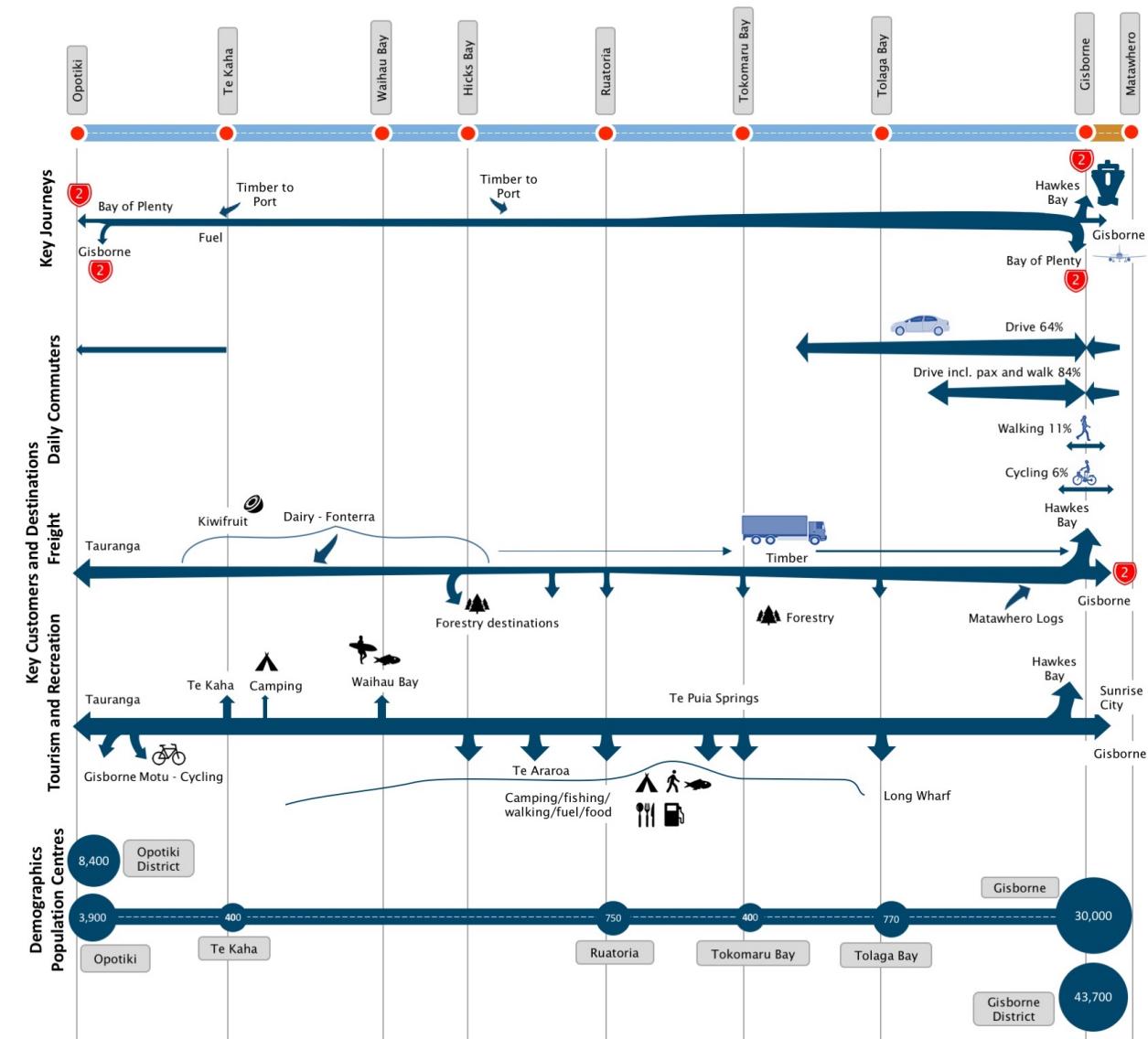
Daily commuters are generally only found between Tolaga Bay and Gisborne, however most these are from communities closer to Gisborne, including Okitu and Wainui. There is minimal delay during peak hours in Gisborne, with sufficient capacity for current demand throughout the whole corridor. There is excess capacity available at all other times.

**Road knowledge:** Residents are familiar with their route, however viable alternatives to avoid delay are generally unavailable, particularly when users are beyond walking and cycling distances. Journey times are relatively predictable during the day and across the week.

**Pain points:** The corridor near Gisborne experiences a mix of modes, including heavy vehicles, commuters, walkers and cyclists near Eastland Port during peak hours. The main area of concern is local driver safety carelessness, driving without a fastened seat belt, under the influence of drink/drugs and overtaking in restricted areas.

**Daily commuters expect:** Predictable journeys at most times, but there is a general awareness that weather, road conditions and hazards are unpredictable.

Figure 4 - Key customers, journeys, and destinations



## Tourist and recreational users

Tourism contributed over \$800 million to the BoP's economy in the year ending December 2016 (approximately 6.5% of regional GDP), with year-to-year growth of just under 10%. Meanwhile, tourism contributes around \$135 million to the Gisborne Region's economy (around 8% of regional GDP), with year-to-year growth in the order of 7%. The BoP and Gisborne Regions have many attractions, including scenic reserves, East Cape and Waioeka Gorge, as well as cycle tourism, fishing, surfing, camping, hunting and nature trails.

The corridor is a key tourist route link connecting the BoP and East Coast tourist destinations, including the East Cape and East Coast surf beaches. The route is the only connection for the area and is also used as a circuit for drivers and motorcycles.

### Insights into tourist and recreational users are as follows:

**Road use:** High numbers of recreational users towing boats and caravans during weekends to and from their holiday and weekend break destination alters the dynamic of the corridor. Visitors tend to drive long distances from the BoP and Gisborne Region to reach their holiday destination, in some areas significantly increasing populations during summer.

**Road knowledge:** Many international visitors are unfamiliar with New Zealand roads and conditions, with the vehicles used often struggling with the weight of the vehicle and corridor topography, causing delays. Driver unfamiliarity with the vehicle and handling can also result in a more precautionary approach and lower speed. Domestic tourists are likely to be more familiar with the conditions but not familiar with the road. Local recreational users are more familiar with the road and their vehicle, travelling at quieter times and taking greater risks, including higher speed, reduced restraint use and drink/drug driving, at times conflicting with tourists and freight vehicles.

**Pain points:** Narrow sections, winding geometry and minimal overtaking opportunities throughout, causing frustration for drivers. Single-lane bridges including the Awatere River Bridge, Whangaparaoa River Bridge and Waiapu River Bridge. Noise and vibration issues at Wainui campground due to logging trucks.

**Tourist and recreational users expect:** There is an expectation that all journeys will be straightforward and relatively delay-free. A variety of travel options, including buses, taxis and car hire. Good directional signage of road names, tourist destinations, distances and urban centres. Places to stop for refreshments on long distance journeys. Also, places to stop for refreshments on long-distance journeys are anticipated, but often not available.

*"I really feel for our whanau up the [East] Coast who are forced to take their lives into their own hands on a daily basis. Driving on rural roads is tough enough without adding to the mix a dangerous surface."*

## Freight operators

Freight movements tend to be in both directions depending on the commodity. Forestry vehicles complete 3-4 return journeys per day to and from Eastland Port in Gisborne. Produce for local markets travels the route, particularly fruit and agriculture produce from between Tolaga Bay and the Gisborne area which travels to Opotiki for packing and further distribution.

*"Log truck queues at [Eastland] Port are a nightmare"*

### Insights into freight operators are as follows:

**Road use:** Forestry timbers go to Eastland Port in Gisborne, and local fruit and agriculture produce travels to Tauranga for distribution. All produce is distributed by road. Heavy vehicles are a relatively high proportion of traffic flow, completing 3 to 4 return trips per day to distribution centres.

**Road knowledge:** Knowledge of road conditions is high, with regular use and understanding of varying conditions. The occasional inexperienced tourist driver and new users can cause delays to freight operators, causing frustration and reckless driver behaviour.

**Pain points:** The corridor has experienced a number of single-vehicle roll overs in the last five years, resulting mainly in road cautions and no road closure. The corridor is vulnerable to frequent weather induced closures/events and has a lengthy detour route (SH2). Short passing/slow vehicle lanes cause safety issues and driver frustration.

**Freight operators expect:** Infrastructure that has consistent travel times and reliable service delivery in the Gisborne section of the corridor. This includes alternative routes that can safely cater for heavy vehicles, opening the road as quickly as possible after a closure, and creating a route that is able to remain open during extreme events, along with good road facilities and safety.

They also expect information about road conditions to allow forward planning and confidence of service delivery.

# How we deliver services along the corridor

## Transport partners

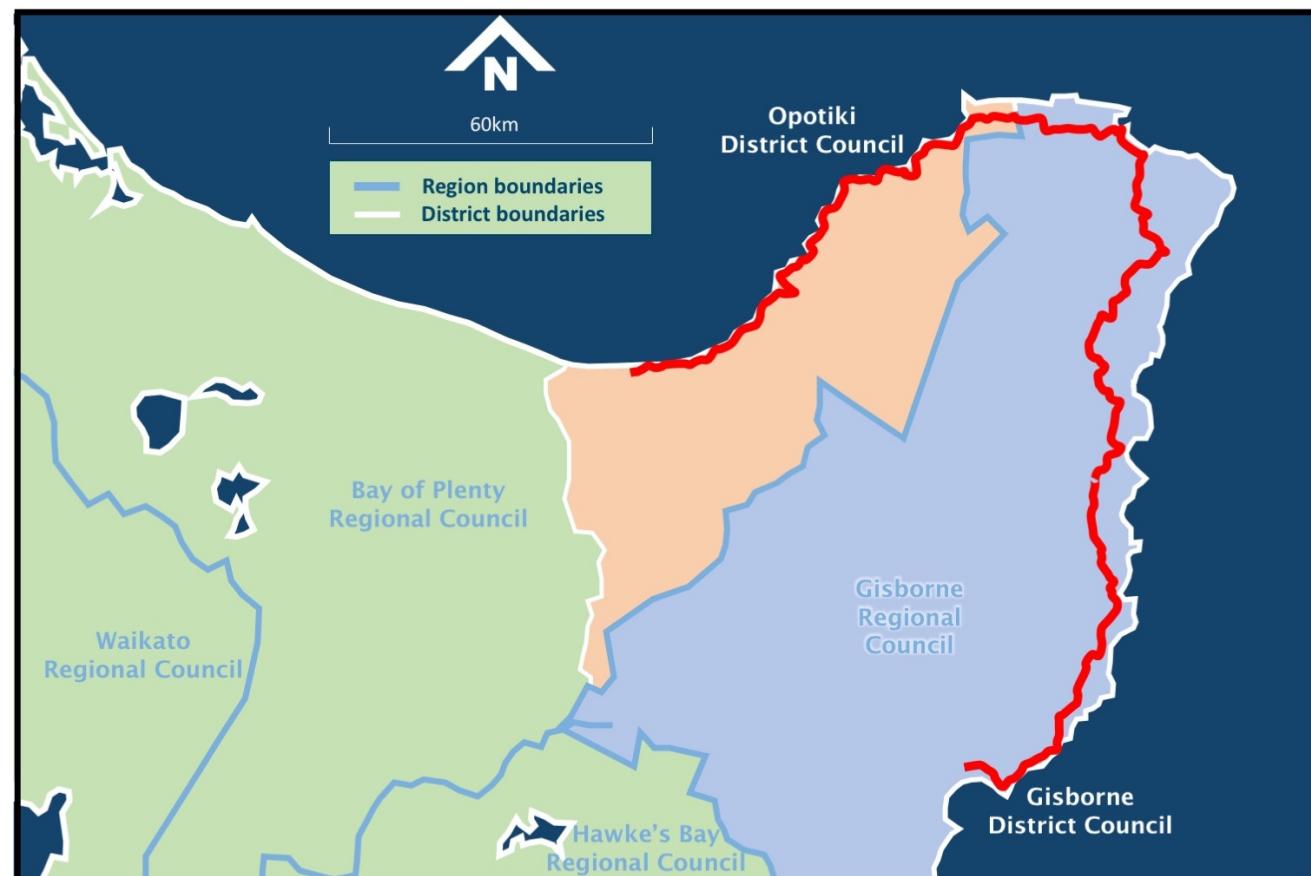
The land transport system comprises more than state highways. Providing customers with a reliable and safe journey usually requires the use of two or more transport infrastructure provider's networks. As such, we work with other network providers to deliver a one network approach.

On the Opotiki to Gisborne corridor, we work with the territorial local authorities (TLAs) and regional councils, shown in Figure 5.

## Collaboration along the corridor

Other transport partners include Ngāti Porou, Eastland Port, Tourism New Zealand, New Zealand Trucking Association, Road Transport Association New Zealand (RTANZ), New Zealand Automobile Association (AA), BoP Tourism, Tourism Eastland, and New Zealand Police.

Figure 5 - Map of associated local authorities



## Network Outcomes Contracts approach

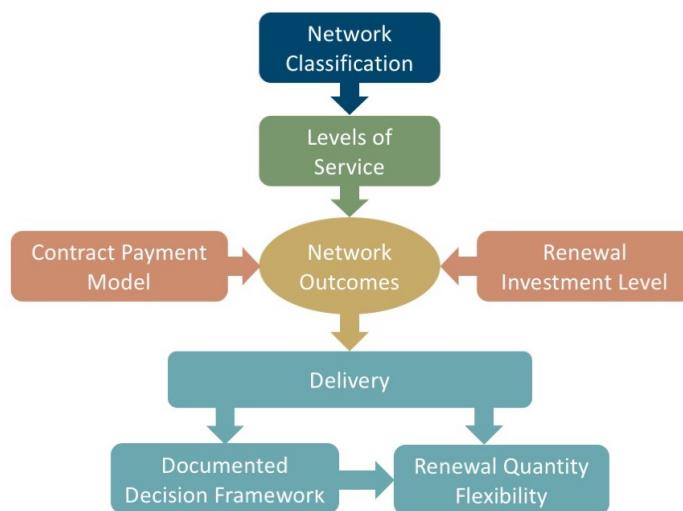
Network Outcome Contracts (NOC) are aimed at improving the effectiveness of service delivery for maintenance and operations of the state highway network. Elements of previous procurement methodologies (PSMC, Hybrid and Traditional models) have been integrated into the NOC contract model which delivers 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 contact documentation, and ensures a consistent application, understanding and implementation of the NOC delivery model.

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

The contract process for the NOC is shown below:

**Figure 6 - NOC process**



## One Network Road Classification

Under the One Network Road Classification (ONRC), the corridor is ranked as a Primary Collector, with a short section of Regional corridor between Gisborne and Matawhero (SH2). The NOC service delivery is tailored to the One Network Road Classification – the lower down, the less investment.

### Collaborative delivery of services

The Opotiki to Gisborne SH35 corridor crosses over two NOC contract areas as shown below. The boundary of the BoP contract areas covers Opotiki to Waihau Bay and the Gisborne/Tairawhiti District Council covers the contract for the district boundary near Waihau Bay to the end of the corridor at Matawhero and beyond.

### Bay of Plenty Network Outcomes Contract

The BoP East NOC was awarded to a partnership led by Higgins, in conjunction with Beca and BoP east contractors Waiotahi, Combined Roads and Traffic (CRTS) provide road-marking services. The contract began on 1 July 2014 and runs for seven years with a possible extension/reward of another two.

The NOC is supported by the following specialist maintenance contracts and supply arrangements:

- **Traffic signal maintenance:** Signals/ITS are operated by the Tauranga (City) Transport Operations Centre. All street lighting is managed separately by Rotorua Lakes Council and Whakatane District Council.
- **Regional bridge and structures:** There are separate BoP Regional Structures contracts (professional services and physical works managed separately).

