WAKA KOTAHI
NZ TRANSPORT AGENCY

PROUDLY DELIVERING
New Zealand Upgrade Programme

ŌTAKI TO NORTH OF LEVIN HIGHWAY PROJECT

Non-Technical Summary - Notices of Requirement for a Designation and Application for Resource Consents: Supporting Information and Assessment of Effects on the Environment

JANUARY 2023

Te Kāwanatanga o Aotearoa
New Zealand Government

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Introduction

He mea whakawhanake te Ōtaki to north of Levin Highway Project (Ō2NL Project) e Waka Kotahi, Muaūpoko Tribal Authority me ngā hapū o Ngāti Raukawa ki te Tonga: Ngā Hapū o Ōtaki (ki te taha ki a Ngāti Kapumanawawhiti), rātou ko Ngāti Hikitanga, ko Ngāti Huia ki Poroutawhao, ko Ngāti Huia ki Mātau, ko Ngāti Kikopiri, ko Ngāti Ngarongo, ko Ngāti Pareraukawa, ko Ngāti Takihiku, ko Ngāti Tukorehe, ko Ngāti Wehiwehi.

Ko te kaupapa o Ō2NL Projeche hanganga o tētahi huarahi matua haumaru hōu, nā konei ka whakautu, ā, ka tūhono anō ki ngā pānga o rāwhiti me te uru i te taiao.

The Ōtaki to north of Levin Highway Project (Ō2NL Project) is being developed by Waka Kotahi NZ Transport Agency (Waka Kotahi), Muaūpoko Tribal Authority and the following hapū of Ngāti Raukawa ki te Tonga: Ngā Hapū o Ōtaki (on behalf of Ngāti Kapumanawawhiti), Ngāti Hikitanga, Ngāti Huia ki Poroutawhao, Ngāti Huia ki Mātau, Ngāti Kikopiri, Ngāti Ngarongo, Ngāti Pareraukawa, Ngāti Takihiku, Ngāti Tukorehe and Ngāti Wehiwehi.

The Ō2NL Project is the formation of a new safe and modern state highway in a manner that responds to and reconnects the physical east west connections in the landscape.

Overview

This document provides a non-technical summary of the documentation and assessments of effects on the environment that have been undertaken as part of the Resource Management Act 1991 (RMA) regulatory process for the Ōtaki to north of Levin Highway Project (Ō2NL Project). It summarises a suite of technical reports that have been prepared to assess the impacts of the Ō2NL Project. More detailed analyses are provided within those reports, which can be accessed via the Waka Kotahi website.[1] This document is intended to provide the reader with a summary of the key environmental matters arising from the Ō2NL Project.

Waka Kotahi has lodged notices of requirement for designations (NoRs) and applications for resource consents with Horizons Regional Council, Greater Wellington Regional Council, Horowhenua District Council and Kāpiti Coast District Council (the Councils) for the Ō2NL Project.

The NoRs and applications for resource consent are for the construction, operation, use, maintenance and improvement of approximately 24 kilometres of a new four-lane median divided state highway (two lanes in each direction) and share use path[2] (SUP) from the end of the recently completed northern end of the Peka Peka to Ōtaki expressway (PP2Ō) at Taylors Road (north of Ōtaki) to Heatherlea East Road, State Highway 1 (SH1) (north of Levin).

The Ō2NL Project is being developed through a Project Partnership of Waka Kotahi, Muaūpoko Tribal Authority and the following hapū of Ngāti Raukawa ki te Tonga: Ngā Hapū o Ōtaki (on behalf of Ngāti Kapumanawawhiti), Ngāti Hikitanga, Ngāti Huia ki Poroutawhao, Ngāti Huia ki Mātau, Ngāti Kikopiri, Ngāti Ngarongo, Ngāti Pareraukawa, Ngāti Takihiku, Ngāti Tukorehe and Ngāti Wehiwehi (Ngāti Raukawa ki te Tonga) (Iwi Project Partners).

A central component of the Ō2NL Project is that iwi and hapū have an inalienable connection with the waterways, whenua and each other, and a responsibility for the health and wellbeing of the environment. Accordingly, the Iwi Project Partners are committed to ensuring that the Project outcomes seek to improve the health and wellbeing of te taiao.

Waka Kotahi, Muaūpoko Tribal Authority and Ngāti Raukawa ki te Tonga have worked together to develop a conceptual design for the Ō2NL Project, along with the range of management responses to actual and potential adverse effects on the environment. The next phases of the Project's development (once RMA

[1] RMA applications | Waka Kotahi NZ Transport Agency (nzta.govt.nz)
[2] For the use of pedestrians and cyclists for commuting and recreational purposes.

approvals have been obtained) is to further develop the design of the Project in accordance with the following kaupapa tumu/core principles:

- Tread Lightly, with the Whenua*
  - Me tangata te whenua (treat the land as a person)
  - Kia māori te whenua (let it be its natural self)
- Create an Enduring Legacy
  - Kia māori te whakaaro (normalise māori values)
  - Me noho tangata whenua ngā mātāpono (embed the principles in all things)
  - Tū ai te tangata, Tū ai te whenua, Tū ai te Wai (elevate the status of the people, land and water)

