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# Ōtaki to North of Levin: Re-evaluation Summary

**New Zealand Transport Agency**

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LINKING  
STRATEGY  
TO DELIVERY

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# Table of Contents

<b>Table of Contents</b> .....	<b>2</b>
<b>Executive Summary</b> .....	<b>3</b>
Overview.....	3
Problems & opportunities.....	3
Re-evaluation findings .....	4
<b>Introduction &amp; Context</b> .....	<b>5</b>
Regional Context .....	5
Project History .....	6
<b>Overview of re-evaluation findings</b> .....	<b>7</b>
Problems to be addressed & investment objectives .....	7
Safety .....	7
Resilience.....	7
Integrated land use and transport planning & mode neutrality.....	8
Wider social and economic opportunities .....	8
Providing choice.....	8
<b>Proposed direction &amp; programme</b> .....	<b>10</b>
Proposed direction .....	10
State highway improvement.....	10
Programme, costs & outcomes.....	11

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# Executive Summary

## Overview

SH1 is a nationally significant route connecting Wellington and the South Island to the upper North Island. It provides an essential economic connection to Palmerston North, the largest freight node in central New Zealand. Construction of the Peka Peka to Ōtaki expressway is due to be completed by 2021. Once complete, this would provide a minimum 4-lane expressway from the Wellington CBD to north of Ōtaki (Taylors Road), as the Mackays to Peka Peka expressway opened in February 2017 and Transmission Gully is due for completion in 2020. To the north of Levin, the construction of the Whirokino Trestle and Manawatu River Bridge replacement project has begun, which is expected to result in additional high productivity motor vehicles (HPMVs) utilising SH1 through the northern extents of the project area.

The Ōtaki to north of Levin project would be the remaining section of the Wellington Northern Corridor.

Traffic volumes on SH1 are currently around 17,250 vehicles per day (vpd) through the Ohau Township (2017) and are conservatively predicted to 18,900 – 22,900 vpd by 2041 (at Ohau).

Earlier investigations, that commenced in 2011, of a four lane expressway from Ōtaki to north of Levin concluded that the existing state highway should be progressively improved to deliver a combination of four lane and 2+1 sections of highway. More recently, the NZ Transport Agency has been assessing a range of proposed improvements that delivered against the following project objectives:

- reducing travel times on the state highway network
- Reducing deaths and serious injuries on the state highway network
- Enhancing the resilience of the state highway network; and
- Providing appropriate connections that integrate the state highway and local road networks to serve urban areas

This has led to a number of safety related on-line improvements including Waitarere Beach Road Curves and improvements through Ohau and Manakau which have since been implemented or are in the process of being delivered. The NZ Transport Agency has also considered a wide range of on-line and off-line options which were shortlisted to 9 full corridors (3 southern and 3 northern options) at the time of the TAIP re-evaluation process commencing.

## Problems & opportunities

Re-evaluation has reviewed the problems, benefits and investment outcomes and concluded that the case for improved journey times is less relevant within the current policy setting. However, there remains a strong case for addressing safety and providing more resilient access on this section of the corridor.

This section of SH1/57 is classified as a high risk rural road with almost 50 deaths and serious injuries (DSI's) having occurred in the corridor over the last five years and for this year, the number of DSI's to July, is already at sixteen. Both SH1 and SH57 within the project area place in the top band of a high risk rural road. SH1 from the Wellington Boundary to Levin ranks as the 8<sup>th</sup> worst rural state highway section in New Zealand in terms of fatalities and within the top 2% of worst corridors when comparing crashes per year per km over the five year period 2013 to 2017.

There is no alternative route to SH1 between Manakau and Ohau, either via another state highway or local roads and this section remains at high risk of a closure due to flooding with at least two full road closures due to flooding in the past three years, with one, on 20 June 2015, closed for over 24 hours due to floodwaters washing away parts of the banks of the Waikawa Stream Bridge.

