

Note: Information in this document was accurate when presented to the NZTA Board; some details may have since changed.

Attachment 5

Te Hana to Whangārei Investment Case for Long Term Route Protection (Northland Corridor)

Overview

- **Project objective:** The Northland Corridor will deliver an efficient, reliable connection between Whangārei and Warkworth, with co-benefits of improved resilience, safety and economic growth.
- s 9(2)(b)(ii)
- s 9(2)(ba)(ii)
- . The project has a BCR of 1.2—1.4 (tolled and untolled).
- The tolling assessment has been completed and recommends tolling of the route.
- The project is ready to proceed to the Route Protection phase for the entire corridor and also to get procurement ready (further statutory approvals and reference design) for the Brynderwyns and Urban Whangārei sections and is seeking funding of \$219m.

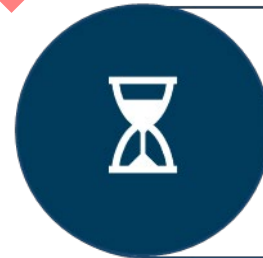


There is an immediate need for investment

There is an immediate need to progressively provide a safe, resilient and efficient State Highway connection between Auckland and Whangārei that is commensurate with its nationally strategic function.

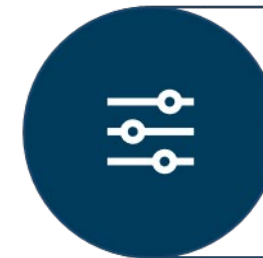


A four-lane grade separated rural motorway is the long-term form and function needed for this corridor to unlock the economic opportunity for Northland.



We should route protect the corridor now

This corridor should be protected now to provide certainty and enable implementation.



Our approach provides flexibility for implementation

The corridor will be staged over time and our approach enables future choices over timing, delivery, project size and funding. ***We are allowing for the accelerated delivery of the critical bypass of the Brynderwyn Hills.***

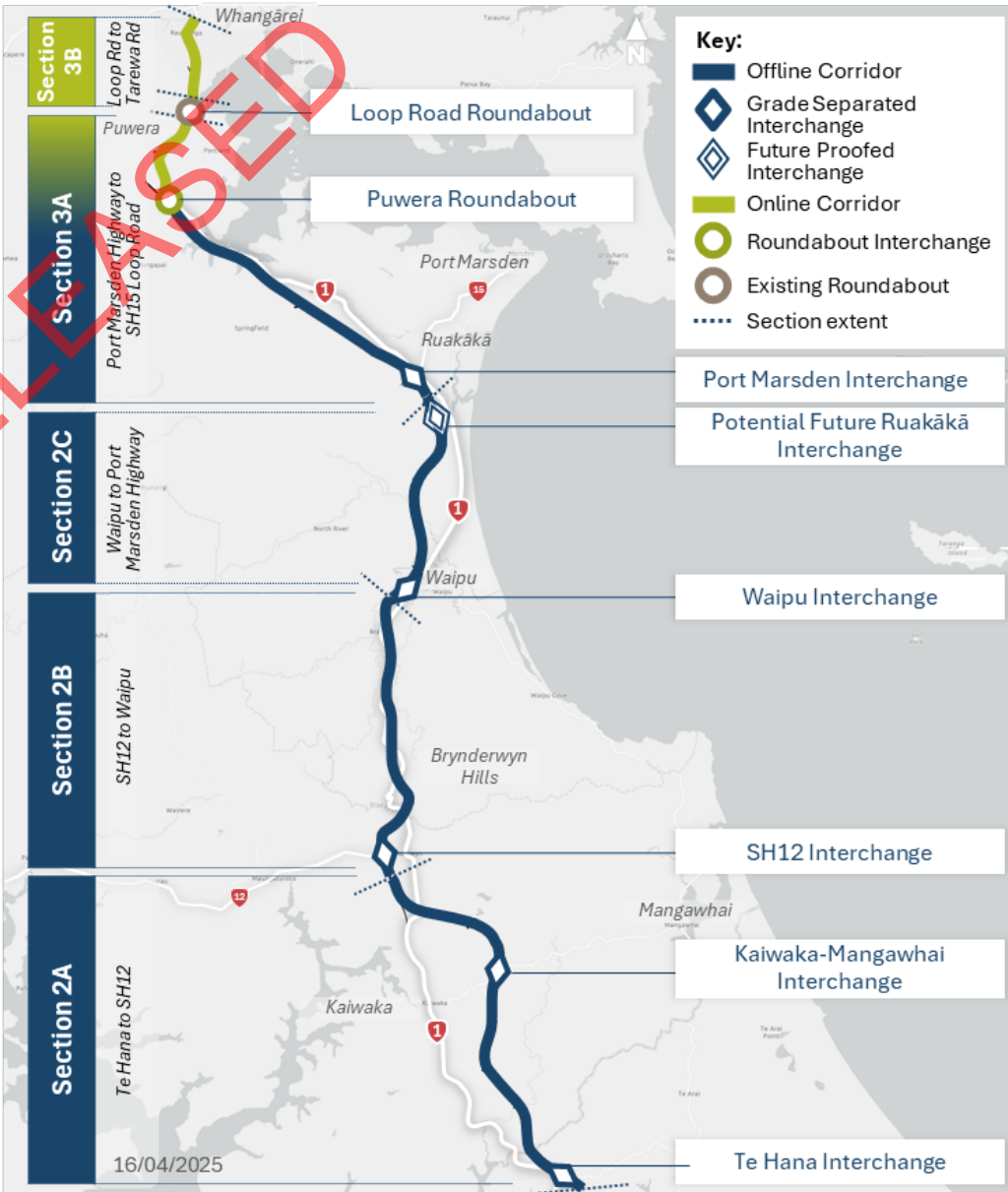
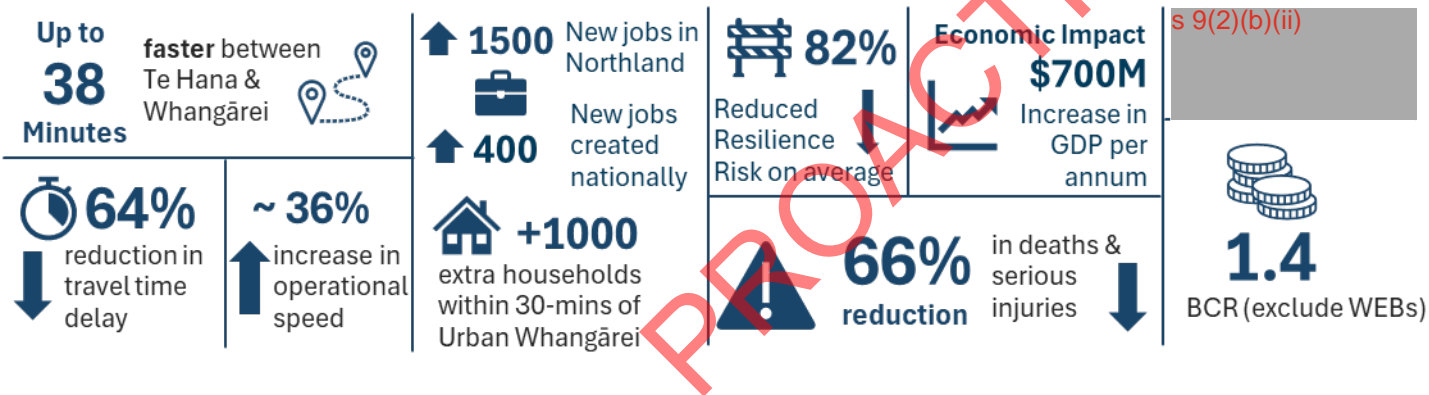
Recommended Option