### Gisborne Northern and Western Network Outcomes Contract

The Gisborne NOC contract is run by Services South East (SSE), under a five-year joint contract from the NZ Transport Agency and Gisborne District Council. This began on 1 October 2015, with a performance-based option of a two-year extension.

# Drivers for change

The Opotiki to Gisborne corridor caters for a variety of customers and the main driver for change is that demand has generally been stagnant to falling, however the need for a reliable and resilient corridor is expected to continue into the future.

## Economic growth and development

### East Coast (Gisborne and Hawke's Bay Regions)

SH35 is a vital link for supplies and industry for the Gisborne Region. Freight, including fuel, food, perishable goods and equipment supplies for the population and industry rely on the corridor, which suffers from regular closures and disruption from rockfalls, slips and flooding, restricting reliability of the corridor, business and community resilience.

With a generally aging population and decline of local residents, no significant change from current demand or use of the network is expected. The Regional Growth Programme was included in the East Coast Economic Potential Study released in 2014, with the main drive being to maintain an affordable road network in to the future, containing the asset base and looking to make operational efficiencies and cost reductions where possible. However, improved connections between suppliers and markets, corridor reliability and access to improved freight distribution may unlock existing corridor capacity, opening investment opportunities and potentially increase region wide opportunities.

## Priorities for action

The governance group identified the following shortlist of the highest-priorities to achieve growth in investment, incomes and employment in the region:

- Longer distance road network use is relatively small, with capacity available for increases in movements – possible encouragement of business expansion in the area with minimal local government investment.
- Interaction between cars and freight discouraging use – overtaking opportunities provided to reduce driver frustration – increasing LOS, business efficiency and customer satisfaction.
- Route security with unstable geological conditions mean the network is prone to closure during adverse weather events, with two closures lasting more than 48 hours in one year – minimising the effects will bring stability, confidence and potential investment to the region.
- Expected faster growth in employment in forestry and logging over the next decade before flattening and slightly declining over subsequent decades – bring short-term employment to the area along with potential maintenance issues

- Smaller declines in employment in livestock farming than has been the case, with less land conversion.
- Continued growth in meat processing employment based on existing business expansion and establishment.

### Bay of Plenty

SH35 through the Eastern BoP is a key connection for freight distribution from growers to fruit packing facilities near Opotiki, as well as dairy and timber processing facilities beyond the corridor. Notable horticulture crops include kiwifruit, apples and avocados, which require a reliable corridor to deliver produce to market along with good connections for forestry products.

The consented Opotiki Harbour Development will create 24/7 access to the harbour for larger vessels, allowing Opotiki to become a service and processing base for the aquaculture industry and other marine-related industries. Logistics and the movement of freight play an important role in the BoP and provide support for key industries.

## Focus areas

The focus area for SH35 is the extended network to Gisborne and SH2 south towards Hawkes Bay, as well as SH2 west of Opotiki towards Tauranga.

There are plans underway to reopen the Gisborne rail link, however these are in early stages of development.

## Implementation

The Ministry of Business, Innovation and Employment is working with property owners in Omaio to develop an irrigation scheme for kiwifruit, which is well suited to the growing conditions of the area. The other regionally important development is the Opotiki harbour development. Both of these projects will be locally beneficial but have minimal impacts to the majority of the corridor.

# Understanding customer levels of service on the corridor

## Current levels of service performance

The 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 CLOS for road users. With the knowledge of current CLOS experienced by customers, we can better target investment to meet future intended service levels.

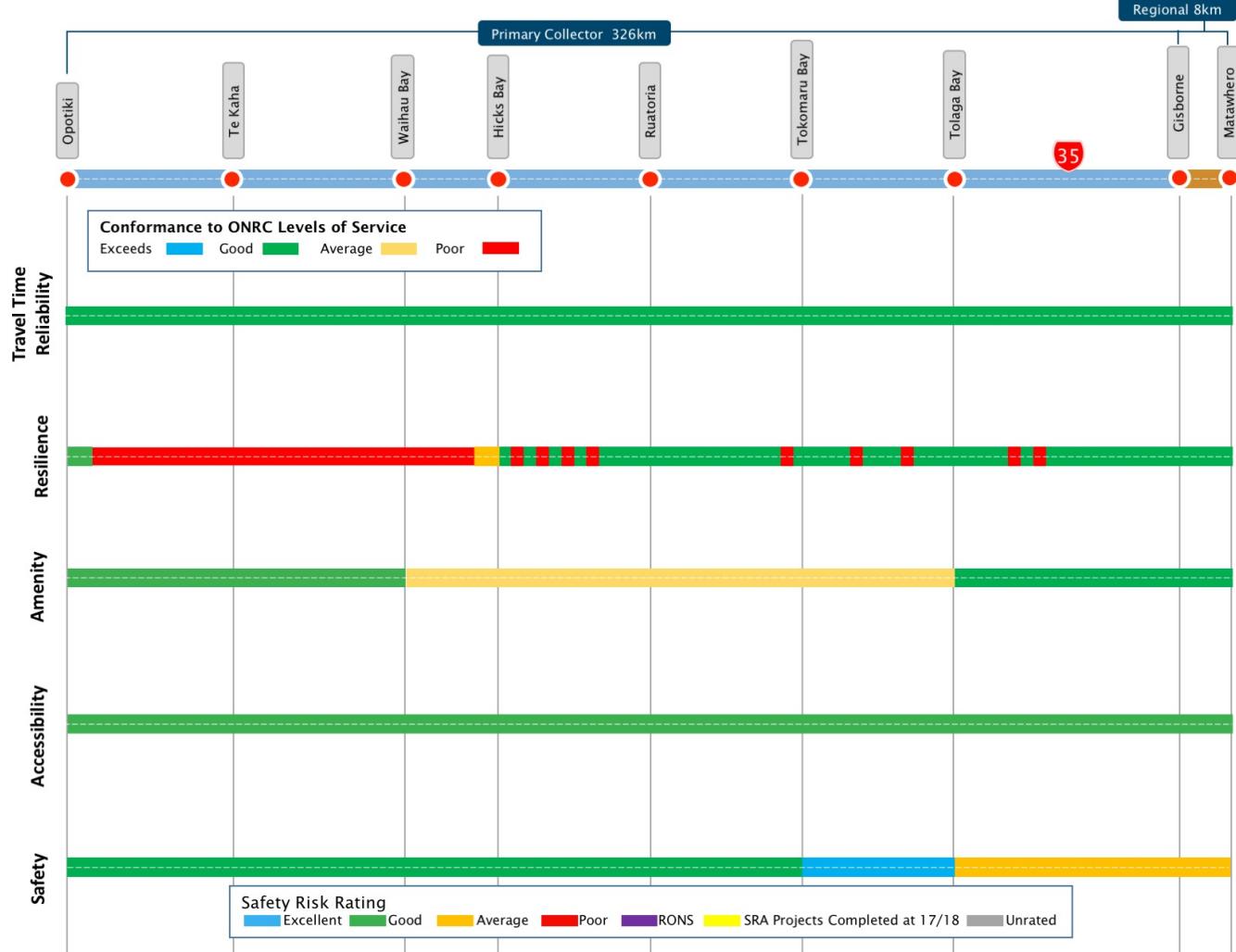
Overall, customers will be provided with the right level of road transport infrastructure where it is needed, determined by a robust, impartial, nationally consistent tool – the ONRC.

## Road classification

The corridor from Opotiki to Gisborne on SH35 is classified as Primary Collector up to Gisborne, continuing briefly up to SH2 as Regional Arterial.

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 Opotiki to Gisborne corridor is performing against the ONRC Levels of Service, as they relate to each of the three current classifications.

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

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

<b>Exceeds</b>	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
<b>Good</b>	The section of corridor generally meets the LOS requirements for the activity and ONRC
<b>Average</b>	The section of corridor meets some but not all of the LOS requirements for the activity and ONRC classification
<b>Poor</b>	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

The vast majority of the corridor is relatively free flowing. The busier sections on approach to Gisborne is where levels of service diminish slightly due to higher vehicle volumes and more intersections. This is likely to continue to have an average LOS when compared to other sections of the corridor. However, traffic flows are likely to remain low.

## Resilience

The majority of the corridor has a high level of resilience risk. There are no viable alternative routes should critical assets, such as single-lane bridges and the general road fail, or a major blockage occur along this section due to flooding, slips or landslides. The only realistic alternative route is via SH2 to the south in the event of road closures, which is a significant detour. The corridor is a critical lifeline for local communities and therefore paramount it is reopened as quickly as possible after a closure.

## Amenity

The general amenity of the corridor is a mix between average and good conditions. The road surface condition from Gisborne to Tolaga Bay is relatively good but is showing signs of subsidence in areas.

## Accessibility

Accessibility on the corridor has a good ONRC Levels of Service. The level of direct access on the corridor is in line with its classification as a Primary Collector for the majority of its length.

## Safety

The star rating of the corridor varies between 2 and 3-star. The high prominence of 2 star rated road segments can be due to roadside hazards, narrow sections and winding roads and sharp bends. The 2 and 3-star rating denotes major deficiencies in the road conditions. The road conditions contribute to the unforgiving nature of the corridor, resulting in a decreased safety performance.

There are several high personal risk sections along the corridor.

## Improving the customer experience

There are currently no identified major improvements along the corridor.

## Access

### Carriageway configuration

The majority of the corridor is the standard two-lane opposing with minimal passing lanes, as shown in blue on Figure 8. A large section of the corridor has been shown narrower than the standard width to highlight that the corridor is constrained. There are a few sections within Opotiki and Gisborne that have a painted central median.

### Speed limits

The majority of the corridor is 100km/h with small sections of lower speed limit through the townships the corridor passes through. The Opotiki end of the corridor ranges between 50km/h and 100km/h and the towns along the corridor range between 50km/h and 70km/h.

### Topography/geography

The topography of the route is fairly varied, with climbs and falls throughout, particularly along the BoP coast. There is a gradual climb through the middle section along the East Coast between Hicks Bay and Motokaru Bay before continuing with the undulating alignment to Gisborne. The section of the corridor between Hicks Bay and Ruatoria is relatively flat, however the vast majority of the corridor has very challenging driving conditions, including narrow road width, winding geometry, minimal stopping areas, and steep drop offs in close proximity. There are ‘out of context’ curves throughout the corridor, adding to driving difficulty.

The surrounding geography of the corridor also varies, with areas of flat rural pasture, coastal and peri-urban/urban environment, interspersed with steep sections of surrounding landscape. Wairau Bay, Ruatoria and Tokomaru Bay have generally steep terrain on both sides. The corridor has a concentration of urban environment around Gisborne with sporadic sections of peri-urban areas and rural areas between.

Figure 8 - 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 corridor contains a regular occurrence of larger radius curves. Sharper bends with a radius below 25m occur at Maraehako Bay east of Te Kaha and just south of Te Araroa.

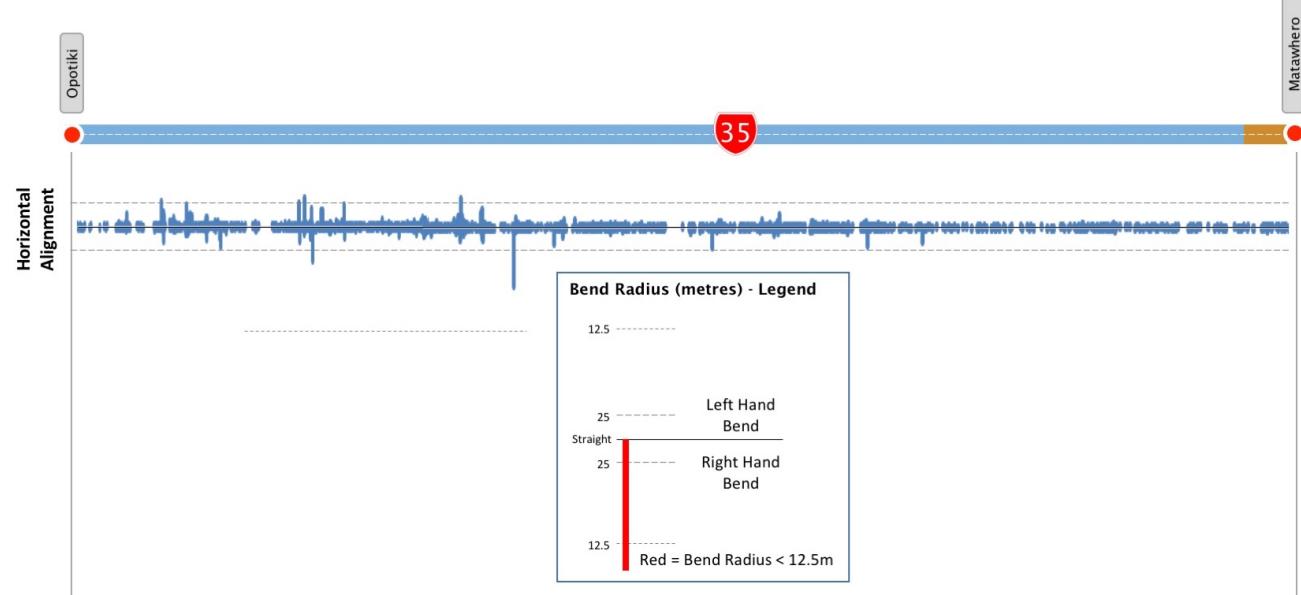
## Forestry access to the corridor

The East Coast forests are experiencing a "wall of wood". Peak productivity is projected to confidently continue for five to fifteen years with repeat planting expected to extend this further. Eastland Port is proposing to double its log ship berthing facility to meet the additional production.

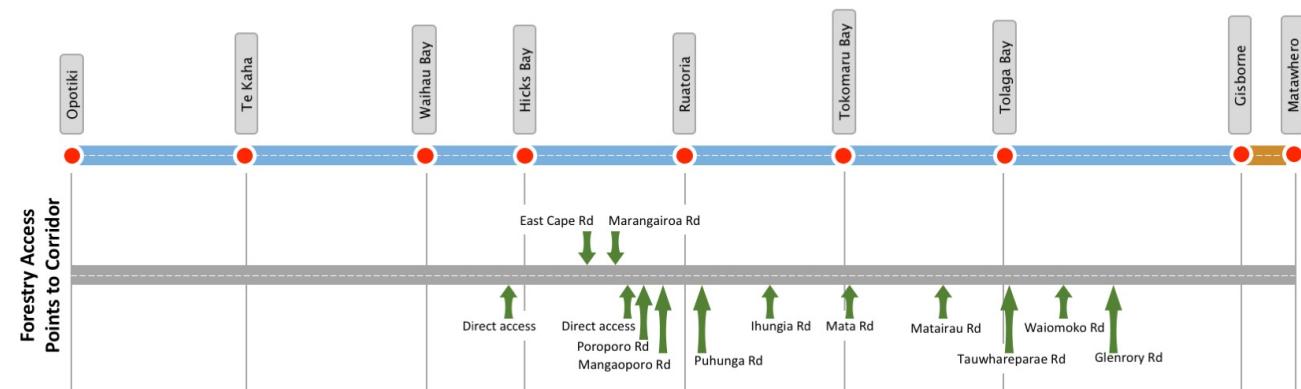
There are many active harvesting areas in multiple ownerships with forests currently coming to maturity. They access the winding coastal SH35 highway corridor both directly and via local side roads. They all use SH35 to deliver their product to Gisborne.

The absence of an HPMV capable network is noted as an impediment to greater productivity. The monitoring station at Wainui Beach indicates that vehicle loading regularly exceeds permissible levels.