The re-evaluation has identified a number of opportunities for the NZ Transport Agency to intensify its working with partners to further contribute to economic growth of the Horowhenua region by improving regional/inter-regional connectedness for all and for enhancing the liveability of Levin, to enhance the outcomes delivered by the project.

Whilst the Agency has been working with Horowhenua District Council on the above there remains significant opportunity to continue to work together to take a wider perspective of the opportunities for closer integrated land-use and transport planning in pursuit of these goals.

## Re-evaluation findings

The conclusion from the re-evaluation is that there is a case for investment to address a significant level of service gap for safety and resilience. With forecast growth levels there is also a case for some enhanced capacity in the corridor to support economic growth. However, this needs to be balanced against the potential for inducing single occupancy vehicle travel. Therefore the recommended investment direction for the corridor is a safer and more resilient SH1 corridor with limited additional capacity which balances providing for economic growth but limits growth in single occupancy vehicle trips.

The re-evaluation has examined the optioneering process which has been undertaken with regard to improving the State Highway network online and agrees with earlier findings that upgrading the existing highway from Ōtaki to north of Levin is not viable due to sub-standard bridges, significant realignment required to address deficient curves with a high safety risk and a large number of constraints adjacent to the existing alignment including Marae, Urupa, historic buildings and a large number of accessways and intersections which make improvements complex to deliver or will lead to sub-optimal safety outcomes.

To provide an appropriate level of service on the existing alignment, within the confines of the above constraints leads to over 70% of the upgraded SH1 being offline (at a cost of around \$300m) with low safety returns and residual resilience issues.

Therefore, it is recommended that route protection for a future proofed off-line four-lane option be continued. However, because of the need to carefully balance supply and demand in order to limit the effects of undesired induced traffic it is proposed that delivery be staged as a four-star KiwiRAP single carriageway road with at grade intersections initially with safety and growth triggers identified and monitored for longer term delivery of a final solution.

In considering the staging of investment the NZ Transport Agency and Horowhenua District Council should re-investigate the desirability for, and effectiveness of, a partial bypass linking SH1 and SH57 to the north of Levin as a means to reduce traffic, and heavy commercial vehicles in particular, from Levin town centre to support improved accessibility, wider community outcomes and the economic re-development of the town centre.

Because delivery of an off-line option will take some time to develop and given the significance of the existing safety risk in the State Highway 1 corridor, in parallel with route protection, it is recommended that on-line safety enhancements be progressed immediately between Ōtaki and Levin. These enhancements should include speed management, enforcement and education packages as well as infrastructure investment. Any infrastructure proposed should be developed such that it is value for money, effective and appropriate for, ultimately, a revoked state highway.

With limited mode share by public transport in the district (public transport makes up about 1.1% of the mode share total of work trips) or public transport choices (there are only 13 return bus/train services every week which could potentially link commuters to Wellington and Palmerston North) there are opportunities for the NZ Transport Agency to work with the local and regional councils to further explore opportunities for providing enhanced mode choice for both inter-regional and regional public transport. This would provide an overall package of investment to improve accessibility and provide enhanced travel choice beyond state highway capacity.

# Introduction & Context

## Regional Context

SH1 is a nationally significant route connecting Wellington and the South Island to the upper North Island. It provides an essential economic connecton to Palmerston North, the largest freight node in central New Zealand.