Project Scope

- A new, offline four-lane SH1 corridor from Te Hana to Puwera, designed to accommodate speeds of 110km/h.
- Upgrading existing SH1 to four lanes from Puwera to Whangarei (SH14) at lower speed.
- Four new grade separated Interchanges at Kaiwaka, SH12, Waipu, SH15 Port Marsden (and the options for a future interchange at Ruakaka) as well as an at grade roundabout at Puwera.
- SH1 Revocation – the existing SH1 would be revoked from a State Highway function to reflect the primary role of access and local trips.

Project Outcomes

- The project is forecast to deliver considerable benefits to the corridor and wider regional economies.



Cost and Contingency

- Applying the estimating process results in the following costs:

Section	Location	Base Estimate \$b	Expected Estimate \$b	Funded Estimate \$b
2A	Te Hana to SH12	s 9(2)(b)(ii)		
2B	SH12 to Waipu			
2C	Waipu to Port Marsden Highway			
3A	Port Marsden Highway to SH15 Loop Road			
3B	SH15 Loop Road to Tarewa Road			
TOTAL	(unescalated)			
TOTAL	(escalated)			

- This includes the following risk profile:

20%
Expected Risk

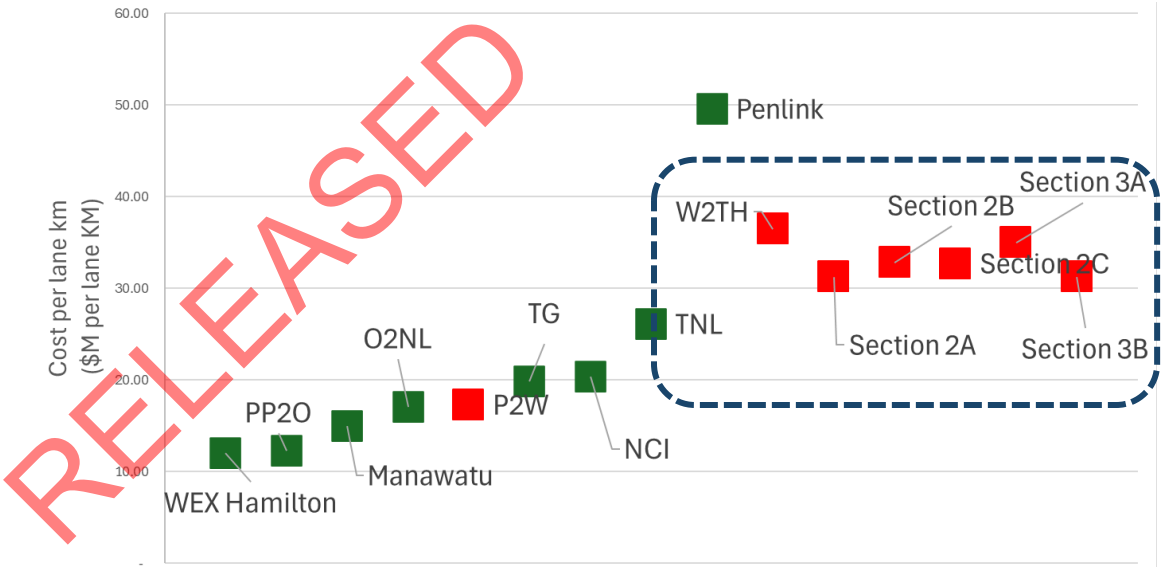
+

25%
Funded Risk

=

45% Total Risk

- The risk profile is considered appropriate as the base costs have been heavily informed by the recent Section 1 costs which are to a much higher level of detail, providing confidence in the risk profile assumed.
- This corridor has been benchmarked against other NZTA projects. Of most relevance is the Section 1 Warkworth to Te Hana project which has had a recent reference design undertaken with similar Northland terrain and as such is a good comparator for this project. The Section 2 & 3 costs are commensurate with Warkworth to Te Hana on a per km basis.
- This analysis also shows that the Northland Corridor costs are high compared to other areas of the State Highway network.



The benchmarking exercise has highlighted a number of areas where there is considerable opportunity to reduce the (base) costs materially through design optimisation (given the high level of the current design and based on recent Warkworth to Te Hana knowledge). As an example, the current designs have bridges at a rate of up to twice that of the current Warkworth to Te Hana and if this could be optimised to reflect the same rate as Warkworth to Te Hana, this could save up to \$1Bn across the corridor.

