

New Zealand Transport Agency
**Transport Agency Investment
Proposal Re-Evaluation | SH1
Whāngārei to Te Hana**
Findings Report

Final | 9 November 2018

This report takes into account the particular instructions and requirements of our client

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

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Abbreviations

AADT	Annual Average Daily Traffic
BCA	Business Case Approach
CMP	Corridor Management Plan
DBC	Detailed Business Case
DSI	Deaths & Serious Injury
ESR	Environmental and Social Responsibility
GDP	Gross Domestic Product
GPS	Government Policy Statement (on Land Transport)
HCV	Heavy Commercial Vehicle
HOV	High Occupancy Vehicle
HPMV	High Productivity Motor Vehicle
IAF	Investment Assessment Framework
IBC	Indicative Business Case
ILM	Investment Logic Map
KPI / KPIs	Key Performance Indicator/s
LoS	Level of Service
MaaS	Mobility as a Service
MCA	Multi-Criteria Analysis
MoT	Ministry of Transport
NAL	North Auckland Line
NLTP	National Land Transport Programme
ONRC	One Network Road Classification
PBC	Programme Business Case
PT	Public Transport
RoNS	Road of National Significance
RLTP	Regional Land Transport Plan
SAR	Scheme Assessment Report
SH (#)	State Highway (#)
SOV	Single Occupancy Vehicle
SSBC	Single Stage Business Case
TAIP	Transport Agency Investment Proposal
Transport Agency	New Zealand Transport Agency
TREIS	Traffic Road Event Information System
Vpd	Vehicles per day
WDC	Whāngārei District Council
W2TH	Whāngārei to Te Hana

Definitions

Long term	10+ years
Medium term	3-10 years
Short term	0-3 years

Executive Summary

This evaluation report outlines the findings of a first principles review of the State Highway 1 (SH1) Whāngārei to Te Hana corridor investment proposal, which considers improvements to address safety, efficiency and resilience along a section of the national strategic route within Northland.

The NZ Transport Agency is re-evaluating selected projects against its Investment Assessment Framework (IAF) to assess whether they achieve transport outcomes aligned with current priorities and represent value for money, prior to inclusion in the National Land Transport Programme (NLTP).

This re-evaluation finds that there is sufficient evidence to support targeted investment and proposes a revised programme of options for further development through the Detailed Business Case phase of the project. The revised programme is summarised below.

Revised Programme of Options

A refined corridor approach should focus investment on safety as the first priority and look to address the access needs of the corridor, by initially making best use of existing infrastructure, and using this infrastructure to enhance choices for customers through promoting use of alternative modes, where feasible.

The revised programme includes system wide measures as well as interventions that are specific to the four distinct sections of the corridor that have different characteristics and problems. The revised programme, for each of the four sections, is shown in Figure E1 below as part of the wider Whāngārei to Warkworth recommended programme.

The updated recommended set of investments comprises:

- In the short term:
 - Consideration of a corridor-wide speed management strategy to improve safety
 - Localised safety improvements designed and implemented in a number of locations (incl. Loop Road, southern Brynderwyn Hills)
 - Increased investment in enforcement and driver licensing education through the corridor to address the behavioural factors impacting on the poor safety record
 - Strengthening network resilience through consideration of alternative routes
 - Development of more integrated land use and transport plans at the northern end of the corridor, and in particular the Whāngārei urban area, to drive better transport choices.

- Identification of measures and locations for prioritisation of more efficient and critical modes of transport (including public transport, HOV and freight between Whāngārei and SH15A).
- In the medium term:
 - Implementation of the identified safety, resilience and efficient modes projects
 - Route protection of longer term priority works such as around the Brynderwyn Hills and Whāngārei to Port Marsden Highway.
- In the long term:
 - Implementation of the longer term priority works as identified in the earlier stages



Figure E1 - SH1 Whāngārei to Te Hana corridor revised programme interventions (as part of wider Whāngārei to Warkworth recommended programme)

Re-Evaluation Findings

The re-evaluation involved a review of the strategic context, problem and benefits statements, investment objectives and options development from the previous investment proposal. The primary source of information on the investment proposal used for the re-evaluation was the Auckland to Whāngārei Programme Business Case (PBC).

The PBC noted that the SH1 corridor between Whāngārei and Te Hana plays a significant role in connecting people and goods between Northland and the rest of New Zealand. The social and economic wellbeing of the region is dependent on the 75 km corridor being safe and resilient.

This narrative remains relevant under the new strategic context. There is sufficient supporting evidence to support the case for investment to address significant safety and resilience issues. Further, based on forecast growth levels, with Whāngārei population growing quite rapidly, there is also a case for some degree of enhanced capacity in parts of the corridor.

The PBC outlined online and offline infrastructure improvements to improve safety and resilience and provide additional capacity. The PBC investment proposal for the Whāngārei to Te Hana section of the SH1 corridor has a total estimated cost of \$0.9 - \$1.4b.

In reviewing the existing programme for value for money, the re-evaluation identified the opportunity to prioritise the substantial safety and resilience problems in the short term and apply a staged approach to providing additional capacity and offline infrastructure upgrades in the medium and long term.

To respond to the growth whilst managing induced demand that would come from providing additional capacity, the Transport Agency should work with Whāngārei District Council to take a multi-modal approach, where feasible, to addressing the increased demand. Opportunities to integrate land use and transport planning should be explored to minimise vehicle demand growth and support the multi-modal approach.

This approach should be further developed in the DBC phase of the project.

1 Background

The 2018-2027 Transport Agency Investment Proposal (TAIP) sets out the ten year programme of activities that the Transport Agency proposes for inclusion in the 2018-2027 National Land Transport Programme (the NLTP), to give effect to the 2018-2027 Government Policy Statement on Land Transport (GPS).

In the development of the TAIP, sixteen state highway improvement proposals (subsequently consolidated into ten corridors) were identified as needing re-evaluation including a more comprehensive assessment against the 2018 Investment Assessment Framework (IAF)¹. The SH1 Whāngārei to Te Hana project is one of the ten corridors to be re-evaluated.

The re-evaluation, described below, was completed to review and refine the investment proposal so that it is aligned with government direction, is supported by the evidence, achieves the right transport outcomes and provides value for money.

1.1 The Previous Investment Proposal

The Auckland to Whāngārei PBC was completed in August 2017 and proposed infrastructure upgrades, such as four-lane carriageways in some sections and safety improvements, alongside a suite of network optimisation and behavioural interventions. The investment narrative focused on improving safety and reliability and reducing the cost of travel.

The PBC encompasses the Whāngārei and Te Hana corridor, which has four distinct sections, as shown in Figure 1, with different characteristics and problems. These include: Whāngārei urban, Whāngārei to Port Marsden Highway, SH1 north of the Brynderwyn Hills and SH1 south of the Brynderwyn Hills.

The problems noted in the Auckland to Whāngārei PBC were:

- Poor resilience and costly journeys between Northland and key markets is undermining growth and investor confidence (50%)
- The corridor is sub-standard for a national strategic route, resulting in a higher number of crashes involving injury and death (30%)
- The lack of a long term, integrated investment approach creates sub-optimal outcomes in transport and reduced economic investment in Northland (20%)

¹ The IAF is the framework the Transport Agency uses to assess and prioritise projects and programs for inclusion in the NLTP. It helps its investment partners to understand how projects will be prioritised under the GPS and to frame-up Regional Land Transport Plans (RLTPs).