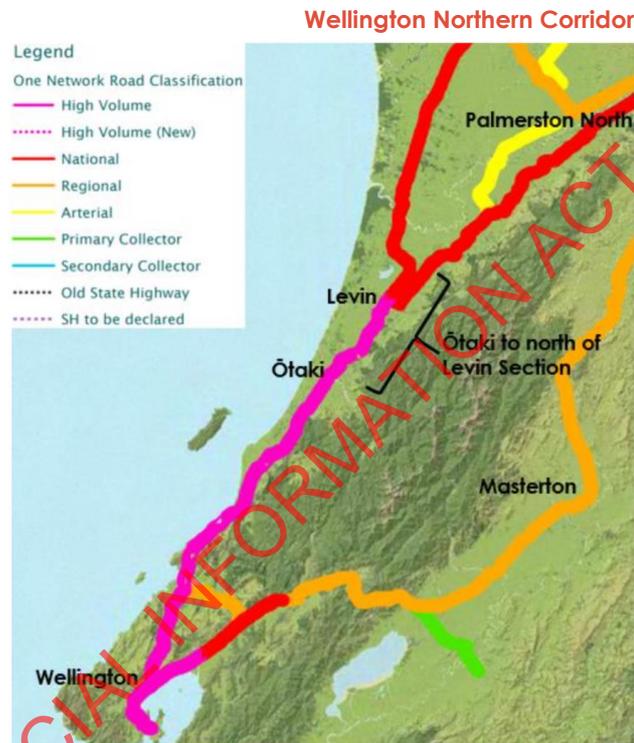
Whilst the Wellington Region has the second largest economy in New Zealand with 11% of the nation's population and 13% of the GDP by contrast the Manawatu-Whanganui economy has been experiencing slow or static growth, ageing and declining populations and rising unemployment.

The region has been identified by the Ministry of Business, Innovation and Employment as one of six regions to be prioritised to increase jobs, income and investment. An action plan (Accelerate 25) is underway to facilitate this upturn.

Construction of the Peka Peka to Ōtaki expressway is due to be completed by 2021. Once complete, this would provide a minimum 4-lane expressway from the Wellington CBD to north of Ōtaki (Taylors Road), as the Mackays to Peka Peka expressway opened in February 2017 and Transmission Gully is due for completion in 2020. To the north of Levin, the construction of the Whirokino Trestle and Manawatu River Bridge replacement project has begun, which is expected to result in additional high productivity motor vehicles (HPMVs) utilising SH1 through the northern extents of the project area.

The Ōtaki to north of Levin project would be the remaining section of the Wellington Northern Corridor.

Traffic volumes on SH1 are currently around 17,250 vehicles per day (vpd) through the Ohau Township (2017) and are conservatively predicted to be in the range of 17,400-20,000 vpd by 2031 and 18,900 – 22,900 vpd by 2041 (at Ohau). Heavy commercial vehicle (HCV) traffic currently represents ~11% of total volumes and the volumes of freight related trips required to be transported along this corridor is expected to grow faster than demand for non-freight trips. As such the overall proportion of heavy vehicles along SH1 (and SH57) is expected to increase.



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## Project History

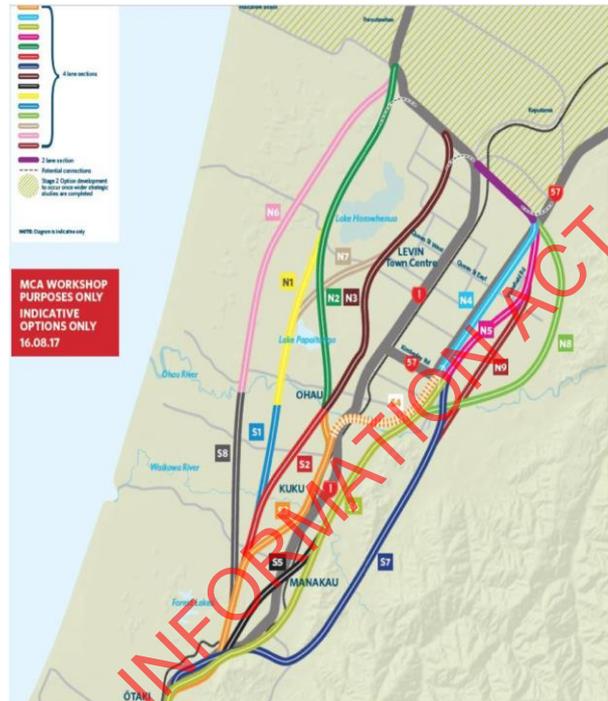
The project is investigating transport options from Taylors Road in the south (being the northern end of the Peka Peka to Ōtaki expressway) through to north of Levin (approximately Heatherlea East Road) including both SH1 and SH57, to provide safer, more resilient and easier access to Levin, Palmerston North, and to Taupo and destinations further north.