Other areas of focus moving forward for project optimisation include:

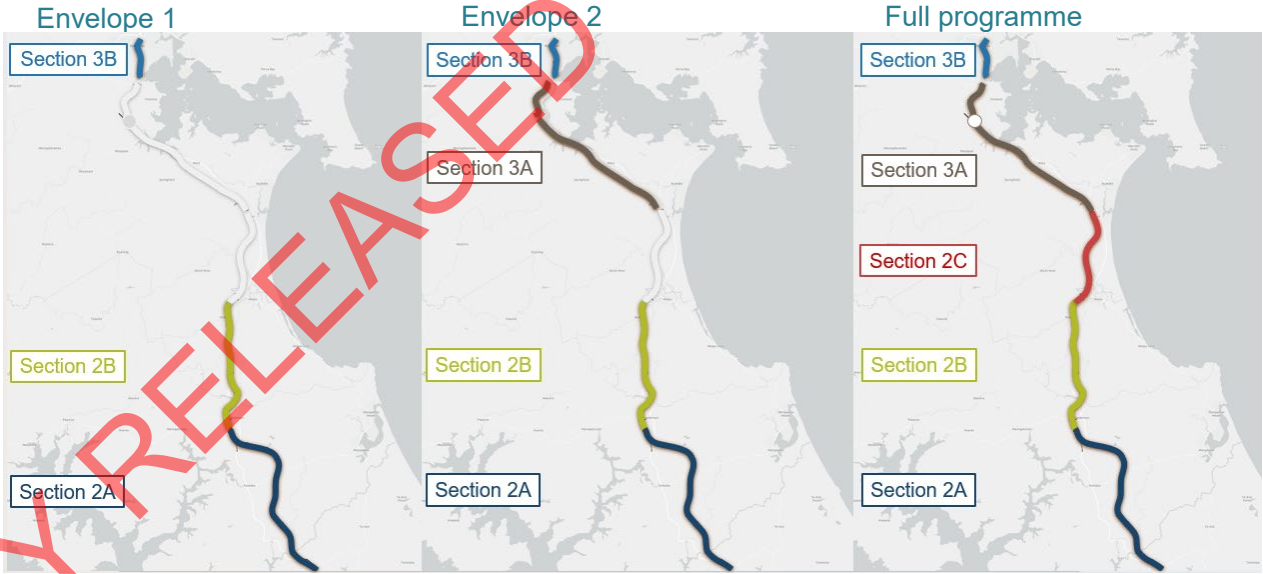
- Earth works optimisation (including bridge vs embankment)
- Consent conditions
- Material handling and sourcing

We have included some of these aspects in the current estimate through a reduced risk allowance. The next phase will focus on design optimisation to drive cost certainty and further value

Why cheaper options are not proposed

- We have considered scope decisions be used to meet the cost envelopes that have been estimated during earlier stages for Sections 2 and 3 of the programme:
 - Envelope 1 of s 9(2)(b)(ii) was the initial envelope established in 2023 based on previous projects.
 - Envelope 2 of s 9(2)(b)(ii) was indicated in 2024 based on the updated form.
- If restricted by the investment envelope, the table below sets out the resultant impacts on the long-term corridor solutions.

	Envelope 1	Envelope 2	Emerging Preferred
Section 3B			
Section 3A	No investment, remains 2 lanes		
Section 2C	No investment, remains 2 lanes	No investment, remains 2 lanes	
Section 2B			
Section 2A			
Cost	s 9(2)(b)(ii)		
BCR (P50 without WEBS)	1.3	1.4	1.4
Incremental BCR	1.5 1.5		



- Whilst Envelope 2 and the Emerging Preferred Option have similar BCRs, the additional investment associated with the Emerging Preferred option will unlock approximately 20% additional benefits by completing the corridor. This Value for Money is demonstrated with an incremental BCR of 1.5.
- Envelope 1 will only achieve half of the benefits and doesn't meet the objectives of the corridor.

Given neither of the options that fit within Envelope 1 or 2 meet the form and function set out by the GPS, nor are they commensurate with the ONF aspirations of an Interregional Connection and they also have a similar or worse BCR it is recommended that the long-term corridor option is the Emerging Preferred programme and that additional funding is earmarked for the future implementation. This will ensure the long-term solution for the Northland corridor is protected for future implementation, achieving the programme outcomes and provides a consistent journey for users, rather than a 'gap' in standard.

Funding and Finance

Funding source		Comment
Public Private Partnerships (PPP)	<input checked="" type="checkbox"/>	Offline corridor suitable for a PPP. Capacity on PPP funding nationwide should be considered for viability.
Tolling Assessment	<input checked="" type="checkbox"/>	Suitable for tolling. Preliminary corridor tolling modelling has been undertaken. s 9(2)(ba)(ii), s 9(2)(f)(iv)
GDP Uplift – Crown Grant	<input checked="" type="checkbox"/>	Substantial increase in accessibility to enhanced GDP per annum by \$700m, create 1500 new jobs in Northland and 400 additional jobs nationally.
Value Capture	<input checked="" type="checkbox"/>	Value capture options considered low due to predominantly rural nature of the project, however localised opportunities at interchanges, particularly the Ruakaka interchange. Value capture as a funding source will be considered further through alternative mechanisms such as Property Development Charges, negotiated contributions, or an IFF levy.
Time of Use Charging	<input type="checkbox"/>	Not considered suitable for inter-regional project, particularly with tolling proposed.
National Land Transport Fund (NLTF)	<input checked="" type="checkbox"/>	Remaining source for project funding. 2024-2027 NLTP currently includes \$96m available for pre-implementation activities.

Delivery

- This decision is seeking the approval of Pre-implementation funding. (We will return to the Board for construction funding).
- The next slide sets out activities by section over coming 18 months.
- The corridor will be delivered over a number of years in stages (like the Waikato Expressway).
- The Brynderwyns have been identified as the next most urgent section within the corridor due to the existing resilience risk. ^{s 9(2)(f)(iv)}
[Redacted]
- The Urban Whangārei section has also been identified for acceleration to provide implementation flexibility and deliver early benefits in the north of the corridor whilst also ensuring that the implementation of future sections of the corridor are able to deliver their forecast benefits.
- The consenting approach has been developed to enable flexibility for future implementation and staging decisions and priorities.