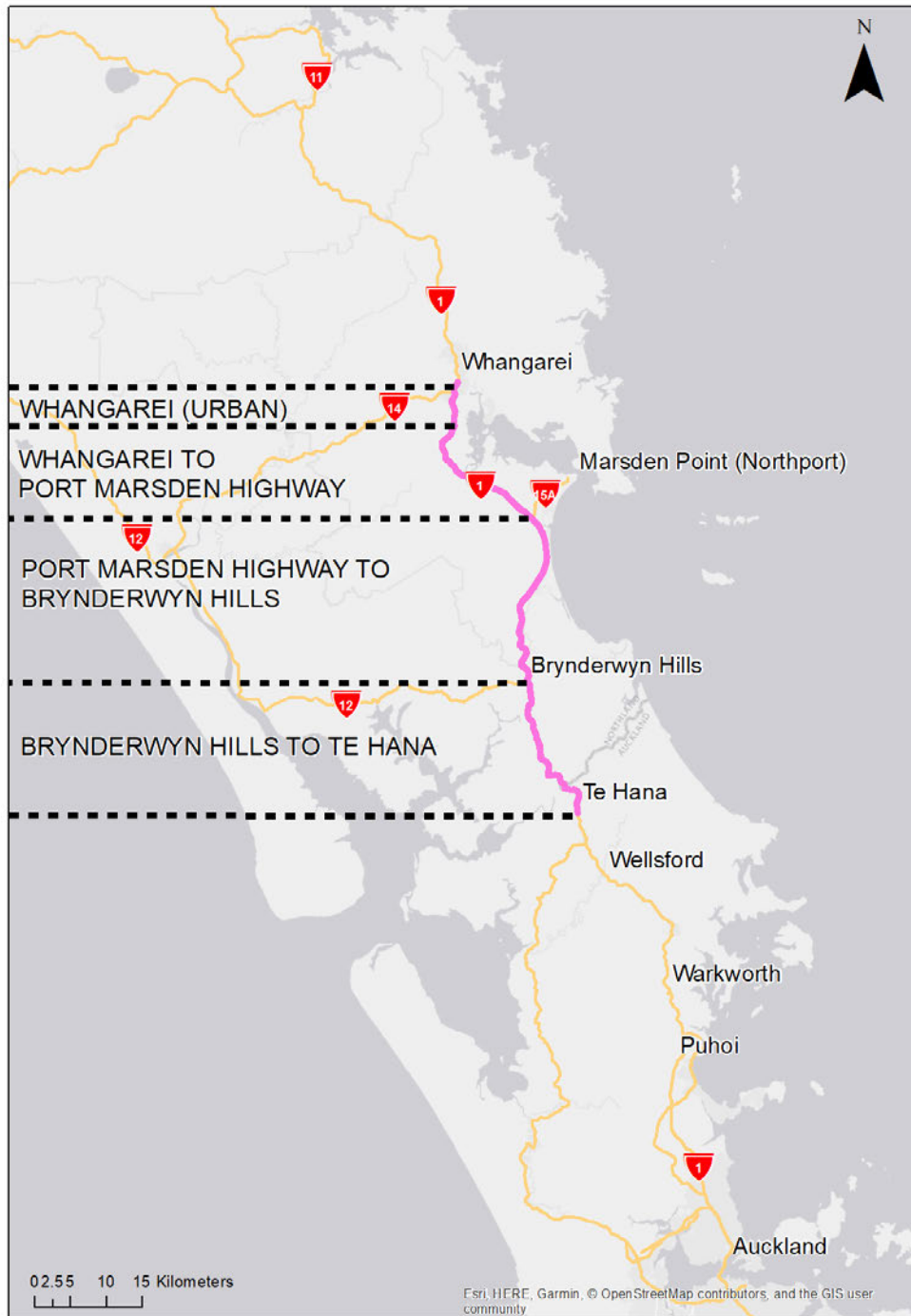


Figure 1 – SH1 Whāngārei to Te Hana corridor location

1.2 Summary of the Re-Evaluation Process

This re-evaluation followed the methodology in the (Draft) TAIP Re-Evaluation Guidance, July 2018, which was founded on the Transport Agency’s business case principle. The core elements of the re-evaluation process are shown in Figure 2.

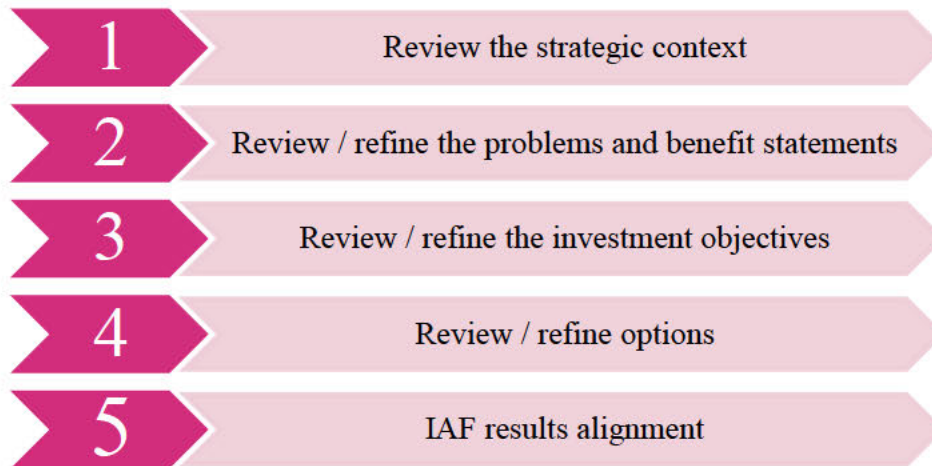


Figure 2 - Re-evaluation approach

The PBC was used as the primary source of information on the existing proposal. The Whāngārei to Te Hana Detailed Business Case (DBC) is under development and was not relied upon during this re-evaluation.

1.3 Further Inputs in to the Re-Evaluation

There are several inputs that are referred to throughout the re-evaluation that are used when planning Transport Agency investments. These are introduced below.

1.3.1 KiwiRAP

The New Zealand Road Assessment Programme (KiwiRAP) analyses the road safety of the state highway network through providing a systematic and internationally recognised way of measuring the actual and predicted safety performance of roads. KiwiRAP risk ratings provide NZ Police, road planners, engineers and investors with benchmarking information to show how well, or how poorly, a road performs in comparison to other roads. KiwiRAP uses a rating system, with a 1-star rating assigned to highest risk carriageways while relatively safe corridors are given a 5-star rating.

The star ratings are derived from a Road Protection Score (RPS); this risk score is determined via evaluation of each of the road's design elements. For example, the risk of being involved in a crash on a road with no sealed shoulders is greater than on a road with wide sealed shoulders of 1.2 metres or more.

1.3.2 The Transport Agency Systems Approach

The Transport Agency applies a systems approach to planning and investing in its transport system. The systems approach means:

- Providing for the different modes of walking, cycling, public transport, MaaS², rapid transit, road and rail in each place to extract the best from the overall network for customers and deliver on priority outcomes
- Considering the full range of possible responses to an issue - land use planning, regulation, policy, pricing, investment in physical and digital infrastructure, behaviour change and use of technology
- Using the Transport Agency's Intervention Hierarchy to guide planning and investment efforts

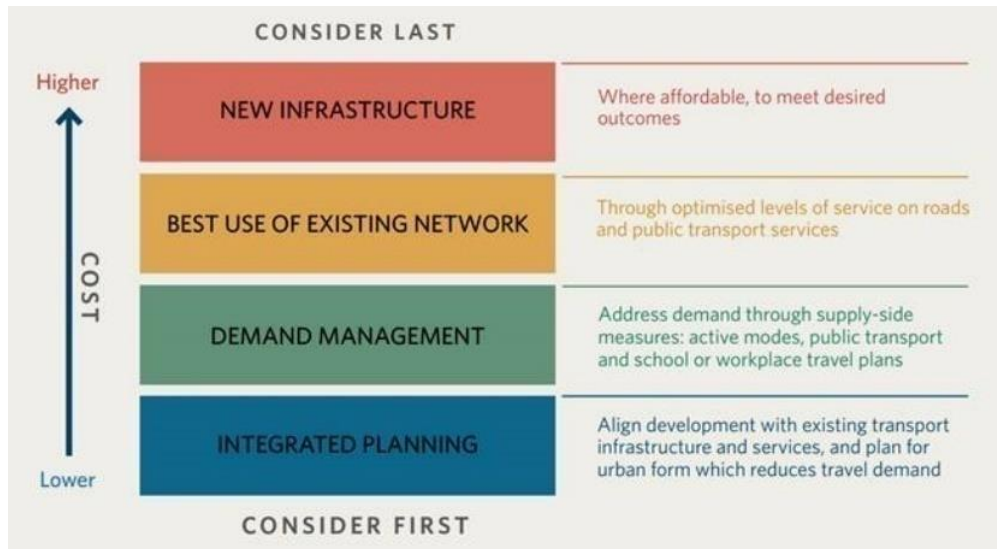


Figure 1 – Transport Agency Intervention Hierarchy

1.3.3 One Network Road Classification (ONRC)

The ONRC identifies different categories of road within the network, along with the customer levels of service appropriate for each classification. Generally, higher road classifications mean a higher level of service, including safety, along with a greater expectation that the corridor will be available to customers more often.

² Mobility as a Service

2 Strategic Context

2.1 Government Priorities

The GPS and the Transport Outcomes Framework provide direction on the outcomes and objectives sought from the transport system. The investment narrative of the existing proposal was reviewed against this direction to assess whether the investment is likely to deliver on the Government objectives.

2.1.1 Government Policy Statement on Land Transport

The GPS outlines the Government's strategy to guide land transport investment over the next ten years. It influences how the Transport Agency allocates resources from the National Land Transport Fund (NLTF) across New Zealand's transport system.

As shown in Figure 3, the strategic priorities include:

- Creating a transport system that is free of death and injuries
- Ensuring there is better access to social and economic opportunities, better access to a range of transport choices and that our transport system is resilient.

These priorities are supported by a strong focus on environment and delivering value for money services and infrastructure.

Section 2.6 of the GPS also introduces three core themes to provide guidance on “how to effectively deliver on the priorities” and provide “the best transport solutions”. These themes are used in Section 6, where the options or solutions proposed are reviewed.