The project has been under investigation for a number of years. Earlier investigations, that commenced in 2011, of a four lane expressway from Ōtaki to north of Levin concluded that the existing state highway should be progressively improved to deliver a combination of four lane and 2+1 sections of highway. More recently, the NZ Transport Agency has been assessing a range of proposed improvements that delivered against the following project objectives:

- reducing travel times on the state highway network
- Reducing deaths and serious injuries on the state highway network
- Enhancing the resilience of the state highway network; and
- Providing appropriate connections that integrate the state highway and local road networks to serve urban areas

This has led to a number of safety related online improvements including Waitarere Beach Road Curves and improvements through Ohau and Manakau which have since been implemented or are in the process of being delivered. The NZ Transport Agency has also considered a wide range of on-line and off-line options which were shortlisted to 9 full corridors (3 southern and 3 northern options) at the time of the TAIP re-evaluation process commencing.

Longlist options



Current shortlisted options



# Overview of re-evaluation findings

## Problems to be addressed & investment objectives

A review of the problems, benefits and investment outcomes as part of the re-evaluation processes has been undertaken and concluded that, the case for improved journey times is less relevant within the current policy setting but there remains a strong case for addressing safety and resilient access on this section of the corridor.

### Safety

Almost 50 deaths and serious injuries (DSI's) have occurred in the corridor over the last five years and for this year, the number of DSI's to July, is already at sixteen. This section of SH1/57 is classified as a high risk rural road and well below the desirable KiwiRAP star rating that customers could expect for a nationally strategic highway.

Both SH1 and SH57 within the project area place in the top band of a high risk rural road. SH1 from the Wellington Boundary to Levin ranks as the 8<sup>th</sup> worst rural state highway section in New Zealand in terms of fatalities and within the top 2% of worse corridors when comparing crashes per year per km over the five year period 2013 to 2017. In addition, crashes involving heavy vehicles are currently over represented, accounting for 17% of high severity crashes.

### Resilience

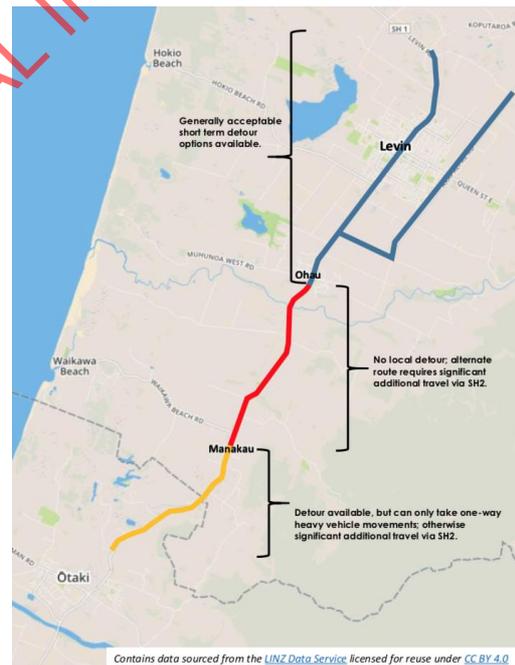
There is no alternative route to SH1 between Manakau and Ohau, either via another state highway or local roads and this section remains at high risk of a closure due to flooding.

There have been at least two full road closures due to flooding in the past three years. On 20 June 2015, SH1 was closed for over 24 hours due to floodwaters washing away parts of the banks of the Waikawa Stream Bridge. SH1 along the Manakau Straight was also closed on 12 June 2016 for 90 minutes due to flooding.

TREIS data<sup>25</sup> as supplied by the NZ Transport Agency's Wellington Transport Operation Centre also recorded nine other cautions or delays caused by flooding, many of which were on sections that have no alternative route.

Crashes throughout this section of road also contribute to the number of closures in the corridor.

Available detour routes



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## Integrated land use and transport planning & mode neutrality

### Wider social and economic opportunities

In addition to the above issues there are a number of opportunities available:

- Contributing towards the economic growth of the Horowhenua region by improving regional/inter-regional connectedness for all;
- Enhancing the liveability of Levin.