^{s 9(2)(j)}

[Redacted]

Delivery Pathway	
Procurement and Delivery	<p>For the next phase of obtaining statutory approvals, the existing professional service teams will be used as this was part of their original scope when tendered in 2024.</p> <p>A Implementation Case will confirm the procurement model for each section, closer to implementation, however early analysis for the Brynderwyns indicate that there are benefits to continue the PPP approach in the corridor, including:</p> <ul style="list-style-type: none">• The stronger whole of life outcomes.• The ability to leverage off the current Section 1 procurement and maximise international market participation.• Provides strong price certainty and effective risk management.• Provides commercial incentive to deliver to programme.
Consenting Pathway	<p>A consenting strategy is based on using the Fast Track provisions. The Fast Track is to be used for a designation for the entire corridor (lodged in different sections) and then for the Brynderwyn and Urban Whangarei sections all other statutory approvals will also be applied for via the Fast Track.</p>
Proposed Property Strategy and Status	<p>Considerable landowner engagement has occurred. This is a major, multi-year acquisition programme, significant in both the number of properties involved and the projected acquisition costs. ^{s 9(2)(j)}</p> <p>[Redacted]</p>
Key Risks with Delivery Pathway	<p>^{s 9(2)(g)(i)}</p> <p>[Redacted]</p>

What are the next steps?

Following the completion of this Investment Case, there are four key next steps for the Northland Corridor.

1

Corridor Route Protection

- Notice of Requirement designation for whole corridor from Te Hana to Whangārei.
- Regional Consenting for Sections 2B (SH12 to Waipu) and 3B (Urban Whangārei).
- Targeted geotechnical investigations.
- Landowner meetings.
- Consenting level design.

2

Section 2B: SH12 to Waipu (Brynderwyn Hills) Implementation Investment Case

- Development of Implementation Investment Case.
- Reference design.
- Advance property acquisition process.

3

Section 3B: Loop Rd to Tarewa Rd (Urban Whangārei) Implementation Investment Case

- Development of Implementation Investment Case to support Early Works programme.

4

Confirmation of Future Staging

- Further work on implementation and early works staging for project development over the medium term (5-10 years).

	2025	2026				2027			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1 . Corridor Route Protection									
Section 2A NoR					2A Lodgement				
Section 2B NoR and Consents		2B Lodgement							
Section 2C NoR				2C Lodgement					
Section 3A NoR				3A Lodgement					
Section 3B NoR and Consents		3B Lodgement							
2. Section 2B Implementation Case									
Develop Implementation Case					2B Implementation Funding Approval				
Reference Design						Utilised in procurement			
Procurement Development						Procurement ready			
Advance property acquisition process						Transitions to Active Acquisition			
3. Section 3B Implementation Case									
Develop Implementation Case					3B Implementation Funding Approval				
Reference Design						Utilised in procurement			
Procurement Development						Procurement ready			
Advance property acquisition process						Transitions to Active Acquisition			
4. Confirmation of Future Staging									
Early works / enabling works				Confirmation of early works programme					
Future sections to Implementation case					NZTA Board decision on next stages				

Key Risks

s 9(2)(g)(i)

PROACTIVELY RELEASED

Pre-Implementation Funding Requirements

- The delivery of the Northland Corridor will happen over a long period of time and staging and funding are intrinsically linked which offers opportunities to explore procurement models and types of delivery packages.
- To progress the project in accordance with the planned delivery schedule, the following funding is required from the NLTP 2024/2027. The corridor implementation will be staged, and we have therefore considered different scenarios for the next phase also.
- Five scenarios in the table have been considered, each of which increasingly take more of the corridor to a 'delivery ready' state.

Scenario	Outcomes Achieved			Cost
	Route certainty - Designation	Delivery Ready – Statutory Approvals	Delivery Ready – Procurement	
1 – Designation for the entire corridor and Statutory approvals for 2B and 3B	Entire Route	Only for 2B and 3B	None	\$147m
2 – Designation and Statutory Approvals for entire corridor	Entire Route	Entire Route	None	\$177m
3 – Scenario 1 plus Imp IC (incl. reference design) for 2B only	Entire Route	Only for 2B and 3B	Only for 2B	\$187m
4 – Scenario 3 plus Imp IC (incl. reference design) for 3B	Entire Route	Only for 2B and 3B	Only for 2B and 3B	\$219m
5 – Scenario 2 plus Imp IC (incl. reference design) for 2B and 3B	Entire Route	Entire Route	Only for 2B and 3B	\$251m

The Investment Case recommendation is to proceed with Scenario 4 for the following reasons:

- Enables Section 2B SH12 to Waipu (Brynderwyns) to be accelerated as much as possible and be procurement ready in 2027.
- Provides opportunity for early works in the northern Urban Whangarei section (3B).
- Maximises flexibility to respond to changes in funding priorities and/or external events (future weather events for example).
- Maintains momentum in the delivery of the corridor by ensuring that sections that are considered a priority are procurement ready in accordance with the ADS.
- This requires funding of \$219m over the next 2 years.

Option Detail – By Section

PROACTIVELY RELEASED

Process For Selecting the Northland Corridor

This Corridor Protection Investment Case documents the work undertaken to establish the long term RoNS corridor for route protection.

This document includes an executive summary of key considerations for the optioneering of each section.

A full option summary is provided in Appendix C1.

More detailed information can be found in the optioneering document suite:

- Appendix C2 Option Commencement Document
- Appendix C3 Emerging Preferred Corridor
- Appendix C4 Design Refinement Report
- Appendix C5 Lower Cost Corridor Option
- Appendix D Design Philosophy Report

Optioneering Process

- The optioneering was split into three phases with an evolving value for money assessment throughout.
- **The corridor identified for route protection is based on the long-term infrastructure solution footprint.**
- Low-cost options were investigated in response to identified investment envelope pressures.
- Following confirmation of the emerging preferred option, staging was then investigated to understand opportunities for optimising the delivery of the infrastructure and maximising the value for money for the corridor.