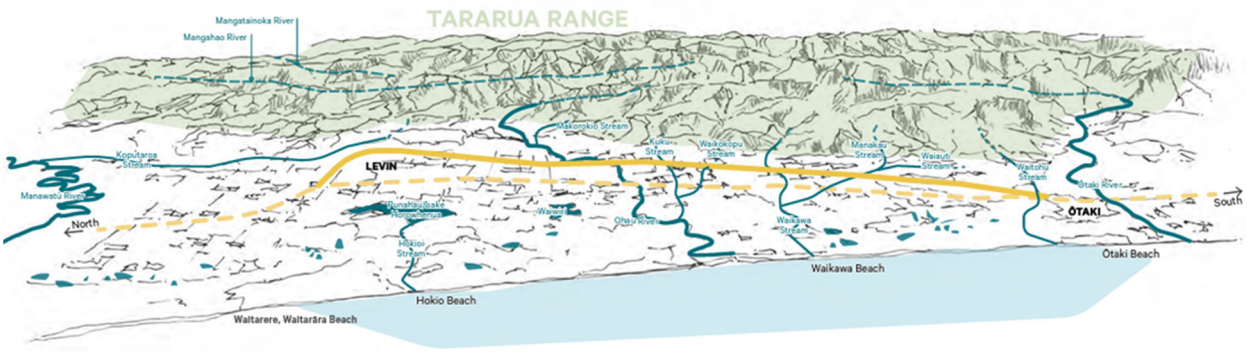
** tread lightly, with the whenua aligns with 'first do no harm'. It does not imply 'do minimum'.*

Figure 1 Location and extent of the Ō2NL Project

Description of the Ō2NL Project

The Ō2NL Project is generally located between Taylors Road (north of Ōtaki) and Koputaroa Road/SH1 (north of Levin). The Ō2NL Project is located within the Manawatū-Whanganui and Wellington Regions and the Kāpiti Coast and Horowhenua Districts. The Project is shown diagrammatically in context of the mountains to the sea in Figure 2.

Figure 2 The Ō2NL Project in context



The Ō2NL Project comprises the following key features:

- four lanes (two in each direction) with continuous median separation;
- access to and from the state highway will be via new interchanges and roundabouts along various sections of the state highway;
- local underpasses, overpasses and local road reconnections are proposed to provide local road connectivity along the proposed state highway;
- bridges over the Waiauti, Manakau, Waikawa and Kuku Streams, the Ohau River and the North Island Main Trunk railway line (near Heatherlea East Road);
- the relocation and improvement of the intersection of Tararua Road with SH1 and the associated rail level crossing, including the introduction of traffic signals;
- stormwater runoff to be collected and treated using swales, drains and sediment traps, constructed wetlands and ponds;
- culverts and stream diversions to reconnect streams across the Ō2NL Project;
- a new, separated (typically) three-metre-wide SUP, for walking and cycling along the entire length of the new highway that will link into the existing shared path facilities provided as part of the PP2Ō expressway and provides for recreational and commuter use;
- approximately 4 to 5 million cubic metres of excavated (cut) material (excluding topsoil) and approximately 3 to 4 million cubic metres of this cut material to be placed as structural fill for embankments along the proposed Ō2NL Project route;
- approximately 250 hectares of native vegetation planting comprising:
    - 146 hectares of landscape planting (including stormwater wetland planting);
    - 40 hectares of stream and river bank planting (subject to land owner agreement) to help restore natural character;
    - 7 hectares of indigenous forest planting;
    - 8.5 hectares of wetland habitat rehabilitated and restored;
    - 15 kilometres of stream banks planted and fenced to prevent stock access; and
    - 1,782 trees on some existing local roads and at key points.

  This planting includes planting to mitigate effects of the Ō2NL Project on surrounding properties (subject to owner agreement) and planting to mitigate, offset or compensate for the effects of the Project on ecosystems.

The proposed design has been developed by Waka Kotahi and Iwi Project Partners and it aligns with the Cultural and Environmental Development Framework (CEDF) that has been developed as part of the Ō2NL Project. This Framework includes kaupapa tumu/core principles that will inform the 'look and feel' of the Project and will guide the next phases of design should RMA approvals be obtained.

A mahi toi strategy will be developed in the next phases and will aim to identify tangata whenua narrative and cultural connections, and could include:

- 'markers' that welcome people onto the state highway at each entrance through planting;
- carving or other forms of cultural expression; and
- artwork and signs recognising the tikanga of the area (such as where access is provided to the awa).

Background/context

SH1 is New Zealand's premier highway and the section between Ōtaki and Levin has some serious safety, efficiency and resilience problems. This section of SH1 connects Wellington to the central and upper North Island and no other appropriately resilient route currently exists. This link provides an essential economic connection to Palmerston North, the largest freight node in central New Zealand.