**Figure 9 - Horizontal alignment**



**Figure 10 - Forestry access to the corridor**



## Volumes

Traffic volumes are generally around 2,000 vehicles per day for the majority of the corridor, dropping as low as 300 in areas. The section on approach to Gisborne up to Matawhero has the highest concentration of traffic for both heavy vehicles and all vehicles. The road configuration remains consistent throughout the corridor between Tolaga Bay and Matawhero, where two lanes are available.

## HPMV routes

The majority of the corridor between Opotiki to Tolaga Bay is not suitable for HMPV vehicles due to the high limits of HMPV requirements. The section between Tolaga Bay and Matawhero has full access with no strengthening required, with several HPMV rated local roads accessing this section.

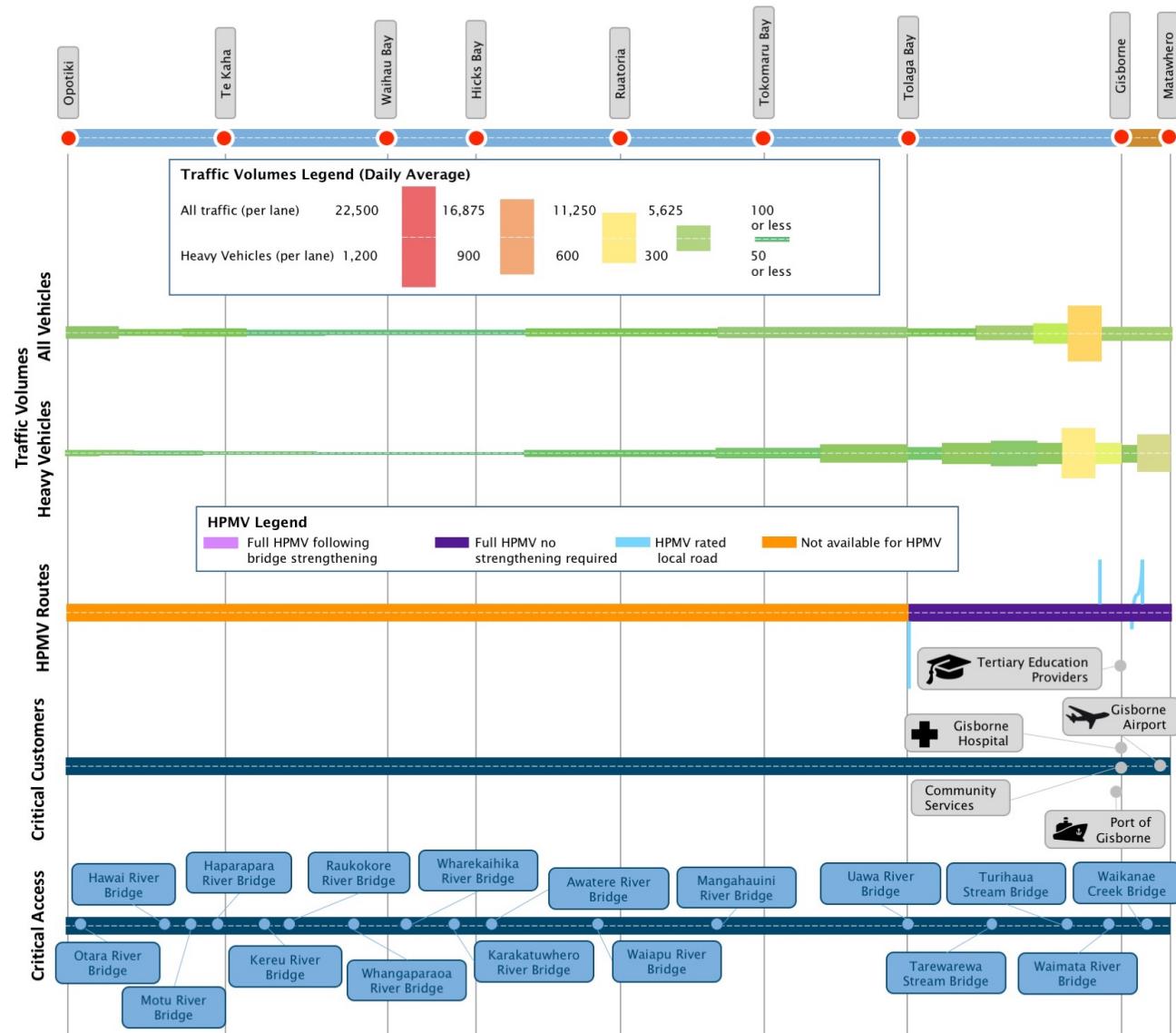
There are also potential issues in allowing longer vehicles on routes with narrow lane widths and winding terrain, in terms of being able to keep vehicles within the lane.

## Critical customers and assets

There are a number of critical customers adjacent to or near to the corridor which rely on the corridor to be fully operational, and are vulnerable to having interruptions which impact productivity and security. This includes Gisborne Hospital, Eastland Port and Gisborne Airport, as well as tourism, forestry plantations, emergency services, education and local communities.

The dominant feature of this corridor is its vulnerability and exposure to flooding from watercourses and the coast, which often damages critical assets along the corridor. The main critical assets are single-lane bridges requiring an enhanced maintenance focus to ensure they do not fail or significantly interrupt services. The Awatere River Bridge, Whangaparaoa River Bridge, and Waiapu River Bridge are key critical assets, along with a number of other single-lane bridges throughout the region due to their vulnerability and the potential disruption to the region.

**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:

- **Physical constraints:** These can limit HPMV and over dimension access, impacting journey times particularly between Opotiki and Tolaga Bay. At present, this is constrained by a number of small bridges with weight limits and out of context' curves. This can impact the movement of goods to local communities and forestry and timber products to the Port of Tauranga and Eastland Port.
- **Narrow carriageway:** Sections of the corridor that narrow to less than a two-lane width, including single-lane bridges, can create choke points which impact journey times, especially if traffic volumes grow. The two-lane opposing section of the corridor between Te Kaha and Tolaga Bay can cause problems and delays due to few passing opportunities.
- **Increasing heavy vehicle volumes:** There has been a general decline of population in the Gisborne Region. Growth is projected in the timber/forestry industry for several years before declining again. This will have greater impact on the corridor with increased freight vehicle movements, but could also have some detrimental impact on potential tourism growth.
- **Local resident needs:** Access to the corridor is vital for communities to supply and access local services including education, healthcare, emergency services support, fuel and day to day supplies.
- **Maintenance access:** Maintenance of some sections of the corridor require high levels of planning and co-ordination, particularly around the East Cape, often at a higher establishment and implementation cost. These may require full closures for periods of time.

## Future considerations

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

- **Maintenance strategy:** Any works completed through the areas of severe disruption will require careful consideration of the time of day, duration of the works and the extended network impacts and possible outputs.
- **Emergency response planning:** The topography makes it difficult for road based emergency response to attend an area in an emergency. Provision of landing sites for helicopters can improve an emergency response, particularly between Te Kaha and Tokomaru Bay. Strategies should be formulated for lengthy closures.
- **Strategy for forestry:** Other regions have a programme of forestry clearance to inform in advance local maintenance requirements of the road network and forward plan for upgrades. There is some risk associated with this as programmes can change as the market price of timber fluctuates.
- **HPMV access:** The section of corridor between Opotiki and Tolaga Bay is not available for HPMV access. No investment is currently planned in this area, limiting the possibilities and performance of freight throughout both the BoP and Gisborne Regions.



## Resilience

The corridor is a vital link for local communities and industries between the BoP and Gisborne Regions.

It is also vital produce to be distributed to key processing locations outside the region, as well as connections to Eastland Port for international trade, providing employment, income and wealth to the region.

### Vulnerabilities

The corridor is susceptible to flooding for the majority of the East Coast on the eastern side, along with wandering stock, rockfalls and slips on the western side. Strong winds are experienced more along the BoP coast, and rockfalls occur throughout. Slips are the main concern as they can cause disruption for several days. The area is also seismically active with frequent small earthquakes and land movement, exacerbating the potential for the above vulnerabilities.

### Alternative routes and diversion lengths

The only realistic diversion route for SH35 is SH2 to the south. The corridor is a crucial link for the regions' businesses for economic sustainability should a catastrophic event, such as an earthquake, occur in the area. The diversion length is significant and could be greater as SH2 is likely to experience similar impacts from such an event. Businesses may have to deliver produce to other markets/distribution centres, utilising Eastland Port in Gisborne.

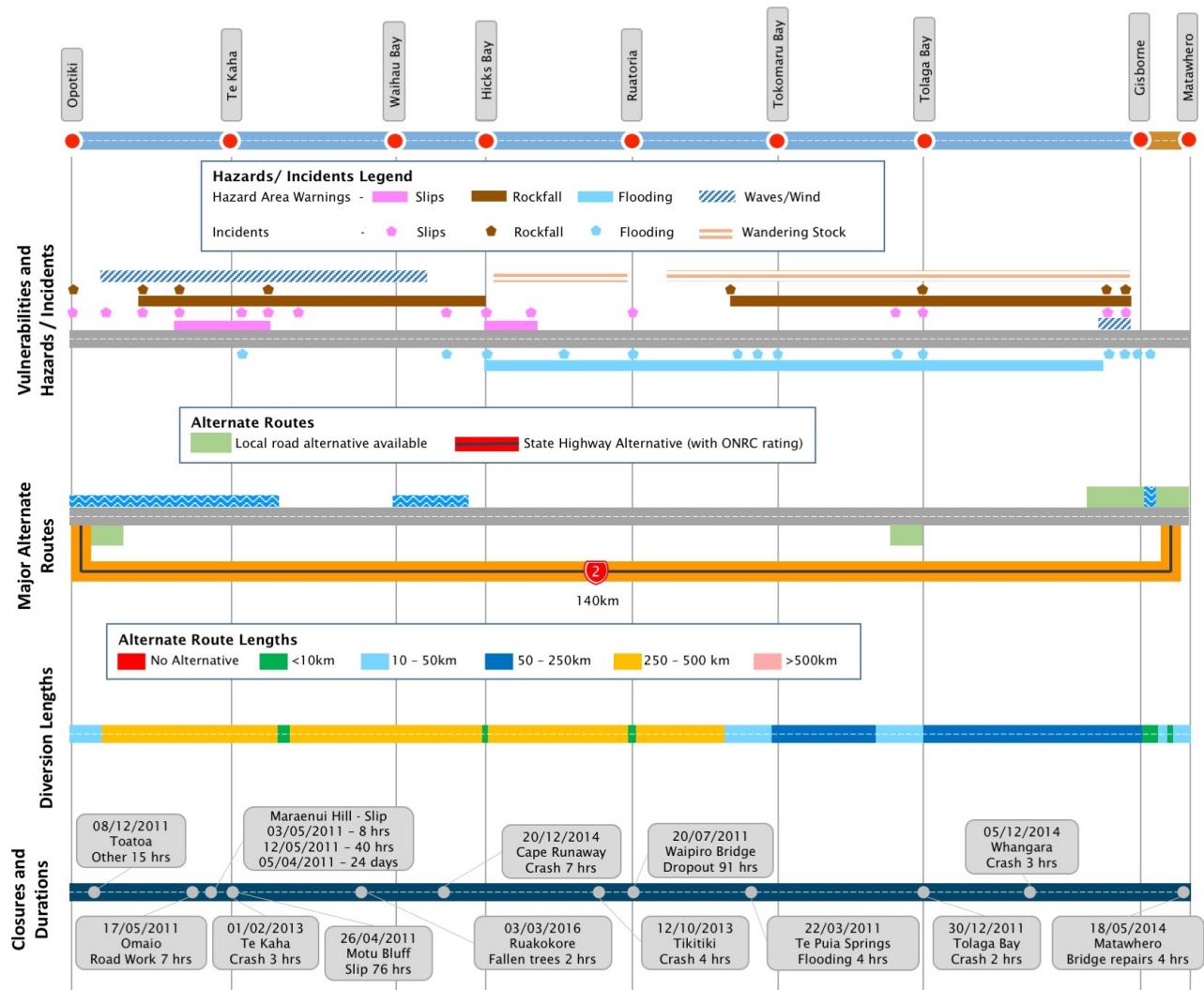
In the event of a closure due to weather conditions, it is common for multiple locations to be blocked simultaneously, preventing any freight from being distributed through the area.

### Closures and duration

The major unplanned road closures and duration of interruption along the corridor in the last five years are shown in Figure 12.

Over the past five years, there have been five major unplanned road closures with the longest being 578 hours (Maraenui Hill - 24 days) as a result of slips in Opotiki and Te Kaha. There was one other notable slip recorded in 2011 nearby a week later at Motu Bluff for 78 hours. The other large disruption recorded in the same year was the Wainiro Bridge dropout, causing a 91-hour closure.

**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:

- **Weather induced events:** The corridor is susceptible to flooding, slips, rockfalls and wind/waves that frequently result in temporary restrictions and/or closures, at times for long periods.
- **Topography and geology:** With unstable geological conditions and a steep and winding topography in parts, slips and rockfalls are common. The experiences seismic events which affect stability. This combined with weather events increases the risk of closure from slips and rockfall.
- **Limited alternative routes:** The only alternative route between Opotiki and Gisborne is SH2 to the south. There are no alternative modes of transport. There is a high dependence on the corridor and its critical assets, including the Awatere River Bridge, Whangaparaoa River Bridge, and Waiapu River Bridge, for the movement of goods, including forestry and timber products, perishable produce, as well as access to critical services for residents, including Gisborne Airport, Eastland Port and Gisborne Hospital. The forestry and timber, and produce (fruit) industries rely on the corridor being available to send products to market and maintaining a sustainable business.
- **Emergency response:** The steep and winding topography of the corridor can cause driver pressure and potential for error. It can also increase the time for emergency services to attend and clear the site when crashes and other weather induced events occur. Mobile coverage is poor in the Eastern BoP between Opotiki and Hicks Bay, in some cases delaying notification of events and lengthening emergency services and maintenance response times.

## Future considerations

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

- **Monitoring of vulnerable areas:** Identification of high risk areas on the corridor, or triggers off the corridor, could be monitored more frequently, possibly in real-time. This would provide earlier warning of potential events, enabling proactive management measures to be considered, including maintenance responses and signage at appropriate locations to inform customers.
- **Improved mobile phone coverage:** Working with telecommunications customers to improve mobile communications will help provide real-time information or staged investment in readiness of first responder personnel and equipment, focussing on the most vulnerable areas at the most critical times. It will also enable residents living in remote areas to connect with emergency services to ensure they are safe.
- **Emergency response planning:** With the area subject natural events, including the risk of seismic events, emergency response planning is important. The likelihood of a seismic event is increasing along with demand and reliance on the corridor. Investment in alternative routes, improved and new assets on the corridor capable of withstanding an event will help minimise the impacts. Provision of landing sites for helicopters particularly towards more remote areas including Waihau Bay at the eastern end of the Eastern BoP can improve an emergency response time and outcome.
- **HPMV improvements:** Upgrading the corridor to full HPMV capability will open opportunities at Eastland Port, with increased national and international trade and an alternative to Napier Port.
- **Improved communications:** New and improved warning measures including real time information allow for improved journey planning for all customers. Providing information relevant to enable decisions is also important, such as understanding the location and nature of a closure. At times, it may be quicker to wait for works to be completed than to drive the detour.
- **Developing a higher quality asset:** With increasing severe weather events and high risk of nature events closing the corridor, measures such as rock fall protection netting in vulnerable areas and investment in drainage maintenance in areas susceptible to flooding will improve resilience. Maintaining or developing a higher quality asset, with greater resilience, longer life, and lower maintenance requirements will ensure ongoing accessibility for local industry, local communities, tourism, potential development and possible population expansion.