While the contribution that an improved state highway could make to the above has begun to be explored with HDC there remains significant opportunity to continue to work together to take a wider perspective of the opportunities for closer integrated land-use and transport planning in pursuit of these goals.

Enhanced state highway infrastructure could provide increased capacity for the district to cater for improvements to key social infrastructure such as education, housing and health as well as provide opportunities for enhanced social connectedness and resiliency.

Horowhenua District Council (HDC) forecasts around another 10,000 people living in the district by 2040 in 5,100 households which is an increase of 33% on the 2017 population. This growth is anticipated, in part, as a consequence of investment in State Highway 1 reducing the travel time between Wellington and Levin to around one hour. Within these estimates, Levin is anticipated to require some 1,250 additional residential properties. Council is currently considering different options to expand Levin east which impacts on options for access.

Similarly, the project has the potential to significantly improve the amenity of the Levin town centre and become a catalyst for enhancing the layout (i.e. re-allocation of road space) and amenity of Oxford Street (the existing SH1) providing Levin with a more pleasant, functional and safer town centre, with enhanced access by walking and cycling and remove the severance effect of State Highway 1 through the town centre. Whilst the North Island Main Trunk Line (NIMT) serves the community and is very close to SH1 through Levin its severance affect is much less due to the infrequency of services, although this should be reviewed with any proposals to enhance the public transport offering.

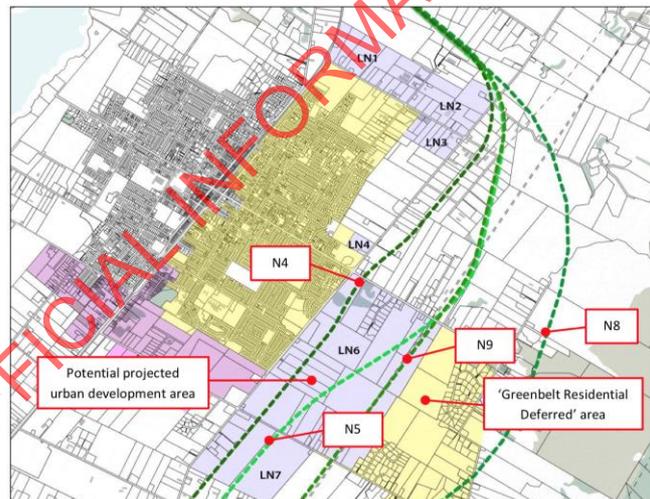
HDC has undertaken initial consultation with the Community on the future of the Levin Town Centre with consideration of earthquake prone buildings, exploring transport options (public transport and cycle opportunities) and town centre activity. The Ōtaki to North of Levin project project forms part of that consultation and is recognised as a 'once in a lifetime opportunity' to transform the Levin Town Centre and provide a sustainable future.

The NZ Transport Agency has been working with HDC through monthly integration meetings. Once re-evaluation is complete it will be important to recommence the collaboration to co-develop the broader integrated land-use and transport plan, including any state highway improvements.

### Providing choice

Currently, public transport makes up about 1.1% of the mode share total of work trips in the Horowhenua District, split into 0.3% by bus and 0.8% by train. Limited bus services are available around Levin, and to

Potential development areas with SH options overlaid



neighbouring districts. Excluding inter-regional intercity services, there are only 13 return bus/train services every week which could potentially link commuters to Wellington and Palmerston North. But some of these are focussed on shoppers / accessibility rather than commuters.

Greater Wellington Regional Council have been exploring the case for expanding the Capital Connection service and for new rolling stock as well as developing a park and ride strategy for the rail corridor however, it does not currently include Ōtaki or communities further north. Therefore, there are opportunities for the NZ Transport Agency to work with the local and regional councils to further this public transport work and explore opportunities for providing enhanced mode choice for both inter-regional and regional public transport. This would provide an overall package of investment to improve accessibility and provide enhanced travel choice beyond state highway capacity.