Re-evaluation finding: The previous investment narrative focused on safety as well as the reliability and cost of access to economic opportunities. Accordingly, the previous investment narrative aligns with the strategic direction established in the GPS.



Figure 4 - Strategic direction of the 2018 GPS

2.1.2 Transport Outcomes Framework

The Ministry of Transport (MoT) Transport Outcomes Framework has five core outcomes, shown in Figure 5 below, that the Government will be seeking from the transport system, to shape *highly liveable places in thriving regions*. The Transport Outcomes Framework in turn aligns with Treasury Living Standards Framework as well as the Transport Agency’s IAF.

The Transport Outcomes Framework has been adopted for this re-evaluation to help assess whether the proposed outcomes for the project align with Government priorities.

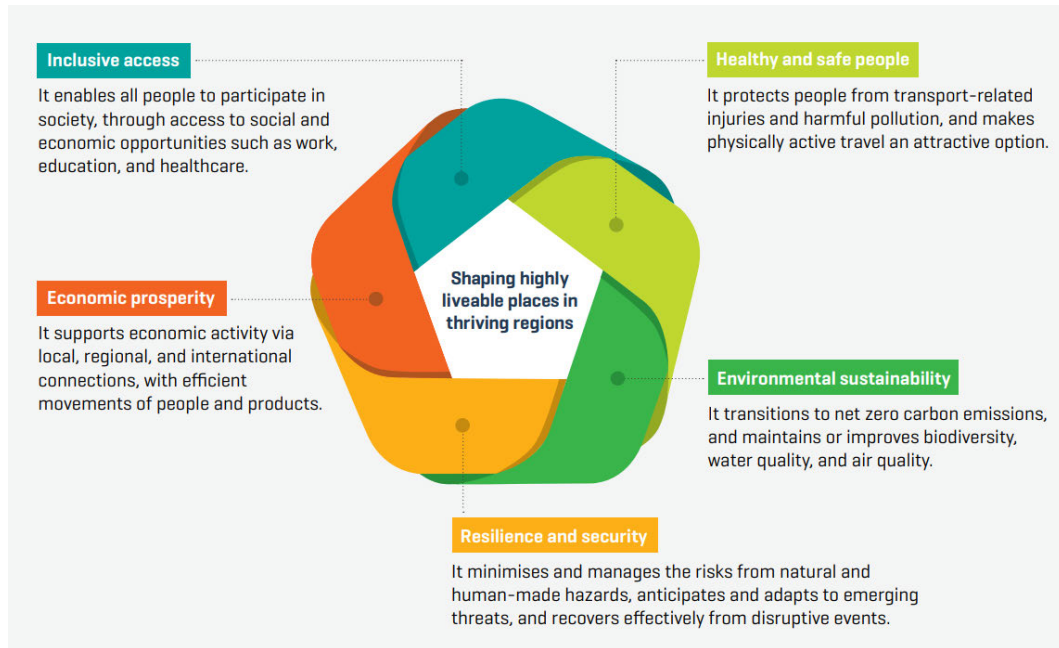


Figure 5 - Transport Outcomes Framework

Re-evaluation finding: The previous investment narrative relates to several of the Government’s desired outcomes from the transport system, particularly, economic prosperity, healthy and safe people, and resilience and security.

2.2 Project Context

The project context is provided below with respect to each of the five outcomes identified in the Transport Outcomes Framework. This approach has been taken to understand how the current transport system supports the delivery of these outcomes before assessing the specific problems that this investment proposal seeks to resolve. The information provided below is also considered in Section 3, when assessing the supporting evidence for the identified problems.

The SH1 Whāngārei to Te Hana corridor acts as the primary route for accessing the city of Whāngārei – the northernmost city in New Zealand and the regional capital of Northland. The transport context is more fully discussed in Section 2.2.6,

2.2.1 Economic Prosperity

The Northland region has a total population of some 152,000 spread across three local authority areas. The Far North and Kaipara districts have a strong focus on primary production, while the city of Whāngārei with a population of 58,000 (out of a district total of 88,000) is the region’s main urban and servicing centre with a concentration of manufacturing and service industries.

The Northland region is home to some of the most deprived populations in New Zealand, with an economy that has underperformed compared to other regions and relative to its resource base. While 20% of New Zealand's population is in the lowest quartile of the deprivation index, the equivalent measure for Northland is 35%.

To address economic disparity, the Government has identified Northland as one of its Regional Economic Development (RED) regions, which are prioritised for increased jobs, income and investment.

An independent study commissioned by the Ministry of Business, Innovation and Employment (MBIE) and the Ministry for Primary Industries (MPI), the Tai Tokerau Northland Economic Action Plan (NEAP), has estimated that there is potential to lift the economy of the region by 24%, or \$1.4b, over the next 5-10 years.

This study identified growth opportunities in primary sectors including: dairy, forestry, horticulture and aquaculture, and processing related to these industries. Tourism is also considered an important growth opportunity, if the region can link cultural and natural advantages to reduce seasonality and keep visitors in the region longer.

All of these industries rely heavily on efficient land transport links. Their growth is also intrinsically linked to better social outcomes with local employment providing higher levels of community cohesion and social and economic prosperity. In the case of primary market sectors, it is especially important to reliably deliver produce to key markets, both nationally and internationally.

The NEAP confirmed that one of the important enablers for improving Northland's economic performance is improving transport accessibility, with the corridor from Auckland to Whāngārei providing a critical transport connection.

Government investigations into the potential re-location of port functions from Auckland to NorthPort at Marsden Point could result in additional demand on the SH1 corridor from NorthPort southwards to Auckland. Ongoing economic activity around NorthPort is also likely to increase demand for employment related trips between Whāngārei and Marsden Point.

2.2.2 Inclusive access

Recent strategic plans identify the importance of the transport network for economic growth in Northland. Given the economic structure of the Northland region, with a high dependence on primary industries that rely heavily on access to export markets, freight movements within the region and to NorthPort at Marsden Point are of major strategic importance.

NorthPort was built specifically as a multi-purpose facility and is well positioned to handle substantial growth in imports and exports. For sustainable and continued economic development of the region to occur, access to NorthPort needs to be supported through safer and more accessible transport connections.

The Whāngārei District Council considers it important to achieve good network connections with the SH1 corridor. The council places particular emphasis on strong connectivity between the SH1 corridor and the town centre to support growth and revitalisation initiatives and increase access to employment, goods and services, through the use of multi-modal facilities.

Community and stakeholder feedback identified concerns with the suitability of the Whāngārei urban section of the SH1 corridor for active modes of transport. One of the recurring themes was the inability for pedestrians and cyclists to safely and conveniently cross the corridor. Feedback suggested that pedestrians are presently forced to make potentially unsafe choices while crossing the corridor due to a limited number of safe crossing points, and/or existing crossing points not necessarily aligning with desire lines.

The feedback also pointed to how Whāngārei residents generally felt safer when driving than when using active modes along the corridor, even when the journeys undertaken were relatively short in distance. This was attributed to the fact that footpaths along the urban section of the corridor in Whāngārei are narrow and in a poor condition – or non-existent.

Further, cycle facilities were generally non-existent or only provided on-road, via a carriageway shoulder, which acted as an impediment to increased usage among higher vulnerability users such as children and the elderly.

Evidence indicated that the high use of single occupancy vehicles could partially be attributed to the lack of suitable public transport along the urban parts of the corridor, with one or two buses per hour operating throughout the day. As increased employment prospects are expected in growth areas across the region including NorthPort and Ruakaka, opportunities for the successful implementation of alternative modes will increase.

However, the largely rural corridor means that very few opportunities will realistically exist for alternatives to car travel for the majority of its length.

2.2.3 Healthy and safe people

The 75 km road corridor between Whāngārei and Te Hana is unsafe by national standards. With 104 Deaths and Serious Injuries (DSIs) from 2013 to 2017 and a predominantly 2 to 3-star KiwiRAP rating, the corridor level of service is not consistent with ONRC aspirations for a 'National' route which is for a 3 to 4-star KiwiRAP safety rating. Even after the implementation of proposed short-term safety improvements by the Safe Roads Alliance, the overall corridor will still not achieve the ONRC safety level of service of 3 to 4-stars.

Alcohol and drugs were major contributing factors for 56% of all fatal crashes. This is followed by excessive speed at 25%, fatigue at 22% and heavy vehicles at 28%. More than half of all fatal crashes along the corridor were head-on incidents. Any intervention options proposed should consider appropriate interventions to address these factors across the Safe System spectrum.

One way to understand the deficiencies of the SH1 corridor is by comparison with similar lengths of state highway. Other ONRC National routes around the country

of similar length include SH1 Taupo to Waiouru (100km) and SH1 Oamaru to Dunedin (80km). These routes have a KiwiRAP star rating of 3 and 2 to 3 stars, respectively. They record a rate of 0.78 DSIs per km, and a rate of 0.78 and 0.9 crashes per km respectively. In comparison, the Whāngārei to Te Hana route has a fatal and serious crash rate of 1.5 DSIs per km.