## Reliability and efficiency

### Efficiency

A large proportion of the corridor performs quite poorly with a LOS D and E throughout between east of Opotiki and east of Tokomaru Bay. This improves as the corridor approaches Gisborne. Some sections around the urban centres, sharp bends and single-lane bridges have an impact throughout the day, particularly between Te Puia Springs and Ruatoria. Despite the data suggesting that the corridor has a LOS D and E through much of corridor, local staff consider the corridor has a higher efficiency, particularly between Ruatoria and Tokomaru Bay. This requires further study. The efficiency from Tolaga Bay to Gisborne is good throughout the day with a minor LOS reduction during the inter-peak.

### Variability

The only section of the corridor with variability information is between Gisborne and Matawhero where there is an expected high variability in the urban area due to higher vehicle volumes than average during peak hours and low traffic volumes at all other times. Based on discussions at the workshops held as part of the CMP development, it is likely that the majority of the corridor has medium to high variability.

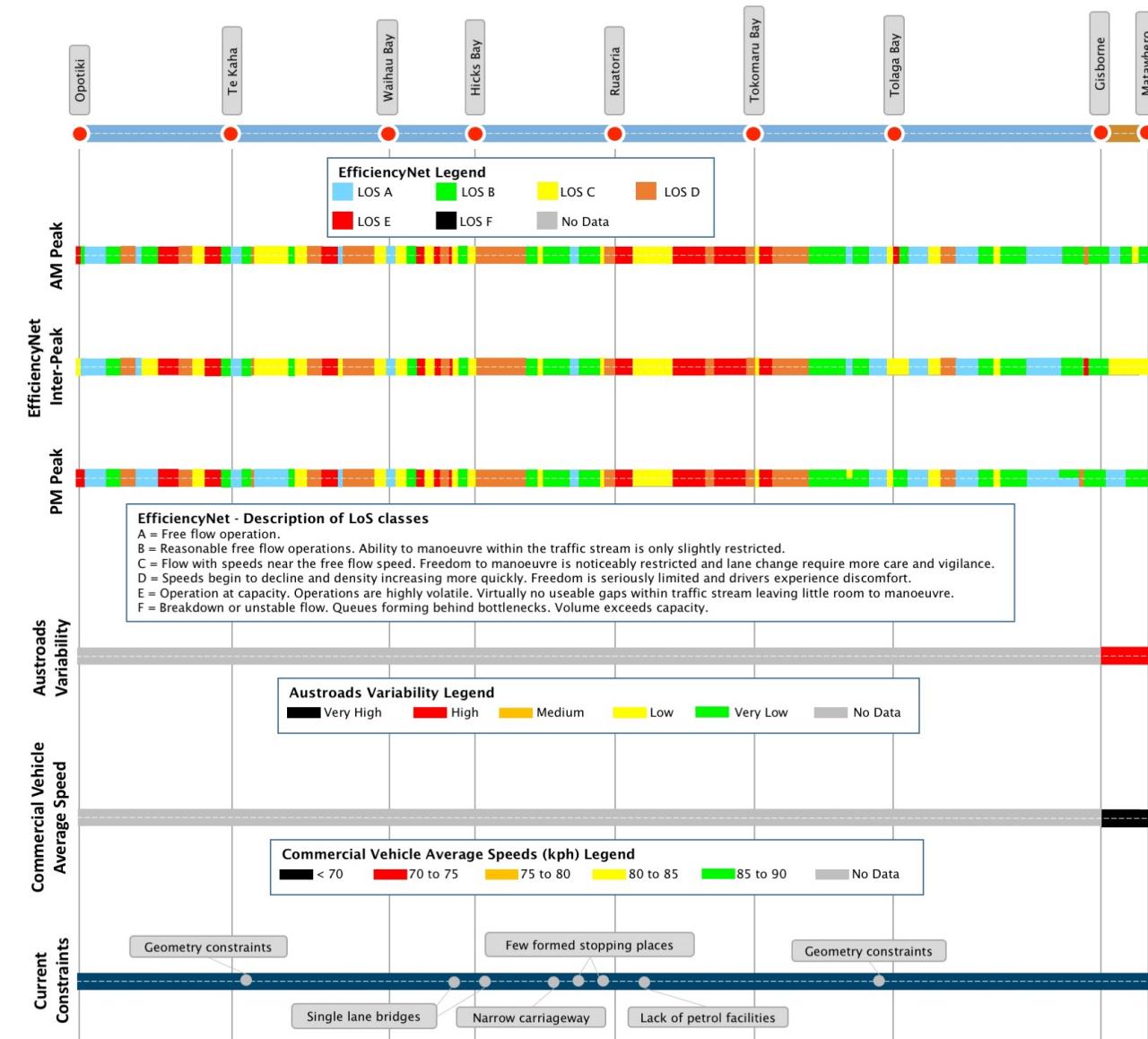
### Commercial vehicle average speed

Data is limited along the corridor but the Gisborne to Matawhero section has less than desirable commercial vehicle average speed of <70kph. This is expected with more delay and higher traffic flows near Eastland Port and the Gisborne town centre. Based on discussions at the workshops, average speed is likely to be less than 70kph for large sections of the corridor, with higher slower speeds between Gisborne and Tolaga Bay.

### Current constraints

The major constraints tend to be due to single-lane bridges, weather extremes, such as flooding, and the effects of rockfalls and slips. A more recent constraint and concern is seismicity, which will be an ongoing concern and potential serious risk for disruption.

Figure 13 - Reliability and efficiency



## Pressures

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

- **Speed restrictions:** Towns generally require an appropriate reduction in travel speed to suit the surrounding environment and users. This speed change results in travel time delay, but increases general safety for pedestrians and drivers in the centres.
- **Access for maintenance:** Opportunities for maintenance are generally limited to the summer months when corridor demand is high. The topography of sections of the corridor also suggest that more robust treatments are required to ensure a continuity of service.
- **Single-lane bridges:** The Awatere River Bridge, Whangaparaoa River Bridge and Waiapu River Bridge can delay traffic impacting efficiency.
- **Limited passing opportunities:** The steep and winding topography of the corridor limits certain vehicles to lower speeds that posted or capable by other drivers and vehicles. With limited overtaking and passing opportunities, the reliability and efficiency of the corridor is compromised.
- **Conflicting customer demand:** The corridor and its neighbouring infrastructure is affected by tourist traffic. Traffic on the Gisborne section of the corridor brings delays to freight and other key services, particularly on the winding sections, as well as reduced travel times through lower speeds, less familiarity and lower confidence levels.

## Future considerations

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

- **Review data:** Local staff feedback has been that the LOS shown by EfficiencyNet is not comparable with local experience. Further study and investigation is required to confirm the current Level of Service.
- **ITS management:** Use of ITS to manage flow is increasing. Reliance on real-time information dissemination to customers will become more important as traffic volumes continue to grow. The supporting infrastructure will need to be maintained and grow with public acceptance and increasing expectations in areas of higher volumes of traffic (Gisborne) and those more prone to closure (Eastern BoP).
- **Maintenance programme:** A strategy for maintenance will minimise disruption for residents and business. Full closures, rolling partial closures with reduced operating speed, longer life treatments, or less maintenance with the acceptance of lower quality/more faults during the lifecycle, are all options to manage maintenance more effectively.
- **Improved passing opportunities and slow vehicle lanes:** Investment in passing and slow vehicle lanes, and replacement of single lane bridges will improve the operation and experience for all customers.

## Safety

### Collective risk

The level of collective risk across much of the corridor is low with small pockets of medium-low risk. There are three segments of medium risk: one immediately north of Tolaga Bay and two between Tolaga Bay and Gisborne.

### Personal risk

The level of personal risk shows significant variation across different parts of the corridor. There are multiple sections of medium-high and high risk through the middle of the corridor and around Waihau Bay and Ruatoria.

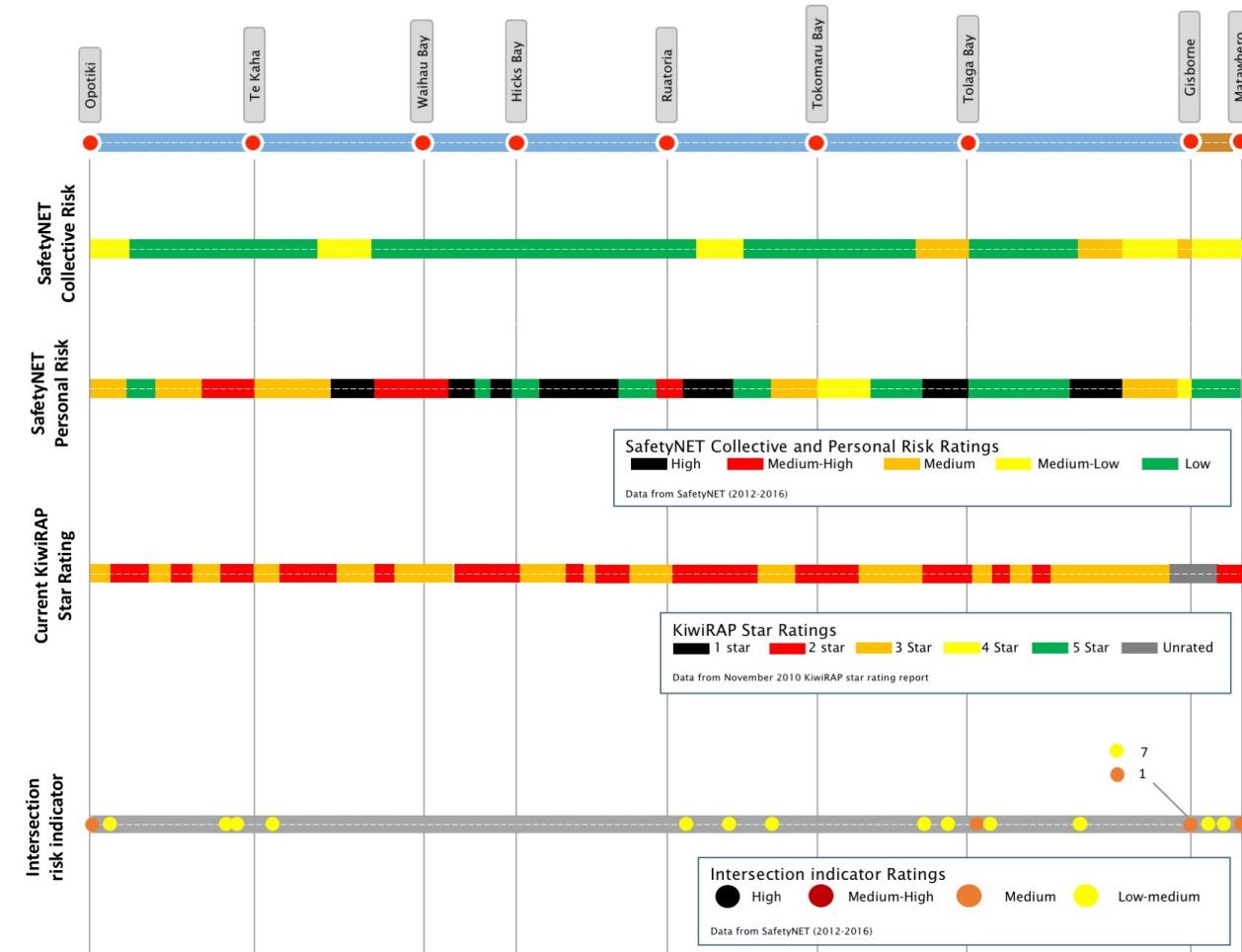
### Star rating

The star rating for the entire corridor varies between 3 and 2 star, with the exception of the Gisborne end of the corridor which is currently unrated.

### Intersection risk indicators

Intersections within the corridor predominantly have a low to medium-low risk rating. There are four medium risk intersections across the corridor, two of these intersections are located where SH35 intersects SH2 at Opotiki in the north and Matawhero in the south.

Figure 14 - Safety



## Pressures

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

- **Lack of safety based assets:** There is limited use of 'safe systems' design features including wire rope barriers, improved visibility at intersections and turning lanes.
- **Speed limits near community facilities:** There are a number of schools and maraes along the corridor, which directly adjoin the corridor. Speed reductions are typically in place outside schools and maraes located in centres, such as Opotiki and Gisborne. However, some do not have speed reductions on the corridor adjoining them, including Raukokore School and Whitianga Marae near Omaio, which adjoin a 100km/h speed limit area. This is a safety risk for children, parents and the local community walking alongside and near the corridor, as well as accessing the corridor by vehicle.
- **Driver fatigue:** The corridor only has a few locations suitable to pull over and rest, either formal or informal. This puts drivers at risk of fatigue.
- **Community behaviours:** There are driver behaviour issues including drink/drug driving, driving without a license, un-roadworthy vehicles and speeding.
- **Limited passing opportunities:** Short passing/slow vehicle lanes and long winding sections of road lead to vehicle platoons that cause driver frustration and potential safety issues, particularly in the summer months with higher numbers of tourists and recreational visitors.
- **Topography and road geometry:** As the road geometry is narrow and winding, it is an unforgiving corridor, which makes drivers susceptible to easily make mistakes.
- **Touring motorists:** The natural and rural highway landscapes are attractive to motorcyclists and motorists who desire a challenging journey. With low vehicle volumes and winding roads some customers take a more comfortable driving trajectory, i.e. cutting corners and overtaking with restricted visibility, particularly along the Eastern Bay of Plenty and south of Tokomaru Bay.

## Future considerations

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

- **Safety improvements programme:** Improvement to high risk areas may include road realignment in crash hot spots, including reduced out of context curves throughout the corridor. Other improvements may include Variable Message Signs (VMS) before high risk areas to warn motorists on approach (particularly between Opotiki and Tolaga Bay), and speed management outside schools and maraes. Extending and adding new passing lanes/slow vehicle lanes, particularly on the sections of the corridor between Te Kaha and Tolaga Bay where driver frustration is higher will help minimise unsafe passing manoeuvres.
- **Stopping areas:** Consider providing rest areas, pull over areas and encouragement for refreshment breaks where possible to allow for drivers to rest, particularly in or near to sections of corridor known for driver fatigue related crashes. This will help improve general safety of the corridor, provide business opportunities for more remote areas and create a positive user experience along the corridor.
- **Community education:** Work with other agencies, including marae, to provide training and education programmes to residents about road safety behaviours and vehicle safety. Road safety messaging could be included in other education programmes, such as literacy, etc. Use locals in advertising and programmes to make them more relevant to locals. Introduce short training programmes to local employers to develop a road safety culture.
- **Speed limit review:** Review speed limits, particularly those in sections of the corridor adjoining schools and maraes.

## People, places and environment

### Natural environment

The key natural environment feature is the coastal highway landscape, particularly on the BoP section up to Waihau Bay. The corridor tends to be more inland from this point but still follows close to the coastline. There are large sections running through natural highway landscape forming an attraction for tourists, as well as rural highway landscape beyond. This is supported by relatively large sections of major reserve area/conservation land and Department of Conservation (DoC) public conservation area, adding to the attraction for tourists.

There are many streams and major river corridors crossing the road corridor.

### Noise, vibration and air quality

Noise and vibration issues are only experienced to some extent close to the more populated areas of Gisborne and Opotiki. Noise and vibration issues have been reported at Wainui campground which adjoins the corridor near Matawhero.