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# Proposed direction & programme

## Proposed direction

The conclusion from the re-evaluation is that there is a case for investment to address a significant level of service gap for safety and resilience on this section of the nationally significant (high volume) State Highway 1 between Ōtaki to the north of Levin.

With forecast growth levels there is also a case for some degree of enhanced capacity in the corridor to support economic growth. However, this needs to be balanced against the potential for inducing single occupancy vehicle travel. Therefore the recommended investment direction for the corridor is:

- A safer and more resilient SH1 corridor with limited additional capacity which balances providing for economic growth but limits growth in single occupancy vehicle trips;
- Explore opportunities for enhanced inter-regional and regional public transport including:
  - The triggers for enhancing inter-regional rail between Levin and Wellington by extending electrification of the NIMT rail line to Ōtaki and Levin;
  - The triggers and options for park and ride at Ōtaki and Levin further into the future;
  - Options for regional rail between Levin and Palmerston North.

The above should be taken forward in collaboration with Horowhenua District Council and the Horizons and Greater Wellington Regional Councils to best develop an integrated transport and land-use package with investment timed to growth and land-use change.

## State highway improvement

The re-evaluation has examined the optioneering process which has been undertaken with regard to improving the State Highway network which has been extensive over the eight years that the NZ Transport Agency has been reviewing the corridor most recently. With respect to improvements, the key consideration has been:

- Is there a value for money, deliverable solution for an online option that provides an appropriate level of service for safety and resilience, if not;
- What is the most appropriate offline option that provides a safe and resilient option for the best value.

Work to date has concluded that upgrading the existing highway from Ōtaki to north of Levin is not viable for the following reasons:

- The requirement for replacing five old sub-standard bridges (at the railway crossings and river crossings) meant that the highway would need to be offline through those sections.
- The highway would need to be significantly realigned at a number of deficient curves with significant safety risk to meet design standards and avoid historical constraints.
- There are a large number of constraints adjacent to the existing alignment including Marae, Urupa, historic buildings and a large number of accessways and intersections which make improvements complex to deliver or will lead to sub-optimal safety outcomes.

To provide an appropriate level of service on the existing alignment, within the confines of the above constraints leads to over 70% of the upgraded SH1 being offline (at a cost of around \$300m) with low safety returns and residual resilience issues.

Therefore, it is recommended that route protection for an (yet to be confirmed) off-line option be progressed as soon as possible including working further with Horowhenua District Council on identifying the most

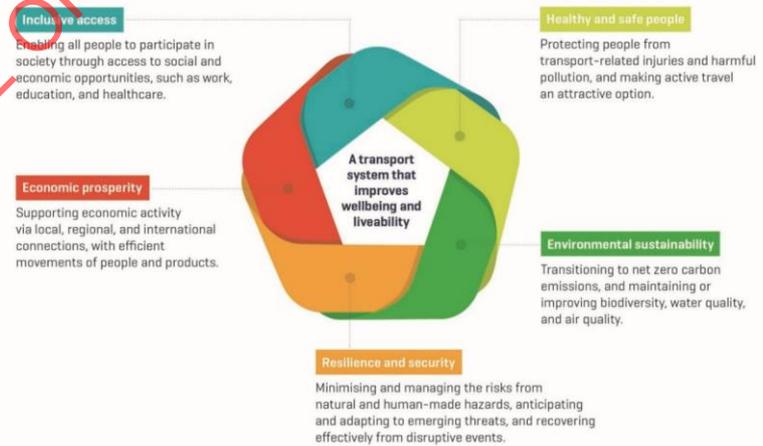
appropriate option for the northern section which provides the best balance of land-use and transport outcomes, noting that they are all broadly the same capital cost. Because of the need to carefully balance supply and demand in order to limit the effects of undesired induced traffic it is proposed that the off-line improvement be developed as a four-star KiwiRAP single carriageway road with at grade intersections but future proofed for four-lanes with safety and growth triggers identified as part of finalising the DBC for the project.