Alternative options investigations

In 2011 Waka Kotahi commenced the current round of investigations for potential upgrades and new alignment options to address the issues with the existing SH1 route. An Indicative Business Case (IBC) seeking out the outcomes of these investigations was finalised in 2018. The IBC concluded that further investigations for a preferred corridor for a new 'offline' highway from Taylors Road (north of Ōtaki) to the north of Levin should proceed. The IBC also recommended that interim safety improvements to the existing state highway network be investigated and implemented.

These further investigations highlighted that the issues with the existing SH1 route that were reported in the IBC have worsened since 2018. The investigations developed a proposed new highway alignment including interchanges, local road connections and a shared use path. The alignment and highway elements are reported in a Detailed Business Case (DBC) that was completed in 2022. It is this alignment that is now subject to the current NoRs and applications for resource consents.

Problems and opportunities

Key problems and/or opportunities that the Ō2NL Project seeks to address are:

- **Safety** - This part of the state highway network is one of the most dangerous sections of road in New Zealand with the number of fatal and serious crashes increasing since 2010. SH1 and State Highway 57 (SH57) have poor road geometry and alignment, with sharp curves in some places, narrow shoulders and a significant number of side accesses. It is likely that the poor safety record will worsen over time, particularly with additional growth and development.
- **Resilience** - This section of SH1 is at high risk of closure from crashes (see preceding bullet), earthquakes (five bridges are highly susceptible to earthquake disruption) and flooding (the existing highway passes through a floodplain and is subject to surface flooding). SH1 is critical to the overall accessibility of Wellington as the only other alternative route is via State Highway 2 and the Remutaka Hill, which is also at high risk of closure in a significant earthquake. When the highway between Manakau and Ohau closes, the trip from Wellington to Levin increases by about two hours and will be longer in peak hour traffic.
- **Horowhenua development** - Horowhenua is growing fast and this growth is expected to continue. Horowhenua District Council are investing in urban development to proactively manage demand.

However, additional investment in the transport network is needed to appropriately support these plans for further urban development. These plans are factored into the design of the Ō2NL Project.

- **Levin town centre amenity** - SH1/Oxford Street is used as both a main freight route and as a town centre. Freight and traffic in the town centre detracts from the amenity of the town centre particularly due to noise, vehicle engine emissions and smell (from stock trucks) and also makes it difficult for people to access shops and facilities located either side of SH1. Safety is also a problem with a high number of crashes involving pedestrians or cyclists. If traffic growth continues as forecast, then the number of vehicles passing through Levin will increase from 14,000 to 22,000 per day by 2039 with heavy vehicles almost doubling to over 2,000 per day.

The Ō2NL Project will deliver a new safe and resilient route between Ōtaki and north of Levin. A new offline state highway route will reduce traffic on the existing SH1, significantly reduce deaths and serious injuries and support urban development and growth. An offline highway provides a viable and resilient alternative route that responds to the issue of climate change adaption by ensuring the network is useable in major flooding events (that is, a 1 in 100 year event with climate change).

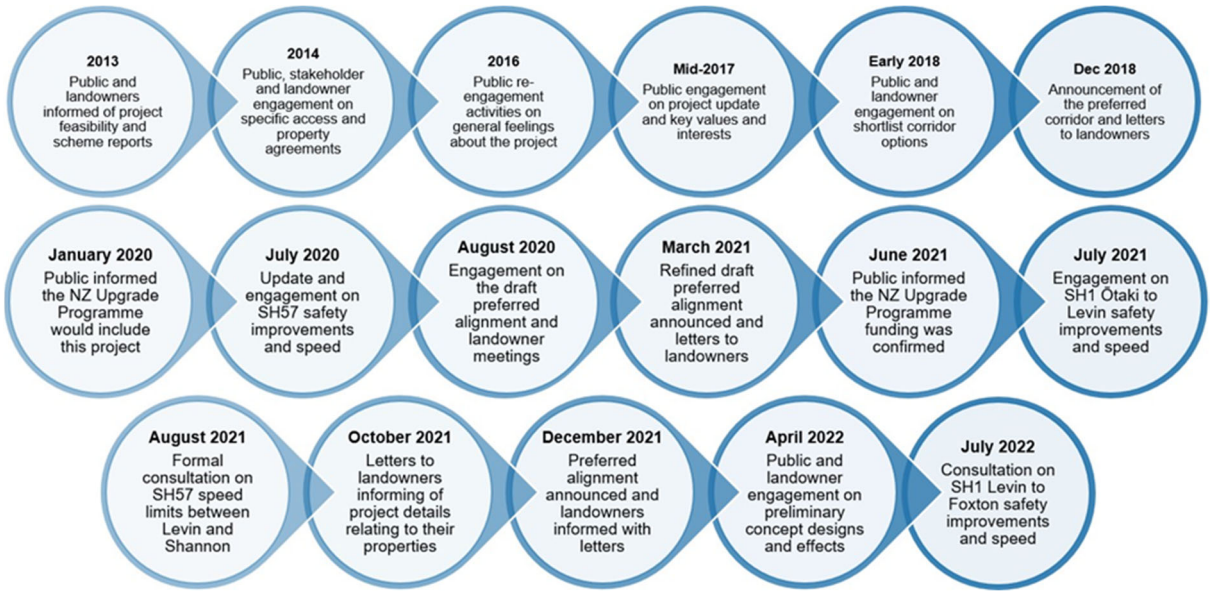
Interim safety improvements to the existing state highway network are currently underway and will continue into 2023 in order to provide a safer transport network for road users until the planned opening of the Ō2NL Project in 2029. These improvements include enhanced surfacing, barriers and intersection improvements at the major problematic areas on the current highway network.