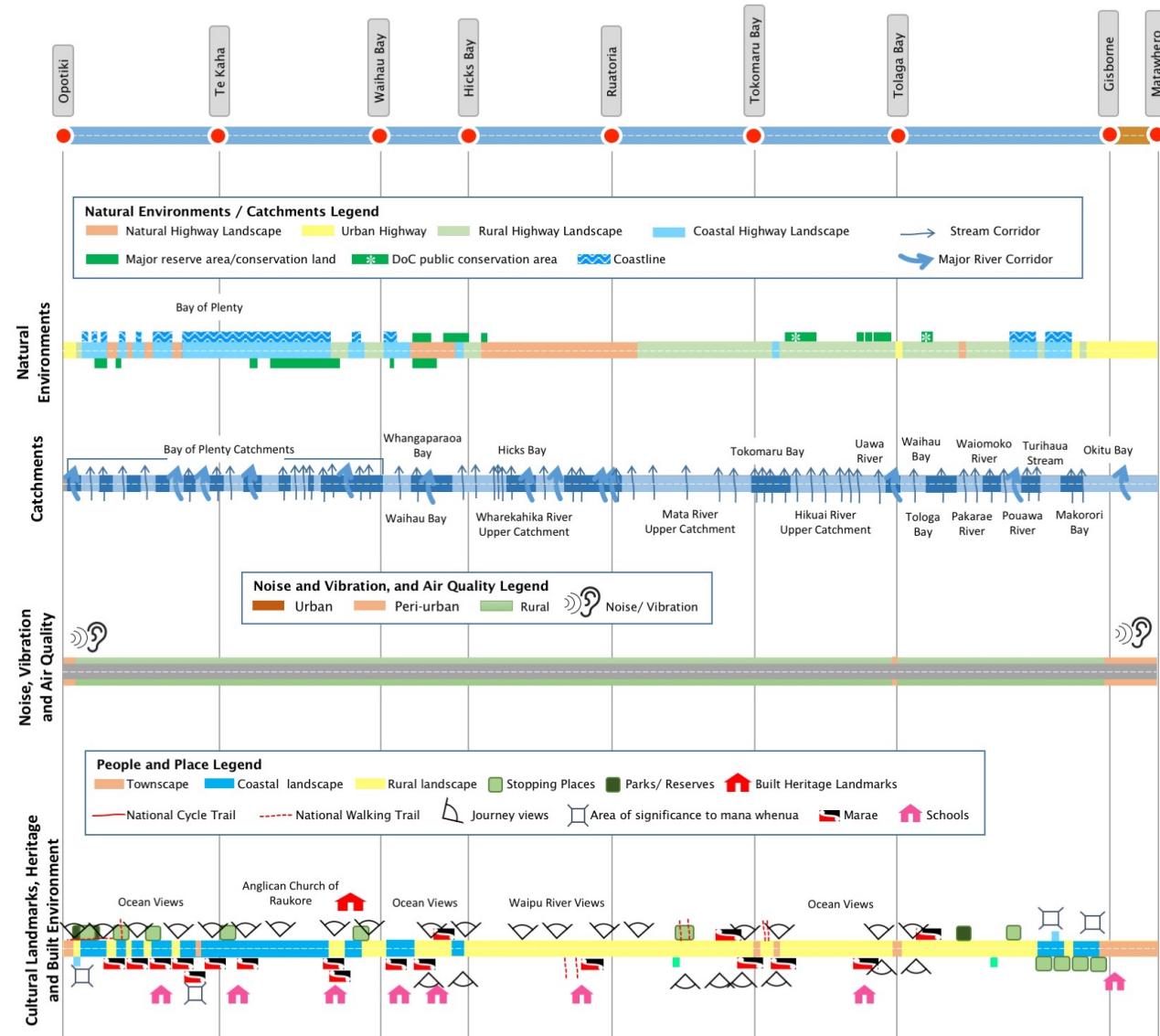
### Cultural landmarks, heritage and built environment

The cultural landmarks and heritage of the area largely reflect the Maori culture. There are a number of maraes along the corridor, although not all highlighted on Figure 15, which directly adjoin the corridor. Some of these maraes are located adjoining 100km/h posted speed limit areas, which is a safety concern for vehicles accessing the site on and off a high-speed corridor. Similar concerns are held for a number of schools located along the corridor, some of which also adjoin 100km/h speed limit areas.

There are regular scenic views throughout highlighted in Figure 15, however there are few stopping places provided, potentially causing problems for drivers, being distracted and having limited opportunities to stop.

The BoP are promoting cycle tourism, with the Motu Trails proving popular with visitors. Additional trails are likely to be developed in future.

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:

- **Flooding:** Along the east coast From Hicks Bay to Gisborne there is a general flooding risk with regular streams and rivers flowing through the corridor. Increasingly frequent severe weather events could increase the risk of erosion, subsidence and degradation of rocks, soils and slopes within and alongside the corridor, particularly in already susceptible sections. The frequency and intensity of flooding could also increase. The management of these risks is likely to require engineering controls and the use of vegetation, particularly in highly exposed areas, such as coastal sections.
- **Ecological connectivity:** Increasing connectivity across the corridor between habitat areas is an outcome increasingly sought by councils and DoC to assist in biodiversity maintenance and will need to be considered in vegetation management programs, particularly between Waihau Bay and Hicks Bay;
- **Pest management:** Pest removal is growing in political, social and economic importance, requiring collaboration with charities, DoC, volunteers and other national groups. Replanting of areas raises issues for maintenance and general safety for workers involved. Greater emphasis on pest control and eradication is likely in the future, requiring bait stations and traps in easily accessible areas as well as pest plant control in grit and other introduced materials.
- **Management of structures:** The complex range of cultural heritage places and landmarks throughout the corridor are subject to incremental damage, through both corridor management activities and environmental changes. Some of these places, such as those in Opotiki and Gisborne, may require management plans with ongoing compliance obligations and specific corridor treatments. Additional investigations and management of impacts on these features may be required.
- **Improved relationships:** Acknowledgement of iwi/mana whenua relationships is increasing along with their input to the management of heritage assets and landscapes. The number of features and locations of importance to iwi along the corridor is expected to increase and these will need to be considered in corridor management and development opportunities.

## 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:

- **Signage:** Engine breaking signs and speed reduction measures at community gateways, interactive signage, corridor width reduction etc., to reduce vibration and noise impacts on communities along the corridor.
- **Electric infrastructure:** The increase of electric vehicles requiring infrastructure for charging at key locations and popular destinations including cultural landmarks and the built environment on the corridor. A strategy for investment in charging infrastructure may be necessary to ensure customer needs are being met.
- **Strategy for stopping places:** There are opportunities to improve the user experience along the corridor with stopping places, cafes and services, particularly at landmarks and tourist attractions. Review existing stopping places to ensure they are in the right places and have the right facilities. This, combined with roadside vegetation control, will provide greater amenity, improve the journey experience and support other government investments (e.g. those made by the Department of Conservation)
- **Community education:** Work with other agencies, including marae, to provide training and education programmes to residents about road safety behaviours and vehicle safety. Road safety messaging could be included in other education programmes, such as literacy, etc. Use locals in advertising and programmes to make them more relevant to locals. Introduce short training programmes to local employers to develop a road safety culture.



Cyclist on SH35

# Understanding the infrastructure assets

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

## Corridor asset base

The state highway system is a significant national asset, made up of 11,412 km of roads and associated assets. This corridor contributes approximately 335 km of road network which reflects 2.9% nationally. The total value of the assets along the corridor is \$403M (excluding ITS, and, heritage and green assets).

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

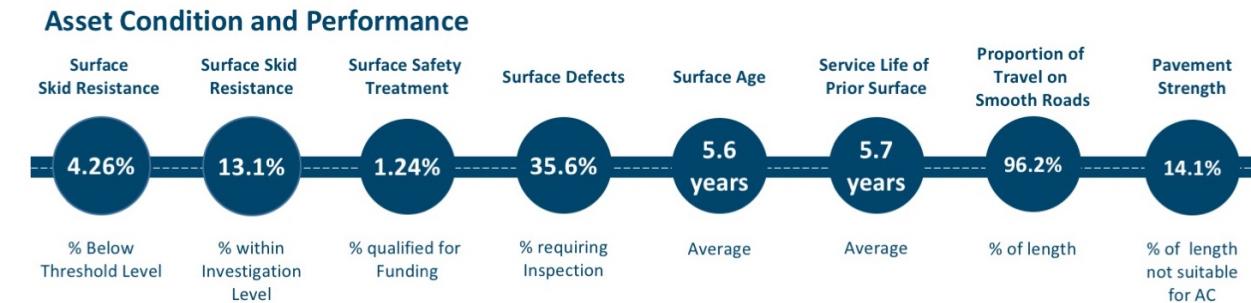
## Asset condition and performance summary

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

Figure 16 – Corridor asset base



Figure 17 – Summary asset condition and performance



## 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.

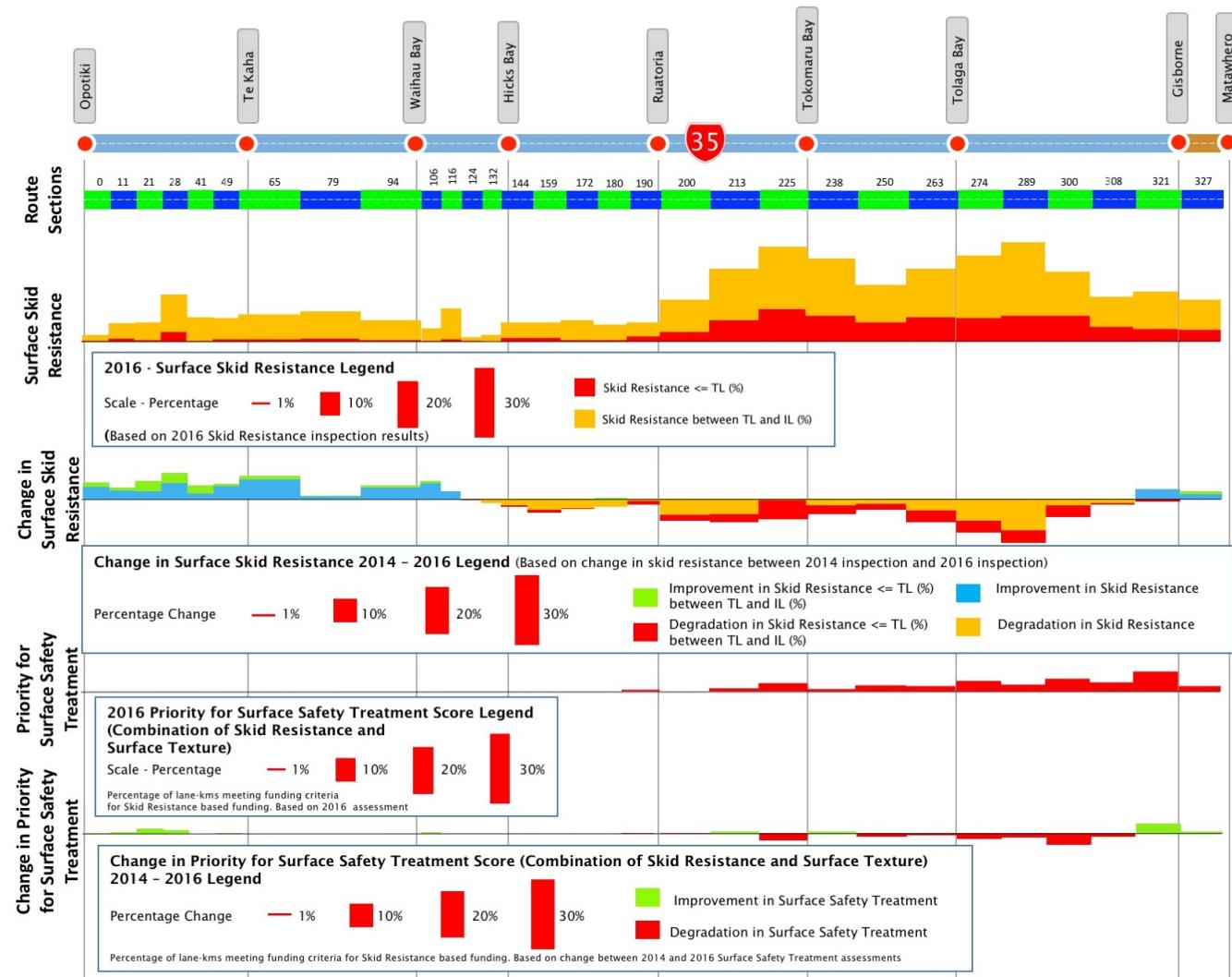
There are three distinctive areas of surface skid resistance results. Between Opotiki and Hicks Bay, SH35 RS0 to RS124 results have improved and this is attributed to a change in aggregate source. The second area, SH35 RS 124 to RS190, has a small portion within the investigatory level, with a trend of ongoing degradation. From Ruatoria to Gisborne, SH35 RS200 to RS321 significant portions of surface skid resistance are within the investigatory level, below the threshold limit and with ongoing degradation.

### Priority for surface safety treatment

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

Taken from inspection data that is normally recorded every 100m in each direction. Each 100m assessment length is rated and if it achieves a score over 140 it qualifies for funding. The proportion is then the length of route section that qualifies for funding as a percentage of the total length of that section. There is an 8.8 lane-km length of the corridor that qualifies for surface skid resistance based funding and it is all located on the East Coast Ruatoria to Gisborne portion of the corridor. The highest percentages are located between Tolaga Bay and Gisborne, although one section has shown an improvement, SH35 RS 321.

Figure 18 – Asset condition



## Surface defects

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

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

More than a third of the corridor has visible surface defects requiring inspection. The worst are at Tokomaru Bay, RS225 and 238, around Waihau Bay, RS116, and west of Te Kaha, RS28, where as much as 70% of the sections have defects.