Within the corridor, the section between Whāngārei and Port Marsden Highway (SH15) has been noted by the Transport Agency as one of the most dangerous state highways with 48 DSIs occurring in the last five years. The section south of the Brynderwyn Hills through to north of Te Hana also has a particularly poor crash record. Crash data is consistent with the challenging corridor geometry, exhibiting high proportions of head-on, cornering and loss of control crashes. This results in an unacceptable level of DSIs.

The corridor on the northern side of the Brynderwyn Hills has undergone significant safety improvements to reduce the number of crashes experienced. There are other safety projects and business cases by the Safe Roads Alliance to address the short-term safety issues along the corridor, which are occurring in conjunction with ongoing road safety awareness campaigns. These safety improvements would result in an approximate 76% reduction in DSIs on the northern section of the corridor (Toetoe Road to SH1/SH15 intersection). However, to achieve the ONRC safety level of service for a state highway of its significance (3 to 4-stars), additional investment may be required.

2.2.4 Environmental sustainability

Connecting communities through walking and cycling initiatives for local trips – particularly in urban Whāngārei and further south for commuter trips to Ruakaka – will slightly lessen the reliance on private vehicle trips. Opportunities exist in the urban areas to encourage public transport use between employment and residential nodes through providing higher frequency public transport, investigating the feasibility of bus priority measures and optimising the location of bus stops along the corridor.

Improved walking and cycling connections within urban Whāngārei and through to Ruakaka, the increase of electric vehicles on the road, along with greater volumes of freight on rail, will all reduce carbon emissions and lead to a very minor positive impact on the environment. This impact, could, however, be totally negated if additional road capacity induces additional car travel.

In the longer term, sections of the corridor, particularly around Ruakaka, Oakleigh and Otaika may become more susceptible to coastal inundation and flooding events, as a result of climate change. Considering environmental resilience and climate change adaptation in the development of options will be important, particularly along the section of the SH1 corridor that borders low lying coastal areas. Consideration is also required for protecting sensitive fauna habitats south of the Brynderwyn Hills.

2.2.5 Resilience and security

The SH1 Whāngārei to Te Hana corridor frequently experiences unplanned closures, usually because of serious or fatal crashes and/or environmentally driven issues. In 2014, there were 27 full closures along the route, with an average delay of 7-8 hours. This gave a total of 216 hours of closure – equivalent to an average of nearly 20 hours per month.

This number excludes partial closures, which would further compound the issues. Of these unplanned incidents, 70% resulted from crashes with the remainder being a combination of other, predominantly environmental, factors. These closures are a major issue for freight, other business and domestic traffic and have a significant consequence for journey cost and time certainty.

For much of its length, viable alternative routes to the SH1 corridor are limited. Where they exist, they are generally significantly longer on lower category roads not suited to accommodating highway traffic volumes and HCVs.

2.2.6 The Transport Context – Connecting Northland

Northland’s long, narrow geography and position at the top of New Zealand makes the transport infrastructure network critical for the economy. The NEAP identifies that further strategic investment is required to complete enhancements and improve the region’s connections through air transport, shipping and roading.

The previous SH1 Whāngārei to Te Hana investment proposal was part of an overarching approach that has been adopted by the Transport Agency and its partners termed “Connecting Northland” – an initiative with the aim to grow and support the Northland economy through transport solutions. Main features of Connecting Northland are illustrated in Figure 6.

In addition to road transport investment, the Government is currently exploring opportunities to enable growth in the movement of people and goods to the regions through rail investment. The Transport Agency undertook a high-level assessment to investigate how many truck movements could be removed from SH1 between Whāngārei and Te Hana if investment were put toward the North Auckland Line (NAL) and a new rail link was provided to NorthPort at Marsden Point, the Marsden Point Link (MPL). It concluded that the commodities most likely to be attracted to rail were logs, woodchips, limestone, cement and dairy. The study estimated that up to 600 trucks could be removed from SH1 per day, resulting in up to 1,200 fewer truck movements per day in the long term (20+ years). This equates to approximately 30% of truck traffic between Whāngārei and Marsden Point.

Current demand along the Whāngārei to Te Hana corridor results in traffic flows ranging from 12,000 (Te Hana) to 28,000 (urban Whāngārei) vehicles per day, of which HCVs comprise of 6-11%. Growth has been relatively consistent through the corridor for the last five years at approximately five percent, per annum, partly driven by Whāngārei’s population growth³.

³ <https://www.stats.govt.nz/news/population-growth-fastest-in-northland-auckland-and-waikato>

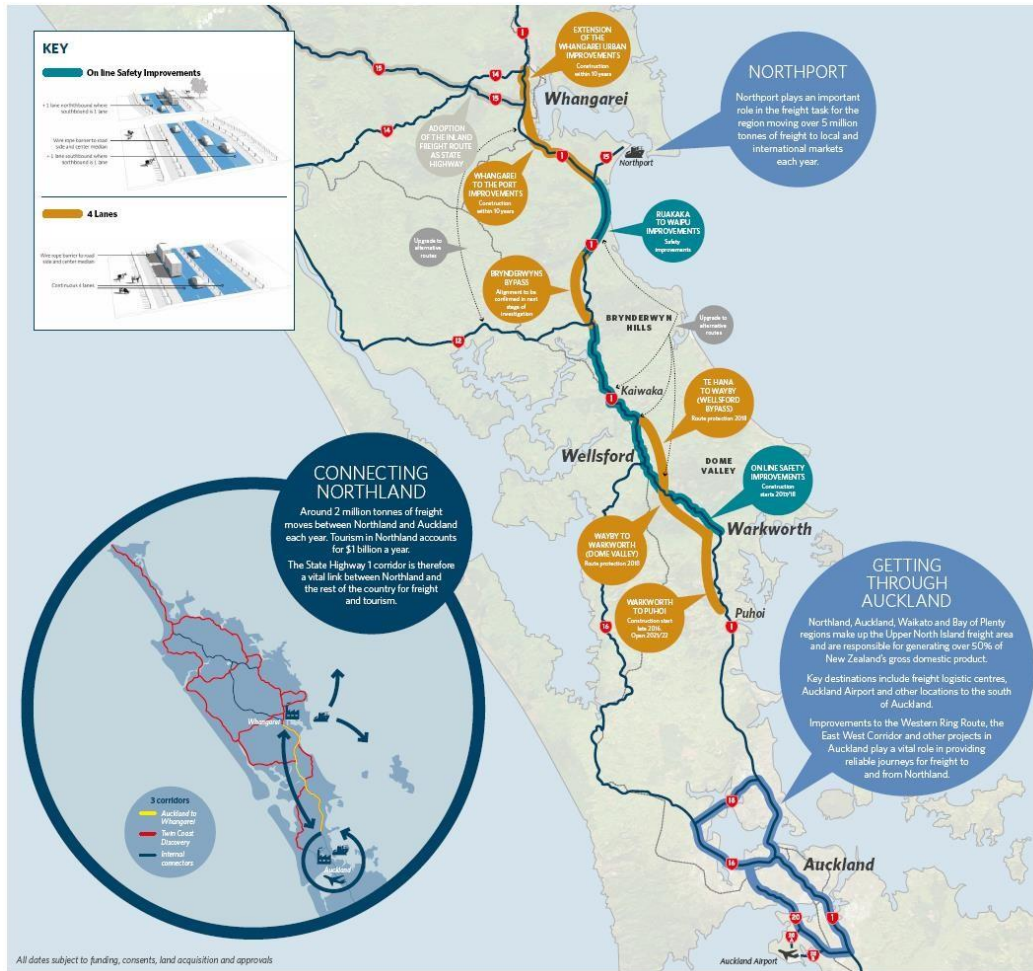


Figure 6 - Connecting Northland main features

3 Review of the Investment Logic Map (ILM)

A review of the Auckland to Whāngārei PBC Investment Logic Map (ILM) was undertaken to assess the clarity of intent, clear cause and effect within the problem and benefit statements, and whether sufficient evidence existed to support the case for investment in the corridor. Consideration was also given as to whether a change in problem prioritisation or weightings is appropriate, given the change in strategic context and the quality of evidence.