After the opening of the Ō2NL Project, existing parallel parts of SH1 and SH57 will function as local roads providing access for communities to various community facilities, services and activities in the area as well as to the new highway. Modifications to existing sections of SH1 and SH57 are likely to be needed and the design of these will be developed in consultation with Horowhenua District Council, Kāpiti Coast District Council, stakeholders and local communities.

Consultation and engagement

A key element of the Ō2NL Project investigations has been consultation and engagement with local communities, councils, stakeholders and landowners. Figure 3 provides a summary of the main consultation and engagement activities that have occurred since the current phase of investigations commenced in 2011.

Figure 3: Consultation and engagement since 2013



Construction

The process to appoint designers and constructors for the Ō2NL Project has commenced and will be completed by the end of 2023. Once appointed, the project will confirm the construction methodology and timing of construction activities. The general process for constructing a road, the types of equipment needed, and methodologies used are known and will be similar to the processes used for constructing the recently completed PP2Ō expressway.

The way construction is undertaken is influenced by many factors including:

- the location and extent of construction compounds, laydown areas, site accesses and haul routes;
- the location of construction activities relative to sensitive environments or land uses (such as residential land use);
- construction water availability;
- approaches to works in and around waterways;
- seasonal weather;
- resource consent and designation conditions;
- Waka Kotahi construction guidelines and standards;
- availability of resources; and
- Ō2NL Project timing and target completion date.

Many of these features are known and shown on the drawings that accompany the NoRs and applications for resource consents. (Volume III).

The effects of construction activities will be managed through the preparation and implementation of a suite of management plans including a Construction Environmental Management Plan. These plans describe how traffic, dust, noise and vibration will be managed during construction, and how communities can discuss raise any issues or concerns. There will also be plans that manage the potential effects of erosion and sedimentation as a result of earthworks; plans to help manage potential effects on fish, lizards, birds and other invertebrates (including finding and relocating any found ahead of construction starting); and plans for creating new native forest areas to replace lost habitat.

Construction will be carried out by a number of work crews working on different parts of the Project either at the same time or at different stages. Early construction activities could start as early as late-2024 in preparation of the main construction works commencing in 2025. The construction period is expected to be 4-5 years.

During the construction phase, five sites are proposed that will supply earth material (fill) to construct the Project. The sites are located north and south of the Waikawa Stream, the Ohau River and south of Heatherlea East Road. Once these sites are no longer required, they will be rehabilitated to provide a positive legacy outcome. Details of the rehabilitation are yet to be confirmed but, for example, may entail creation of new open water habitat (in the material supply site located to the north of the Ohau River) and to provide new community access to the south bank of the Waikawa Stream from North Manakau.

Assessment of effects on the environment

In accordance with the relevant provisions of the RMA, an assessment of effects on the environment has been undertaken. The various effects and the mitigation measures proposed are summarised below.

The concept design allows for the actual and potential effects of the Ō2NL Project on the surrounding environment to be identified and appropriately managed. The actual and potential effects described below

include an allowance for design variation and includes both effects of the Project during construction and also the effects of the Ō2NL Project once it is operating.

A detailed design, including construction methodology, will be developed should RMA approvals be obtained. The detailed design of the Ō2NL Project will need to ensure that any potential adverse effects (including during construction) are no greater than the limits specified below.

Cultural effects

In order to integrate cultural and spiritual values into the Ō2NL Project, iwi have chosen to be part of the project team. Iwi Project Partners have developed key cultural values for the Project that underpin the ongoing cultural, environmental and wider design, management and implementation elements. Through this ongoing partnership, a collaborative and iterative approach has allowed the design to respond to and avoid potential effects on cultural values including, as follows:

To tread lightly, with the whenua

- avoiding effects on groundwater that feeds Punahau/Lake Horowhenua;
- avoiding cutting into maunga (mountains);
- avoiding earthwork cuts across spiritual pathways and reconnecting them with overbridges;
- avoiding effects on Ohau, Kuku, Waikawa and Manakau awa, and otherwise providing for fish passage in other awa;
- avoiding effects on native forest remnants wherever possible;
- designing stormwater and drainage to avoid mixing catchments, and to allow current awa patterns of movement to be retained (the same as pre-development);
- designing earthworks to reduce the need to take earth between catchments.