	Optioneering Stages	Value for Money Considerations
1	Long-term corridor Identification (Appendix C2 & C3) Stage 1: Confirming stage to commence optioneering e.g., long list, short list, design refinement Stage 2: Selection of emerging preferred corridor.	<ul style="list-style-type: none">• Using proxy costs to confirm the cost implications of each corridor option.• Lowest cost corridor confirmed for all sections.
2	Long-term Emerging Preferred Alignment (Appendix C4) Stage 3: Emerging preferred alignment Variety of alignments assessed, and design refined for each section.	Testing section specific parameters such as: <ul style="list-style-type: none">• Online vs offline• Reduced cross sections for peri-urban areas• Opportunities to reduce speed to 80km/hr to ease geometrics• Alignments to better balance cut and fill• Alignments to reduce impact on identified constraints and property
3	Low Cost (Appendix C5) Assessment of the corridor investment envelope and consideration of permanent low-cost alternatives.	<ul style="list-style-type: none">• Testing section specific permanent low-cost options i.e., not interim interventions.• As many of these will not achieve the RoNS standards or intentions additional Vfm assessments to understand the trade offs.
4	Recommended Option Long term alignment	<ul style="list-style-type: none">• Incorporating previous value for money investigations
5	Sub-Staging Considerations (Appendix C4) Assessment of delivery staging options to understand the impact for corridor protection and future implementation	Testing recommended option for section specific staging concepts such as: <ul style="list-style-type: none">• Timing of property acquisition to understand potential market appreciation• Provision of at-grade interchanges first to then upgrade to grade- separated once triggers are met.• Ability to build 2 lanes initially.• Staging to match funding envelopes

Key Considerations for the Corridor

The corridor enables the inter-regionally significant connection between Auckland and Northland as well as the regional journey between Whangārei and the Port. Both are important journeys for the corridor and will be a key trade off when considering timing of implementation.

Throughout the corridor there are a number of notable constraints and challenges which impact each section. These are explored in more detail throughout the optioneering section. The whole corridor faces challenges in accommodating existing property access on SH1 which will need to be carefully considered in the corridor solution.

Section 2A Te Hana to SH12

- There is a strong case to bypass Kaiwaka, which with the pending completion of Warkworth to Te Hana section will be the only remaining township to be severed by the Northland Corridor. Kaiwaka expansion plans need to be considered in the development of the corridor.
- There are several other constraints on this section such as the Kaipara Harbour Coastal Management Area (CMA), flooding, Te Ika-a-Ranganui site of cultural significance, Pukekaroro Maunga and Bald Rock.

Section 2B SH12 to Waipu (Brynderwyn Hills)

- The Brynderwyn Hills have steep topography, areas of Outstanding Natural Landscape, and complex flora and fauna. The geology to the west of the hills is poor with soft and moving ground. There is a nationally significant commercial operation at the base of the hills.

Section 2C Waipu to Port Marsden Highway

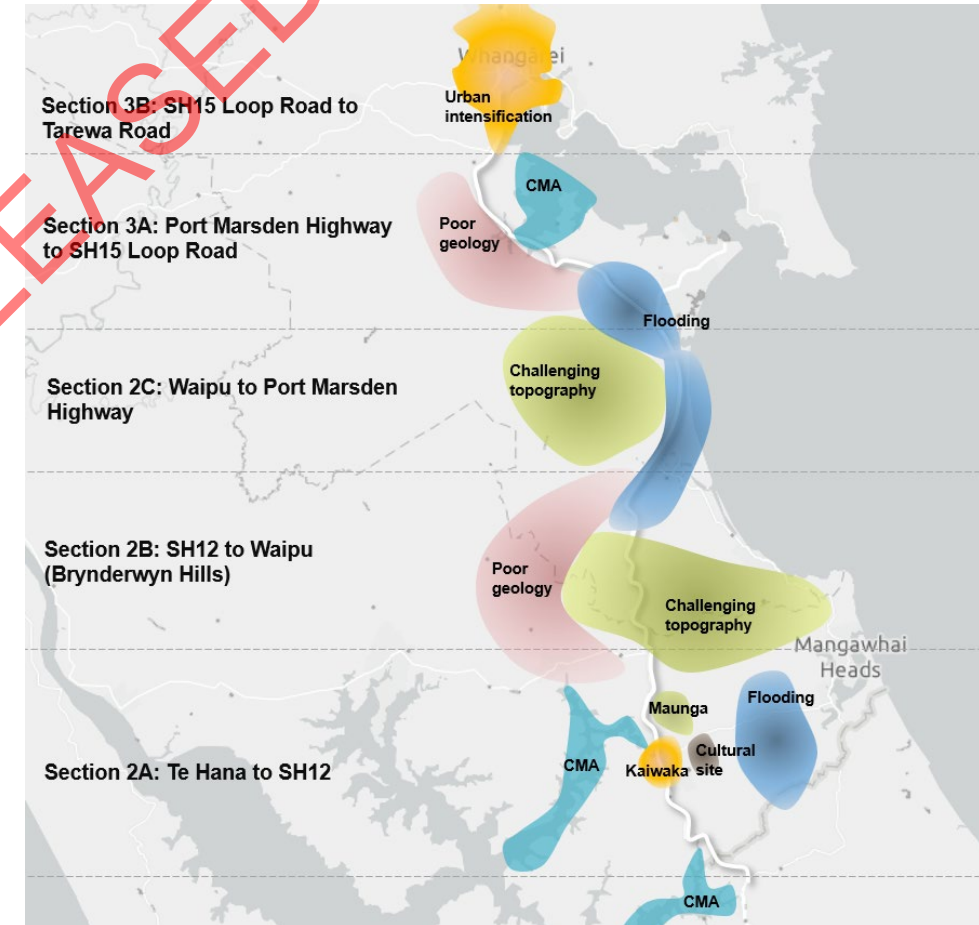
- This section is low-lying and susceptible to flooding and coastal inundation. A new corridor will need to consider raising the road to improve long term resilience.

Section 3A Port Marsden Highway to SH15 Loop Road

- There is low lying land on the eastern section and the central section of existing SH1 currently traverses the CMA area. KiwiRail has a designation for the proposed Marsden Point Rail Line on the northeastern side of SH1 in the CMA. To the wider west of SH1 there is poor geology.
- The northern end of this section will need to tie in with the recently constructed Loop Road. The land use at this point transitions to peri-urban with increased access complexity.