3.1 Existing ILM map (whole SH1 corridor)

Figure 7 below shows the ILM map that was developed during the Auckland to Whāngārei Programme Business Case:

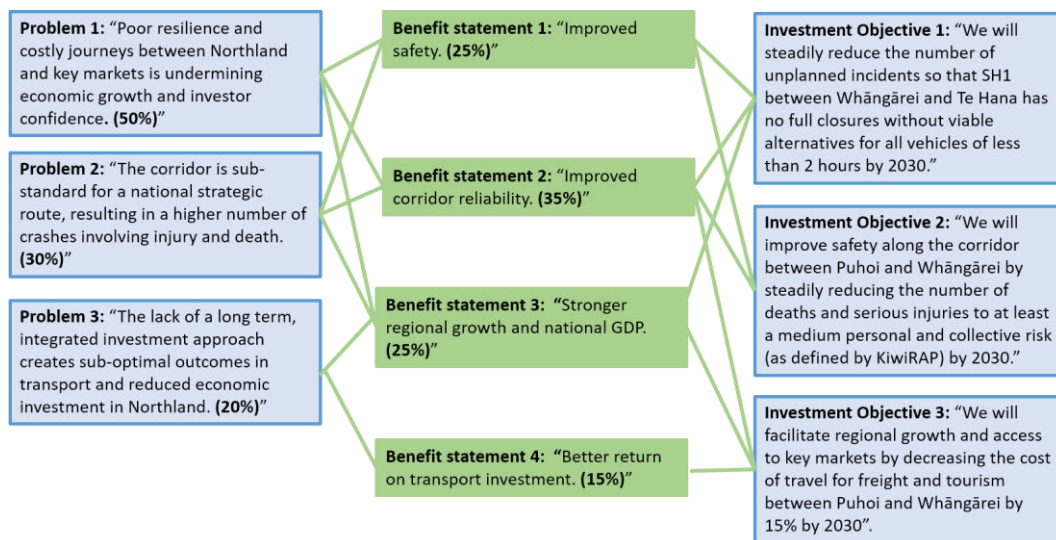


Figure 7 - Auckland to Whāngārei PBC ILM map

3.2 Review of Problem Statements

Problem statement one: “Poor resilience and costly journeys between Northland and key markets is undermining economic growth and investor confidence. (50%)”.

There is sufficient evidence to confirm that resilience along the Whāngārei to Te Hana corridor is a significant issue, as shown in Section 2.2.5.

The average speed within the corridor is also lower than sections of highway with the same ONRC classification. The slower speed and lack of reliability is related to a greater cost of journeys for freight and people.

Furthermore, customer and industry insights collected during stakeholder engagement showed that the high cost of travel is perceived as a deterrent to investment decisions by industry and business.

Establishing direct links between economic performance/growth, business productivity and transport accessibility is difficult as there are many factors that influence economic outcomes, particularly for regions like Northland. However, the NEAP supports the argument that the performance of the transport network, and particularly connectivity to a strong economic centre such as Auckland, has a significant role to play in the economic performance of Northland.

Re-evaluation finding: Problem statement one is supported by sound evidence. However, it is recommended that the weighting for this problem be reduced to 45%, so that it becomes the second highest priority after problem statement two. This reflects the change in strategic context, particularly the emphasis on safety, and the relative strength of the evidence.

Problem statement two: “The corridor is sub-standard for a national strategic route, resulting in a higher number of crashes involving injury and death. (30%)”

The corridor is identified as a “national strategic route” on the ONRC. In accordance with the ONRC, the aspirational safety level of service for a national state highway is a 3 to 4-star KiwiRAP rating.

The evidence, in Section 2.2.3 is that the safety record is poor and not commensurate with the ONRC classification. The corridor has no 4-star rated sections and 36% of its length is rated 2-star.

Prior to barriers recently being installed on the north Brynderwyn Hills, the crash history on the Brynderwyn Hills showed a high proportion of head-on, cornering and loss of control crashes. The corridor has a higher proportion than nationally of crashes with driver fatigue listed as a contributing factor. There is also a higher proportion of crashes involving heavy vehicles compared to national levels. This is especially so for crashes involving serious and fatal injuries.

As much of the evidence supporting the safety issues is at least two years old, it should be updated in the revised DBC and the analysis confirmed. The DBC should also consider the effectiveness of recently installed safety improvements along the corridor.

Re-evaluation finding: Problem statement two is supported by sound evidence and remains relevant. Given the change in strategic context, the weighting for this problem statement should be increased to be the highest priority, with a weighting of 55%.

Problem statement three: “The lack of a long term, integrated investment approach creates sub-optimal outcomes in transport and reduced economic investment in Northland (20%).”

This problem states that the lack of an integrated investment approach affects transport outcomes and investment in Northland. Northland does underperform economically compared to other comparable regions and there is evidence to suggest that this could be due to the transport system. There are current sub-optimal outcomes in transport along this corridor.

The focus on the lack of a plan, however, is not appropriate in a problem statement as the cause is not an external factor, and could be resolved without addressing the required effect. Further, the effect is largely a re-statement of problems one and two.

Re-evaluation finding: Problem statement three should be reviewed for the DBC, and probably, deleted.

3.3 Review of Benefit Statements

Benefit statement one: “Improved safety (25%).”

Improved safety has been shown to be required in this corridor and justifies expenditure. The standard performance measures used by the Transport Agency can apply to assess the benefit.

Re-evaluation finding: Benefit statement one remains relevant. It is recommended that this benefit be given a weighting of 40% given the significance of the benefit and alignment with the strategic context.

Benefit statement two: “Improved corridor reliability (30%).”

Addressing the resilience and safety issues would result in improved corridor reliability. The benefit is clearly aligned to problem statements one and two. Further, the benefit clearly aligns to organisational and strategic objectives to provide resilient access.

Re-evaluation finding: Benefit statement two remains relevant. A weighting of 35% is considered appropriate and this benefit should be taken forward as the second highest priority for the project.

Benefit statement three: “Stronger regional growth and national GDP (30%).”

Consideration of the link between transport improvements and economic growth in the Northland region is reflected within several development strategies.

Economic prosperity is a core outcome sought from the Transport Outcomes Framework. Whilst regional growth and national GDP are dependent on many factors external to the transport system between Whāngārei to Te Hana, the regional strategies argue that better, more reliable, transport linkages will benefit the regional economy. The weighting should drop to 25 % to reflect the interrelationship with benefits one and two.

Re-evaluation recommendation: When completing the DBC, assess the benefits to ensure that the linkage between the transport system quality and the economy is well-founded and which aspects of the transport system are most important.

Benefit statement four: *“Better return on transport investment (15%).”*

This benefit statement does not describe an outcome improvement for the end customer and should be removed. Its underlying principle, of course, needs to be reflected in the chosen interventions. The percentages for other benefits need to be adjusted accordingly.

Re-evaluation recommendation: When completing the DBC, benefit statement four should be deleted.

3.4 Review of Investment Objectives

The PBC investment objectives were reviewed to assess how they relate to the revised problem and benefit statements and to identify whether the change in the strategic context might impact the objectives of the investor.

Investment Objective one: *“We will steadily reduce the number of unplanned incidents so that SH1 between Puhoi and Whāngārei has no full closures without viable alternatives for all vehicles of less than two hours by 2030.”*

This investment objective refers to the longer corridor between Puhoi and Whāngārei, and should be refocussed to specifically address SH1 between Whāngārei and Te Hana. There is a clear link between this investment objective and the preceding problem and benefit statements related to safety and reliability. Further, the investment objective is measurable as it relates to full closures which are recorded by the Transport Agency. The investment objective is directly related to a key organisational objective of the Transport Agency.

It is recommended that the wording of the investment objective be revised to specifically address SH1 between Whāngārei and Te Hana, and achieve greater clarity of intent, as the PBC refers to a two-hour closure limit of the incident, not the viable alternative. This meaning could be misunderstood from the current wording. This intent of the investment objective remains unchanged.

Re-evaluation finding: Investment objective one remains strategically appropriate and follows logically from the relevant problems and benefits. The wording should be revised to relate more specifically to SH1 between Whāngārei and Te Hana, and to achieve clarity of intent, but this does not have a significant impact on the meaning of the objective.

Investment Objective two: “We will improve safety along the corridor between Puhoi and Whāngārei by steadily reducing the number of deaths and serious injuries to at least a medium personal and collective risk (as defined by KiwiRAP) by 2030.”

This investment objective refers to the state highway corridor between Puhoi and Whāngārei, and should be redefined in the DBC to relate more specifically to the Whāngārei to Te Hana corridor section. Notwithstanding, there is a clear link between this investment objective and the preceding problem and benefit statements related to safety. The investment objective is measurable as it relates to the reduction of DSIs. Specific targets are provided in the PBC to reduce the DSIs by 86 in a five-year period and for the entire corridor to achieve the KiwiRAP star rating commensurate with the ONRC classification.

The investment objective is directly related to a key organisational objective of the Agency and generally aligns with the “SMART” philosophy.

Re-evaluation finding: Investment objective two remains strategically appropriate and follows logically from the relevant problems and benefits. The wording should be revised to relate more specifically to SH1 between Whāngārei and Te Hana. No further changes are proposed.