To create an enduring legacy

- designing the proposed restoration planting in accordance with ki uta ki tai; to restitch the landscape together and restore connections that align with mountains to sea principles;
- designing to restore access to awa (at Waikawa Stream) and also, potentially, the northern bank of the Ohau River;
- planting types that afford rongoa (Māori medicine) and mahinga kai opportunities; and
- ongoing involvement of Iwi Project Partners in the design, through the CEDF design process and management plans; and then construction, through karakia and construction site overview.

Cultural impact assessments have been provided from Muaūpoko Tribal Authority, Ngāti Hapū o Ōtaki, Ngā Hapū o Kereru, Ngāti Huia Collective, Te Iwi ō Ngāti Tukorehe and Te Kotahitanga o Te Iwi o Ngāti Wehi Wehi for the Ō2NL Project. These assessments identify how cultural effects should be managed, including through ongoing involvement in the design and construction phases. Accordingly, conditions are proposed that include the requirement for continued CEDF design audits; involvement in the preparation of management plans; and the requirement for the preparation of a Muaūpoko Management Plan and a Ngāti Raukawa ki te Tonga Management Plan.

Through formal partnership arrangements and the commitment to develop a design that is consistent with the CEDF (including the Design Audit processes), the rangatiratanga of the Iwi Project Partners is able to be upheld and tīkanga and kawa can be appropriately recognised throughout the Project, including construction phases.

Transport and traffic effects

The effects of the Ō2NL Project on transport have been assessed by comparing a predicted 2039 transport network with, and without, the Project taking into consideration current transport patterns. This

comparison allows for projected population and jobs growth and means that effects on the transport network are considered against the current network and also against the future network, 10 years after the Project is opened. This approach is the typical way in which the transport impacts of projects like the Ō2NL Project are understood.

The assessment shows that the Project will have significant positive transport effects at a local, regional and national scale, including:

- safety benefits including through a reduction of deaths and serious injuries on the existing state highway network and on local roads, and the provision of a new state highway that is designed to increase road user safety and enables road users to drive at a safe and appropriate speed;
- improved resilience by creating an alternative route that can be used if the existing state highways are closed due to crashes, weather events and other natural hazards;
- improved travel times for trips between Ōtaki and Levin;
- reduced delays on the state highway network and for side roads that access the existing state highway; and
- connectivity and accessibility for pedestrians and cyclists through the provision of a SUP.

Accesses to all properties along the route will be provided or maintained, but for some communities some trips will be slightly longer, notably for residents on Waitohu Road when they wish to travel south.

During construction, construction vehicles will use the existing state highway network where they can, but some local roads will need to be used and therefore there will be some localised short-term traffic effects, including possible delays or inconvenience arising from increased heavy construction traffic. These effects are proposed to be managed through a Construction Traffic Management Plan, the development of which will involve engagement with local residents.

Land use and property effects

The land that is required for the Ō2NL Project includes Te Ture Whenua Māori land, Government owned land and privately owned land. All property owners whose land is needed for construction purposes have been made aware of the extent of land that is required.

Potential disruption to accesses to property, or to water (including local water supply schemes) and other utilities will be identified so that plans can be made to provide continuity of use and supply during construction and once the road is operational. There may be some disruption to allow for re-routing and reconnection of services and accessways. Where this occurs, disruptions will be discussed directly with the affected property owners.

Noise and vibration effects during construction

Most of the Ō2NL Project is located well away from urban areas and therefore construction noise will generally be within the limits of the New Zealand construction noise standard (NZS 6803:1999).

Where construction is proposed to be in close proximity to sensitive receivers (for example, residential houses), methods to manage noise and vibration effects will be in place, and include ensuring no reversing beepers are used on construction vehicles, reducing and muffling noisy work and discussing how the work is done with local communities. These measures will be set out in a Construction Noise and Vibration Management Plan.

Noise and vibration effects once the Ō2NL Project is complete

To assess the road-traffic sound levels at locations that are sensitive to noise (for example, residential houses), noise modelling of existing and future road-traffic noise levels has been undertaken using industry standard modelling that is used for all road projects in New Zealand. Similar to the transport

modelling, the noise model considers current noise levels and compares them with noise from the predicted transport network in 2039 with, and without, the Ō2NL Project.

The noise modelling has taken a conservative approach by using a higher growth forecast (than used by the transport model) and assumed that vehicles are travelling at 110km/hr on the new state highway. The noise levels generated by higher volume and higher speed traffic is higher than would be generated by slower speed (100km/h - as is currently proposed) and lower volumes of traffic.

For state highways the main source of noise is generated is the sound of tyres on the road surface itself. The approach to manage and reduce road traffic noise is to reduce this noise from occurring in the first instance. So a specific type of road surface (known as open graded porous asphalt) is proposed to be used for the length of the Project as its use has proven to result in much less noise being generated as compared to standard chip seal surfaces (which is used on the existing sections of state highway network in Horowhenua today). A greater depth of this asphalt surface is proposed to be used relative to the urban areas of Levin, Ohau and Manakau as this reduces noise levels even further. This greater depth (extra-high standard) asphalt has not yet been used on other highway projects in the North Island but test show that it will result in further reductions in road traffic noise. In some locations additional noise barriers (road-side concrete barriers) are proposed to further reduce noise.