Section 3B SH15 Loop Road to Tarewa Road

- This section is through the peri-urban and urban areas of Whangārei. Existing SH1 has insufficient width for widening to four lanes. Due to the urban nature, additional consideration will need to be given for active modes and pedestrian connectivity.



Te Hana to SH12 Emerging Preferred Option

Te Hana to SH12 - Emerging Preferred Option



3-9 Minutes
travel time
savings



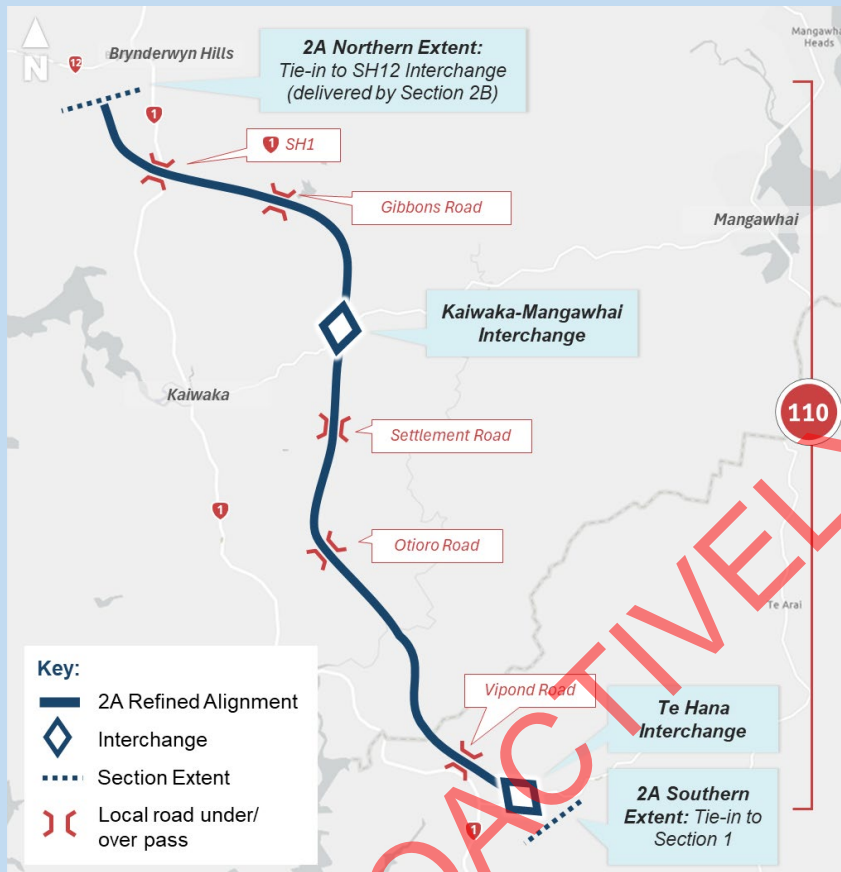
85% less road
closures



3 DSI reductions
per year

s 9(2)(b)(ii)

19.5 km
Length new
infrastructure



- Safe, resilient and economically productive corridor.
- Interchanges will be provided at Te Hana and Kaiwaka-Mangawhai Road to directly connect both Kaiwaka and Mangawhai to the Northland Corridor.
- Alignment avoids key flooding areas in Hakuru and continues to minimise impact on Pukekaroro and Te-Ika-a-Ranganui battle site.

Key Design Refinements

- The eastern corridor is the preferred corridor as it is the shortest, quickest route with quantifiable and known geotechnical risks. Refinements were focused on optimising earthworks and minimising crossings in flood prone areas.
- A SH1 online corridor was discounted due to unsuitable geology and geometry, construction complexity and severance to Kaiwaka including impacts on existing businesses and planned growth.
- West of SH1 corridor was discounted due to proximity to the coastal area, less effective connections to Mangawhai and less stable geology.

s 9(2)(g)(i)

SH12 to Waipu (Brynderwyn Hills) Emerging Preferred Option

SH12 to Waipu (Brynderwyn Hills) - Emerging Preferred Option



2-8 Minutes
travel time
savings



79% less road
closures

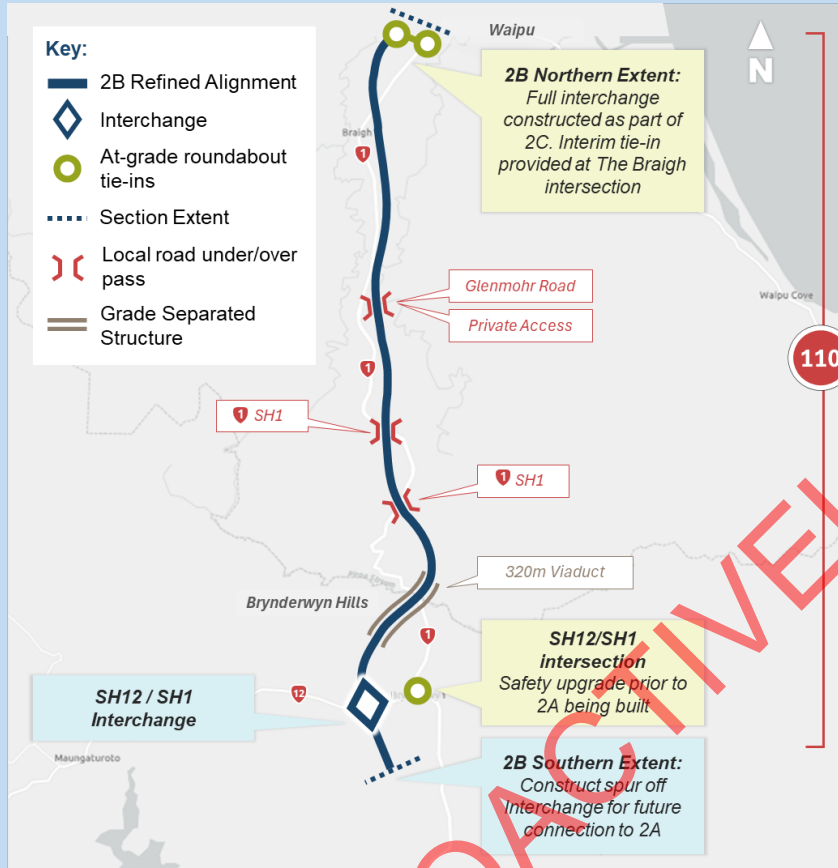


1 DSI reductions
per year

s 9(2)(b)(ii)

15 km

Length new
infrastructure



- Safe, resilient and economically productive corridor.
- Alignment continues to balance environmental, property and constructability challenges.
- Interchange to be provided at SH12 and a temporary tie in to SH1 at Waipu at The Braigh /Millbrook Rd prior to the full Waipu interchange being delivered as part of the Waipu to Port Marsden Project (Section 2C).