Investment Objective three: “We will facilitate regional growth and access to key markets through decreasing the cost of travel for freight and tourism between Puhoi and Whāngārei by 15% by 2030.”

While the investment objective is measurable, it contains an arbitrary target – 15% – that is not related to any particular external factor. It also relates to a longer corridor than is being considered here. The objective should be reviewed in the DBC.

Re-evaluation finding: Investment objective three should be revisited during the DBC and related to the evidence linking economic growth to the state highway corridor travel times (and reliability).

The achievability of all the targets by 2030 will need to be revisited in the DBC.

3.5 Summary of the ILM review

Key findings from the ILM review are:

- Investment objectives one and two are robust and demonstrate strong alignment with the strategic context, only minor wording changes are required. Investment objective three should be reconsidered.
- Weightings should be reviewed.
- The investment objectives, as modified, should be retained for the development of the DBC, and checked that the 2030 target remains feasible

Figure 8 below shows an indicative revised ILM map for further development during the DBC:

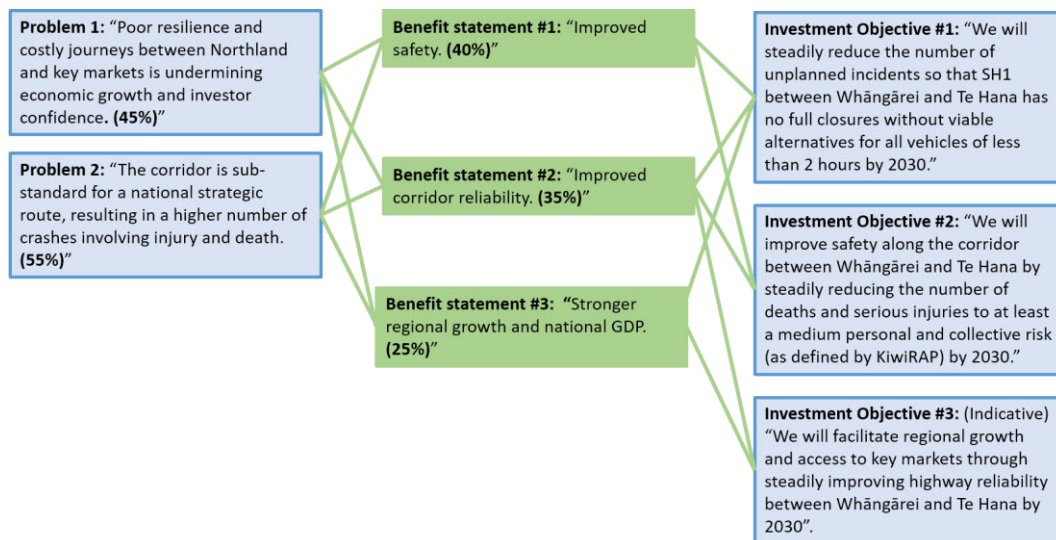


Figure 8 – Indicative revised ILM for development in W2TH DBC

4 Review of Existing Uncertainty Log

During the development of the PBC, the critical assumptions and uncertainties that have an impact on the investment proposal were noted. Appendix A presents the project uncertainty log provided in the PBC.

Factors such as land-use changes, port activity, rail mode-share and economic development were appropriately considered and should be revised and expanded on within the DBC. Specifically, uncertainties around the timing and nature of the investment and growth of NorthPort and the NAL rail corridor emerged during the re-evaluation, and should also be revisited during the DBC as parallel studies undertaken by others are concluded.

Some risks have been used to develop project options, while others have heavily influenced the programme. The majority will form the basis of sensitivity tests carried out on project options or become trigger points within the recommended programme.

Re-evaluation recommendation: When finalising the DBC, further analysis should be provided to explain the severity or impact on the corridor from the various uncertainties, particularly those with medium or high impacts. The likelihood of existing uncertainties should be reviewed, given the change in strategic context. Further, additional uncertainties that have developed owing to the change in government priorities should be added, such as the potential increase in coastal shipping.

5 Review of Existing Programme Options

The existing Whāngārei to Auckland PBC preferred programme is shown in Table 1 below. The estimated cost of the proposed programme is \$0.9 - \$1.4b and included capacity increases requiring significant infrastructure works.

The programme previously proposed includes a variety of interventions, including behavioural change, network optimisation, and online and offline improvements to safety and capacity. The previous proposed programme responds to the PBC investment narrative to improve safety and reliability, and provide significant additional capacity.

With a greater emphasis on value for money, and taking account of the relative strengths of the evidence, there is an opportunity now to review the timing and need for capital intensive infrastructure investment to achieve the investment objectives. These factors were considered in developing the revised direction for development in the DBC, as described further in Section 7, below.

Table 1 – Pre-evaluation programme (extracted from SH1 Auckland to Whāngārei Programme Business Case⁴)

Section	Infrastructure Investment
OPERATIONAL - Driver education and enforcement	Licence assistance – programme to assist young people in Northland to obtain drivers licenses. Programme implemented in partnership with local councils and the NZ Police. Alcohol education programme to target areas of poor compliance with drink driving limits. Courtesy shuttles at popular pubs and drinking establishments along and near the corridor Increased police enforcement – Increasing budget to the Police to undertake road enforcement including drink driving, speed and *555 response. Safe Police observation bays
OPERATIONAL - Wayfinding	Tourist signage – Enhance use of the Twin Coast Discovery Route Travel time signage – Retrofit existing distance guidance with travel time in order to set travel time expectations. VMS detour advance warning at key decision points on journey. I.e. at Wellsford with information on SH16 vs SH1 to airport. Directional arrows installed at 2.5km centres. SATNav details of detour routes
SH15: Inland Freight Route (SH1 to SH14)	Corner realignment and shoulder widening on selected corners to ease significantly substandard horizontal radii to address safety concerns on this route. Includes provision for a weigh station near the SH1/SH15 intersection.
Whangarei Urban Improvements	<ul style="list-style-type: none"> • Four laning between Toetoe Road and Rewa Rewa Road • Four laning between Southend Avenue and Murdoch Crescent • Four laning between Murdoch Crescent and Tarewa Road • Footpath between Toetoe Road and Murdoch Crescent

⁴ The previous PBC can be accessed at: <https://www.nzta.govt.nz/assets/projects/whangarei-to-auckland/SH1-Auckland-to-Whangarei-programme-business-case.pdf>

Section	Infrastructure Investment
	<ul style="list-style-type: none"> Cycle facilities between Toetoe to SH14 intersection
Toetoe to Oakleigh	<p>Offline 2+2 alignment with divided carriageway between Toetoe Road and Oakleigh (Mangapai Road).</p> <p>Connection provided between Otaika Valley Road and Portland.</p>
Oakleigh to SH15	<p>2+2 online upgrade of existing alignment with installation of wire rope central and side barriers.</p> <p>Truck stop at SH15A intersection including vehicle charging facilities</p> <p>Intersection improvements at SH15A</p>
SH15 to Brynderwyn Hills	<p>Central wire rope barrier installed. Additional passing lanes provided to improve passing opportunities.</p> <p>Access rationalisation in Waipu</p>
Brynderwyn Hills	<p>Western Bypass of the Brynderwyn Hills. 2+1 or 2+2 lanes. Wire rope barriers provided.</p> <p>Tourist rest area – top of Brynderwyn Hills</p> <p>Truck stop – SH12 intersection including vehicle charging facilities</p>
Brynderwyn Hills to Te Hana	<p>Safety improvements including minor curve realignment particularly around Ross Road. Installation of some side barriers. Selected shoulder widening, paint marking and signage improvements.</p> <p>Kaiwaka township improvements including gateway treatments.</p> <p>Upgrade detour routes including Mangawhai Road and Kaiwaka-Mangawhai Road including sections of shoulder widening and minor curve realignments.</p> <p>Truck stop/rest area in Kaiwaka including vehicle charging facilities</p> <p>Improved permanent detour and tourism signage</p>
Te Hana to Warkworth	<p>RoNS project including extension to north of Te Hana. Offline 2+2 divided carriageway with interchanges north of Warkworth, Wellsford and north of Te Hana.</p> <p>Online safety improvements – Dome Valley</p> <p>Town Centre improvements in Wellsford.</p>
Warkworth to Puhoi	<p>Puhoi to Warkworth RoNS. A 2+2 divided carriageway built to a high standard. Includes interchanges at Puhoi and northern interchange at Warkworth.</p> <p>Park and Ride - Warkworth</p>

6 Development of Revised Programme of Options

Following the review of the previous programme, The Transport Agency, Commute Transportation Consultants and Arup developed a refined direction for the Whāngārei to Te Hana investment.

In developing revised options that would be taken forward through the DBC, there was an opportunity to respond to the increased emphasis on value for money and to take account of the GPS 2018 themes.

6.1 Consideration of GPS themes

The themes in GPS 2018 are:

- a mode-neutral approach to transport planning and investment decisions
- incorporating technology and innovation into the design and delivery of land transport investment
- integrating land use and transport planning and delivery.