Overall, operational road traffic noise levels are predicted to generally be within the New Zealand road traffic noise standards (NZS 6806) and World Health Organisation criteria. However, for a small number of private properties, further investigation and discussion with owners is required to identify how to reduce internal noise levels. This will be confirmed through the next stages of the design of the Ō2NL Project.

The Project will also result in an improved noise environment for people living in close proximity to the existing state highways (existing SH1 and SH57). This is a result of traffic (and particularly heavy vehicles) using the new state highway rather than the existing state highways. In the 2039 scenario, a total of 317 houses are expected to benefit from an improved noise environment as a result of the Ō2NL Project.

The assessment concludes that there are no or minimal potential vibration effects from the operation of the new highway due to the ground conditions and distance of the physical works from any buildings or structures.

Air quality effects

Similar to the transport and noise modelling, an air quality (atmospheric dispersion) model, based on weather (meteorological) data, has been developed and used to predict air quality in 2039 with the Ō2NL Project. The predicted air quality is compared with predicted air quality in 2029 without the Project and enable the potential effects of the Project, including the potential effects of operational vehicles emissions to be assessed.

The assessment concludes that on completion of the Ō2NL Project there will be no adverse effects on air quality from vehicle emissions as the relevant health impact assessment guidelines and values can be met. In addition, there will be an overall reduction in public exposure to vehicle emissions near the existing state highways primarily due to the removal of vehicles from the existing SH1 and SH57 and reduced congestion.

Construction of the Project (and particularly earthworks activities) has the potential to generate nuisance dust. It is proposed to managed dust through standard and effective measures such as water sprays, treating earthwork areas, and wind and visual dust monitoring that will be set out in a Construction Air Quality Management Plan.

Effect on contaminated land

Preliminary investigations indicate that there may be contaminated soils at locations along the Project corridor as a result of historic land uses. Further investigations will be undertaken prior to the commencement of construction to confirm whether there are any sources of contamination that present a risk to human health or to the environment. Where found, contaminated land will be managed using standard practices and is subject to a separate RMA approval process.

Water quality effects

Once the Ō2NL Project is complete, any stormwater discharges from the new highway will be managed through a variety of different treatment devices including vegetated slopes, vegetated swales, vegetated wetlands, detention basins, infiltration, wetland swales and erosion control and discharge points. The discharge of the treated operational stormwater to surface water will therefore have a negligible or low impact on stream hydrology and water temperature.

The current state highway network does not have any stormwater treatment devices and as a significant proportion of traffic will shift from these untreated highways onto the new highway (where runoff is treated), and therefore an overall improvement in water quality is expected to be achieved.

Groundwater and hydrology effects

The Ō2NL Project avoids intersecting groundwater with the exception of two locations, one near to Pukehau (north of Ōtaki) and the other close to Sorenson's Road. In both the impact of intersecting groundwater is assessed as minor because any effects on groundwater are expected to be localised and minor.

There will be no effect on the existing water balance because existing flows (surface water) and groundwater are maintained. Further, the Project will not have an impact on other users of groundwater (via existing bores).

Overall, the Project is assessed as having a minor positive impact on the quality of groundwater as a result of the proposed stormwater treatment which is expected to improve the quality of run-off from highway surfaces.

In terms of potential effects of the Ō2NL Project on flooding and hydrology, the difference in water levels and the speeds in streams, rivers and overland flow paths has been assessed with, and without the Project. This assessment is based on culverts and bridges being sized and designed to manage expected water levels and speeds during a predicted 1 in 100 year storm event that occurs in 2130 including allowing for the effects of climate change. This size of storm event is bigger than a 1 in 200 year storm today.

During a 1 in 100 year event in 2130, it is predicted that the Project will not result in discernible impacts on the majority of the water levels of water courses and overland flow paths. There may be some localised increases in water levels upstream of the Project but these will dissipate quickly.

Terrestrial ecology effects

The Ō2NL Project is on land that is almost entirely used for agricultural and horticultural purposes (98%). The remaining 2% comprises original vegetation, forest and indigenous wetlands (including open water). These areas include locally characteristic totara forest, some black beech forest and mixed podocarp-broadleaved forest in the south and forest remnants dominated by kohekohe and/or tawa. Wetland habitats are primarily swamps on valley floors.

In terms of indigenous fauna (animals) 28 indigenous birds, two lizard species and various terrestrial invertebrates have been found in the vicinity of the Project. Of the two lizard species, the ornate skink is classed[3] as being 'At Risk-Declining' whilst the other species, the northern grass skink, is 'Not Threatened'. Two notable, but non-threatened terrestrial invertebrate species that have been recorded, including the *peripatus* and the giant land snail.

The Project has been designed to avoid any identified high value indigenous forest remnants. However, the Project results in the loss of some terrestrial and wetland habitats and construction activity and traffic on the new highway will have some indirect effects on habitats of high ecological value, including fragmentation of habitats.

[3] Based on the New Zealand Threat Classification System that is used to assess the threat status of our taxa (species, subspecies, varieties and forma).