Key Design Refinements

- Central corridor is preferred due to its direct route, lowest cost and known and quantifiable geological risk with being situated in greywacke.
- Existing SH1 corridor does not have suitable geometry or resilience for a four lane RoNS road.
- Wider western corridor discounted due to unsuitable ground conditions, higher costs and less direct route.

Central corridor refinements include:

- A 2+2 online/offline option in northern section discounted due to poor value for money. Inner western alignments also discounted in northern section due to limited mitigation opportunities for floodplains.
- Inner west options in southern section discounted due to increased structures and costs.

s 9(2)(g)(i)

Waipu to Port Marsden Highway Emerging Preferred Option

Waipu to Port Marsden Highway- Emerging Preferred Option



**2-4 Minutes
travel time
savings**



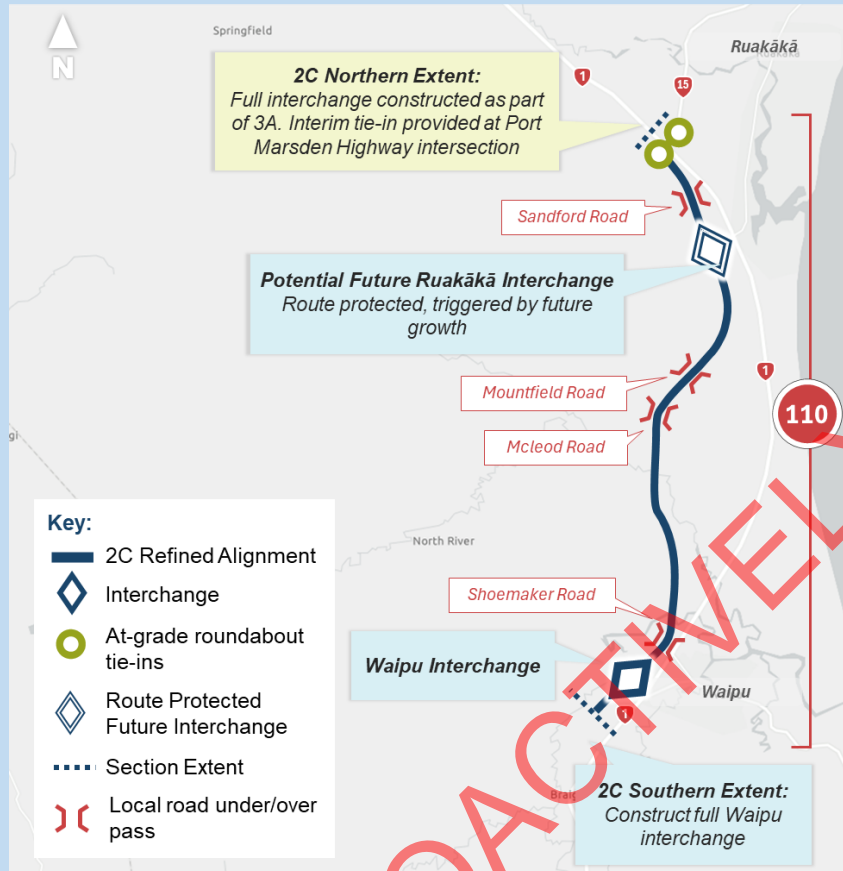
**Low Resilience
Risk Section**



**1 DSI reductions
per year**

s 9(2)(b)(ii)

**10.5 km
Length new
infrastructure**



- Safe and resilient corridor.
- Project will deliver the full interchange at Waipu and an interim tie in at Port Marsden Highway. A long term interchange will be protected at Ruakākā but delivery would be dependent on growth triggers for implementation.
- Alignment navigates flood plains, wetlands and cultural sites and continues to avoid key constraints such as Ruakākā School.

Key Design Refinements

- **Wider western offline corridor is preferred as it the lowest cost corridor, has the best cut/fill balance and was refined to respond to earthworks and flood/river management needs.**
- Online widening was discounted due to the complexity of retaining access to existing SH1 properties resulting in highest cost, significant constructability issues and ultimately wider final footprint due to requirement for service lanes.
- Offline corridor to near west of SH1 was discounted due to significantly higher earthwork and drainage costs from raising the road to address flood resilience issues.

s 9(2)(g)(i)