6.1.1 Mode Neutrality

The SH1 Whāngārei to Te Hana corridor includes an urban section where consideration of public transport, walking and cycling schemes should be included to address growing demand through a multi-modal approach. Some road safety initiatives, such as localised intersection improvements that also address active mode facilities could have benefits in removing real or perceived barriers that limit uptake of active travel.

Elsewhere, the principal consideration may be the use of the NAL and the spur line to NorthPort. That opportunity has been the subject of a separate study which will need to be reflected in future work.

Re-evaluation finding: The revised programme should consider a stronger multi-modal approach to addressing the demand. This opportunity should be explored further through the completion of the DBC and included in the revised programme.

6.1.2 Integrated land-use and transport

The PBC concluded that the SH1 corridor needs to remain the strategic spine between Whāngārei, Te Hana and further south and that future development should be concentrated along the corridor.

Safety and resilience are the primary issues for the corridor, which are generally unable to be solved by integrated planning interventions.

However, in the urban area, there is an opportunity to work with Whāngārei District Council to optimise land use and transport integration in Whāngārei and immediate surrounds.

Re-evaluation finding: Opportunities to integrate land use and transport should be considered during the completion of the business case where they are expected to be beneficial.

6.1.3 Technology

During the PBC, the Transport Agency explored technology opportunities to increase corridor resilience. Specifically, the use of Variable Message Signs (VMSs) and electronic driver information signage was investigated to mitigate the

effects of events and improve safety on the corridor. Following meetings with the Safe Roads Alliance, it is understood that these technology elements are planned to be incorporated into their programme of interventions.

Technology initiatives related to demand management, such as MaaS and car/ride sharing have not been included in the revised programme as they are unlikely to have a material impact on the problems. However, corridor improvements should not preclude future technology options.

6.2 Revised Programme of Options

The revised programme of options includes short, medium, and long term activities, focussing on the immediate safety and resilience challenges through the corridor whilst also considering localised enhancements for public transport, high occupancy vehicles and freight.

Some degree of enhanced capacity in parts of the corridor is proposed to support economic growth if current growth trends continue. It is however critical that any additional capacity be considered in the context of people capacity (rather than vehicular) and within a hierarchy of prioritisation for higher priority customers such as freight and public transport.

The recommended investment direction for the corridor is:

- Provide a safer and more resilient SH1 corridor with limited additional capacity
- Include non-infrastructure road safety interventions
- Consider any additional capacity in the context of people capacity and within a hierarchy of prioritisation for higher priority customers such as freight and public transport
- Promote additional localised transport solutions with Whāngārei District Council to include an integrated transport and land use response.

The recommended programme is shown in Figure 9.



Figure 9 – SH1 Whāngārei to Te Hana corridor revised programme interventions (as part of wider Whāngārei to Warkworth recommended programme)

6.2.1 State Highway Interventions

The PBC identified a preferred programme but also considered a low-cost safety option at nearly half the cost. The larger scale programme delivered a wider range

of benefits and delivered a greater DSI saving compared to the low-cost safety programme. This was, however, achieved at nearly twice the cost per DSI (being \$10m per DSI vs almost \$6m). With a renewed focus on safety and value for money, this programme was closely reviewed and forms the basis of the new recommended programme.

Working south from Whāngārei, the current transport demand and forecast growth in the urban area to Rewa Rewa Road supports localised additional capacity (for over 28,000vpd) in the short to medium term. This is a built-up urban environment and planning for this additional capacity now through route protection is recommended. This should be done with an integrated transport and land use corridor plan, as the implications and opportunities for land-use changes as result of this transport intervention are considerable.

The exact form of this additional capacity will need to be examined closely. Freight has other options (SH15). Walking and cycling is also a priority in this section of the corridor given it is urban nature of the environment. Investment in public transport services and localised priority in the short term should also be an area of focus.

Between Rewa Rewa and Marsden (SH15) there is considerable current transport demand and a substantial safety problem. This should be addressed through:

- Localised safety enhancements at Loop Road (and where identified by Safe Roads Alliance along this section)
- Upgrading the existing alignment to enhance safety and resilience (especially against flooding) for the entire length of the route
- Increasing transport choices between Marsden growth area and Whāngārei through localised prioritisation of public transport, HOV and potentially freight, including:
 - Intersection prioritisation (HOV and public transport)
 - Higher quality public transport services
- Route protection for additional offline capacity for the long term. Use of this additional capacity (and the magnitude of the added capacity) should be confirmed closer to implementation, with a focus on managed capacity (for public transport, HOV, freight) as a priority.
- Safety enhancements on SH15 to improve safety and resilience of the network.

Between Marsden and the top of the Brynderwyn Hills the focus is on safety and resilience with localised safety enhancements where required and as defined by Safe Roads Alliance. The Brynderwyn Hills are a known resilience challenge, and therefore strengthening of alternative routes in the short to medium term is recommended. This would include localised widening, signage, paint markings and bridge strengthening on Cove Road and Mangawhai Road. In the longer term, a bypass should be considered and designated if a strong enough case can be

presented from safety, resilience and value for money perspectives, following further analysis of up-to-date data that take account of localised safety works.

From the Brynderwyn Hills to Te Hana the focus is also on safety and resilience. The southern side of the Brynderwyn Hills is susceptible to landslip closures and has a poor safety record. Immediate safety works are to be considered and implemented on the southern side (though it is acknowledged that a significant intervention would be difficult to achieve given the constraints). The long term solution of a bypass could address the long term needs of the corridor and requires further consideration. Further south to Te Hana localised safety enhancements are proposed through the Safe Roads Alliance. A focus will be on high risk locations and also at Kaiwaka where severance issues will need to be addressed.

It is noted that south of Te Hana a similar approach is being adopted with short term safety improvements being implemented in the Dome Valley whilst planning and protection of the long-term intervention continues.

6.2.2 Other Interventions

As well as the above physical measures there are a number of non-physical interventions to address the safety problem. With 50% of the DSIs being related to behaviour including alcohol and drugs the following measures are also recommended immediately:

- Licence assistance programmes for young drivers in partnership with police and local councils
- Greater police enforcement including drink driving, speed and *555 response
- Safe police observation bays
- Alcohol education.

A speed management strategy for the corridor should also be considered. It will need to consider the trade-off between improved safety outcomes from changes in speed against any degradation of access for customers.

6.2.3 Programme summary

The focus is on making best use of the current alignment and capacity to address the safety and resilience challenges whilst providing investment in access outcomes with increased choice, including through public transport investment.

To ensure the corridor has the flexibility to respond to the inherent uncertainty of a fast-growing economy, route protection of long term alignments is also recommended.

6.3 Alignment to Transport Outcomes Framework and IAF

The revised programme has been assessed against the outcomes specified in the Transport Outcomes Framework using the IAF model. The assessment is provided below in Table 2. It is shown at a high level, that the revised programme will enable the desired government outcomes to be achieved.

Activity	Timing			Key Benefits	A transport system that improves wellbeing and liveability				
	Short (2018-21)	Medium (2021-27)	Long (2028+)		Inclusive access	Healthy & safe people	Economic prosperity	Resilience & security	Environmental sustainability
Land-Use & Transport Integration									
Work with Whangarei District Council to confirm land use in and around Whangarei, Marsden	✓			<ul style="list-style-type: none"> Optimises land-use/transport integration Increased liveability 	H	M	H	M	M
Making improvements in Kawaka to address severance and safety		✓							
Public Transport Investment									
Develop an PT improvements plan following exploring the potential for enhancing public transport choices. Items to consider include: <ul style="list-style-type: none"> Whangarei service enhancements Whangarei to Marsden services PT Prioritisation improvements identified 	✓			<ul style="list-style-type: none"> Supports mode shift & travel choice Reduces single occupancy vehicles 	H	M	M	M	M
Implement the findings of the PT improvements plan		✓	✓						
System Interventions									
Speed management strategy	✓			<ul style="list-style-type: none"> Contributes to DSI reduction 	L	VH	L	L	L
Speed management & enforcement and *555 responses	✓			<ul style="list-style-type: none"> Contributes to DSI reduction 	L	VH	L	L	L
Safe Police observation bays	✓			<ul style="list-style-type: none"> Contributes to DSI reduction 	L	VH	L	L	L
Alcohol education programme	✓			<ul style="list-style-type: none"> Contributes to DSI reduction 	L	VH	L	L	L
License assistance programme	✓			<ul style="list-style-type: none"> Contributes to DSI reduction 	L	VH	L	L	L
SH Investment									
Implement online safety and resilience works on south side of Brynderwyns		✓		<ul style="list-style-type: none"> Contributes to DSI reduction and resilience 	L	H	L	M	L
Identify and route protect (if confirmed as required) western Brynderwyns bypass	✓			<ul style="list-style-type: none"> Contributes to DSI reduction and enhanced access and resilience 	M	L	M	M	L
Implement Brynderwyns bypass			✓	<ul style="list-style-type: none"> Contributes to DSI reduction and enhanced access and resilience 	M	L	H	H	L
Identify online safety and resilience works	✓			<ul style="list-style-type: none"> Contributes to DSI reduction and resilience 	L	H	L	M	L
Implement online safety and resilience works		✓		<ul style="list-style-type: none"> Contributes to DSI reduction and resilience 	L	H	L	M	L