To reduce ecological effects, and to offset and compensate for these potential effects (including during construction), the following is proposed:

- the protection of existing bush areas close to the Project with buffer planting;
- the restoration of approximately 12 hectares of wetland;
- the installation of a predator proof fence around an area and the search for, and relocation of, lizards, snails and insects from within the Project construction area to this area;
- the checking for bird nesting before clearing vegetation
- careful selection of plant species for landscaping to reduce the effects on birds, including pūkeko;
- the planting of approximately 7 hectares of forest and the creation of approximately 4,800m^2 of new open water area.

All planting work will be monitored and managed to ensure successful outcomes. These actions including planting will provide a positive effect that, taking into account potential losses caused by the Project, results in an overall net positive indigenous biodiversity gain.

Freshwater ecology effects

Streams and rivers crossed by the Ō2NL Project include the Koputaroa Stream (a tributary of the Manawatū River), the Ohau River and the Kuku, Waikokopu, Waikawa, Manakau, Waiauti and Waitohu streams.

These streams and rivers have been highly modified over time by agricultural and horticultural land use in the area. Significant lengths of stream do not have any planting on their banks and, typically, have low ecological values. A number of common fish species are found in all streams crossed by the Ō2NL Project. Fish species present in at least one of the streams crossed by the Project include:

- Nationally 'At Risk-Declining': longfin tuna/eel, bluegill bully, inanga, giant kōkopu, kōaro, brown mudfish and torrent-fish;
- Nationally 'Threatened–Vulnerable': short-jaw kōkopu and pirahau/lamprey;
- Regionally 'Rare': redfin bully, bluegill bully, banded kōkopu, kōaro; and
- Regionally 'Threatened': giant kōkopu, short-jaw kōkopu, brown mudfish and pirahau/lamprey.

Bridges will be constructed over the Ohau River, and the Kuku, Waikawa, Manakaua and Waiauti Streams, which avoids or minimises freshwater effects on these watercourses. A number of culverts are needed to bring other streams to across the new highway. These culverts are oversized and embedded so that a stream bottom can form on the base of the culvert and will provide for the passage of fish. A number of minor stream diversions are also required to minimise the number and length of culverts, along with the footprint of the Project itself, means that some freshwater habitats will be permanently lost.

To address the loss of freshwater habitat, it is proposed to plant (with native plant species) along both banks of approximately 15 kilometres of stream (being the Kuku, Waikawa, Waiauti, Manakau and Waitohu Streams). Stock will also be excluded from these planted areas so that overall, these lengths of streams are expected to return to their natural state. This action will provide a positive effect that, taking into account losses caused by the Project, results in an overall net freshwater ecological gain.

Other freshwater mitigation and management measures include:

- avoiding, when able, construction plant and machinery being in water courses, including through the use of temporary bridges;
- the construction of culverts when water flows are low or waterways are dry and, where necessary, transferring fish out of affected areas, providing temporary diversion avoiding work during fish spawning / migration seasons; and

- implementing erosion and sediment control measures to reduce sediment generation and to reduce sedimentation entering waterways.

Landscape, visual and natural character effects

The Ō2NL Project will change the existing landscape. Elements of the Project such as overbridges, roundabout intersections and river crossings have the potential to impact on the surrounding landscape. The Project reduces, minimises or avoids effects on the landscape, including by:

- locating the North Island Main Trunk rail line overbridge in a relatively unobtrusive location;
- locating the Project in rural areas in a manner that does not compromise future and earmarked residential and industrial development;
- designing bridges crossing water courses with piers to enable the river to maintain a natural bed and channels;
- avoiding areas of remnant bush;
- maintaining views towards natural features and landmarks, such as valleys, streams, hills and the Tararua Range from residential settlements;
- following the topography of the land along the base of hills; and
- maintaining views and connections between sites of cultural and heritage significance and natural features.

Measures to reduce impacts on the existing landscape; to manage natural character effects on streams and rivers; and to soften (filter) views of, and from, houses, include:

- planting alongside, and on embankments of, the new highway including interchanges and naturalising stormwater treatment devices;
- restoring wetlands and swamp forest;
- planting along the banks of rivers and streams;
- planting on edges of native bush areas (such as Staples Bush) and planting new forest area;
- establishing an avenue of trees along Waihou Road, Eastern Rise and Manakau Heights Drive (subject to Horowhenua District Council and landowners agreement) to soften (filter) views of the highway; and
- landscape restoration and planting to reduce visual impacts of the Project on specific public and private properties.

These planting measures are coordinated to provide for the integrated management of potential adverse effects across different disciplines including cultural, water quality, stream hydrology, terrestrial ecology and freshwater ecology.

The planting intended to result in positive landscape outcomes that will:

- ‘soften’ the Ō2NL Project;
- help tie in the Project into the landscape; and
- improve the landscape’s natural processes and patterns.