## Surface age

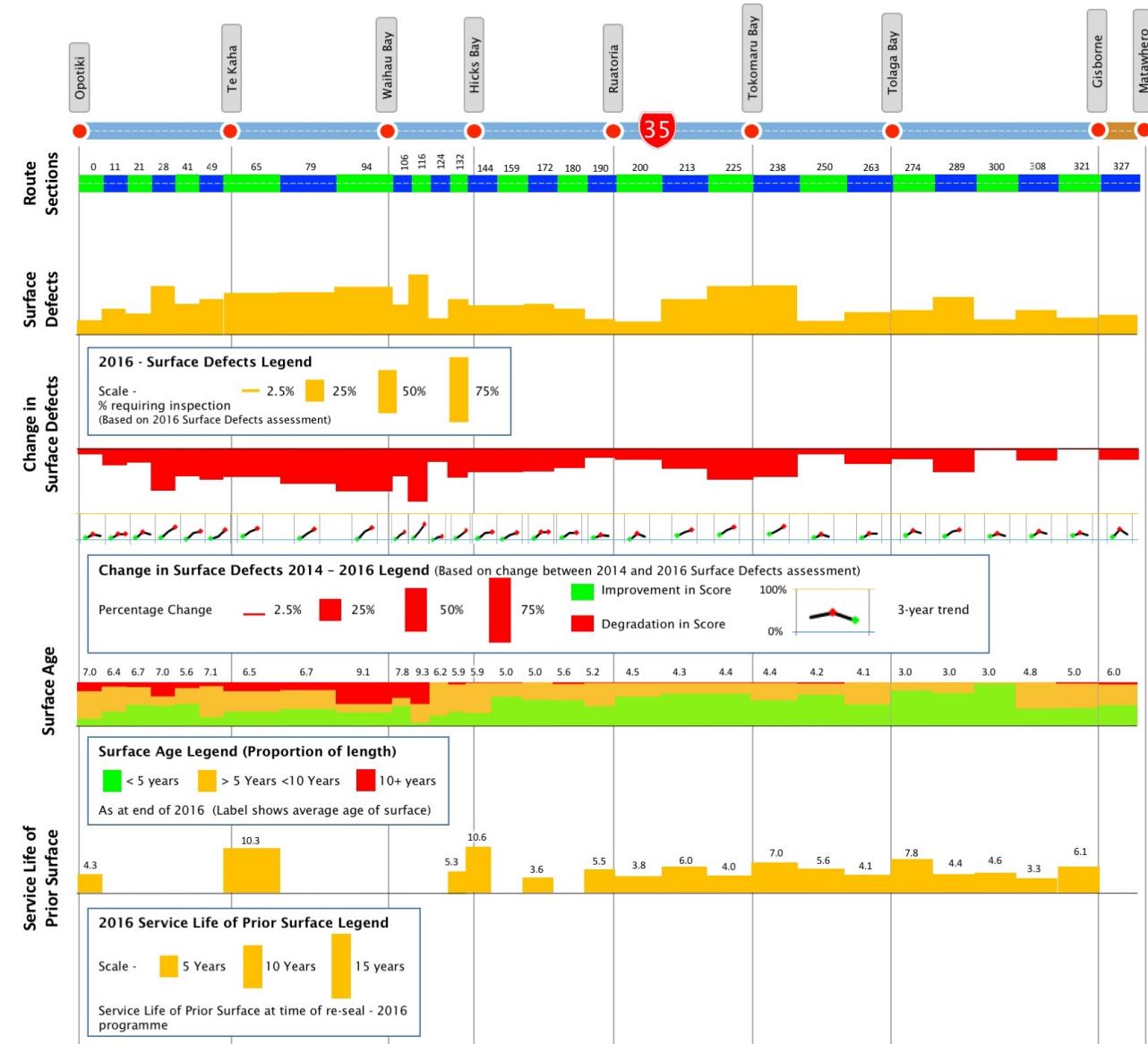
The infographic shows the weighted average age of road surface, and the proportions of surface age that fall within the three age bands. The base data is all the seal lengths and their age from RAMM. Then a weighted average is then calculated. Overall, all sections add up to 100%. The proportion is the length of corridor in a particular age band as a percentage of the total length of that section. The section from Te Araroa south to Gisborne is between 3 and 5 years old, with high proportions of road surface being under 5 years old. The Route Sections 35/94, 35/106, and 35/116 from Papatea Bay east through Waihau Bay have the oldest age profile, with significant proportions over 10 years old.

## 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.

Average service life is below 5 years and low achieved life has been a concern. Exceptions are section 35/144 north of Te Araroa, and 35/65 around Te Kaha where service lives are in excess of 10 years. Measures have been agreed and implemented through the NOC to achieve improvement.

**Figure 19 – Asset condition 2**



## Resurfacing

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

Areas identified for resurfacing works are primarily along the East Coast sections south of Ruatoria, with major rehabilitation through sections south of Tolaga Bay, RS274 to 308. One of the noted worst defects sites, RS28 is programmed for only limited treatment in 2017/18.

### 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.

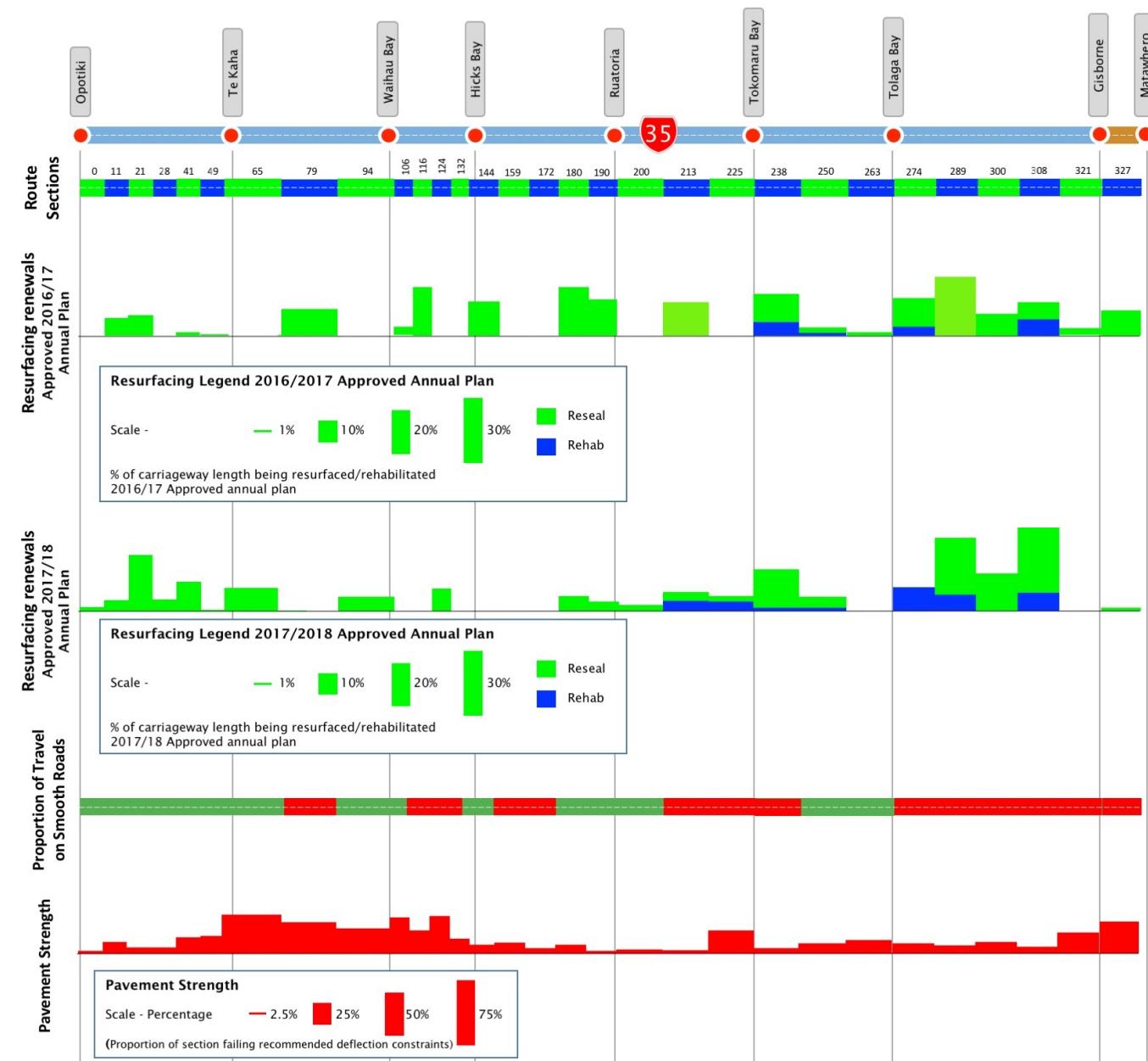
Average roughness on this corridor is the worst of the comparable state highway rural primary collectors. Overall condition is described as low and declining and can be attributed to factors such as the high proportion of laden logging trucks, the widespread papa soils, land movement and subsidence, particularly along the East Coast.

### 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.

Traffic loading of the East Coast is dominated by logging trucks heading southbound toward Gisborne and returning northbound unladen. This greater loading drives more rapid deterioration of the southbound lanes and requires heavy maintenance interventions – often justified for only the single loaded lane.

**Figure 20 – Asset condition 3**



## Asset condition and performance pressures

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

- **Land Movement:** Unstable slopes and subsidence are challenges on this corridor. There are 130 listed subsidence sites. Subsidence causes greater roughness and poorer user experience – large drops can happen overnight or suddenly and require closure of the corridor. The continuous land movement also drives drainage renewals and breaks culverts, especially in the section Hicks Bay to Gisborne.
- **Heavy vehicle loading:** On the East Coast, laden vehicles are predominantly southbound towards Gisborne. Loading ratio calculated as 1 to 3.7 northbound to southbound. There are a high proportion of ESA on a thin pavement (over 20% HCV in places). It is a challenge to maintain as the damage tends to be the single laden side. The uneven distribution of faults and difficulty justifying more substantial interventions means there is a dominance of heavy maintenance responses, which reflects in condition indicators such as the rutting profile.
- **Sensitive Soils:** the subgrade materials are known to be water sensitive and highly reactive. The identified lower levels of ONRC service expected require less conservative surface maintenance which could leave the route susceptible to water ingress that will accelerate deterioration in the pavement structure and could result in failure, as evidenced by the current rutting trends. The risks of this approach are much higher on these pavements.
- **Hazardous Trees:** wilding pines and large trees (poplars, willows and pines) cannot be sustained on the steep slopes and are destructive when they self-evacuate. They can damage the pavement directly, or as a result of repeated debris removal. Trees further up the slopes can mobilise sizeable slips. Once exposed slip areas often require ongoing maintenance until they stabilise.
- **Weather Events:** existing corridor vulnerabilities are exacerbated by the extreme weather events that are increasingly prevalent along this exposed coastal corridor. Examples include mudflows, slope instability, blocked culverts and fallen trees and dropouts or accelerated subsidence. In wet periods, movement at subsidence sites can be rapid and extreme, requiring numerous speed restrictions and traffic management until remediation or mitigation can be applied.
- **Legacy Issues:** there have been historical periods where the quality of maintenance work or materials has proven inferior. When these areas are remediated they require additional consideration in design and often extra cost. Some legacy issues are yet to be resolved.

## 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:

- **Revegetation programme:** Revegetation of exposed areas with slow growing native and low species has proven successful at slope stabilisation.
- **Heavy Vehicle** (mostly forestry) demands on the corridor need to be well understood. There is both evidence and anecdote that speak to the significant overloading of some vehicles. The number and distribution of forestry harvesting areas is expected to grow and move onto parts of corridor previously subject to negligible heavy loading and unproven pavements (Hicks Bay to Ruatoria). Future considerations will need to balance the growing heavy vehicle needs with how to maintain a sustainable corridor. It will need accurate usage information to inform these decisions.
- **Corridor sustainability:** How to maintain an appropriate level of service to establishing higher value products from farms – resilient, reliable and smooth travel to market for the likes of manuka honey & Kiwifruit. How to trade off choices between reactive and heavy-duty maintenance with more robust improvements. How to trade off a relatively low classification route with an imbalanced low traffic volumes, extremely high pavement loading, weak and vulnerable pavements with the current and future needs and expectations of the community and its investors.
- **Fragile and light duty pavements** subjected to ongoing very heavy loadings, moisture sensitive and carrying huge volumes of logging traffic, low total volumes and little light traffic. Need to incorporate or improve confidence intervals for design and understanding of actual loading and pavement performance, which requires robust monitoring.
- The challenge to satisfy **customer expectations** given the classification, which sets relatively low standards based on absolute volume or amount of usage. Customer expectations and significance to local economy and communities.
- **Cumulative risk** across both vulnerabilities and the corridor length. This remote corridor is only as reliable or strong as its weakest section, particularly for businesses attempting to get goods to market or for communities reliant on external products.
- **Aggregates:** Quality aggregate does not exist on the East Coast and both regular and specialist products need to be brought into the region at an additional cost i.e. basic products for surfacing and waterproofing or higher quality for skid resistance.

## 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.

Gisborne Strategic Case was developed in 2015 to understand the need for investment in the Tairawhiti region. Five strategic problems were developed with a focus on economic development, particularly around the need to efficiently and safely move forestry from source to Eastland Port and how to increase the forestry productivity and value of underutilised land.

### 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.

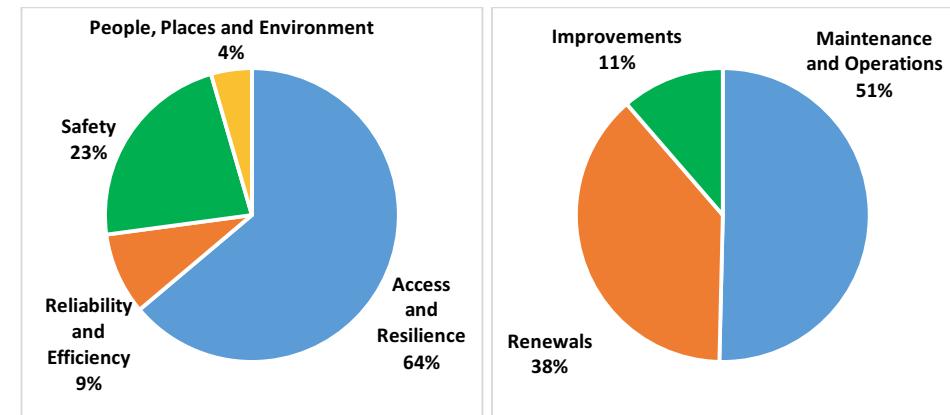
## Summary investment

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	\$11,251	\$10,376	\$14,718
	Renewals	\$15,068	\$17,346	\$23,811
	Improvements	\$12,000	\$250	\$0
Reliability and Efficiency	Maintenance and Operations	\$2,309	\$2,287	\$3,475
	Renewals	\$96	\$104	\$155
	Improvements	\$6,375	\$0	\$0
Safety	Maintenance and Operations	\$9,159	\$8,922	\$13,522
	Renewals	\$1,500	\$1,599	\$2,449
	Improvements	\$0	\$0	\$0
People, places and Environment	Maintenance and Operations	\$1,923	\$1,952	\$2,793
	Renewals	\$85	\$250	\$375
	Improvements	\$0	\$0	\$0
	Total	\$59,766	\$43,086	\$61,298

**Figure 21 – Corridor investment**



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

Outcome	Work Category	2018-2021	2021-2024	2024-2028	Outcome	Work Category	2018-2021	2021-2024	2024-2028
Access and Resilience	111 Sealed Pavement Maintenance	\$1,965	\$1,687	\$2,549	People, places and Environment	112 Unsealed Roads	\$0	\$0	\$0
	112 Unsealed Roads	\$0	\$0	\$0		113 Drainage Maintenance	\$676	\$608	\$933
	113 Drainage Maintenance	\$671	\$658	\$987		114 Structures Maintenance	\$503	\$553	\$865
	114 Structures Maintenance	\$1,652	\$1,524	\$2,341		121 Environmental Maintenance	\$319	\$353	\$499
	121 Environmental Maintenance	\$3,927	\$3,587	\$4,456		122 Traffic Services Maintenance	\$2,508	\$2,560	\$3,977
	122 Traffic Services Maintenance	\$50	\$86	\$129		124 Cycle Path Maintenance	\$25	\$30	\$45
	124 Cycle Path Maintenance	\$32	\$37	\$55		151 Network & Asset Management	\$2,300	\$2,306	\$3,464
	151 Network & Asset Management	\$2,372	\$2,246	\$3,373		161 Property	\$249	\$242	\$363
	161 Property	\$583	\$552	\$828		212 Surface Skid Resistance	\$1,000	\$1,081	\$1,624
	211 Unsealed Road Metalling	\$8	\$8	\$12		214 Pavement Rehabilitation	\$18	\$35	\$53
	212 Sealed Road Resurfacing (excl. surface skid resistance)	\$5,103	\$7,700	\$9,760		215 Structures Component Replacements	\$172	\$177	\$312
	213 Drainage Renewals	\$915	\$491	\$763		222 Traffic Services Renewals	\$310	\$306	\$460
	214 Pavement Rehabilitation	\$6,993	\$7,127	\$9,925		321 - 341 Improvements	\$0	\$0	\$0
	215 Structures Component Replacements	\$1,998	\$1,958	\$3,250		111 Sealed Pavement Maintenance	\$387	\$405	\$466
	222 Traffic Services Renewals	\$52	\$61	\$100		121 Environmental Maintenance	\$1,220	\$1,249	\$1,881
	321 - 341 Improvements	\$12,000	\$250	\$0		151 Network & Asset Management	\$253	\$239	\$359
Reliability and Efficiency	121 Environmental Maintenance	\$462	\$571	\$928		161 Property	\$62	\$59	\$88
	123 Operational Traffic Management	\$1,174	\$1,082	\$1,594		221 Environmental Renewals	\$85	\$250	\$375
	151 Network & Asset Management	\$566	\$534	\$803		321 - 341 Improvements	\$0	\$0	\$0
	161 Property	\$107	\$100	\$150		Total	\$59,766	\$43,086	\$61,298
	222 Traffic Services Renewals	\$96	\$104	\$155					
	321 - 341 Improvements	\$6,375	\$0	\$0					
Safety	111 Sealed Pavement Maintenance	\$2,578	\$2,270	\$3,376					

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.