In considering the staging of investment the NZ Transport Agency and Horowhenua District Council should re-investigate the desirability for, and effectiveness of, a partial bypass linking SH1 and SH57 to the north of Levin utilising existing roads as much as possible. A partial by-pass could reduce traffic, and heavy commercial vehicles in particular, from Levin town centre to support improved accessibility, wider community outcomes and the economic re-development of the town centre. However, as a partial bypass would also be longer it would likely be less attractive and would need to be supported by other measures, such as bylaws limiting HCV access and traffic calming and speed reduction through the town centre. There would be significant complexities of enforcement (you could not limit HCV's delivering in the area) and so to be successful as an early measure it would be necessary to link it to a wider urban regeneration project and require close working with the freight industry to obtain their buy-in. The staging discussion should form part of completing the Detailed Business Case.

Because delivery of an off-line option will take some time to develop and given the significance of the existing safety risk in the State Highway 1 corridor, in parallel with route protection it is recommended that on-line safety enhancements be progressed immediately between Ōtaki and Levin. These enhancements should include speed management, enforcement and education packages as well as infrastructure investment. Any infrastructure proposed should be developed such that it is value for money, effective and appropriate for, ultimately, a revoked state highway.

### Programme, costs & outcomes

The table below outlines the proposed programme of work, timescales and current estimate of costs and key benefits. In addition, an assessment of the proposals against the Government's recently published Outcomes Framework is presented. The framework states that the purpose of the transport system is to "improve people's wellbeing and liveability of places". The Framework gives broad direction about how the transport system can achieve this, by contributing to five inter-related outcomes as shown.



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Activity	Timing			Key Benefits	Cost (\$m)	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
<b>Land-Use &amp; Transport Integration</b>										
Work with Horowhenua District Council to confirm land use in and around Levin	✓			<ul style="list-style-type: none"> <li>Optimises land-use/transport integration</li> <li>Increased liveability</li> </ul>	Part of DBC	H	M	H	L	M
Start place making improvements in Levin as part of initial revocation and preparation	✓	✓								
<b>Public Transport Investment</b>										
Develop an PT improvements plan following exploring the potential for enhancing public transport choices. Items to consider include: <ul style="list-style-type: none"> <li>options for transitional access via Capital Connection or use of diesel/electric</li> <li>feasibility and staging of electrification to Ōtaki, Manakau and Levin</li> <li>Park and ride in Ōtaki</li> <li>Bus service enhancements</li> </ul>	✓			<ul style="list-style-type: none"> <li>Supports mode shift &amp; travel choice</li> <li>Reduces single occupancy vehicles</li> </ul>	\$0.5m PBC  Imp unknown	H	M	M	L	L
Implement the findings of the PT improvements plan		✓	✓							
<b>System Interventions</b>										
Speed management & enforcement	✓			<ul style="list-style-type: none"> <li>DSI reduction (included in online safety benefits)</li> </ul>	unknown	L	VH	L	L	L
<b>SH Investment</b>										
Undertake online safety improvements and speed management ~\$50-150m	✓	✓		<ul style="list-style-type: none"> <li>5-10 DSI savings per 5 years</li> </ul>	50-150	L	H	M	M	L
Confirm offline route alignment	✓			<ul style="list-style-type: none"> <li>20-30 DSI savings per 5 years</li> <li>Limited additional capacity to support freight growth</li> <li>Improved w/c facilities</li> </ul>	450-600	H	H	H	M	L
Complete DBC and pre-imp to get 100m (or as required) designation in place.	✓									
Property Purchase	✓	✓								

Construct partial HVC bypass (dependent on timing) and complete improvements to SH57 to align to land-use development		✓		<ul style="list-style-type: none"> <li>• Removes restrictions to upgrading of rail</li> <li>• Enhanced resilience through provision of alternative route</li> <li>• Reduced susceptibility to flooding</li> <li>• Reduced noise and vibration adjacent to existing communities</li> </ul>						
Construct full offline Levin bypass and route, subject to the the triggers being met		✓	✓							

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