Archaeology and built heritage

There are no known nationally significant archaeological or built heritage sites within the area of land that will be disturbed as part of the Ō2NL Project. There are 13 low heritage value archaeological sites within the proposed designations and any effects of construction activities or future operational maintenance or works on these sites are considered negligible. A protocol to manage unexpected archaeological discoveries during construction is proposed.

Ashleigh is a significant homestead located on Queen Street East that is located close to the Ō2NL Project. Measures to manage construction dust, noise and vibration are proposed to protect Ashleigh during construction. Planting is proposed to minimise effects on the setting of the building.

Social impacts

Construction of the Project has the potential to generate adverse social impacts on people and communities that live, work or play in close proximity to the Project. Construction activities will also result in general community disruption. These effects have been minimised through the generally rural location of the Project.

Measures to manage potential construction effects (such as noise and dust nuisance) and the design of measures to manage the effects of construction traffic and traffic disruption are proposed through a suite of management plans that will be prepared and implemented in consultation with local communities and stakeholders. In addition, the Project, and community, will be supported by a community liaison person or persons and the establishment of a community liaison group to ensure that community members are able to engage with the Project when necessary. This approach is proposed so that adverse effects on communities are appropriately managed over the design and construction process.

People and communities near SH1 and SH57 will experience positive effects due to reduced traffic, especially heavy vehicles passing through communities on either side of SH1 and SH57, with associated noise reductions, and improved air quality outcomes. The removal of traffic from existing SH1 and SH57 will improve local access and community cohesion following construction.

Effects on productive land

The Ō2NL Project will unavoidably result in the loss of up to approximately 360 hectares land from farming of which up to approximately 167 hectares is highly versatile land. This amounts to less than 1% of the total amount of productive land in the Horowhenua District. Approximately 134 hectares of this land will become available again following the completion of construction.

Where existing land parcels are broken up (by the road cutting across them), and parcels less than 1 hectare in size are created, there is the opportunity for these parcels of land to be amalgamated with adjacent properties to become productive.

Economic effects

The Ō2NL Project is expected to boost the economy (in gross domestic product (GDP) terms) by between $1.2 billion and $1.3 billion. In addition, it is estimated that the Project will causing additional wider economic benefits of up to $500 million and will also help stimulate population growth, as Horowhenua becomes a more attractive place to live and work.

During the construction phase, the Horowhenua economy is predicted to benefit by between $59 and $139 million and the Kāpiti economy by between $45 and $60 million.

The effect of the Project on Levin Town Centre has been assessed, taking into account the diversion of through-traffic to the new highway. Allowing for population growth the amount of traffic in Levin town centre is estimated to be similar to current day volumes by 2039, but with less than half the number of trucks. Allowing for growth, the economic assessment indicates that any effects on the Levin town centre will be temporary and minor.

Similarly, but on a smaller scale, shops in Manakau and Ohau could experience a minor drop in sales due to a reduction in passing traffic. However, the retail and hospitality sector as a whole in these locations can expect to have substantial growth as a result of population growth.

Natural hazard effects

The Project will be able to continue to operate in a 1:100 year storm event (allowing for climate change) in 2130 (100 years from now), whereas sections of the current network would be flooded and closed in this scale of storm event. Further, new structures will be designed to meet current design standards. Therefore, the Project is substantially more resilient to earthquakes, flooding and other significant weather events.

Statutory matters

There are a number of objectives and policies in the national, regional and district planning documents that are relevant to the statutory assessment of the Ō2NL Project. Overall, the Project is not inconsistent with, and will give effect to (as required) the vast majority of these relevant objectives and policies of the statutory planning documents.

The main conclusions of the statutory assessment are that:

- the Project will assist in improving the safety and resilience of the transport network;
- the Project achieves the sustainable management of natural and physical resources including because it meets the growing transportation needs of the region and does not preclude future opportunities for other land transport developments such as public transport;
- the Project will contribute to a well-functioning urban environment through (amongst other things) enabling full urban development of the Tara-Ika Growth Area at Levin and other areas identified for urban growth by providing additional capacity on both the local and strategic transport network;
- the Project seeks to avoid where practicable, or otherwise, remedy or mitigate any adverse effects associated with the construction and operation of the Project;
- the route selection and consideration of alternatives has resulted in the route for the Project largely avoiding urban areas and areas of cultural and ecological significance;
- the Project has a functional need for the Project to traverse particular wetland environments;
- fish passage is provided in all instream structures and therefore gives effect to the National Policy Statement for Freshwater Management;
- through the Waka Kotahi partnership with tangata whenua, the Project has recognised and provided for the relationship of tangata whenua and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga;
- tangata whenua have been able to exercise their kaitiakitanga through the partnership with Waka Kotahi on all aspects of the Project, including the independent preparation of cultural impact assessments; and
- the Project safeguards the life-supporting capacity of air, soils, water and ecosystems.

The statutory assessment concludes that the Project will give rise to significant positive effects and will form an integral part of the region's transport network. The Project will enable people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety. The adverse effects will vary in significance, scale (local, regional and national), intensity and duration both during construction and operation of the Ō2NL Project. Overall, the statutory assessment concludes that the Project meets the statutory tests of the RMA.