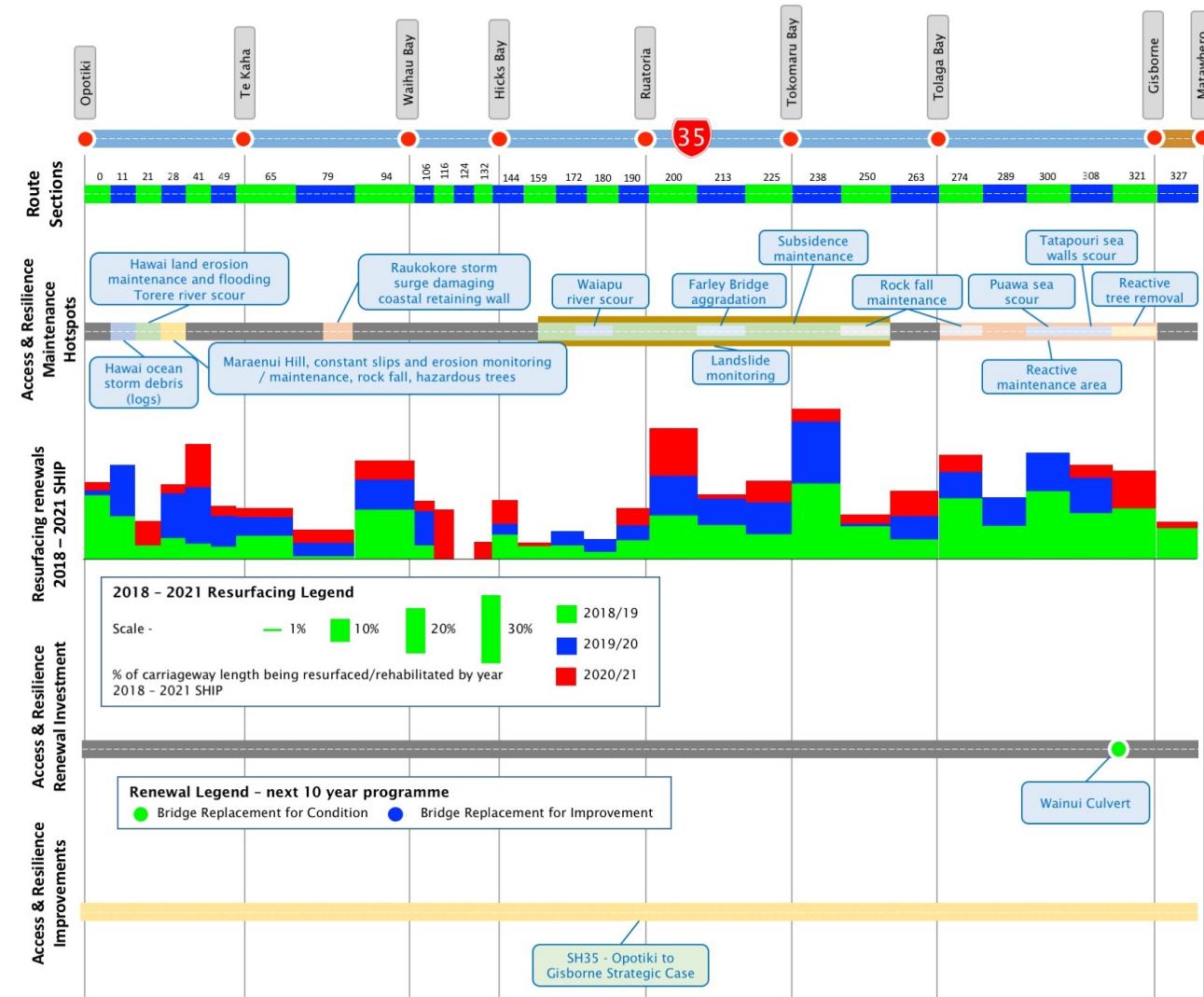
### Maintenance hot spots

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

### Maintenance hot spots

- Scour:** River and sea scour needs at many locations along the corridor and requires continual attention to avoid undercut of the road. Examples include Torere in Bay of Plenty, Puawa and Tatapouri on the East Coast.
- Hawai RS21/5:** Ocean storm driven debris covers road and land erosion silts up culverts also causing flooding of the highway.
- Maraenui Hill:** Slips through RS28 with constant erosion (underslips), road getting narrower (some single lane), monitoring, requires constant maintenance. Trees regularly fall across the road requiring ongoing maintenance.
- Raukokore:** Storm surges removing rocks from beach and threaten highway.
- Hicks Bay to Gisborne:** Speed restrictions and greater traffic management required through winter months due to increased movement of subsidence sites (130 noted subsidence sites) and more slips. Movement can be significant in short periods i.e. overnight drops.
- Turitaka Dropout:** Between Tikitiki and Ruatoria, the road is undermined by erosion and threatens community isolation.

Figure 22 – Access and resilience investment



## Renewals

### Resurfacing

Subsidence, poor aggregates, bad weather and heavy vehicle loading are drivers for renewals, but low traffic volumes limit the intervention options that can be justified. Vegetation interventions are key low cost, but longer term, solutions to stabilise some of the land movement.

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

Significant investment in resurfacing is planned for sections: 35/41 around the Motu River, 35/200 south of Ruatoria, 35/238 south of Tokomaru Bay, 35/274 south of Tolaga Bay, and sections 2/300, 2/308 and 2/321 between Whangara and Gisborne.

This investment aligns with the areas of anticipated increase in heavy traffic from forest harvesting and with the trends of degradation shown in condition and performance indicators. Care will be required in monitoring and prioritising the programme given that some of the areas in year three are already showing significant degradation in measured condition.

### Structure renewal

The renewal investment infographic shows the planned bridge replacements along the corridor. One bridge is planned for replacement due to asset condition, at a total estimated cost of \$650k.

The single lane structures are generally adequate for the traffic volumes using this corridor. Loading and speed restrictions might prolong asset life, but were deemed impractical and have been removed from the highway corridor.

The demands on and vulnerabilities of the structures primarily arise from the environment and threaten access and resilience. The many watercourses feed from steep and friable catchments prone to slips, debris, mudflow and riverbed aggradation, all of which can threaten the bridges or retaining walls, progressively or dramatically, such as the Mangahauini Sheetpile Wall (SH35 RP 225/9.40).

## Improvements

### Planned

There are no currently planned access and resilience related improvements underway on this corridor.

### Draft Regional Land Transport Programme considered for the SHIP

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

**Table 3- Draft regional programme considered for SHIP**

Project	Funding Status	Description
SH35 Opotiki to Gisborne Strategic Case		Measures to protect road link from various environmental risks & deliver safety maintenance level treatments



The heavy logging traffic is a year-round constant through the city's urban environment due to the location of the Gisborne port.

## Investing in reliability and efficiency

### Operations and maintenance

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

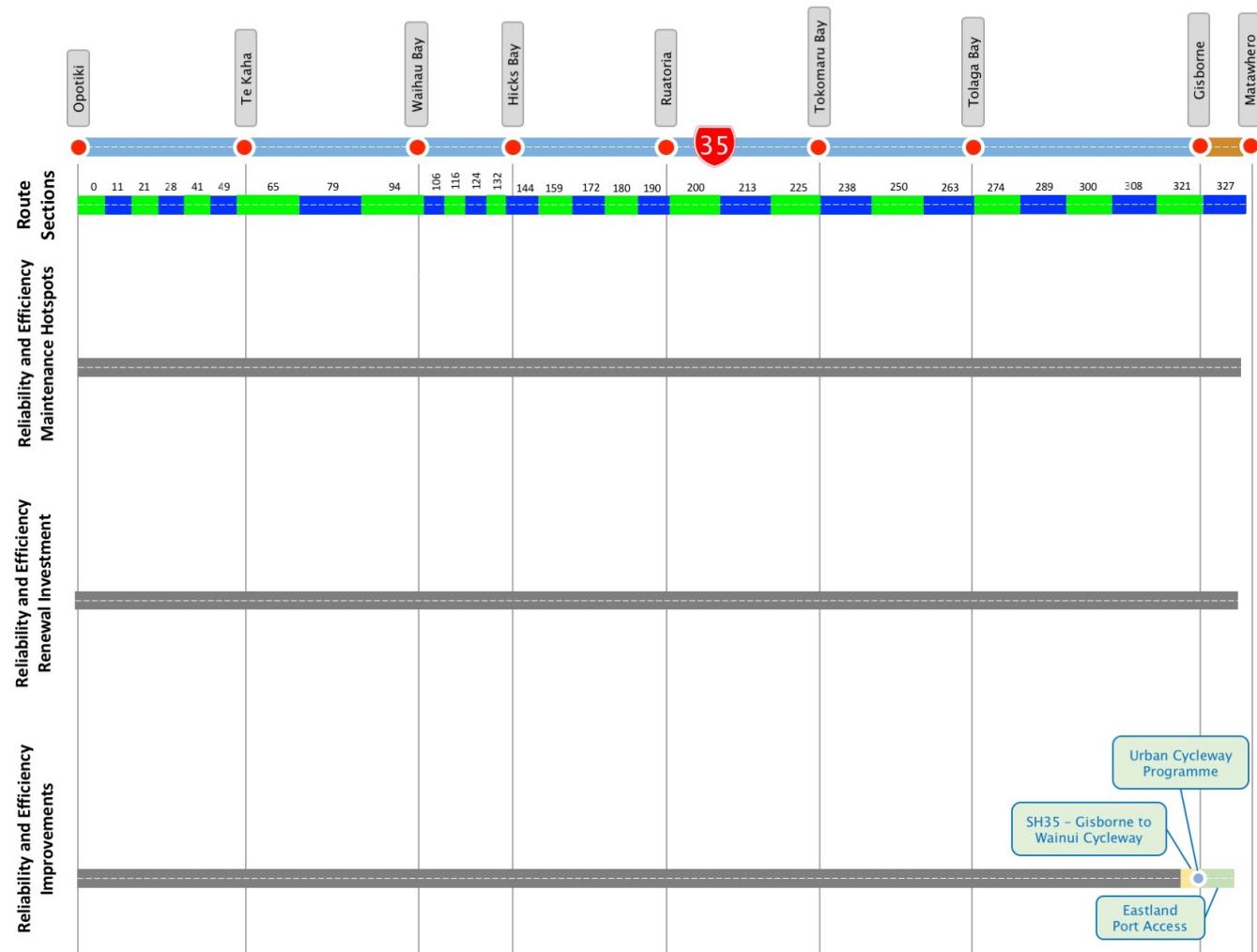
### Maintenance hot spots

No reliability and efficiency related maintenance hotspots were identified for the corridor.

Many of the same hotspots requiring maintenance attention for access and resilience also influence the performance of reliability and efficiency on this corridor. Examples include monitoring and response to slips and subsidence sites, culvert and vegetation maintenance.

The intersection of Hirini Street (SH35), Wainui (SH35) and Gladstone Roads, is identified as a significant source of future delay and an impediment to the efficient operation of and access to Eastland Port. In preference to using SH35, southbound logging trucks continue on the straight local road route and travel through the Gisborne shopping precinct and residential areas.

Figure 23 – Reliability and efficiency investment



## Renewals

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



## Improvements

### Planned

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

### Draft Regional Land Transport Programme considered for the SHIP

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

**Table 4- Draft regional programme considered for SHIP**

Project	Funding Status	Description
Eastland Port Access		The project addresses inefficiencies in access to the port for freight vehicles - Upgrade SH35 intersection with Gladstone Road, at Gisborne town centre.
SH35 Gisborne to Wainui Cycle way		To provide cycling facilities compatible with the Gisborne Cycling Strategy.
Urban Cycleway Programme		Delivering on the Gisborne Walking and Cycling strategy. This is link into the city past the Eastland Port Gates (subject to present and worsening capacity issues) and across the constrained Gladstone Bridge.

## 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

There were no safety related maintenance hotspots identified for the corridor.

### 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.

To the north of Gisborne there is significant potential to reduce fatal and serious injuries through targeted, low-medium cost improvements. Between Gisborne and Matawhero, the application of targeted low cost, high coverage improvements would be beneficial.

The unrated segment is either an area where potential crash savings are low or are being addressed under other existing programmes.

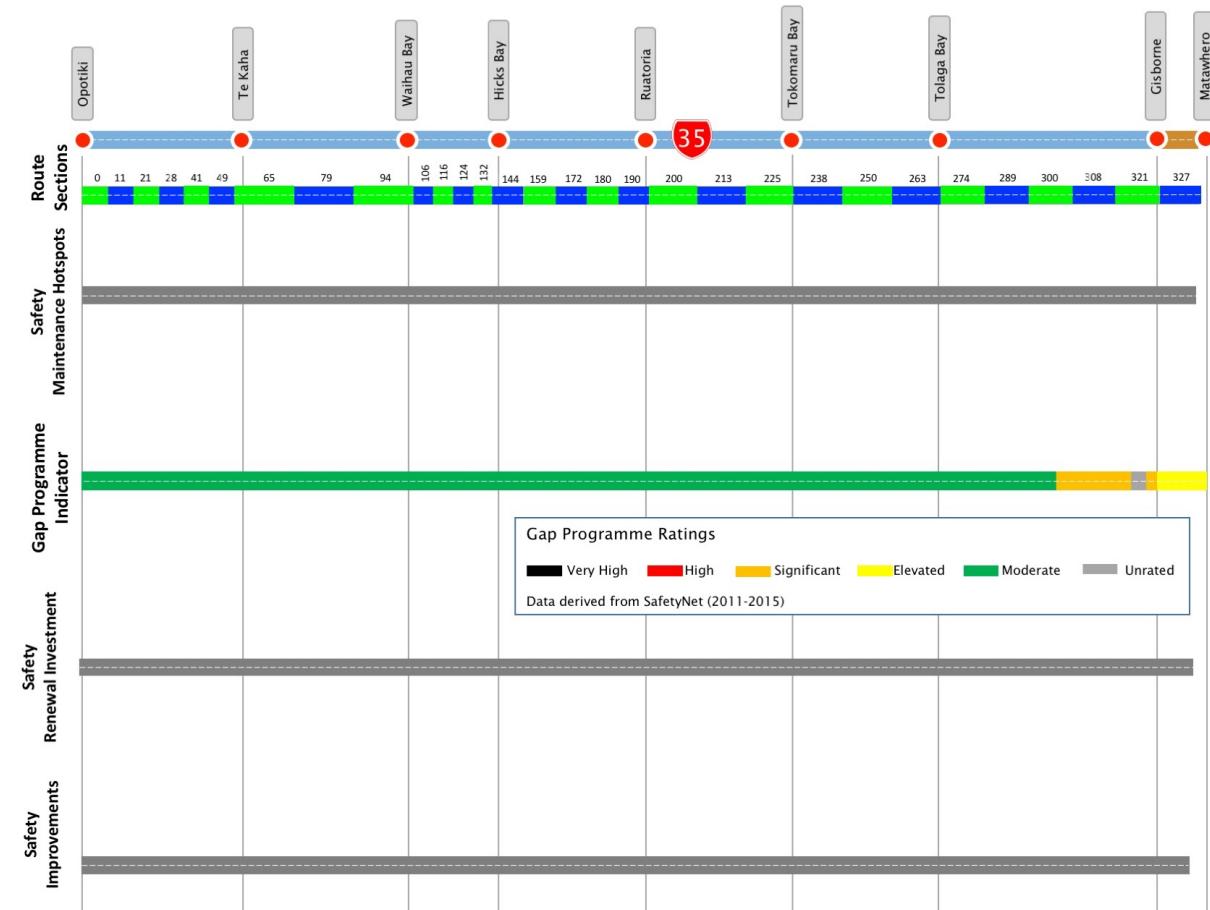
### Renewals

There are no safety related renewals planned for the corridor.