Port Marsden to SH15 Loop Road Emerging Preferred Option

Port Marsden Highway to SH15 Loop Road Emerging Preferred Option



1-9 Minutes
travel time
savings



86% less road
closures

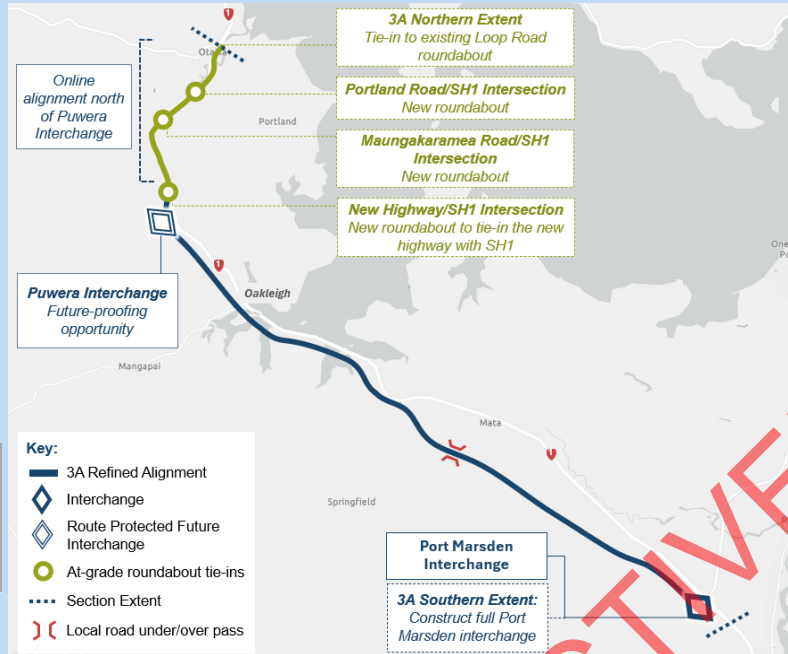


4 DSI reductions
per year

s 9(2)(b)(ii)

21 km

Length new
infrastructure



- Safe, resilient and economically productive corridor.
- Project will deliver the full interchange at Port Marsden Highway, a termination of the rural motorway at Puwera and at grade roundabouts at both Maungakaramaea and Portland Roads.
- Alignment navigates flood plains, rural and peri-urban communities land uses and continues to minimise impact on the CMA with further opportunities for refinement. It offers the best constructability of the central options assessed.

Key Design Refinement

- Central corridor was preferred as it is the most direct connection with well understood geological conditions. A wider western corridor was discounted as whilst a similar order of costs, it has poor geology retaining significant geological risk and introduces new community severances.
- **Western offline route between Port Marsden and Puwera is preferred as it has lowest costs, best constructability with opportunities to further optimise alignment.**
 - Online widening in the central corridor was discounted due to highest proxy costs, extensive requirement for service lanes to mitigate SH1 property access and significant constructability issues relating to ground settlement and redundant temporary works.
 - Between Mata and Puwera, sharing a corridor with KiwiRail infrastructure was carefully considered. This was ultimately discounted as it has a higher cost, significantly increased construction complexity and potential to impact KiwiRail's ability to comply with consent conditions. Would also involve a complex, large and costly 3 tier interchange at Oakleigh.
- Connecting the Northland Corridor into SH15 Loop Road roundabout will sever the existing SH1 and create complex local access issues. Online and offline options with a variety of interchange locations and forms were tested. **The online option with a series of at-grade roundabouts was selected between Puwera and Loop Road** as it demonstrated best value for money, addressed local access whilst still providing the capacity upgrade required for this peri-urban transition to urban Whangārei.

s 9(2)(g)(i)

SH15 Loop Road to Tarewa Road Emerging Preferred Option

SH15 Loop Road to Tarewa Road Emerging Preferred Option



**0.5 - 9 Minutes
travel time
savings**



**84% less road
closures**

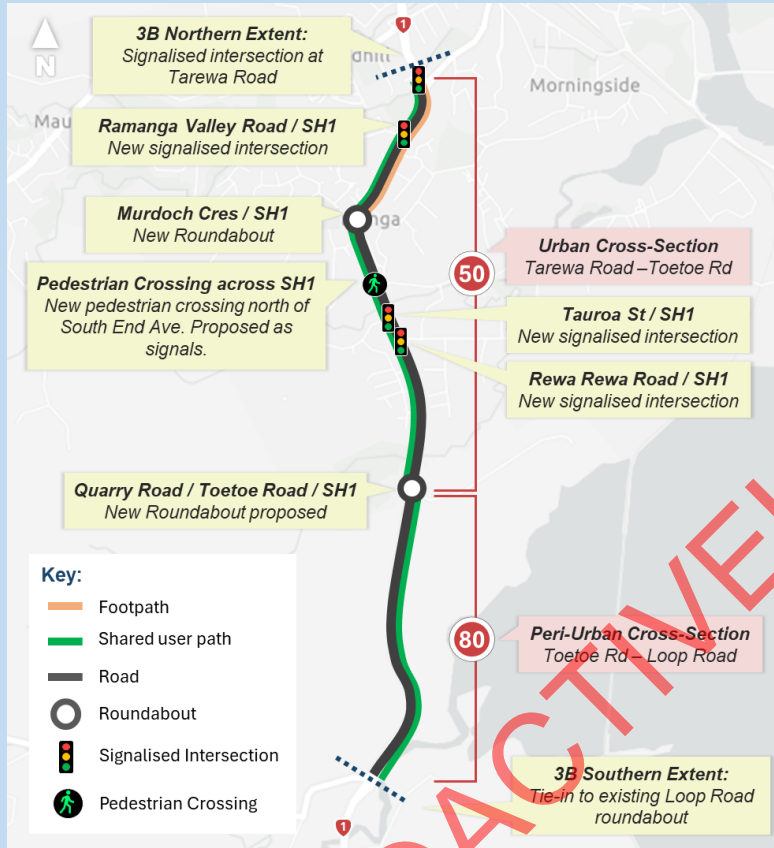


**1 DSI reductions
per year**

s 9(2)(b)(ii)

5 km

**Length new
infrastructure**



- Safe and economically productive corridor with reduced congestion.
- Project streamlines cross sections to minimise impact to properties whilst still providing property access, intersection treatments and a fit for purpose connected active mode network.
- Widening to the west only to minimise property impact and enable a construction methodology to minimise impact during construction and provide opportunity for project staging.

Key Design Refinements

- Online widening of SH1 was reconfirmed as the preferred corridor for the peri-urban and urban sections of Whangārei.
- Refinements explored a reduced cross section in the peri-urban section between Loop road and Toetoe Road to minimise impacts and continue to allow local access.
- Adoption of a shared path to the west only between Murdoch and Toetoe Road to minimise impact on adjacent properties. Shared path switches to the east between Toetoe Road and Loop Road to connect with newly constructed active mode facilities.
- Decision to widen on the western side only of the urban project to minimise impacts on eastern driveways, replace only one set of retaining walls (which are nearing end of life) and create sufficient construction space to allow service relocation.

s 9(2)(g)(i)