Whangarei (SH14 to Rewa Rewa Rd)									
Undertake route protection for four laning in Urban Whangarei, to include for enhanced safety, walking and cycling, prioritised users and integrated land use	✓			• Contributes to DSI reduction and enhanced access to Whangarei	M	M	H	M	L
Implement four laning in Urban Whangarei, to include for enhanced safety, walking and cycling, prioritised users and integrated land use		✓		• Contributes to DSI reduction and enhanced access to Whangarei	M	M	H	M	L
Rewa Rewa Rd to Marsden (SH15A)									
Implement Loop Road Safety improvements	✓			• Contributes to DSI reduction	L	H	L	M	L
Identify online safety and resilience works	✓			• Contributes to DSI reduction	L	H	L	M	L
Implement online safety and resilience works	✓	✓		• Contributes to DSI reduction	L	H	L	M	L
Identify localised priority points and works for PT, HOV and freight	✓			• Contributes to an enhanced access, resilience and DSI reduction	M	M	M	M	L
Implement localised priority points and works for PT, HOV and freight		✓		• Contributes to an enhanced access, resilience and DSI reduction	M	M	M	M	L
Identify and route protect long term additional capacity (2 lanes) for prioritised use	✓			• Contributes to an enhanced access, resilience and DSI reduction	M	M	M	M	L
Implement additional capacity (2 lanes) for prioritised use			✓	• Contributes to an enhanced access, resilience and DSI reduction	M	M	M	M	L
Marsden (SH15A) to Brynderwyns									
Identify and route protect resilience works on Cove and Mangawhai Road	✓			• Contributes enhanced access and resilience	L	L	L	H	L
Implement resilience works on Cove and Mangawhai Road		✓		• Contributes to enhanced access and resilience	L	L	L	H	L
Identify online safety and resilience works	✓			• Contributes to DSI reduction	L	H	L	M	L
Implement online safety and resilience works		✓		• Contributes to DSI reduction	L	H	L	M	L
Brynderwyns to Te Hana									
Identify online safety and resilience works on south side of Brynderwyns	✓			• Contributes to DSI reduction and resilience	L	H	L	M	L

Table 2 – Assessment of revised programme against the Transport Outcomes Framework

7 Conclusions

This evaluation report outlines the findings of a first principles review of the SH1 Whāngārei to Te Hana corridor investment proposal.

This re-evaluation finds that there is sufficient evidence to support targeted investment and proposes a revised programme of options for further development through the Detailed Business Case phase of the project. The revised programme is summarised below.

Revised Programme of Options

A refined corridor approach should focus investment on safety as the first priority and look to address the access needs of the corridor, by initially making best use of existing infrastructure, and using this infrastructure to enhance choices for customers through promoting use of alternative modes, where feasible.

The revised programme includes system wide measures as well as interventions that are specific to the four distinct sections of the corridor that have different characteristics and problems. The revised programme, for each of the four sections, is shown in Figure E1 below as part of the wider Whāngārei to Warkworth recommended programme.

The updated recommended set of investments comprises:

- In the short term:
 - Consideration of a corridor-wide speed management strategy to improve safety
 - Localised safety improvements designed and implemented in a number of locations (incl. Loop Road, southern Brynderwyn Hills)
 - Increased investment in enforcement and driver licensing education through the corridor to address the behavioural factors impacting on the poor safety record
 - Strengthening network resilience through consideration of alternative routes
 - Development of more integrated land use and transport plans at the northern end of the corridor, and in particular the Whāngārei urban area, to drive better transport choices.
 - Identification of measures and locations for prioritisation of more efficient and critical modes of transport (including public transport, HOV and freight between Whāngārei and SH15A).
- In the medium term:
 - Implementation of the identified safety, resilience and efficient modes projects
 - Route protection of longer term priority works such as Brynderwyn Hills bypass
- In the long term:

- Implementation of the longer term priority works as identified in the earlier stages

The PBC ILM review has confirmed the need for investment with sound logic and adequate supporting evidence.

More specific conclusions related this evaluation are summarised below:

Investment Logic Map (ILM)

- The evidence for the first two problems in the PBC (related to safety and resilience) is robust and their priority aligns with the current strategic context. These problems should be carried forward to the DBC.
- The review indicates that a higher weighting should now be allocated to problem two than was identified in the PBC.
- The third problem does not demonstrate clear cause and effect and does not align to the new strategic context and should be omitted.
- The revision of the ILM should support a stronger multi-modal approach. This is to be explored further through the completion of the DBC and included in the revised program.
- Opportunities to integrate land use and transport planning should be considered during the completion of the DBC where they are expected to be beneficial.

Problem Statements

- Problem statement one is supported by sound evidence. However, it is recommended that the weighting for this problem be reduced to 45%, so that it becomes the second highest priority after problem statement two. This reflects the change in strategic context, particularly the emphasis on safety.
- Problem statement two is supported by sound evidence and remains relevant. Given the change in strategic context, the weighting for this problem statement should be increased to be the highest priority, with a weighting of 55%.
- Problem statement three should be reviewed for the DBC, and omitted.

Benefit Statements

- It is recommended that benefit statement one be given a weighting of 40% given the significance of the benefit and alignment with the strategic context.
- Benefit statement two remains relevant and the weighting is appropriate. A weighting of 35% is considered appropriate and this benefit should be taken forward as the second highest priority for the project.

- Benefit statement three, pertaining to economic growth, needs to be retained, with a revised weighting of 25%.
- When completing the DBC, assess the benefits to ensure that the linkage between the transport system quality and the economy is well-founded.

Investment Objectives

- Investment objective one remains strategically appropriate and follows logically from the relevant problems and benefits. It is recommended that the wording be revised to specifically address SH1 between Whāngārei and Te Hana, and to achieve clarity of intent.
- It is recommended that the wording in investment objective two be revised to specifically address SH1 between Whāngārei and Te Hana.
- Investment objective three should be revisited during the DBC and related to the evidence linking economic growth to the state highway corridor travel times (and reliability).

Uncertainty Log

- When finalising the DBC, further analysis should be provided to explain the severity or impact on the corridor from the various uncertainties, particularly those with medium or high impacts.
- The likelihood of existing uncertainties should be reviewed given the change in strategic context.
- Further, additional uncertainties that have developed owing to the change in government priorities should be added, such as the potential increase in regional rail and coastal shipping.

Appendix A – Uncertainty Log

Uncertainty	Time	Likelihood	Severity/Impact on Corridor	Comments
Land use changes				
Growth forecasts Whāngārei changes. Marsden Point increases population and employment		Reasonably foreseeable	Medium	As per WDC high forecast for Marsden Point
Warkworth growth as per SubRAP with Future Urban area	2020	More than Likely	High	As per latest ART modelling
Wellsford population increases	2021 post RoNS	Hypothetical	Medium	Growth in accordance with Warkworth
Kaipara District Council development	2021 post RoNS	Reasonably foreseeable	Low	Growth in KDC higher than anticipated following improved access
Port activity				
Bigger containers or bulk goods import role at NorthPort	Post 2020	Hypothetical	High	Informed from the UNI Freight Study scenarios and the Auckland Port Study currently in progress
Air travel				
Whāngārei Airport increases domestic flights	unknown	Hypothetical	Low	Informed by Whāngārei Airport study
Whāngārei Airport moves	unknown	Hypothetical	Low	Reduction in accessibility to Whāngārei
Rail mode share				
Investment in rail network, including Marsden Rail connection	unknown	Reasonably foreseeable	Medium	Greater portion of freight transported by rail. Reduction in heavy vehicles on road.

Uncertainty	Time	Likelihood	Severity/Impact on Corridor	Comments
Inability of rail freight to travel through Auckland economically following increasing Auckland commuter demand.	Post CRL	More than likely	Medium	Risk of rail investment being ineffective due to constraints outside the scope of this corridor.
Economic development				
Development of key industries creating additional jobs	unknown	Reasonably foreseeable	Medium	Informed by Tai Tokerau Growth Study
Increased tourism industry activity – more visitors	2025	Reasonably foreseeable	Medium	Tourism in Northland accounts for a large proportion of industry and affects traffic volumes significantly
Transport baseline				
Fuel prices	unknown	Reasonably foreseeable	Medium	Change in fuel price will affect vehicle travel and traffic levels on the corridor