### Improvements

There are no safety related improvements planned for the corridor.

Figure 24 – Safety investment



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

- **Abandoned or dumped vehicles** are common at Raukokore – this can create uncertainty about whether crash assistance is required and a maintenance burden for the cost of their removal.
- **Fish passage** – there is an increasing expectation to responsibly manage environmental effects such as water quality and fish passage at existing and redeveloped sites. The location of many NZTA culverts with fish passage obstructions are a pinch point for migrating fish. The GDC 2015 Freshwater plan requires identification of fish passage by 1 May 2020 and report by DoC provides a prioritised list of stream structures for remediation. A long term sustainable approach for highways fish passage is to be developed.
- **Residential & Community areas** -- heavy vehicles travel through the built-up Gisborne township area rather than the designated highway corridor creating both noise and vibration effects that diminish quality of life for residents and commercial activities. Similarly, where the highway travels close to housing such as Wainui Beach and Arapuni. Surfacing can only go partway to minimising these impacts. Asphalt has been used in some locations, but as its limits. Low noise treatments such as slurry have been trialled (proving to be effective – both cost wise and customer satisfaction).

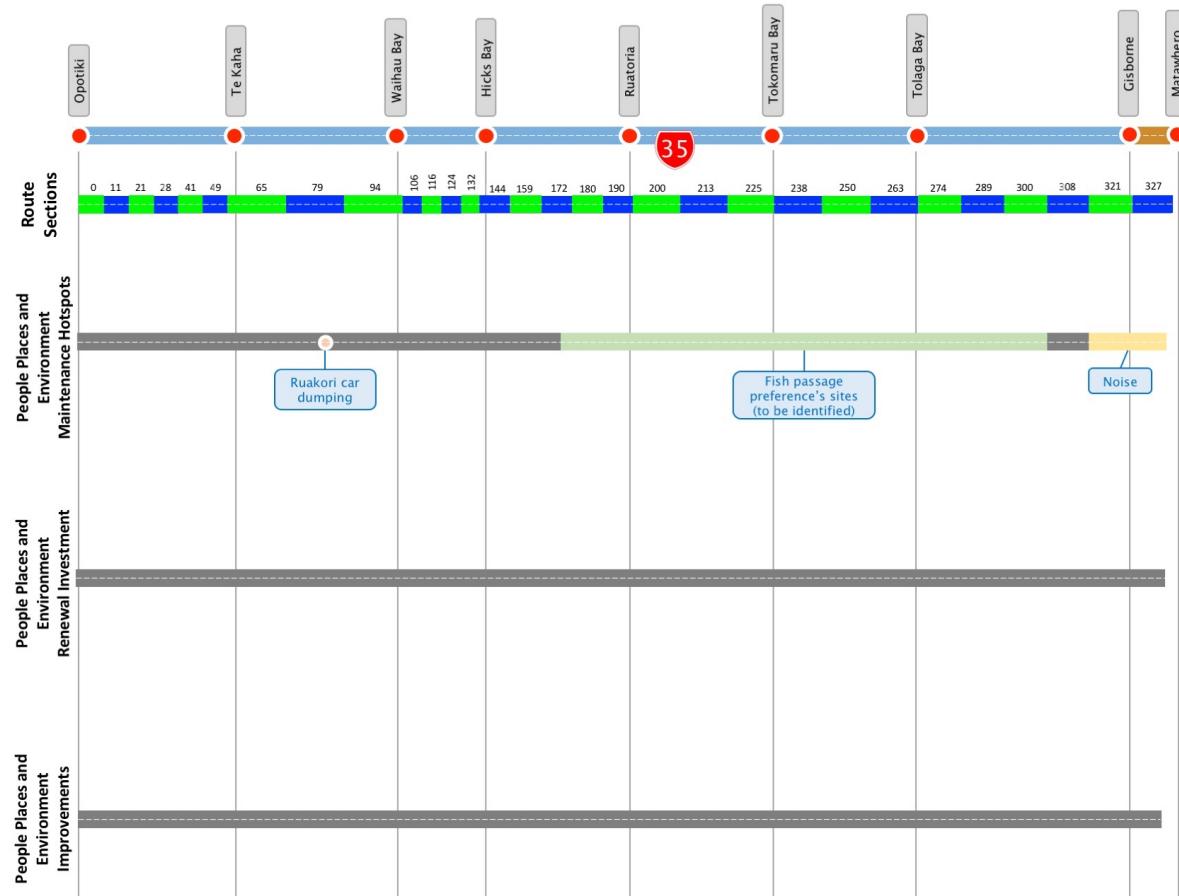
### Renewals

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

### Improvements

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

Figure 25 – People, places and environment investment



## Investment pressures

### Access and resilience

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

- **Resilience** is the major concern for users of this corridor – there is pressure for investment in more resilient designs and preventative measures such as the revegetation programmes to minimise and stabilise open or instable faces. This corridor traverses the two distinct coastal areas of Bay of Plenty and Poverty Bay - they are typified by remote communities, erosive terrain, narrow and tight alignments squeezed between steep cliffs and the open Pacific Ocean. The state highway is the sole access for the greater area of the East Coast.
- **Prioritisation of investment** means that levels of service for comfort or efficiency are secondary to being able to move through the corridor. Maintenance investment focusses on providing an accessible route and minimising closure duration. Ensuring that the community can go about their business.
- **Culverts** require constant attention to maintain drainage and protect carriageway – land movement breaks the culverts which then leaves pavement vulnerable to water damage and scour.

### Reliability and efficiency

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

- **Certainty:** Users of this corridor accept that Levels of Service may be lower, but they want certainty about the ability to travel and about the conditions – seek timely and relevant information such as from real time information sources, whether that is on personal devices or road side guidance. As a lower classification primary route, users can and will experience delays travelling through the corridor. Likely sources of delay on this corridor are rough surfaces, frequent maintenance, tourist travellers or crashes.
- **Land Movement:** Longer term programmes such as tree removal and revegetation aim to improve reliability of the route. Winter movement and slips often require increased traffic management and lowered speeds along the route, especially Hicks Bay to Gisborne portion. Ongoing repairs to continuous movement sites can mean rough and patched pavements requiring slower travel speed.
- **Active modes:** Through much of the corridor there is little additional or dedicated space for vulnerable or active road users. This can contribute to slower vehicle speeds particularly through rural settlements and around gathering places.

### Safety

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

- **Driver behaviour:** Most of the crashes on this corridor have a high behavioural component – impaired driving, vehicle safety, restraint usage. The strategic business case identified the region's drivers as “risk-takers”.
- **High safety risk:** The corridor has many features that are recognised as high safety risk, including long crash response distances, tight curves and narrow alignments, abrupt drops into the sea and single lane bridges.
- **Skid resistance treatments:** Application of melter slag have proven very effective, but are difficult to economically justify on this corridor. Given the relatively low traffic volumes and reported crash numbers it is difficult to clearly prioritise any one site over many others and initiatives are focussed on low cost measures such as adequate warning for motorists through curve advisory signage, advance warning signage and delineation.
- **Emerging trends:** Motorcycle crashes and truck rollover crashes are recent emerging trends. On the East Coast, truck rollovers are more likely in the southbound lane (when trucks are carrying logs to Gisborne) and exposed to the sea and coastal drop-offs.

### People, places and environment

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

- **Lack of defined network hierarchy:** The Gisborne Strategic Case, 2015 identified that a lack of defined network hierarchy for Gisborne may exacerbate the conflict between the towns place function and the through function of the state highway. This is most apparent at the Gisborne intersection of SH35 and Gladstone road, where there is a mix of heavy and light traffic, pedestrians and cyclists in a closely confined area.
- **Erosion control plantings on farmland:** Poplars and willows, and extensive forestry, pines, have resulted in more self-sown trees close to the road that eventually pose a hazard to road users. Fallen trees and limbs are a frequent issue with poor soils, high rainfall and wind events and pose a significant risk to road users in terms of safety and journey disruption. Complementary tree removal and revegetation programmes are proposed as preventative measures, but don't easily meet current funding criteria.
- **Revegetation strategy** – proposes establishing a routine re-vegetation programme to dovetail with the hazardous tree, noxious weed, and erosion and slip problems in the region. Aim to promote revegetation by more tolerant and low growing native species.

## Investment future considerations

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

- **Monitoring:** – The current weigh in motion assets are approaching end of life. Modern weigh stations can provide accurate and timely information about vehicles and loading in a more readily useable format. Needs consideration how can effectively monitor usage and impacts particularly from heavy vehicles. Co-ordination with programmes such as Weigh Right.
- **Sustainability:** How to sustainably manage the corridor balancing the low volumes present and the need for durable access with the increasingly very high proportion of heavy trucks along a fragile and vulnerable environment.
- **Balance of investment:** Concern at role of large trucks on the corridor in face of doubling of Eastland Port log volumes when trying to also increase tourist usage along the corridor – balancing the investment in forestry servicing with the economic opportunities for other businesses to achieve their potential.
- **Local community economics** is closely linked to the transport corridor and needs to be considered in any investment along this corridor.
- **Improved communication** such as from real time and variable message signage has been identified as desirable both for resilience and for reliability, mobile connectivity is sporadic and limited to nil outside of the townships from about Te Kaha around the Cape until Tokomaru.
- **Safety Response:** The maintenance challenge for any safety response along this corridor is which high risk features and sites to treat and the level of investment, or to choose a lower cost measure that would enable treatment of more of the corridor.
- **Managing risk:** High crash risk features occur repeatedly along the corridor, but it is only a low secondary collector classification and there is little economic justification for treatment of individual sites (either site by site or as a comprehensive programme).
- **Corridor form:** There is pressure for improved width and eased alignment to reduce truck rollover crashes and create a less intimidating, more inviting tourist experience.
- **Rest Areas:** Consideration for improved amenities around SH35 that currently has limited stopping places. This lack of rest area amenities constrains engagement of tourists with local communities and road safety. Quality stopping places are needed.

- **Rock Fences:** During winter rock falls on the network are frequent. The need for rock fences has been assessed for the network; five sites have been identified for renewal and short lengths of new fencing.
- **Gisborne CBD:** Gateway treatments do not support use of the highway over the local roads with flow on effects on safety of other users and adjacent properties – businesses and residences alike with noise, vibration and comfort.
- **Growth in forestry:** Forestry is a major export earner for this community and has yet to reach its peak productivity with many forests approaching harvesting age. The hours of operation are long, particularly for truck drivers. Log transport continues for much of the day and night, meaning that any noise and vibration effects also continue. Eastland Port plans for a doubling of log volumes and twin berthing meaning that transport volumes (and effects) will also grow.



## Appendix A – Information sources

Section	Infographic	Information Source	Date
Introduction	Corridor Overview Map	The Road Efficiency Group <a href="https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/">https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/</a>	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 <a href="http://www.mbie.govt.nz/info-services/business/business-growth-agenda/regions">http://www.mbie.govt.nz/info-services/business/business-growth-agenda/regions</a>	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 <a href="https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/">https://www.nzta.govt.nz/roads-and-rail/road-efficiency-group/onrc/</a>	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: <a href="https://www.nzta.govt.nz/projects/">https://www.nzta.govt.nz/projects/</a>  NZTA Safe Roads web page: <a href="https://www.nzta.govt.nz/safety/our-vision-vision-of-a-safe-road-system/safe-roads/">https://www.nzta.govt.nz/safety/our-vision-vision-of-a-safe-road-system/safe-roads/</a>  Submitted Regional SHIP programmes	2017

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

Section	Infographic	Information Source	Date
	Closures	NZTA 2011-2015_Treis_incidents_by_region.xlsx	2015
Reliability and efficiency	Efficiency	NZTA - MapHub EfficiencyNet	2016
	Variability	NZTA / Beca Dwg No. GIS-3391515-500-4 Network Performance - Attachments.pdf March 2012 eRUC Commercial Vehicle Data – State Highway Austroads Variability Assessment	2012
	Commercial Vehicle Average Speed	NZTA / Beca Dwg No. GIS-3391515-500-5 Network Performance - Attachments.pdf March 2012 eRUC Commercial Vehicle Data – State Highway Average Speeds	2012
	Current Constraints	Network Manager and Regional Staff Corridor drive-over	2016
	KiwiRAP Collective Risk	<a href="https://nzta.abley.com/SafetyNET_2017">https://nzta.abley.com/SafetyNET_2017</a> SafetyNET	2016
Safety	KiwiRAP Personal Risk	<a href="https://nzta.abley.com/SafetyNET_2017/">https://nzta.abley.com/SafetyNET_2017/</a> SafetyNET	2016
	KiwiRAP Star Rating	<a href="http://www.kiwirap.org.nz">http://www.kiwirap.org.nz</a> From 2010 KiwiRAP star rating report.	2010
	Intersection Risk Indicator	<a href="https://nzta.abley.com/SafetyNET_2017/">https://nzta.abley.com/SafetyNET_2017/</a> SafetyNET	2016
	Gap Programme Rating	<a href="https://nzta.abley.com/SafetyNET_2017/">https://nzta.abley.com/SafetyNET_2017/</a> SafetyNET	2015
	Natural Environment	NZTA - Environment and Urban Design Team	2016
Environment Culture and Heritage	People and Place: Journeys	NZTA - Environment and Urban Design Team	2016
	People and Place: Landmarks and Heritage Places	NZTA - Environment and Urban Design Team	2016

Section	Infographic	Information Source	Date
	Noise and Vibration	NZTA - Environment and Urban Design Team	2016
	Drainage Catchments	NZTA - Environment and Urban Design Team	2016
Understanding the Infrastructure Assets			
Overview	Corridor Asset Base	NZTA_ 2017 Values by Corridor.xlsx compiled by Opus International Consultants from RAMM and other asset information sources	
	Asset Condition and Performance	Summarised from the data sets described below	
Asset condition and performance	Surface Skid Resistance	SCRIM data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Safety Treatment	SAL data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Defects	100m Priority data derived from RAMM by NZTA Data Quality and Access team	2016
	Surface Age	Surface Age data derived from RAMM by NZTA Data Quality and Access team	2016
	Service life of Prior Surface	Surface Age data derived from RAMM by NZTA Data Quality and Access team	2016
	Resurfacing	Resurface data derived from forward works programme	2016
	Proportion of Travel on Smooth Roads	STE data derived from RAMM by NZTA Data Quality and Access team	2016
	Pavement Strength	Deflection data derived from RAMM by NZTA Data Quality and Access team	2016
Investing in the Corridor			
Summary Investment	Summary Corridor Investment	2028-21 SHIP programme funding requests 2017/18 Annual Plans	2017
	Summary investment by work category	2028-21 SHIP programme funding requests 2017/18 Annual Plans	2017
Investing in access and resilience			
	Maintenance Hot Spots	Network Manager and Regional Staff	2017

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

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



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